

Tuck School of  
Business at Dartmouth

Tuck School of Business Working Paper No. 2008-47

## **Corporate Takeovers**

Sandra Betton  
John Molson School of Business, Concordia University  
sbett@jmsb.concordia.ca

B. Espen Eckbo  
Tuck School of Business at Dartmouth  
b.espen.eckbo@dartmouth.edu

Karin Thorburn  
Tuck School of Business at Dartmouth  
karin.s.thorburn@dartmouth.edu

May 2008  
This version, August 2008

This paper can be downloaded from the  
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<http://ssrn.com/abstract=1131033>

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Sandra Betton  
John Molson School of Business  
Concordia University  
sbett@jmsb.concordia.ca

B. Espen Eckbo  
Tuck School of Business  
Dartmouth College  
b.espen.eckbo@dartmouth.edu

Karin S. Thorburn  
Tuck School of Business  
Dartmouth College  
karin.s.thorburn@dartmouth.edu

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To appear in B. E. Eckbo (ed.), *Handbook of Corporate Finance: Empirical Corporate Finance, Volume 2*  
(North-Holland/Elsevier, Handbooks in Finance Series), Chapter 15, 2008.

*Keywords:* takeover, merger, tender offer, auction, offer premium, bidder gains, toeholds, markups,  
hostility, executive compensation, arbitrage, announcement return, long-run performance, monopoly,  
antitrust

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\*Surveying the vast area of corporate takeovers is a daunting task, and we have undoubtedly missed many interesting contributions. We apologize to those who feel their research has been left out or improperly characterized, and welcome reactions and comments. Some of the material in Section 3 is also found in Eckbo (2008).

## Abstract

This essay surveys the recent empirical literature and adds to the evidence on takeover bids for U.S. targets, 1980-2005. The availability of machine readable transaction databases have allowed empirical tests based on unprecedented sample sizes and detail. We review both aggregate takeover activity and the takeover process itself as it evolves from the initial bid through the final contest outcome. The evidence includes determinants of strategic choices such as the takeover method (merger v. tender offer), the size of opening bids and bid jumps, the payment method, toehold acquisition, the response to target defensive tactics and regulatory intervention (antitrust), and it offers links to executive compensation. The data provides fertile grounds for tests of everything ranging from signaling theories under asymmetric information to strategic competition in product markets and to issues of agency and control. The evidence is supportive of neoclassical merger theories. For example, regulatory and technological changes, and shocks to aggregate liquidity, appear to drive out market-to-book ratios as fundamental drivers of merger waves. Despite the market boom in the second half of the 1990s, the proportion of all-stock offers in more than 13,000 merger bids did not change from the first half of the decade. While some bidders experience large losses (particularly in the years 1999 and 2000), combined value-weighted announcement-period returns to bidders and targets are significantly positive on average. Long-run post-takeover abnormal stock returns are not significantly different from zero when using a performance measure that replicates a feasible portfolio trading strategy. There are unresolved econometric issues of endogeneity and self-selection.

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# 1 Introduction

Few economic phenomena attract as much public attention and empirical research as the various forms of transactions in what Manne (1965) dubbed "the market for corporate control." Corporate takeovers are among the largest investments that a company ever will undertake, thus providing a unique window into the value implications of important managerial decisions and bid strategies, and into the complex set of contractual devices and procedures that have evolved to enable the deals to go through. Empirical research in this area has focused on a wide range of topics including the impact of statutory and regulatory restrictions on the acquisition process (disclosure and target defenses), strategic bidding behavior (preemption, markup pricing, bid jumps, toeholds, payment method choice, hostility), short- and long-run abnormal stock returns to bidder, and targets (size and division of takeover gains), and the origin and competitive effects of corporate combinations (efficiency, market power and antitrust policy). In this survey, we review empirical research on each of these and related topics.

The structure of our survey differs from most earlier empirical reviews, where the focus tends to be on the final bid in completed takeovers.<sup>1</sup> We follow the approach begun by Betton and Eckbo (2000) and examine the entire takeover process as it evolves from the first bid, through bid revision(s) and toward the final outcome (success or failure). This more detailed focus on the takeover process is also found in more recent publications.<sup>2</sup> We provide new empirical updates in some areas, using takeovers found in the Thomson Financial SDC database for the period 1980–2005. One limitation of the survey is that we do not discuss the general interplay between the market for corporate control, ownership structure and corporate governance (with the exception of hostile bids).<sup>3</sup> We also limit the review to empirical studies of takeovers of U.S. target firms.<sup>4</sup> Takeovers by financial buyers such as leveraged buyouts (LBOs) are surveyed in Eckbo and Thorburn (2008b), Chapter 16 of this volume.

Throughout, we use the term *takeover* generically for any acquisition of corporate control

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<sup>1</sup>Jensen and Ruback (1983), Jarrell, Brickley, and Netter (1988), Eckbo (1988), Andrade, Mitchell, and Stafford (2001), Martynova and Renneboog (2005, 2007).

<sup>2</sup>Bhagat, Dong, Hirshleifer, and Noah (2005), Boone and Mulherin (2007b), Betton, Eckbo, and Thorburn (2007). See also the survey by Burkart and Panunzi (2006).

<sup>3</sup>Research on corporate ownership structure, managerial private benefits of control, shareholder activism and voting, etc., is surveyed in Becht, Bolton, and Roll (2003), Dyck and Zingales (2004), and Adams and Ferreira (2007).

<sup>4</sup>See Martynova and Renneboog (2006) for the European takeover market.

through the purchase of the voting stock of the target firm, regardless of whether the bid is in the form of a merger agreement or a tender offer. Moreover, in our vernacular, the first observed bid for a specific target starts a takeover "contest" whether or not subsequent bids actually materialize. All initial bids start a contest in the sense of attracting potential competition from rival bidders and/or incumbent target management. This is true even after signing a merger agreement, as director fiduciary duties require the target board to evaluate competing offers all the way until target shareholders have voted to accepted the agreement (the fiduciary out). Also, we know from the data that a friendly merger negotiation is not a guarantee against the risk of turning the takeover process into an open auction for the target. The contest perspective helps us understand why initially friendly merger bids are sometimes followed by tender offers and vice versa, why we sometimes observe bid revisions even in the absence of rival bidders, why target hostility emerges even when the initial bidder appears to be friendly, and why the auction for the target sometimes fail, altogether (no bidder wins).

We begin in Section 2, "Takeover activity," with a brief discussion of takeover waves, followed by a detailed description of the initial bids in an unprecedented sample consisting of more than 35,000 takeover contests for U.S. public targets over the period 1980-2005. The description includes initial deal values, degree of actual competition (single-bid versus multiple-bid contests), success rates, the deal form (merger versus tender offer), payment method (cash, stock, or a mix), target attitude (hostile v. neutral or friendly), product market connection (horizontal v. nonhorizontal), public versus private status of the bidder and the target, time to second bid, and total contest duration. We also characterize the actual institutional environment in which firms are sold, including rules governing tender offers and various contractual innovations designed to support merger negotiations. Moreover, this section comments on the determinants of the choice between merger and tender offer, and it discusses the impact of mandatory disclosure rules on premiums in tender offers.

We then move to Section 3, "Bidding strategies." In theory, a complex set of factors determine the design of optimal bids.<sup>5</sup> These include auction design, the nature of bidder valuations, the private information environment, target ownership structure, and bidding costs. A key empirical challenge is to establish whether there is evidence of strategic bidding and/or signaling effects in

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<sup>5</sup>For surveys of takeover theories, see Spatt (1989), Hirshleifer (1995), Burkart and Panunzi (2006), and Dasgupta and Hansen (2007).

the data. As the first mover in the takeover game, the initial bidder is in a unique position, so strategic bidding behavior is likely to be most evident in the first bid. Thus, our empirical analysis is structured around the actions of the first bidder making a control-offer for the target.

We begin Section 3 with a brief description of the classical free-rider model of Grossman and Hart (1980b) and of the standard auction setup in models with a single seller. This helps frame some of the subsequent empirical test results. We then review empirical work on strategic decisions including the initial bidder's choice between merger and tender offer, the payment method, pre-bid acquisition of target shares in the market (toehold bidding), markup pricing following a pre-bid target stock price runup, takeover defenses, and acquisitions of formally bankrupt targets. This section focuses on how the various actions affect the initial and final offer premium.

In the first part of Section 4, "Takeover gains," we discuss estimates of the announcement effect of takeovers on the wealth of bidder and target shareholders. In their review of the empirical evidence from the 1960s and 1970s, Jensen and Ruback (1983) conclude that the average sum of the deal-related stock market gains to bidders and targets is significantly positive. Subsequent surveys have also made this conclusion (Jarrell, Brickley, and Netter, 1988; Andrade, Mitchell, and Stafford, 2001). On the other hand, as pointed out by Roll (1986) and strongly emphasized in Moeller, Schlingemann, and Stulz (2004), bidder deal-related abnormal returns are often negative. Drawing on Betton, Eckbo, and Thorburn (2008c), we show that the value-weighted sum of announcement-induced three-day abnormal stock return to bidders and targets is significantly positive. This conclusion holds for the entire sample period 1980-2005 as well as for each of the five-year subperiods. We also discuss the large bidder dollar losses from the period 1998-2001 that are the central focus of Moeller, Schlingemann, and Stulz (2004).

In the second part of Section 4, we review and update estimates of abnormal stock returns to merged firms over the five-year period following successful completion of the takeover. We show that post-merger performance is on average negative if one benchmarks the returns with the returns to nonmerging firms matched on size and book-to-market ratio. However, the abnormal performance is insignificantly different from zero when using standard asset pricing benchmarks. These conflicting inferences concerning long-run performance produced by the matched-firm technique and the "Jensen's alpha" (regression) procedure is reminiscent of the debate in the literature on

security offerings.<sup>6</sup>

In Section 5, "Bondholders, executives, and arbitrageurs", we review empirical studies of the wealth implications of mergers for bondholders, for bidder and target executives and directors, and for arbitrageurs. Issues for bondholders include the potential for a wealth transfer from stockholders to bondholders as a result of the coinsurance effect of takeovers, and protection against event-risk. For executives, a key issue is the disciplinary role of the market for corporate control, and whether undertaking value-decreasing takeovers is costly in terms of increased turnover and/or reduced compensation. Merger (risk) arbitrage is an investment strategy that tries to profit from the spread between the offer price and the target stock price while the offer is outstanding. It is essentially a bet on the likelihood that the proposed transaction closes. Research documents the determinants of the arbitrage spreads, trading volumes, the role of transaction costs in establishing these positions, and the returns to arbitrage activity.

Finally, in Section 6, "Takeovers, competition, and Antitrust," we broaden the focus to the industry of the bidder and target firms. The key empirical issue centers on the extent to which mergers are driven by opportunities for creating market power. While the potential for market power is most obvious for horizontal combinations (as recognized by the antitrust authorities), vertical mergers may generate buying power vis--vis suppliers. We review empirical tests employing estimates of abnormal stock returns to the industry rivals of the merging firms. These estimates show that mergers tend to cause a wealth effect throughout the industry of the target firm. One consistent interpretation is that synergy gains generated by takeovers represent quasi-rents from scarce resources owned throughout the target industry. The alternative hypothesis—that the industry wealth effect represents the present value of monopoly rents from collusive behavior—is consistently rejected by the empirical studies. We end this section with a brief discussion of implications for antitrust policy.

The survey concludes in Section 7 with a summary of the key findings and some directions for future research.

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<sup>6</sup>See the reviews by Ritter (2003) and Eckbo, Masulis, and Norli (2007).

## 2 Takeover activity

### 2.1 Merger waves

A merger wave is a clustering in time of successful takeover bids at the industry- or economywide level. This is shown in Figure 1 for U.S. publicly traded firms over the period 1926-2006. The figure plots the annual fraction of all firms on the University of Chicago's Center for Research in Security Prices (CRSP) database in January of each year which delists from the stock exchange due to merger during the year. Looking back, aggregate takeover activity appears to occur in distinct waves—peaks of heavy activity followed by troughs of relatively few transactions.

Merger activity tends to be greatest in periods of general economic expansion. This is hardly surprising as external expansion through takeovers is just one of the available corporate growth strategies. As seen in Figure 1, aggregate takeover activity was relatively high in the late 1960s, throughout the 1980s, and again in the late 1990s. These waves are typically labeled the conglomerate merger wave of the 1960s, the refocusing wave of the 1980s, and the global wave or strategic merger wave of the 1990s.<sup>7</sup>

These labels indicate the character of the typical merger within the wave. Thus, a majority of the mergers in the 1960s were between firms operating in unrelated industries (conglomerate mergers). It is possible that the internal capital market created through conglomerate merger may have reduced financing costs for unrelated corporate entities.<sup>8</sup> On the other hand, since conglomerates tend to reduce (diversify) the risk of managerial human capital and to create "business empires" perhaps valued excessively by CEOs, the conglomerate wave may also reflect an agency problem. The agency view is strengthened by the fact that executive compensation showed little sensitivity to firm performance at the time (Jensen and Murphy, 1990). Thus, value-reducing diversifying mergers may have had little consequence for CEOs, leading to excessive conglomeration. However, estimates of abnormal stock returns around the conglomerate takeovers of the 1960s do not indicate that these investments were on average detrimental to shareholder wealth.<sup>9</sup>

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<sup>7</sup>The merger wave of the late 1890s and early 1900s (not shown in Figure 1) has been referred to as the Great merger wave (O'Brien, 1988) or the "monopolization wave" (Stigler, 1950).

<sup>8</sup>Hubbard and Palia (1999), Maksimovic and Phillips (2002). Maksimovic and Phillips (2007) review internal capital markets, while Eckbo and Thorburn (2008b), Chapter 16 of this volume, review breakup transactions that may follow excessive conglomeration.

<sup>9</sup>Loderer and Martin (1990), Matsusaka (1993), Akbulut and Matsusaka (2003).

The merger wave of the 1980s includes a number of mergers designed either to downsize or to specialize operations. Some of these corrected excessive conglomeration, others responded to excess capacity created by the 1970s recession (following the creation of the OPEC oil cartel), while yet others responded to the important advances in information and communication technologies (Jensen, 1986, 1993). The 1980s also experienced the largest number of hostile bids in U.S. history. The subsequent spread of strong takeover defenses in the late 1980s halted the use of hostile bids, and the late 1990s saw a "friendly" merger wave, with a primary focus on mergers with global strategic partners.

A complex set of factors are at play in any given merger wave. For example, merger waves may be affected by changes in legal and regulatory regimes. Shleifer and Vishny (1991) suggest that the demand for conglomerate mergers in the 1960s may have been triggered by the stricter antitrust laws enacted in the early 1950s.<sup>10</sup> While this may have had an effect in the United States, it is interesting that countries with lax antitrust laws (Canada, Germany, and France) also experienced diversification waves in the 1960s (Matsusaka, 1996). Industry-specific deregulations may also create merger waves, such as deregulations of the airline industry in 1970s (Spiller, 1983; Slovin, Sushka, and Hudson, 1991) and of the utility industry in 1992 (Jovanovic and Rousseau, 2004; Becher, Mulherin, and Walkling, 2008).

The perhaps most compelling theory of merger waves rests on the technological link between firms in the same industry. A merger implementing a new technological innovation may, as news of the innovation spreads, induce follow-on takeovers among industry rivals for these to remain competitive. This argument goes back at least to Coase (1937), who suggests that scale-increasing technological change is an important driver of merger activity. Jensen (1993) draws parallels between merger activity and the technological changes driving the great industrial revolutions of the nineteenth and twentieth centuries. Gort (1969) and Jovanovic and Rousseau (2002) use the related-technology notion to build theories of resource reallocations based on valuation discrepancies and Tobin's Q. Rhodes-Kropf and Robinson (2008) propose a search theory where bidders and targets match up based on the degree of complementarity of their resources.

There is substantial evidence of industry-clustering of mergers.<sup>11</sup> Andrade and Stafford (2004)

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<sup>10</sup>One important antitrust development was the 1950 Celler-Kefauver amendment of the 1914 Clayton Act. See Section 6 below.

<sup>11</sup>Mitchell and Mulherin (1996), Mulherin and Boone (2000), Andrade, Mitchell, and Stafford (2001), Maksimovic

find that mergers play both an expansionary and a contractionary role in industry restructurings. During the 1970s and 1980s, excess capacity tended to drive industry consolidation through merger, while peak capacity utilization triggered industry expansion through nonmerger investment (internal expansion). This phenomenon appears to have reversed itself in the 1990s, as industries with strong growth prospects, high profitability and near capacity also experienced, the most intense merger activity. Maksimovic and Phillips (2001) use performance improvements at the plant level to support the neoclassical reallocation theory of merger waves. Maksimovic, Phillips, and Prabhala (2008) show that, for mergers in manufacturing industries, the acquirer on average closes or sells about half of the target firm's plants. Moreover, a simple neoclassical model of production helps predict the choice of which target plants to sell/close. The plants that are kept are often restructured, resulting in productivity increases. Servaes and Tamayo (2007) find that industry peers respond by financing and investment policies when another firm in the industry is the subject of a hostile takeover attempt, suggesting that firms in the same industry are linked by both technology and resource complementarities

The fact that merger waves are correlated with economic expansions and high stock market valuations has also spurred the development of models in which merger waves result from market overvaluation and managerial timing. The idea is that bull markets may lead bidders with overvalued stock as currency to purchase the assets of undervalued (or less overvalued) targets. In Shleifer and Vishny (2003), target managements accept overpriced bidder stock as they are assumed to have a short time horizon. In Rhodes-Kropf and Viswanathan (2004), target management accepts more bids from overvalued bidders during market valuation peaks because they overestimate synergies during these periods. In both models, the bidder gets away with selling overpriced stock.

Eckbo, Giammarino, and Heinkel (1990) present a rational expectations model of the payment method in takeovers with two-sided information asymmetry (neither the bidder nor the target knows the true value of the shares of the other), in which the fraction of the deal paid in cash signals the bidder's true value. In equilibrium, the target receives correctly priced bidder stock as part of the payment. Their analysis suggests that the pooling equilibrium proposed by Shleifer and Vishny (2003) is sensitive to the possibility of mixed offers. As shown in Figure 7 below, mixed offers represent a substantial portion of all takeovers: during the period 1980 through 2005, there

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and Phillips (2001), Andrade and Stafford (2004), and Harford (2005).

were nearly as many mixed cash-stock offers as there were all-stock bids. Moreover, despite the market boom in the second half of the 1990s, the relative proportions of all-cash, all-stock, and mixed cash-stock offers in more than 15,000 merger bids did not change from the first half of the decade. Also, during the 1996-2000 period with peak market valuations, the sum of all-cash and mixed cash-stock bids in mergers equals the number of all-stock merger bids.

Rhodes-Kropf, Robinson, and Viswanathan (2005), Ang and Cheng (2006) and Dong, Hirshleifer, Richardson, and Teoh (2006) find that merger waves coincide with high market-to-book (M/B) ratios. One argument is that the M/B ratio is a reliable proxy for market overvaluation and that investor misvaluations tend to drive merger waves. High market valuations may be a fundamental driver of merger waves as bidders attempt to sell overpriced stock to targets (and succeed). Rhodes-Kropf and Viswanathan (2004) present an interesting model in which *rational* (Bayesian) managers accept too many all-stock merger bids when the stock market booms and too few when the market is low. They assume that the market's pricing error has two components, one economywide and another that is firm-specific. When receiving a bid, the target attempts to filter out the marketwide error component. The Bayesian update puts some weight on there being high synergies in the merger, so when the marketwide overvaluation is high, the target is more likely to accept the offer. In other words, bids tend to look better in the eyes of the target when the market is overvalued.

Harford (2005) contrasts these predictions with a neoclassical argument in which the driver of merger waves is market liquidity. That is, under the neoclassical view, market liquidity is the fundamental driver of *both* M/B ratios and merger waves.<sup>12</sup> Harford (2005) constructs a measure of aggregate capital liquidity based on interest rate (default) spreads and uses this measure in a "horse race" with M/B ratios in predicting industry merger waves. He finds that waves are preceded by deregulatory events and high capital liquidity. More importantly, he shows that the capital liquidity variable eliminates the ability of M/B ratios to predict industry merger waves. He concludes that aggregate merger waves are caused by the clustering of shock-driven industry merger waves, not by attempts to time the market.

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<sup>12</sup>For example, Shleifer and Vishny (1992) argue that merger waves tend to occur in booms because increases in cash flows simultaneously raise fundamental values and relax financial constraints, bringing market values closer to fundamental values. Harford (1999) shows that firms that have built up large cash reserves are more prone to acquire other firms.

Patterns of merger waves notwithstanding, predicting individual target firms with any accuracy has proven difficult.<sup>13</sup> Probability estimates are sensitive to the choice of size and type of control sample. Firm size consistently predicts targets across most studies, while results are mixed for other commonly used variables, including factors capturing growth, leverage, market-to-book ratios, and ownership structure.

## 2.2 Takeover contests, 1980-2005

As discussed in Section 2.3, after signing a merger agreement, the target board is normally required to consider new outside offers until target shareholders have given final approval of the takeover (the so-called fiduciary out clause). This means that no bidder can expect to lock up the target through negotiations but must be prepared for potential competition. All initial bidders, whether the initial bid is in the form of a merger or a tender offer, face this potential competition. We therefore refer to all initial bids as initiating a *control contest* whether or not multiple bids actually emerge ex post.

The "contest tree" in Figure 2 shows the potential outcomes of any initial bid. In the first round of the contest, one of three outcomes will occur: (1) the bid is accepted by the target and the contest ends; (2) the bid is rejected and the contest ends; or (3) the bid is followed by one or more rival bids and/or bid revisions before the contest ends. After two or more rounds of bidding, one of three final outcomes will occur: (4) the initial bidder wins control; (5) a rival bidder wins control; or (6) no bidder wins control (the target remains independent). Later in this chapter, we use this contest-tree structure to organize successive bids for the same target and to describe recent bidding activity.

### 2.2.1 Initial bidders and offer characteristics

We collect bids from the Thomson Financial SDC mergers and acquisitions database. SDC provides records of individual bids based on information in the news and Securities and Exchange Commission (SEC) filings by the bidder and target firms. As shown by Boone and Mulherin (2007b), targets increasingly initiate takeovers through a process where they privately solicit several poten-

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<sup>13</sup>Hasbrouck (1985), Palepu (1986), Mork, Shleifer, and Vishny (1988), Mikkelson and Partch (1989), Ambrose and Megginson (1992), Shivdasani (1993), Comment and Schwert (1995), Cremers, Nair, and John (2008).

tially interested bidders and select a negotiating partner among the respondents. The initial bidder identified by the SDC may well have emerged from such a process. However, we follow standard practice and use the first *official* (public) bid for the target to start the contest.

The bids are by U.S. or foreign bidders for a U.S. public or private target announced between January 1980 and December 006. We start by downloading all mergers (SDC deal form M), acquisition of majority interest (AM), acquisition of partial interest (AP), and acquisition of remaining interest (AR).<sup>14</sup> This results in a total of 70,548 deals (bids). We then use the SDC "tender" flag to identify which of the bids are tender offers and control-block trades.<sup>15</sup> Next, we organize the 70,548 bids into control contests, where a target is identified using the CUSIP number. A control bid is defined as a merger or acquisition (tender offer) of majority interest where the bidder holds less than 50% of the target shares at announcement.<sup>16</sup> The control contest begins with the first control bid for a given target and continues until 126 trading days have passed without any additional offer (including acquisitions of minority interests). Each time an additional offer for the target is identified, the 126 trading day search window rolls forward.

A control bid is successful if SDC's deal status field states "completed." For successful contests, the formal contest ending date is the earlier of SDC's effective conclusion date and target delisting date. Unsuccessful contests (no bid is successful) end with the offer date of the last control bid or partial acquisition plus 126 trading days (given that there were no more bids in the 126-day period).<sup>17</sup> This selection process produces a total of 35,727 contests. Control contests may be single-bid, multiple-bid but single bidder, or multiple bidder. A multiple-bid contest occurs either because there are multiple bidders or because the initial bidder submits a bid revision. Bid revisions are shown on SDC as a difference between the initial and final offer price within one SDC deal entry. For multiple-bidder contests, the identity of the successful bidder is determined by comparing the CUSIP of the successful bidder with the CUSIP of the initial control bidder. If they are the same,

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<sup>14</sup>We exclude all transactions classified as exchange offers, acquisition of assets, acquisition of certain assets, buy-backs, recaps, and acquisition (of stock).

<sup>15</sup>This identification proceeds as follows: If the tender flag is "no" and the deal form is a merger, then the deal is a merger. If the tender flag is "no" and the deal form is "acquisition of majority interest" *and* the effective date of the deal equals the announcement date, then the deal is classified as a control-block trade. If the tender flag is "yes," or if the tender flag is "no" and it is not a block trade, then the deal is a tender offer.

<sup>16</sup>If information on the bidder's prior ownership in the target is missing from SDC, we assume that the prior shareholding is zero.

<sup>17</sup>We removed a single contest due to missing target name, 23 contests due to multiple successful bids, and 36 contests where the target was a Prudential-Bache fund.

then the initial bidder is successful otherwise a rival bidder is successful.

Tables 1 through 3 and Figures 3 through 6 describe the central characteristics of the total sample of 35,727 initial bids and their outcomes. Table 1 shows how the total sample is split between initial merger bids (28,994), tender offers (4,500), and control-block trades (2,224). Panel A of Figure 3 shows the annual distribution of the initial merger bids and tender offers, confirming the peak activity periods also shown earlier in Figure 1. The number of merger bids exceeds the number of tender offers by a factor of at least three in every sample year and by a factor of seven for the total period. The relative frequency of tender offers peaked in the second half of the 1980s.

The SDC deal value, converted to constant 2000 dollars using the Consumer Price Index of the Bureau of Labor Statistics (Series Id: CUUR0000SA0), averages \$436 million for initial merger bids, and \$480 million for initial tender offers.<sup>18</sup> The distribution of deal values is highly skewed, with a median of only \$35 million for mergers and \$79 million for tender offers, respectively. The annual deal values plotted in Panel A of Figure 3 show that tender offers have somewhat greater deal values in the first half of the sample period, and that merger bids have slightly greater deal values than tender offers in the years 1998-2000.

Table 1 also provides information on the initial bidder's choice of payment method, the target's reaction to the initial bid, and the product-market relationship between the initial bidder and the target. SDC provides payment information for 53% of the sample bids. Of these, 26% (4,798) are classified as all-cash bids, in 37% the method of payment is all-stock, and for 37% the bidder pays with a mix of cash, bidder stock, and/or other (typically debt) securities. In terms of average deal size, mixed and all-stock offers have similar sizes (\$538 and \$493 million, respectively), while all-cash bids are somewhat lower with \$310 million. SDC classifies 590 initial bids as hostile and another 435 bids as unsolicited. All other bids are grouped here as friendly—including bids for which SDC does not provide a classification. The hostile bids are by far the largest in terms of size, with an average deal size of \$1,612 million versus \$609 million for unsolicited offers and \$384 million for the average friendly deal.

The last panel in Table 1 shows that 10,452 or 29% of all bids are horizontal (defined as the initial bidder and the target operate in the same four-digit SIC industry). With an average deal value of \$562 million, the typical horizontal bid is somewhat larger than the sample average deal

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<sup>18</sup>SDC deal values are available for 17,367 of the merger bids and for 3267 of the tender offers.

size. Figure 4 complements the industry information by listing the total number of bids (Panel A) and the fraction of horizontal initial bids (Panel B) by broad industry sectors and by time period. The industry sectors are Manufacturing; Finance, Insurance, and Real Estate; Services; Retail and Wholesale; Utilities and Public Administration; and Agriculture, Mining and Construction. The two first sectors (Manufacturing, and Finance, Insurance, and Real Estate) are by far the most takeover-intensive sectors in every one of the five five-year subperiods covering the total sample. The only exception is that Services experienced a peak takeover-intensity during 1996-2005. The percentage of the takeover bids that are horizontal tends to be somewhat greater for the least takeover-intensive sectors such as Utilities and Public Administration, and Agriculture, Mining and Construction.

Table 2 and Figure 5 list the sample according to the public status of the target and initial bidder. Of the total sample of 35,727 initial bidders, 67% (24,058) are publicly traded. There are a total of 13,185 publicly traded targets, of which 8,259 receive initial bids from a public bidder. Not surprisingly, these are also the largest deals, with an average of \$957 million in constant 2000 dollars (median \$116 million). The largest single group is public bidders initiating a contest for a private target, with a total of 15,799 initial bids (44% of the sample). These deal values are typically small, with an average deal value of \$66 million (median \$16 million). There is also a group of 4,482 private bidder/private targets, comprising 13% of the total database and with an average deal value of \$114 million (median \$23 million).

Panel A of Figure 5 plots the number and total deal value (in constant 2000 dollars) for public and private target deals over the sample period, while Panel B repeats the plot based on the bidder being either public or private. The number of deals with public targets (Panel A) and with public bidders (Panel B) both increase sharply in the second half of the 1990s. The average deal values when the target is private (Panel A) is small and stable over the entire sample period. Deal values for private bidders (Panel B) are also relatively low, but fluctuate over time in direct proportion to the number of public targets in this group.

Recall that our sampling procedure requires the target but not the bidder to be a U.S. firm. The last panel of Table 2 shows how the bidders split according to nationality. A total of 3,882 or 11% of the total sample of initial bidders are domiciled outside of the United States. Of these, 1,044 bidders are from Canada, 716 from the United Kingdom, and the remaining 2,122 are from

a variety of other nations. Interestingly, contests initiated by a foreign bidder are on average large, with a mean of \$701 million (median 41 million) when the bidder is from the UK, and \$649 million (median \$78 million) when the bidder is from the group of "other" countries.

### 2.2.2 Duration, time to second bid, and success rates

Recall that, starting with the initial offer, we identify the final bid in the contest when 126 trading days have passed without any new offer. Table 3 provides information on the duration of the 25,166 successful contests initiated by a merger or a tender offer. Duration is measured from the date of the initial bid to the effective date of the takeover. The effective date is the day of target shareholder approval of the target shareholder approves the deal. Given the stringent disclosure rules governing public offer, it is important to separate public from private firms. In the group where both the initial bidder and the target are public, the duration averages 108 trading days (median 96) when the initial bid is a merger offer and 71 days (median 49) when the initial bid is a tender offer. This confirms the conventional view that tender offers are quicker than merger negotiations.

These results are comparable to Betton and Eckbo (2000), who report contest durations for 1,353 tender offer contest, 1971-1990. Of these contests, 62% are single bid with an average duration of 40 trading days (median 29 and highest quartile 52 days). For the multibid contests, the average (median) duration is 70 (51) days. Thus, there is very little change in duration from the 1980s. Also, Table 3 shows clearly that a public target slows down the the takeover process, whether or not the initial bid is a merger or a tender offer. Contests have the shortest duration when both firms are private: 27 days (median 0) for mergers and 67 days (median 41) for tender offers.<sup>19</sup>

Figure 6 shows the distribution of the number of weeks from the initial to the second bid in 1,787 of the 1,891 multibid contests in our sample (Table 1). In general, the expected time to arrival of a second bid depends on the cost to rival bidders of becoming informed of their own valuation of the target, as well as the time it takes to file a formal offer. For some rival bidders, the initial bid may have been largely anticipated based on general industry developments or prior rumors of the target being in play. However, in general, the observed time to the second bid sheds some light on the likelihood that rival bidders have ready access to the resources required to generate takeover

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<sup>19</sup>A contest duration of zero results when the initial offer is announced and accepted on the same day. This is possible in some private deals, provided bidder shareholders do not need to vote on a share issue to pay for the target, and provided the target vote is quick due, say, to high shareownership concentration.

gains.

For the 1,204 contests with multiple bidders, the time from the initial to the second bid averages 5.7 calendar weeks (29 trading days), with a median of 3.7 weeks. For the 583 contests with a single bidder making multiple bids, the average time to the first bid revision is 9 weeks (45 trading days) with a median of 7.6 weeks.<sup>20</sup> Thus, the time to the second bid is, on average, shorter when a rival bidder enters than when the second bid represents a bid revision by the initial bidder. These findings are comparable to those in Betton and Eckbo (2000), who report a mean of two weeks (14 trading days) and a highest quartile of 6 week days from the first to the second bid for their sample of 518 multibid tender offer contests.

Several studies provide estimates of the probability that the target will be successfully acquired by *some* bidder (the initial or a rival) following takeover bids. Given our contest focus (Figure 2), we are particularly interested in the probability that the *initial* bidder wins (possible after multiple bid rounds). Betton, Eckbo, and Thorburn (2007) estimate this probability using 7,470 initial merger bids and tender offers. They find that this probability is higher when the initial bidder has a toehold in the target and when the initial bid is all-cash (rather than all-stock or mixed cash-stock), when the bid is a tender offer (rather than merger), and when the bidder is a public company. The probability is also increasing in the pre-bid target stock price runup (the average cumulative target abnormal return from day -42 through day -2 relative to the initial offer day), when the target is traded on the NYSE or the Amex, and when the bidder and target are horizontally related in product markets. Finally, the probability that the initial bidder wins the contest is lower if the target has a poison pill and if the target reaction is hostile. The negative impact of the presence of a poison pill is interesting, for it suggests that pills deter some bids. We return to this issue in Section 3.5.

Finally, Table 1 implies that the probability that all bids fail in a contest is 23% when the contest is initiated by merger and 28% when the initial bid is a tender offer. Thus, as noted by Betton, Eckbo, and Thorburn (2007) as well, merger negotiations are risky for the initial bidder. They are particularly risky when the initial bidder is private. As shown in Table 2, the probability that all bids fail is as high as 40% when the initial bidder is private and the target is public and

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<sup>20</sup>Under the 1968 Williams Act, any given tender offer must be open for at least 20 days, and a new bid extends the minimum period accordingly.

the bidder approaches with a merger offer.

## **2.3 Merger negotiation v. public tender offer**

### **2.3.1 Merger agreement and deal protection devices**

A merger agreement is the result of negotiations between the bidder and target management teams. The agreement sets out how the bidder will settle any noncash portion of the merger payment. Frequently used contingent payment forms include stock swaps (discussed extensively in Section 3.2), collars, and clawbacks and earnouts.<sup>21</sup> Contingent payment forms allow bidder and target shareholders to share the risk that the target and/or bidder shares are overvalued *ax ante*. Both parties typically supply fairness opinions as part of the due diligence process.<sup>22</sup>

Whenever the bidder pays the target in the form of bidder stock, the merger agreement specifies the exchange ratio (the number of bidder shares to be exchanged for each target share). A collar provision provides for changes in the exchange ratio should the level of the bidder's stock price change before the effective date of the merger. This helps insulate target stockholders from volatility in the bidder's stock price. Collar bids may have floors and caps (or both), which define a range of bidder stock prices within which the exchange ratio is held fixed, and outside of which the exchange ratio is adjusted up or down. Thus, floors and caps guarantee the target a minimum and a maximum payment.

The total payment to target shareholders may also be split between an upfront payment and additional future payments that are contingent upon some observable measure of performance (earnouts, often over a three-year period). This helps close the deal when the bidder is particularly uncertain about the true ability of the target to generate cash flow. It provides target managers with an incentive to remain with the firm over the earnout period, which may be important to the bidder. The downside is that the earnout may distort the incentives of target managers (an emphasis on short-term over longer-term cash flows), and it may induce the new controlling shareholder (the bidder) to manipulate earnings in order to lower the earnout payment. Thus, earnouts are not for everyone.

Merger negotiations protect the negotiating parties against opportunistic behavior while bar-

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<sup>21</sup>Officer (2004), Officer (2006), Kohers and Ang (2000), Cain, Denis, and Denis (2005).

<sup>22</sup>Kisgen, Qian, and Song (2007), Makhija and Narayanan (2007), Chen and Sami (2006).

gaining takes place. Before negotiations start, the parties sign agreements covering confidentiality, standstill, and nonsolicitation. The confidentiality agreement allows the target board to negotiate a sale of the firm without having to publicly disclose the proceedings, and it permits the target to open its books to the bidder. The standstill commits the bidder not to purchase target shares in the market during negotiations, while nonsolicitation ensures that neither the bidder nor the target tries to hire key employees away from the other firm. It is also common for the bidder to obtain tender agreements from target insiders, under which these insiders forsake the right to tender to a rival bidder (Bargeron, 2005).

Delaware case law suggests that a merger agreement must include a fiduciary out clause enabling the target board to agree to a superior proposal if one is forthcoming from a third party.<sup>23</sup> As a result, the target board cannot give its negotiating partner exclusive rights to negotiate a control transfer: it must remain open to other bidders along the way. The resulting potential for bidder competition (after the merger agreement has been signed but before the shareholder vote) has given rise to target termination agreements, starting in the mid 1980s. A termination agreement provides the bidder with compensation in the form of a fixed fee (breakup fee) or an option to purchase target shares or assets at a discount (lockup option) should the target withdraw from the agreement (Burch, 2001; Officer, 2003; Bates and Lemmon, 2003; Boone and Mulherin, 2007a).<sup>24</sup> As discussed in Section 3.3, the value of a target termination agreement may be substantial, and it may affect the initial bidder's optimal toehold strategy.

When merger negotiations close, the bidder seeks SEC approval for any share issue required in the deal, and a merger prospectus is worked out. Writing the prospectus typically takes from 30 to 90 days, so the target shareholder vote is typically scheduled three to six months following the signing of the initial merger proposal.<sup>25</sup> The New York Stock Exchange requires that the shareholders of the bidder firm must also be allowed to vote on the merger if the agreement calls for the bidder to increase the number of shares outstanding by at least 20% in order to pay for the

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<sup>23</sup>*Omnicare Inc. v. NCS Healthcare Inc.*, 818 A.2d 914 (Del. 2003). Delaware law is important as approximately 60% of all publicly traded companies in the United States are incorporated in the state of Delaware. Moreover, decisions in the Delaware Supreme Court tend to set a precedence for court decisions in other states.

<sup>24</sup>The Delaware court views termination fees anywhere in the range of 2 to 5% of the transaction value as reasonable. Termination agreements sometimes allow a reduction in the breakup fee if the target strikes a competing deal within a 30/45-day time frame. There are also cases where the deal includes a bidder termination agreement.

<sup>25</sup>During this waiting period, the bidder also performs a due diligence on key assumptions behind the merger agreement. If the bidder receives 90% of the target shares in a prior tender offer, the bidder can force a merger without calling for a vote among the remaining minority target shareholders (so-called short-form merger).

target.

### 2.3.2 Mandatory disclosure and tender offer premiums

In contrast to the merger process, a public tender offer is relatively quick. A tender offer is an offer made by the bidder directly to target shareholders to purchase target shares. The offer specifies the price per target share, the method of payment (cash, securities, or a mix of the two), whether the offer is restricted to less than 100% of the target shares, conditions for accepting tendered shares (e.g., all or nothing or any or all), and how long the offer is outstanding. The 1968 Williams Act, the main federal law governing public tender offers, requires an orderly auction mechanism: the tender offer must be open for a minimum of 20 business days; competing bid and material bid revisions automatically extend the offer period by 10 days; target shareholders may withdraw all tendered shares for any reason (typically in response to a higher bid) within 15 days; and the bidder must purchase target shares on a pro rata basis among those who tendered their share.<sup>26</sup>

The 1968 Williams Act also requires public information disclosure.<sup>27</sup> These provisions of the Act were in part a response to perceived takeover abuses in the 1960s, such as "creeping takeovers" and "Saturday night raids" where the bidder quickly gained control of the target shares using all-cash purchases in the market and privately from blockholders. While the stated intention of the Act is to protect target shareholders, a concern for potential bidders is that the mandatory disclosure rules also act to increase the ability of potential rival bidders to compete for the target. As pointed out by Grossman and Hart (1980a) and Jarrell and Bradley (1980), an active market for corporate control presupposes that initial bidders expect to have an advantage over potential rivals when search costs are sunk. Mandatory disclosure rules that increase expected competition among bidders possibly raise offer premiums and therefore deter some bids.<sup>28</sup>

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<sup>26</sup>Note that, contrary to takeover regulations in many Western countries (Berglof and Burkart, 2003), the Williams Act does not include a mandatory bid rule. A mandatory bid rule requires the bidder to proceed with an offer for 100% of the target shares after acquiring a certain stake in the target (Burkart and Panunzi, 2003). Mandatory bid rules do, however, exist in certain states, including Pennsylvania and Maine. The mandatory bid price varies with jurisdiction but is typically a function of the price(s) the bidder paid for the initial stake.

<sup>27</sup>A tender offer is disclosed through a 14D filing with the SEC. Also, regardless of any plans to acquire the target, an investor purchasing 5% or more of the target shares must file Form 13D with the SEC within a 10-day period. The 13D includes statements concerning the purchaser's intention with respect to the eventual purchase of control. Antifraud provisions were added to the Williams Act in 1970 to back up these disclosure requirements.

<sup>28</sup>However, severe penalties on the release of false (or misleading) information may benefit some bidder firms by making their otherwise voluntarily disclosed information more credible (Eckbo and Langohr, 1989). This positive effect is greater the lower the correlation between rival bidders' private valuations of the target (i.e., the more unique the bidder's contribution to total synergy creation).

Did the disclosure provisions of the Williams Act raise tender offer premiums? Jarrell and Bradley (1980) examine this issue and find that the average cash tender offer premium increased from 32% to nearly 53% following passage of the Act in 1968. Consistent with higher premium costs, Schipper and Thompson (1983) present evidence indicating that a sample of frequent acquirers earned significantly negative abnormal returns over the months surrounding announcements of the introduction of the Williams Act. Also, Asquith, Bruner, and Mullins (1983), Loderer and Martin (1990), and others report that gains to bidder firms in mergers are on average lower after 1968.

Nathan and O’Keefe (1989) find that the premium increase after introduction of the Williams Act is not restricted to cash tender offers: Cash *mergers* experienced an increase in the average premium from 30% to 67%, while security exchange mergers saw the average premium increase from 30 to 54%. They also show that the majority of the increase in the average offer premium takes place after 1972. This delay is puzzling and raises the question of whether the premium increase is due to the Williams Act or to some other economic phenomenon.

The Williams Act introduced both disclosure rules and a minimum 20-day offer period. Providing rival bidders with time to respond to the initial bid (the 20-day wait period) is obviously key to increased competition. Thus, studies of the Williams Act cannot isolate the premium impact of the disclosure rules. Specifically, these studies do not answer the fundamental question of whether the introduction of disclosure rules affects offer premiums in an environment where rival bidders already have time to respond.

Eckbo and Langohr (1989) provide evidence on this question using a different institutional setting. In 1970 France introduced mandatory disclosure rules for public tender offers—much like those in the Williams Act. The difference is that France had already established a minimum (four-week) tender offer period much earlier (in 1966). Eckbo and Langohr (1989) find that the average offer premium in successful cash tender offers increased from 34 percent to nearly 61 percent after the 1970 disclosure regulations. Since the minimum tender offer period remained at one month throughout their sample period, this indicates that disclosure requirements *alone* can cause a substantial increase in average offer premiums. Eckbo and Langohr (1989) also study a contemporaneous control sample of privately negotiated controlling-block trades, exempt from the 1970 disclosure regulations. Premiums in these alternative control acquisitions did not increase subsequent to the 1970 regulations..

### 2.3.3 Determinants of the merger choice

What are some of the determinants of the choice between merger negotiations and a public tender offer? From the bidder's point of view, two immediate advantages of the tender offer process is speed of execution (supported empirically by Table 3) and the fact that it does not require prior approval by—or even prior contact with—target management. Thus, the tender offer is an option for bidders who believe the target will refuse to negotiate ex ante, or should negotiations break down ex post.<sup>29</sup> Also, many tender offers involve prior contact and even negotiations with the target management (Comment and Jarrell, 1987). Negotiated tender offers may help resolve bargaining issues (e.g., difference of opinions on what constitutes a reasonable bid price), and the arm's length transaction implied by a public tender offer helps protect target managements against charges ex post that they "sold out" to the bidder.

As discussed in Section 3.5, the target takeover defenses developed in the 1980s, in particular the poison pill, have significantly raised the cost to the bidder of launching a hostile tender offer. This is evidenced by a substantial decline in the frequency of hostile bids over the past 20 years. In today's legal environment, it is likely that virtually *all* bidders (also those who intend to replace incumbent target management) prefer to approach the target management with a proposal to negotiate. Again, an initially friendly approach preserves the option of making a hostile tender offer down the line. Moreover, a significant benefit of a friendly cooperative approach is that it gives the bidder access to the target books, a crucial factor in pricing.

Systematic empirical evidence on the choice of merger versus tender offer is only beginning to emerge. Kohers, Kohers, and Kohers (2007) study 2,610 completed mergers and 795 successful tender offers for the period 1984—1999. They find that the probability of a tender offer is more likely when the form of payment is all-cash, when the target is defensive, and has high institutional ownership, and when there are multiple bidders. The tender offer form is less likely between two "glamor" companies (i.e., when the bidder and target have low book-to-market (B/M) ratios), and for deals after the 1980s.

Betton, Eckbo, and Thorburn (2008a) study the *initial* bidder's choice between merger and tender offer for 4,618 merger bids and 1,638 tender offers for public U.S. target firms from 1980

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<sup>29</sup>Berkovitch and Khanna (1991), Aktas, de Bodt, and Roll (2008), and Betton, Eckbo, and Thorburn (2007) present models in which a tender offer (auction) is an explicit outside option in merger negotiations.

through 2002. They separate public bidders (3,119) from private bidders (1,438) and test for differences in their choices. They show that bidder and target B/M values drive the merger choice only when these ratios exceed the median B/M of the respective industry rivals. Public bidders are significantly less likely to select merger over tender offer when the B/M values of the target or of the bidder exceed their respective industry medians. For private bidders, however, this glamor effect does not exist: private bidders are *more* likely to select merger over tender offer when the target's B/M exceeds its industry median (data on private bidders' B/M values are not available). In the 1980s, public bidders were less likely to choose merger, while private bidders were more likely to select this acquisition form. While the target's asset size and target hostility both reduce a public bidder's likelihood of selecting a merger, these factors do not influence the choice of private bidders. Moreover, the greater the concentration of the target's industry, the less likely both public and private bidders are to select merger over tender offer.

### **3 Bidding strategies**

#### **3.1 Modeling the takeover process**

Before reviewing the empirical evidence on various bidding strategies, it is instructive to briefly characterize the two most common theoretical settings used to model takeover bids. This in turn helps us understand the various empirical hypotheses and their relevance for actual takeover activity.

##### **3.1.1 Free-riders and post-offer dilution**

An early workhorse in the theoretical takeover literature is the free-rider model of Grossman and Hart (1980b) and Bradley (1980). They analyze the incentives of dispersed, noncooperative target shareholders to accept a tender offer from a single bidder and the resulting inefficiency of the takeover market. To illustrate, suppose the target's pre-offer (stand-alone) share price is equal to zero and that it is common knowledge that the post-takeover share price will equal  $v > 0$ . The value-increase  $v$  may be thought of as synergy gains resulting from the bidder taking control of the target. The bidder makes a conditional unrestricted bid  $b$  for 50% of the target shares (sufficient

to transfer control of the target to the bidder).<sup>30</sup> A risk-neutral target shareholder tenders only if the offer price exceeds the expected value of her share if she retains it:

$$\text{Tender if } b \geq \Pr(\text{Success} | \text{i Retain})v \tag{1}$$

where  $\Pr(\cdot)$  denotes the probability that the offer succeeds given that the shareholder does not tender.<sup>31</sup>

By inspection of Equation 1, the target shareholder is more willing to tender the lower is the post-takeover value  $v$ , and the more she believes that retaining reduces the takeover's probability of success. As the number of target shareholder becomes larger, however, the probability that any single shareholder is pivotal for the outcome of the bid becomes arbitrarily small. For such shareholders, the tender criterion in (1) reduces to:

$$\text{Tender if } b \geq v \tag{2}$$

Since the bidder has no economic incentive to make the bid in Equation 2, these shareholders are in effect free-riding on a decision by others to tender. Of course, if all shareholders behave this way, the takeover opportunity never materializes.<sup>32</sup>

Making *every* target shareholder pivotal by a conditional and restricted offer for 100% is unlikely to help. Because the bidder gains control after receiving 50% of the shares, refusing to purchase those shares if she is one share short of 100% is not credible. Also, allowing the bidder to be better informed than target shareholders (about  $v$ ) does not solve the problem. Individual target shareholders now demand an offer price  $b \geq E(v | \text{Offer})$  in order to tender, where the right-hand side is the expected valuation of the bidder given that he makes an offer. An offer below this expectation leads target shareholders to infer that  $b < v$  and therefore to retain their shares. In

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<sup>30</sup>"Conditional" means no shares will be purchased if less than 50% are tendered. "Unrestricted" means any or all tendered shares above 50% will be purchased.

<sup>31</sup>We are ignoring taxes. For example, when  $b$  is paid in cash, the offer may trigger a capital gains tax liability.

<sup>32</sup>Just as the free-rider problem can discourage value-increasing bids, value-reducing bids—bids where the post-takeover value of the target is less than its pre-offer value—may be encouraged due to a "pressure-to-tender" problem (Bebchuk, 1985): Conditional on the offer succeeding, tendering may dominate retaining and receiving an even lower value. Thus, paradoxically, there may be "pressure-to-tender" when the bidder is value-reducing. The root cause of this result is, as above, that each target shareholder bases the tendering decision on a comparison between  $b$  and  $v$ , ignoring the pre-takeover value.

this case, there does not exist a rational expectations (perfect Bayesian) equilibrium in which the bidder expects to make a profit from the takeover.<sup>33</sup>

There are a number of ways to mitigate the free-rider problem so that the bidder gains on the acquired target shares. Two frequently mentioned mechanisms are post-takeover dilution (Grossman and Hart, 1980b) and pre-takeover toehold acquisition (Shleifer and Vishny, 1986b). Post-takeover dilution reduces the "back-end" value of the takeover and may be enforced through a two-tiered tender offer. The first tier is a bid  $b$  while the back end is a minority buyout (enforced by the bidder after acquiring control in the front end) at a lower value  $v_d < v$ . Alternatively, if fair price rules prevent the minority buyout to take place at a price below the front-end price, the bidder may resort to self-dealing ("asset tunneling") which is harmful to minority shareholders after the takeover. Examples of such dilution techniques are asset sales at prices below market value, transfer pricing favorable to the majority shareholder, excessive compensation schemes, and so on. These schemes create a wedge between the post-takeover share value to the acquirer and minority shareholders and enable the acquirer to make a profit. Although such transfers may enhance the ex ante efficiency of the takeover market, they are controversial and legally difficult to enforce ex post.<sup>34</sup>

A firm contemplating making a bid for the target may also decide to purchase target shares—a toehold—in the market at the pre-bid (no-information) target share price. The implications of such toehold acquisitions for optimal bidding are discussed in detail later in this chapter. In the context of the free-rider problem, the important point is that the toehold bidder may gain on the toehold while making zero profits on the shares acquired in the formal takeover bid. Let  $\delta$  denote the fraction of the target post-takeover value that may be diluted ex post, and  $\alpha$  the fraction of the target shares held by the bidder prior to the offer, respectively. The bidder makes the conditional unrestricted offer of

$$b^* = (1 - \delta)v \tag{3}$$

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<sup>33</sup>Hirshleifer and Titman (1990) prove the existence of a separating equilibrium in which the offer price fully reveals  $v$ .

<sup>34</sup>Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2007) survey the opportunities for corporate insiders around the world to dilute minority shareholder value through self-dealings deemed *legal* under a country's corporate laws. Under the European Takeover Directive (article 14), member-states may grant acquirers a squeeze-out right, that is, the right to compel post-takeover minority shareholders to sell their shares after the acquirer has purchased 90% of the target shares.

which yields a bidder profit of

$$v - (1 - \alpha)b^* = \alpha v + (1 - \alpha)(v - b^*) = \alpha v + (1 - \alpha)\delta v \quad (4)$$

The first term,  $\alpha v$ , is the gain on the toehold shares, while the second term is the profits on the shares purchased in the takeover. The second term,  $(1 - \alpha)\delta v$ , shows that dilution is costly for the bidder in that it also reduces the value of the bidder's toehold shares. Thus, the larger the initial stake  $\alpha$ , the lower the controlling shareholder's incentive to dilute ex post. In other words, a corporate insider with a larger equity stake is more prone to act in the outside (minority) shareholders' interest (Jensen and Meckling, 1976; Burkart, Gromb, and Panunzi, 1998).

What is the empirical relevance of the free-rider problem in corporate takeovers? The most direct way to evaluate this question is to look at the frequency of (pivotal) blockholders in corporate shareownership structures. A large blockholder likely accounts for the possibility that her tendering decision affects the probability that the offer will succeed. In this case, shareholders are willing to tender at a price lower than indicated by expression (1) above (Bagnoli and Lipman, 1988; Holmstrom and Nalebuff, 1992).<sup>35</sup>

The evidence on corporate ownership structures around the world suggests that the existence of one or more large blockholder is the rule rather than the exception.<sup>36</sup> In the United States and elsewhere, small and midsized publicly traded companies typically have one or more large shareholder (defined as a minimum 5% holding).<sup>37</sup> In large-cap firms, individual (or family) blockholdings are less frequent in the United States, however, large blocks held by financial institutions such as pension funds are common for our large firms. As highlighted by Holderness (2006), the evidence challenges the view—originating with Berle and Means (1932)—that U.S. ownership is

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<sup>35</sup>In Holmstrom and Nalebuff (1992), there are  $N$  target shareholders of equal size, and the bidder needs  $K$  of these to tender in order to acquire control. They show that there exists a mixed strategy equilibrium where the takeover succeeds and the bidder makes a positive expected profit. In this equilibrium, individual target shareholders tender with a probability  $p = K/N$ . Expected profits go to zero when  $N$  becomes large.

<sup>36</sup>Following the early international evidence of La Porta, Lopez-de-Silanes, and Shleifer (1999), detailed information on corporate ownership structures has appeared for East Asia (Claessens, Djankov, and Lang, 2000), Western Europe (Faccio and Lang, 2002; Franks, Mayer, and Rossi, 2005), and the United States (Holderness, Kroszner, and Sheehan, 1999; Holderness, 2006; Helwege, Pirinsky, and Stulz, 2007; Dlugosz, Fahlenbrach, Gompers, and Metrick, 2006).

<sup>37</sup>The definition of a block varies in the literature from 5% to 20%. Note that a relatively small block may become pivotal depending on the ownership distribution of the remaining shares. A natural empirical measure of "pivotal" is the Shapley transformation of the block (Shapley, 1953). The Shapley value is the probability that the block will be pivotal, computed using all possible shareholder coalitions (with the block) in which the coalition determines the voting outcome. See, for example, Eckbo and Verma (1994) and Zingales (1994) for applications in corporate finance.

largely dispersed, and it suggests that free-rider problems in takeovers may be a rarity.<sup>38</sup>

A more indirect way to evaluate the empirical relevance of free-rider problems is to examine characteristics of observed takeover bids. For example, the unequal distribution of takeover gains between target and bidder firms—with most, if not all, of the total gains typically accruing to the target—is often cited in support of the existence of the free-rider problem (Hirshleifer, 1995; Burkart and Panunzi, 2006). However, as discussed in Section 4, there are a number of alternative and plausible reasons for the observed uneven distribution of takeover gains. Moreover, toehold bidding—perhaps the most obvious way to mitigate expected free-rider problems—is extremely rare in control-oriented acquisitions (Betton, Eckbo, and Thorburn, 2007).

### 3.1.2 Auction with single seller

A second workhorse in the theoretical literature on takeover bidding is the competitive auction. Here, the bidder faces a single seller in the form of a large target shareholder or a target management with sufficient authority to commit to selling in the auction. As noted by Dasgupta and Hansen (2007), auction theory plays an important prescriptive role: to inform a company’s board or regulators about the impact of selling processes or rules on shareholder wealth, efficiency, and welfare. They also note that, for such prescriptions to be useful, the auction model must reasonably mimic the actual takeover bidding environment. One important characteristic of any auction is the seller’s commitment to stick to the rules of the game. For auction-theoretic results to apply, the seller must be trying to secure the best price for the firm’s shareholders by committing to a selling mechanism.<sup>39</sup> As noted earlier, since a publicly traded target’s board of directors has a fiduciary obligation to accept the highest offer (provided the board has placed the target “in play”), a takeover is arguably much like an auction even if the target initially negotiates a merger agreement.

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<sup>38</sup>Holderness (2006) studies a random sample of 10% of the firms trading on the NYSE, Amex, and NASDAQ. Large shareholders (which include institutional holdings) on average own 39% of the voting power of the common stock. Moreover, 96% of the firms have at least one 5%+ blockholder, and the average holding of the largest blockholder is 26%. Holderness also reports that 89% of the firms in the S&P 500 Index have large blockholders. Thus, free-rider problems are unlikely. Whether the evidence also challenges the seriousness of the Berle-Means warnings of agency costs associated with delegated management in public firms is, of course, a different issue. It is possible that a large block held by a financial institution (as opposed to an individual investor) carries with it serious agency problems when seen from the point of view of the firm’s individual shareholders.

<sup>39</sup>For example, in a first-price auction, in which bidders optimally shave their bids, the seller must be able to commit not to allow further bid revisions by the losing bidder (who, after losing, may want to submit a bid higher than the winning bid).

The typical assumption is of an open, ascending (English) auction with zero entry and bidding costs, and where the winning bidder pays the second-highest bid.<sup>40</sup> Bidder valuations  $v$  (synergies) are private knowledge, but the seller knows the probability distribution function over  $v$ ,  $G(v)$ . Since bidders tend to have different skill levels in terms of managing the target assets, it is often assumed that the valuations  $v$  are uncorrelated across bidders—a "private value." Alternatively, bidder valuations may be correlated—a "common value" environment that requires bidders to shave their bids in anticipation of the "winners curse."<sup>41</sup>

It is also commonly assumed that the bidder's outside option is status quo. That is, the payoff to the bidder is zero when losing the auction. This assumption is effectively relaxed when the bidder has a toehold,<sup>42</sup> or a target termination agreement, or when the takeover is a response to changes in industry competition (Morellec and Zhdanov, 2005; Akdogu, 2007b; Molnar, 2008). The toehold provides a positive payoff when the toehold bidder loses to a rival (who purchases the toehold). A termination contract also pays off when the bidder loses and no other bidder wins (the target remains independent). Also, a worsening of the competitive industry equilibrium can place the unsuccessful bidder at a competitive disadvantage vis--vis the winner.

### 3.2 The payment method choice

As discussed earlier (Table 1), the payment method in takeovers includes all-stock payment, various debt securities, mixes of securities and cash, and all-cash payment.<sup>43</sup> As Table 1 shows for the total sample, 26% of the initial bidders use the all-cash method while the groups of all-stock and mixed offers each cover 37% of the initial bids. Figure 7 plots the fraction of all initial bids that are in the form of each of these three payment methods over the 1980-2005 period. Use of the various payment methods clearly differs between merger bids (Panel A) and tender offers (Panel B): the

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<sup>40</sup>With zero entry and bidding costs, optimal bid increments are infinitesimal, so the winning bidder pays the second highest price whether or not the auction is defined formally at a first-price or second-price auction.

<sup>41</sup>In a common-value setting, bidders receive private and noisy signals as to the true (common) value of the target. Bidding the full value of the signal would cause the bidder with the largest positive signal error to win and overpay (the "curse"). Optimal bidding takes this possibility into account by reducing the bid to the point where the expected value of the bid *conditional on winning* is nonnegative. Thus, testing for the presence of a winner's curse is equivalent to testing the hypothesis that bidders are irrational (cannot compute). See Boone and Mulherin (2008) for same evidence inconsistent with this hypothesis. In a private value setting, bidders know their true valuations and thus do not face a winner's curse.

<sup>42</sup>Burkart (1995), Bulow, Huang, and Klemperer (1999), Betton, Eckbo, and Thorburn (2007).

<sup>43</sup>The cash amount is typically financed using accumulated retained earnings (financial slack) or debt issues prior to the takeover.

majority of tender offers use all-cash or a mix of cash and stock, while the majority of merger bids are in the form of all-stock (with the exception of the 1980-1985 period when 90% of the initial merger bids offered a mix of cash and securities).

Notice that in the two subperiods 1990-1995 and 1996-2000, the percentage of all-stock offers in initial merger bids was approximately 55% in *both* periods. This means that (1) nearly half of the initial merger bids in the 1990s used some cash as payment, and (2) the percentage of all-stock merger bids remained unaffected by the significant runup in overall market valuations in the 1996-2000 period.

Table 4 summarizes a number of economic hypotheses and related empirical evidence concerning the choice of payment method. The associated empirical evidence is a combination of determinants of the probability of a specific payment method choice (e.g., all-cash versus all-stock), and announcement-induced abnormal stock returns as a function of the payment method. The hypotheses deal with tax effects, deal financing costs under asymmetric information, agency and corporate control motives, and behavioral arguments. These hypotheses are not necessarily mutually exclusive, so a given payment choice may reflect elements of several theories.

### **3.2.1 Taxes**

The U.S. Internal Revenue Code (IRC) requires target shareholders to immediately pay capital gains taxes in an all-cash purchase. If the merger qualifies as a tax-free reorganization under Section 368 of IRC, for example by using all-stock as method of payment, target shareholder capital gains taxes are deferred until the shares received in the deal are sold. Mixed cash-stock offers are treated as either all-cash bids or the stock part is treated as an all-stock bid depending on the cash portion and other characteristics of the deal. There is a carry-over of the tax basis in the target to the acquiring company, unless a 338 election is made. Under a 338 election, there is a step-up of the tax-basis of the target assets to the price paid in the takeover (Bruner, 2004). Such elections imply a capital gains tax in the target, and are used only in rare circumstances such as when there are substantial target net operating losses (NOLs) due to expire, or when the target is a subsidiary.

Given these differences in the tax treatment, there is little doubt that taxes play an important role in the bidder's choice of payment method. The more difficult empirical issue is whether the bidder in all-cash offers must pay target shareholders a compensation up front both for the

realization of a potential capital gains tax penalty and for the value of the target's unused tax benefits. This depends, of course, on the relative bargaining power of the bidder and the target and is therefore transaction specific. For example, targets that have low-cost substitute ways of capitalizing on unused tax benefits will force bidders to pay for these in the deal (Gilson, Scholes, and Wolfson, 1988).

Hypothesis H1 in Table 4 holds that targets will receive higher offer premiums in all-cash bids than in all-stock offers, where the difference is compensation for the capital gains tax penalty inherent in the cash bid. Early studies that classify takeover premiums according to the payment method include Huang and Walkling (1987) and Hayn (1989) on U.S. data, and Franks, Harris, and Mayer (1988) and Eckbo and Langohr (1989) on acquisitions in the UK and France, respectively. This evidence shows that takeover premiums are indeed significantly greater in all-cash deals than in all-stock offers, which is consistent with H1. Also, Brown and Ryngaert (1991) find empirical support for their hypothesis that stocks are less likely to be found in taxable offers (offers where less than 50% of the offer is to be paid in bidder stock).

On the other hand, Franks, Harris, and Mayer (1988) show that takeover premiums in the UK were greater in cash deals even *before* the introduction of capital gains taxes. Moreover, Eckbo and Langohr (1989) argue that for a tax compensation to induce tendering behavior, it must be included in the value of the option to tender (as opposed to keeping) the target shares. They approximate this option value with the difference between the offer price and the expected post-offer target share price, and they find that this difference is indistinguishable across all-stock and all-cash offers. They also show that the larger total premium in all-cash offers carries over to minority buyouts that convey few if any bidder tax benefits (as the two firms are already consolidated for accounting purposes). This evidence does not support the view that the larger takeover premiums observed in all-cash deals are driven by the tax hypothesis H1.

### **3.2.2 Information asymmetries**

Hypotheses H2-H4 in Panel B of Table 4 suggest that the payment method choice may be economically important—and give rise to premium effects—even in the absence of taxes. When the bidder and target are asymmetrically informed about the true value of their respective shares, the payment method may cause information revelation and affect both the division of synergy gains

and the probability that the offer is successful. Hypothesis H2 is motivated by the adverse selection argument of Myers and Majluf (1984) and the associated financing "pecking order" suggested by Myers (1984). H2 focuses on the implication for the market's reaction to the all-stock vs. all-cash announcement: Equity issues to relatively uninformed target shareholders may cause a negative market reaction as investors hedge against the possibility that the bidder's stock is overpriced.

There is substantial empirical evidence that seasoned equity offerings (SEO) are on average met with a negative market reaction (approximately -3%)—even when the SEOs are fully underwritten by reputable investment banks. This is consistent with the hypothesis that outside investors are somewhat nervous that the typical equity issue may be overpriced—despite the substantial due diligence effort and reputational risk exposure of underwriters. The evidence on takeovers indicates that all-equity acquisition announcements also tend to cause a statistically significant (approximately) 1% price bidder price drop when the target is a public company.<sup>44</sup> However, bidder announcement returns are nonnegative (or even positive) in all-stock offers for *private* targets.<sup>45</sup>

Hansen (1987), Fishman (1989), and Eckbo, Giammarino, and Heinkel (1990) provide theoretical analyses that also incorporate adverse selection but where the bidder's choice of payment method is modeled explicitly. An important insight of Hansen (1987) is that ex-post means of payments such as stock can increase the seller's revenue beyond what cash payments can do.<sup>46</sup> This point is easily illustrated using our second-price, independent private value auction with two bidders ( $v_1 > v_2$ ). If bidder 1 (B1) wins with an all-cash offer, the target receives  $v_2$  (the second price). Alternatively, with all-stock as the payment method, the bidder offers the target the ownership fraction  $z_i$  in the merged firm. Suppose B1 and B2 have the same stand-alone value  $v$ . The optimal bid is the fraction  $z_i$ , which satisfies

$$(v + v_i)(1 - z_i) = v \tag{5}$$

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<sup>44</sup>Travlos (1987), Asquith, Bruner, and Mullins (1987), Servaes (1991), Brown and Ryngaert (1991), Martin (1996), Emery and Switzer (1999), Heron and Lie (2004), and Schlingemann (2004). Because the level of communication between bidder and target management teams in merger negotiations is greater than that between underwriters and the market in SEOs, the potential for adverse selection is also smaller, thus the smaller price drop in all-equity bids than in SEOs.

<sup>45</sup>Chang (1998), Fuller, Netter, and Stegemoller (2002), Moeller, Schlingemann, and Stulz (2004), Bradley and Sundaram (2006), Officer, Poulsen, and Stegemoller (2007). Faccio, McConnell, and Stolin (2006) find a similar positive bidder announcement effect of all-stock offers in Europe.

<sup>46</sup>See also Hansen (1985) and DeMarzo, Kremer, and Skrzypacz (2005), and Dasgupta and Hansen (2007) for a review.

or  $z_i = v_i/(v+v_i)$ . This leaves each bidder with a post-acquisition value equal to the pre-acquisition (stand-alone) value. If B1 wins, the target receives

$$z_2(v+v_1) = \frac{v+v_1}{v+v_2}v_2 > v_2 \quad (6)$$

since  $v_1 \geq v_2$ . In other words, the all-stock offer extracts a higher revenue from the winning bidder than does the all-cash bid, resulting in more efficient sell/don't sell decisions by the target.<sup>47</sup>

Another insight is that all-stock payment may increase the expected deal value for the bidder if there is little or no uncertainty concerning the true bidder value. Consider a single bidder B who has all the bargaining power. Denote B's with-synergy value as  $v_B \equiv v+v_i$ . Assume that  $v_B$  is known to everyone and that B only knows the probability distribution over the true target value,  $v_T \in [\underline{v}_T, \bar{v}_T]$ , where  $\underline{v}_T < \bar{v}_T$ . Moreover, suppose B's strategy is to ensure bid success.<sup>48</sup> The all-cash offer is therefore  $c = \bar{v}_T$ . This means that B expects to overpay for the target by the amount  $\bar{v}_T - E(v_T | \text{accept})$ , where the expectation is conditional on the target accepting the bid. The corresponding all-stock offer solves  $z(v_B + \bar{v}_T) = \bar{v}_T$ , or  $z = \bar{v}_T/(v_B + \bar{v}_T)$ . The expected overpayment cost is now

$$z[v_B + E(v_T | \text{accept})] - E(v_T | \text{accept}) = \frac{v_B}{v_B + \bar{v}_T}[\bar{v}_T - E(v_T | \text{accept})] \quad (7)$$

Since  $v_B/(v_B + \bar{v}_T) < 1$ , the expected overpayment cost of securities is less than that of cash, reflecting the contingent nature of stock as payment form (payment in shares causes the target to share in the overpayment ex post). Cash, on the other hand, precommits the bidder to a target value ex ante.

If we also allow  $v_B$  to be private information (two-sided information asymmetry), then the above preference for a stock offer is reversed provided the bidder shares are sufficiently undervalued by the target. With two-sided information asymmetry, let  $\hat{v}_B$  denote target beliefs about bidder value.

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<sup>47</sup>In Fishman (1989), the alternative to cash is a debt instrument secured in the *target's* asset. This also eliminates target uncertainty about the true value of the bidder's payment for all-security offers and leads to efficient target accept/reject decisions.

<sup>48</sup>This bid strategy is maintained in the model of Eckbo, Giammarino, and Heinkel (1990). In Hansen (1987), high-value bidders separate themselves by lowering their all-stock offers  $z$ , which is costly as it reduces the probability that the target will accept. The signaling cost is the reduction in the bidder's expected synergy gains from a reduction in  $z$ .

In this case, the all-stock offer which guarantees success solves  $z(\hat{v}_B + \bar{v}_T) = \bar{v}_T$ , and the difference between the expected overpayment cost of an all-stock and an all-cash offer becomes

$$\bar{v}_T \frac{(v_B - \hat{v}_B) - (\bar{v}_T - E(v_T | \textit{accept}))}{v_B + E(v_T | \textit{accept})} \quad (8)$$

which is positive or negative depending on whether the target undervalues ( $v_B - \hat{v}_B > 0$ ) or overvalues ( $v_B - \hat{v}_B < 0$ ) the bidder shares, respectively. Consistent with this, Chemmanur and Paeglis (2003) find that the probability of a stock offer falls when measures of bidder share underpricing increase.

As discussed earlier (see Figure 7), mixed cash-stock offers are pervasive across the entire sample period. Eckbo, Giammarino, and Heinkel (1990) and Berkovitch and Narayanan (1990) model equilibrium mixed offers.<sup>49</sup> In the separating equilibrium of Eckbo, Giammarino, and Heinkel (1990), bidder types are separated by the fraction of the total target payment that is paid in cash. Consistent with a separating equilibrium, Eckbo, Giammarino, and Heinkel (1990) and Eckbo and Thorburn (2000) find that abnormal announcement returns are, on average, highest in all-cash offers and lowest in all-stock deals, with mixed offers in between.<sup>50</sup>

Eckbo, Giammarino, and Heinkel (1990) present cross-sectional regressions tests of their signaling model. To illustrate, let  $\gamma_j$  denote the announcement-induced bidder abnormal return. The separating equilibrium implies that

$$\gamma_j = h_j\left(\frac{c_j}{v_T}\right), \quad h'_j, h''_j > 0, \quad (9)$$

where  $c_j$  is the cash payment,  $v_T$  is the average pre-bid target value, and the superscripts  $h'_j$  and  $h''_j$  denote first and second derivatives, respectively. That is, in the separating equilibrium, the market reaction to the takeover announcement is an increasing and convex function of the cash portion of the deal. The cross-sectional regression tests confirm the "increasing" part, but fails to identify a significant second derivative (convexity). Additional empirical tests are required to sort

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<sup>49</sup>In Hansen (1987) and Fishman (1989), bidders select between all-stock and all-cash offers but do not mix the two.

<sup>50</sup>These two studies use mergers in Canada where offering less than 50% of the deal in cash does not trigger capital gains taxes. In the United States, the tax code confounds the analysis as it in and of itself discourages mixed offers where the cash portion exceeds 50% (Brown and Ryngeart, 1991).

out why convexity fails.

### 3.2.3 Capital structure and control motives

Under hypothesis H5 in Panel C of Table 4, the payment method is selected as part of a broader capital structure choice. Moreover, some bidder managements select cash over stock to avoid diluting private benefits of control. Attempts to link the payment method choice to financing sources for the cash portion of the bid are only starting to emerge. For example, Yook (2003) find greater bidder gains in all-cash offers when the takeover causes downgrading of the merged firm's debt (due to increased leverage). He interprets this as consistent with the free-cash flow argument of Jensen (1986).

Schlingemann (2004) and Toffanin (2005) examine whether the market reaction to the payment method choice is a function of the type of cash financing. While the market is aware of any pre-bid public security issues, the acquisition bid announcement possibly resolves uncertainty regarding use of the issue proceeds. If this resolution is economically important, the source of financing for the cash portion of the bid will affect the market reaction to the takeover attempt. The empirical results indicate a prior-cash-financing-source component in acquisition announcement returns.

Schlingemann (2004) reports that, after controlling for the form of payment, financing decisions during the year before a takeover play an important role in explaining the cross section of bidder gains. Bidder announcement period abnormal returns are positively and significantly related to the amount of ex-ante equity financing. This relation is particularly strong for high *it* Q firms. He further reports a negative and significant relation between bidder gains and free cash flow. This relation is particularly strong for firms classified as having poor investment opportunities. The amount of debt financing before a takeover announcement is not significantly related to bidder gains. Interestingly, Toffanin (2005) finds that the well-known positive market reaction to all-cash bids requires the cash to have been financed either using internal funds (retained earnings) or borrowing. All-cash acquisitions financed by a prior equity issue earn zero or negative abnormal returns.

Early theories incorporating private benefits of control in the contexts of takeovers and capital structure choice are Stulz (1988) and Harris and Raviv (1988). In our context, an all-cash offer preserves the bidder's control position, while an all-stock offer may significantly dilute this position

(e.g., a merger of equals). The potential for control dilution may therefore drive the use of cash. Several empirical papers examine the payment method choice from this angle. For example, Amihud, Lev, and Travlos (1990), Martin (1996), and Ghosh and Ruland (1998) all find that bidder management shareholdings in the United States have negative effects on stock financing. Similarly, studying European mergers, Faccio and Masulis (2005) find that corporate control incentives to choose cash are particularly strong in bidder firms with relatively concentrated shareownership structures. Overall, corporate control motives are likely to play a role in some all-cash mergers. Martynova and Renneboog (2006), who also examine acquisitions in Europe, find a link between the quality of a country's corporate governance system and the market reaction to stock as payment form. All-stock offers are more likely in countries with greater levels of shareholder rights protection.

### 3.2.4 Behavioral arguments for all-stock

The hypothesis here is that bidders are able to sell overpriced stock to less overpriced targets (H6). We discussed this hypothesis in Section 2.1 on merger waves and so will provide only a summary here. In the model of Shleifer and Vishny (2003), bidders succeed in selling overpriced stock to target managers with a short time horizon. In Rhodes-Kropf and Viswanathan (2004), bidders succeed as targets (rationally) accept more bids from overvalued bidders during market valuation peaks because they tend to overestimate synergies during these periods. Empirically, the propensity to select all-stock offers increases with M/B ratios. If one views the M/B ratio as a proxy for stock overvaluation, then this empirical regularity supports the behavioral argument for all-stock selections.<sup>51</sup> On the other hand, Harford (2005) finds that a macroeconomic measure of capital liquidity (interest rate spreads) drives merger activity and drives out M/B as a predictor of merger activity. This finding reduces the likelihood that market overvaluation systematically drives the bidder's selection of all-stock as the payment method.

Earlier we reported that there are nearly as many mixed cash-stock offers as all-stock offers, even in the recent period of high market valuations and peak merger activity (1996-2000). Because mixing cash and stock increases the ability of undervalued bidders to separate out from the pool

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<sup>51</sup>Rhodes-Kropf, Robinson, and Viswanathan (2005), Ang and Cheng (2006), Dong, Hirshleifer, Richardson, and Teoh (2006).

of overvalued bidders (Eckbo, Giammarino, and Heinkel, 1990), the substantial presence of mixed offers undermines the pooling equilibrium of Shleifer and Vishny (2003). Also, our finding in Figure 7 that the substantial market runup prior to year 2000 did not induce greater use of all-stock offers as a proportion of all merger bids further undermines the behavioral argument. In sum, while some bidders undoubtedly get away with selling overpriced stock to their targets, additional research is needed to systematically contrast behavioral to rational theories of the payment method choice in takeovers.

### 3.3 Toehold bidding

#### 3.3.1 Optimal bids

In this section, we first discuss optimal bids when the initial bidder has a toehold and has also negotiated a termination agreement. We then review the empirical evidence on toehold bidding. We use a standard auction setting with two risk-neutral bidders. The bidders have private valuations that are independent and identical distributed (i.i.d.) with distribution and density functions  $G(v)$  and  $g(v)$ , respectively. The initial bidder (B1) has toehold  $\alpha \in [0, 0.5)$  acquired at the normalized pre-takeover target share price of zero. B1 has negotiated a merger agreement with the target management that includes a termination fee  $t \in (0, v)$ . A rival bidder (B2) challenges the agreement and forces an open auction. The termination fee is paid by B2 if B2 wins, or by the target if neither B1 nor B2 wins (the target remains independent). The no-bidder-wins outcome occurs with an exogenous probability  $\theta$ .<sup>52</sup>

Since the termination fee represents a claim of  $t$  on the target, the fee reduces B2's private valuation to  $v_2 - t$ . B2's optimal bid is therefore  $b_2^* = v_2 - t$ : bidding less risks foregoing a profitable takeover, while bidding more risks overpaying for the target. Given B2's optimal bid, and noting that the net termination fee paid to B1 if B2 wins is  $(1 - \alpha)t$ , B1's expected profits from bidding  $b$  is

$$E(\Pi) = \{(v)G(b+t) - (1-\alpha) \int_t^{b+t} (v_2 - t)g(v_2)dv_2 + (t + \alpha b)[1 - G(b+t)]\}(1 - \theta) + t(1 - \alpha)\theta \quad (10)$$

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<sup>52</sup>The probability  $\theta$  captures exogenous factors that may derail merger negotiations or cause all bidders to abandon a takeover auction. For example, the market may revise upwards its estimate of the target's stand-alone value during the contest, causing the takeover to be unprofitable for both B1 and B2. Betton, Eckbo, and Thorburn (2007) reports that close to 30% of takeover contests end in the no-bidder-wins state. This issue is discussed further below.

The right-hand side is the sum of four components. The first three (inside the curly bracket) are, respectively, B1’s expected private value, the expected payment for the target, and the expected value from selling the toehold  $\alpha$  and receiving  $t$  when B2 wins the auction. The fourth term is the expected payoff when no bidder wins. Using Equation (10), the first order-condition for profit maximization,  $\partial E(\Pi)/\partial b = 0$ , implies an optimal bid for B1 of<sup>53</sup>

$$b_1^* = v_1 - t + \alpha h(b_1^*) \tag{11}$$

where  $h(b_1^*) \equiv \frac{1-G(b_1^*)}{g(b_1^*)}$ . Notice the following from Equation (11):

- The toehold induces overbidding, that is, a bid greater than the private valuation  $v_1$ . This means that B1 may win even if B2 is the higher-valuation bidder (when  $v_1 < v_2 < b_1^*$ ).
- The effect of the termination fee is to induce underbidding. For example, a bidder with zero toehold and a termination agreement walks away from the target when rival bids exceed  $v_1 - t$  (quitting means receiving  $t$  while continued bidding implies an expected profit of less than  $t$ ).
- Since B1’s optimal bid is increasing in the toehold, the probability that B1 wins the auction is also increasing in the toehold. This gives economic content to the frequently heard notion among practitioners that toehold bidding is ”aggressive” toward the target.
- When  $\alpha = 1$ , the optimal bid  $b_1^*$  is equivalent to the optimal reserve price by a monopolist seller in a take-it-or-leave-it offer (Eckbo and Thorburn, 2008c).

Bulow, Huang, and Klemperer (1999) and Dasgupta and Tsui (2003) examine toehold bidding in a pure common-value setting where both B1 and B2 have toeholds but of unequal size (asymmetric toeholds). Toehold bidding also induces overbidding in a common-value setting, and these researchers show that holding B1’s toehold constant, B2’s probability of winning goes to zero as B2’s toehold becomes arbitrarily small. Even small differences in toeholds can produce significant benefits for the bidder with the greater toehold. Moreover, the expected winning sales price is decreasing in the difference between the toeholds of B1 and B2. This suggests an incentive on the part of the target to sell a toehold to B2—and for B2 to purchase a toehold—in order to even the

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<sup>53</sup>To ensure uniqueness,  $G(v)$  must be twice continuously differentiable and satisfy the monotonicity condition  $\partial(1 - G(v))/\partial g(v) \geq 0$ .

playing field. Consistent with this, Betton and Eckbo (2000) find that when a rival bidder enters a takeover contest with a toehold, the toehold size is on average roughly the same size as that of the initial bidder (approximately 5%).

### 3.3.2 The toehold puzzle

A priori, there is a compelling case for acquiring a toehold prior to initiating a takeover bid. The toehold not only reduces the number of shares that must be purchased at the full takeover premium, but it may also be sold at an even greater premium should a rival bidder enter the contest and win the target. This expected toehold gain raises the bidder's valuation of the target, which in turn helps overcome free-rider problems and makes the toehold bidder a more aggressive competitor in the presence of rivals. Early empirical research supports the existence of toehold benefits. Walkling (1985), Jennings and Mazzeo (1993), and Betton and Eckbo (2000) show that toehold bidding increases the probability of winning the target. Consistent with entry deterrence effects of toeholds, Betton and Eckbo (2000) also find that toeholds are associated with lower offer premiums in winning bids.

However, toehold bidding has in fact been declining dramatically over the past two decades and is now surprisingly rare. This decline is apparent in Figure 8, which plots toehold data from Betton, Eckbo, and Thorburn (2007). The toeholds in Figure 8 include target shares held by the bidder long term as well as shares purchased within six months of the actual offer date (short-term toeholds). Betton, Eckbo, and Thorburn (2007) report a sample-wide toehold frequency of 13%. Moreover, the sample-wide frequency of short-term toeholds—defined as target shares purchased within six months of the offer—is only 2%. In sum, toehold benefits notwithstanding, toeholds acquired as part of an active bidding strategy are almost nonexistent.

Presumably, rational bidders avoid toeholds as a response to large toehold costs. Several potential sources of toehold costs have been suggested in the literature, ranging from mandatory information disclosure and market illiquidity to costs associated with target management resistance to the takeover. Consider first the argument that mandatory disclosure rules make toeholds too costly because they reveal the bidder's intentions early in the takeover process. As discussed above, toehold purchases of 5% or more have triggered mandatory disclosure requirements (13d filings with the SEC since the 1968 Williams Act. Also, under the 1976 Hart-Scott-Rodino Antitrust

Improvements Act, share acquisitions exceeding a certain threshold (\$60 million in 2007) trigger notification to the antitrust agencies.

As shown in Figure 8, however, toehold bidding was relatively common in the early 1980s. The passage of disclosure rules in the 1970s cannot explain this time-series pattern. Also, the decline in toehold bidding has occurred despite a steady increase in market liquidity over the entire sample period.<sup>54</sup> Furthermore, Betton, Eckbo, and Thorburn (2007) report that the average toehold size (when positive) is as large as 20%, and 13% for short-term toeholds. It is difficult to explain the observed bimodal toehold distribution (centered on either zero or large toeholds) by appealing to general market illiquidity.

Goldman and Qian (2005) point to a toehold cost when entrenched target management successfully thwarts the takeover bid. In their model, entrenched target managements may resist a bidder in order to retain the private benefits of control. The degree of target entrenchment is unknown ex ante and, in equilibrium, is signaled ex post through the size of the bidder's toehold in successfully resisted offers. Successful resistance causes the target share price to drop, and the price drop is greater the greater the bidder's toehold. Bidders trade off expected toehold benefits (greater success probability) with expected toehold costs (greater target price decline when the bid fails), causing some bidders to select small or even zero toeholds. However, the evidence in Betton, Eckbo, and Thorburn (2007) rejects the predicted negative correlation between the sizes of bidder toeholds and target price declines conditional on all bids failing. The potential for a toehold loss in the event that all bids fail following target resistance does not appear to explain the toehold puzzle.

Betton, Eckbo, and Thorburn (2007) develop and test a model in which toehold costs arise endogenously. The takeover game starts with the initial bidder approaching the target with an invitation to negotiate a merger. In line with the fiduciary out requirement discussed earlier, a merger agreement is always followed by a period during which the target board is required to consider any rival bids (until the shareholder vote). The expected outcome of this open auction period determines the outcome of merger negotiations. Since a toehold affects the expected auction outcome (recall the optimal bid in Equation (11)), it also affects the willingness of entrenched target

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<sup>54</sup>Small toeholds, for which concerns with liquidity and disclosure are unimportant, can also have significant investment value as they retain many of the strategic benefits of larger ones. Toehold benefits arise as long as the toehold is greater than that of the rival bidder (Bulow, Huang, and Klemperer, 1999; Dasgupta and Tsui, 2004).

managements to accept the bidder's invitation to negotiate. If the target management rejects negotiations, the bidder foregoes the benefit of the termination agreement and incurs resistance costs during the takeover process.

These toehold-induced bidder costs make it optimal for some bidders to approach the target without a toehold. That is, the expected toehold cost creates a *toehold threshold* (a minimum toehold size), below which the optimal toehold is zero. Betton, Eckbo, and Thorburn (2007) show that the toehold threshold averages 9% in the data, which is consistent with the observed bimodal distribution of observed toeholds (centered on zero or large toeholds). That is, some bidders find that the toehold threshold is too costly to purchase in the market (e.g., due to market illiquidity) and select zero toehold. The key model prediction is that the likelihood of toehold bidding decreases in the toehold threshold estimate (the expected opportunity loss of the termination agreement), which the empirical evidence supports.

The threshold model is also consistent with another stylized fact: toeholds are much more common in hostile than in friendly takeovers. While 11% of initial bidders have toehold when the target is friendly, 50% of the initial bidders in hostile contests have toeholds. The threshold theory suggests that one should observe toehold bidding when the opportunity cost of the toehold is relatively low. A special case is when the opportunity cost is *zero*, which occurs whenever the target's optimal resistance strategy is independent of the toehold. That is, if target management is expected to resist regardless of toeholds, acquiring a toehold is always optimal.<sup>55</sup> Thus, the toehold threshold model predicts a higher toehold frequency in hostile bids, and it is consistent with the observed decline in the frequency of toehold bidding over the 1990s (Figure 8). This decline coincides with a general reduction in hostile bids due to a widespread adoption of strong takeover defenses such as poison pills.

Finally, in the absence of synergistic opportunities with the target ( $v = 0$ ), the owner of a toehold may contemplate making a (false) bid in an attempt to put the target in play. The idea is to try to sell the toehold to a potential rival bidder or (anonymously) to an unwitting market anticipating a successful takeover. Bagnoli and Lipman (1996) present a model with a single bidder selling the toehold shares to individual noise traders through a market maker before calling off the takeover bid. While charges of price manipulation go back at least to the greenmail episodes of

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<sup>55</sup>Similarly, toehold bidding occurs when the target's optimal strategy is to never resist.

the late 1970s, systematic empirical evidence on the feasibility of this type of price manipulation is virtually nonexistent. The context of hostile bids is potentially interesting since hostility may induce the target to produce a white knight committed to purchase the toehold.

### 3.4 Bid jumps and markup pricing

In this section we examine evidence on the size of bid jumps in multiple-bid contests and investigate how pre-bid target runups affect the initial and final offer prices. Also, an interesting question is whether target runups and markup pricing deter toehold acquisitions by the initial bidder.

#### 3.4.1 Preemption and bid jumps

As indicated earlier, the high premiums observed in takeovers are consistent with the hypothesis that takeover benefits are partly common to several potential bidders. This is likely when takeover benefits emanate, for example, from replacing inefficient target management or using voting control to extract value from ex-post minority shareholders in the merged firm. These and other forms of bidder-target complementarities often do not require specialized resources owned by a single potential bidder firm. As a result, the first bidder is concerned that the initial bid will alert potential rivals to a profit opportunity. The empirical issue is whether this possibility affects observed bid strategies.

Fishman (1988) analyzes this issue assuming that bidders must pay an investigation cost to identify their respective private valuations of the target. If both bidders enter (so that both investigation costs are sunk), an open English auction with costless bidding ensues and produces the "ratchet" solution  $\min[v_1, v_2]$  (Hirshleifer, 1995). However, there exists an initial bid that deters the second bidder from paying the investigation cost and entering the auction. The high initial (all-cash) bid signals that the initial bidder has a relatively high private valuation for the target, which reduces rival bidders' expected value of winning. For a sufficiently large investigation cost, the expected value is negative and the rival does not enter.

Testing preemption arguments is difficult since one obviously cannot observe deterred bids nor bidder private valuations in observed bids. One must look to auxiliary or related predictions, and the following four categories of results seem relevant. First, entry is rapid when it occurs: the average number of trading days between the first and second control bid is 40 in our sample (Figure 6) and

15 days in Betton and Eckbo (2000). This suggests that the rival bidder's investigation process required to establish its own valuation of the target is not very time-consuming in these cases. Also, some rivals may have completed much of the evaluation prior to the initial bid. Observing the initial bid event may produce a sufficient target valuation estimate to make a bid.

Second, auction outcomes are sensitive to bidder asymmetries. One important form of bidder asymmetry is the size of bidder toeholds. Even small toehold differences can have a large impact on entry and competition. Empirically, Betton and Eckbo (2000) find that when a rival bidder enters a takeover contest with a positive toehold, the toehold size is on average of roughly the same size as that of the initial bidder (approximately 5%). It is as if the rival bidder realizes the initial bidder's toehold advantage and wants to neutralize it upon entry.

Third, both Betton and Eckbo (2000) and Betton, Eckbo, and Thorburn (2007) report that the average offer premium in single-bidder successful tender offer contests (the first node in Figure 2) is slightly marginally higher than the average *initial* offer premium in contests that developed into multiple bids. This is consistent with the argument that the premiums in single-bid successful contests are preemptive in the sense of Fishman (1988). However, the premium effect is weak: the probability of rival bidder entry appears unaffected by the initial offer premium (Betton, Eckbo, and Thorburn, 2008b).

Fourth, Betton and Eckbo (2000) report evidence of significant bid jumps throughout the tender offer contests. For example, the average jump from the initial to the second bid price in the contest is 10%, implying a 31% change in the initial offer premium. The jump from the first to the final bid average 14% (a 65% revision in the initial offer premium), and the average bid jump throughout the entire contest, is 5% (average premium increments of 17%). The evidence of significant bid jumps throughout the contest is consistent with the presence of bidding costs. This in turn supports the notion in Fishman (1988) that initial bidders may strategically raise the first bid in an attempt to deter competition.<sup>56</sup>

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<sup>56</sup>See also Hirshleifer and Ping (1990) and Daniel and Hirshleifer (2008) for discussions of the implication of bidding costs for optimal bidding strategies.

### 3.4.2 Runups and markups

We now turn to the markup pricing phenomenon first documented by Schwert (1996). Initial takeover bids are typically preceded by substantial target stock price runups. The runup reflects takeover rumors generated from various public sources, such as Schedule 13(d) filings with SEC disclosing stake purchases of 5% or more in the target, media speculations, and street talk. The conventional view is that runups reflect takeover rumors based on information that is already known to the bidder.<sup>57</sup> If this view is correct, the runup anticipates an already planned offer premium and does not require a premium revision before the offer is made.

This is not the only possible scenario, however. Schwert (1996) begins his paper with the following question:

Suppose that you are planning to bid for control of a company and, before you can announce the offer, the price of the target firm's stock begins to rise coincident with unusually high trading volume. You have not been buying the target company's stock, and there is no reliable evidence to show who has been buying. Do you go forward with the offer exactly as you had planned? Or do you take into account the recent movement in the target's stock price and adjust your bidding strategy? (pp. 153-154).

Bidders need a plan for how to react to the runup before making the initial bid. Moreover, such a plan requires an understanding of the true nature of the pre-bid target runup. For example, it is possible that the target runup represents an increase in the target's fundamental (stand-alone) value, in which case the target management may demand a higher price. If so, the bidder may be forced to mark up the offer price to reflect the higher target stock price on the day before the offer is made.

To examine the extent of markup pricing, Schwert (1996) writes the total offer premium as  $Premium \equiv Markup + Runup$ , where  $Runup$  is the cumulative target abnormal stock return from day -42 through day -1 relative to the first bid for the target (day 0), and  $Markup$  is the cumulative abnormal target stock return from day 0 through day 126 (or until delisting, whatever comes first).

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<sup>57</sup>Jarrell and Poulsen (1989) and King and Padalko (2005) conclude that runups are primarily a result of public information. Meulbroek (1992) and Schwert (1996) find greater target runups in cases where the SEC subsequently alleges insider trading.

He then estimates the coefficient  $b$  in the following cross-sectional regression:

$$Premium_i = a + bRunup_i + u_i \quad (12)$$

where  $u$  is an error term. With a sample of 1,814 mergers and tender offers from the period 1975–1991, Schwert finds a statistically significant  $b = 1.13$  for the total sample (with a  $t$ -value of 2.88 for the null hypothesis of  $b = 1$ ). In other words, in the total sample, a dollar runup in the target stock price raises the total offer premium by approximately a dollar. Under the more conventional view of the runup, *Markup* and *Runup* are substitutes (predicting  $b = 0$  in regression (12)), which Schwert’s evidence rejects.

Schwert’s estimate of the markup is impacted by events occurring *after* the initial offer, such as the entry of rival bidders and bid revisions by the initial bidder, target management resistance, and ultimate target shareholder voting outcomes. Betton, Eckbo, and Thorburn (2008b) use the initial offer price  $p_{initial}$  to measure the initial markup directly as  $Markup = \ln(p_{initial}/p_{-1})$ , where  $p_{-1}$  is the target share price on the day prior to the initial bid. The runup is measured as  $Runup = \ln(p_{-1}/p_{-42})$ . With a sample of six thousand initial takeover bids for U.S. public targets from the period 1980-2002, they estimate the coefficient  $b'$  in the following regression,

$$Markup_i = a' + b'Runup_i + cX + u_i \quad (13)$$

where  $X$  is a set of bidder- and target-specific deal characteristics. Betton, Eckbo, and Thorburn find that  $b' = -0.18$  for the total sample ( $t$ -value of -15.44). Thus, in the cross section of bids, a dollar increase in the target runup is associated with an increase in the average initial offer price by \$0.82.<sup>58</sup> They also show that the degree of substitution between the markup and the runup is greater when the bidder purchases a target toehold in the runup period, and they conclude that target runups are an unlikely explanation for the sparsity of toehold purchases by initial bidders in the runup period.

Is markup pricing costly in the sense of reducing bidder synergies? To examine this issue, Betton, Eckbo, and Thorburn (2008b) estimate the following cross-sectional regression with bidder

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<sup>58</sup>If one changes the dependent variable in Equation (13) to the total initial offer premium  $\ln(p_{initial}/p_{-42})$ , the slope coefficient changes to  $1 + b' = 0.82$ .

takeover-induced abnormal stock returns,  $BCAR$ , as dependent variable:

$$BCAR_i = a_b + b_b Runup_i + c_b X_i + u_i \quad (14)$$

where  $Runup$  is the *target* runup (as before). The coefficient  $b_b$  is positive and highly significant in a sample exceeding 4,000 public bidders. That is, greater target runups are simultaneously associated with markup pricing and greater bidder synergies from the takeover.

Since target synergies are also (obviously) increasing in target runups, the positive estimate of  $b_b$  means that the runup is a proxy for *total* synergies in the cross section. This finding affects the interpretation of the coefficients  $b$  and  $b'$  in Equations (12) and (13). To illustrate, suppose takeover rumors allow market investors to not only identify the target but also to distinguish targets with high and low expected total synergies. Moreover, suppose competition always forces bidders to grant target shareholders (in the form of a takeover premium) a fixed portion of the total synergies. Bidders expecting the takeover to be profitable now also expect a high pre-bid runup, and mark up the initial offer price ex ante (before the runup). This also produces a markup that is independent of the runup ex post ( $b = 1$ ), although there are no actual bid revisions following the runup. Ultimately, distinguishing between this total synergy hypothesis and Schwert (1996)'s ex post markup proposition requires evidence on actual offer price changes made by the initial bidder during the runup period. However, either scenario is consistent with a positive association with target runups and bidder takeover gains.

### 3.5 Takeover defenses

In this section, we briefly characterize the legal basis for target takeover defenses, and then we examine the empirical evidence on the shareholder wealth effects of antitakeover measures, in particular poison pills, classified boards, and defensive payouts (greenmail). Figure 9 shows the annual frequency of the sample of 1,052 unfriendly (unsolicited and outright hostile) initial bids previously listed in Table 1.

Since target hostility may simply represent posturing to improve the target's bargaining position, several definitions of hostility exist (Schwert, 2000). The SDC definition probably casts a relatively wide net, as all it ensures is that (1) the bidder (and not the target) initiates the takeover

and (2) the target board is initially unprepared and/or unwilling to enter into merger negotiations. Specifically, the SDC classification does *not* necessarily mean that the target is dead set against negotiations nor does it mean that it is going to implement defensive tactics. However, target defensive actions are more likely in this sample than in cases where initial bids are classified by SDC as solicited or friendly. Notice also that the SDC definition allows a hostile initial bid to be in the form of either a merger or a tender offer (although, as shown in Figure 9, unfriendly initial bids are typically in the form of a tender offer). An example of an initially hostile merger bid is a "bear hug," in which the bidder invites the target to negotiate while reminding the target board that the bidder is likely to pursue a tender offer should the board refuse negotiations.

As shown in Figure 9, the fraction of bids that are unfriendly is relatively high throughout the 1980s and then drops sharply after 1989. Comment and Schwert (1995) analyze the drop in hostility, which is closely associated with the spread of takeover defenses and the development of state antitakeover statutes (control share and business combinations laws). Given this close association, it is natural to view the drop as being caused by increased managerial entrenchment afforded by strong takeover defenses. Comment and Schwert (1995), however, argue that the emergence of takeover defenses played only a minor role in ending the 1980s merger wave. They point instead to the development of a general economic recession beginning in 1989, which caused a collapse in net new lending to the nonfinancial sector by commercial banks from \$33 billion in 1989 to \$2 billion in 1990. Commercial banks were the dominant providers of bridge or transaction financing for large, cash acquisitions at the time. Takeover activity was also generally reduced as a result of a drop in the availability of long-term and subordinated financing, in part due to government intervention in the junk bonds in 1989.<sup>59</sup>

While the overall credit crunch undoubtedly slowed the economy and reduced takeover activity, there is also little doubt that the sharp reduction in *unfriendly* takeovers in large part reflects the legal certification and spread of strong antitakeover measures. Indeed, Jensen (1993) argues that the regulatory attack on the junk bond market around 1989 in of itself may be understood as a

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<sup>59</sup>In August 1989, Congress passed the Financial Institutions Reform, Recovery and Enforcement Act (FIRREA), which penalized savings and loans for holding junk bonds and mandated their sale, while regulators issued guidelines barring commercial bank participation in highly leveraged transactions (including all acquisition loans that raised liabilities to 75% of assets, or doubled the debt ratio while raising it to 50% of assets). The junk bond market crashed in September 1989" (Comment and Schwert, 1995, p.9).

broadly organized defensive tactic against unwanted takeovers.<sup>60</sup> While the combination of a poison pill and staggered board is not viewed as a draconian defense in the eyes of the law (see below), there can be no question that these measures when used in combination effectively bar or seriously delay a hostile bid. As discussed in the following, however, the overall degree of deterrence remains unclear from the empirical literature.

### 3.5.1 Legal basis for defensive measures

In this section, we summarize certain aspects of the highly complex case law governing takeover defenses.<sup>61</sup> We focus on Delaware case law since a majority of U.S. public companies (and more than 60% of the Fortune 500 firms) are incorporated in the state of Delaware.

Delaware case law sanctions the right of a board to "just say no" to an unsolicited takeover bid and to defend itself against that bid if necessary to remain an independent corporation. The case law rests on director fiduciary duties and the judicially developed principle referred to as the business judgement rule. Director fiduciary duties include duty of care and duty of loyalty. Duty of care is typically satisfied as long as the board examines fairness opinions of a bid and spends a minimum amount of board time discussing the value of the proposed deal.<sup>62</sup> Duty of loyalty is typically satisfied as long as the proposed deal does not imply a personal benefit for directors. Moreover, the presence of a majority of independent directors is viewed as a strong indication of the satisfaction of duty of loyalty.

The business judgment rule presumes, when director action is challenged, that the director of a corporation acted on an informed basis, in good faith, and in the best interest of the company. If the board is found to have acted this way, a court will not substitute its judgment for that of the board, and the court is inclined to find some rational purpose for the board action. In the context of a takeover bid, the board may determine in good faith that the continuing independence of the

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<sup>60</sup>The critical view many business leaders had of the junk bond market is illustrated by the sentiment expressed by J. Richard Munro, chairman and CEO of Time, Inc., in a speech in 1989: "Notwithstanding television ads to the contrary, junk bonds are designed as the currency of casino economics ... they've been used not to create new plants or jobs or products but to do the opposite: to dismantle existing companies so the players can make their profit This isn't the Seventh Cavalry coming to the rescue. It's a scalping party" (Munro, 1989, p. 472).

<sup>61</sup>We have benefited greatly from conversations with John G. Gorman, partner in the law firm Luse Gorman Pomeroy & Schtik, P.C. (Washington D.C.). For comprehensive reviews of federal and state rules governing corporate control changes, see, for example, Wasserstein (2000), Lipton and Steinberger (2004), and Gaughan (2007).

<sup>62</sup>The standard for determining breach of the duty of care is generally considered to be gross negligence. *Smith v. Van Gorkam*, 488 A.2d 858 (Del. 1985).

corporation is in the long-term best interests of the corporation and its stockholders. The board "is under no obligation, in the abstract, to submit to an external summons to the auction block or otherwise transfer control of corporate assets."<sup>63</sup>

A board may even be legally required to oppose an offer that it believes is not in the best interest of the corporation and its stockholders.<sup>64</sup> The board is not obligated to accept an offer simply because it represents a premium over a current market price. Refusal of such an offer is not *prima facie* evidence of a breach of fiduciary duty,<sup>65</sup> *except* when a sale of control of the corporation has been decided. If a determination is made to enter into a sale of control transaction, the fiduciary duties of the directors are enhanced and the directors have an obligation to seek the transaction offering the best value (which may mean highest price) reasonably available to stockholders—the so-called Revlon-duties.<sup>66</sup>

Case law sanctions a wide range of target defensive mechanisms against an unsolicited bid. However, the courts have noted that given the "omnipresent-specter that a board may be acting primarily in its own interests, there is an enhanced duty which calls for judicial examination at the threshold before the protections of the business judgement rule may be conferred."<sup>67</sup> This modified business judgment rule requires that the board initially establishes that (i) it had reasonable grounds for believing there was a danger to corporate policy and effectiveness, and (ii) the measure adopted in response to the threat was reasonable in relation to the threat posed.<sup>68</sup>

If the board's defensive response is not draconian (i.e., it is neither coercive nor preclusive) but within the range of reasonableness given the perceived threat, the board is protected by the modified business judgment rule. The following excerpt from the Unitrin decision, the leading case on a board of directors' ability to use defensive measures to prevent a hostile takeover, illustrates

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<sup>63</sup> *Paramount Communications, Inc. v. Time, Inc.*, 571 A.2d 1140 (Del. 1990).

<sup>64</sup> *Gilbert v. El Paso Co.*, 575 A.2d 1131 (Del. 1990).

<sup>65</sup> *Pogostin v. Rice*, 480 A.2d 619 (Del. 1984).

<sup>66</sup> See *Revlon, Inc. v. MacAndrews and Forbes Holdings, Inc.*, 506 A.2d 182 (Del. 1986), and *Paramount Communications, Inc. v. QVC Network, Inc.*, 637 A.2d 34 (Del. 1994).

<sup>67</sup> *Unocal Corp. v. Mesa Petroleum Co.*, 493 A.2d 946 (Del. 1985).

<sup>68</sup> The burden of proving reasonable grounds as to the danger to corporate policy and effectiveness can be met by showing good faith and reasonable investigation. A board's ability to show the reasonableness of the response adopted is enhanced when a majority of the board consists of outside, independent directors, or when the actions taken precede an actual threatened change in control. An "inadequate" offer price can be a reasonably perceived threat. The concern that shareholders may be ignorant of the true value of the company may be considered by the board, and the interests of long-term shareholders versus short-term speculators (such as arbitrageurs) may be taken into account.

the court's mind-set:<sup>69</sup>

Proper and proportionate defensive responses are intended and permitted to thwart perceived threats. When a corporation is not for sale, the board of directors is the defender of the metaphorical medieval corporate bastion and the protector of the corporations shareholders. The fact that a defensive action must not be coercive or preclusive does not prevent a board from responding defensively before a bidder is at the corporate gate...Thus, continuing with the medieval metaphor, if a board reasonably perceives that a threat is on the horizon, it has broad authority to respond with a panoply of individual or combined defensive precautions, e.g., staffing the barbican, raising the drawbridge, and lowering the portcullis. Stated more directly, depending upon the circumstances, the board may respond to a reasonably perceived threat by adopting individually or sometimes in combination: advance notice by-laws, supermajority voting provisions, shareholder rights plans, repurchase programs, etc.

A defense that is deemed preclusive because it frustrates, impedes, or disenfranchises a shareholder vote will be held to the so-called Blasius standard of compelling justification<sup>70</sup> and is unlikely to be upheld.<sup>71</sup> For example, a stock repurchase designed primarily to preclude a third party from winning a proxy contest for the selection of directors may not pass the Blasius standard. Also, defensive measures have not fared well in court when the defense has involved a transaction in which existing management will have an equity interest or where the purpose is to favor one party over another.

### 3.5.2 Defenses and offer premiums

Following the reference made by Manne (1965) to the "external" and "internal" market for corporate control, several authors have similarly categorized antitakeover provisions.<sup>72</sup> The external

<sup>69</sup> *Unitrin, Inc. v. American General Corp.*, 651 A.2d 1361 (Del. 1995).

<sup>70</sup> *Blasius Indus., Inc. v. Atlas Corp.*, 564 A.2d 651, 660 (Del. 1988).

<sup>71</sup> *MM Companies v. Liquid Audio, Inc.*, 813 A.2d 1118 (Del. 2003). In this case, the court invalidated the board's decision to add two new directors to prevent the acquirer from obtaining board control at the subsequent shareholder meeting. The Blasius standard "is to be applied sparingly, and only in circumstances in which self-interested or faithless fiduciaries act to deprive stockholders of a full and fair opportunity to participate and to thwart what appears to be the will of a majority of stockholders" (*MONY Group, Inc. Shareholder Litigation*, Del. (class action that was settled)).

<sup>72</sup> Jarrell and Poulsen (1987), Danielsen and Karpoff (1998), Gompers, Ishi, and Metrick (2003), Moussawi (2004). Bebchuk, Coates, and Subramanian (2002) summarize case law concerning antitakeover provisions.

control market involves takeover bids and specific target responses, while the internal market involves general board actions and shareholder voting. Examples of internal antitakeover provisions are classified (staggered) board (directors are divided into separate classes—typically three—and elected to overlapping terms), unequal voting rights (e.g., two classes of common stock, one with zero voting rights), and various restrictions on shareholder rights to amend company charter and bylaws, to act by written consent, and to call special meetings. Examples of external antitakeover provisions include antigreenmail provision (prohibition on paying greenmail—the targeted repurchase of a single shareholder’s stockholding at a premium), supermajority requirements to approve a merger, blank check preferred stock (used to implement a poison pill), fair price provisions (requires a large shareholder to pay a minimum price set by formula for all shares acquired in the back end of a two-tiered acquisition), and poison pills or shareholder rights plans.

The development of the poison pill is tied directly to the history of greenmail. Following several occurrences of greenmail payments during the late 1970s and early 1980s, Unocal made what turned out to be a landmark decision to reverse the greenmail payment. In 1983, Mr. T. Boone Pickens Jr. and his Mesa Partners II, who held 13.6% of Unocal’s stock, made an \$8.1 billion takeover bid for Unocal. The offer was for \$54 a share in cash for 37% of Unocal’s stock and \$54 a share in junior securities for the rest. Unocal’s board responded by offering to exchange \$72 a share in senior securities for 50.1% of the company’s total shares, but barred the Mesa group from participating in the stock repurchase. Delaware Supreme Court upheld Unocal’s right to undertake the targeted repurchase.<sup>73</sup>

Attorney Martin Lipton of Wachtell, Lipton, Rosen & Katz was a key legal strategist working for Unocal. Subsequently, Mr. Lipton’s law firm proceeded to develop the “shareholder rights plan”—popularly referred to as the poison pill—which is an ongoing commitment to trigger what in essence is a reverse greenmail payment.<sup>74</sup> When adopting the poison pill, the corporation issues to its stockholders (usually by means of a dividend) certain rights to purchase stock. The rights are out of the money (the exercise price exceeds the then market price) and not exercisable until a triggering event. The triggering event is that someone acquires a certain percentage (e.g., 15%) of the firm’s voting shares. Pending their exercise, the rights may be redeemed for a nominal value by

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<sup>73</sup> *Unocal Corp. v. Mesa Petroleum Co.*, 493 A.2d 946 (Del. 1985).

<sup>74</sup> Mr. Lipton’s law firm became a dominant supplier of poison pills to U.S. public companies thereafter.

the board. If triggered, the rights give each holder, other than the stockholder who triggered the pill, the right to purchase shares of the issuing corporation (flip-in) or of the acquirer (flip-over) at a deep discount (e.g., 50%) to the then market price. The board may offer pills without prior stockholder approval, and the pills may be issued after having received a hostile bid ("morning after" pill).<sup>75</sup>

In 1985, the Delaware Supreme Court upheld Household International's adoption of a shareholder rights plan as reasonable under the Unocal standard, even though the company did not face a hostile threat.<sup>76</sup> Subsequently, Delaware has upheld the right of a board to refuse to redeem a pill in the face of an all-cash, noncoercive tender offer, even though a majority of the company's stockholders had tendered their shares to the bidder.<sup>77</sup> On the other hand, Delaware courts have invalidated the so-called dead-hand poison pill, which attempted to provide that only incumbent directors could redeem the rights, thus preventing newly elected directors from unwinding the pill.<sup>78</sup> This is an important decision, as one (though costly) way to circumvent the pill is to launch a proxy contest simultaneously with the hostile offer, in the hope of winning enough board seats to have the board rescind the pill and let the offer go through.

The combination of a hostile bid and a proxy contest does not work if the target board is classified or staggered. For example, if only one-third of the board is up for election, the hostile bidder cannot win the majority needed to rescind the pill. Indeed, as argued by Bebchuk, Coates, and Subramanian (2002), Bebchuk, Cohen, and Ferrell (2004), and Bebchuk and Cohen (2005), board classification may in of itself constitute an antitakeover device. Bebchuk and Cohen (2005) examine the cross-sectional relationship between board classification and firm value, and find that board classification is negatively correlated with industry-adjusted Tobin's Q. Also, Masulis, Wand, and Xie (2007) find that acquisition announcement-period stock returns are significantly lower for bidders with staggered boards, possibly because board classification reduces forced board turnover and quality. On the other hand, Bates, Becher, and Lemmon (2008) find that board classification does not reduce the probability that a firm, once it is targeted, is ultimately acquired. Moreover,

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<sup>75</sup>Pill adoption does not require a shareholder vote since it is akin to a dividend payment. Recently, there has been growing demand from large institutional shareholders such as pension funds to allow shareholders to vote on pill adoptions.

<sup>76</sup>*Moran v. Household International, Inc.*, 500 A.2d 1346 (Del. 1985).

<sup>77</sup>*Moore Corp., Ltd. v. Wallace Computer Services, Inc.*, 907 F. Supp. 1545 (D. Del. 1995).

<sup>78</sup>*Quickturn Design Systems, Inc. v. Shapiro*, 721 A.2d 1281 (Del. 1998). This version of the pill had been upheld under Georgia Law, but also invalidated under New York law.

targets with classified boards appear to extract premiums equivalent to those of single-class boards. However, they do find that board classification is associated with a small reduction in the probability of receiving a takeover bid. Rose (2008) also concludes that the presence of staggered boards has more of a detrimental impact on firm value when management is relatively entrenched.

The ambiguities in interpreting the overall consequences for shareholders of a defensive measure such as a staggered board are also present in the debate over the poison pill defense. There is substantial empirical evidence that targets that have adopted poison pills receive offer premiums that are, on average, indistinguishable from offer premiums received by nonpill targets.<sup>79</sup> This evidence is consistent with the following four alternative hypotheses:

H1 Poison pills are irrelevant for determining final takeover premiums.

H2 Poison pills convey bargaining power, which increases the final takeover premium relative to what the premium would have been for the same target without a pill.

H3 Poison pills convey bargaining power that is used to benefit target management at the expense of target shareholders.

H4 Poison pills provide bargaining power, but "shadow" pills are as effective as adopted pills.

Hypotheses H2-H4 maintain that pills do convey bargaining power but that a comparison of offer premiums in samples of firms with or without pills is difficult from an econometric point of view. Pill adoptions are voluntary, which raises complex issues of endogeneity (H2). Controlling for self-selection is difficult because the marginal effect of a poison pill depends on the firm's entire governance system, including executive compensation (H3).<sup>80</sup> Also, in order to isolate the true premium effects of pills, empirical work relies on the existence of two samples, one representing "poison" and the other "placebo" effects (Comment and Schwert, 1995). This sampling is difficult, if not impossible, if, as in H4, *all* firms effectively have ready access to the pill (Coates, 2000).

H1 maintains that pills may simply be ineffective and therefore irrelevant for final offer premiums. At first blush, H1 seems to be rejected by the fact that no bidder (to our knowledge) has yet

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<sup>79</sup>Comment and Schwert (1995), Field and Karpoff (2002), Heron and Lie (2006), Betton, Eckbo, and Thorburn (2007).

<sup>80</sup>Compensation effects of takeovers are discussed in Section 5.2. Heron and Lie (2006) find that the targets of hostile bids are more likely to adopt poison pills when they have classified boards, suggesting that the two antitakeover devices are interdependent.

triggered a pill. However, why trigger an ineffective pill if the trigger itself is costly—also to target management? Consider the failed 1996 takeover attempt by U.S. Surgical Corporation of medical device maker Circon Corporation. Exercising the Circon pill would have required Circon shareholders to pay approximately \$800 million in cash into a company with a pre-takeover total equity value of \$150 million. In return for this massive (and expensive) cash infusion, Circon shareholders would lose a 70% takeover premium and stood to gain only \$10 million from the resulting dilution of U.S. Surgical’s shareholding in Circon. In general, a pill with this structure may lack credibility and therefore have little effect on bargaining outcomes.<sup>81</sup>

Moreover, the definition of target “hostility” used in the literature probably captures many targets that are ready to negotiate with or without the pill (Schwert, 2000). Bidders that are able to look beyond the pill and determine whether negotiations are possible (based on observable target characteristics or on the bidder’s own ability to persuade a hostile target management) may reach a final bargaining outcome that is largely indistinguishable from that observed in samples of ex-ante “friendly” targets. Empirical evidence shows that the probability of receiving a bid (and ultimate bid success) is either unaffected or slightly lower for targets with strong antitakeover defenses.<sup>82</sup>

Finally, several studies estimate the valuation effects of antitakeover charter amendments (which require a shareholder vote), with data primarily from the 1980s. An advantage of studying charter amendments is that the market reaction isolates the net present value of the expected impact of the antitakeover measures on all future takeover activity. A disadvantage, however, is that the lengthy process toward a vote at the shareholder meeting leaks information and leads the market to partially anticipate the event, thus reducing power to register significant changes in market expectations. There is also some controversy over which event date is the most appropriate: the shareholder meeting date, the proxy announcement date, or the proxy mailing date (Bhagat and Jefferis, 1991). Also, as with studies of poison pills, it is important but difficult to properly account for the endogenous nature of the amendment choice, as it is part of the amending firm’s entire governance system.<sup>83</sup>

Since the amendments must pass a shareholder vote, a natural null hypothesis is that these

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<sup>81</sup>In the Circon case, Circon chairman and CEO Richard Auhll appeared to be protecting large private benefits of control. Using information on SDC, approximately half of all pills are cash pills (the exercise price is paid in cash rather than by an exchange of securities).

<sup>82</sup>Comment and Schwert (1995), Field and Karpoff (2002), Heron and Lie (2006).

<sup>83</sup>Malekzadeh, McWilliams, and Sen (1998), Bhagat and Jefferis (2002).

serve the interests of shareholders. Under this hypothesis, a takeover amendment increases the expected future takeover premium (the change in the probability of a takeover times the change in the premium conditional on a takeover). For example, the amendments may help resolve a target shareholder coordination (holdout) problem and increase the expected takeover price, especially in a two-tier tender offer setting (DeAngelo and Rice, 1983). Or, in the context of optimal contracting, the amendment decreases the expected future takeover premium in return for greater managerial incentives to invest in firm-specific human capital (Shleifer and Vishny, 1989). The main alternative hypothesis is that the amendments further entrench incumbent management (with insufficient offsetting benefits) and that the voting mechanism is unable to prevent the management proposal from passing.<sup>84</sup>

Early studies of share price effects of fair price amendments, classified boards, supermajority requirements, and other "shark repellents" adopted by publicly traded firms find a zero or small negative market reaction. These include DeAngelo and Rice (1983), Linn and McConnell (1983), and Jarrell and Poulsen (1987). Fair-price amendments (the bulk of the sample amendments) are met with an insignificant market reaction while board classification elicits significantly negative abnormal stock returns. Jarrell and Poulsen (1987) also find that the amendments having the most negative effects are adopted by firms with the lowest percentage of institutional holdings and the greatest percentage of insider holdings. Malatesta and Walkling (1988) distinguish between takeover defenses that do or do not require shareholder approval, and conclude that defenses that are not ratified by a shareholder vote reduce shareholder wealth. Ryngaert (1988) also finds evidence that poison pill adoptions reduce shareholder value, as do news of court decisions upholding poison pill defenses. More recent studies of the market reaction to antitakeover amendments tend to confirm the conclusions of this literature, also after providing a more detailed picture of the interaction with the adopting firm's corporate governance and ownership structures.<sup>85</sup>

Finally, a number of papers examine the valuation effects of greenmail—the precursor to the poison pill—and antigreenmail charter amendments. As indicated above, greenmail refers to an arrangement in which a company repurchases the stock held by a large shareholder, usually at

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<sup>84</sup>It is well understood that a vote may not necessarily safeguard shareholder interests. See, for example, Austen-Smith and O'Brien (1986), Jarrell and Poulsen (1987), Brickley, Lease, and Smith (1988), and Gordon and Pound (1993) for evidence of voting on antitakeover amendments. Since the 1980s, increasing institutional shareholder activism has made it more difficult for incumbents to secure shareholder support for defensive measures.

<sup>85</sup>Mahoney and Mahoney (1993), McWilliams and Sen (1997), Sundaramurthy, Mahoney, and Mahoney (1997).

a substantial above-market price. In return, the large stockholder signs a standstill agreement - committing not to purchase additional target shares or launch a control bid for typically a 10-year period. Bradley and Wakeman (1983), Dann and DeAngelo (1983), and Mikkelsen and Ruback (1991) find that the announcement of greenmail transactions are associated with significantly negative abnormal stock returns of approximately -2%. Mikkelsen and Ruback (1991) find that the market reaction is negative only if the stockholder signs a standstill agreement or if it aborts a control contest.<sup>86</sup> Mikkelsen and Ruback (1985) show that the total abnormal stock return from the initial 13D filing by the toehold investor until he receives the greenmail payment is significantly positive. In other words, the greenmail payment and standstill do not eliminate all gains from having had a significant blockholder in the firm's ownership structure.

Eckbo (1990b) and Bhagat and Jefferis (1991) present evidence on antigreenmail charter amendments. The typical amendment prohibits the firm from repurchasing some or all of the common (voting) stock of an *interested shareholder*, normally defined as a shareholder who owns 5% or more of the outstanding common stock and who acquired this ownership position within the past two to three years. Virtually all firms retain the option to pay greenmail as long as (1) two-thirds or more of the *disinterested shareholders* approve of the action, or (2) if the shares are repurchased at a fair price, usually defined as an average of the stock's trading prices over the 90 days immediately preceding the share repurchase.

The market reaction to greenmail prohibitions represents the value of the *option* to pay greenmail in the future. If the option value is negative, the market reaction to the amendment will be positive. The option value is negative if the sum of the repurchase premium (greenmail payment), the marginal increase in agency costs from successfully rebuffing future hostile takeover bids, and the increased likelihood of receiving purely extortive bids (bids designed exclusively to generate greenmail payments) exceed the expected benefits. Thus, evidence of a positive market reaction to the greenmail prohibition would support the widely held view that greenmail payments harm nonselling shareholders.<sup>87</sup>

For a subsample where the antigreenmail amendment is proposed by itself (without other si-

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<sup>86</sup>They also report that even with the standstill, 40% of the firms paying greenmail experience a control change within the subsequent three years.

<sup>87</sup>It is not, however, the only possible interpretation. In the asymmetric information model of Shleifer and Vishny (1986a), greenmail payments increase the intrinsic value of the firm while at the same time causing the firm's stock price to fall.

multaneous antitakeover proposals), Eckbo (1990b) has found the average market reaction to the charter amendments to be weakly negative. The market reacts negatively to the greenmail prohibition if the value of the unrestricted option to pay greenmail is positive. However, cross-sectional regressions further indicate that the market reaction is strongly positive when the firm has experienced a recent stock price runup along with takeover rumors. Eckbo (1990b) concludes that the option to pay greenmail is costly when the firm likely has been identified as a target, in which case the antigreenmail amendment removes a possible barrier to the pending takeover.

### **3.6 Targets in bankruptcy**

In this section, we consider evidence on the acquisitions of target firms that have filed for bankruptcy. Since bankruptcy law alters the bargaining position of the target, one expects the outcome for bidders to be different from that for out-of-court acquisitions. We begin with targets in Chapter 11 of the U.S. Bankruptcy Code, where a decision to put the bankrupt firm up for sale is driven jointly by incumbent management and creditor committee votes. We then consider targets sold in the automatic auction bankruptcy system in Sweden. This code essentially eliminates the target's bargaining opportunities and relies on bidder competition to maximize debt recovery and an efficient reallocation of the target assets.

#### **3.6.1 Chapter 11 targets**

Beginning with U.S. bankruptcies, there is growing use of market-based mechanisms to lower the costs of traditional Chapter 11 proceedings. These include prepackaged bankruptcies with a reorganization plan in place at filing (Betker, 1995; Lease, McConnell, and Tashjian, 1996), acquisition of distressed debt by "vulture" investors in order to make voting more efficient (Hotchkiss and Mooradian, 1997), and voluntary sales in Chapter 11 (Hotchkiss and Mooradian, 1998; Maksimovic and Phillips, 1998). Baird and Rasmussen (2003) report that more than half of all large Chapter 11 cases resolved in 2002 used the auction mechanism in one form or another, and that another quarter were prepacks.

Hotchkiss and Mooradian (1998) study acquisitions of targets in Chapter 11. There are two ways in which a firm in Chapter 11 can sell substantially all of its assets: through a Section 363 (of the U.S. Bankruptcy Code) sale or as part of a confirmed reorganization plan. Under a Section

363 sale, management must first obtain an offer and then notify the court, which in turn notifies creditors. The Bankruptcy Code invalidates no-shop agreements and allows creditors to retain advisers at the expense of the debtor firm to search for competing buyers. If there are several potential buyers, the court holds an auction.

Chapter 11 grants the incumbent management exclusive rights within a limited time period (rolling six months) to propose a reorganization plan. As a consequence, hostile acquisitions are difficult and the targets will be more likely for firms whose management has already been replaced or for which managerial private benefits of control are small. It is also possible that management is willing to put the target up for sale when it has private information that the target assets are of relatively low quality. Furthermore, since acquisition bids are subject to creditor approval (just as for any other reorganization plan), complex debt structure makes it more difficult to generate the necessary votes. Thus, targets are also likely to have relatively simple capital structures.

Hotchkiss and Mooradian (1998) start with 1,200 public companies that filed for Chapter 11 between October 1970 and December 1992. Using SEC and Compustat information, they identify 339 firms that reorganized as independent public companies and 111 firms that were acquired by another operating company. Of these, 55 acquirers are publicly traded firms. Target firms spend a median time in bankruptcy of 14 months, compared to 17 months for independently reorganized firms. They find little evidence that acquired firms have unusually simple capital structures (although they tend to have less public debt) or that incumbent management is particularly entrenched. Acquirers tend to be firms in the same industry as the target and have some prior relationship with the target such as an ownership stake. Of the 55 takeovers, 18 transactions have multiple bidders.

Hotchkiss and Mooradian (1998) also report that the bankrupt targets on average are purchased at a 45% discount relative to prices paid for nonbankrupt targets in the same industry. However, they do not consider this as evidence of allocative inefficiency: "Although the transactions are at discount prices, the high proportion of acquirers operating in the same industry as the target, as well as the competitive bidding environment, does not support the conclusion that acquisitions in bankruptcy are sales to lower value users" (p. 243). This conclusion is further supported by their finding that the postmerger cash flow performance of firms combined with bankrupt targets is better than that reported by Hotchkiss (1995) for firms emerging from Chapter 11. Finally, there

is evidence of positive and significant abnormal stock returns to both bidders and bankrupt targets for the days surrounding the announcement of the acquisition.

### 3.6.2 Bankruptcy auctions and fire-sales

Next, we consider bankruptcies in Sweden's mandatory auction system. Here, a firm filing for bankruptcy is turned over to a court-appointed trustee who puts the firm up for sale in an auction. This mandatory auction system has an attractive simplicity. All debt claims are stayed during the auction period and the bids determine whether the firm will be continued as a going concern or liquidated piecemeal. A going-concern sale takes place by merging the assets and operations of the auctioned firm into the bidder firm, or into an empty corporate shell—much like a leveraged buyout transaction. Payment must be in cash, allowing the auction proceeds to be distributed to creditors strictly according to absolute priority.

As surveyed by Hotchkiss, John, Mooradian, and Thorburn (2008), bid premiums observed in the mandatory auction bankruptcy system in Sweden provide an important empirical perspective on the viability auctions as a mechanism for resolving bankruptcy. Proponents of the market-oriented auction system point to costs associated with conflicts of interests and excessive continuation of operations due to managerial control over the restructuring process in Chapter 11.<sup>88</sup> These costs most likely explain the trend toward increased use of market-based mechanisms in the United States. On the other hand, opponents of an auction-based system argue that the time pressure of an auction system is costly as it may cause excessive liquidation and fire sales of economically viable firms when potential bidders in the auction are themselves financially constrained.

A series of papers study the Swedish auction system using a sample of 260 auctioned firms.<sup>89</sup> The average auctioned firm has \$5 million in sales and assets of \$2 million (\$8 million and \$4 million, respectively, in 2007 dollars), and it has an average of 45 employees.<sup>90</sup> Thorburn (2000) reports that the auctions are quick—lasting an average of two months—and relatively cost-efficient. Moreover, three-quarters of the filing firms survive the auction as a going concern, which is similar

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<sup>88</sup>See, for example, Baird (1986), Bebchuk (1988), Jensen (1989), Aghion, Hart, and Moore (1992), Bebchuk and Chang (1992), Bradley and Rosenzweig (1992), and Baird (1993). Hotchkiss (1995) finds that firms emerging from Chapter 11 tend to underperform their industry rivals which is consistent with excessive continuation.

<sup>89</sup>Thorburn (2000), Strömberg (2000), Eckbo and Thorburn (2003, 2008a,c).

<sup>90</sup>A majority of Chapter 11 filings are also by small private firms: Chang and Schoar (2007) report average sales of \$2 million and 22 employees in a large and representative sample of Chapter 11 filings between 1989 and 2003. Bris, Welch, and Zhu (2006) report that the median firm filing for Chapter 11 has assets of \$1 million.

to the survival rate of Chapter 11 cases. In going-concern sales, the buyer typically rehires lower-level employees. Top management fares less well: Eckbo and Thorburn (2003) find that while the buyer rehires the old management to run the restructured company in about one-half of the going-concern sales, the old management typically experiences a median wealth decline of -47% relative to managers of nonbankrupt firms matched on size and industry. They argue that this expected personal bankruptcy cost, along with the loss of private benefits of control, counteract shareholder risk-shifting incentives when the firm is in severe financial distress (Jensen and Meckling, 1976). That is, if the CEO's objective includes being rehired by the buyer in the auction, she may implement a relatively conservative investment policy to preserve the possibility of a going-concern sale in the auction.

Does the auction mechanism induce an efficient reallocation of the resources of the bankrupt firm? First, Eckbo and Thorburn (2003) show that firms sold as going-concerns typically perform at par with industry rivals. Second, Eckbo and Thorburn (2008a) fail to find auction fire-sale discounts in going-concern sales. That is, the auction produces auction premiums (and post-bankruptcy operating performance) in going-concern sales that are independent of fire-sale conditions such as industry-wide financial distress, industry leverage, and whether or not the buyer is an industry insider or outsider.

Third, Eckbo and Thorburn (2008a) find that prepackaged auctions (where the buyer has been identified prior to filing) tend to produce prices consistent with the hypothesis that the contracting parties are concerned with preempting piecemeal liquidation. Strömberg (2000) shows that salebacks to the previous owner-manager tend to increase during periods of high industry financial distress, which further helps preempt liquidation. Eckbo and Thorburn (2008a) document that prices paid in salebacks are as high as prices in non-saleback going concern transactions, which fails to support arguments that salebacks carry an inherent conflict of interest with junior creditors.

### **3.6.3 Testing for auction overbidding**

Eckbo and Thorburn (2008c) develop and test the argument that creditor incentives may induce auction overbidding. Recall from Section 3.3 that toehold bidding raises the optimal bid above the bidder's own private valuation of the target, for example, as shown in Equation (11). In the sample of Swedish bankruptcies, the main creditor is always a single bank. Thus, the toehold analogy

is that the bankruptcy event effectively creates an instant "creditor toehold" of  $\alpha = 1$  when the creditor's debt is impaired at filing. The question is whether the existence of this creditor toehold leads to overbidding in the auction. Given the importance of toehold bidding in the takeover literature, we outline the main test procedure and results below.

Swedish bank regulations prevent the bank from bidding directly in the auction. However, Eckbo and Thorburn (2008c) report that the bank often finances the winning bidder and uses this observation to motivate the following proposition: Bank financing allows the bank to induce bidder 1 to submit a bid  $b_c^*$  that involves overbidding and is jointly optimal for both parties.<sup>91</sup> As in Section 3.3, overbidding forces a wealth transfer from bidder 2 to the bank-bidder coalition when bidder 2 wins the auction. This rent transfer raises auction revenue and the bank's expected debt recovery rate.

Suppose the bank forms a coalition with bidder 1. Continuing the notation from Section 3.3, the coalition's optimal bid is as follows:

$$b_c^* = \begin{cases} v_1 + h(b_c) & \text{if } v_1 \leq f - h(b_c) & (\text{unconstrained overbidding}) \\ f & \text{if } f - h(b_c) < v_1 < f & (\text{constrained overbidding}) \\ v_1 & \text{if } v_1 \geq f, & (\text{no overbidding}) \end{cases} \quad (15)$$

where  $f$  is the face value of the bank's debt claim. Note that the unconstrained overbidding price is identical to the bid in Equation (11) but with  $\alpha = 1$  and a termination fee  $t = 0$ . A value of  $\alpha = 1$  follows because the bank, being the secured creditor with an impaired debt claim, is effectively the seller of the auctioned firm. Thus, the bank has a creditor toehold equal to one. As shown by Hotchkiss and Mooradian (2003) as well (in the context of Chapter 11 sales), a creditor toehold induces overbidding in exactly the same manner as a bidder toehold outside of bankruptcy.

What makes this overbidding theory testable is the constraining effect of the bank-debt face value  $f$ .<sup>92</sup> To illustrate, let  $l$  denote the piecemeal liquidation value of the bankrupt firm, and suppose  $l$  is public knowledge at the beginning of the auction. Since  $l$  is the sum of the value of

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<sup>91</sup>The bank may induce the bidder to bear the expected overpayment cost by granting a lower interest on the loan. Eckbo and Thorburn (2008c) show that there exists a positive transfer from the bank to bidder 1 which makes coalition formation incentive compatible for both parties.

<sup>92</sup>This testable restriction does not exist for takeovers outside of bankruptcy. Extant empirical evidence on toehold-induced overbidding is therefore indirect. For example, theory implies that overbidding increases the probability of winning, which is supported by studies of corporate takeover bids with equity toeholds (Betton and Eckbo, 2000).

the firm's assets if sold individually, it constitutes a price floor in the auction of the firm as a going concern. Let  $r \equiv l/f \in [0, 1]$  denote the bank's debt recovery if the firm is liquidated piecemeal.  $r$  is a measure of the bank's debt impairment: low values of  $r$  indicate that the bank's debt is highly impaired. For low values of  $r$ , the bank-bidder coalition fully overbids (unconstrained overbidding). However, as the value of  $r$  increases, the amount of overbidding becomes constrained by  $f$ : the coalition optimally overbids *only* to the extent that overbidding does not benefit junior creditors. If the valuation of the bank's coalition partner is such that  $v_1 > f$ , the bank will receive full debt recovery even without overbidding, so the optimal coalition bid is simply  $b_c^* = v_1$ .

Eckbo and Thorburn (2008c) prove that the greater the liquidation recovery rate  $r$ , the lower is the incentive to overbid and, in turn, the lower is the expected premium paid by the winning bidder. They use a professional estimate of the piecemeal liquidation value  $l$ , published by the bankruptcy trustee at the beginning of the auction.<sup>93</sup> They find that when the firm is sold as a going-concern, final auction premiums are higher the lower is the liquidation recovery rate, as predicted by overbidding. Equally important, in subsamples where the theory implies zero overbidding incentive, the cross-sectional regressions reject overbidding. That is, final auction premiums are unaffected by the liquidation recovery rate when the auction leads to the target being liquidated piecemeal (in which case the going-concern premium is zero), or when the bank's collateral exceeds the face value ( $l > f$ ) so the bank's debt is not impaired.

Overbidding results in allocative inefficiency whenever the bank-bidder coalition wins against a higher-valuation bidder. To examine this possibility, Eckbo and Thorburn (2008c) estimate the post-bankruptcy operating performance of firms sold as going-concerns conditional on the bank-bidder coalition having large overbidding incentives and winning the auction. While this is the most powerful subsample to look for ex-post allocative inefficiency, they show that the post-bankruptcy operating performance in this subsample is at par with or excess that of industry rivals. Overall, they conclude from this that the bank's coalition partner tends to be efficient in terms of restructuring and operating the bankrupt firm's asset.

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<sup>93</sup>Bidders appear to rely on this estimate as well: when the auction does lead to piecemeal liquidation, the average price paid by the winning bidder is close to (on average 8% above) the trustee's estimate. In contrast, when the bankrupt firm is purchased as a going concern, the average auction premium more than doubles the trustee's piecemeal liquidation value estimate.

### 3.7 Offer premium summary

Reflecting restrictions on the availability of actual offer prices, the bulk of the empirical studies on takeovers are content to use target cumulative abnormal stock returns around the takeover bid as a proxy for the actual offer premium. Obviously, target abnormal stock returns present noisy estimates of offer premiums because they incorporate the probability of bid failure and competition at the initial offer date, and they must be estimated over a long event window to capture the final premium. Thus, it is difficult to properly sort out how bidders determine offer premiums unless one employs offer price data directly.

Several papers study offer prices directly. Bradley (1980) provides the first systematic offer price analysis in the context of public tender offers. Walkling (1985) uses offer premiums to predict tender offer success. Eckbo and Langohr (1989) examine the effect of disclosure rules and method of payment (cash versus stock) on tender offer premiums. Betton and Eckbo (2000) examine bid jumps and offer premium determinants in tender offers. Officer (2003, 2004), Bates and Lemmon (2003), and Barger (2005) examine the premium effects of deal protection devices such as termination and share tendering agreements. Betton, Eckbo, and Thorburn (2007) study the premium effects of toehold bidding, while Betton, Eckbo, and Thorburn (2008b) are the first to estimate the effect of target runups on markups in initial and final offer prices. Chatterjee, John, and Yan (2008) study the effect of divergence of opinion on bid prices, while Levi, Li, and Zhang (2008) examine whether CEO and director gender affect takeover premiums.

Table 5 shows the cross-sectional determinants of both the initial and final offer premiums. The offer price data used for this table is taken from Betton, Eckbo, and Thorburn (2008b), and covers a total of 4,889 targets. The premiums are defined as  $\ln(p_{initial}/p_{-42})$  and  $\ln(p_{final}/p_{-42})$ , respectively, where  $p_{initial}$  is the initial offer price,  $p_{final}$  is the final offer price in the contest, and  $p_{-42}$  is the stock price on day -42 adjusted for splits and dividends. The sample is restricted to targets in the period 1980-2002 with a stock price  $\geq$  \$1 and a market capitalization  $\geq$  \$10 million. As shown in the first two rows of the table, the mean (median) value of the initial offer premium is 43% (37%), which increases to 48% (39%) by the time of the final bid.

The explanatory variables, which are grouped into Target characteristics, Bidder characteristics, and Deal characteristics, cover the types of decisions discussed throughout Section 3. We alternately

use a time dummy for offers taking place in the early sample period (1980-1989) and year fixed effects. Notice also that the information in these variables is known at the time the offer premium was set. We include the variable Hostile target response as a determinant of the initial offer premium because we believe this information is basically known at the outset. However, the variable multiple bidders obviously is not and is included as a determinant of the final offer premium only.

Not surprisingly (given the relative paucity of multiple-bid contests in the total sample of 4,889), the explanatory variables have similar coefficients and level of significance for both the initial and final offer premiums. In the order of the discussion of this section, the initial and final offer premiums are

1. significantly *higher* when the bidder is a public company and significantly *lower* if the initial bid is a tender offer (Section 2.3).
2. significantly *greater* when the method of payment is all cash (Section 3.2).
3. significantly *lower* when the bidder has a positive toehold (Section 3.3).
4. significantly *greater* the greater the target runup  $\ln(p_{-1}/p_{-42})$  prior to the initial bid (Section 3.4).<sup>94</sup>
5. *unaffected* by either the presence of a target poison pill or target hostility to the initial bid (Section 3.5).

Table 5 further shows that the initial and final offer premiums are decreasing in target total equity capitalization on day -42, and they are greater if the target's book-to-market ratio exceeds the industry median B/M (i.e., if the target has a few growth options relative to industry rivals). Offer premiums are unaffected by target stock liquidity, by the presence of multiple bidders, and by whether the bidder and target are horizontally related in product markets. Finally, offer premiums have increased from the 1980s.<sup>95</sup>

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<sup>94</sup>The coefficient on the runup variable is 0.80. This means that a dollar increase in the target runup causes the bidder to raise the offer price by 80 cents on average. Betton, Eckbo, and Thorburn (2008b) also shows that offer markups (either  $\ln(p_{initial}/p_{-1})$  or  $\ln(p_{final}/p_{-1})$ ) are significantly decreasing in the runup. Thus, there is partial substitution between runups and markups.

<sup>95</sup>Since most of the hostile bids occurred in the 1980s, this is consistent with the finding that offer premiums in hostile bids are no lower than those for non hostile offers.

Officer (2003) and Bates and Lemmon (2003) show that offer premiums are significantly greater when the SDC indicates the existence of a target termination agreement, while Bargeron (2005) finds lower premiums in the presence of a target board/management tender agreement. Moeller (2005) presents evidence indicating that powerful entrenched target CEOs reduce takeover premiums. Chatterjee, John, and Yan (2008) find that takeover premiums are larger the greater the disagreement between the earnings forecasts of financial analysts following the target. Levi, Li, and Zhang (2008) use RiskMetrics Group data on board structure and find that bid premiums are affected by the gender composition of the board. Specifically, bid premiums are lower when the bidder CEO is female, and the higher the target board's proportion of female directors (provided that the female directors are independent appointees).

Several of the variables used to explain the offer premium are themselves endogenous choice variables (payment method, toehold, hostility, termination agreements, bidder's public status), Some of the reported effects appear robust to endogeneity.<sup>96</sup> One variable that does *not* appear to be robust is "Tender Offer." The inclusion of other variables (such as toeholds and hostility) tends to affect conclusions as to whether offer premiums are higher, the same, or lower in tender offers than in merger bids. Additional specification analysis is needed to fully sort out the endogenous from truly exogenous forces in the data.

## 4 Takeover gains

In this section, we present estimates of abnormal stock returns to bidders and targets around takeover contests, as well as in the post-merger period. Given the large number of papers providing abnormal returns estimates in takeovers, we limit the review to more recent studies with large samples of 1,000 or more bidder firms, such as those listed in Table 6. Studies are included in the table only if announcement-induced abnormal returns to bidders are in fact reported. This excludes large-sample studies such as Schwert (1996) and Bates and Lemmon (2003) where the main focus is on targets or some other deal aspect and where bidder returns may be estimated and used for purposes of cross-sectional regressions—but average announcement returns are not reported. It

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<sup>96</sup>Betton and Eckbo (2000), Officer (2003) and Betton, Eckbo, and Thorburn (2007) use systems of equations and various corrections for self-selection. See Li and Prabhala (2007) for a survey of self-selection models in corporate finance.

also excludes almost all studies before SDC became available as a convenient online data source.<sup>97</sup>

#### 4.1 Econometric caveats

Abnormal stock returns measure only the unanticipated component of the total economic effect of the event. Given the difficulty in predicting target firms, partial anticipation of the bid announcement does not pose much of an econometric problem for studies of target takeover gains. Most researchers agree that one captures most, if not all, of the total target gains by comparing the offer price to the pre-offer target share price within two months of the first bid. As illustrated in this section, the bulk of the target pre-offer runup typically actually occurs within 10 days of the bid.

It is also widely understood that partial anticipation can severely complicate estimation of gains from bidding. Any partial anticipation must somehow be accounted for to avoid underestimating the value implications. In simple environments with only a single possible event, the announcement effect equals the valuation effect times one minus the probability that the merger event will occur. It is thus attenuated toward zero, creating a bias against rejection of the null of zero gains from bidding. Malatesta and Thompson (1985) directly model the information arrival process and conclude that bidder stock returns include a component due to partial anticipation of future acquisition activity. Eckbo, Maksimovic, and Williams (1990) model the probability of the takeover event and conclude that this probability affects estimates of bidder takeover gains. The conclusion from these studies is that partial anticipation of bidding activity is an important empirical issue when the researcher fails to reject the hypothesis of zero abnormal stock returns to bidders.

Another approach to dealing with partial anticipation is through various sampling techniques. For example, Schipper and Thompson (1983) sample firms that announce entire acquisition programs. Since this announcement capitalizes a whole series of future expected acquisitions (rather than responding to a single-acquisition announcement), power to detect true acquisition gains is enhanced. Their evidence is consistent with the hypothesis that future expected acquisitions have positive net present value as a group. Song and Walkling (2000, 2005) select takeover announcements that follow a dormant period—with no previous takeovers in the industry of the bidder for a minimum of 12 months. Presumably, these announcements come as a relative surprise to the

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<sup>97</sup>Two exceptions in Table 6 are Loderer and Martin (1990) and Betton and Eckbo (2000), who use large hand-collected samples.

market, adding power to reject the null of zero bidder abnormal returns. Perhaps as a direct result, the authors report significantly positive bidder announcement returns.

Takeover announcements may also reveal new information about the quality of the bidder’s management team—regardless of the value of the proposed acquisition per se. This further confounds the interpretation of bidder announcement returns as gains from merger activity. One approach is to formally model the signaling problem and test for its existence using cross-sectional regressions with bidder announcement returns as dependent variable (Eckbo, Giammarino, and Heinkel, 1990). Fuller, Netter, and Stegemoller (2002) approach this issue by selecting a sample of frequent acquirers (firms that acquire five or more targets within a three-year period.) This sampling strategy helps control for certain bidder characteristics in the cross section.

Finally, because bidder managers time takeovers based on private information, consistent estimation of parameters in cross-sectional models with bidder returns as the dependent variable requires a correction for self-selection (Eckbo, Maksimovic, and Williams, 1990). While such cross-sectional regressions are commonly presented in the literature, this (or other equivalent) correction is rarely implemented. However, the recent review of Li and Prabhala (2007) is likely to increase general awareness of the importance of providing unbiased estimates in these cross-sectional models.<sup>98</sup>

## 4.2 Runup- and announcement-period returns

We estimate the average daily abnormal stock return for firm  $j$  over event window  $k$  as the event parameter  $AR_{jk}$  in the value-weighted market model

$$r_{jt} = \alpha_j + \beta_j r_{mt} + \sum_{k=1}^K AR_{jk} d_{kt} + \epsilon_{jt}, \quad t = \text{day}\{-293, \dots, \text{end}\} \quad (16)$$

where  $r_{jt}$  is the return (in logarithmic form) to firm  $j$  over day  $t$ ,  $r_{mt}$  is the value-weighted market return, and  $d_{kt}$  is a dummy variable that takes a value of one if day  $t$  is in the  $k$ th event window and zero otherwise.<sup>99</sup> This conditional event parameter estimation yields identical abnormal return

<sup>98</sup>Note that self-selection poses an econometric issue in cross-sectional regressions, with the target abnormal return as dependent variable only to the extent that the target self-selects the timing of the acquisition.

<sup>99</sup>The return analysis is limited to ordinary shares. Missing returns are dealt with as follows: A succession of less than six missing returns are backfilled by allocating the cumulative return equally over the missing days. For example, if there are three missing days and then a return of 10%, each missing day and the subsequent nonmissing

estimates as the more standard residual analysis technique, but is more efficient in terms of using the available return data. Moreover, the regression easily incorporates variable-length event windows across takeovers, and it produces estimates of standard errors of the abnormal returns directly.<sup>100</sup>

Day 0 is the day of the initial control bid, and the ending date is the earlier of the day of the control last bid in the contest plus 126 trading days and the effective date + 126. If the target delisting date is between the date of the last control bid and the effective date, then the contest end is set to the target delisting date. The runup and announcement abnormal returns are estimated using three event windows ( $K = 3$ ). The three event windows are  $[-41, -2]$  (the runup period),  $[-1, 1]$  (the announcement period), and  $[2, end]$ . The estimation uses Ordinary Least Squares (OLS) with White's heteroscedastic-consistent covariance matrix and requires a minimum of 100 days of nonmissing returns during the estimation period.

The cumulative abnormal return (CAR) to firm  $j$  over event period  $k$  is

$$CAR_{jk} = \omega_k AR_{jk} \quad (17)$$

where  $\omega_k$  is the number of trading days in the event window. In a sample of  $N$  firms, the average CAR is

$$ACAR_k = (1/N) \sum_j CAR_{jk} \quad (18)$$

The z-values are determined as

$$z = (1/\sqrt{N}) \sum_j AR_{jk} / \sigma_{AR_{jk}} \quad (19)$$

and  $\sigma_{AR_{jk}}$  is the estimated standard error of  $AR_{jk}$ . Under the null of  $ACAR=0$ ,  $z \sim N(0,1)$  for large  $N$ . The combined bidder and target abnormal returns are determined by weighting the bidder and target abnormal returns by the market capitalization on day -42.

The twin Tables 7 and 8 detail the average abnormal return estimates (CAR) for the runup period (-42, -2), the announcement period (-1, 1), classified by market capitalization (Panel B), the public status of the bidder and target firms (Panel C), merger v. tender offer (Panel D), the payment

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day would be allocated a return on 2.5%.

<sup>100</sup>For reviews of event study econometrics, and the conditional event parameter approach used here, see Thompson (1985, 1995), MacKinlay (1997), and Kothari and Warner (2007).

method (Panel E), and, finally, the time period (Panel F). CAR is shown for the target, the initial bidder, and the value-weighted sum of the bidder and target CARs. For illustrative purposes, Figure 10 plots the daily cumulative abnormal returns from day -40 through day 10 relative to the initial offer announcement, classified by the public status of the bidder and target.<sup>101</sup> The cumulative abnormal returns to targets are somewhat greater when the bidder is public than when the bidder is private. Moreover, bidder returns are somewhat greater when the target is private than when the target is public.

Several overall conclusions emerge from the results in Tables 7 and 8 that are broadly consistent with the conclusions from the extant literature, including those listed in Table 6:

(1) *Target CARs*

- (a) The average target CAR is positive and significant in all samples, over both the runup and the announcement period.
- (b) The runup typically constitutes about one-third of the total runup plus announcement CAR. The largest target CAR occurs in all-cash offers (Panel E), where the sum of the runup and the announcement CAR is 28%.

(2) *Combined CARs (value-weighted)*

- (a) The average combined CAR is positive and significant over the runup period for 9 of the 10 sample categories, and insignificant for the lowest size-quartile bidders (Panel B). The average combined runup-period CAR for the total sample of 4,803 cases is 0.7% with a  $z$ -value of 4.3.
- (b) The average combined CAR is positive and significant for the announcement period for 8 of the 10 samples, insignificant in one (Panel E, for bidders in the lowest size quartile), and significantly negative in one (Panel E, when the payment method is all-stock). The average combined announcement-period CAR for the total sample of 4,803 cases is 1.06% with a  $z$ -value of 14.6.
- (c) For the total sample (Panel A), the sum of the combined CAR for the runup and announcement periods is a significant 1.79%.

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<sup>101</sup>The cumulative abnormal returns shown in the graph are estimated by including a dummy variable for each of the days in the (-42, +10) interval and adding the estimated dummy coefficients.

### (3) Bidder CARs

- (a) Announcement-period CAR is 0.73% for the total sample, but with a negative and significant  $z$ -statistic of -2.53.<sup>102</sup> The median CAR is -0.05%, and the percentage of bidders with negative CAR is 49%.
- (b) The average announcement-period bidder CAR's is significantly positive for the lowest bidder size-quartile (Panel B), when the target is private (Panel C), in all-cash bids (Panel E), and in the period 1991-1995 (Panel F). It is significantly negative for bidders in the highest size-quartile (Panel F), when the target is public (Panel C), when the initial bid is a merger (Panel D), and when the payment method is all-stock (Panel E).
- (c) The runup period bidder CAR is positive but largely insignificant, typically in the range 0.05% to 0.10%. Bidders in the lowest size quartile have a significantly positive average runup of 4.9%, and the average runup is a significant -1.2% for bidders in the highest quartile (Panel B). In these two subsamples, the runup is greater than the announcement return (and of the same sign).

This confirms several of the conclusions of the studies listed in Table 6, in particular Fuller, Netter, and Stegemoller (2002), Moeller, Schlingemann, and Stulz (2004, 2005), Bradley and Sundaram (2006), Savor (2006), Moeller, Schlingemann, and Stulz (2007), Bargeron, Schlingemann, Stulz, and Zutter (2007), and Betton, Eckbo, and Thorburn (2007, 2008b,c). Table 9 further highlights the impact of key offer characteristics on bidder announcement returns. The combination of large bidder (here in the upper-size quartile), payment in all-stock, and the target being a public company represents a worst-case scenario with average bidder announcement-period CAR of -2.21%. The best-case scenario is the combination of a small bidder (lower size-quartile), private target, and, again, *all-stock* as payment. This produces an average bidder announcement-period CAR of 6.46%. Thus, a major driver of negative bidder returns is not, as previously thought, the all-stock payment. Rather, the two key drivers appear to be the target's status as public or private and the bidder size. As shown next, bidder size was particularly large in 1999 and 2000, which suggests that the bidder size effect may also represent a unique time-period effect.

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<sup>102</sup>The average CAR and its  $z$ -statistic may differ in sign.

### 4.3 Dollar returns

Figure 11 presents an annual scatter plot of the three-day announcement period bidder abnormal returns  $CAR(-1, 1)$  (Panel A) and the raw bidder dollar change from closing of day -2 to closing of day 1. As first noticed by Moeller, Schlingemann, and Stulz (2004, 2005), the distributions of the  $CAR(-1, 1)$  and the dollar change are dramatically different. Betton, Eckbo, and Thorburn (2008c) extend the sample period to 2005 and discover that the period 1998-2000 is unusual not only relative to the pre-1998 period, but also relative to the post-2000 years. Figure 12 further illuminates the role and effect of bidder size. Panel A plots bidder market values (in constant 2000 dollars) as of day -2. Clearly, bidders in the 1998-2000 period were unusually large.

Betton, Eckbo, and Thorburn (2008c) examine the distribution of dollar differences in Figure 11B. They identify 125 firms in the lower 1% and 129 firms in the upper 1%. In *both* groups, the dominant sector was manufacturing and the dominant firm was Cisco. Cisco appears with 62 deals in the total sample, with an average (constant dollar) market capitalization of \$180 billion. Other frequent acquirers are Union Planters with 40 deals (market cap \$2.5 billion) and BancOne with 40 deals (market cap \$8.1 billion).<sup>103</sup> Of these 62 deals made by Cisco, 26 appear in the group with the highest 1%  $CAR(-1, 1)$ , with 10 bids in 99 and 6 bids in 2000.<sup>104</sup> Furthermore, Cisco appears 17 times in the lower 1% group (distributed evenly over the three-year period 1999-2001).<sup>105</sup>

Panel D in Figure 12 plots the aggregate dollar  $CAR(-1, 1)$  for each sample year (combining Panel A of Figure 11 and Panel C, Figure 12). The large negative spike in the years 1999 and 2000 is what Moeller, Schlingemann, and Stulz (2005) characterize as a "wealth destruction on a massive scale." It is massive indeed; yet, it is important not to forget that it is caused by a few very large firms that decided to bid in this particular period and that, on average, made value-decreasing acquisitions. Note that Panel D of Figure 12 does not eliminate overlapping abnormal returns to frequent acquirers (which may be one reason why the spike is greater here than in Moeller, Schlingemann, and Stulz (2005)). Also, removing Cisco from the sample changes the minimum of the spike to -\$198 billion from -\$267 billion. The ultimately unanswered question is whether the

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<sup>103</sup>The largest bidders are CitiGroup (market cap \$245 billion and two deals), Microsoft (market cap \$190 billion and seven deals.)

<sup>104</sup>The next most common bidders in the upper 1% group are Johnson & Johnson with six cases and Tyco with five cases.

<sup>105</sup>The next most common bidder in the lower 1% group is Lucent with six bids.

spike is a bidder size effect or a year fixed effect (or a combination of the two). At this point, there appears to be no explanation for why the large firms decided to enter the market for corporate control in 1998-2001, and then only to leave again.

Finally, Figure 13 shows the frequency distribution for the dollar announcement abnormal return for the total sample of successful initial bidders, classified by the time period and the method of payment (all-stock or all-cash). Panel A covers the total sample, while Panel B is restricted to the 1995-2005 period. There is very little difference between the two panels (in both panels, all-stock offers are slightly skewed relative to all-cash bids). Thus, the distribution in Panel B is not noticeably affected by the extreme cases from the 1998-2000 period. Until we reach a better understanding of the unique 1998-2000 period, estimate of the expected gains from bidding are best obtained from overall distributions such as those in Figure 13.

#### 4.4 Estimating expected bidder gains

Referring back to Figure 2, let  $CAR_s$  and  $CAR_f$  denote average bidder gains conditional on the offer succeeding or failing, respectively. Moreover, let  $\pi(x_j)$  denote the market's estimate of the probability that an offer by bidder  $j$  will succeed conditional on the offer characteristics  $x_j$ . As discussed in Section 3, important offer characteristics include the offer premium, toehold, payment method, and hostility. The bid announcement causes rational investors to impound the *expected* bidder takeover gain into the bidder's share price, generating the following announcement return:

$$CAR(-1, 1) = CAR_s\pi(x) + CAR_f(1 - \pi(x)) \quad (20)$$

The empirical objective is to estimate the bidder gain  $CAR_s$  from successful takeovers. The common procedure is to form the average cumulative return in the subsample of ex-post successful bids. This average is either the average  $CAR(-1, 1)$  for successful bids or the average abnormal bidder return cumulated all the way through the end of the contest (at which point  $\pi = 1$ ). Note that, since these ex-post averages necessarily restrict the sample to successful bids, they ignore information in the abnormal returns to ultimately unsuccessful bids. Also, cumulation to the end of the contest (typically six months for mergers) adds noise relative to that of the three-day estimate  $CAR(-1, 1)$ .

Betton and Eckbo (2000) develop an alternative estimation procedure that exploits the information in *all* initial bids (also the ultimately unsuccessful ones), in order to extract an estimate of  $CAR_s$ . The idea is to view Equation (20) as a cross-sectional regression where  $CAR_j(-1, 1)$  is the dependent variable,  $\pi(x_j)$  is the regressor, and  $CAR_s$  and  $CAR_f$  are estimated directly as regression parameters. Using a sample of 1,353 initial tender offers (both successful and unsuccessful), Betton and Eckbo (2000) find that the parameter  $CAR_s$  for bidders is statistically insignificantly different from zero. Thus, the expected net bidder return from initiating tender offers is nonnegative. Moreover, they estimate  $CAR_f$  to be significantly positive, which they suggest in part reflects the expected gain to the unsuccessful bidder from selling its toehold in the target to the ultimately winning (rival) bidder.<sup>106</sup>

This alternative estimation procedure also allows one to test the effect on bidder expected returns of changing one or more of the offer parameters in the vector  $x$ . That is, when estimated, the right-hand-side of Equation (20) forms the predicted (conditional) value  $E[CAR(-1, 1) | x]$ . As modeled in Equation (20), changes in  $x$  affect bidder expected gains by changing  $\pi(x)$ . Tests of the bidder valuation impact of changing the offer parameters  $x$  amount to testing whether the partial derivative of  $E[CAR(-1, 1) | x]$  with respect to  $x$  is significantly different from zero. For example, both Betton and Eckbo (2000) and Betton, Eckbo, and Thorburn (2007) report that this partial derivative with respect to the bidder's toehold is positive and significant.

#### 4.5 Post-takeover (long run) abnormal returns

Several studies report evidence of post-merger underperformance, particularly when using the matched-firm buy-and-hold technique (implemented below). For example, Rau and Vermaelen (1998) find that merged firms with low book-to-market ratio tend to underperform, while Loughran and Vijh (1997) report underperformance when the merger is paid in stock (while all-cash mergers overperform). Moeller, Schlingemann, and Stulz (2004) report insignificant long-run (36-month) post-merger performance. Harford (2005) finds some evidence suggestive of relatively poor post-merger performance for the largest bidders. Moeller, Schlingemann, and Stulz (2005) find significantly negative long-run buy-and-hold returns to portfolios of "large loss deal" bidders. Rosen

<sup>106</sup>In Betton and Eckbo (2000), 48% of all initial bidders have a positive toehold. Their sample period is 1971-1990, with the largest toehold frequency prior to the mid-1980s (consistent with Figure 8).

(2006) reports evidence that mergers that take place during periods of high general merger activity tend to have high pre-merger share prices followed by low post-merger performance.

There are at least three possible explanations for the post-merger underperformance. First, under behavioral arguments, the market slowly corrects its overvaluation of the merged firms' shares (Shleifer and Vishny, 2003; Baker, Ruback, and Wurgler, 2007). Second, a neoclassical argument is that the merger is a response to a negative industry shock and that the merged firm performs better than it would have without the merger—which may still be worse than the pre-merger performance (Harford, 2005). Third, the apparent underperformance is an artifact of the econometric methodology itself. The rest of this section sheds light on the third hypothesis.

We begin the long-run abnormal return analysis with the matched firm technique, and then we show results when returns are risk-adjusted using factor regressions applied to portfolios of merged firms.<sup>107</sup> Our sample drops to 15,298 mergers after imposing the following additional restrictions: (1) The sample period is 1980–2003 to allow a minimum of three years of post-merger stock returns. (2) The merged firm is found on CRSP and is listed on NYSE/AMEX/Nasdaq for at least one year following the year of the effective date of the merger. (3) The merged firm must have Compustat information on equity book-to-market ratio (B/M) to allow selection of a matched firm based on size and B/M.<sup>108</sup>

#### 4.5.1 Buy-and-hold returns

The typical buy-and-hold experiment involves buying the merged firm's stock in the month following the merger completion month (effective merger date) and holding the stock for a period of three to five years or until delisting, whichever comes first. In a sample of  $N$  issues, the average return over a holding period of  $T$  months is computed as the average cumulative ( $T$ -period) return, also

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<sup>107</sup>We thank Øyvind Norli for his generous programming assistance. The econometric methodology implemented below is identical to the one used by Eckbo, Masulis, and Norli (2007) when estimating the long-run performance following security offerings.

<sup>108</sup>Book value is defined as “the Compustat book value of stockholders equity, plus balance sheet deferred taxes and investment tax credits (if available), minus the book value of preferred stock. Depending on availability, we use the redemption, liquidation, or par value (in that order) to estimate the value of preferred stock” (Fama and French, 1993, p. 8). If available on Compustat, the book value of equity is also measured at the end of the year prior to the year of the acquisition. If this book value is not available, we use the first available book value on Compustat starting with the acquisition year and ending with the year following the acquisition year.

referred to as  $\overline{\text{BHR}}$  (for buy-and-hold return):

$$\overline{\text{BHR}} \equiv \omega_i \sum_{i=1}^N \left[ \prod_{t=\tau_i}^{T_i} (1 + R_{it}) - 1 \right] \quad (21)$$

where  $R_{it}$  denotes the return to stock  $i$  over month  $t$  and  $\omega_i$  is stock  $i$ 's weight in forming the average holding-period return ( $\omega_i = 1/N$  when equal-weighting). The effective holding period for stock  $i$  is  $T_i$ , where  $T_i$  in the analysis below is either five years or the time until delisting or the occurrence of a new merger, whichever comes first).<sup>109, 110</sup> The matched-firm technique equates the *expected* return to merged firms with the *realized* return to a nonmerging firm, usually matched on firm characteristics such as industry, size, and book-to-market ratio. The abnormal or unexpected return  $\text{BHAR}$  is then

$$\text{BHAR}_{\text{Issuer}} \equiv \text{BHR}_{\text{Issuer}} - \text{BHR}_{\text{Matched firm}} \quad (22)$$

Table 10 shows average five-year percent buy-and-hold returns for our sample and for firms matched on size and B/M. The matched firms are selected from all CRSP-listed companies at the end of the year prior to the year of the merger completion and companies that are not in our sample of mergers for a period of five years prior to the offer date. Moreover, the matching procedure is as follows: We first select the subset of firms that have equity market values within 30% of the equity market value of the merged firm. This subset is then ranked according to book-to-market ratios. The size and book-to-market matched firm is the firm with the book-to-market ratio, measured at

<sup>109</sup>Kothari and Warner (1997), Barber and Lyon (1997) and Lyon, Barber, and Tsai (1999) provide simulation-based analysis of the statistical properties of test statistics based on long-run return metrics such as  $\text{BHR}$ . Kothari and Warner (2007) survey the main statistical conclusions from this analysis.

<sup>110</sup>An alternative to  $\overline{\text{BHR}}$  is to estimate the average monthly return to a strategy of investing in the stocks of merged firms and hold these for up to  $T$  periods. The  $T$ -period return would then be formed as the *cumulative average* (portfolio) return, or

$$\overline{\text{CMR}} \equiv \prod_{t=\tau}^T \left[ 1 + \frac{1}{\omega_t} \sum_{i=1}^{N_t} R_{it} \right] - 1$$

As noted by Kothari and Warner (2007), depending on the return generating process, the statistical properties of  $\overline{\text{BHR}}$  and  $\overline{\text{CMR}}$  can be very different. Notice also that while  $\overline{\text{CMR}}$  represents the return on a feasible investment strategy,  $\overline{\text{BHR}}$  does not. You obtain  $\overline{\text{CMR}}$  by investing one dollar in the first security issue at the beginning of the sample period, and then successively rebalancing this initial investment to include subsequent issues as they appear (and  $N$  increases), all with a  $T$ -period holding period. In contrast,  $\overline{\text{BHR}}$  is formed in event time—and thus presumes prior knowledge of the magnitude of  $N$ . Thus, estimates of  $\overline{\text{CMR}}$  are better suited than estimates of  $\overline{\text{BHR}}$  to address the question of whether investors have an incentive to take advantage of a potential market mispricing of merged firms' securities. Most of the empirical studies using the matched firm technique report results based on  $\overline{\text{BHR}}$ , which we follow here. In the subsequent section, we discuss portfolio benchmark returns based on asset pricing models, which use the return concept  $\overline{\text{CMR}}$  on a monthly basis, that is, without the  $T$ -period cumulation.

the end of the year prior to the merger year, that is closest to the merged firm’s ratio. Matched firms are included for the full five-year holding period or until they are delisted, whichever occurs sooner. If a match delists, a new match is drawn from the *original* list of candidates described earlier.

Table 10 shows that, when using either the total sample period 1980–2003 or the subperiod 1990–2003, merged firms on average underperform their matched firms whether  $\overline{\text{BHR}}$  is formed using equal weights or value weights. For the total sample period, the difference between the equal-weighted  $\overline{\text{BHR}}$  for merged and matched firms is -21.9%, and -17.1% with value-weighting, both with  $p$ -values of 0.00. About 20% of the sample mergers take place in the 1980s, and here the underperformance is evident only for equal-weighted  $\overline{\text{BHR}}$ . For the subperiod 1990–2003 the underperformance estimates are again highly significant and slightly greater than for the total period—25.4% using the equal-weighted estimate of  $\overline{\text{BHR}}$ .

#### 4.5.2 Portfolio performance estimation

An alternative to the buy-and-hold matched firm technique is to form portfolios of event firms rolling forward in calendar time and to estimate portfolio performance. Monthly portfolio (excess) returns are regressed on a set of risk factors presumed to generate expected returns. The regression intercept—or alpha—is the measure of average monthly abnormal return. We estimate alphas in a model with the following five risk factors:

$$r_{pt} = \alpha_p + \beta_1 RM + \beta_2 \text{SMB}_t + \beta_3 \text{HML}_t + \beta_4 \text{UMD} + \beta_5 \text{LMH} + e_t \quad (23)$$

where  $r_{pt}$  is the excess return to an equal-weighted portfolio of issuers, RM is the excess return on the CRSP value-weighted market index. SMB and HML are the Fama and French (1993) size and book-to-market factors. UMD is a momentum factor inspired by Carhart (1997) and constructed as the returns difference between the one-third highest and the one-third lowest CRSP performers over the past 12 months. LMH is the Eckbo and Norli (2005) turnover factor, defined as a portfolio long in low-turnover stocks and short in high-turnover stocks.

We report estimates for three different portfolios: (1) the merging firms, (2) the nonmerging matched firms, and (3) the zero-investment portfolio that is long in merged firms and short in

matched firms. The zero-investment portfolio has the advantage that it controls for any omitted risk factor with identical factor betas across issuer and matched firm, effectively combining the matched-firm and asset pricing techniques. For example, suppose the true set of risk factors is given by the vector  $F$  and that only a subset  $F_1$  of this vector is included in the regression model, with the complement vector  $F_2$  omitted. Let B denote merged firm and M matched firm. The merger-match zero-investment portfolio regression is then

$$r_B - r_M = (\alpha_B - \alpha_M) + (\beta_{1B} - \beta_{1M})F_1 + \epsilon \quad (24)$$

where  $\epsilon = (\beta_{2B} - \beta_{2M})F_2 + u$ , where  $u$  is a white noise error term. The definition of a "good" match is that  $\beta_B$  is close to  $\beta_M$ . Given a good match, the zero-investment portfolio will have both a small alpha and values of beta close to zero. Alternatively, if the matching technique fails to control for important risk factors, then the zero-investment portfolio will contain significant factor loadings.

Table 11 reports the alphas and factor loadings (betas) for our three portfolios and the five-factor model. Portfolio formation starts in 1980 and ends in 2003. The table shows estimates for both equal weighting and value weighting of the firms in the portfolios. Given the large portfolios, the  $R^2$  are high, approximately 0.94. Notice also that the zero-investment portfolios receive  $R^s$  of close to 0.20, with several significant factor loadings, indicating that the usual size and B/M matching procedure typically yields firms that have different expected returns than the event firms. This in turn means that the "abnormal" return reported earlier in Table 11 in part reflects differences in *expected* returns for merged and matched firms.

The key result in Table 11 is that the alphas for the portfolio of merged firms are small and statistically insignificant for both equal- and value-weighted portfolios. Thus, we cannot reject the hypothesis of zero abnormal post-merger performance. Four of the five factor-mimicking portfolios have significant factor loadings, with the turnover-based factor producing a factor loading that is significant at the 10% level for equal-weighted portfolio returns.

Table 11 also shows that the empirical factor model misprices the equal-weighted portfolio of matched firms. The alpha of this portfolio is 0.23 with a p-value of 0.003. As a result, the portfolio of merged firms underperforms the matched portfolio (the alpha for the zero-investment portfolio is -0.15 with a p-value of 0.05). When equal-weighting returns, the factor model's mispricing of

the matched-firm portfolio is less significant, and now the alpha of the zero-investment portfolio is insignificantly different from zero.

In sum, when using the rolling portfolio technique, there is no evidence of abnormal stock returns following mergers. Moreover, our evidence that matched firms have significantly different factor loadings than merged firms undermines the notion that the underperformance reported in Table 10 represents truly negative abnormal stock returns.

## 5 Bondholders, executives, and arbitrageurs

### 5.1 Takeovers and bondholder wealth

Corporate mergers affect the wealth of the target and the acquiring firms' senior claimholders for the same reasons that they affect stockholders. Merger-induced synergies add security to outstanding bonds and therefore increase bond values, while value-reducing mergers reduce bond value. In addition, bondholders benefit from any co-insurance effect from combining the less than perfectly correlated cash flows of the bidder and target firms.<sup>111</sup> The coinsurance effect means that a merger that generates no synergies, and where the bidder firm neither overpays for the target nor manages to sell overpriced bidder stock to the target, nevertheless causes a wealth transfer from stockholders to bondholders (Galai and Masulis, 1976). The magnitude of this wealth transfer depends on the sensitivity of the bond payments to changes in firm value (bond risk), with greater potential valuation impact on ex-ante riskier bonds.<sup>112</sup> The coinsurance effect also reduces the risk of firm-specific human capital. This argument has led to a concern that entrenched managers seek empire building through conglomerate merger activity primarily in order to hedge the risk of their firm-specific human capital.

A difficulty facing bond studies is the lack of access to high-frequency data on bond values, particularly prior to the 1980s. One of the primary data sources is the Lehman Brothers Fixed Income Database. Most bonds do not have published transaction prices, and many of the reported prices are matrix prices. Matrix prices are reported when the bond does not trade or a dealer quote

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<sup>111</sup>Levy and Sarnat (1970), Lewellen (1971), Higgins and Schall (1975).

<sup>112</sup>There is also a maturity effect: When the bonds of the bidder and target firms have different maturities, the shorter maturity bonds effectively gain seniority after the merger. This seniority effect is valuable because of the larger merged firm's asset base.

is unavailable. The matrix consists of prices of similar bonds that did trade, based on characteristics such as bond rating and maturity. Obviously, the effect of a merger does not show up in matrix prices (for other bonds), reducing power to reject the null of no price impact of the merger.

Kim and McConnell (1977) examine 2,286 mergers but find price data for 44 bonds of 39 firms only. In their sample of 2,870 mergers, Asquith and Kim (1982) find prices for 62 bonds, while the sample in Eger (1983) includes 33 acquirer bonds and 6 target bonds. The Dennis and McConnell (1986) bond sample contains 67 bonds of 39 acquirers and 27 bonds for 21 targets. Maquieira, Megginson, and Nail (1998) identify a large sample of 504 acquirer bonds and 124 target bonds of firms involved in 260 stock-for-stock mergers (the bulk of which took place prior to 1980). More recently, Billett, King, and Mauer (2004) examine 940 mergers and acquisitions from the period 1979-1997, identifying 818 bonds of 265 target firms and 3,083 bonds of 831 acquiring firms. Moreover, Penas and Unal (2004) use a sample of 282 bonds in 66 mergers between commercial banks during the period 1991-1997.<sup>113</sup>

The early studies found mixed evidence for the wealth effects of mergers on bidder bonds: excess bond returns (typically computed as the difference between monthly total return and the return on a bond index matched on rating and remaining maturity) are significantly positive in Eger (1983) and Maquieira, Megginson, and Nail (1998); insignificant in Kim and McConnell (1977) and Asquith and Kim (1982); and negative (marginally significant) in Dennis and McConnell (1986). Billett, King, and Mauer (2004) find zero or negative bidder bond excess returns, while Penas and Unal (2004) document significantly positive bidder bond returns for their sample of commercial bank mergers.

Early studies of target bond returns report insignificant excess returns to target bonds. This finding is surprising, as one would expect target bondholders to benefit from the typically large asset-base increase that comes with a merger with a bidder that is often several times larger than the target. However, with improved data, both Billett, King, and Mauer (2004) and Penas and Unal (2004) report significantly positive excess returns to target bonds. This finding may also reflect the increased use of event risk covenants in bonds issued in the 1990s.<sup>114</sup> Penas and Unal

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<sup>113</sup>Warga and Welch (1993) also use this Lehman Brothers Fixed Income Database to study the bond wealth effects of leveraged buyouts, while Eberhart and Siddique (2002) use these bond data in their study of long-run bond returns following securities offerings. See Eckbo and Thorburn (2008b) and Eckbo, Masulis, and Norli (2007) for reviews.

<sup>114</sup>A typical event risk covenant for mergers requires the company to repurchase the outstanding bonds at the full principal amount plus accrued interest, effectively insuring the bond against potentially value-decreasing control

(2004) conclude that the bond market views bank mergers as default-risk reducing events. Billett, King, and Mauer (2004) conclude that there is no evidence of wealth transfers in the data, or that positive synergies expected from the corporate combinations tend to overshadow any wealth transfer that do exist.

## 5.2 Takeovers and executive compensation

Does the structure of CEO compensation packages affect the quality of takeover decisions? Or, as Lehn and Zhao (2006) put it: "Are Bad Bidders Fired?" The literature on optimal compensation presumes that a strong pay-performance sensitivity helps promote better acquisition decisions.<sup>115</sup> There is evidence that target firms tend to underperform prior to becoming targets.<sup>116</sup> Moreover, Mitchell and Lehn (1990), Martin and McConnell (1991), Agrawal and Walkling (1994), and Kini, Kracaw, and Mian (1995, 2004) document that targets of hostile bids tend to show a prior history of value-decreasing acquisitions and that CEO turnover increases after hostile bids. Offenber (2008) find evidence that CEOs of larger firms are more likely to be replaced following a series of poor acquisitions than CEOs of smaller firms. This is consistent with a disciplinary role played by the market for corporate control.

With the spread of the poison pill defense and the subsequent decline of hostile takeovers after the 1980s, the market for corporate control may have become a court of last resort—with internal governance structures being the primary mechanism for disciplining poor managers.<sup>117</sup> Huson, Parrino, and Starks (2001) find that changes in the intensity of the takeover market over the period 1976–1994 are *not* associated with changes in the sensitivity of CEO turnover to firm performance. Their evidence suggests that changes in external and internal governance mechanisms have not significantly changed the likelihood that the CEO of a poorly performing firm will be replaced. They also suggest that the effectiveness of internal monitoring mechanisms is not dependent on the intensity of the takeover market. With data from 1979 through 1998, Kini, Kracaw, and Mian (2004) conclude that the corporate takeover market intercedes when internal control mechanisms

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events (Lehn and Poulsen, 1992; Nash, Netter, and Poulsen, 2003).

<sup>115</sup>See, Murphy (1999) and Aggarwal (2008) for comprehensive reviews of the literature on executive compensation and pay-performance sensitivity.

<sup>116</sup>Asquith (1983), Malatesta (1983). There is also evidence of poor operating performance prior to divisional sales. See Eckbo and Thorburn (2008b) for a review.

<sup>117</sup>Mikkelson and Partch (1997), Holmstrom and Kaplan (2001).

are relatively weak or ineffective.

Lehn and Zhao (2006) show that managers who undertake value-reducing acquisitions in the period 1990-1998 face a significantly higher probability of being replaced than managers who make value-enhancing acquisitions, either by internal governance, takeovers, or bankruptcy. They also show that CEOs who cancel an acquisition after observing a reduction in their company's stock price face significantly lower replacement risk than their counterparts who proceed with value-reducing acquisitions. Among firms not subjected to takeover or bankruptcy, they find no association between a firm's governance characteristics and the probability that the CEOs who make value-reducing acquisitions are replaced.

Lehn and Zhao (2006) conclude that "corporate governance and the external market for corporate control generally work well in disciplining managers who pursue acquisitions to the detriment of their stockholders." Moreover, they interpret their evidence of a lack of association between the CEO replacement probability and specific governance characteristics following bad takeovers as an indication that governance structures are on average optimally chosen. While this is one possible interpretation, an alternative view (which they recognize) is that governance structure is irrelevant as to the firing decision for the sample firms. Given the endogeneity of the governance structure (where the CEO herself plays a role), additional research is necessary to discriminate between these two positions.<sup>118</sup>

Lehn and Zhao (2006) also present evidence of relevance for the "market-driven acquisition" hypothesis of Shleifer and Vishny (2003). This hypothesis implies that acquisitions that are followed by poor long-run bidder stock returns may nevertheless be in the interest of bidder stockholders, provided the alternative of no merger would have been even worse. For example, it is tempting (with hindsight) to characterize AOL/Time Warner merger as a successful attempt by AOL's CEO Stephen Case to use overvalued stock as currency to acquire Time Warner's "hard" assets:

From our perspective, the central feature of this acquisition is not technological synergies, but rather the attempt by the management of the overvalued AOL to buy the hard assets of Time Warner to avoid even worse returns in the long run. In this acquisition, as in other deals involving high-technology acquirers with overvalued stock prices, long-run acquirer returns appear to be poor. However, according to our model, these

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<sup>118</sup>Himmelberg, Hubbard, and Palia (1999), Bhagat and Jefferis (2002), Hermalin and Weisbach (2003).

returns are not as negative as they would have been had the acquisitions not taken place. When future writers condemn the merger spree of the late 1990s as manifesting misguided policies on the part of acquirers, they should focus on the alternative of not making these acquisitions. (Shleifer and Vishny, 2003, p. 295)

The market-driven acquisition hypothesis implies that the bidder prefers cash as payment method when bidder stock is sufficiently undervalued. Cash acquisitions must generate value through synergies (as opposed to selling overvalued stock) for the bidder management to act in their shareholders' interest. Thus, while poor bidder performance following all-stock mergers is consistent with bidder value-maximizing behavior, poor performance following all-cash mergers is not.

Lehn and Zhao (2006) find a significant inverse relation between long-run returns after acquisitions and the probability that CEOs are replaced. More importantly, CEOs of acquiring firms with negative bidder returns are equally likely to be replaced, regardless of whether they used stock or cash as the method of payment in the acquisition. This finding challenges the prediction of Shleifer and Vishny (2003) and instead suggests that stock acquisitions (as well as cash acquisitions) associated with negative long-run bidder returns are destructive of value.

Several recent papers provide evidence on CEO compensation changes (other than turnover) following acquisition activity. Bliss and Rosen (2001) study bank mergers over the period 1985-1995, a period characterized by overcapacity and frequent mergers. Mergers are found to have a net positive effect on bidder firm CEO compensation, mainly via the effect of size on compensation. Compensation increases even if the merger causes the acquiring bank's stock price to decline (which is typical upon merger announcement). However, CEOs with more stock-based compensation are less likely to make an acquisition, suggesting that bank managers are motivated by their compensation contracts.

Datta, Iskandar-Datt, and Raman (2001) study 1,719 acquisitions over the period 1993-1998 and separate the acquirers into whether the equity-based compensation of their respective CEOs is above (high) or below (low) the median. While the market reaction to the merger announcements is insignificantly different from zero on average, it is significantly positive for bidder CEOs with high equity-based compensation and significantly negative when the equity-based compensation is low. Moreover, the compensation structure impacts the target selection: high equity-based managers

tend to seek out targets with relatively high market-to-book ratio (growth targets), whereas CEOs in the low-incentive compensation group tend to acquire targets with low growth prospects. Thus, it appears that managers with high equity-based compensation are willing to take on riskier and more valuable acquisition projects than managers with low equity-based compensation.

Grinstein and Hribar (2004) examine M&A bonuses (typically all-cash) paid to CEOs of bidder firm after 327 large merger deals over the period 1993–1999. Bonuses are larger for larger deals. Other than size, the CEO power is the single most powerful variable explaining the cross-sectional variation in M&A bonuses. Much as in Bebchuk and Fried (2003), CEO power is measured as the CEO's ability to influence directors (and thereby the compensation decision). A CEO gains influence as a chairman of the board, as a member of the nominating committee, as the proportion of insiders on the board increases, and as board size increases. The size and power variables explain much more of the variation in bonuses than variables capturing CEO skill, effort, and performance. Moreover, the deal announcement-induced abnormal stock return is significantly lower (more negative) in the sample of CEOs with high power than those with low power. Moeller (2005) also concludes that targets with powerful CEOs receive lower takeover premiums. However, Bauguess, Moeller, Schlingemenn, and Zutter (2007) present evidence that inside (managerial) ownership has a positive relation with target returns, whereas active-outside (nonmanaging director) ownership has a negative relation with target returns. They suggest that the latter effect reflects outsiders' willingness to share gains with the bidder.

Harford and Li (2007) also study how CEO pay and pay-performance sensitivity are affected by acquisitions. With a sample of 1,508 mergers completed over the period 1993–2000, they show that bidding firm CEOs receive substantial rewards in the form of new stock and options grants following acquisitions. While a poorly performing acquisition reduces the value of the CEO's portfolio of stocks and options obtained prior to the acquisition, the new post-acquisition grants more than compensate for this personal value reduction. As a result, "CEO's pay and wealth are completely insensitive to poor post-acquisition performance, but CEO's wealth remains sensitive to good post-acquisition performance" (p. 919). Interestingly, they show that bidding firms with stronger boards retain the sensitivity of their CEO's compensation to poor post-acquisition performance.

Harford and Li (2007) also document that compensation changes around major capital expenditures are much smaller and more sensitive to performance than those following acquisitions. That

is, similar to conclusions made by Andrade and Stafford (2004), external and internal expansion decisions are treated fundamentally differently by the board. This difference may be rooted in the greater degree of uncertainty and information asymmetry surrounding acquisitions, which may allow the CEO to demand (and receive) some degree of protection for the downside risk to her personal wealth.

Walkling and Long (1984), Cotter and Zenner (1994), Wulf (2004) and Hartzell, Ofek, and Yermack (2004) all present evidence on acquisition-induced compensation of *target* firm CEOs. Hartzell, Ofek, and Yermack (2004) analyze a sample of 311 negotiated mergers between 1995 and 1997. A key question is what package of capital gains, cash, and subsequent employment do target CEOs accept in exchange for relinquishing control? Another important issue is whether target CEOs sacrifice premiums paid to their own outside shareholders in return for a favorable golden handshake.<sup>119</sup> Consistent with earlier studies, they conclude that "acquirers overtly pay certain CEOs to surrender managerial control over the firm's assets, or equivalently, that some CEOs "purchase" executive jobs in the buyer by foregoing cash payments that they might otherwise have obtained" (p. 39). Also, they present some evidence of an inverse association between selling shareholder premia and unusual bonuses received by the target CEO as a reward to "step aside." However, since their study uses a sample of completed mergers only, it does not provide information on the sort of packages that other target CEOs turn down in attempted mergers that were not completed. Thus, as the authors recognize, the study does not conclusively indicate that the large CEO packages come at the expense of target shareholders.

Finally, there is some evidence that board structure and director compensation affect the outcome of takeovers. Byrd and Hickman (1992) and Cotter, Shivdasani, and Zenner (1997) find that boards dominated by outsider directors increase value for their shareholders during an acquisition attempt. Harford (2003) documents the effect of a takeover bid on target directors, both financially and in terms of its effect on the number of future board seats held by those directors. He finds that directors are rarely retained following a completed offer and that target directors as a group hold fewer directorships after a takeover, suggesting that the target board seat is difficult to replace. Moreover, he shows that for outside directors, the direct financial impact of a completed merger is largely negative. In sum, failing as a monitor imposes a personal cost on outside directors.

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<sup>119</sup>Yermack (2006) presents evidence on severance packages more generally, in a sample of *Fortune 500* companies.

## 5.3 Merger arbitrage

### 5.3.1 Arbitrage positions

After the announcement of a takeover bid, the target stock price adjusts upward but typically still trades at a discount from the offer price. The difference between the offer price and the post-announcement market price is called the arbitrage spread. Merger arbitrage (or risk arbitrage) is a specialized investment strategy that tries to profit from this spread. Specifically, it is a bet on the likelihood that the proposed transaction closes. If the bid (or a rival bid) is successful and the target is acquired, the arbitrageur captures the price differential. If the takeover fails and the target remains independent, however, the target stock tends to fall back to pre-bid levels and the arbitrage position has to be closed at a loss. Since the position carries the transaction risk, it is not an arbitrage in the true (riskless) sense of the word. It is, however, designed to be neutral to subsequent market movements and to price fluctuations between the bidder and the target if the deal succeeds.

For a cash bid, a merger arbitrage position simply involves a long position in the target stock. When the acquisition is consummated, the target stock is exchanged for cash. With a positive arbitrage spread, the cash received at closing will exceed the initial investment in the target stock, hence generating a profit. In contrast, if the takeover fails and the target stock price falls, the speculative position has to be sold at a loss equal to the price decline in the target stock.

The arbitrage position in a stock-for-stock transaction is more complex, since target shareholders are offered acquirer stock as payment. Here, the arbitrage position consists of a long target stock and a short acquirer stock in the same proportion as the exchange ratio. For example, with an offer of two acquirer shares for each target share, the arbitrage position is long one target share and short two acquirer shares. If the bid is subsequently revised, the arbitrage position must be adjusted to reflect the new exchange ratio. When the transaction closes, the arbitrageur receives in return for the target share the promised number of acquirer shares, which are used to cover the short position. The profit from a successful arbitrage position in a stock deal is the difference between the price of the short acquirer stock and the price of the target at the point in time when the position is established. If the bid fails, the arbitrageur will likely incur a loss from selling its target share holdings. The effect of closing out the short position in the acquirer is more uncertain:

if the bidder stock falls, there may be an offsetting gain; and if the bidder stock appreciates, there may be additional losses.

Jindra and Walkling (2004) examine arbitrage spreads for 362 cash tender offers of publicly traded U.S. targets between 1981 and 1995. They document large cross-sectional variations in the initial arbitrage spread, with one-quarter of the targets exhibiting a negative spread (i.e., a trading price exceeding the offer price) and an average spread of 2% (median 2%). Arbitrage spreads are greater for lengthier contests and smaller for hostile targets, and they suggest that spreads reflect market anticipation of the duration and price resolution of the offer.

### **5.3.2 Arbitrage gains**

The magnitude of arbitrage returns depends on several factors, including the size of the arbitrage spread, the probability that the deal closes, the length of time that the arbitrageur must hold the position, and the target stock price development, if the deal fails. Several empirical studies document that merger arbitrage strategies tend to generate substantial excess returns. The largest abnormal returns have been documented for cash tender offers. For a sample of 295 cash tender offers from 1962 to 1980, Bhagat and Loewenstein (1987) document an average target excess return of 2% from two days after the tender offer announcement to the day prior to the expiration of the offer (on average 29 days). Dukes and Ma (1992) analyze 761 cash tender offers identified from 14D-1 filings in 1971-1985. They find average daily raw returns of 0.5%, or holding-period returns of 25%, for the average arbitrage-position holding period of 52 days. Jindra and Walkling (2004) report an abnormal monthly return of 2% for investments in the target stock from the day after the initial bid until bid resolution. Although continuous reinvestment at similar returns is unlikely, these studies indicate annualized excess returns ranging from 25% to over 100%.

Studies involving a mix of cash and stock, as well as tender and merger offers, also document positive, though smaller returns to merger arbitrage. Larcker and Lys (1987) examine a sample of 111 13-D filings in 1977-1983 that state arbitrage or participation in a takeover proposal as the purpose of the investment and are associated with an acquisition offer. They show that an arbitrage position held from the announcement date to the resolution of the offer (median of 31 days) generates a cumulative excess return of on average 5% (median 3%). Karolyi and Shannon (1999) study 37 takeover bids for Canadian publicly traded targets in 1997. They find an average

abnormal return to a merger arbitrage strategy of 5% over a 57-day average investment period. Baker and Savasoglu (2002) report monthly abnormal returns of almost 1% from a merger arbitrage strategy for a portfolio of 1,901 U.S. takeover offers between 1981 and 1996.

The studies reviewed above collectively suggest that merger arbitrage strategies systematically generate excess risk-adjusted returns. The literature proposes various explanations for the existence of these returns. One is that risk arbitrageurs may be compensated for carrying the risk of deal failure. Jensen (1986) points to three important roles played by merger arbitrageurs for which they should be compensated: (1) they help value alternative offers; (2) they provide risk-bearing services for investors who do not want the uncertainty associated with the outcome of the takeover offer; and (3) they help resolve the free-rider problems of small, diffuse shareholders who cannot organize to negotiate directly with competing bidders for the target. Moreover, transactions costs and other practical constraints may limit the possibilities of successfully implementing an arbitrage strategy.

Larcker and Lys (1987) argue that the excess returns constitute compensation to arbitrageurs for assembling costly information related to the outcome of the bid. They show that the ex post fraction of successful bids is significantly higher than the success probability implied by the arbitrage spread, suggesting that arbitrageurs have gathered private information about the deal outcome. In contrast, Cornelli and Li (2002) argue that the private information may be endogenous to the creation of the arbitrage position itself. The probability of offer success is positively related to the increased participation of arbitrageurs, since they are more likely to tender their target shares. The arbitrageur's investment in the target will therefore create an informational advantage, which can explain the profits earned by arbitrageurs. The model in Cornelli and Li (2002) predicts that the more liquid the stock, the easier it is to hide trades and the larger the arbitrage profits.<sup>120</sup>

Hsieh and Walking (2005) examine the importance of merger arbitrageurs for the market for corporate control using a sample of 680 all-cash and all-stock takeover offers during the period 1992-1999. They find that arbitrage holdings increase in offers that are likely to be successful and suggest that this is evidence of the participation of passive arbitrageurs, whose accumulation of target stock does not affect the outcome of the deal. Hsieh and Walking further find that these changes in arbitrage holdings are positively correlated to the probability of bid success, bid premia,

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<sup>120</sup>Gomes (2001) makes a similar argument where the entry of merger arbitrageurs creates large blocks of target shares that can hold out to a freezeout and hence forces the bidder to offer a higher preemptive bid.

and arbitrage returns. They interpret this as evidence of the involvement of active arbitrageurs, who influence the outcome and the terms of the deal.

### 5.3.3 Limits to arbitrage

The significance of transactions costs in limiting profits from merger arbitrage is investigated by Mitchell and Pulvino (2001). For a sample of 4,750 mergers from 1963 to 1998, they document annual excess returns to merger arbitrage of 10% when ignoring transactions costs. When accounting for transactions costs, such as brokerage commissions and the price impact of trading, the annual excess returns are reduced to 4%. Thus, transactions costs appear to limit but not entirely eliminate the excess profits generated by merger arbitrage strategies. Mitchell and Pulvino (2001) further show that merger arbitrage returns are correlated with market returns in a nonlinear way. Specifically, the returns are positively correlated in down markets but uncorrelated in flat and appreciating markets. They suggest that the excess returns are compensation to arbitrageurs for providing liquidity, especially during severe market downturns.

Arbitrage activity may be limited in practice because these investments are risky and require capital (Shleifer and Vishny, 1997). It is obvious that merger arbitrage in cash offers require capital, since the investor takes a long position in the target stock. Because the lender of a stock typically demands the short-sale proceeds as collateral, merger arbitrage positions require capital in stock-for-stock transactions too. Baker and Savasoglu (2002) propose that the capacity of arbitrageurs to carry risk is limited by the transaction risk and the size of their arbitrage position. They report that merger arbitrage returns increase with target size and a measure for the ex ante deal completion risk. Moreover, there is some evidence that subsequent arbitrage profits are negatively related to changes in the supply of arbitrage capital.

Although merger arbitrage tends to be a profitable strategy, these trading strategies periodically generate large losses, primarily caused by unexpected deal failure (Baker and Savasoglu, 2002). Such liquidity events could affect the available supply of risk capital and hence the presence of arbitrageurs in subsequent deals. Officer (2007) examines the direct effect of two liquidity events—large arbitrage losses and the announcement of large deals—on arbitrage spreads. For a sample of 4,593 all-cash and all-stock offers in 1985-2004, he finds that risk returns are negatively related to big arbitrage losses, but this is attributable to the deal itself and has no contagion to other deals or

spreads on pending deals. Overall, Officer (2007) finds little evidence indicating that large losses would cause withdrawal of arbitrage funds to the extent that it affects pricing in other merger and acquisition transactions.

Trading volumes typically increase in connection with the announcement of a takeover offer. Estimates of the target ownership by merger arbitrageurs following a takeover announcement ranges from 15% (Hsieh and Walking, 2005) to 35% (Officer, 2007). Yet, Geczy and Reed (2002) suggest that merger arbitrage strategies may be limited by short-selling constraints. They show that it is relatively expensive to borrow acquirer stock compared to other company stocks, in particular when the acquirer is small.

Mitchell, Pulvino, and Stafford (2004) study the effects of merger arbitrage for 2,130 mergers announced between 1994 and 2000. They document a substantial arbitrage activity after the announcement of a takeover offer. In the announcement month, the acquiring firm's short interest increases with a median of 40% in fixed-exchange-ratio stock mergers (i.e., where the exchange ratio is determined in the merger agreement). Interestingly, there is no corresponding change in the short interest for mergers where the arbitrage position does not involve a concurrent shorting of the acquirer stock, such as cash mergers or floating-exchange-ratio mergers (where the acquirer offers stock equivalent to a specific dollar value). The level of short interest falls dramatically when the merger closes. Also, the announcement effect of stock mergers is related to the change in short interest that occurs in the month of the announcement, suggesting a relationship between the arbitrage spread and the level of arbitrage activity.

To single out the effect of arbitrage trading activity, Mitchell, Pulvino, and Stafford (2004) further examine a subsample of 64 floating-exchange-ratio mergers. During the pricing period, which typically lasts 10 days and ends 5 days prior to merger closing, the corresponding number of acquirer stock is determined. In this type of stock mergers, the short selling of acquirer stock typically takes place during the pricing period. Since most of the deal uncertainty has already been resolved at this point, the effect of the short-selling pressure is no longer confounded with the revelation of new information about the merger. Importantly, the short interest increases significantly and there is a negative abnormal drift in the acquirer stock price of 3% during the pricing period for the floating-exchange-ratio mergers. Mitchell, Pulvino, and Stafford (2004) conclude that the short-selling by merger arbitrageur causes downward price pressure that accounts for almost half

of the negative announcement return for acquirers in stock-financed mergers.

Overall, mergers and acquisitions of publicly traded firms attract substantial merger arbitrage activity. Such merger arbitrage strategies, betting on the closing of the transaction, seem to systematically generate positive excess returns. These returns reflect limits to arbitrage from transaction costs as well as compensation for carrying transaction risk.

## 6 Takeovers, competition and antitrust

In Section 4, we concluded that the typical merger produces significantly positive combined announcement-induced abnormal stock returns to bidders and targets. A standard interpretation is that the wealth effect is the present value of future expected increases in the merging firms' operating margins (the spread between future revenues and costs). In this section, we review studies that attempt to tease out whether the wealth effect predominantly originates in cost reductions (efficiency effects) or in revenue increases (market power effects).

### 6.1 Efficiency v. market power: predictions

Eckbo (1983) and Stillman (1983) develop a test approach based on stock prices rather than product price data to infer the anticompetitive significance of horizontal mergers.<sup>121</sup> On the one hand, the (combined) abnormal stock returns to the bidder, and the target cannot be used to discriminate between efficiency and market power hypotheses: these returns represent the *net* effect of expected cost reductions and revenue increases. On the other hand, merger-induced changes in expected future product and factor prices translate into abnormal stock returns to industry rivals (as well as upstream suppliers and downstream customers) of the merging firms. In particular, a collusive, anticompetitive merger raises the product price and thus benefits the nonmerging rivals as well. This means that evidence of a negative industry wealth effect of a merger announcement is inconsistent with the merger having collusive, anticompetitive effects on its industry.

A positive industry wealth effect is necessary but not sufficient to conclude in favor of the collusion hypothesis. The reason is that the industry wealth effect of an efficient merger may

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<sup>121</sup>Examples of merger studies examining product price and output data are Barton and Sherman (1984) on microfilm; Borenstein (1990), Werden, Joskow, and Johnson (1991), Kim and Singal (1993) and Singal (1996) on airlines; Akhavein, Berger, and Humphrey (1997), Prager and Hannan (1998) and Focarelli and Panetta (2003) on banking; and Dafny (2005) on hospital mergers.

be either positive or negative. On the one hand, scale-increasing efficient mergers tend to have a negative impact on the industry's equilibrium product price, which harms rival firms and by itself causes a negative industry wealth effect.<sup>122</sup> On the other hand, news of the merger may reveal positive information about the value of the resources controlled by the rival firms. That is, the merger may reveal increased demand for resources owned by other firms, causing a positive revaluation of these rivals. For example, the increased demand may lead to expectations of future merger activity, resulting in a positive "in-play" effect on rival firms from the announcement of the initial merger. In sum, the efficiency hypothesis does not restrict the abnormal returns to industry rivals.

As summarized in Table 12, which is reproduced here from Eckbo and Wier (1985), these predictions can be refined further by distinguishing between public announcements that either increase or decrease the probability of a merger in the industry. The table adds predatory pricing as a variant of the market power hypothesis. The predation theory holds that the merger provides an incentive for the bidder firm to increase output and drive product prices down until rivals exit—at which point output is cut back to the monopoly level. Thus, both predation and productive efficiency arguments predict a lowering of the product price (albeit in the short run under the predation argument), which harms rivals.

An event decreasing the probability of the merger is the announcement of a decision by U.S. antitrust authorities (Department of Justice or Federal Trade Commission) to challenge the proposed merger with violation of antitrust laws (Section 7 of the 1914 Clayton Act).<sup>123</sup> As is seen in Table 12, the only pattern of abnormal stock returns to rival firms at once inconsistent with the market power hypothesis and consistent with the efficiency hypothesis is one where the rivals experience nonnegative returns in response to *both* probability-increasing and probability-decreasing events. Moreover, the collusion hypothesis is rejected unless one observes positive rival returns to the initial merger proposal followed by negative returns to news of the antitrust action. The predation theory is rejected unless a price pattern opposite to the pattern under the collusion theory is observed.

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<sup>122</sup>Rivals may minimize the negative product price impact by racing to adopt similar technological innovations as the merging firms—prompting industry merger waves.

<sup>123</sup>Section 7 of the Clayton Act replaced Section 2 of the 1890 Sherman Act as the principal federal antitrust law regulating corporate mergers and acquisitions. A *potential* threat to competition constitutes an offense under this law, and it is not necessary to prove a horizontal relationship between the combining firms. Furthermore, anticipated or demonstrated economic efficiencies are not a defense against the illegality of a merger that may lessen competition.

This shows that information on the abnormal return to rival firms in principle has the power to test market power hypotheses. This is true even if a given merger has a combination of productive efficiency and market power effects (so the rival firm performance reflects the net effect of the two). Tests of the predictions in Table 12 do, however, presume that collusion and predation are mutually exclusive market power effects (since you would otherwise be netting out positive and negative rival effects at both announcements). It is common in the theoretical literature, as well as in the practice of antitrust policy, to treat these two market power theories as separate.

Further refinements of the predictions in Table 12 are possible. Schumann (1993) suggests that market power theories may have different implications for rivals with small versus large market shares. Fee and Thomas (2004) and Shahrur (2005) follow the suggestion of Eckbo (1983) to examine the wealth effects of mergers also for customers and suppliers. The two papers develop similar predictions, reproduced here as Table 13 from Table 1 in Shahrur (2005). The major focus in these two studies is on the buyer power hypothesis (last column)—that is, the possibility that the merger increases the monopsony power of the combined firm over its input suppliers. In this case, the merger benefits the merging firms and (possibly) its industry rivals at the expense of upstream suppliers. Consumers benefit as well, provided some of the increased monopsony rents are passed on downstream from the merging firms' industry. Evidence on customer performance also helps resolve a possible ambiguity from looking at rival firm performance alone. For example, while evidence of a positive rival firm performance in response to the merger proposal announcement does not discriminate between collusion and efficiency, collusion is rejected if customers also benefit.

Tests of predictions such as those in Tables 12 and 13 are likely to pick up an in-play effect in the abnormal returns to rival firms in response to merger announcements. The in-play effect, which motivates the positive information effect predicted by hypothesis (4) of Table 12, occurs when the merger event increases the probability that the rivals may become targets. An in-play effect follows naturally from the fact that rival firms use similar production technologies and own some of the same (and possibly scarce) productive resources. A takeover may signal increased resource scarcity, causing a positive revaluation of every firm holding those resources. The findings of most of the studies discussed below are consistent with such a positive industry information effect.<sup>124</sup>

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<sup>124</sup>Exceptions are Eckbo (1992), Akdogu (2007a), and Becher, Mulherin, and Walkling (2008), who find a negative industry wealth effect of multi-industry horizontal merger announcements in Canada, and in single-industry studies of the U.S. telecommunications and utility firms, respectively.

Banerjee and Eckard (1998) and Fridolfson and Stennek (2005) suggest that since a successful merger bid eliminates rival firms as potential merger partners for the target, there could be a negative out-of-play effect for these rivals. Such a negative effect might attenuate a positive effect due to market power. In their sample of largely conglomerate takeovers (where there arguably are no market power effects), Betton and Eckbo (2000) document *positive* rival firm performance when the rival learns that it has lost the target. While the idea of an out-of-play effect is interesting and consistent with formal competitive takeover models such as Akdogu (2007b) and Molnar (2008), we are unaware of evidence favoring a significant out-of-play effect on rival firms.

## 6.2 Effects of merger on rival firms

Table 13 lists a number of empirical studies providing estimates of the industry wealth effects of horizontal mergers, beginning with Eckbo (1983) and Stillman (1983). Eckbo (1983) examines intra-industry wealth effects of 191 horizontal mergers in the United States between 1963 and 1978, 65 of which were challenged by either the Department of Justice or the Federal Trade Commission with violating Section 7 of the Clayton Act. A sample of 68 vertical mergers, of which 11 were challenged, is also examined. For each merger, a set of horizontal competitors of the merging firms that were listed on the NYSE or the American Stock Exchange (ASE) at the time of the merger proposal announcement is identified.

The rivals are defined based on overlapping five-digit Standard Industrial Classification (SIC) codes. For the challenged mergers, the relevant product market is the one identified in court records as being the market "threatened" by the "anticompetitive" merger. For unchallenged mergers, the relevant product market is the target's major product line, as defined in Standard & Poor's Registry of Corporations. As shown by Eckbo and Wier (1985), the empirical results based on the five-digit SIC rivals are robust: They duplicate the tests using rivals identified by the Department of Justice (DOJ) or the Federal Trade Commission (FTC) as being relevant competitors, and they draw the same inferences. To test the hypotheses in Table 12, the paper reports estimates of the abnormal stock returns to the merging firms and their horizontal rivals relative to (i) the merger proposal announcement and (ii) the subsequent announcement that the DOJ or the FTC has filed a Section 7 complaint against the horizontal merger.

Eckbo (1983) reports that the observed sequence of abnormal returns across the proposal and

antitrust complaint announcements does not follow the pattern predicted by the collusion hypothesis. Rivals of the 65 horizontal challenged mergers earn small but significantly positive abnormal returns around the merger proposal announcement, followed by zero or positive abnormal returns in response to the antitrust complaint announcement.<sup>125</sup> The antitrust complaint causes a negative average abnormal return of -10% to the *merging* firms. This means that the antitrust complaint comes as a surprise to the market, which in turn means that the complaint announcement has the requisite power to test the market power hypothesis using rival firm returns.

This pattern of abnormal return to rival firms is inconsistent with the predictions as summarized in Table 12 of the collusion hypothesis, but it is jointly consistent with the efficiency and information arguments. Stillman (1983) performs a similar set of tests on 11 horizontal, challenged mergers for the period 1964–1972 and finds zero average abnormal rival stock returns relative to both merger announcements and antitrust complaints. Thus, both Eckbo and Stillman conclude against the market power hypothesis. Eckbo (1983) also reports that the average intra-industry wealth effect of unchallenged horizontal mergers is indistinguishable from the average intra-industry wealth effect of unchallenged vertical mergers. Since vertical mergers are unlikely to have collusive effects, this further supports the view that the horizontal unchallenged mergers in the sample were not expected to be anticompetitive.

Schumann (1993) also examines the effect of horizontal merger proposals and antitrust complaints on rival firms. His sample consists of 37 cases from 1981–1987 that were challenged by the FTC, a period with less antitrust intervention than in the sample periods of the earlier studies. Rival firms are identified using antitrust litigation reports, much as in Eckbo and Wier (1985). The results for the total sample, which indicates significantly positive rival returns at the proposal announcement and zero at the time of the antitrust complaint, are “remarkably similar to those reported in Eckbo (1983) and Eckbo and Wier (1985)” (Schumann, 1993, p. 681). For a subsample of 97 rivals with available data on market shares, Schumann also reports that rivals in the smallest market-share quartile have the largest abnormal returns and that these are significantly positive

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<sup>125</sup>The industry wealth effect of the merger is estimated by first forming an equal-weighted portfolio of the rivals of a given target and then estimating the portfolio abnormal return. Let  $AR(t_1, t_2)$  denote the average of these portfolio estimates, where the period of cumulation is  $t_2 - t_1 + 1$  days around the event-announcement day (day 0). Eckbo (1983) reports  $AR(-1,1)=0.10\%$  and  $AR(-10,5)=1.17\%$  relative to the merger proposal (significant at the 5% level), and an insignificant  $AR(-1,1)=0.17\%$  relative to the antitrust complaint announcement. Eckbo (1983) also reports that complaints by the FTC cause a significantly *positive* industry wealth effect of  $AR(0)=0.74\%$ .

at both the proposal and complaint events. Following the predictions in Table 12, these findings contradict the collusion (market power) hypothesis.

Several studies also document significantly negative abnormal returns to rival firm portfolios in response to the announcement of horizontal mergers. Eckbo (1992) finds a negative industry wealth effect of horizontal merger announcements in Canada. Aktas, de Bodt, and Roll (2006) study horizontal mergers in the European Union, several of which were subjected to a preliminary antitrust review. They report significantly negative rival abnormal returns. Akdogu (2007a) finds negative rival abnormal returns in response to horizontal takeover bids in the U.S. telecommunications industry. Becher, Mulherin, and Walkling (2008) document a significantly negative industry wealth effect in a large sample of horizontal mergers between U.S. electric utilities. All of these studies reject the market power hypothesis and conclude that the typical sample merger would likely enhance efficiency.

### **6.3 Effects of merger on suppliers and customers**

Fee and Thomas (2004) and Shahrur (2005) estimate the effect of horizontal mergers on rivals and, in particular, on upstream suppliers and downstream customers, over the period 1981–1999. These two studies provide new tests of market power theories based directly on the wealth effects for suppliers and customers. Moreover, by revisiting abnormal returns to rivals during a time period with relatively lax U.S. antitrust enforcement in the merger area, they provide a perspective on the generality of the findings of earlier studies on industry wealth effects.

Starting with the evidence on rival firms, both studies report a statistically significant, positive industry wealth effect in response to the merger proposal announcement. Abnormal returns to portfolios of single-segment rival firms average 0.54% in Fee and Thomas (2004) and 0.39% in Shahrur (2005). These results are close to the early results in Eckbo (1983), and to those in Song and Walkling (2000). The evidence confirms that the composition of the rival firm portfolios in this literature yields sufficient power to register industry wealth effects of horizontal mergers.<sup>126</sup> Moreover, Eckbo (1983), as well as Fee and Thomas (2004) report significantly positive rival firm abnormal returns in response to news of antitrust action against the proposed merger.<sup>127</sup> Thus,

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<sup>126</sup>See Eckbo (1983, 1989, 1992), McAfee and Williams (1988), and Schumann (1993) for discussions of power issues in the selection of rivals.

<sup>127</sup>Shahrur (2005) does not study antitrust events.

consistent with the earlier literature, Fee and Thomas (2004) reject the collusion hypothesis for the horizontal-merger gains.

Fee and Thomas (2004) and Shahrur (2005) identify customer and supplier information using Compustat's industry segment files. These files record information mandated by Federal Accounting Standards Board (FASB) rule No. 14 during their sample period. Under this rule, firms are required to report financial information for any industry segment comprising more than 10% of consolidated yearly sales, assets, or profits.<sup>128</sup> This reporting requirement also discloses the identity of any customer representing more than 10% of the total sales, as well as the company segment that was primarily responsible for those sales. Both studies also use sales data to identify suppliers and customers that are particularly dependent on the industry of the merged firm.

Under the monopoly (collusion) hypothesis, the merging firms and their rivals gain at the expense of customers. Fee and Thomas (2004) and Shahrur (2005) reject this hypothesis because they find no systematic evidence of customer losses, even for customers that are particularly reliant on the merging firm's industry. There is also evidence that the mergers with the largest gains to the merging firms also produce gains to customers. As Fee and Thomas (2004) conclude, "Taken together, the customer and rival results are strongly inconsistent with the monopolistic collusion hypothesis" (p. 457). Shahrur (2005) states that "Our overall evidence suggests that the lenient antitrust policy in recent years does not appear to have resulted in predominantly anticompetitive takeovers" (p. 95). These results support the conclusion in Eckbo (1992) that, when it comes to the need to use antitrust policy to strongly deter potentially anticompetitive mergers, "Judging from the evidence, there simply isn't much to deter" (p. 1028).

Fee and Thomas (2004) and Shahrur (2005) find some evidence of losses to upstream suppliers of the merging firms and conclude that horizontal merger tends to increase buying power. Increased buying power follows if the merger increases monopsony power or if it forces upstream suppliers to be more efficient. Fee and Thomas (2004) argue that if the source of buying power is upstream efficiency, then the losses to suppliers will be asymmetric—with losses only to those suppliers that are not retained post-merger. That is, those suppliers that lose a bidding competition post-merger would suffer. Fee and Thomas in fact find that the wealth effect for suppliers depends significantly on the supplier's ability to retain its product-market relationship with the merged

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<sup>128</sup>After 1998, SFAS No. 131 governs required segment disclosures.

entity. Only the suppliers that are terminated experience negative abnormal returns around the merger announcement and significant negative cash flow changes post-merger. Suppliers that are retained experience increases in market share and do not show evidence of abnormal stock returns or changes in operating performance. The authors therefore conclude that the effect of the merger on suppliers reflects efficiency-increasing buying power. Shahrur (2005) reaches a similar conclusion: "Along with the evidence in Fee and Thomas (2004), our results suggest that industry consolidations can help increase the efficiency of upstream industries" (p. 96).

Bhattahcaryya and Nain (2006) and Shenoy (2008) also focus on vertical buying power. Bhattahcaryya and Nain (2006) sample 615 successful horizontal mergers and fail to find a significant announcement effect on the horizontal rivals. However, they find evidence of a reduction in the product price paid to upstream suppliers, which is consistent with increased buying power. Moreover, they find some evidence indicating that the upstream suppliers, perhaps feeling the squeeze from the increased buying power, restructure to counter the effect of the downstream horizontal merger. The authors suggest that the net effect of all this may have been to leave the market value of the horizontal rivals of the merging firms unchanged. Finally, Shenoy (2008) studies the industry wealth effects of 453 successful *vertical* mergers and concludes that these on average have efficiency effects. This evidence is also consistent with the effects of vertical mergers first reported by Eckbo (1983).

## 6.4 Some implications for antitrust policy

### 6.4.1 The market concentration doctrine

The U.S. government select Section 7, Clayton Act, cases against horizontal mergers largely on the basis of market share and industry concentration.<sup>129</sup> The government agencies' reliance on structural standards for selection of merger cases is rooted in one of the oldest propositions in industrial economics: the market concentration doctrine. This doctrine holds that the level of industry concentration is a *reliable* index of the industry's market power. The empirical implication

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<sup>129</sup>The Justice Department's Merger Guidelines of 1968 state market shares that were likely to trigger an antitrust complaint. The critical aggregate market shares varied according to the four-firm market concentration ratios. For example, a merger between two firms each having 4% of the sales in a market with a four-firm concentration ratio of 75% or more was likely to be challenged. The department's 1982 Merger Guidelines use the Herfindahl Index of concentration and are somewhat less restrictive than the old guidelines, but their focus is also on market structure.

is that a relatively high level of industry concentration, which in the presence of entry barriers is believed to facilitate intra-industry collusion or dominant-firm pricing, should be associated with relatively large industrywide monopoly rents.

A horizontal merger produces a measurable change in the industry's level of concentration and a change in the risk-adjusted present value of industry rents that is directly associated with the concentration change. Under the market concentration doctrine, this change in industry rents is positively correlated with the change in concentration. This value-based test in the *changes* of the two variables (industry rents and concentration) allows more specific inferences than can be drawn from a correlation between the levels of (accounting) profits and concentration.

Eckbo (1985, 1992) provides empirical tests of the market concentration doctrine by estimating cross-sectional regressions of the following form:

$$AR_i = \alpha_0 + \alpha_1 CR_i + \alpha_2 dCR_i + \beta' \mathbf{Z}_i + e_i \quad (25)$$

where  $CR_i$  is a measure of the pre-merger level of concentration in the industry where the horizontal merger is taking place,  $dCR_i$  is the change in concentration caused by the merger,  $\mathbf{Z}_i$  is a set of firm- and industry-specific control variables, and  $AR_i$  is the abnormal return to an equal-weighted portfolio of the rivals of the merging firms around the merger proposal announcement. Under the market concentration doctrine, and assuming the sample includes some anticompetitive mergers, one should find that  $\alpha_2 > 0$ . This is because the  $AR$  of rivals of an anticompetitive merger represents increased monopoly rents, and the market concentration doctrine holds that the increase in monopoly rents will be larger the larger the increase in concentration caused by the merger. Furthermore, under the stronger proposition embedded in antimerger policy, which holds that a merger is more likely to have anticompetitive effects the larger the pre-merger *level* of concentration, one should also find evidence of  $\alpha_1 > 0$ .

While the form of Equation (25) is similar in spirit to the regression models typically estimated in the “structure-conduct-performance” (industrial organization) literature, there are some notable qualitative differences: For example, while the dependent variable  $AR$  measures directly the market value of the increase in industry profits expected to follow from the (merger-induced) increase in industry concentration, the tradition has been to regress an accounting measure of the level of

industry profits on the level of concentration. The traditional approach has been criticized on the grounds that accounting profits are a poor proxy for economic profits and that any cross-sectional variation in the level of industry profits can simply reflect differences in risk. This criticism does not apply here, since  $AR$  is measured using market values and represents a risk-adjusted change in the level of industry rents. Equally important is the fact that since Equation (25) is specified in the form of changes in the central variables,  $\alpha_2$  can be meaningfully interpreted without specifying a complete structural model relating the level of industry profits to concentration.

Eckbo (1985, 1992) uses the four-firm concentration ratio ( $CR_4$ ) of the major four-digit SIC industry of the target firm to represent  $CR$ , while the change in the industry's Herfindahl Index ( $dH$ ) measures  $dCR$ .<sup>130</sup> While data on  $CR_4$  is generally available, the market shares of the bidder and target firms, which yield  $dH$ , were collected from case-related court records and publications. In the sample of challenged mergers in Eckbo (1985), the average level of  $CR_4$  is 58% (ranging from 6 to 94%), while the average value of  $dH$  is 3.3% (ranging from 0.02 to 24.2%).

Both studies report a statistically significant negative coefficient on  $dH$ . In Eckbo (1985), increasing  $dH$  by 1% implies a reduction of 0.42% in the abnormal returns to the average portfolio of rival firms. Similar results emerge when one uses the abnormal returns to the *merging* firms as dependent variable. The author notes that since the regressions of the type in Equation (25) are based on challenged mergers, the results are biased in favor of the market concentration doctrine. Despite this potential bias, there is no evidence supporting the doctrine.<sup>131</sup>

#### 6.4.2 Did the 1978 Antitrust Improvements Act improve antitrust?

The 1976 Hart-Scott-Rodino (HSR) Antitrust Improvements Act significantly increased the legal powers of the law enforcement agencies to obtain private information needed for judging a merger's anticompetitive impact before filing a complaint. The HSR Act addressed two perceived handicaps borne by the agencies charged with enforcing Section 7 of the Clayton Act. First, under the 1962 Antitrust Civil Process Act, the DOJ could not require third parties, such as competitors

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<sup>130</sup> $CR_4 \equiv \sum_{i=1}^4 s_i$ , and  $H \equiv \sum_{i=1}^n s_i^2$ , where  $s_i$  is the market share of firm  $i$  (in  $CR_4$  the sum is over the four firms with the largest market shares) and  $n$  is the total number of firms in the industry. The change in the Herfindahl Index caused by the merger between firms  $i$  and  $j$  in the same industry is therefore given by  $dH = 2s_i s_j$ .

<sup>131</sup> “[T]he evidence systematically rejects the antitrust doctrine even for values of industry concentration and market shares which, over the past four decades, have been considered critical in determining the probability that a horizontal merger will have anticompetitive effects” (Eckbo, 1992) (p. 1028)

and trade associations, to provide information about corporate acquisitions until after a Section 7 complaint had been filed. This frequently caused the DOJ to drop an investigation altogether for lack of information or to file a “skeleton” complaint based on scanty data. HSR established the right of the DOJ to issue Civil Investigative Demands to the merging firms and to other parties not directly involved in the merger prior to filing a complaint. Second, until the HSR Act, the government could not require postponement of proposed acquisitions pending investigation. HSR required firms planning mergers to prenotify the FTC and the DOJ of the transaction, providing the agencies with time and information to prepare a case before merger consummation.

According to the FTC,<sup>132</sup> the notification requirements and delay assure that “virtually all significant mergers or acquisitions occurring in the United States will be reviewed by the antitrust agencies prior to the consummation of the transaction.” Moreover, the information provided by the parties “usually is sufficient for the enforcement agencies to make a prompt determination of the existence of any antitrust problems raised by the transaction.” These assurances notwithstanding, Eckbo and Wier (1985) compare the anticompetitive significance of horizontal mergers challenged before and under HRS and find no significant difference in their effect on rival firms. Moreover, they conclude that the pattern of abnormal stock returns to the industry rivals is inconsistent with the mergers having collusive anticompetitive effects both before and under HSR. Based on this, they argue that HSR is unlikely to have significantly increased the precision with which defendants are chosen by the antitrust agencies.

Why would the antitrust process, which many believe is designed to protect consumer interests, result in blocking efficient mergers? Bittlingmayer and Hazlett (2000) suggest bureaucratic self-interest, political extraction, and private benefits. In this context, it is important to keep in mind that, while preventing efficient mergers harms consumers, the *rivals* of the merging firms benefit as they avoid having to face competition from an increasingly efficient merged firm. The rivals can indeed form a politically strong interest group in situations where they perceive a significant threat to their existing industry equilibrium. This industry capture theory is highlighted by Posner (1969) who asserts that the FTC is significantly impaired in its task of promoting the public interest; Posner claims that its investigations are initiated “at the behest of corporations, trade associations, and trade unions whose motivation is at best to shift the costs of their private litigation to the

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<sup>132</sup>6 FTC Ann. Rep. to Cong. concerning HSR ACT 11 (1983).

taxpayer and at worst to harass competitors” (p.88).

A case in point is Chrysler’s vocal opposition to the joint venture between GM and Toyota in 1983. At the time the venture was announced, Chrysler demanded publicly that the FTC take action to stop the venture because it would ”harm competition” in the automobile industry. An alternative interpretation of Chrysler’s opposition is that it suspected the venture would make GM a tougher competitor, placing Chrysler at a competitive disadvantage. In fact, Eckbo (1990a) finds significant abnormal returns of -9% to Chrysler upon the announcement of the GM-Toyota joint venture. More recent cases in point include the airline industry, where Slovin, Sushka, and Hudson (1991) conclude that Civil Aeronautics Board interventions during 1965 to 1988 reduced competition and favored collusion among existing carriers. Bittlingmayer and Hazlett (2000) study the effect on the software and computer industry of 54 antitrust enforcement actions against Microsoft over the period 1991–1997, and strongly reject the thesis that these actions would enhance efficiency. Also, Aktas, de Bodt, and Roll (2006), who study rival firm performance following antitrust interventions against mergers in the European Union, find evidence consistent with antitrust policy being used to protect EU firms from outside competition.

Since the anticompetitive significance of a horizontal merger does not represent a directly observable characteristic, policy makers are forced to rely on largely untested theories to justify their decisions. As noted by Stigler (1982), the economics profession has supplied “precious little” in the way of *tested* knowledge to support the market share and concentration criteria that(still) form the basis for U.S. antimerger policy. As long as those responsible for antimerger policy continue to insist on rigid structural standards for evaluating the competitive effects of mergers, it is reasonable, given the evidence, that special interest groups, including those representing relatively inefficient producers and/or a rigid workforce, will continue to exploit antitrust policy toward merger.

## 7 Summary and Conclusions

Table 15 summarizes key findings across the various topics we have surveyed. Here, we draw broad inferences from these findings and point to interesting but unresolved issues.

## 7.1 Takeover activity

While there are clear patterns of merger waves in the data, there is little agreement on the basic sources of the waves. Under neoclassical theories, basic sources include industry-specific technological and demand shocks, regulatory changes, and liquidity constraints. Under behavioral arguments, mergers are driven by attempts to sell overpriced assets and securities and herding behavior. There is evidence that regulatory changes and liquidity factors predict industry waves. There is also evidence of greater average market-to-book ratios during periods of merger waves, which may (but need not) indicate overvaluation. On the other hand, additional research is needed on the extent to which bidders select stock as payment in response to market-to-book ratios and on whether the presence of mixed cash-stock offers (which are typically as frequent as all-stock offers) are consistent with equilibria in which targets willingly accept overpriced bidder shares.

Perhaps the most straightforward way to advance our understanding of aggregate merger activity is to model the takeover process from basic, microeconomic principles. One does not get something from nothing—so this requires imposing various restrictive (but hopefully testable) assumptions on production technologies and market structures. The theoretical literature on the optionality of corporate investments is a promising avenue, as are models of industry competition in which industry shocks force rival firms to restructure. Empirical research tailored to such modeling efforts is only starting to emerge.

Important stylized facts from the aggregate takeover activity in the 1980-2005 period include (1) the stability of horizontal combinations at 30-40% of the total takeover population, (2) negotiations (as opposed to open auction) as the preferred route to acquiring control (3) the sharp drop-off in hostile takeovers after 1988, (4) the large increase in volume and deal values involving public bidders toward the end of the 1990s, (5) the predominance of all-cash and mixed cash-stock offers in tender offers, (6) the rise of mixed stock-cash offers to become the most frequently used payment method in mergers by 2001, and (7) the dramatic fall in toehold bidding since the mid-1980s.

Additional research is needed to sort out the competing theories for the sharp drop in hostile takeovers and what this drop means for the market for corporate control to function effectively as the court of last resort. While takeover activity depends on market liquidity factors, and thus fell during the credit crunch of the late 1980s, it is also important to establish how draconian

antitakeover devices such as the staggered board and poison pill defense contributed to the fall.

The choice between merger and tender offer is interesting but has received little attention. There is some evidence that this decision is impacted by industry competition. This is hardly surprising as the likelihood of attracting rival competition in an auction setting depends on industry structure as well as asset characteristics. This is a fertile area for future research, both empirical and theoretical, and it ultimately links back to our understanding of takeover waves. Moreover, there are some indications that the target (and not the bidder) is increasingly initiating takeovers and thus determines the acquisition form. The economics of the selection process behind target-initiated deals is an exciting area for future research.

## 7.2 Bidding strategies and offer premiums

Bidders initiating takeover bids for U.S. targets over the period 1980-2005 offered all-cash as payment in 26% of the cases, all-stock in 37%, and a mix of stock of cash in 37%. The majority of tender offers are all-cash or a mix of cash and stock. while the majority of merger bids are in the form of all-stock (with the exception of the 1980-1985 period where most merger bids offered a mixed cash-stock payment). As pointed out earlier, all-cash and mixed cash-stock offers are predominant in tender offers. Moreover, mixed stock-cash offers rose to become the most frequently used payment method in mergers by 2001. In the two subperiods 1990-1995 and 1996-2000, the percentage of all-stock offers in initial merger bids was approximately 55% in *both* period. This means that (1) nearly half of the initial merger bids in the 1990s use some cash as payment, and (2) the percentage all-stock merger bids remained unaffected by the significant runup in overall market valuations in the 1996-2000 period.

The choice of payment method is strategic for several reasons, including tax effects, its impact on the conditional expected value of the bid to asymmetrically informed bidders and targets, and corporate control considerations. The evidence indicates that stock offers are more likely the greater the bidder's asset size and market-to-book ratio. Stock offers are less likely the greater the bidder management's shareholdings and the greater the dispersion in analyst forecast of bidder earnings. Moreover, offer premiums are greater in all-cash offers than in all-stock offers, and the probability that the initial bidder wins the target is lower for all-stock offers than for cash offers.

The pervasive negative market reaction to all-stock merger bids by public bidders is typically

compared to the average negative market reaction to seasoned equity offers. The comparison is appealing since the timing of the equity issue is determined endogenously by the issuer in both events, and thus involves some degree of adverse selection. On the other hand, in terms of the *issue method*, stock swaps in mergers are closer to private placements than they are to an underwritten seasoned equity offering—and there is substantial evidence that the market reaction to private placement is positive on average (Eckbo, Masulis, and Norli, 2007). Moreover, the market reaction to merger stock swaps is positive when the target is private. Also, formal tests of signaling theories for the payment method choice have received mixed success. Additional research is needed to establish the empirical relevance of asymmetric information arguments for the strategic payment choice.

The dramatic fall in toehold bidding coincides with the rise of structural takeover defenses beginning in the 1980s. In theory, toehold bidding conveys the substantial strategic advantage of rival bidders, particularly in a common-value setting. Since many of these advantages come at the expense of the *target*, some targets may be reluctant to negotiate if the bidder has a toehold. If so, acquiring a toehold prior to attempting friendly merger negotiations may backfire: if the target refuses, the bidder foregoes not only things like a termination agreement but also the opportunity to examine the target books—which is crucial for pricing the merger.

Another way to put this is that a toehold must be large to be worth it—larger than 10% by some (conservative) estimates. This argument may go a long way in explaining the dual observation that toeholds are large (on average 20%) when they exist and that they occur mostly in hostile bids. An interesting and hitherto unexplored empirical issue is whether toeholds are important in other jurisdictions, in particular those with highly concentrated shareownership and a set of takeover regulations and corporate governance practices that differ from those in the U.S..

The average offer premium in successful single-bid takeover contests is somewhat higher than the average initial offer premium in multi-bid contests. While this is consistent with the greater premium preempting competition in ex-post successful single-bid cases, systematic empirical tests of preemption are almost nonexistent. Bid revisions are substantial when the initial bid attracts competition and/or is revised by the initial bidder. The average bid jump from the first to the second bid in the contest is 10 percentage points, a 31 % change in the offer premium.

Another interesting jump is the markup of the offer price above the target stock price on the day

before the offer is announced. There is substantial evidence that a dollar increase in the pre-offer target share price runup causes the initial bidder to mark up the total offer premium by almost a dollar (\$0.80). Interestingly, *bidder* takeover gains are also found to be increasing in the target runup, which raises issues concerning the true nature of the markup pricing phenomenon itself. It appears that takeovers with greater pre-bid target runups are more profitable for *both* bidder and target firms, which may explain why bidders agree to the (partial) markup.

A useful approach to investigating the markup pricing phenomenon further is to document in much greater detail the bidder's pricing process during merger negotiations. An analogy here may be the structure of the pricing process in seasoned equity offerings and in initial public offerings. Which parties are involved? What role do fairness reports play for the pricing process? If bidders, in fact, react by revising the offer price in response to the target runup, how is the runup analyzed? Is the reverse causality at play, that is, is the offer price set high *ex ante* in profitable takeovers, which when rumored drives the runup in the target price *ex post*?

Delaware case law sanctions the right to "just say no" to an unsolicited takeover bid. Moreover, if the board's defensive response is not draconian (i.e., it is neither coercive nor preclusive), the board is protected by the business judgment rule. The twin defense of staggered board election and a poison pill (shareholder rights plan) is draconian in the eyes of many economists but not the court. However, "dead-hand" pills (where only incumbent directors may vote to rescind the pill) have been struck down.

There is a small but significantly negative market reaction to the adoption of strong antitakeover amendments such as poison pills and staggered board. The market reacts positively to antigreenmail amendments provided these occur when a takeover is rumored. Offer premiums appear to be as high (if not higher) for targets with poison pills than targets with no pill in place. Since pills can be adopted any time, and in particular in response to a bid ("morning after pill"), the power of tests that compare offer premiums in pill-targets with no-pill-targets is questionable and should be examined further. Understanding the true economic effects of defenses such as staggered boards and poison pills is important, not the least for the ongoing public policy debate over antitakeover measures.

There is a trend toward market-based mechanisms for resolving Chapter 11 cases, including sale of the firm to a bidder. Target firms that are sold spend less time in Chapter 11, which lowers

bankruptcy costs. Acquirers tend to be in the same industry, and premiums paid are on average lower than in takeovers of nonbankrupt firms in the same industry. Premiums paid for targets sold in mandatory, open, first-price, all-cash bankruptcy auctions in Sweden suggest the possibility that the auction mechanism may also work well for the typical Chapter 11 case (which is of a similar size as the Swedish sample firms). Importantly, the Swedish auction prices do not exhibit fire-sale discounts, contradicting a central presumption behind the creation of Chapter 11 back in 1978. The growing use of auction-related mechanisms in the United States is likely to have lowered bankruptcy costs. By how much remains an important question for future research.

Large-sample evidence on offer premiums are only starting to emerge. This evidence indicates that both the initial and final offer premiums were greater after the 1980s; greater for public bidders; greater in all-cash offers; lower for toehold bidders; increasing in the target runup (markup pricing); decreasing in target total equity capitalization and greater if the target's book-to-market ratio exceeds the industry median market-to-book ratio; greater in the presence of substantial dispersion in analysts' earnings forecasts; lower when the bidder CEO is female, and the higher the target board's proportion of female directors (provided that the female directors are independent appointees); and unaffected by either the presence of a target poison pill or target hostility to the initial bid.

Several variables used by researchers to explain the offer premium are themselves endogenous choice variables (payment method, toehold, hostility, termination agreements, bidder's public status). Some of the effects stated earlier appear robust to corrections for endogeneity (including systems of equations and Heckman procedures). One variable that does *not* appear to be robust, however, is tender offer. The inclusion of other variables (such as toeholds and hostility) appears to affect conclusions as to whether offer premiums are higher, the same, or lower in tender offers than in merger bids. Additional work is needed to sort this issue out—and may also affect the conclusion so far that poison pills have a neutral effect on offer premiums.

### **7.3 Takeover gains**

Becoming a target is a significant surprise event; thus target total gains are measured relatively precisely by the offer premium (typically, relative to the target market price two months prior to the first offer announcement) or, alternatively, by target cumulative abnormal returns over

the same period. Consistent with the evidence on offer premiums (above), the average target cumulative average abnormal stock return (CAR) is positive and significant, over both the runup and the announcement period. The target runup constitutes about one-third of the total runup plus announcement CAR. The largest target CAR occurs in all-cash offers.

The average, value-weighted combined CAR to bidders and targets is positive and significant over both the runup period and the announcement period. For the overall sample used here, the sum of the combined CAR for the runup and announcement periods is a significant 1.79%. Bidder announcement-period CARs average close to zero for the overall sample, with 49% of the bidders having negative CAR. The combination large bidder (here in the upper size quartile), payment in all-stock, and the target being a public company represents a worst-case scenario with average bidder announcement-period CAR of a significant -2.21%. The best-case scenario for the bidder is the combination of a small bidder (lower size-quartile), private target, and *all-stock* as payment. This produces a significant average bidder announcement-period CAR of 6.46%.

The major driver of negative bidder returns is not, as previously thought, the all-stock payment. Rather, the two key drivers are the target's status as public or private and bidder size. Bidder size was particularly large in 1999 and 2000. These years were unusual relative to years before *and* years after. Cisco, with a market capitalization of \$180 billion (constant 2000 dollars) was the dominant bidder in *both* the upper 1% and lower 1% tails of the distribution of bidder abnormal announcement returns. Removing Cisco from the sample reduces the aggregate bidder dollar wealth loss in the 1999-2000 period by almost \$100 billion. An important but unanswered question is whether the negative spike is truly a bidder size effect or a year effect (or a combination of two). At this point, there appears to be no explanation for why the large firms decided to enter the market for corporate control in 1998-2001, only then to leave again.

Studies of long-run abnormal stock returns use either the matched-firm technique or Jensen's alpha (regression constant in an asset pricing model) to measure expected return to the merged firms in the sample. With 15,298 successful takeovers completed during 1980-2003, we show that long-run returns are significantly negative based on the matched-firm technique but insignificantly different from zero-based Jensen's alpha. Of the two methods, only the latter can actually be replicated using a portfolio investment strategy. We also show that the standard matched-firm procedure identifies firms that have significantly different factor loadings than the event firms—

which undermines their role as "matches." A zero-investment portfolio strategy that is long in the merged firms and short in the matched firms fails to produce long-run abnormal stock returns that are significantly different from zero, even for the sample of all-stock mergers. Overall, the long-run performance evidence presented here does not support the hypothesis that merged firms underperform.

#### **7.4 Bondholders, executives, and arbitrage**

Studies of bondholder returns have suffered from limited access to data on bond market values. However, bond data are improving. Recent studies of excess returns to bondholders of bidder and target firms find zero or negative gains to bidder bondholders and positive gains to target bondholders. There is no evidence of a wealth transfer from stockholders to bondholders due to a coinsurance effect of mergers. As of the 1990s, target bondholders are often fully protected via event risk covenants. Bondholder wealth effects of a variety of corporate control decisions seem a fertile area for future research.

There is evidence that managers undertaking value-reducing acquisitions face a greater probability of being replaced than do managers undertaking value-increasing acquisitions. That is, bad bidders risk being fired. Some target firms, particularly those receiving hostile bids, underperform prior to becoming targets. However, CEO turnover increases after hostile bids, indicating a disciplinary role played by the market for corporate control. There is also evidence that CEO compensation (other than turnover) changes following acquisition activity. The market reaction to merger announcements tends to be positive and greater for CEOs with above-average equity-based compensation, suggesting that compensation affects the quality of managerial investment decisions.

CEOs with high equity-based compensation tend to seek out targets with relatively high market-to-book ratios (growth firms). This is consistent with high equity compensation inducing risk-taking behavior. Moreover, while a poorly performing acquisition reduces the value of the CEO's portfolio of stocks and options, there is evidence that the value of post-acquisition grants more than compensates for this value reduction. This indicates that CEOs face the combination of low downside risk and high upside potential from making good acquisition decisions.

There is also some evidence that target firm CEOs may be sacrificing takeover premium in return for a golden handshake from the bidder (to step aside and relinquish control). Empirical

measures of CEO power helps explain the cross-sectional variation in M&A bonuses. Moreover, deal announcement-induced abnormal stock returns tend to be lower for CEOs with greater power, suggesting that power may be misused. This raises the question of what role boards play in monitoring takeover activity. There is evidence that boards dominated by outside directors tend to increase value for their shareholders during an acquisition attempt. Target directors are rarely retained after a completed takeover, and their number of board seats and income levels tend to drop. This suggests that failing as a monitor imposes a personal cost on directors, which helps align the interest of directors and shareholders.

Merger arbitrage (or risk arbitrage) is a specialized investment strategy that tries to profit from the spread between the offer price and the target stock market price conditional on the offer having been made. It is essentially a (risky) bet on the likelihood that the proposed transaction will go through. Arbitrage gains depend on several factors, including the size of the arbitrage spread, the probability that the deal closes, the length of time that the arbitrageur must hold the position, and the target stock price development if the deal fails. Average gains are significantly positive, with the largest abnormal returns reported for cash tender offers. In addition to bearing deal failure risk, merger arbitrageurs provide a service in terms of providing deal-related information, liquidity, and helping resolve the free rider problems among small, diffuse target shareholders. Transaction costs, such as brokerage commissions and price impact of trading, limit arbitrage returns. There is evidence that short-selling by merger arbitrageur causes downward price pressure that accounts for almost half of the negative announcement return for acquirers in stock-financed mergers.

## **7.5 Competition and antitrust**

Merger-induced changes in product and factor prices directly translate into abnormal stock returns to the merging firms' industry rivals, upstream suppliers, and downstream customers. Market power theories (collusion, predation, buying power) and productive neoclassical efficiency theories make empirically testable predictions for these abnormal stock returns. Such tests complement and extend the traditional product price analysis seen in industrial economics. The empirical studies typically conclude against the horizontal market power effects of horizontal mergers. That is, the observed wealth effects on horizontal rivals and downstream (corporate) customers do not support increased market power. Some studies find traces of monopsony (buying power) effects vis--vis

upstream suppliers.

A horizontal merger causes a measurable increase in industry concentration (equal to twice the product of the market shares of the bidder and target when using the Herfindahl measure of concentration). The classical market concentration doctrine holds that an increase in concentration reliably increases the industry's market power and thus industry monopoly rents. Since the abnormal returns to industry rivals directly measure changes in industry rents, regressing the merger-induced rival abnormal returns on the change in industry concentration provides a powerful test of the market concentration doctrine. Empirical tests reject the doctrine.

The power of tests based on stock returns depends on the accurate identification of related firms (rivals, customers, suppliers). Since much of the available evidence indicates significant contagion effects of horizontal merger announcements on these related firms, the tests appear to have sufficient power. Related firms are identified using four-digit SIC codes, Compustat industry segment information, and the Bureau of Economic Analysis Input Output tables. The tests utilize two sets of samples: mergers that have been challenged with violation of antitrust laws (or, in the European Union, reviewed for such violation) and nonchallenged mergers. For challenged mergers, the tests exploit two events with (typically) opposing implications for the industry wealth effects, thus increasing power to reject.

In the future the interaction of industrial and financial economics, where econometric methods traditionally used in corporate finance are applied to interesting phenomena in industrial economics, is likely to increase in importance. While most of the attention thus far has centered on testing theories of monopoly, the econometric method applies equally well to an examination of alternative efficiency theories of corporate investment. For example, an industry-based theory of merger waves may be couched in terms of the valuation effects for related firms and may be tested using the event study methodology. Similarly, behavioral arguments for things like clustering of merger activity and post-merger underperformance have hitherto untested implications for the event-induced valuation effect across industry rivals.

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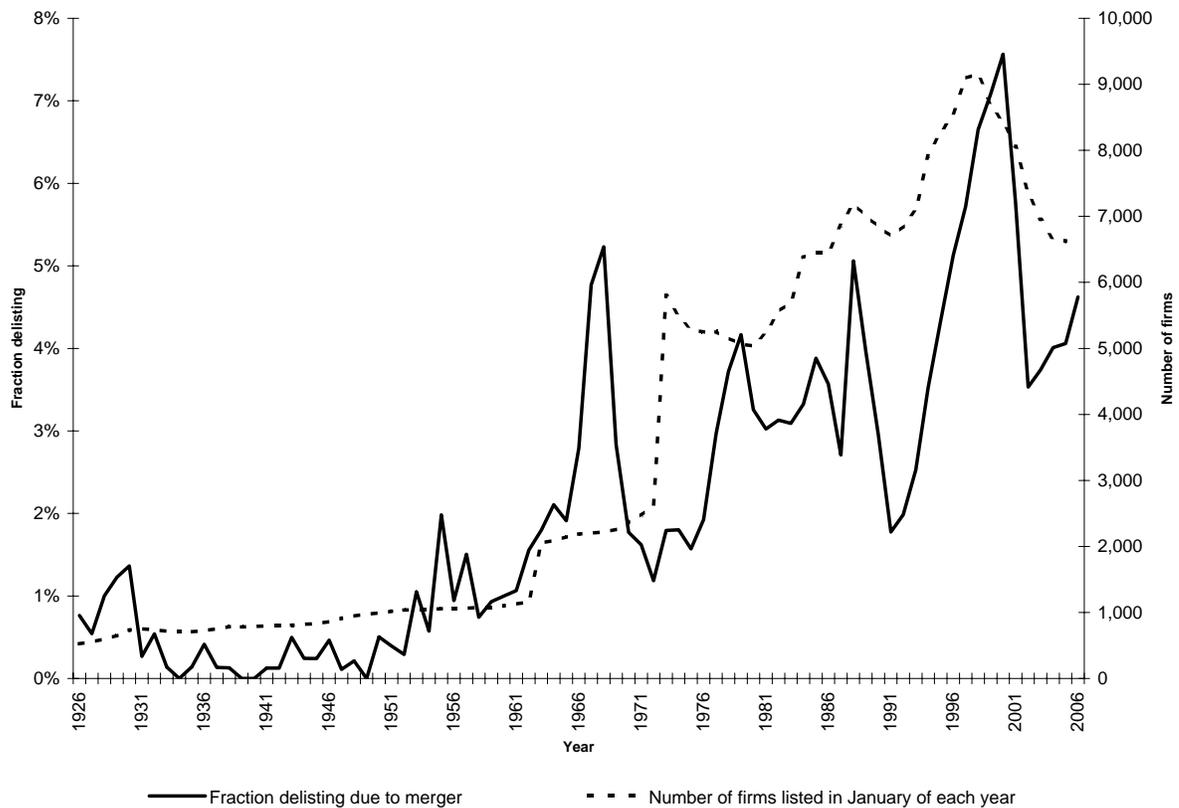
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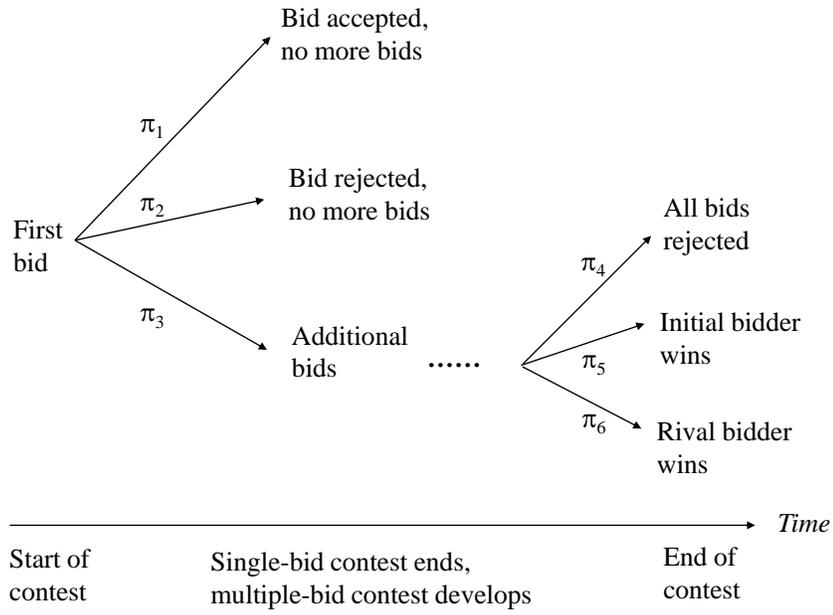
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**Figure 1**  
**Annual fraction of all publicly traded (CRSP) firms in January of each year which delists due to merger during the year, 1926-2006**

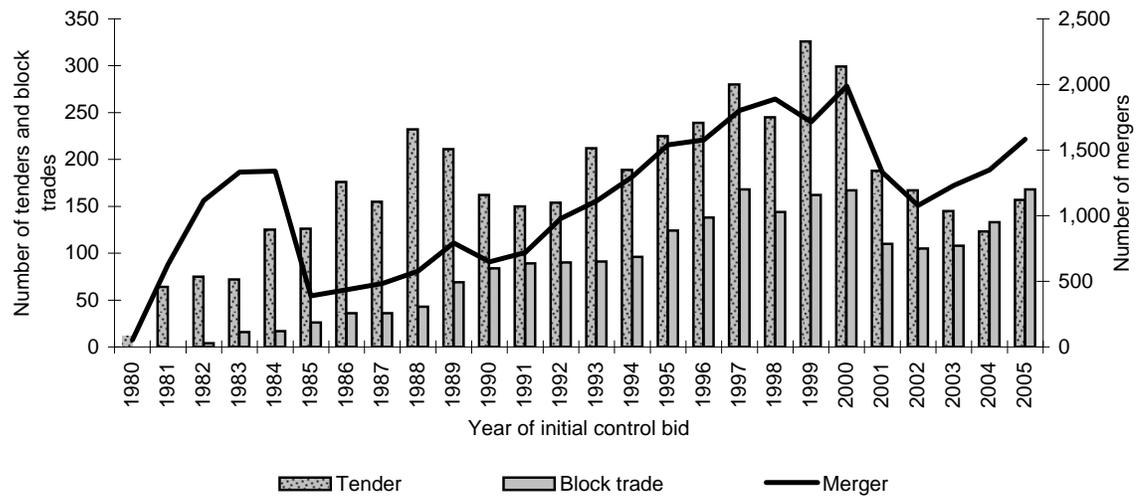


**Figure 2**  
**Takeover contest structure and outcomes**

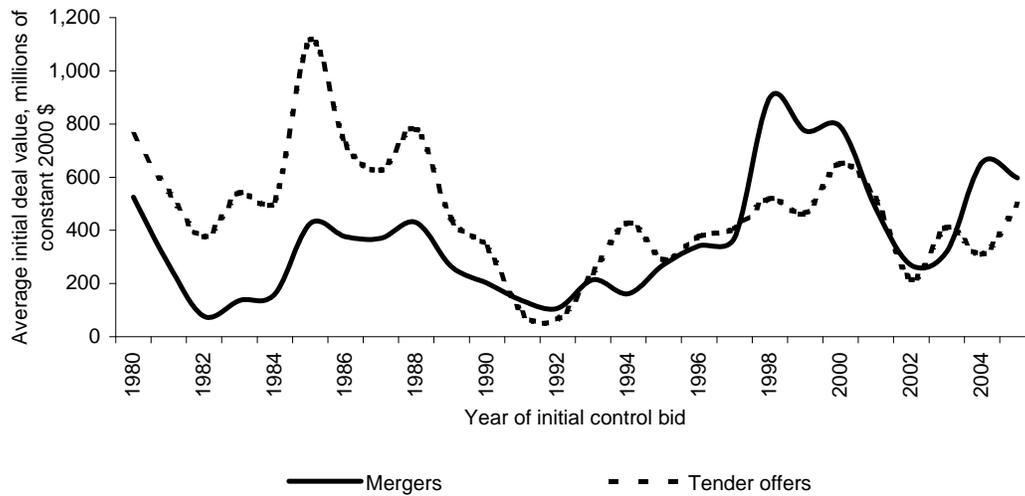


**Figure 3**  
**Initial control bids for U.S. targets, 1980-2005: merger, tender offer, or block trade.**

Panel A: Number of initial control bids by type

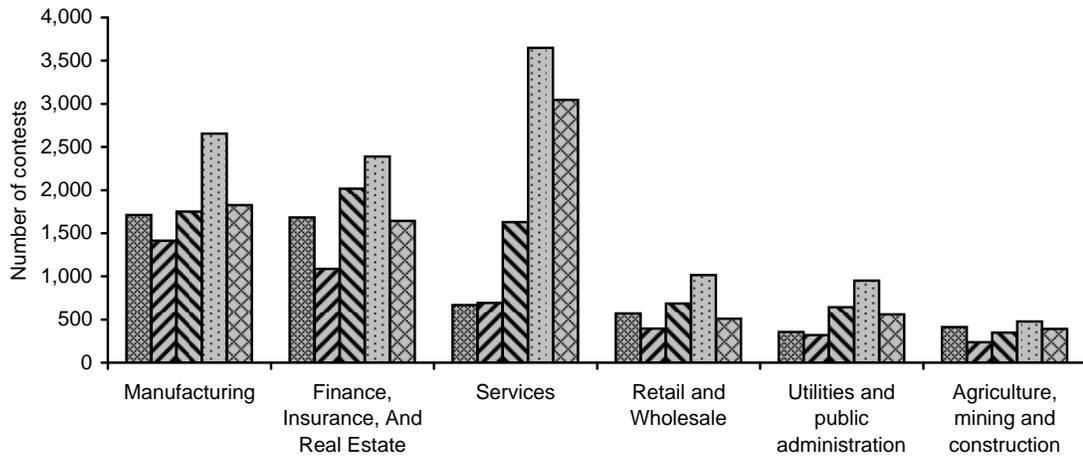


Panel B: Average deal value by type of initial control bid



**Figure 4**  
**Initial control bids for U.S. targets, 1980-2005, by 2-digit SIC target industry sector**  
**and 4-digit SIC horizontal within sector.**

**Panel A: Number of contests by time period and industry sector**



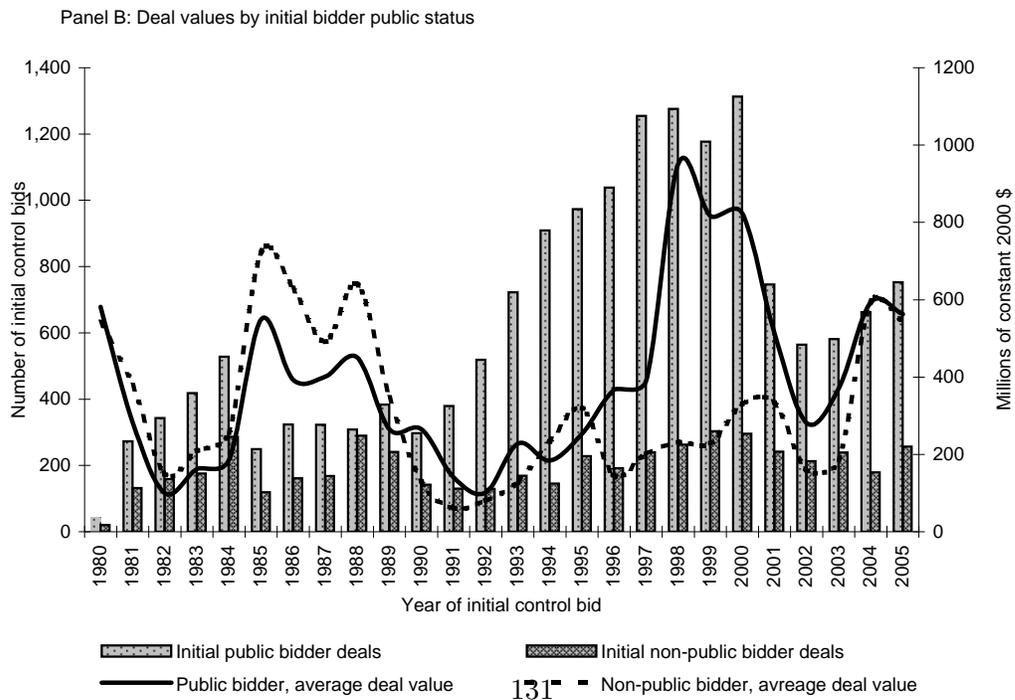
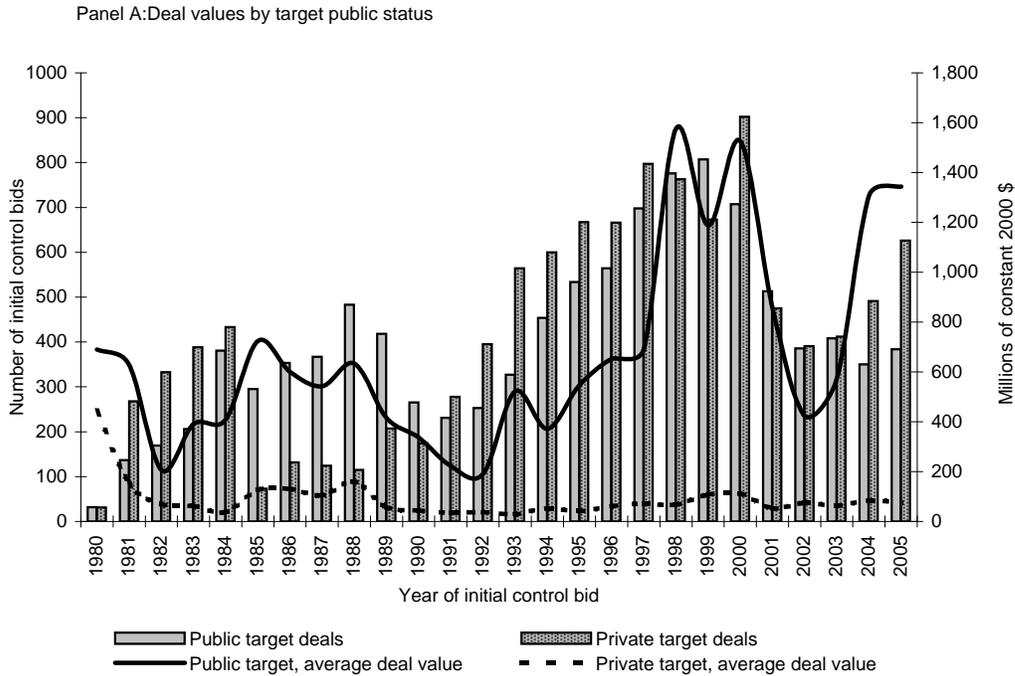
**Panel B: % of horizontal deals**



1980-1985
  1986-1990
  1991-1995
  1996-2000
  2001-2005

Figure 5

Initial control bids for U.S. targets, by public status of bidder and target, 1980-2005.



**Figure 6**  
**Weeks from first to second bid in 1,787 contests with multiple bids for U.S. targets, 1980-2005.**

For the 1,204 contests with multiple bidders, the time from the initial to the second bid averages 5.7 calendar weeks (40 trading days) with a median of 3.7 weeks. For the 583 contests with a single bidder making multiple bids, the average time to the first bid revision is 9 weeks (63 trading days) with a median of 7.6 weeks. Under the 1968 Williams Act, any given tender offer must be open for at least twenty days, and a new bid extends the minimum period accordingly.

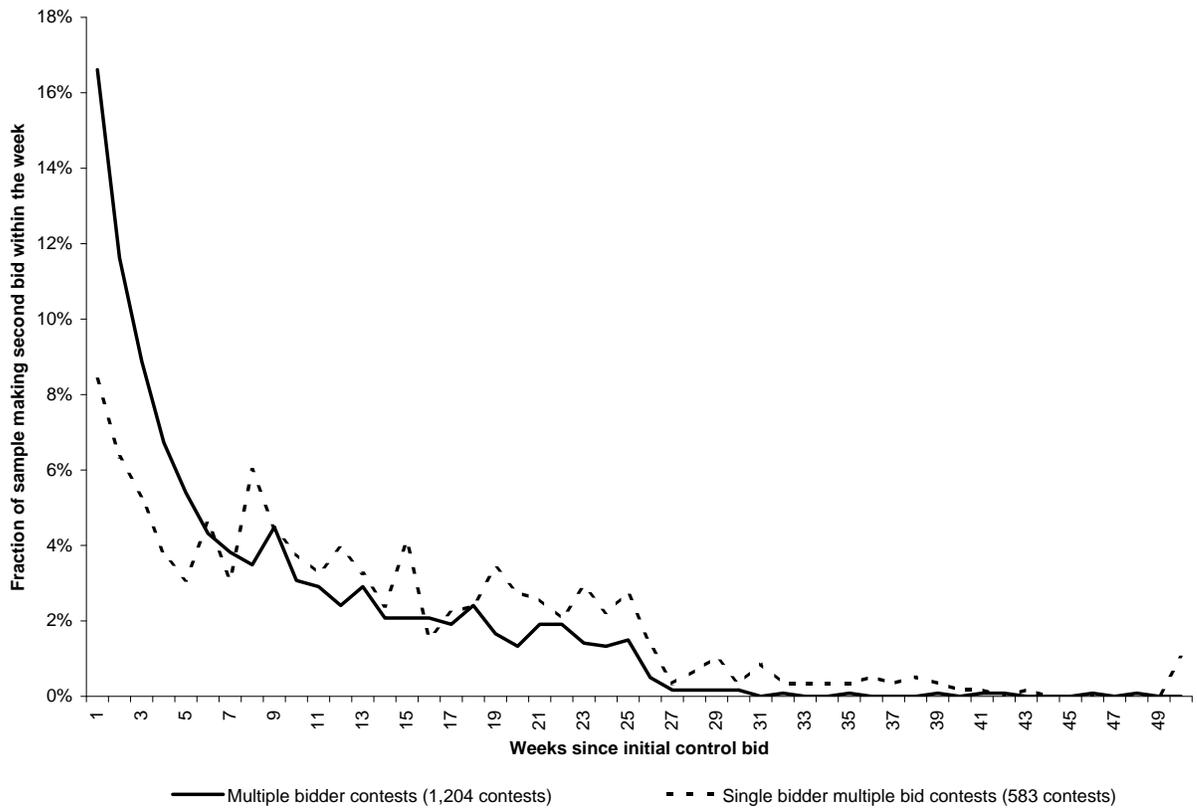
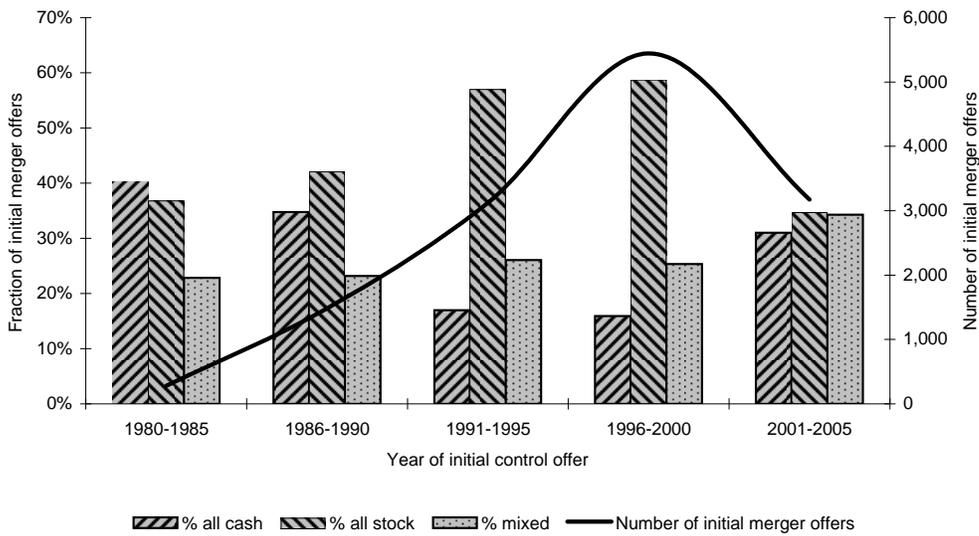


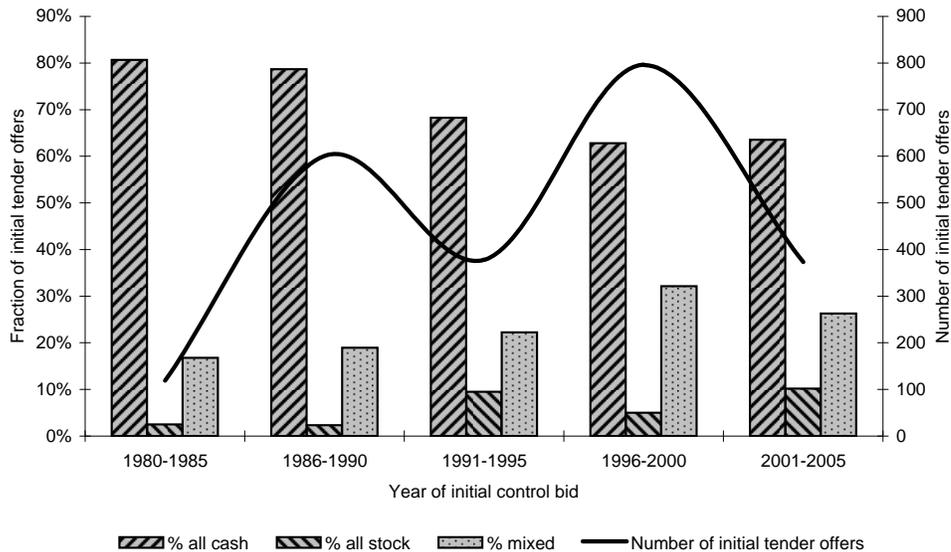
Figure 7

The initial control bidder's use of all-cash, all-stock, and mixed cash-stock as method of payment. Total sample of 13,503 merger bids and 2,678 tender offers with SDC information on payment method. U.S. targets, 1980–2005.

Panel A: Distribution of mergers by time period and method of payment



Panel B: Distribution of tender offers by time period by method of payment



**Figure 8**  
**Annual percentage of initial control bidders with a positive toehold in the target, classified by the type of the initial bid. U.S. public targets. Data source: Betton, Eckbo, and Thorburn (2007).**

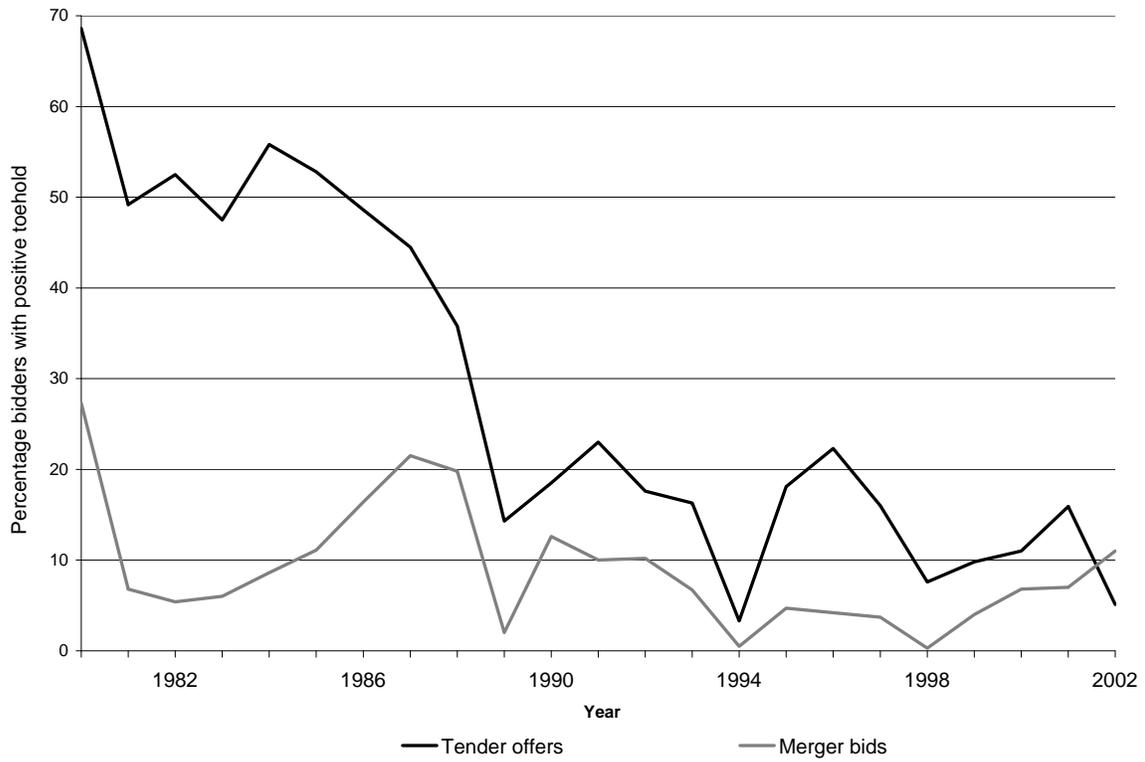
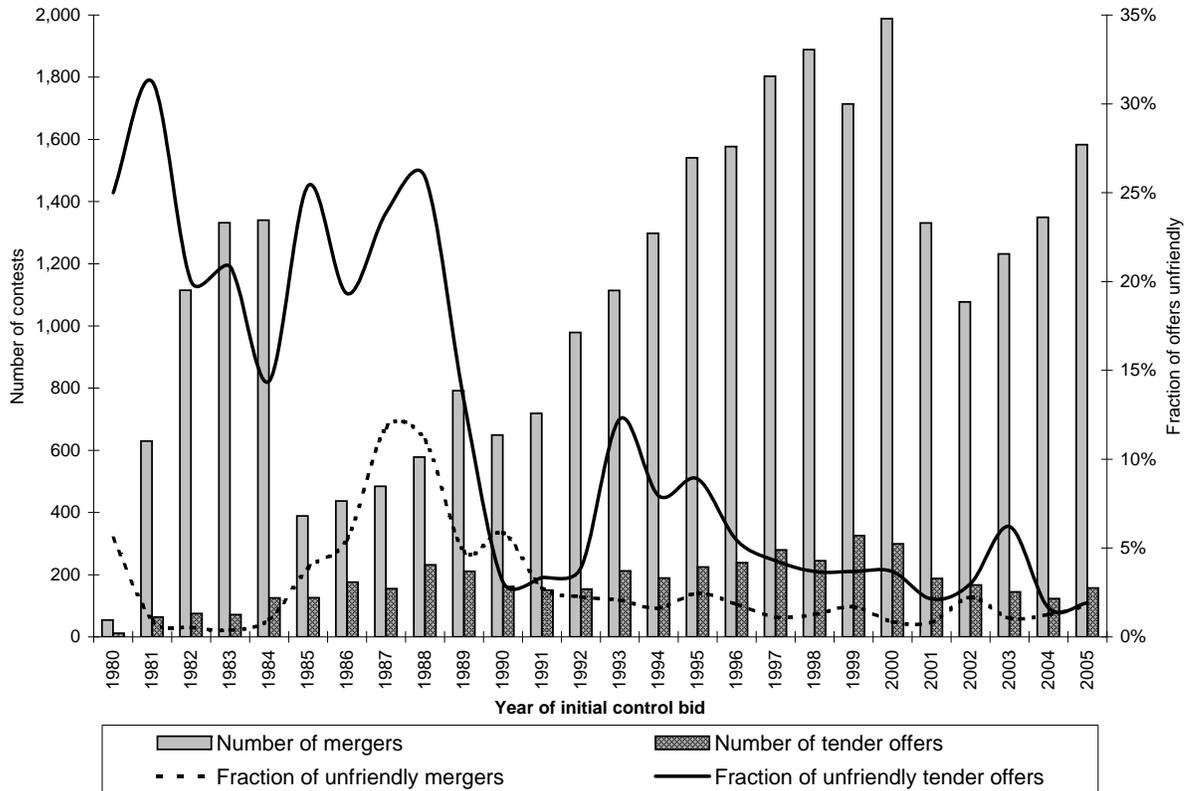
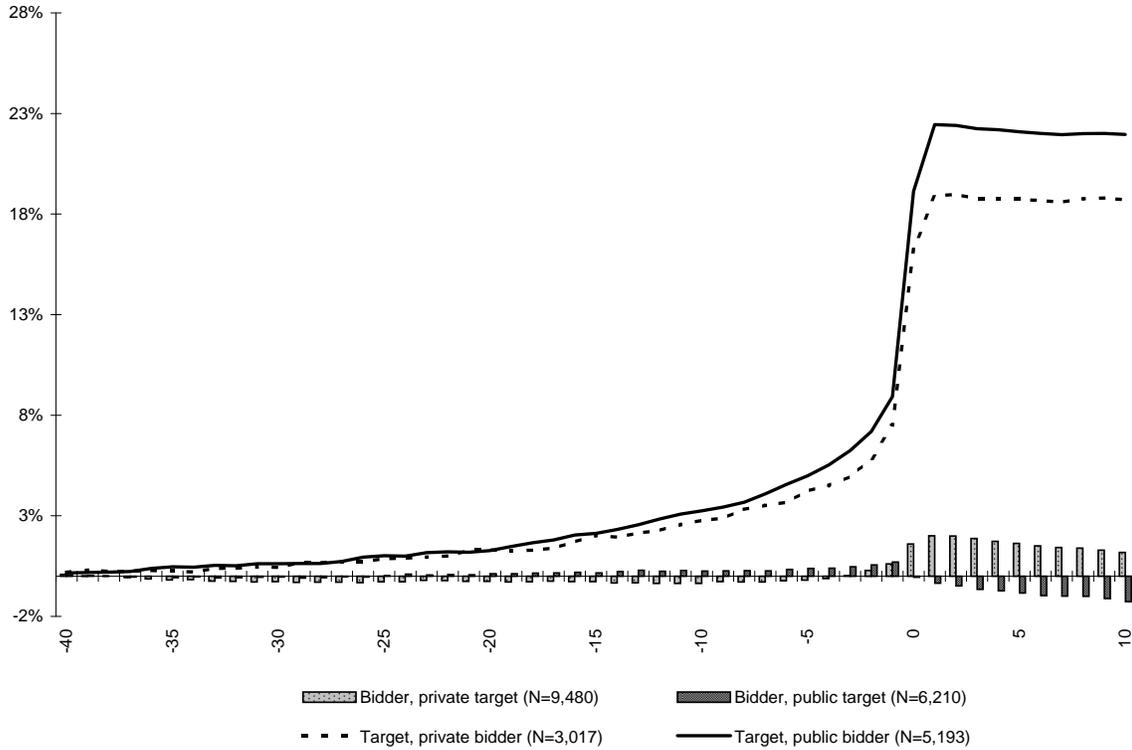


Figure 9

Target attitude towards the initial control bidder in mergers and tender offers. The attitude is shown as "unfriendly" (N= 1,025) if the SDC lists the offer as either "hostile" or "unsolicited". All other offers are shown as "friendly" (N=34,702). U.S. targets, 1980-2005.



**Figure 10**  
**Percent average cumulative abnormal stock returns to targets and initial bidders**  
**from day -40 through day 10 relative to the initial control bid. U.S. targets**  
**1980-2005.**



**Figure 11**  
**Announcement-period abnormal returns and dollar-changes for 12,898 successful initial bidders, 1980-2005.**

Panel A is a scatter plot of the announcement period abnormal stock returns,  $CAR(-1, 1)$ . Panel B is a scatter plot of the bidders' announcement-period dollar changes. Dollar changes are calculated as the change in market capitalization from day -2 to day 1 (relative to initial control bid) and converted to constant 2000 dollars using the CPI.

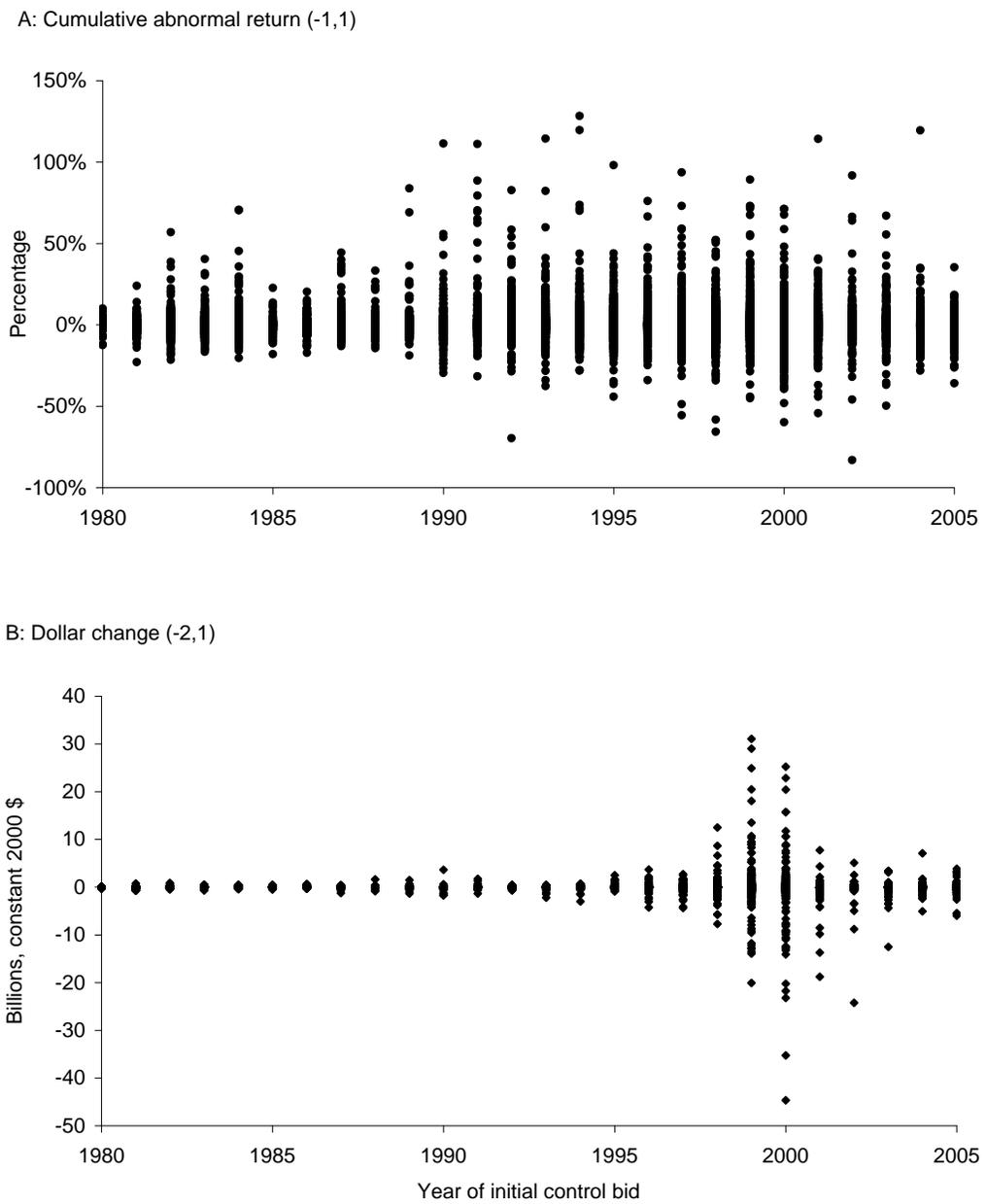
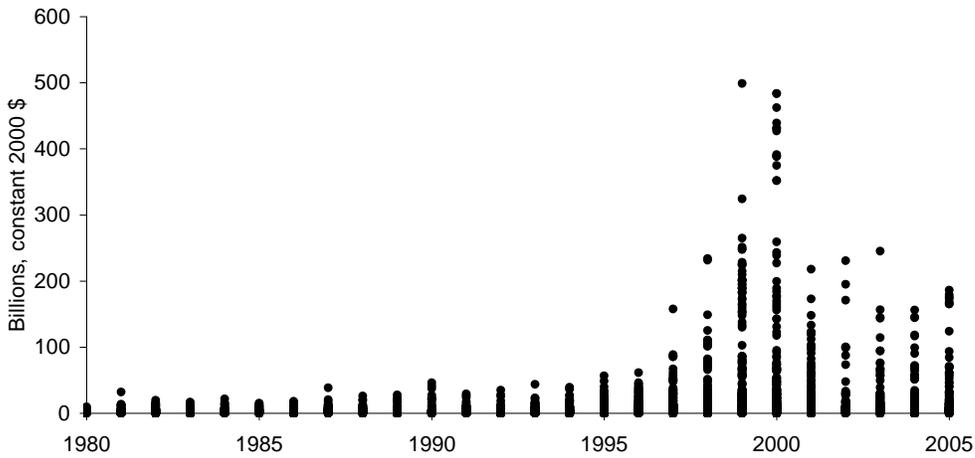


Figure 12

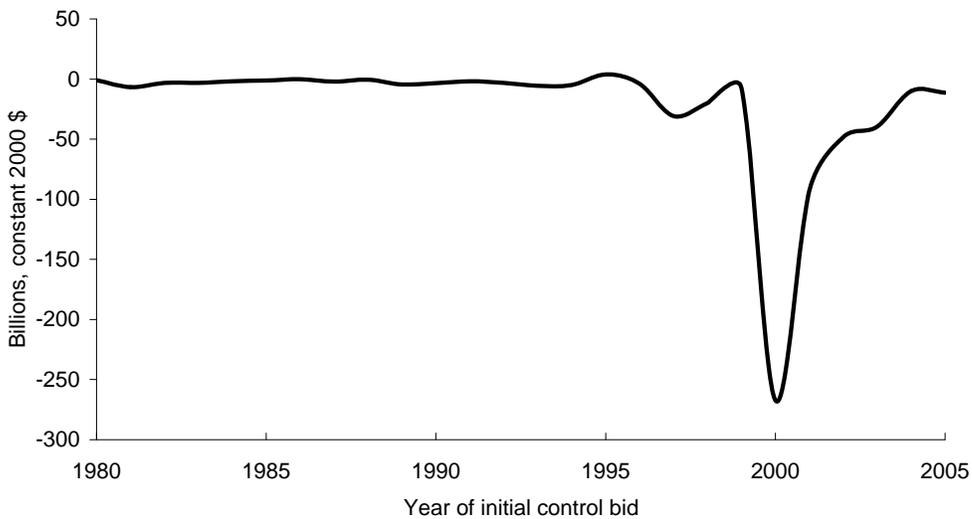
The market values and announcement-period aggregate dollar abnormal return to 12,898 successful initial bidders, 1980-2005.

Panel C is a scatter plot of the market value in constant 2000 dollars of successful initial bidders on day -2 relative to the initial control bid announcement. Panel D is a plot of the aggregate dollar abnormal returns earned by successful initial bidders over the window (-2,1). Aggregate dollar abnormal returns are calculated by multiplying the the bidder market capitalization on day -2 by the cumulative abnormal return and then summing over the year.

C: Market value day -2



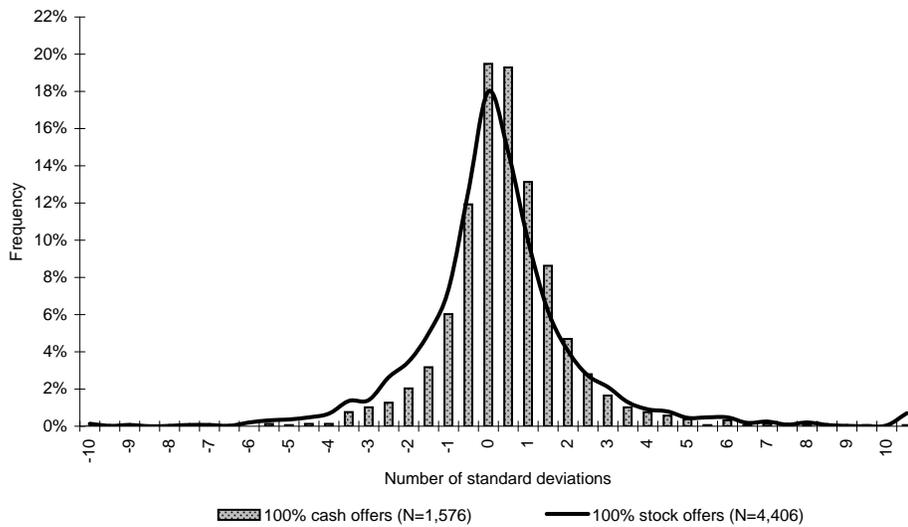
D: Aggregate dollar abnormal returns



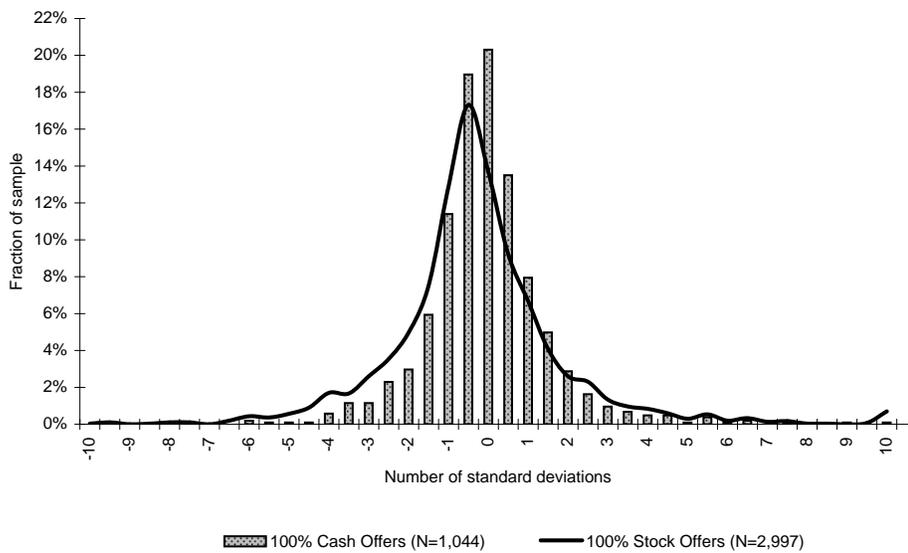
**Figure 13**  
**Standardized dollar abnormal returns to successful initial bidders by method of payment, 1980-2005 (Panel A) and 1995-2005 (Panel B).**

Dollar abnormal returns are calculated as the change in market capitalization (in constant 2000 dollars) from day -2 to day 1 relative to initial control bid. Dollar abnormal returns are then standardized by the historical average and standard deviation of non-overlapping 3 day dollar market value changes measured over the period -293 to -42 relative to the initial control bid. Sample windows are (-45,-42), (-48,-45) etc.

A: Successful initial bidders 1980-2005



B: Successful initial bidders 1995-2005



**Table 1**  
**Total number of takeover contests and characteristics of the initial control bid, 1980-2005**

Control bids (mergers and tender offers) and their characteristics are from SDC. Control contests begin with the first control bid for a company and continue until 126 trading days have passed without any offer (including acquisitions of minority interests). Each time an offer for the target is identified, the 126 trading day search window rolls forward. Multiple bid contests occur when there are either multiple control bidders or the initial bidder revises the bid. Successful offers are identified as completed by the SDC status variable. Initial deal values provided by SDC for the first control offer in the contest are restated in constant 2000 dollars using the Consumer Price Index obtained from the Bureau of Labor Statistics (Series Id: CUUR0000SA0).

	Number of contests						Number of successful contests				Initial deal values			
	All contests	Single bid		Multiple bidders		Single bid	Single bidder	Multiple bids		Rival bidder	Number	Mean	Stdev	Median
		Single bidder	Multiple bidders	Initial bidder	Multiple bidders									
<b>All Contests</b>	35,727	33,836	671	1,220	26,012	476	732	646	21,476	419.43	2,610.1	36.39		
<b>Initial Deal Form</b>														
Merger bid	28,994	27,663	481	850	21,087	349	481	462	17,367	426.33	2,838.2	34.57		
Tender offer	4,509	3,955	188	366	2,707	125	246	183	3,267	481.36	1,384.3	79.01		
Block trade	2,224	2,218	2	4	2,218	2	5	1	842	36.95	93.1	8.45		
<b>Initial Payment Method</b>														
All-Cash	4,798	4,114	268	416	3,424	160	266	209	4,798	309.54	1,130.1	54.82		
All-Stock	6,983	6,699	161	123	5,708	146	181	62	6,983	492.89	3,747.1	33.56		
Mixed Cash-Sec.	6,995	6,516	172	307	5,672	133	221	167	6,995	538.41	2,410.9	38.56		
No payment data	16,951	16,507	70	374	11,208	37	64	208	2,700	116.50	621.3	19.45		
<b>Initial Attitude</b>														
Hostile	590	207	153	230	35	72	126	133	560	1611.8	4,055.0	301.06		
Unsolicited	435	272	38	125	3	5	6	84	362	608.92	2,729.9	103.19		
Friendly	34,702	33,357	480	865	25,974	399	600	429	20,554	383.61	2,549.4	33.94		
<b>Initial offer</b>														
horizontal	10,452	10,043	154	255	7,953	130	198	128	6,080	562.48	3,172.0	40.17		



**Table 3**

**Distribution of the time to completion of control contests for successful U.S. target firms, classified by the type of initial offer and the public status of the bidder and target firms. Total sample of 25,166 successful targets, 1980-2005**

Control contests begin with the first control bid for a company and continue until 126 trading days have passed without any offer (including acquisitions of minority interests). Each time an offer for the target is identified, the 126 trading day search window rolls forward. The table reports the number of trading days from the date of the initial control bid to the effective merger date reported by the SDC. The effective date is the date target shareholders approve the merger agreement.

Public status		No of Obs.	Trading days from initial control bid to effective date			
			Mean	Median	Lowest	Highest
Target	Bidder					
<b>Entire sample</b>		25,166	64.62	42	0	100
<b>Merger</b>		2,2030	62.42	39	0	100
Public	Public	5,147	107.92	96	63	136
Public	Private	1,766	97.84	86	42	136
Private	Public	11,131	48.42	19	0	73
Private	Private	3,986	27.09	0	0	28
<b>Tender</b>		3,136	80.06	52	30	98
Public	Public	1,257	71.44	49	31	85
Public	Private	1,030	97.8	67	34	123
Private	Public	533	73.61	43	21	84
Private	Private	316	67.38	41	19	92

**Table 4**  
**Selected hypotheses and U.S. evidence concerning the choice of payment method in takeovers**

Theories	Hypotheses	Evidence
<b>A. Taxes and the payment method</b>		
U.S. Internal Revenue Code, Section 368 governing statutory merger.	H1: <i>Cash deals may be relatively costly as the implied capital gains tax penalty forces higher target premiums.</i>	Carleton, Guilkey, Harris, and Stewart (1983): Probability of stock offer increases in bidder's market-to-book ratio.
Gilson, Scholes, and Wolfson (1988)	In a cash-for-stock deal, target shareholders pay capital gains tax immediately (the deal is taxable if target shareholders receive less than fifty percent of the deal in bidder stock). The buyer steps up the tax basis with the takeover premium. In a Stock deal, however, target capital gains taxes are deferred until shares received are sold. No step-up of tax basis for buyer. Buyer in stock deal may make a Section 338 election to be treated as cash deal (Bruner, 2004).	Huang and Walkling (1987), Hayn (1989): Target announcement returns in U.S. deals higher for taxable than tax-deferred transactions.  Franks, Harris, and Mayer (1988): Reach similar conclusion for control-oriented takeovers in U.K.. However, the all-cash premium effect is present also <i>before</i> the introduction on capital gains taxes.  Eckbo and Langohr (1989): Find higher target premiums in all-cash tenders offers for control as well as for minority buyouts in France.  Brown and Ryngaert (1991): Find empirical support for their proposition that stock should not be used by bidders selecting taxable offers.

*continued on next page*

Theories	Hypotheses	Evidence
<b>B. The payment method choice motivated by asymmetric information</b>		
Myers and Majluf (1984)	H2: <i>One-sided information asymmetry: Investor concern with adverse selection produces a negative market reaction to the news of a stock deal.</i>	Travlos (1987); Asquith, Bruner, and Mullins (1987); Servaes (1991); Brown and Ryngaert (1991); Smith and Kim (1994); Martin (1996); Emery and Switzer (1999); Heron and Lie (2004); Schlingemann (2004) and many others show that bidder announcement-induced abnormal stock returns are on average negative in all-stock offers for public targets.  However, bidder announcement returns are non-negative in all-stock offers for private targets (Chang, 1998; Fuller, Netter, and Stegemoller, 2002; Moeller, Schlingemann, and Stulz, 2004; Bradley and Sundaram, 2006; Officer, Poulsen, and Stegemoller, 2007).
Hansen (1987)	H3: <i>Two-sided information asymmetry: Paying with securities induce targets to make more efficient accept/reject decisions than with cash. Stock offers are less likely when (i) the bidder has a relatively large total equity size, and (ii) when the target undervalues the bidder's shares.</i>	Hansen (1987): Probability of stock offer increases in bidder's asset size as well as in the size of its liabilities.
Fishman (1989)	The value of a stock offer is contingent on the true values of both the bidder and the target. A cash offer that undervalues the target will be rejected, while an equivalent stock offer may be accepted because the stock offer will rise in value ex post. This ex post price effect is smaller the smaller the size of bidder's total equity relative to the target's.  The more the target undervalues the bidder's stock, the more costly a given stock offer, and the more likely the bidder is to use cash.	Chemmanur and Paeglis (2003): Probability of stock offer increases in a measure of market mispricing of bidder shares and falls as the dispersion of analyst forecast of bidder earnings increases.  Betton and Eckbo (2000): Probability that the target accepts the initial bid in tender offer contests is lower for stock offers than for cash bids.  Travlos (1987): Bidder's announcement-induced abnormal stock returns lower for stock offers than for cash bids.

Theories	Hypotheses	Evidence
Eckbo, Giammarino, and Heinkel (1990)	H4: <i>Two-sided information asymmetry where bidders in equilibrium choose a mix of cash and stock. There exists a fully revealing separating equilibrium in which the greater the proportion of the deal paid in cash, the greater the true value of the bidder.</i>	Eckbo, Giammarino, and Heinkel (1990); Eckbo and Thorburn (2000): The average announcement-induced abnormal stock returns to bidders are highest for all-cash deals, lowest for all-stock deals, with mixed cash-stock deals in between.
Berkovitch and Narayanan (1990)	In Eckbo, Giammarino, and Heinkel (1990), target adverse selection pushes the bidder towards using stock as payment method, while target undervaluation of bidder shares pushes the bidder towards cash. The market uses the proportion of the deal paid in cash to separate low-value from high-value bidders. In equilibrium, bidder announcement-induced abnormal stock returns are an increasing and convex function of the cash portion of the deal.  In Berkovitch and Narayanan (1990), the bidder's choice of cash-stock mix affects target returns as well. Greater potential bidder competition raises the optimal amount of cash, and with actual competition all but the lowest type make all-cash offers.	Eckbo, Giammarino, and Heinkel (1990): In cross-sectional regressions, bidder announcement-induced abnormal stock returns are increasing in the cash portion of the deal as predicted. However, the data rejects convexity.  Betton, Eckbo, and Thorburn (2008c): Shows frequent use of mixed cash-stock offers in tender offers (see also Figure 7). Moreover, there is evidence that multiple bids raise the use of cash, however, the amount of stock used in competitive contests remains significant.

### C. Capital structure and corporate control motives for the payment method choice

Ross (1977)	H5: <i>The payment method is selected as part of a broader capital structure choice. Moreover, some bidder managements select (possibly debt financed) cash over stock as payment method in order to avoid diluting their private benefits of control in the merged firm.</i>	Capital structure: The cash portion of the bid must be financed internally or by a previous security issue. Schlingemann (2004); Toffanin (2005) find a link between the market reaction to takeover announcements and financing decision in the previous year.
Jensen (1986)		
Harris and Raviv (1988)		
Stulz (1988)	In Ross (1977) increased leverage raises expected managerial-specific bankruptcy costs. In Jensen (1986), paying with cash drains free-cash flow and reduces agency costs. In Harris and Raviv (1988); Stulz (1988), managers act to protect private benefits of control.	Yook (2003) find greater bidder gains in all-cash offers when the takeover causes downgrading of the merged firm's debt (due to increased leverage). The results are consistent with agency costs of free cash flow (Jensen, 1986).  Control: Amihud, Lev, and Travlos (1990); Martin (1996); Ghosh and Ruland (1998) find that bidder management shareholdings in the U.S. have negative effect on stock financing.  Studying European mergers, Faccio and Masulis (2005) find that corporate control incentives to choose cash are particularly strong when in bidder firms with relatively concentrated shareownership structures. Martynova and Renneboog (2006) finds a link between the quality of a country's corporate governance system and the market reaction to stock as payment form.

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Theories	Hypotheses	Evidence
<b>D. Behavioral motives for the payment method choice</b>		
Shleifer and Vishny (2003)	H6: <i>Bidders are able to sell overpriced stock to less overpriced targets</i>	The propensity of all-stock offers increases with M/B ratios (Rhodes-Kropf, Robinson, and Viswanathan, 2005; Ang and Cheng, 2006; Dong, Hirshleifer, Richardson, and Teoh, 2006). This supports the behavioral argument provided M/B is a fundamental driver of takeovers.
Rhodes-Kropf and Viswanathan (2004)	Bidders attempt to cash in on a temporary market overvaluation of their stocks. In Shleifer and Vishny (2003) they succeed because targets have "short time horizon". In Rhodes-Kropf and Viswanathan (2004) they succeed because targets accept more bids from overvalued bidders during market valuation peaks because they tend overestimate synergies during these periods.	Harford (2005): A macroeconomic measure of capital liquidity (interest rate spreads) drives merger activity and drives out M/B as a predictor of merger activity. This is inconsistent with the behavioral argument.  Betton, Eckbo, and Thorburn (2008c): There are nearly as many mixed cash-stock offers as all-stock offers, also in the recent period of high market valuations and peak merger activity (1996-2000). Mixed offers are an enigma in the model of Shleifer and Vishny (2003). The fact that the substantial market runup prior to year 2000 did not induce a greater use of all-stock offers as a proportion of all merger bids is inconsistent with the behavioral argument.

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**Table 5**  
**Determinants of the offer premium in 4,889 control contests for U.S. public targets**  
**1980-2002**

The table shows OLS estimates of the initial and final offer premium, defined as  $\ln(p_{initial}/p_{-42})$  and  $\ln(p_{final}/p_{-42})$ , respectively, where  $p_{initial}$  is the initial offer price,  $p_{final}$  is the final offer price in the contest, and  $p_{-42}$  is the stock price on day -42 adjusted for splits and dividends. Amihud liquidity is the average value of  $|R_i|/(p_i S_i)$  over days  $i \in \{-250, -42\}$ , where  $R_i$  is the % holding period return,  $p_i$  is the closing price and  $S_i$  is the number of shares traded. Industry is the four-digit SIC code in CRSP. The sample is 4,889 control bids 1980-2002 for U.S. targets with a stock price  $\geq$  \$1 and a market capitalization  $\geq$  \$10 million. p-values are in parenthesis. The data is from Betton, Eckbo, and Thorburn (2007).

	Initial offer premium		Final offer premium	
Mean		0.43		0.48
Median		0.37		0.39
St. dev.		0.46		0.47
Intercept	0.296 (0.000)	0.256 (0.000)	0.296 (0.000)	0.254 (0.000)
<b>A: Target characteristics</b>				
Size: ln of target market capitalization on day -42	-0.030 (0.000)	-0.027 (0.000)	-0.030 (0.000)	-0.027 (0.000)
Target book-to-market > industry median	0.025 (0.000)	0.029 (0.000)	0.024 (0.000)	0.029 (0.000)
Target runup: $\ln(p_{-1}/p_{-42})$	0.808 (0.000)	0.811 (0.000)	0.808 (0.000)	0.811 (0.000)
Amihud liquidity	8.55 (0.311)	13.29 (0.114)	8.71 (0.302)	13.46 (0.110)
Poison pill dummy	-0.016 (0.606)	0.000 (0.990)	-0.016 (0.604)	-0.001 (0.987)
<b>B: Bidder characteristics</b>				
Positive toehold (vs. zero toehold)	-0.023 (0.032)	-0.025 (0.024)	-0.023 (0.032)	-0.025 (0.024)
Acquiror public (vs. private)	0.015 (0.079)	0.023 (0.008)	0.015 (0.072)	0.023 (0.007)
Horizontal takeover (same industry)	-0.004 (0.608)	-0.004 (0.664)	-0.004 (0.618)	-0.004 (0.673)
<b>C: Deal characteristics</b>				
Tender offer (vs. merger)	-0.061 (0.000)	-0.066 (0.000)	-0.061 (0.000)	-0.066 (0.000)
All cash consideration (vs. stock or mixed)	0.019 (0.017)	0.021 (0.012)	0.019 (0.017)	0.021 (0.012)
Hostile target response (vs. friendly or neutral)	0.020 (0.185)	0.020 (0.185)	0.019 (0.216)	0.019 (0.216)
Multiple bidders (vs. single bidder contest)			0.009 (0.497)	0.008 (0.501)
Announced in 1980-1989 (vs. 1990-2002)	-0.016 (0.056)		-0.017 (0.050)	
Year fixed effects	no	yes	no	yes
Adjusted $R^2$	0.424	0.436	0.423	0.436
F-value	300.3 (0.000)	115.3 (0.000)	277.2 (0.000)	111.9 (0.000)

**Table 6**

**Large-sample (N>1,000) estimates of announcement-induced average cumulative abnormal stock returns (ACAR) to U.S. bidders.**

Study	Sample	Average announcement return: ACAR(day $\tau_1$ , day $\tau_2$ ) (*=significant at 10% level)
Loderer and Martin (1990)	N=1,135 completed mergers, 274 completed tender offers, and 3,296 "other" acquisitions (not classifiable as merger or tender offer) by public acquirers, where the offer is announced in the <i>Wall Street Journal</i> , 1996-1984.	ACAR(-5, 0) is 1.7%* for 970 cases 1966-1968, 0.57%* for 3,401 cases 19860-1980, and -0.1% for 801 cases 1981-1984. Bidder announcement returns smaller for larger bidders and decreasing in the relative size of the target firm.
Betton and Eckbo (2000)	Initial and rival bidders in N=1,353 tender offer contests for public targets, 1971-1990.	(1) Day 0 is the initial bid date: ACAR(-60, 0) is 1.3% for initial bidders and 2.2% for rival bidders. (2) Day 0 is the second bid date: ACAR(-60, 0) is 1.2% for initial bidders, and 6.1%* for rivals.
Fuller, Netter, and Stegemoller (2002)	N=3,135 takeovers, 1990-2000, by 539 public acquirers with at least 5 successful control bids within three years. Minimum deal size is \$1 million.	ACAR(-2, 2) is 1.8%* for total sample of bidders, -1.0%* when target is public, 2.1%* when target is private, and 2.8%* when target is a subsidiary.
Akbulut and Mat-susaka (2003)	N=3,466 successful mergers between public firms, 1950-2002.	ACAR(-2, 1) is 1.2%* for "related" acquisitions (bidder and target have at least one 3-digit SIC code in common) and 1.1%* for unrelated acquisition.
Officer (2003, 2004)	N=2,511 attempted mergers and tender offers between public firms, 1988-2000 (Officer, 2003).	ACAR(-3, 3) is -1.2%* for the total sample.
Moeller, Schlingemann, and Stulz (2004, 2005)	N=12,023 acquisitions, 1980-2001. Minimum deal value is \$1 million and 1% of the acquirer's assets.	ACAR(-1, 1) is 1.1%* for total sample, 2.3%* for small acquirers, and 0.1% for large acquirers. Using dollar values, bidders lose a total of \$221 billion in market capitalization over day -1 to +1. This aggregate loss is driven by a small number of very large deals concentrated to the 1998-2001 period.

*continued on next page*

Study	Sample	Average announcement return: ACAR(day $\tau_1$ , day $\tau_2$ ) (* = significant at 10% level)
Bhagat, Dong, Hirschleifer, and Noah (2005)	N=1,018 tender offers for public targets.	ACAR(-5, 5) is 0.2% with a median dollar return of -1.2 million.
Song and Walkling (2005)	N=3,389 acquisitions, 1985-2001. Minimum deal value is \$10 million.	ACAR(-1, 0) for the first bidder after a 12-month dormant period in the industry is 0.7%*, and 0.04% for subsequent bidders. Consistent with an attenuation effect of partial anticipation of takeover activity.
Bradley and Sundaram (2006)	N=12,476 completed acquisitions by 4,116 public companies, 1990-2000.	ACAR(-2, 2) is 1.4% for the total sample, -0.7% for public targets, and 1.9% when the target is private. Bidding firms experience a large stock price runup over the two-years period preceding the bid. This runup is greater for stock bids than for cash bids.
Savor (2006)	N=1,484 (159 failed and 1,335 successful) merger bids, 1990-2000. The bid is non-hostile and all-cash (359 successful cases) or all-equity (976 successful cases). Minimum deal size is 5% of bidder market value.	ACAR(-1, 1) is -3.5%* for all-stock bidders and 1.0%* for all-cash bidders. Similar results for the full sample of failed acquirers.
Dong, Hirschleifer, Richardson, and Teoh (2006)	N=3,137 merger bids and tender offers between public firms, 1978-2000	ACAR(-1, 1) ranges from -0.2% (when target is ranked as relatively "undervalued") to -1.8 (when target is ranked as relatively "overvalued")%
Moeller, Schlingemann, and Stulz (2007)	N=4,322 all-cash and all-stock bids, 1980-2002. Minimum deal value is \$1 million and 1% of the acquirer's assets.	ACAR(-1, 1) for the total sample is 0.8%. When target is public, ACAR(-1, 1) is -2.3% in all-stock deals and 0.7% in all-cash deals. When the target is private, ACAR(-1, 1) is 3.4% in all-stock deals.
Bargeron, Schlingemann, Stulz, and Zutter (2007)	N=1,292 completed all-cash takeovers of US public targets by private and public bidders, 1990-2005.	Average target announcement $CAR_{(-1,1)}$ is 32% for public bidders and 22% for private bidders.
Betton, Eckbo, and Thorburn (2007, 2008b)	N=10,806 initial control bids for public targets: 7,076 merger bids from 1980-2002 and 3,730 tender offers from 1973-2002.	ACAR(-1, 1) is -1.2%* for total sample and -0.15%* if the bidder has a toehold. In Betton, Eckbo, and Thorburn (2008b), ACAR(-1, 1) is -1.9%* for merger offers, and an insignificant 0.3% for tender offers.
Betton, Eckbo, and Thorburn (2008c)	N=15,987 initial control bids by public bidders for public or private targets, 1980-2005: 13,985 merger bids and 1,468 tender offers.	ACAR(-1, 1) is 0.69% with a significantly <i>negative</i> z-statistic of -3.9 for initial bidders in mergers, and 0.76 (insignificant) for initial bidders in tender offers. Large public bidders acquiring public targets and paying with all-cash produces ACAR(-1, 1) of -2.2%*. Small public bidders acquiring private targets in all-stock offers produces ACAR(-1, 1) of 6.5%*. Details are in Tables 7, 8 and 9 in this survey.

*continued from previous page*

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<b>Study</b>	<b>Sample</b>	<b>Average announcement return: ACAR(day <math>\tau_1</math>, day <math>\tau_2</math>) (* = significant at 10% level)</b>
Hackbarth Morellec (2008)	and N=1,086 completed takeovers between public firms, 1985-2002. Minimum transaction value of \$50 mill., and regulated and financial firms are excluded.	ACAR(-1, 1) is -0.5%*. Bidder risk changes around the acquisition events are found to be consistent with a neoclassical investment model.

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Table 7

**Cumulative abnormal stock returns (CAR) to targets and bidders (individually and combined) relative to the initial bid date. Sample of control contests for U.S. targets, 1980-2005.**

See the text for the details of the abnormal return estimation. The average market capitalization on day -42 for the target ( $V_T$ ) and bidder ( $V_B$ ), and for the ratio  $V_T/V_B$ , are reported in brackets (in \$1,000). Day 0 is the day of the initial control bid. The combined bidder and target abnormal returns are determined by weighting the bidder and target abnormal returns by the market capitalization on day -42.

	Target CAR			Initial Bidder CAR			Combined CAR		
	N (Average $V_T$ )	Runup (-41,-2)	Ann'ct (-1,1)	N (Average $V_B$ )	Runup (-41,-2)	Ann'ct (-1,1)	N (Av. $V_T/V_B$ )	Runup (-41,-2)	Ann'ct (-1,1)
<b>A: Entire sample</b>									
Mean	\$9,298	0.0680	0.1461	15,987	0.0049	0.0073	4,803	0.0072	0.0106
Median	(\$641,951)	0.0516	0.1234	(3,752,262)	-0.0024	-0.0005	(0.4445)	0.0070	0.0067
Z		25.2701	102.2990		-2.1463	-2.5297		4.2496	14.6057
% positive		0.6231	0.8271		0.4924	0.4939		0.5259	0.5640
<b>B: Subsamples based on market capitalization on day -42</b>									
Lowest quartile									
Mean	2,324	0.1019	0.1472	3,995	0.0492	0.0404	1,200	0.0009	-0.0001
Median	(11,207)	0.0708	0.1200	(28,762)	0.0154	0.0087	(0.0195)	-0.0005	-0.0011
Z		11.9283	46.8157		5.5730	21.7874		0.5042	0.1303
% positive		0.6248	0.7900		0.5357	0.5827		0.4958	0.4858
Highest quartile									
Mean	2,323	0.0365	0.1327	10,480	-0.0122	-0.0049	1,201	0.0155	0.0279
Median	(2,372,966)	0.0385	0.1156	(5,698,863)	-0.0073	-0.0035	(1.3891)	0.0149	0.0195
Z		11.2752	51.6770		-6.0704	-17.5109		4.1736	15.0328
% positive		0.6117	0.8429		0.4757	0.4599		0.5612	0.6295
<b>C: Subsamples based on the public status of the bidder and target firms</b>									
<b>Public target</b>									
Mean	9,298	0.0680	0.1461	6,301	0.0065	-0.0087	4,803	0.0072	0.0106
Median		0.0516	0.1234		0.0012	-0.0066		0.0070	0.0067
Z		25.2701	102.2990		0.5387	-19.0462		4.2496	14.6057
% positive		0.6231	0.8271		0.5034	0.4269		0.5259	0.5640
<b>Private target</b>									
Mean				9,686	0.0040	0.0176			
Median					-0.0051	0.0029			
Z					-3.1918	12.1118			
% positive					0.4852	0.5375			

Table 8  
 Cumulative abnormal announcement returns in control contests (continued from Table 7).

	Target CAR			Initial Bidder CAR			Combined CAR		
	N	Runup (-41,-2)	Ann't (-1,1)	N	Runup (-41,-2)	Ann't (-1,1)	N	Runup (-41,-2)	Ann't (-1,1)
<b>D: Subsamples based on form of initial bid</b>									
<b>Merger</b>									
Mean	6,836	0.0619	0.1338	13,995	0.0050	0.0069	3,939	0.0071	0.0060
Median		0.0481	0.1134		-0.0024	-0.0008		0.0070	0.0037
Z		20.7051	88.2153		-2.2479	-3.8858		3.5536	7.7429
% positive		0.6181	0.8212		0.4921	0.4920		0.5268	0.5380
<b>Tender offer</b>									
Mean	2,320	0.0868	0.1881	1,468	0.0060	0.0076	837	0.0090	0.0335
Median		0.0693	0.1707		0.0006	0.0011		0.0073	0.0232
Z		14.9492	52.7321		0.5420	0.9110		2.6312	18.4987
% positive		0.6427	0.8573		0.5014	0.5123		0.5245	0.6941
<b>E: Subsamples based on method of payment of initial offer</b>									
<b>All-Cash</b>									
Mean	2,846	0.0765	0.2023	1,857	-0.0039	0.0081	996	0.0011	0.0285
Median		0.0523	0.1797		-0.0027	0.0025		0.0039	0.0170
Z		15.0345	65.3668		-1.1140	7.7136		1.4279	18.6150
% positive		0.6283	0.8949		0.4890	0.5315		0.5120	0.6837
<b>All-Stock</b>									
Mean	2,163	0.0680	0.1396	5,189	0.0096	0.0025	1,909	0.0092	-0.0030
Median		0.0533	0.1215		-0.0003	-0.0044		0.0083	-0.0016
Z		12.6045	46.7639		0.8922	-10.0304		3.0591	-2.5634
% positive		0.6301	0.8174		0.4993	0.4531		0.5343	0.4819
<b>F: Subsamples based on time period of initial offer</b>									
<b>1991-1995</b>									
Mean	1,601	0.0608	0.1344	3,654	0.0102	0.0169	941	0.0012	0.0131
Median		0.0485	0.1141		-0.0027	0.0017		0.0019	0.0079
Z		9.0822	43.0355		-0.9762	6.6646		0.4272	6.0191
% positive		0.6121	0.8189		0.4910	0.5216		0.5090	0.5770
<b>1996-2000</b>									
Mean	3,008	0.0818	0.1564	5,464	0.0039	0.0074	1,816	0.0099	0.0072
Median		0.0674	0.1372		-0.0017	-0.0008		0.0108	0.0052
Z		16.6761	56.6973		-0.3038	-1.4063		3.6605	5.9602
% positive		0.6483	0.8328		0.4941	0.4929		0.5391	0.5435

**Table 9**  
**Summary of initial bidder three-day announcement-period abnormal returns,**  
**1980-2005**

Initial bidder cumulative abnormal returns for the window -1,1 relative to the initial control bid. Large bidders are bidders in the upper quartile of market capitalization on day -42 (in constant 2000 dollars) and small bidders are bidders in the lower quartile of market capitalization on day -42. The cutoff values for the upper and lower quartiles are \$134 million and \$2.2 billion respectively. The method of payment is determined from the SDC 100% cash or 100% stock consideration field. The public status of the target is determined from SDC. \*\* represents significance at the 1% level (2 sided test).

Sample	Public targets		Private targets	
	N	CAR(-1,1)	N	CAR(-1,1)
<b>A: Large bidders</b>				
All-stock	769	-0.0221**	445	0.0010
All-cash	439	-0.0030**	88	0.0026**
<b>B: Small bidders</b>				
All-stock	495	-0.0006	872	0.0646**
All-cash	190	0.0306**	184	0.0176**

**Table 10**

**Percent average five-year buy-and-hold stock returns ( $\overline{\text{BHR}}$ ) for merged firms, non-merging matched firms, and the difference between merged and matched firms, 1980–2006.**

Buy-and-hold percent returns are defined as:

$$\overline{\text{BHR}} \equiv \sum_{i=1}^N \omega_i \left[ \prod_{t=\tau_i}^{T_i} (1 + R_{it}) - 1 \right] \times 100.$$

The sampling of merged firms starts in February 1980 and ends in December 2003, while the return holding period is allowed to continue to December 2006. The total sample of merged firms with information on matched firms is 15,298. The non-merging matched firms are firms that did not merge in the previous five-year period and have similar total equity size and book-to-market ratio. When equal-weighting,  $\omega_i \equiv 1/N$ , and when value-weighting,  $\omega_i = MV_i/MV$ , where  $MV_i$  is the firm’s common stock market value at the start of the holding period and  $MV = \sum_i MV_i$ . The abnormal buy-and-hold returns shown in the column marked “Diff” represent the difference between the  $\overline{\text{BHR}}$  in the “Merged” and “Match” columns. “N” is the total number of issues. The  $p$ -values for equal-weighted abnormal returns are  $p$ -values of the  $t$ -statistic using a two-sided test of no difference in average five-year buy-and-hold returns for issuer and matching firms. The  $p$ -values for the value-weighted abnormal returns are computed using  $U \equiv \omega'x/(\sigma\sqrt{\omega'\omega})$ , where  $\omega$  is a vector of value weights and  $x$  is the corresponding vector of differences in buy-and-hold returns for issuer and match. Assuming that  $x$  is distributed normal  $N(\mu, \sigma^2)$  and that  $\sigma^2$  can be consistently estimated using  $\sum_i \omega_i(x_i - \bar{x})^2$ , where  $\bar{x} = \sum_i \omega_i x_i$ ,  $U$  is distributed  $N(0, 1)$ .

Merger sample period	N	Equal-weighted $\overline{\text{BHR}}$				Value-weighted $\overline{\text{BHR}}$			
		Merged	Matched	Diff	$p(t)$	Merged	Matched	Diff	$p(t)$
1980-2003	15,298	62.6%	84.6	-21.9	0.000	32.6	49.6	-17.1	0.000
1980-1989	3,815	83.6	95.1	-11.5	0.003	102.0	113.9	-12.0	0.120
1990-2003	11,483	55.7	81.1	-25.4	0.000	26.7	44.2	-17.5	0.000

**Table 11**  
**Alphas and factor loadings for five-year rolling portfolios of merged firms,  
non-merging matched firms, and long-short merged-matched firms, 1980–2006.**

The merged-matched portfolio is a zero-investment portfolio that is long in the merged firms and short in the non-merging matched firms. The portfolios are either equal-weighted ("EW") or value-weighted ("VW"). The non-merging matched firms are firms that did not merge in the previous five-year period and have similar total equity size and book-to-market ratio. The portfolios are formed starting in February 1980: a firm is added to the portfolio in the month following the month of the effective merger date and held for the minimum of five years and until delisting. The merger sampling stops in 12/2003, yielding a total of 15,298 successful mergers with data on size- and book-to-market matched firms. The abnormal return estimation ends in December 2006. Abnormal returns are estimated using the following asset pricing model:

$$r_{pt} = \alpha_p + \beta_1 RM + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD + \beta_5 LMH + e_t$$

where  $r_{pt}$  is the portfolio excess return, RM is the excess return on the CRSP value weighted market index, SMB and HML are the Fama and French (1993) size and book-to-market factors, UMD is a momentum factor constructed as the returns difference between the one-third highest and the one-third lowest CRSP performers over the past 12 months, and LMH is the Eckbo and Norli (2005) turnover factor (a portfolio long in low-turnover stocks and short in high-turnover stocks). The coefficients are estimated using OLS. Standard errors are computed using the heteroskedasticity consistent estimator of White (1980). The numbers in parentheses are  $p$ -values.  $R^2$  is the adjusted R-squared.

Portfolio	$\alpha_p$	RM	SMB	HML	UMD	LMH	$R^2$
EW-merger	0.08 (0.434)	1.05 (0.000)	0.62 (0.000)	0.26 (0.000)	-0.28 (0.000)	-0.13 (0.070)	0.943
EW-match	0.23 (0.003)	0.97 (0.000)	0.52 (0.000)	0.24 (0.000)	-0.19 (0.000)	-0.14 (0.019)	0.949
EW-zero	-0.15 (0.050)	0.09 (0.000)	0.11 (0.000)	0.02 (0.333)	-0.09 (0.000)	0.01 (0.785)	0.239
VW-merger	0.02 (0.838)	1.07 (0.000)	-0.08 (0.029)	-0.10 (0.016)	-0.05 (0.028)	-0.01 (0.828)	0.935
VW-match	0.11 (0.076)	1.00 (0.000)	-0.14 (0.000)	-0.06 (0.016)	-0.02 (0.266)	0.07 (0.100)	0.949
VW-zero	-0.09 (0.288)	0.06 (0.017)	0.06 (0.027)	-0.03 (0.386)	-0.03 (0.181)	-0.09 (0.071)	0.170

**Table 12**

**Predicted abnormal returns to merging firms and their industry rivals under market power and productive efficiency hypotheses, classified by whether the event increases or decreases the probability of merger in the industry.**

Examples of positive information effects on rival firms are the case where the merger announcement reveals possibilities for efficiency gains also available to non-merging rivals and the case where the merger signals an increase in demand for resources generally owned throughout the industry of the merging firms.

<b>Theory predicting the source of the merger gains</b>	<b>Abnormal returns to merging firms</b>	<b>Abnormal returns to industry rivals</b>
<b>A. Events increasing the probability of merger (e.g. initial merger proposal announcement)</b>		
<b>Market Power:</b>		
(1) Collusion	<i>Positive</i> (monopoly rents)	<i>Positive</i> (monopoly rents)
(2) Predatory pricing	<i>Positive</i> (monopoly rents)	<i>Negative</i> (costs of price war)
<b>Productive Efficiency:</b>		
(3) Productivity increase	<i>Positive</i> (cost savings)	<i>Negative</i> (competitive disadvantage)
(4) Information	<i>Positive</i> (undervalued resources)	<i>Zero or Positive</i> (undervalued resources and/or opportunities for productivity increases)
<b>B. Events decreasing the probability of merger (e.g. antitrust complaint blocks the merger)</b>		
<b>Market Power:</b>		
(1) Collusion	<i>Negative</i> (loss of monopoly rents)	<i>Negative</i> (loss of monopoly rents)
(2) Predatory pricing	<i>Negative</i> (loss of monopoly rents)	<i>Positive</i> (avoiding price war)
<b>Productive Efficiency:</b>		
(3) Productivity increase	<i>Negative</i> (loss of cost savings)	<i>Positive</i> (avoiding competitive disadvantage)
(4) Information	<i>Zero</i> (information already out)	<i>Zero</i> (information already out)

**Table 13**  
**Predicted abnormal returns to merging firms, rivals, customers, and suppliers.**  
**Source: Shahrur (2005)**

	Productive efficiency	Collusion	Buyer power
<b>Merging firms:</b>	<i>Positive</i>  More-efficient production will result in higher infra-marginal rents to the merging firms	<i>Positive</i>  Higher likelihood of collusion will result in increased monopoly rents to the merging firms (Eckbo, 1983)	<i>Positive<sup>a</sup></i>  Lower input prices due to intensified competition among suppliers (Snyder, 1996)
<b>Rivals:</b>	<i>Unrestricted</i>  <u>Positive:</u> information regarding industry-wide restructuring. <u>Negative:</u> more-intense competition in the industry due to a new, more-efficient combined firm (Eckbo, 1983)	<i>Positive</i>  Higher likelihood of collusion will result in increased monopoly rents to rival firms (Eckbo, 1983)	<i>Positive<sup>a</sup></i>  Lower input prices due to more intense competition among suppliers (Snyder, 1996)
<b>Customers:</b>	<i>Unrestricted<sup>b</sup></i>  <u>Positive:</u> scale-increasing mergers. <u>Negative:</u> scale-decreasing mergers	<i>Negative</i>  Restricted output in the takeover industry results in lower demand for suppliers' output	<i>Unrestricted<sup>c</sup></i>  <u>Positive:</u> benefit from lower input costs for merging firms. <u>Negative:</u> supplier underinvestment
<b>Suppliers:</b>	<i>Unrestricted<sup>b</sup></i>  <u>Positive:</u> scale-increasing mergers. <u>Negative:</u> scale-decreasing mergers and/or more-efficient combined firm	<i>Negative</i>  Restricted output in the takeover industry results in lower demand for suppliers' output	<i>Negative<sup>a</sup></i>  The increased buyer power of the merging firms will intensify competition among suppliers (Snyder, 1996)

<sup>a</sup>Efficient mergers can be of the scale-increasing or the scale-decreasing types (see, e.g. Eckbo, 1992; Andrade and Stafford, 2004). If the merger is expansionary in nature, it should benefit customers. Suppliers can benefit from a scale-increasing merger as long as the positive effect of expansion is not outweighed by the adverse effect of the increased efficiency of the combined firm. Finally, an efficient merger of the scale-decreasing type can hurt customers and suppliers.

<sup>b</sup>Snyder (1996) shows that by creating a larger buyer, a horizontal merger can result in more intense competition among suppliers, which will benefit the merging firms and their rivals at the expense of suppliers.

<sup>c</sup>Customers may benefit from the increased buyer power if some of the gains resulting from lower input prices are passed on to them because of competition in the takeover industry. Customers can also suffer if the increased buyer power induces suppliers to underinvest.

**Table 14**  
**Stock market studies examining industry wealth effects of horizontal mergers**

Study	Merger Sample	Selection of Industry Rival, Customers and Suppliers	Key Findings
Stillman (1983)	11 U.S. horizontal mergers challenged by DOJ or FTC with violating Section 7 of the Clayton Act, 1964–72	Rival firms identified in antitrust litigation reports and antitrust enforcement agency fact memoranda	Zero average abnormal returns to rivals. Results inconsistent with market power effects of the sample mergers
Eckbo (1983)	191 U.S. horizontal and 68 vertical mergers between mining or manufacturing firms operating nationally, 1963–78. 65 horizontal and 11 vertical mergers were challenged by DOJ or FTC under Section 7	Rival firms selected from the major target industry using a <i>five</i> -digit SIC-based product classification procedure created by the author. For challenged mergers, the relevant industry is identified using court documents	Rival firms earn zero or positive abnormal returns in response to <b>both</b> the initial merger proposal announcement and the subsequent antitrust complaint. Results inconsistent with the market power (collusion) effects of the horizontal mergers
Eckbo and Wier (1985)	82 U.S. challenged horizontal mergers, 1963–81, including 65 from Eckbo (1983). 17 cases occurred after the passage of the 1978 Hart-Scott-Rodino Antitrust Improvements Act	Two sets of rivals: one based on five-digit SIC codes as in Eckbo (1983), and another identified in antitrust litigation reports	Rival firm performance inconsistent with market power either before or after 1978. This conclusion holds for both sets of rivals
Eckbo (1985)	266 U.S. merger proposals (196 horizontal, 98 challenged), including those in Eckbo (1983) and Eckbo and Wier (1985), 1963–81	Rivals selected using the 5-digit SIC code procedure of Eckbo (1983)	Industry wealth effect <i>negatively</i> related to merger-induced increase in industry concentration. Inconsistent with predictions of the Market Concentration Doctrine
Eckbo (1992)	471 merger proposals (312 horizontal), 266 between U.S. firms and 205 between Canadian firms, 1963–82. 80 of the U.S. horizontal mergers were challenged under Section 7, none of the Canadian mergers were challenged	Rivals for both U.S. and Canadian mergers identified using the 5-digit SIC code procedure of Eckbo (1983)	No evidence of market power despite no antitrust deterrence of anticompetitive mergers in Canada until 1985. Industry wealth effect <i>negatively</i> related to merger-induced increase in industry concentration.

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<b>Study</b>	<b>Merger Sample</b>	<b>Selection of Industry Rivals, Customers and Suppliers</b>	<b>Key Findings</b>
Schumann (1993)	37 acquisitions challenged by the FTC, 1981–87	Rival firms identified using antitrust litigation reports	Positive rival firm performance at merger proposal and zero or positive at antitrust complaint. At the complaint, rival returns lower the greater the merger-induced change in concentration
Fee and Thomas (2004)	554 proposed (four-digit SIC) U.S. horizontal mergers between publicly traded firms from SDC, 39 challenged under Section 7, 391 deals completed, 1981–1997	Identifies single- and multiple-segment rivals in same 4-digit horizontal industry using Compustat industry segment information. The segment information also helps identify customers and suppliers	Evidence inconsistent with increased monopolistic collusion, but consistent with improved efficiency and buying power of merged firm
Shahrur (2005)	463 successful (four-digit SIC) U.S. horizontal mergers and tender offers from SDC, 1987–99	Identifies single-segment rivals, and customer and supplier firms, using Compustat industry segment information	Evidence inconsistent with increased monopolistic collusion, but consistent with improved efficiency and buying power of merged firm
Aktas, de Bodt, and Roll (2006)	290 proposed horizontal mergers in the European Union, of which 55 were subjected to "in depth investigation" for potential antitrust violation. Bidder is a non-EU firm in 104 cases	Rival firms identified in same country and industrial sector as target using Hoover's Online Database, European Commission Web Site, and Datastream	Negative rival abnormal performance around merger proposal announcements. Suggests the sample mergers enhance industry competitiveness
Bhattacharyya and Nain (2006)	615 successful (four-digit SIC) U.S. horizontal mergers, 1989-2000, from SDC	Use Bureau of Economic Analysis benchmark Input-Output tables to identify the fraction of the supplier industry's output sold to the merging industry	Conclude with increased buying power based on post-merger decline in supplier product prices
Akdogu (2007a)	N=275, of which 115 (four-digit SIC) U.S. horizontal takeover bids in the telecommunications industry, 1996-2005	Rivals firms identified using SDC and CRSP, using SIC code 4813.	Evidence of negative industry wealth effect of the acquisition bids. Conclude that acquirers are on average expected to gain competitive advantage from the takeovers.

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<b>Study</b>	<b>Merger Sample</b>	<b>Selection of Industry Rivals, Customers and Suppliers</b>	<b>Key Findings</b>
Becher, Mulherin, and Walkling (2008)	384 successful mergers between electric utilities, 1980-2004	Rival firms are all public utilities with assets > \$500 mill.	Evidence inconsistent with market power but consistent with efficiency (synergy) effects of the horizontal mergers
Shenoy (2008)	453 successful vertical mergers, 1981-2004	Use Bureau of Economic Analysis benchmark Input-Output tables to identify the main customer industries and rivals. Customer portfolios based on single-segment firms	Evidence fail to support market power but consistent with vertical mergers having efficiency effects

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**Table 15**  
**Summary of empirical results on corporate takeovers, classified by research topic**

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**Topic**

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**A. Takeover Activity:**

- (1) Merger waves (clustering of takeovers) tend to occur in periods of market booms. They occurred in the late 1800s and early 1900s ("the monopolization wave"), the late 1960s ("the conglomerate wave"), the mid 1980s ("the refocusing wave"), and the late 1990s ("the strategic/global wave").
- (2) There is substantial evidence of industry-clustering of mergers. Regulatory changes and macroeconomic liquidity variables are better predictors of industry merger waves than are market-to-book ratios.
- (3) In the period 1996-2000, when market valuations were particularly high, the sum of all-cash and mixed cash-stock bids was equal to the number of all-stock bids. Also, in this period, the proportion all-stock offers was the same as during the previous five-year periods.
- (4) Despite strong merger patterns, predicting target firms with any accuracy has proven difficult.
- (5) Target firms increasingly initiate the takeover process by soliciting bid indications from a set of potential negotiating partners. The bidder that is selected is recorded as the first bidder in SEC registration documents and therefore by data bases such as SDC (Thomson Financial).
- (6) When organizing all SDC control bids into contest for U.S. targets, there were a total of 35,727 control contests. Of these, the initial bidder proposed a merger in 28,994 cases and made a public tender offer in another 4,500 cases (the balance being 2,224 controlling-block trades).
- (7) In constant 2000 dollars, the merger deal was valued at \$436 million on average (median (\$35 mill.)), while the deal value of the average tender offer was \$480 (median \$79 mill.).
- (8) SDC provides information on the payment method for about half of the cases. Of these, 26% were all-cash deals, 37% were all-stock deals, and 37% were mixed cash-stock deals. All-cash and mixed offers have similar deal sizes, slightly above all-stock deals.
- (9) A total of 590 initial bids are classified as "hostile" and another 435 deals are "unsolicited". Hostile bids have substantially higher than average deal values.
- (10) In approximately thirty percent of all deals, the initial bidder and target operate in the same four-digit SIC industry (horizontal takeover). The two most active takeover sectors are Manufacturing, and Finance/Insurance/Real Estate.
- (11) Two-thirds of the 35,727 initial bidders are public companies, while 37% of the targets are public. In 44% of the initial bids, a public bidder is pursuing a private target (the largest single group of takeovers), with an average deal value of \$114 mill. (median \$23 mill.). The total number of deals involving either a public bidder or target rose sharply in the 1990s.

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- (12) Of the 35,727 initial bidders, 11% were foreign companies (primarily Canada and the UK). Deals involving foreign bidders are relatively large.
- (13) The time from the initial offer to the effective takeover date averages 108 trading days (median 96) when the initial bid is a tender offer, and 71 days (median 49) for merger bids. In cases where there are more than one control bid for the target, the time from the first to the second bid averages 40 trading days (median 19).
- (14) The likelihood that the initial bidder wins the target is higher when the bidder has a toehold, when the payment method is all-cash, when the bid form is tender offer, and when the bidder is a public company. The probability of winning is lower for targets with poison pills, and when the target reaction is negative. All bids fail (no bidder wins) in 22% of the cases, with a greater failure probability for private bidders.

**B. The Payment Method:**

- (15) Bidders initiating takeover bids for U.S. targets over the period 1980-2005 offered all-cash as payment in 26% of the cases, all-stock in 37%, and a mix of stock of cash in 37%.
- (16) The majority of tender offers are all-cash or a mix of cash and stock. while the majority of merger bids are in the form of all-stock (with the exception of the 1980-85 period where most merger bids offered a mix cash-stock payment).
- (17) In the two subperiods 1990-1995 and 1996-2000, the percentage all-stock offers in initial merger bids were approximately 55% in *both* period. This means that (1) nearly half of the initial merger bids in the 1990s use some cash as payment, and (2) the fraction of merger bids where the payment is all-stock percentage all-stock merger bids remained unaffected by the significant runup in overall market valuations in the 1996-2000 period.
- (18) The payment method choice is in part determined by tax considerations, the degree of information asymmetry between the bidder and the target, the degree of market mispricing of bidder stock, and by corporate control considerations. Stock offers are more likely the greater the bidder's asset size and market-to-book ratio. Stock offers are less likely the greater the bidder management's shareholdings and the greater the dispersion in analyst forecast of bidder earnings.
- (19) Offer premiums are greater in all-cash offers than in all-stock offers. The probability that the initial bidder wins the target is lower for all-stock offers than for cash offers.
- (20) When the target is public, bidder announcement returns are on average negative in all-stock offers and greater in all-cash and mixed cash-stock offers than in all-stock offers. Moreover, bidder announcement-induced stock returns are increasing in the cash-portion of the (mixed) offer.
- (21) When the target is a private company, stock offers generate positive bidder announcement returns that are as high—if not higher—than for all-cash bids.

**C. Toehold Bidding:**

- (22) The frequency of toehold bidding in friendly mergers and tender offers has fallen dramatically since the 1980s. Over the 1990-2002 period, 7% of bidders initiating a takeover had toeholds, and only 2% had toeholds acquired in the market shortly prior to launching the bid.

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- (23) Toehold bidding remains common in hostile bids (50% frequency).
- (24) Toeholds are large when they exist: on average 20%.
- (25) Toehold bidders tend to pay lower offer premiums and win the target more often than zero-toehold bidders.
- (26) The presence of a bidder toehold attenuates the drop in the target share price when all bids fail.
- (27) Since bidder toehold benefits mirror target toehold costs (lower offer price, greater probability of target management being replaced) toehold bidding may be viewed as aggressive by the target. Thus, approaching the target with a toehold may cause some otherwise friendly targets to refuse negotiations. Consistent with this, the data indicates a significantly negative association between the likelihood of the initial bidder approaching with a toehold and the expected value of resistance costs (including the opportunity loss of a termination agreement).

**C. Bid Jumps and Markup Pricing:**

- (28) The average offer premium in successful single-bid takeover contests is somewhat higher than the average initial offer premium in multi-bid contests. This is consistent with the greater premium preempting competition in ex post successful single-bid cases.
- (29) Bid revisions are substantial, with an average bid jump from the first to the second bid in the contest of 10% (a 31 % change in the offer premium).
- (30) A dollar increase in the pre-offer target share price runup causes the initial bidder to mark up the total offer premium by \$0.80.
- (31) Markup pricing notwithstanding, bidder takeover gains are increasing in the target runup. Thus, takeovers with greater target runups are more profitable for *both* bidder and target firms, which may also explain why bidders agree to (partial) markup pricing.
- (32) Toehold acquisitions during the runup period bidder increases the target runup. When the toehold is acquired by the initial bidder, however, the markup is reduced. No such markup reduction is observed when the toehold is acquired by another investor.

**D. Takeover Defenses:**

- (33) The presence of a majority of independent directors on the board of the target is viewed by the court as a strong indication of satisfaction of the fiduciary duty of loyalty.
- (34) Delaware case law sanctions the right to "just say no" to an unsolicited takeover bid. That is, the board may determine in good faith that the continuing independence of the corporation is in the long-term best interest of the corporation and its stockholders.
- (35) If the board's defensive response is not "draconian" (i.e., it is neither coercive nor preclusive) but "within the range of reasonableness" given the perceived threat, the board is protected by the business judgement rule. A defense that is deemed preclusive because it frustrates, impedes or disenfranchises a shareholder vote is unlikely to be upheld.

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- (36) The twin defense of staggered board election and a poison pill ("shareholder rights plan") is "draconian" in the eyes of many economists but not the court. However, "dead hand" pills (where only directors not up for election may vote to rescind the pill) have been struck down.
- (37) The fraction of "hostile" (sum of unsolicited bids and bids where target is explicitly hostile) drops sharply after 1989, from more than 20% in the 1980s to less than 3% by the end of the 1990s.
- (38) Offer premiums are no lower for targets with poison pills.
- (39) There is a small but significantly negative market reaction to the adoption of strong antitakeover amendments such as poison pills and staggered board. The market reacts positively to antigreenmail amendments provided these occur when a takeover is rumored.

**E. Targets in Bankruptcy:**

- (40) There is a trend towards market-based mechanisms for resolving Chapter 11 cases, including sale of the firm to a bidder. Target firms that are sold spend less time in Chapter 11, which lowers bankruptcy costs. Acquirers tend to be in the same industry, and premiums paid are on average lower than in takeovers of non-bankrupt firm in the same industry.
- (41) Premiums paid for targets sold in mandatory, open, first-price, all-cash bankruptcy auctions in Sweden suggest the possibility that the auction mechanism may work well for the typical Chapter 11 case as well (which is of a similar size as the Swedish sample firm).
- (42) The average mandatory auction receives three bids and lasts two months; three-quarters of the auctioned firms are sold as going concern; the prices paid in these going-concern sales do not exhibit fire-sale discounts; and competition among bidders appear to force insiders to pay premiums comparable to those paid by outsiders.
- (43) The bankrupt firm's major creditor (bank) often finances a bidder in the auction, which pushes the auction towards overbidding. Post-bankruptcy operating performance is found to be at par with non-bankrupt industry rivals, regardless of overbidding incentives, suggesting that the auction leads to a relatively efficient restructuring of the target firm.

**F. Offer Premiums:**

- (44) Large-sample evidence on offer premiums are only starting to emerge. This evidence indicates that both the initial and final offer premiums are
- greater after the 1980s;
  - greater for public bidders;
  - greater in all-cash offers;
  - lower for toehold bidders;
  - increasing in the target runup (markup pricing);
  - decreasing in target total equity capitalization and grater if the target's book-to-market ratio exceeds the industry median market-to-book ratio;
  - greater in the presence of substantial dispersion in analysts' earnings forecasts;
  - lower when the bidder CEO is female, and the higher the target board's proportion of female directors (provided that the female directors are independent appointees).
  - unaffected by either the presence of a target poison pill or target hostility to the initial bid;

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**G: Takeover Gains:**

- (45) The average target cumulative average abnormal stock return (CAR) is positive and significant, both over the runup period and the announcement period. The runup constitutes about one-third of the total runup plus announcement CAR. The largest target CAR occurs in all-cash offers.
- (46) The average, value-weighted combined CAR to bidders and targets is positive and significant over both the runup period and the announcement period. For the overall sample used here, the sum of the combined CAR for the runup- and announcement periods is a significant 1.79%.
- (47) Bidder announcement period CARs average close to zero for the overall sample, with 49% of the bidders having negative CAR. The combination large bidder (here in the upper size quartile), payment in all-stock, and the target being a public company represents a "worst-case scenario" with average bidder announcement-period CAR of a significant -2.21%. The "best-case scenario" for the bidder is the combination of a small bidder (lower size-quartile), private target and *all-stock* as payment. This produces a significant average bidder announcement-period CAR of 6.46%.
- (48) The major driver of negative bidder returns is not, as previously thought, the all-stock payment. Rather, the two key drivers are the target's status a public or private, and bidder size.
- (49) Bidder size was particularly large in 1999 and 2000. These years were unusual relative to years before *and* years after. Cisco, with a (constant 2000 dollar) market capitalization of \$180 billion was the dominant bidder in *both* the upper 1% and lower 1% tails of the distribution of bidder abnormal announcement returns. Removing Cisco from the sample reduces the aggregate bidder dollar wealth loss in 1999-2000 period by almost \$100 billion.
- (50) Studies of long-run abnormal stock returns use either the matched-firm technique or Jensen's alpha (regression constant in an asset pricing model) to measure expected return to the merged firms in the sample. With 15,298 successful takeovers completed during the period 1980-2003, we show that long-run returns are significantly negative based on the matched-firm technique and insignificantly different from zero based Jensen's alpha.
- (51) The standard matched-firm procedure identifies firms that have significantly different factor loadings than the event firms—which undermines their role as "matches".
- (52) A zero-investment portfolio strategy which is long in the merged firms and short in the matched firms fail to produce long-run abnormal stock returns which are significantly different from zero, even for the sample of all-stock mergers.

**H. Bondholders, Management, and Arbitrageurs:**

- (53) Studies of excess returns to bondholders of bidder and target firms find zero or negative gains to bidder bondholders and positive gains to target bondholders. There is no evidence of a wealth transfer from stockholders to bondholders due to a coinsurance effect of mergers. As of the 1990s, target bondholders are often fully protected via event risk covenants.
- (54) Some target firms, particularly those receiving hostile bids, underperform prior to becoming targets. Moreover, CEO turnover increases after hostile bids. These findings indicate a disciplinary role played by the market for corporate control. There is, however, indications that this external control mechanism represents a "court of last resort".

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- (55) There is evidence that managers undertaking value-reducing acquisitions face a greater probability of being replaced than do managers undertaking value-increasing acquisitions. That is, bad bidders risk being fired.
- (56) There is evidence that CEO compensation (other than turnover) changes following acquisition activity. The market reaction to merger announcements tends to be positive and greater for CEOs with above-average equity-based compensation, suggesting that compensation affects the quality of managerial investment decisions.
- (57) CEOs with high equity-based compensation tend to seek out targets with relatively high market-to-book ratios (growth firms). This is consistent with high equity compensation inducing risk-taking behavior.
- (58) Empirical measures of CEO "power" helps explain the cross-sectional variation in M&A bonuses. Deal announcement induced abnormal stock returns tend to be lower for CEOs with greater "power", suggesting that power may be misused.
- (59) While a poorly performing acquisition reduces the value of the CEO's portfolio of stocks and options, there is evidence that the value of post-acquisition grants more than compensates for this value reduction. This indicates that CEOs face combination of low downside risk and high upside potential from making good acquisition decisions.
- (60) There is evidence that some target firm CEOs may be sacrificing takeover premium in return for a "golden handshake" from the bidder (to step aside and relinquish control).
- (61) There is evidence that boards dominated by outside directors tend to increase value for their shareholders during an acquisition attempt. Target directors are rarely retained after a completed takeover, and their number of board seats and income levels tend to drop. This indicates that failing as a monitor imposes a personal cost on directors.
- (62) There is substantial evidence of increased trading activity in the bidder and target shares following merger announcements. In all-cash offers, merger (risk) arbitrageurs purchase target shares without shorting the bidder shares. In all-stock deals, arbitrageurs short the bidder stock using the exchange rate. If the exchange ratio is floating, the short sales are postponed until the final pricing has been set and the floating ratio has been fixed.
- (63) There are substantial (risk-adjusted) returns to merger arbitrage strategies. Moreover, the short selling activity appears to put downward pressure on the acquirer stock price that may account for almost half of the negative announcement return for acquirers of stock-financed mergers.

**I. Mergers, Competition and Antitrust:**

- (64) Merger-induced changes in product and factor prices directly translate into abnormal stock returns to the merging firms' industry rivals, upstream suppliers and downstream customers. Market power theories (collusion, predation, buying power) and productive neoclassical efficiency theories make empirically testable predictions for these abnormal stock returns. Such tests complements and extend traditional product price analysis seen in industrial economics.
- (65) The power of tests based on stock returns depend on the accurate identification of related firms (rivals, customers, suppliers). Since much of the available evidence indicates significant contagion effects of horizontal merger announcements on these related firms, the tests appear to have sufficient power. Related firms are identified using four-digit SIC codes, Compustat industry segment information, and the Bureau of Economic Analysis Input Output tables.

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- (66) The tests utilize two sets of samples: Mergers that have been challenged with violation of antitrust laws (or, in the European Union, reviewed for such violation), and non-challenged mergers. For challenged mergers, the tests exploit *two* events with (typically) opposing implications for the industry wealth effects, thus increasing power to reject.
- (67) The empirical studies typically conclude against horizontal market power effects of horizontal mergers, whether or not these were challenged. That is, the observed wealth effects on horizontal rivals and downstream (corporate) customers do not support increased market power. Some studies find traces of monopsony (buying power) effects vis-a-vis upstream suppliers.
- (68) A horizontal merger *causes* a measurable increase in industry concentration (equal to twice the product of the market shares of the bidder and target when using the Herfindahl measure of concentration). The classical market concentration doctrine holds that increases in concentration reliably increases the industry's market power and thus industry monopoly rents. Since the abnormal returns to industry rivals directly measures changes in industry rents, regressing the merger-induced rival abnormal returns on the change in industry concentration provides a powerful test of the market concentration doctrine. Empirical tests reject the doctrine.
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