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Revisiting acquirer returns: Evidence from unanticipated deals*

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Abstract

This paper examines the implications of market anticipation of impending merger and acquisition (M&A) deals on the assessment of acquirer wealth effects through event study methods. We find evidence suggesting that prior studies have understated the gains to acquirers. The documented negative or near-zero abnormal returns to acquirers appears to be confined to sub-samples of highly-anticipated deals. By contrast, unanticipated acquirers gain significantly from M&As, achieving average cumulative abnormal returns of 5.4% to 7.5% in the seven days around the bid announcement. Empirically, we show that market anticipation partly explains (1) the documented low returns to acquirers, (2) the positive abnormal return spillover to close rivals of acquirers, and (3) the declining returns to serial acquirers across successive deals. Overall, our study provides evidence against several stylised facts and sheds light on the puzzle that M&A activity persists despite recurrent research findings that they do not create value for acquirers.

Keywords: Acquirers, Event studies, Takeovers, Market anticipation, Rivals, Serial acquirers.

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1 Introduction

One paradox at the heart of corporate finance research is the recurrent finding that mergers and acquisitions (M&As) lead to a systematic loss of wealth to acquirers (see, e.g., Alexandridis et al., 2017; Faccio et al., 2006; Franks and Harris, 1989; Jaffe et al., 2015; Jensen and Ruback, 1983; Renneboog and Vansteenkiste, 2019; Wang and Lahr, 2017; Xu, 2017). This stylised fact underlies several streams of research seeking to explain the phenomenon. For example, leveraging on this finding, prior studies explore the extent to which hubris (Roll, 1986), entrenchment (Morck et al., 1990) and over-payment (Harford et al., 2012) explain the negative acquirer returns, as well as how corporate governance improvements (Alexandridis et al., 2017) and certain governance features, such as institutional ownership (Andriosopoulos et al., 2016), partly address associated agency problems. Importantly, this stylised fact—negative abnormal returns to acquirers—is inconsistent with the observation that M&As remain a ubiquitous feature of the global corporate landscape. Indeed, by our estimates (see Figure 1), the value (and number) of US M&A deals increased from $45.5bn (233 deals) in 1988 to $469.7bn (553 deals) in 2017 with a high of $599.9bn (1,280 deals) in 2015 (1998).[1] In the face of these statistics, the view that M&As are a source of systematic value destruction is a puzzle—one which our study seeks to revisit.

Like ours, a few recent studies seek to re-examine the negative acquirer abnormal return puzzle (Alexandridis et al., 2017; Harford et al., 2011; Matvos and Ostrovsky, 2008). Amongst others, Matvos and Ostrovsky (2008), for example, argue that institutional investors do not lose from M&As as they hold stocks both in targets (who gain significantly) and acquirers (who lose marginally), while Alexandridis et al. (2017) find that acquirer returns have significantly increased since the 2007-2009 financial crisis, partly due to substantial improvements in corporate governance quality amongst acquiring firms.

Our study provides an alternative view with, perhaps, more profound implications for M&A research and established stylised facts. Specifically, we argue that short-run event

[1] This represents all US deals with available M&A data. Deal values are not adjusted for inflation.

studies, which is the method of choice in M&A research (e.g., Alexandridis et al., 2017; Brooks et al., 2018) systematically understate the gains to acquirers by ignoring the *fact* that market participants actively anticipate M&A activity ex-ante (Cremers et al., 2009; Danbolt et al., 2016; Palepu, 1986). Consistent with semi-strong form market efficiency assumptions, share prices should broadly reflect the likelihood that firms will engage in future deals, such that when these deals are subsequently announced, the market only *corrects* prior beliefs or probabilities. Hence, we contend that, to a large extent, what is captured and reported by short-run event studies, is the market's revision of prior probabilities rather than its reaction to the deal at hand. We, therefore, expect to find a significant difference in the returns to acquirers depending on the level of market anticipation of the deal. Specifically, if M&As create value for shareholders, we should observe significant cumulative abnormal returns (CARs) to acquirers in unanticipated or surprise M&A deals. Besides helping to explain the divergence between research and practice, such a finding will question some stylised facts relating to acquirers' performance and its antecedents.

To test our prediction, we use a comprehensive dataset which covers all M&A deals announced by US-listed firms between 1st January 1988 and 31st December 2017. This dataset is matched to a panel of 183,823 firm-year observations. We first show that, by using a parsimonious deal anticipation model and only publicly available information (consistent with a semi-strong form market efficiency assumption), acquirers' engagement in future deals can be reasonably predicted up to five years in advance. Consistent with prior studies, we estimate short-run announcement returns (CARs) using the market model. The average (1.2%) and median (0.5%) CARs in the seven days surrounding takeover bids (7-day CAR or CAR(-3,+3)) reported by all acquirers in our sample are broadly comparable to those in prior studies (Alexandridis et al., 2017; Brooks et al., 2018; Xu, 2017) and are consistent with the view that M&As do not create value for acquirers.

In our first empirical test, we partition our sample of acquirers into quintiles based

on our estimates of pre-bid acquisition likelihood, then explore the CARs to acquirers within each quintile. We find that the mean and median CAR monotonically decreases from the quintile of acquirers with the lowest acquisition likelihood (i.e., unanticipated acquirers, Q1) to the quintile of acquirers with the highest acquisition likelihood (Q5). The CARs to unanticipated acquirers (Q1) are over 13 to 27 times greater than the CARs to anticipated acquirers (Q5). For example, over the (-3,+3) event window, Q5 acquirers earn 0.2% CAR, on average. By contrast, acquirers in Q1 earn 7-day CARs of 5.4%, on average. This pattern of significantly higher returns to unanticipated acquirers persists across *all* deal characteristics we examine.[2] The pattern existed in the 1980s (when our study begins) and persists over our study period (up until 2017), but to our knowledge, has not been reported in prior research. In all but two years (i.e., 1999 and 2001)[3] between 1987 and 2017, unanticipated acquirers outperform anticipated acquirers.

We explore the relationship between bid anticipation and CARs in a multivariate setting in which we control for several other determinants of M&A CARs including firm, governance and deal-specific attributes, as well as industry, state (e.g., regulations) and year (e.g., macro-economic) fixed effects. We document a significant negative association between measures of bid anticipation and the CARs earned by firms when deals are announced. To establish a causal link, we use an instrumental variable approach with two instruments for bid anticipation; an indicator variable to identify the first deal after a long period of industry inactivity (post-dormant deal) and another indicator to capture bidding activities of a firm's close rivals (rival bidding activity). By deploying these instruments within a two-stage least squares and two-step generalised method of moments regression specification, we establish a causal link between bid anticipation and the low CARs to acquiring firms.

We corroborate our story by drawing evidence from CAR spillovers to close rivals of firms that initiate takeover bids. Close rivals have an incentive to mimic their peers (i.e.,

[2]These include; cash vs stock, private vs public, non-diversifying vs diversifying, cross-state vs same-state and domestic vs cross-border deals.

[3]These two years coincide with the dot-com bubble.

also initiate acquisitions), as this allows them to maintain their legitimacy (DiMaggio and Powell, 1983) and/or retain competitive positioning within the industry (Gort, 1969; Mitchell and Mulherin, 1996; Palepu, 1986). If M&As create value for acquirers, as we suggest, then close rivals with a comparatively higher likelihood of engaging in subsequent takeovers should earn significant CARs when the acquirer initiates a bid (i.e., a spillover effect). Indeed, we document spillover effects as close rivals also earn significant 7-day CARs of up to 2.01%, on average, when their counterparts announce deals. The median rival with a high likelihood of initiating future bids (Q5) accrues 7-day CARs of 1.5% compared to 0.5% earned by the median rival with a low bid likelihood. Using a multivariate setting, we provide evidence that the spillover CARs to close rivals are positively related to the likelihood that these firms will initiate takeovers in the future.

Our findings have implications for several stylised facts—one of those being the declining returns to serial acquirers in successive higher-order deals. Merger activities or acquisition programmes by serial acquirers are easy to detect and are, perhaps, broadly anticipated by market participants. Hence, per our argument and the extant empirical evidence (Aktas et al., 2011; Antoniou et al., 2007; Conn et al., 2005), serial acquirers should earn higher returns in their first deals compared to subsequent deals. If our prediction is valid, then we should find that bid anticipation explains much of this declining returns to serial acquirers. Using a mediation analytical framework, we show that over 81.3% of the declining returns to serial acquirers is explained by the measure of bid anticipation.[4] A portfolio of active serial acquirers earns abnormal returns (Fama & French three-factor and Carhart four-factor alphas) of up to 23.3% per year during acquisitions programmes as opposed to 6.4% per year when the programme is terminated.

Overall, our results suggest that the low or negative announcement period CARs to US acquirers reported across the literature is largely driven by highly-anticipated deals—which make up a majority of US deals. The significant surprise premium (i.e.,

[4]We do not rule out other explanations such as optimal target selection (Conn et al., 2005), CEO hubris (Billett and Qian, 2008) and time-varying investment opportunity sets (Klasa and Stegemoller, 2007).

the difference between CARs to anticipated and unanticipated acquirers) suggests that short-run event studies do not reasonably capture the impact of M&As on anticipated acquirers. Given our finding that unanticipated acquirers earn large positive CARs during the event window, it is probable that they also accrue significant gains outside the short event window—gains which are ignored by conventional research methods. Indeed, we document average CARs to unanticipated acquirers of up to 11.6% over a 41-day event window (-20,+20) and 8.5% over a longer 61-day event window (-40, 20).

Our study complements and extends three prior studies by Becher (2009), Cai et al. (2011) and Wang (2018). Becher (2009) attributes his finding that 65 US banks that became acquirers in the two years following the Riegle Neal Act (of September 24, 1994) gained significantly during the passage of the Act but not during the announcement of subsequent deals, to evidence of deal anticipation by investors. Becher (2009) argues that the returns generated by firms during the passage of the Act (26% on average) capture the benefits of any subsequent merger engagements. Our study explores a much larger sample of 16,048 deals across all industries over the period 1988-2017. Additionally, we show that even at the deal announcement, acquirers of unanticipated deals earn significant abnormal returns.

Secondly, Cai et al. (2011) employ the time between M&A bids within an industry as a measure of market anticipation. The study finds that the first bidder, after a minimum twelve-month period of no M&A activity within an industry, experiences significant positive abnormal returns averaging 1.5% (Cai et al., 2011). However, Cai et al. (2011) find that the returns to acquirers of public targets (34% of their sample) are still indifferent from zero and that there is no significant difference between the returns to more and less anticipated private deals (66% of their sample). We extend Cai et al. (2011) by using an alternative and, perhaps, a more direct measure of anticipation—the probability that a firm will initiate a bid in the future. Using our measure, we find that the returns to our unanticipated deals (7-day CAR of 5.4%) are substantially larger than those reported in Cai et al. (2011) i.e., 1.5%. Additionally, we find that our results hold across all

sub-samples of deal characteristics, including deals involving public and private targets.

Wang (2018) argues that acquirers gain from takeovers but this is clouded by a negative revelation effect when a deal is announced—the deal announcement reveals new information about the firm's standalone value. Wang (2018) estimates that acquirers gain 4.0% from a typical merger but an average revelation effect of -5% brings down the observed average announcement effects to -1.0%. Different from Wang (2018), we show that the announcement effect varies by pre-bid deal anticipation, with the quintile of unanticipated acquirers gaining an average CAR of 5.2% in the three days surrounding the bid.

Our study, therefore, contributes to the M&A literature in three important ways. First, we provide the first large scale evidence that irrespective of deal characteristics, acquirers have substantially gained from M&As, at least over the last three decades (1988-2017), but these gains are not reflected in short-run event studies due to pre-bid market anticipation. This finding reconciles the divergence between research and practice. Secondly, our work questions whether the impact of M&A on acquirers can be reliably quantified through event study methods and alerts researchers to the limitations of using event studies when assessing predictable events. We show that a parsimonious model for predicting acquirers can reasonably predict merger activity up to five years in advance. Our two-stage approach of (1) assessing market anticipation of M&A events, then (2) exploring returns to less anticipated events, provides a starting point for addressing this bias. Finally, we contribute to the literature on the determinants of returns to serial acquirers by showing that market anticipation of successive deals partly explains the observation that acquirers earn less and less in higher-order deals.

The rest of our paper is organised as follows: Section 2 sets out our empirical predictions. Section 3 discusses our data and methodology. Section 4 discusses the results and section 5 presents concluding remarks.

2 Related literature and empirical predictions

2.1 Prior research on acquirer M&A performance

The wealth effects of M&As has been explored by classic (e.g., Franks and Harris, 1989; Jensen and Ruback, 1983) and recent studies (e.g., Alexandridis et al., 2017; Jaffe et al., 2015; Wang and Lahr, 2017; Xu, 2017) alike. Event study methods, particularly the use of short-run event windows, remains the method of choice for assessing how M&As impact on merger candidates (Alexandridis et al., 2017; Brooks et al., 2018). The consensus is that targets gain significantly, at the expense of acquirers, suggesting (1) a recurrent destruction of value by acquirers, (2) a systematic transfer of wealth from acquirers to targets, and/or (3) a disproportionate distribution of value created during mergers between targets and acquirers (Danbolt and Maciver, 2012; Goergen and Renneboog, 2004; Graham et al., 2002; Gregory and Sheila, 2014; Jaffe et al., 2015; Masulis et al., 2007; Tuch and O'Sullivan, 2007; Wang and Lahr, 2017; Xu, 2017).[5] Renneboog and Vansteenkiste (2019) provide an excellent review of this literature. Hence, for brevity, we do not provide a detailed review here.

If the findings from this stream of the literature suggest that M&A is *bad* for acquirers, the persistence of M&As[6] over time remains a puzzle. Perhaps, more puzzling is the fact that several firms (dubbed serial acquirers), even under the watchful guidance of large institutional investors, recurrently engage in M&As over their lifetime (i.e., acquisition programmes) even though research has repeatedly documented a systematic decline in serial acquirers' CARs across successive deals (Aktas et al., 2011; Antoniou et al., 2007;

[5] Graham et al. (2002), for example, report that, on average, targets earn 22.51% while acquirers earn -0.78% CARs in the three days around the bid. A systematic review by Bruner (2002) concludes that targets gain significantly—mean abnormal returns of between 20% and 30%—while acquirers earn negative or close to 0% abnormal returns. Over 50% of the studies reviewed by Bruner (2002) report negative abnormal returns to acquirers. More recently, Brooks et al. (2018) report a mean acquirer CARs of -2.0% for US acquirers between 1984 and 2014. These results traverse US samples as the stylised fact has also been documented using UK and EU samples (Danbolt and Maciver, 2012; Goergen and Renneboog, 2004; Gregory and Sheila, 2014; Tuch and O'Sullivan, 2007; Wang and Lahr, 2017)

[6] Prior research documents a substantial growth in the number and value of M&A deals over time (Alexandridis et al., 2017; Xu, 2017). As shown in Figure 1, we observe a similar trend in our sample of acquirers.

Conn et al., 2005; Fuller et al., 2002; Laamanen and Keil, 2008).

Our study provides another perspective on this puzzle by exploring the role of pre-bid merger anticipation. We draw on the literature that explores the extent to which firms' likelihood of M&A involvement (either as targets or acquirers) can be modelled ex-ante using publicly available information (Ambrose and Megginson, 1992; Brar et al., 2009; Comment and Schwert, 1995; Danbolt et al., 2016; Faccio and Masulis, 2005; Palepu, 1986; Powell, 1997, 2001).

Market participants have an incentive to actively engage in merger prediction given the price-sensitive nature of merger deals (Cornett et al., 2011; Cremers et al., 2009; Danbolt et al., 2016; Jarrell and Poulsen, 1989; Palepu, 1986; Powell, 2001). Danbolt et al. (2016), for example, show that investors can earn significant abnormal returns by investing in portfolios of predicted targets. This potential for substantial abnormal returns encourages traders to conduct legitimate research by analysing publicly available information to identify firms that are most likely to engage in M&As (Danbolt et al., 2016). To our knowledge, the implications of this routine market anticipation of impending deals on the assessment of M&A performance remains unexplored.

2.2 Empirical prediction

Event studies typically make assumptions about market efficiency, specifically that the market reaction to M&A deal announcements unbiasedly captures the market's assessment of the value created by the deal (Brown and Warner, 1980; Fama et al., 1969). By the same token, in such an efficient market, if M&As are value-sensitive, then share prices already reflect firms' likelihood of becoming M&A candidates, such that any price change upon deal announcement (i.e., announcement effects) is not so much a market reaction to the deal but a revision of prior probabilities. As such, in anticipated deals, the market reaction during short-run event windows, perhaps, poorly captures the market's view of the wealth effect of the deal. Indeed, if prices already reflect acquisition likelihood, the use of short-run event study methods to assess the wealth effects of M&A will lead

to results that are systematically biased downwards. Specifically, CARs derived from short-run event studies will only capture the *new* information revealed at the time of the bid (e.g., choice of target, method of payment and the premium offered etc.). Hence, we relax the implicit assumption of conventional event studies exploring shareholder wealth effects of M&A—investors learn of M&A deals and adjust their valuations during the event window—and explore the consequence of the markets' anticipation of bids made by acquirers.

Consistent with neoclassical arguments[7] and the ubiquitous nature of M&As in practice (see Figure 1), we predict that M&A is, on average, a value-creating activity; acquirers gain significant positive returns which are not captured by short-run event studies due to the market's anticipation of deals ahead of announcements.

3 Data and method

3.1 M&A sample selection

We collect data (from Thomson Reuters Eikon database) on all US M&A deals announced between 1st January 1988 and 31st December 2017 in which the acquirer is a publicly-traded US company listed on the NYSE, AMEX or NASDAQ. Following Brooks et al. (2018), we restrict our sample to completed and withdrawn deals with a minimum deal value of $1million.[8] We focus on deals in which the acquirer seeks to obtain control of the target.[9] Our focus on control deals is consistent with the literature and reflects the fact that the motivations for control deals[10] are different from those underlying other non-control deals (Ambrose and Megginson, 1992; Danbolt et al., 2016; Powell, 2001).

[7]The neoclassical perspective suggests that M&As create value by reallocating resources to more efficient uses, replacing inefficient managers, creating synergies, exploiting economies of scale and bolstering market power, amongst others (Andrade et al., 2001; Gort, 1969; Manne, 1965; Mitchell and Mulherin, 1996).

[8]That is, we exclude deals classified as minority stake purchases, repurchases, exchange offers, self-tenders, spin-offs, recapitalisation, privatisation and acquisitions of remaining interest.

[9]We identify these as deals in which the acquirers owns less that 50% of the target before the deal and will own more than 50% of the target after the M&A should the deal be successful.

[10]We rely on these motivations to develop our prediction model.

Several firms engage in multiple acquisitions within the same year.[11] Given that we later match M&A data to annual firm financial data, we restrict our sample to a maximum of one deal per firm per year. Here, we retain only the largest bid (by deal value) announced by each company in each year.

[Insert Figure 1 here]

Figure 1 shows the distribution of all US deals by value and number over time. The number and value of deals increased considerably from 1988 up until 2000. We observe a decline in deal activity following the 2007-2009 financial crisis. Notwithstanding, deal activity appears to be on the rise again since 2011.

We collect firm accounting information covering the period from 1984-2016 from Compustat. We augment the accounting information with governance data collected from BoardEx. We match our M&A data to the panel of firm financial and governance data and retain only firm-year observations with comprehensive data required for our main analysis.[12] The final sample consists of 16,048 M&A deals by listed US firms matched to a panel dataset of 183,823 firm-year observations.

[Insert Table 1 here]

As shown in Table 1, a significant proportion of the deals in our final sample are non-cash (i.e., stock-for-stock or a mix of stock and cash), non-public (i.e., private), non-foreign (i.e., domestic), and involve a single bidder (i.e., non-competing). Specifically, of the 16,048 deals, about 39.5% are pure cash offers, 16.4% involve a listed target and 17.8% are for foreign targets. In 93.7% of the deals, the acquirer seeks to own 100% of the target. Even for domestic deals, in about 75.3% of the cases, the acquirer and target are domiciled in different US states.

[11] We capture these sequential deals as part of our analysis of serial acquirers.

[12] In additional tests, we exclude all financial (SIC code 6000-6999) and utility firms (SIC code 4910-4939) from the panel dataset. The results do not change qualitatively.

3.2 Estimating acquirer M&A performance

Our strategy for estimating acquirer performance (CAR) is consistent with prior research. Using standard event study methods and the market model, we measure acquirer CAR over the three (-1,+1), five (-2,+2) and seven (-3,+3) days centred on the bid. We denote these as 7-day CARs, 5-day CARs and 3-day CARs, respectively. Following Brooks et al. (2018), we use an estimation window of 209 days ending 90 days before the deal announcement i.e., (-300, -91) and proxy the market portfolio using the equally-weighted CRSP index.[13]

Table 2 presents descriptive statistics of the CARs generated by the acquirers in the sample. We also present descriptive statistics of other firm-level variables used in the study. The mean CAR across the different event windows (i.e., three, five and seven days) is 1.2% and the median is about 0.5%. While these returns are generally statistically different from zero (skewness-adjusted $p-values$ of 0.000), their economic significance is, perhaps, marginal. Indeed, as we later discuss, the abnormal returns are negative (mean of -1.2% and median of -1.0%) when we focus on a sub-sample of acquirers bidding for listed targets (see Appendix C). Overall, the low level of returns mirror findings from past studies (Alexandridis et al., 2017; Bradley et al., 1988; Bruner, 2002; Datta et al., 1992; Graham et al., 2002; Jaffe et al., 2015; Jensen and Ruback, 1983; Masulis et al., 2007; Mitchell and Mulherin, 1996; Schwert, 1996) and are consistent with the view that M&As, on average, do not create value for acquirers.

[Insert Table 2 here]

[13]Consistent with Brooks et al. (2018), the estimation requires a minimum of 30 non-missing daily returns from the estimation window. In sensitivity analysis, we also use the Fama & French three-factor model (Fama and French, 1992), as well as, the Fama & French plus momentum factor models (Carhart, 1997) to ensure robustness. Our results and conclusions are consistent so, for brevity, we do not present these. These results are available on request.

3.3 Estimating bid likelihood

To ensure that our measure of anticipation is free from look-ahead bias and uses only information that is available to the market at the end of each year, we estimate each firm's likelihood of initiating a takeover bid in period t (our measure of market anticipation) as a function of its observable characteristics in period $t-1$. Here, following the literature (Brar et al., 2009; Cremers et al., 2009; Danbolt et al., 2016; Palepu, 1986; Powell, 2001), we assume that market participants obtain firm financial reports at the end of each calendar year (t). At the start of year $t+1$ (January 1), participants plug this data into an already-derived model (model coefficients) to identify the firms that are most likely to make bids over the year $(t+1)$—i.e., portfolio of potential acquirers. The performance of this portfolio can then be assessed at the end of year $t+1$ (December 31). Our regression model for deriving these model coefficients is the logit model given as follows:

$$Bid_{it} = \frac{1}{1 + e^{-Z_{it-1}}} \tag{1}$$

where Bid_{it} is an indicator variable that takes a value of one when a firm i makes a control bid in period (t) and Z_{it-1} is a vector of firm i's characteristics in the previous period. Bids (the dependent variable) that are successful may lead to substantial changes in the acquiring firm's characteristics such as size, leverage, free cash flow, tangible assets and governance structure, amongst others—variables which we will use to populate vector Z_{it-1}. Therefore, the use of one-year lags (i.e., matching bids from year t to observable characteristics in year $t-1$), partly addresses reverse causality concerns in equation (1).

For parsimony, in the first instance, we populate our vector (Z_{it-1}) using commonly available firm characteristics which have been shown to explain firms' likelihood of initiating takeover bids. These include proxies of firm performance (profitability), firm valuation (Tobin's Q), firm growth (sales growth), firm resources (liquidity and leverage), the mismatch between growth and resource availability (growth resource), industry disturbance (an indicator variable for prior industry merger activity), firm size and its squared value

(firm size sq.), free cash flow, tangible assets, firm age, and industry concentration. The base model is shown in equation (2).

$$\begin{aligned} Z_{it-1} =& \beta_0 + \beta_1 Profitability_{it-1} + \beta_2 Tobin's\, Q_{it-1} + \beta_3 Sales\, growth_{it-1} + \beta_4 Liquidity_{it-1} \\ &+ \beta_5 Leverage_{it-1} + \beta_6 Growth\, Resource_{it-1} + \beta_7 Disturbance_{it-1} + \beta_8 Firm\, size_{it-1} \\ &+ \beta_9 Firm\, size\, sq._{it-1} + \beta_{10} Free\, cash\, flow_{it-1} + \beta_{11} Tangible\, assets_{it-1} \\ &+ \beta_{12} Firm\, age_{it-1} + \beta_{13} Industry\, concentration_{it-1} + \epsilon_{it-1} \end{aligned} \tag{2}$$

The rationale for including these variables is as follows: Well-performing managers (profitability) might create value for their shareholders by replacing inefficient managers in target firms (Palepu, 1986). Firms that are relatively overvalued (Tobin's Q) might use their stock as cheap currency to acquire relatively less overvalued targets (Dong et al., 2006). Growth-resource mismatch captures potential complementarities that firms can achieve through M&A (Palepu, 1986). For example, low-growth firms with significant resources can more efficiently deploy these resources by acquiring high-growth firms with low resources.[14]

Prior research (Danbolt et al., 2016; Gort, 1969; Palepu, 1986; Tunyi et al., 2019) suggests that mergers within an industry (disturbance) incentivises other firms to engage in acquisitions to retain their competitive position or market share. Due to significant resource requirements when dealing with acquisitions and post-acquisition integration, comparatively larger firms (firm size) with significant cash resources (free cash flow) are more likely to engage in acquisitions (Zhang, 2016). Notwithstanding, antitrust regulation can prevent the largest firms (firm size squared) from engaging in further acquisitions (Tunyi, 2019). Firms with significant fixed assets (tangible assets) can use these as collateral to secure debt and raise cash for acquisitions (Ambrose and Megginson, 1992; Tunyi and Ntim, 2016). Older firms (firm age) are more likely to reinvent themselves by acquiring younger firms with new technologies, products and business models (Loderer and

[14]Following the literature, we use four variables including sales growth, liquidity, leverage and a growth-resource dummy to capture the potential for a mismatch (Cornett et al., 2011; Palepu, 1986).

Waelchli, 2015). Finally, firms in less concentrated industries (industry concentration) can improve their competitive position and gain market power by acquiring other firms within their industry (Powell and Yawson, 2007).

Firms' decision to engage in M&As is also shaped by governance factors and ownership characteristics (see Renneboog and Vansteenkiste, 2019, for a review). While our sample period for firm characteristics starts from 1984, governance data (from BoardEx) is only available from 1999. Additionally, this data is missing for a large proportion of our sample. For robustness, using the available data, we derive an "extended" anticipation model which utilises additional predictor variables including measures of block holders (Block holders), an indicator for a CEO-Chair dual role (CEO Chair), the proportion of directors that are independent (Board independence), the proportion of directors that are females (Board females), the level of managerial ownership (Board ownership) and board outside connections (Board networks). The extended model is shown in equation (3). Descriptive statistics for the variables in equations (2) and (3) are presented in Table 2.[15] The variables are fully defined in Appendix A.

$$
\begin{aligned}
Z_{it-1} =& \beta_0 + \beta_1 Profitability_{it-1} + \beta_2 Tobin's\, Q_{it-1} + \beta_3 Sales\, growth_{it-1} + \beta_4 Liquidity_{it-1} \\
&+ \beta_5 Leverage_{it-1} + \beta_6 Growth\, Resource_{it-1} + \beta_7 Disturbance_{it-1} + \beta_8 Firm\, size_{it-1} \\
&+ \beta_9 Firm\, size\, sq._{it-1} + \beta_{10} Free\, cash\, flow_{it-1} + \beta_{11} Tangible\, assets_{it-1} \\
&+ \beta_{12} Firm\, age_{it-1} + \beta_{13} Industry\, concentration_{it-1} + \beta_{14} Block\, holding_{it-1} \\
&+ \beta_{15} CEO\, Chair_{it-1} + \beta_{16} Board\, independence_{it-1} + \beta_{17} Board\, females_{it-1} \\
&+ \beta_{18} Board\, Ownership_{it-1} + \beta_{19} Board\, networks_{it-1} + \epsilon_{it-1} \qquad (3)
\end{aligned}
$$

[15] In untabulated results, we conduct a difference of means (and medians) test to establish the relevance (predictive value) of our predictor variables i.e., their ability to distinguish between acquirers and non-acquirers. The difference of means and medians tests reveal statistically significant differences between acquirers and non-acquirers across most of the variables. Specifically, the results reveal that, compared to non-acquirers, acquirers are more profitable, exhibit higher sales growth, hail from disturbed industries, are larger and older, hold higher levels of free cash flow and come from less concentrated industries. Non-acquirers, on the other hand, have higher levels of Tobin's Q, liquidity, leverage and tangible assets than acquirers. In terms of governance features, acquirers also have higher levels of block holding, and board networks but lower levels of board ownership. Our results from tests of mean and median differences are generally consistent.

To derive our measure of anticipation, we follow a back-testing approach consisting of two main steps. In the first step, we calibrate our prediction model (equation (1)) using firm-level data (Z_i) for the entire sample of firms up until year $t-1$ (i.e., Z_{it-1}) matched to bids initiated in year t (i.e., Bid_{it}). In the second step, we use the estimated model coefficients together with firm-level data in year t (i.e., Z_{it}) to compute the likelihood that each firm will make a bid in year $t+1$—our measure of anticipation. To estimate anticipation in subsequent years, we follow a recursive approach (Cremers et al., 2009; Danbolt et al., 2016) and extend our estimation window by one year, keeping the starting year constant.[16] We repeat the computation across the two specifications of Z_{it-1} i.e., equations (2) and (3).[17]

4 Results and discussions

4.1 Models' predictive ability

Our first task is to ascertain the extent to which our measure of anticipation explains future takeover activity—i.e., whether our predicted acquirers or firms with high bid likelihoods initiate future bids as predicted. We define "high" and "low" bid likelihood based on quintiles.[18] Specifically, starting from 1988 (our first year of prediction), in each year (up until 2016), we rank firms by their level of bid likelihood and generate quintiles (Q1 to Q5). Q1 (Q5) represents the 20% of firms with the lowest (highest) likelihood of

[16] That is, we use firm-level data for the entire sample of firms up until year t (i.e., Z_{it}) matched to bids in year $t+1$ (i.e., Bid_{it+1}) to calibrate the model. We then use the estimated model coefficients together with firm-level data in year $t+1$ (i.e., Z_{it+1}) to compute the firm's likelihood of making a bid in year $t+2$.

[17] In untabulated results, we explore summary results (descriptive statistics) for marginal effects across the recursive regression models. The results suggest that profitable firms (profitability), with significant growth opportunities (sales growth) and high market valuations (Tobin's Q), are more likely to engage in acquisitions. Bid likelihood also appears to increase when there is a mismatch between firm resources and growth opportunities, significant free cash flow and takeovers by other firms in the industry. Further, bid likelihood has a positive relationship with industry concentration, a non-linear relationship with size and a negative relationship with liquidity, leverage, firm age and tangible assets. When we consider additional governance predictors, we find that bid likelihood declines with block holding, board females and board ownership but increases with board independence and board networks.

[18] For robustness, in untabulated results, we also define "high" and "low" bid likelihood based on deciles. Our results offer stronger support for our predictions but our conclusions do not change.

initiating a bid in the next year (i.e., 1989). We track the firms in the quintile portfolios to evaluate what proportion of firms within each quintile announce takeover bids in the next year. If our bid likelihood measure captures future market anticipation as we suggest, we should observe comparatively more actual acquirers in Q5 than in Q1. The focus on "one year ahead" implicitly (perhaps, unjustifiably) imposes a time restriction (i.e., within one calendar year). Hence, to assess the model's quality, we extend the period to also explore the extent to which predicted acquirers initiate bids over the next three and five years.

The results of our model's performance are presented in Table 3. We assess results for our base (panel A) and extended measures of anticipation (panel B). As we noted previously, our extended measure imposes more stringent data restrictions. As shown in column 1, the number of firm-year observations per quintile reduces from an average of 36,567 in panel A to an average of 17,437 in panel B. To effectively compare the two models, in panel C, we re-estimate our base model using only observations that meet the data restrictions imposed by the extended model. In columns 2, 4 and 6, we present the number of firms in each quintile that announce a takeover bid within one, three and five years, respectively. Finally, we present the percentage of actual targets in each quintile in columns 3, 5 and 7.

Notice that the full dataset has 183,823 firm-year observations matched to 16,048 bid announcements—an average of 8.7 bids per 100 observations (see Table 1). A model with no predictive ability (i.e., a null model or random selection strategy) will, on average, correctly identify 8.7% of actual acquirers each year. If our model ascribes bid likelihood better than such a null model, we should find that Q1 has a significantly lower number of actual acquirers compared to Q5.

[Insert Table 3 here]

[Insert Figure 2 here]

As in Table 3 and Figure 2, firstly, the number (and percentage) of actual acquirers increases monotonically from the quintile of firms with lowest bid likelihood (Q1) to the

quintile with the highest bid likelihood (Q5). For example, for the base model (panel A), of the 36,732 firms in Q1, only about 2% (or 569) initiate a bid. This is much lower than the average of 8.7% for the full sample (null model). This percentage of firms initiating a bid in each quintile increases to 5% in Q2, then 8% in Q3, 11% in Q4 and up to 18% in Q5. Secondly, the measure of anticipation translates into future bid announcements up to five years ahead. Specifically, in panel A, over 39% of the firms in Q5 initiate a bid over the next five years.

Our measures of anticipation (base and extended measures) are highly correlated (correlation coefficient (ρ) of 0.86). As in panels B and C, the two models achieve comparable performance when data restrictions are considered. In the analyses that follow, we use the base anticipation measure as our main measure and the extended measure for robustness, as this allows us to test our predictions over a substantively larger dataset. Overall, the results in Table 3 and Figure 2 suggest that our measures, to a reasonable extent, capture firms' likelihood of initiating bids in the future, and presumably, the market's ability to predict future acquirers using only publicly available information.

4.2 M&A performance and anticipation: Univariate results

4.2.1 Returns across quintiles of anticipation

If our predictions are supported, we should find that acquirers within the lowest anticipation quintile (Q1) report the highest CARs, which should be positive and statistically significant. Importantly, acquirers in Q1 should also report CARs that are significantly larger than those reported by acquirers in Q5. In Figure 3, we graph the CARS around M&A announcements for all acquiring firms (All), as well as sub-samples of acquirers in different quintiles (Q1, Q2, Q3, Q4 and Q5), starting 40 days before and ending 20 days after the bid announcement—i.e., 61-day CARs.[19]

[19]To ensure that our 61-day CARs are not biased by outliers and/or confounding events we (1) winsorize the top and bottom 1% of daily returns, and (2) exclude from our sample all M&A deal announcements made in the three days before or the three days after quarterly earnings announcements.

[Insert Figure 3 here]

As in Figure 3, acquirers in Q1 generate CARs which are markedly greater than those generated by other firms (in Q2 to Q5). Indeed, over the 61 days, all acquirers in our sample generate a 61-day CAR of -0.8%—a level consistent with the notion that M&As do not create value for acquirers. However, while the acquirers in Q5 generate a 61-day CAR of -0.5%, the sample of unanticipated acquirers (Q1) report a substantially higher 61-day CAR of 8.5%.[20] Acquirers in Q2, Q3 and Q4 report 61-day CARs of -3.8%, -1.1% and 0.1%, respectively. Overall, these results suggest that not all acquirers perform poorly—one sub-sample (Q1) appears to perform well.

Consistent with prior research (Alexandridis et al., 2017; Brooks et al., 2018), our subsequent multivariate analyses are based on 3-day, 5-day and 7-day CARs, hence we provide some descriptive statistics of the distribution of these measures across different quintiles. In Table 4, we report mean and median CARs achieved by acquirers across different quintiles, as well as results from skewness-adjusted t-tests of statistical significance. We report results from our base measure of anticipation in panel A. Here, acquirers in Q1 earn mean CARs of 5.2%, 5.5% and 5.4% in the three, five and seven days around the bid announcement (significant at the 1% level). The median CARs for these acquirers are more modest (i.e., 1.0%, 2.4% and 1.4%) but still higher than the CAR reported in prior studies (Alexandridis et al., 2017; Bruner, 2002; Graham et al., 2002; Jaffe et al., 2015; Masulis et al., 2007). By contrast, acquirers in Q5 report much lower CARs over the same event windows (0.4%, 0.4% and 0.2%, respectively). On average, the CARs reported by Q1 acquirers are about 13 (3-day CAR) to 27 times (7-day CAR) larger than those reported by acquirers in Q5.

[Insert Table 4 here]

One concern is that the number and characteristics of acquirers vary by quintile—an issue which we further address in our multivariate analysis. To control for sample size, deal

[20]The CARs to Q1 acquirers are 11.6% for the 41-day window (-20,+20) and 11.4% for the (-10,+10) window.

characteristics and other market-wide, year and industry factors, we use a propensity score matching (PSM) with a nearest-neighbour estimator to identify 569 acquirers in each quintile (Q2 to Q5) that are similar (in characteristics) to the 569 acquirers in Q1.[21] CARs generated by the matched sample of firms are presented in panel B. Consistent with results in panel A, acquirers in Q1 outperform their counterparts (i.e., nearest-neighbours) in Q2 to Q5. Finally, as in panel C, our results are robust to the measure of anticipation. Specifically, our univariate results are consistent and conclusions do not change when we use the extended measure of anticipation.

To establish the economic importance of our finding, we multiply the CAR generated in each deal by the acquirer's market capitalisation (at the start of the year in which the deal was announced) to obtain an estimate of the dollar gain or economic value created by acquiring firms (Appendix B). While M&As, appear to destroy value for acquirers in Q3-Q5, the average acquirer in Q1 reports an abnormal increase in market capitalisation by $44 million, $34 million and $10 million in the three, five and seven days (respectively) around the bid.

4.2.2 Deal characteristics and year effects

We also explore CARs for anticipated (Q5) and unanticipated (Q1) acquirers across different deal characteristics (Appendix C) and over time (Figure 4). Consistent with prior studies (Alexandridis et al., 2017; Danbolt and Maciver, 2012; Franks and Harris, 1989; Jensen and Ruback, 1983; Masulis et al., 2007), the mean 7-day CARs to all acquirers of public targets in the sample is negative (i.e., -1.2%). However, acquirers of public

[21] We match firms in Q1 (treated group) to firms in Q2 then Q3, Q4 and finally Q5 (untreated groups) based on the following characteristics: the relative size of the acquirer to the target, whether the deal is cross-border or domestic, the method of payment, previous acquisition activity, whether the target is public or private, whether the acquirer and target are domiciled within the same state, the acquirer's industry and the year in which the deal is announced. The choice of characteristics is consistent with prior research suggesting that acquirers gain more in private, cross-border and stock-for-stock deals (Danbolt and Maciver, 2012; Franks and Harris, 1989; Jensen and Ruback, 1983; Masulis et al., 2007) and less when acquiring large targets or when making multiple acquisitions (Aktas et al., 2011; Antoniou et al., 2007; Franks and Harris, 1989; Laamanen and Keil, 2008). We assess the quality of the PSM procedure by computing measures of bias, as well as Rubin's statistics (Rubin's B and R). The mean and median percentages of bias are generally low (average of 3.1 and 2.4, respectively) and Rubin's B and R statistics (average of 14.6 and 1.22, respectively) are within generally acceptable thresholds.

targets in Q1 earn mean 7-day CAR of 1.4%. Interestingly, on average, substantial CARs appear to accrue to Q1 acquirers initiating diversifying deals (8.2%), pursuing targets within the same US state (9.6%) and seeking cross-border targets (8.0%). While prior studies have documented comparatively higher returns to acquirers in cross-border deals (Danbolt and Maciver, 2012; Xu, 2017), these returns have generally been much lower than what we arrive at. Our findings, therefore, suggest that cross-border deals, amongst others, potentially create much more value than earlier anticipated.

[Insert Figure 4 here]

Prior research has suggested that the performance of acquirers varies over time and is sometimes driven by external market valuation (Harford, 2005). The merger wave literature also suggests that firms are more likely to engage in acquisitions during certain periods (Gorton et al., 2009; Harford, 2005; Xu, 2017). To rule out the possibility that our results are driven by external market conditions, we additionally explore the extent to which acquirers in Q1 outperform acquirers in Q5 over our entire sample period. In Figure 4, we explore the difference in CARs to acquirers in Q1 and Q5 over the sample period. In all but two (i.e., 1999 and 2001) of the 29 years, the CAR to acquirers in Q1 is higher than the CAR to acquirers in Q5.

By showing that substantial CARs accrue to unanticipated acquirers, our univariate results support the contention that acquirers create value through M&As but, in the case of highly-anticipated acquirers, those gains are not captured by short-run event study methods. The gains to acquirers is not just a recent phenomenon as suggested by Alexandridis et al. (2017), as we document this finding over the last three decades and across several sub-samples (e.g., by deal characteristics). To our knowledge, this study is the first to document this level of gains to M&A acquirers.

4.3 M&A performance and anticipation: Multivariate results

We can strengthen the results from the univariate analysis by establishing a negative relationship between bid anticipation and announcement returns (CARs), and importantly, by providing evidence of a causal link in this relationship. To provide evidence of the relationship, we regress our measures of anticipation on CARs[22] while controlling for several firm- and deal-specific characteristics, as well as industry, state and year fixed effects. Our tests are based on robust standard errors clustered at the firm-level. Our baseline OLS model is specified in equation (4) and our results are presented in Table 5.

$$\begin{aligned} CAR_{it} =& \beta_0 + \beta_1 Anticipation_{it} + \sum \beta_k Firm\, controls_{kit} \\ &+ \sum \beta_k Deal\, controls_{kit} + v_t + v_j + v_s + \epsilon_{it} \end{aligned} \tag{4}$$

In columns 1 and 5 of Table 5, consistent with our prediction, we find a negative relationship between the base measure of anticipation and acquirer CARs ($p - value$ of 0.000) after controlling for several firm attributes, deal characteristics and governance characteristics (in column 5). By controlling for governance characteristics (as in column 5), we lose a substantial proportion of data (i.e., from 16,048 deals to 1,957 deals) but our conclusions do not change. Indeed, a unit increase in the measure of anticipation coincides with a 15.8% (column 1) or 9.9% (column 5) decline in CAR. In columns 4 and 6, we find that the results are robust to the specification of our anticipation measure. Specifically, a unit decrease in the extended anticipation measure is associated with a 7.1% (column 4) or a 4.4% (column 6) decline in CAR. These results are statistically significant at the 5% level.

[Insert Table 5 here]

Endogeneity due to omitted variables is, potentially, a key concern for our regression analysis. Specifically, the results will be biased if the model does not control for cer-

[22]For brevity, we only report results for 7-day CARs. Results for all other CARs (3- and 5-day CARs) are consistent.

tain factors that explain firms' acquisition likelihood and also firms' performance during M&As. Our first approach to partly address the issue (in columns 5 and 6) is to explicitly control for several factors that have been shown to impact M&A decisions and acquirers' performance. These include measures of females on the board, managerial ownership, managerial (equity) compensation, block holding, independent directors, board size, CEO duality, board tenure, board busyness, board networks, managerial (board) ability and managerial (board) experience (see Renneboog and Vansteenkiste, 2019, for a review). Our results are robust to these additional controls.

We recognise that the measure of market anticipation (estimated from firm-specific characteristics) is not completely exogenous, and hence acquirers may be able to change their level of anticipation within some range. Consistent with Edmans et al. (2012), we use quintiles and quintile ranks of anticipation as an alternative more exogenous measure. The use of quintiles allows for acquirers to change their level of anticipation within each quintile but not to the extent that they migrate from one quintile to the next (Edmans et al., 2012). Specifically, acquirers in Q5 can influence their level of anticipation by changing the characteristics of their firms. However, it is unlikely that these acquirers, without altering the nature of their business, can substantially change their characteristics to the extent that they migrate from Q5 to Q1.[23]

In columns 2, we explore how membership within each acquisition quintile (captured with a dummy variable) influences acquirer returns. Using Q3 as the base category, we find that membership in Q1 relative to Q3 increases CARs by 2.5%, on average. Membership in Q2 relative to Q3 also increases CARs (by 1.2%) but not as much as membership in Q1. At the other end of the spectrum, membership in Q5 is associated with a decline in CARs by 1.1%. As in column 3, the findings are further supported when we use quintile ranks (i.e., from 1 to 5) as the measure of anticipation. Here, a unit increase in the quintile rank (e.g., from Q1 to Q2) is associated with a 0.7% decline in CARs. Overall, the findings (i.e., a negative relationship between measures of anticipation

[23]For robustness, in untabulated results, we additionally exclude all observations at the boundaries between quintiles as it is easier for these to switch quintiles. Our results are robust to this exclusion.

and CARs earned by acquirers) are consistent with our prediction.

4.4 The causal effect of anticipation

To formally establish a causal link, we deploy the two-stage least squares (2SLS) instrumental variable approach and utilise two exogenous instruments for anticipation; post-dormant deal and rival bidding activity. The first instrument (post-dormant) is inspired by Song and Walkling (2000). The underlying rationale is that firms in merger-active industries are more likely to engage in acquisitions and hence, acquisition activities by these firms are more likely to be anticipated. By contrast, firms in merger-inactive industries are less likely to be involved in deals. Importantly, the first industry bid after a long period (12 months) of no merger activity within that industry is likely to be a major surprise to the market. "Post-dormant deal" is constructed as an indicator variable that takes a value of one if, prior to the bid, there have been no other bids in a firm's 4-digit SIC code industry in the last 12 months. This instrument possibly meets the two criteria for valid instruments. Firstly, the instrument (post-dormant deal) is plausibly exogenous to the system because each firm can influence the timing of its takeover activity but not the timing of takeover activities for *all* other firms within its 4-digit SIC code industry. Secondly, any relationship between post-dormant deal and CAR is plausibly through the anticipation channel. Of the 16,048 deals in the sample, 14.2% (or 2,285 deals) are classified as post-dormant deals.

The second instrument builds on the perspective of mimetic isomorphism (DiMaggio and Powell, 1983) and is consistent with the economic disturbance theory of takeovers (Gort, 1969; Mitchell and Mulherin, 1996). Here, firms may mimic their rivals (e.g., by announcing takeover bids in response to takeovers completed by their rivals) to secure or increase legitimacy. Consistent with this view, the economic disturbance theory (Gort, 1969) suggests that mergers cluster by industry as one industry merger incentivises other firms to consolidate. We focus on *close* rivals within an industry as the peer effects which

we seek to capture are likely to be stronger for these firms.[24] We identify up to 10 of the closest rivals (by market share) of each acquirer. Specifically, we rank firms within each 4-digit SIC code industry-year group by their market share (based on sales) and identify the group of firms ranked five places before and five places after each firm, as its closest rivals. If a firm i is ranked "first" in its industry, then we only consider the five firms ranked below i as its close rivals.

"Rival bidding activity" is defined as an indicator variable that takes a value of one if an acquirer's rival announced a bid in the last year. The instrument is plausibly exogenous to the system as firms do not typically have influence over their rivals' takeover decisions but are likely to be incentivised by their rivals' actions. To empirically ascertain the suitability of the two instruments, we conduct standard tests for instrument validity and report the results alongside the instrumental variable regression results in Table 6.

[Insert Table 6 here]

In columns 1 and 2 (3 and 4) we present results for the base (extended) measure of anticipation. As shown in the first-stage regressions (columns 1 and 3), the two instruments are strongly correlated with the measure of merger anticipation ($p-values$ of 0.000). Here, anticipation declines with merger-inactivity (post-dormant deals) and increases with bid activity by rivals. Results from the under-identification test (Kleibergen-Paap rk LM statistic) suggest that the instruments are relevant ($p-value$ of 0.000). Secondly, the null hypothesis that the instruments are weak is rejected as both the Cragg-Donald Wald F stat and Kleibergen-Paap rk Wald F stat are substantially greater than acceptable benchmarks (Staiger et al., 1997; Stock et al., 2002; Stock and Yogo, 2002). Thirdly we reject the null hypothesis of over-identification as $p-values$ for the Hansen J statistic are greater than 0.1. Together, these tests provide some assurance that the instruments meet the required thresholds for inclusion in the first-stage and exclusion in the second-stage equations. The results from the second stage regressions (columns 2 and 4) suggest that,

[24] Within an industry, the largest firms are unlikely to respond to acquisitions announced by the smallest firms as such merger activity does not considerably alter industry competition.

consistent with our prediction, bid anticipation plausibly leads to or causes a reduction in CAR. These results are significant at the 1% and 5% levels of significance, respectively.

For robustness, we re-estimate the 2SLS model using a generalized method of moments (GMM) regression approach. In the first instance (columns 5 and 6), we utilise the two instruments; "post-dormant deal" and "rival bidding activity". In the second instance (columns 7 and 8), we use lagged values of the measure of anticipation (over the previous five years) as alternative instruments in the two-step GMM model. The conclusions from the GMM models are consistent with earlier results, therefore, allaying concerns that the 2SLS results are driven by the choice of instruments.

4.5 Evidence from abnormal returns to close rivals

Prior research has explored the impact of acquisitions on merging firms, rivals, customers and suppliers, amongst others (Eckbo, 1983; Gaur et al., 2013; Shahrur, 2005; Song and Walkling, 2000). These studies put forward different hypotheses[25] to explain the returns to rivals. Using a sample of horizontal takeovers, Shahrur (2005), for example, finds that rivals of merging firms (i.e., acquirers and targets) earn significant positive abnormal returns when the deals are announced.[26] In support of the "acquisition probability hypothesis"[27], Song and Walkling (2000) provide evidence that rivals of acquisition targets earn significant returns when bids are announced.

Different from Song and Walkling (2000), we focus on close rivals of acquiring firms. If our prediction that M&As create value for acquirers is valid, then we should observe that close rivals of acquirers also earn positive abnormal returns around the period when deals are announced. This is because acquisitions increase the incentives for close rivals to engage in mergers in order to retain their competitive position (Gort, 1969) or legitimacy

[25] These hypotheses include the productive efficiency (Eckbo, 1983), acquisition probability (Song and Walkling, 2000), growth probability (Gaur et al., 2013), collusion (Eckbo, 1983) and the buyer power hypotheses (Snyder, 1996).

[26] Shahrur (2005) rules out the collusion hypothesis and argues that their evidence supports the buyer power hypothesis i.e., rivals enjoy lower input prices due to increased competition among suppliers.

[27] Acquistions increase the likelihood that rivals will become takeover targets.

(DiMaggio and Powell, 1983). Consistent with our semi-strong form market efficiency arguments, this likelihood of future acquisition activity by rivals should be reflected in their prices at the time of the bid made by their peers. *Close* rivals as opposed to *all* rivals are more likely to respond to the actions of the acquiring firm and hence, our focus on this sub-sample should lead to more powerful empirical tests.[28]

We identify up to 10 close rivals for each of the 16,048 acquirers in the sample and match these rivals to the deal announcement dates. In total, we identify 65,555 events (close rivals).[29] Using the event study parameters discussed in section 3.2, we compute 7-day CARs to the close rivals. We find that the close rivals of acquiring firms earn significant positive abnormal returns around the period when acquirers initiate bids—i.e., spillover abnormal returns. The mean and median CARs to close rivals are 2.01% and 1.14% (significant at the 1% level). This level of spillover abnormal returns to rivals is higher than the returns to acquirers reported in prior studies (see Brooks et al., 2018; Bruner, 2002; Graham et al., 2002, amongst others). Nonetheless, there is substantial cross-sectional variation in CARs to close rivals as the 25th percentile is -2.02% and the 75th is 4.94%. The median 7-day CAR for close rivals with a high likelihood of initiating future bids (Q5) is 1.5% compared to 0.5% earned by the median rival with a low bid likelihood.

We can support our contention that takeovers create value for acquirers in the announcement period by showing that the spillover CARs earned by close rivals when deals are announced by their peers are systematically related to variables associated with bid anticipation (Song and Walkling, 2000)—i.e., the likelihood that rivals will engage in future takeovers. Specifically, rivals that are more likely to engage in future takeovers should experience higher spillover CARs when their peers announce bids. Our results are presented in Table 7.[30]

[28] We discuss our identification of close rivals in the previous section.

[29] Notice that a single firm may recurrently appear in the sample of rivals at different points in time.

[30] While matching rival CARs to firm-level data, we lose several observations as we can only consider one event per observation per year. We use the event with the highest CAR.

[Insert Table 7 here]

In column 1, we capture industry-specific merger intensity using the number of years since a deal was announced in the 4-digit SIC code industry. Rivals in merger-active industries (i.e., industries with less time between deals) are, perhaps, more likely to initiate bids in the future. We find a negative relationship in column 1, suggesting that spillover CARs earned by close rivals increases with merger intensity or the prospect of the rival engaging in future mergers.

In column 2 of Table 7, we find a positive relationship between rivals' subsequent bidding activity (i.e., whether or not the rival makes a bid in the next year) and spillover CARs earned by the rival when deals are announced by their peers. In columns 3 and 4, we also find that the measures of bid anticipation that we have used in our previous analysis, explain returns to close rivals of acquiring firms. Specifically, rivals that are more likely to subsequently engage in takeovers appear to earn higher spillover abnormal returns when deals are announced by their peers. Importantly, the results are robust to controlling for several firm, ownership and governance factors that may influence the short-run returns to close rivals of acquiring firms.[31]

4.6 Evidence from serial acquirers

Prior studies (Aktas et al., 2011; Antoniou et al., 2007; Conn et al., 2005; Fuller et al., 2002; Laamanen and Keil, 2008) suggest several reasons for the observation that (serial) acquirers earn less and less in successive higher-order deals. If our contention (i.e., the low returns to acquirers are explained by bid anticipation) is valid, then we should find that market anticipation explains much of the declining returns to serial acquirers. Serial acquirers engage in multiple acquisitions, hence the market expects them to engage in such acquisitions in the future (Cumming and Li, 2011).

[31] In a few cases, the rivals of acquirers could also be the rivals of targets and hence, for robustness, we re-estimate the results in Table 7 using a sub-sample of deals which meet any of the following criteria; (1) the acquirer and target are from different industries, (2) the target is a foreign firm (cross-border deals), and (3) the target is an unlisted (private) firm. Our findings remain consistent. For brevity, we do not present these results.

Our market anticipation argument, when applied to serial acquirers, will suggest that serial acquisition activity (i.e., a firm's acquisitiveness), by itself, does not directly lead to systematically lower CARs, particularly as we suggest that firms create (rather than destroy) value through acquisitions. Instead, following our argument and consistent with (Cumming and Li, 2011), lower CARs may arise from the impact of serial acquisitions on bid anticipation. In essence, a firm's acquisitiveness should increase its bid likelihood which, in turn, leads to lower CARs. If this is the case, a firm's acquisitiveness should have only an indirect effect on its CARs, as this relationship will be *mediated* by bid anticipation. We empirically explore this issue by testing whether anticipation mediates the relationship between a firm's serial acquisition activity (acquisitiveness) and CAR. That is, we explore whether, if we control for bid anticipation, the impact of serial acquisitions (acquisitiveness) on CAR disappears.

[Insert Figure 5 here]

We present the mean and median 7-day CAR to acquirers across successive higher-order deals in Figure 5. If our anticipation argument holds, consistent with Cumming and Li (2011), we should find higher CARs in first deals (least anticipated). Consistent with our argument and with the extant literature (Aktas et al., 2011; Laamanen and Keil, 2008), the sample of acquirers experience a decline in returns across successive deals. Prior studies attribute this stylised fact to optimal target selection (Conn et al., 2005), CEO hubris (Billett and Qian, 2008) and time-varying investment opportunity sets (Klasa and Stegemoller, 2007). As discussed below, we contribute to this literature by showing that much of the decline in acquirer CAR across successive deals disappears when we control for levels of market anticipation.

We generate a measure of acquisitiveness (defined as the average number of deals completed per year since the start of the sample period) to capture a firm's involvement in multiple M&As over time. To test mediation, we run the following system of OLS

regressions on the sample of acquirers then perform the Sobel-Goodman mediation test.

$$CAR_{it} = \beta_0 + \beta_1 Acquisitiveness_{it} + \sum \beta_k FirmControls_{kit} + \sum \beta_k DealControls_{kit} + v_t + v_j + v_s + \epsilon_{it} \quad (5)$$

$$Anticipation_{it} = \beta_0 + \beta_1 Acquisitiveness_{it} + \sum \beta_k FirmControls_{kit} + \sum \beta_k DealControls_{kit} + v_t + v_j + v_s + \epsilon_{it} \quad (6)$$

$$CAR_{it} = \beta_0 + \beta_1 Anticipation_{it} + \beta_2 Acquisitiveness_{it} + \sum \beta_k FirmControls_{kit} + \sum \beta_k DealControls_{kit} + v_t + v_j + v_s + \epsilon_{it} \quad (7)$$

All equations control for year (t), industry (j) and state (s) unobservable fixed effects. Equation (5) explores whether acquisitiveness predicts CAR from M&A announcements. Equation (6) explores whether acquisitiveness predicts market anticipation. Equation (7) explores whether anticipation and acquisitiveness explain CAR. To evidence mediation, the coefficient of acquisitiveness should be significant in equations (5) and (6) but insignificant in equation (7) which controls for the mediator, anticipation. Our results are presented in Table 8.

In column 1 of Table 8, we find that a unit increase in a firm's acquisitiveness reduces CAR by 0.8%. This supports the notion that acquirers perform poorly as their acquisitiveness increases (Aktas et al., 2011; Conn et al., 2005; Laamanen and Keil, 2008). Consistent with our argument that acquisition activity by serial acquirers is highly-anticipated, the relationship between acquisitiveness and the measure of market anticipation is positive and significant at the 1% level. Importantly, after controlling for market anticipation (in column 3), the relationship between acquisitiveness and CAR attenuates (from a -0.8% to a -0.1% decline in CAR per unit increase in acquisitiveness) and ceases to be significant at the 10% level ($p - value$ of 0.760). The results from the Sobel-Goodman mediation

tests show that the direct effect (i.e., the negative relationship between acquisitiveness and CAR) is not significant at the 10% level ($p - value$ of 0.564). Further, we find that over 81.3% of the total effect of acquisitiveness on CAR (column 1) is mediated by anticipation. Overall, the results suggest that acquisitiveness, at best, has only an indirect relationship with CAR, as the relationship is strongly mediated by anticipation. Indeed, consistent with our arguments, the results from column 3 suggest that the relationship between acquisitiveness and CAR disappears when we take account of merger anticipation.

[Insert Table 8 here]

Our results point to the possibility that serial acquirers gain from M&As. However, because these acquirers are highly-anticipated, event studies may not be useful in assessing the value created by these acquirers. We, therefore, turn to portfolio analysis using the Fama & French three-factor and Carhart four-factor models (Carhart, 1997; Fama and French, 1992). If our predictions are supported, we should find that serial acquirers accrue significant regression abnormal returns (alphas) during acquisition programmes. Importantly, we should also find that these returns disappear following the termination of acquisition programmes.

We identify a sample of firms that have initiated five or more M&A bids over a five-year period (i.e., active period), then followed by zero bid announcements for at least the next five-year period. A sample of 155 serial acquirers meets this condition. To ensure that the results are not influenced by uncertainty around the identification of the end of active periods, we allow a gap of two years. Specifically, $t_1 - t_5$ represents the period over which serial acquirers initiate five or more bids (active period) and t_8 represents the start of the inactive period (break period) during which no new bids are announced. The average break period is five years with a minimum of three years and a maximum of 16 years.

Using daily stock prices, we estimate alphas to the 155 serial acquirers during the active period and the break period. As reported in Table 9, the daily abnormal return

(alpha) to serial acquirers during the active period is 0.001 (0.00082 in column 1 and 0.00084 in column 2). This is significant at the 1% level and equivalent to between 22.7% and 23.3% abnormal returns per year (over a 250-day trading year). By contrast, the daily abnormal returns (alpha) during the break period is 0.000 (0.00025 in column 3 and 0.00023 in column 4), equivalent to between 5.9% and 6.4% abnormal returns per year (not significant at the 10% level). The abnormal returns to serial acquirers during the active period is over four times greater than those earned during the break period. While we cannot rule out other arguments, the comparatively higher abnormal returns to serial acquirers during the active period is consistent with the argument that M&As create value for (serial) acquirers.

[Insert Table 9 here]

4.7 Sensitivity analysis

We conduct several sensitivity checks. For brevity, we discuss but do not tabulate the results here. First, given that our main results compute CARs using the market model, we explore whether the results hold when we use more sophisticated models for deriving abnormal returns, specifically, the Fama & French three-factor and the Fama & French plus momentum (four-factor) models (Carhart, 1997; Fama and French, 1992). Overall, the results from all previous analyses are consistent and all conclusions remain robust.

Second, we explore whether the results are driven by time-specific factors such as merger waves and the 2007-2009 financial crises. Indeed, prior studies have suggested that the performance of acquirers has significantly changed over time. For example, Alexandridis et al. (2017) find that acquirers have become more successful since the 2007-2009 financial crisis. Consistent with the results in Figure 4, we do not find evidence that the results are driven by time periods.

Third, we explore whether the results are driven by mega-deals.[32] Indeed, Alexandridis et al. (2017) argue that mega-deals have been profitable since the financial crisis

[32]Our analysis already controls for deal value.

(post-2009). Consistent with Alexandridis et al. (2017), we identify mega-deals as deals with value over $500million. We exclude all mega-deals from the sample before conducting all the main analyses. We find that the results do not change and our conclusions are robust, suggesting that our results are not driven by such deals.

Fourth, prior studies have documented significant differences in acquirer returns across different deal types (Chang, 1998; Danbolt and Maciver, 2012; Franks and Harris, 1989; Jensen and Ruback, 1983). We, therefore, explore whether our main results (Table 5) are, robust across different deal types; public versus private targets, cash versus non-cash deals and cross-border versus domestic deals. Consistent with our findings in Table 5, we document a negative and statistically significant relationship between anticipation and CAR across all the six sub-samples (i.e., public targets, private targets, cash payment, non-cash (equity or mix) payment, cross-border targets and domestic targets).

Across the study, we use quintiles as the criteria to calibrate levels of bid anticipation. For robustness, in untabulated results, we explore whether the results are consistent when we use alternatives measures, particularly deciles. Interestingly, we find that the results are even stronger, perhaps, because the use of deciles is more precise and/or allows us to capture fewer but more extreme cases of bid anticipation and merger surprises. For example, we find that the decile of firms with the lowest bid anticipation (D1) earn 7-day CARs averaging 7.5% compared to the 5.4% earned by firms in Q1 (see Table 4). On the other hand, acquirers in D10 earn CARs of -0.1% as against 0.2% reported by acquirers in Q5 (in Table 4).

5 Concluding remarks

Prior research has recurrently argued that acquirers destroy or, at best, do not create shareholder value through takeovers. These results are puzzling in light of the growth in number and value of M&As over the last three decades. In this study, we attempt to reconcile the puzzle that takeovers are ubiquitous in the corporate world despite recurrent

research findings that they do not create value for shareholders. Specifically, we argue that acquirers can reasonably be predicted ex-ante and hence, their share prices in the period leading up to takeovers already reflect future acquisition likelihood. When bids are announced, share prices only move to revise previous beliefs. This suggests, therefore, that price movements around merger announcements do not fully capture the market's assessment of the value created by takeovers. Hence, we contend that short-run event studies—the method of choice across the M&A literature—systematically underestimate the value created by M&As.

Using US data, we empirically show that market anticipation largely explains the differences in abnormal returns earned by acquirers around merger deals. The average 7-day CAR to acquirers in the sample is about 1.2%. However, the quintile of acquirers with the *lowest* ex-ante likelihood of making M&A bids (Q1) earn average 7-day CARs of 5.4%, while their counterparts with the *highest* likelihood of initiating bids (Q5) earn average 7-day CARs of 0.2%. The differences in returns to anticipated and unanticipated acquirers are robust to deal characteristics, time periods, event windows, selection bias and alternative measures of merger anticipation. Using a multivariate framework, we show that acquisition CARs decline with pre-bid merger anticipation and provide evidence consistent with merger anticipation causing this decline in CARs. We corroborate our findings by showing that close rivals of acquirers also earn positive announcement returns, with the CARs to rivals increasing with the likelihood that these firms will initiate bids in the future. Finally, we show that merger anticipation also largely explains the declining returns to serial acquirers across successive takeover bids. Our findings suggest that serial acquirers create substantial value during acquisition programmes. Overall, the results suggest that acquirers significantly gain from takeovers but these gains are not captured in short-run event windows due to pre-bid market anticipation.

Our findings imply that the results from short-run event studies (e.g., those exploring acquirer abnormal returns from merger activities) are, plausibly, biased downwards. That is, these studies have largely underestimated the wealth created by acquirers, particularly

in cases in which firms' initiation of M&As is predictable ex-ante. While event studies have a rich history and have contributed enormously to the advancement of finance research, our study highlights the importance of controlling for market anticipation when using the technique. In our case, if unanticipated acquirers are randomly distributed (i.e., no selection bias), then the returns to this subgroup of acquirers is plausibly a less biased estimate of the market's perception of the impact of M&As on acquirers. We find that this group of acquirers earn significant CARs which are up to 18 times higher than the CARs earned by their more predictable counterparts. Based on this finding, we contend that acquirers gain from acquisitions, they always have, but these gains are not fully captured by short-run event studies.

Our research reconciles the inconsistency between prior research findings (i.e., mergers do no create value for acquirers) and practice (the number and value of M&As have continued to grow over the last three decades). Our argument that M&As create value for acquirers has implications for the regulation of mergers and efforts by some stakeholders who seek to discourage merger activity.

Finally, these findings create new opportunities to revisit some of the established stylised facts on the factors that explain M&A activity and how these activities impact on different stakeholders. Our findings further create opportunities to explore the extent to which bid likelihood is reflected in stock prices and the conditions under which this occurs.

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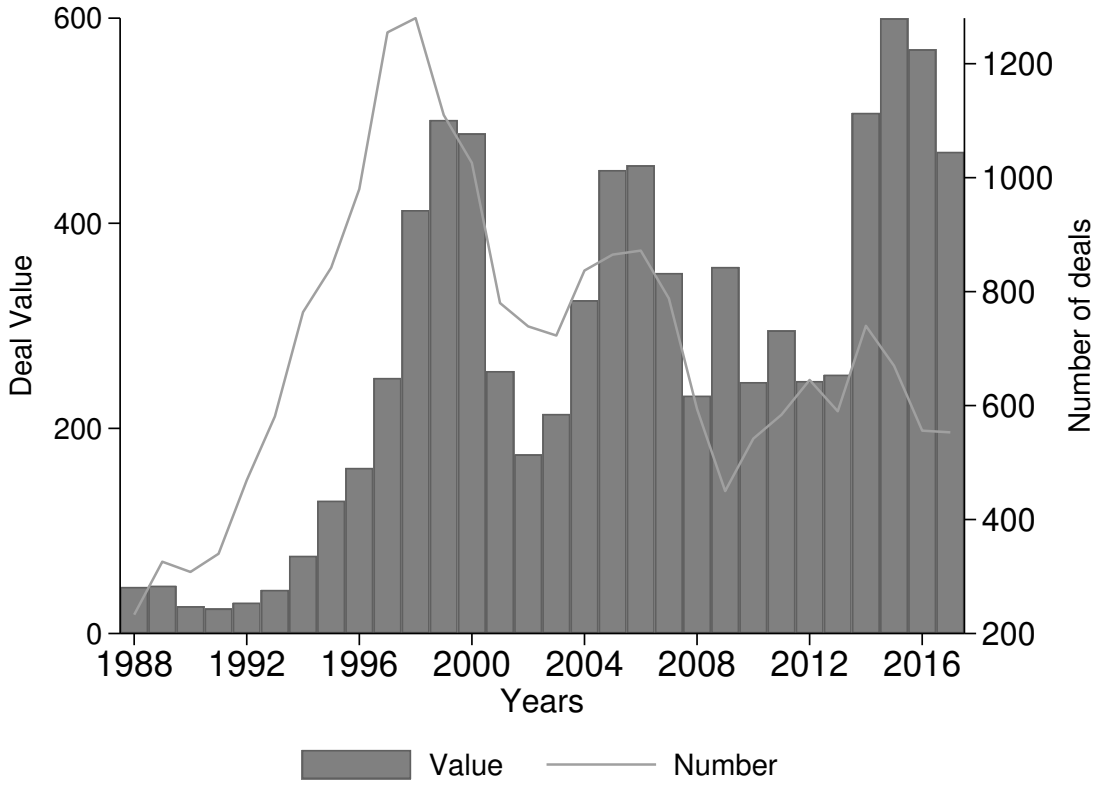

Figure 1 Three decades of M&A activity

The figure presents the value (in $billions of dollars) and the number of US M&A deals announced between January 1988 and December 2017.

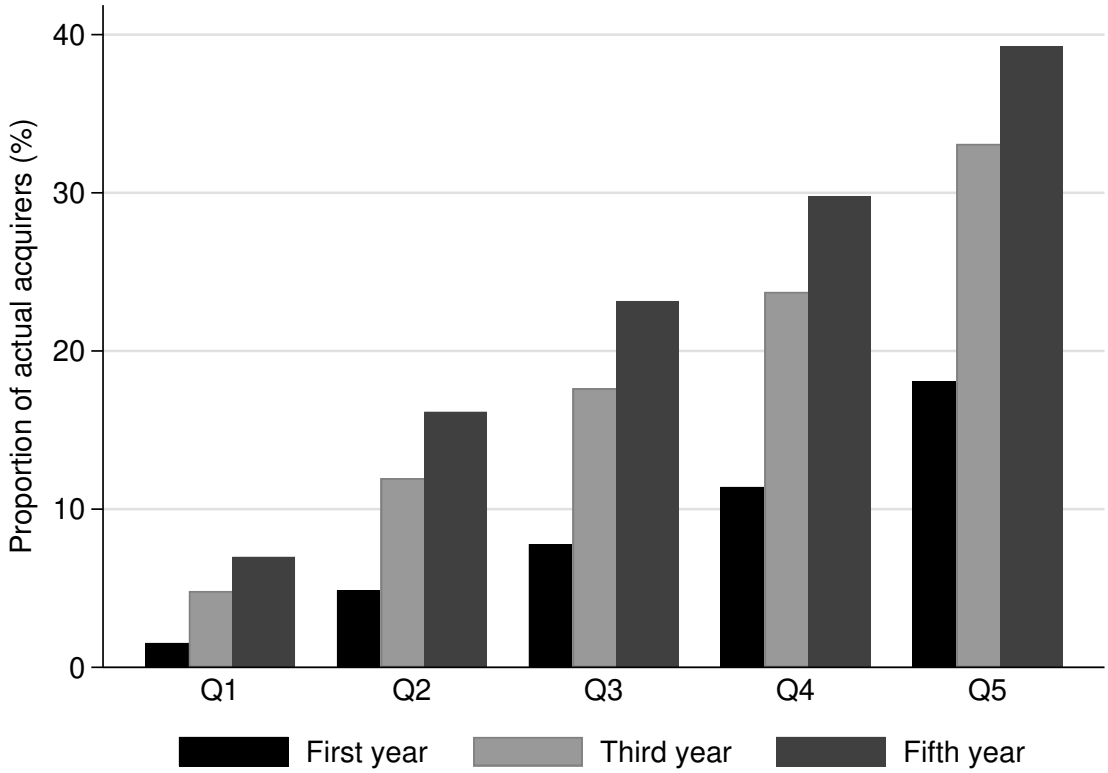

Figure 2 Predictive ability of bid anticipation model

The figure reports the performance of the base model when predicting actual acquirers one, three and five years ahead. Q5(Q1) represents the 20% of firms with the highest (lowest) likelihood of initiating a bid. Performance is measured as the proportion of actual acquirers (i.e., true positives) in quintile portfolios of predicted acquirers.

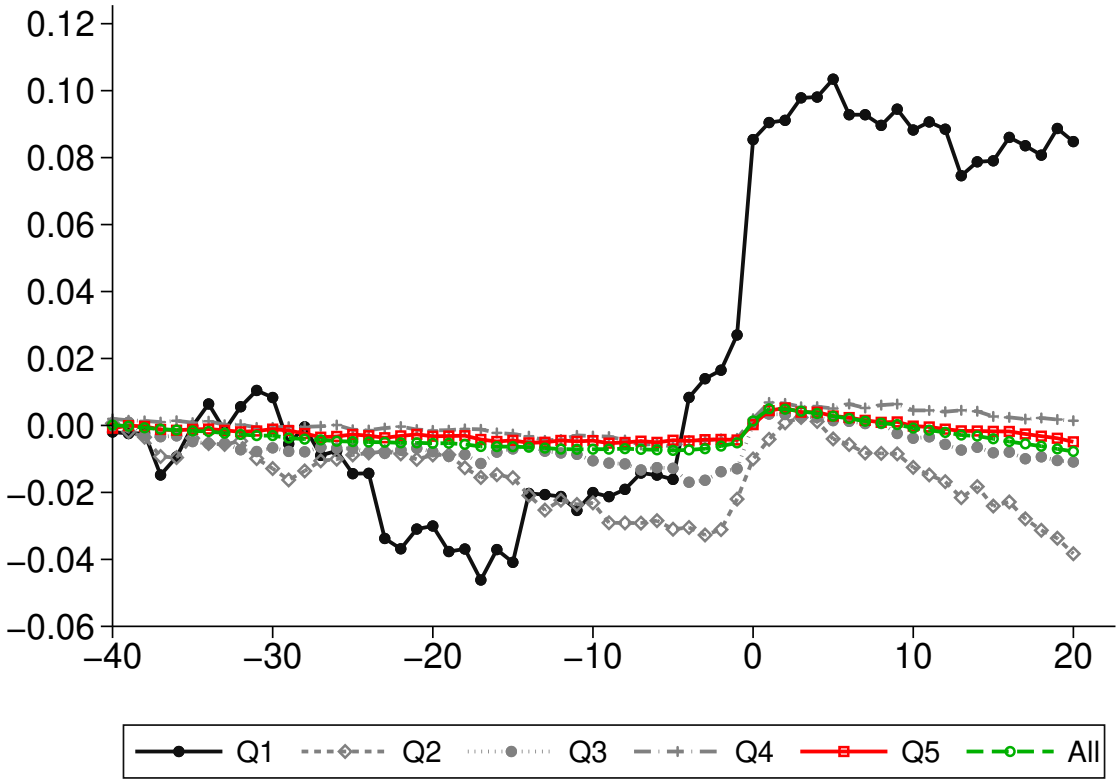

Figure 3 Cumulative abnormal returns and bid anticipation

The figure presents the cumulative abnormal returns (CAR) earned by acquirers between day -40 (40 days before the bid) and +20 (20 days after the bid) across different quintiles of bid anticipation. Q5(Q1) represents the 20% of firms with the highest (lowest) likelihood of initiating a bid.

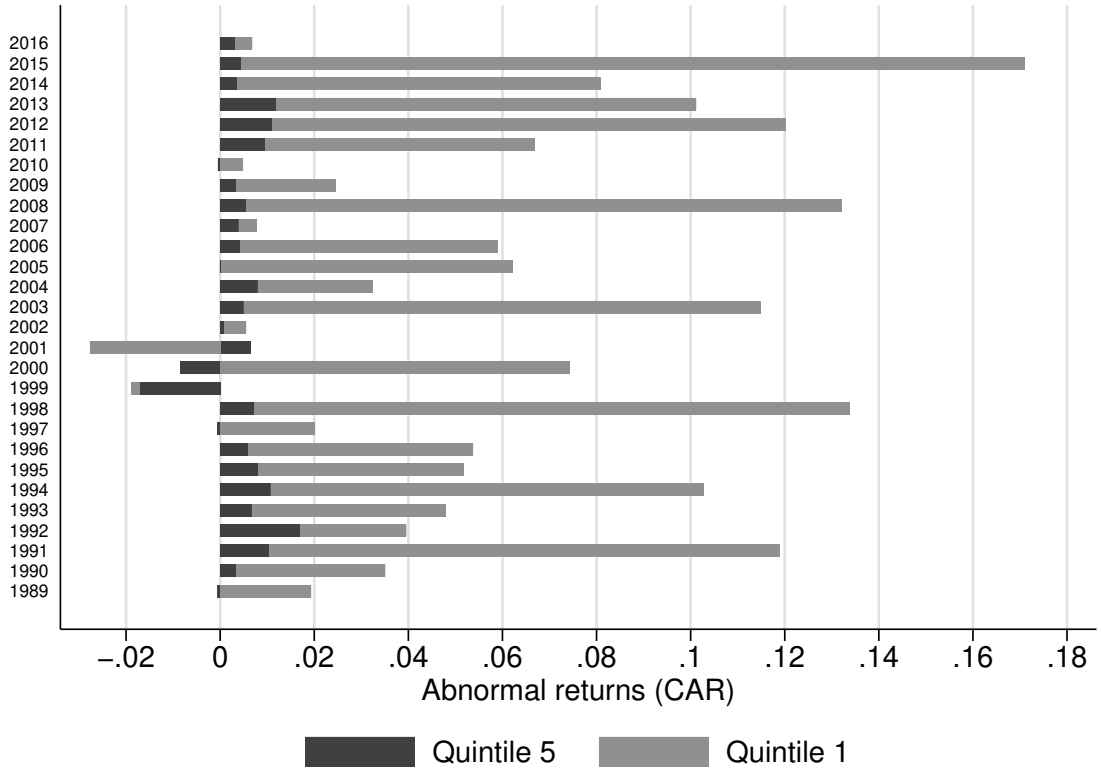

Figure 4 Bid anticipation and abnormal returns across time

The figure presents the mean abnormal returns (7-day CARs) to acquirers in quintile 5 (quintile of anticipated acquirers) and quintile 1 (quintile of surprise acquirers) between 1987 and 2016.

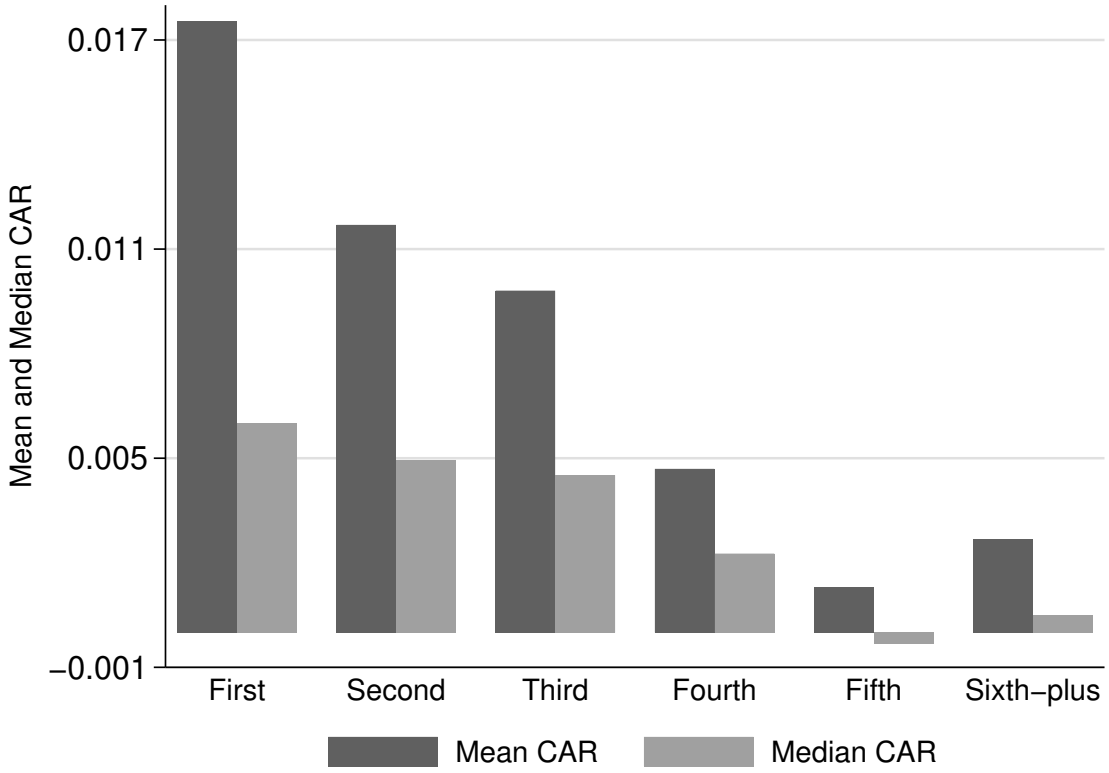

Figure 5 Abnormal returns to serial acquirers across successive bids

The figure presents the mean and median abnormal returns (7-day CARs) to serial acquirers across successive bids. "First" presents CARs earned during the first bid announced by the acquirer. "Sixth-plus" represents average CARs earned in all bids after the fifth successive bid announced by the acquirer.

Table 1 Sample distribution

The table shows the annual number of observations, the number of deals and the distribution of deal characteristics in the sample. The observations are drawn from Compustat and the deal/deal characteristics from Thomson Eikon. The sample of deals includes all the deals announced by US public firms for US and non-US public and private firms. The sample includes all the deals with deal value above $1million, which if completed will give the acquirer control (>50% shareholding) of the target.

Year	Obs.	Deals	Cash	Public	Cross-border	Compete	Full	Same state
1988	655	42	16	14	2	3	35	5
1989	4,505	244	76	42	33	6	219	40
1990	4,741	247	66	40	37	5	217	50
1991	4,786	260	65	32	34	5	243	56
1992	4,942	347	68	39	57	5	309	68
1993	5,250	451	115	47	45	2	424	106
1994	5,620	510	140	73	76	9	476	97
1995	5,965	603	149	106	86	7	560	118
1996	6,602	689	168	107	101	9	641	118
1997	7,233	879	251	145	133	8	798	155
1998	7,367	900	271	156	167	7	862	172
1999	7,193	768	192	150	137	7	723	174
2000	7,389	738	207	143	134	9	684	166
2001	7,418	582	185	108	121	8	555	117
2002	7,030	575	248	86	100	6	538	141
2003	6,806	560	236	96	91	13	521	120
2004	6,467	623	285	86	125	6	583	127
2005	7,123	711	322	113	125	6	672	157
2006	6,962	712	341	115	122	3	682	149
2007	6,809	653	313	108	120	2	623	142
2008	6,767	511	249	73	102	7	480	99
2009	6,481	404	182	73	85	7	374	81
2010	6,353	466	240	83	104	2	435	103
2011	6,252	493	254	55	119	3	463	80
2012	6,194	521	273	75	121	1	488	97
2013	6,082	484	239	76	98	3	457	101
2014	6,296	598	279	97	117	6	574	117
2015	6,371	550	331	110	103	3	518	105
2016	6,215	477	297	97	89	3	450	93
2017	5,949	450	282	84	79	3	425	103
Total	183,823	16,048	6,340	2,629	2,863	164	15,029	3,257

Table 2 Descriptive Statistics

The table reports descriptive statistics across several variables for firms included in the sample. Full variable definitions are provided in Appendix A.

	N	Mean	SD	p25	p50	p75
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Main variables						
3-Day CAR	16,048	0.012	0.097	-0.023	0.005	0.038
5-Day CAR	16,048	0.012	0.105	-0.029	0.006	0.046
7-Day CAR	16,048	0.012	0.114	-0.035	0.005	0.051
7-day CAR (Rivals)	65,555	0.020	0.095	-0.020	0.011	0.049
Anticipation	183,823	0.098	0.064	0.050	0.092	0.138
Anticipation (Extended)	87,181	0.137	0.085	0.076	0.125	0.181
Acquisitiveness	15,230	0.381	0.540	0.059	0.250	0.500
Panel B: Control variables — Firm financial characteristics						
Profitability	183,823	0.008	0.802	-0.029	0.089	0.176
Tobin's Q	183,823	2.678	6.079	1.029	1.380	2.245
Book to market	183,823	0.493	1.855	0.234	0.492	0.869
Growth opportunities	183,823	0.355	1.642	0.197	0.490	0.848
Sales growth	183,823	0.268	1.042	-0.049	0.078	0.259
Liquidity	183,823	0.182	0.220	0.026	0.088	0.255
Leverage	183,823	0.690	1.152	0.319	0.532	0.743
Growth resource	183,823	0.266	0.442	0.000	0.000	1.000
Disturbance	183,823	0.800	0.400	1.000	1.000	1.000
Firm size	183,823	19.020	2.661	17.230	19.000	20.790
Free cash flow	183,823	-0.098	0.483	-0.086	0.008	0.061
Tangible assets	183,823	0.262	0.255	0.054	0.174	0.406
Firm age	183,823	2.047	0.842	1.386	2.197	2.708
Concentration	183,823	0.232	0.201	0.098	0.177	0.300
Panel C: Control variables — Corporate governance characteristics						
Board ability	145,753	0.000	0.126	-0.073	-0.018	0.043
Board females	12,090	0.135	0.105	0.071	0.125	0.200
Board ownership	12,090	0.063	0.103	0.008	0.022	0.064
Equity compensation	11,354	0.199	0.288	0.000	0.000	0.483
Block holding	11,860	0.246	0.126	0.153	0.236	0.328
Board independence	12,090	0.792	0.110	0.714	0.818	0.889
Board size	12,090	9.384	2.359	8.000	9.000	11.000
CEO Chair	12,090	0.520	0.500	0.000	1.000	1.000
Board tenure	12,090	9.041	3.822	6.429	8.556	11.110
Board busyness	11,354	2.082	3.548	0.000	0.000	4.000
Board networks	11,354	7.167	0.631	6.818	7.220	7.591
Board age	12,089	62.460	3.743	60.130	62.570	64.820
Panel D: Control variables — M&A characteristics						
Relative size	16,048	0.344	1.870	0.033	0.102	0.277
Deal Value	16,048	17.790	1.893	16.410	17.710	19.060
Cross-border	16,048	0.178	0.383	0.000	0.000	0.000
Cash deal	16,048	0.395	0.489	0.000	0.000	1.000
Competing bids	16,048	0.010	0.101	0.000	0.000	0.000
Previous deals	16,048	0.506	0.500	0.000	1.000	1.000
Public target	16,048	0.164	0.370	0.000	0.000	0.000
Same state	16,048	0.203	0.402	0.000	0.000	0.000

Table 3 Predictive ability of prediction models

The table assesses the prediction models' ability to predict future takeover activity. All firms are first ranked by their estimated likelihood of initiating bids, then split into five groups (quintiles). Q1 (Q5) represents the 20% of firms with the lowest (highest) bid likelihood. We report the total number of firms in each quintile (Total) in column 1. We then track this quintile portfolio of firms over the next one (Year 1), three (Year 3) and five years (Year 5) and record the number of firms within each quintile that initiate takeover bids over this period (Actual). The ratio of Actual to Total (Perc.(%)) captures the models' ability to predict future acquirers. The measure of anticipation in panel A is estimated from equation (2) while the measure in panel B is estimated from equation (3). In panel C, bid likelihood is estimated using equation (2) but restricting the estimation to data used in panel B.

Quintile	**Total**	**Year 1**		**Year 3**		**Year 5**	
		Actual	Perc.(%)	Actual	Perc.(%)	Actual	Perc.(%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Base anticipation model							
Q1	36,732	569	2	1,649	4	2,446	7
Q2	36,650	1,797	5	4,251	12	5,796	16
Q3	36,552	2,858	8	6,293	17	8,320	23
Q4	36,489	4,184	11	8,517	23	10,731	29
Q5	36,412	6,640	18	11,833	32	14,092	39
Panel B: Extended anticipation model							
Q1	17,471	799	5	1,998	11	2,680	15
Q2	17,435	1,583	9	3,556	20	4,626	27
Q3	17,439	2,258	13	4,775	27	5,989	34
Q4	17,401	3,064	18	6,060	35	7,423	43
Q5	17,438	4,544	26	8,050	46	9,380	54
Panel C: Base anticipation model (Re-estimated)							
Q1	17,392	793	5	2,038	12	2,744	16
Q2	17,371	1,629	9	3,712	21	4,794	28
Q3	17,372	2,237	13	4,740	27	6,039	35
Q4	17,314	3,180	18	6,216	36	7,540	44
Q5	17,334	4,368	25	7,649	44	8,876	51

Table 4 M&A likelihood and acquirer CARs

The table reports the mean and median abnormal returns (7-day CARs) generated by acquirers in different quintiles of bid likelihood. Q1 (Q5) represents the 20% of firms with the lowest (highest) bid likelihood. The number of acquirers in each quintile is reported in column 1. In panel A, we report results obtained using the base measure of anticipation (estimated from equation (2)). In panel B, we use a propensity score matching algorithm with nearest neighbour matching to identify observations in Q2 to Q5 that share similar characteristics with the 569 observations in Q1. Panel C reports results obtained from using an alternative measure of anticipation derived from an extended model (see equation (3). In each panel, Q1-Q5 assesses the difference in abnormal returns earned by unanticipated (Q1) and anticipated (Q5) acquirers. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively, based on the t-test (means) and sign-test (median).

Quintile	**Acquirers**	**3-day CAR**		**5-day CAR**		**7-day CAR**	
(Difference)	N	Mean	Median	Mean	Median	Mean	Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Base anticipation model							
Q1	569	0.052***	0.010***	0.055***	0.024***	0.054***	0.014***
Q2	1,797	0.025***	0.011***	0.028***	0.014***	0.028***	0.013***
Q3	2,858	0.013***	0.005***	0.014***	0.007***	0.016***	0.008***
Q4	4,184	0.009***	0.004***	0.010***	0.005***	0.010***	0.005***
Q5	6,640	0.004***	0.003***	0.004***	0.003***	0.002***	0.002***
(Q1-Q5)		0.048***	0.007**	0.051***	0.021***	0.052***	0.012***
Panel B: Propensity score-matched acquirers							
Q1	569	0.052***	0.010***	0.055***	0.024***	0.054***	0.014***
Q2	569	0.032***	0.013***	0.036***	0.019***	0.035***	0.011***
Q3	569	0.021***	0.011***	0.022***	0.014***	0.024***	0.012***
Q4	569	0.019***	0.008***	0.017***	0.007***	0.019***	0.010***
Q5	569	0.006***	0.007***	0.006***	0.005***	0.004***	0.006***
(Q1-Q5)		0.046***	0.003	0.049***	0.019**	0.049***	0.008
Panel C: Extended anticipation model							
Q1	799	0.033***	0.013***	0.038***	0.019***	0.037***	0.016***
Q2	1,583	0.019***	0.010***	0.020***	0.014***	0.020***	0.010***
Q3	2,258	0.013***	0.006***	0.014***	0.006***	0.015***	0.007***
Q4	3,064	0.009***	0.005***	0.009***	0.006***	0.009***	0.005***
Q5	4,544	0.002	0.002***	0.002	0.002***	0.001	0.002*
(Q1-Q5)		0.031***	0.011***	0.036***	0.017***	0.036***	0.014***

Table 5 Bid anticipation and announcement returns

The table reports the OLS regression coefficient estimates of abnormal returns (7-day CARs) on measures of bid anticipation and other control variables. The model (see equation (4)) controls for industry, state and year fixed effects. Industry controls are based on the Fama & French 48 industry classification scheme. Full variable definitions are provided in Appendix A. $P-values$ computed from robust standard errors (clustered at the firm-level) are presented in parenthesis. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	**CAR** (1)	**CAR** (2)	**CAR** (3)	**CAR** (4)	**CAR** (5)	**CAR** (6)
Anticipation	-0.158***				-0.099**	
	(0.000)				(0.019)	
Quintile 1 (Q1)		0.025**				
		(0.036)				
Quintile 2 (Q2)		0.012***				
		(0.004)				
Quintile 4 (Q4)		-0.004*				
		(0.075)				
Quintile 5 (Q5)		-0.011***				
		(0.000)				
Anticipation (Ranks)			-0.007***			
			(0.000)			
Anticipation (Extended)				-0.071***		-0.044**
				(0.000)		(0.040)
Book to market	0.018*	0.018*	0.018*	0.025***	-0.016	-0.029
	(0.083)	(0.084)	(0.076)	(0.002)	(0.450)	(0.154)
Firm size	-0.006***	-0.006***	-0.006***	-0.006***	-0.003	-0.003
	(0.000)	(0.000)	(0.000)	(0.000)	(0.307)	(0.268)
Free cash flow	0.003	0.005	0.003	-0.001	0.005	-0.013
	(0.803)	(0.727)	(0.813)	(0.952)	(0.878)	(0.682)
Growth opportunities	-0.024**	-0.023**	-0.024**	-0.011	0.024	0.039*
	(0.032)	(0.048)	(0.036)	(0.149)	(0.313)	(0.067)
Relative size	0.001	0.000	0.000	-0.002	0.004	0.002
	(0.519)	(0.774)	(0.738)	(0.109)	(0.822)	(0.892)
Deal Value	0.006***	0.006***	0.006***	0.006***	0.004**	0.005**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.045)	(0.017)
Cross-border	-0.000	-0.000	-0.000	-0.000	-0.002	-0.001
	(0.976)	(0.987)	(0.986)	(0.897)	(0.576)	(0.708)
Cash deal	0.004**	0.004**	0.004**	0.004**	0.002	0.002
	(0.032)	(0.011)	(0.012)	(0.012)	(0.530)	(0.525)
Competing bids	-0.007	-0.006	-0.006	-0.008	-0.004	-0.003
	(0.399)	(0.480)	(0.485)	(0.344)	(0.814)	(0.863)
Previous deals	-0.000	0.000	0.000	-0.000	-0.001	-0.002
	(0.820)	(0.934)	(0.906)	(0.829)	(0.905)	(0.677)
Public target	-0.029***	-0.029***	-0.029***	-0.025***	-0.013***	-0.014***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.003)
Same state	0.006**	0.006**	0.006**	0.001	-0.005	-0.007
	(0.034)	(0.041)	(0.041)	(0.651)	(0.400)	(0.183)
Board females					-0.021	-0.022
					(0.265)	(0.249)
Board ownership					0.021	0.012
					(0.224)	(0.496)
Equity compensation					-0.007	-0.005
					(0.331)	(0.516)
Block holding					0.004	-0.008
					(0.837)	(0.664)
Board independence					0.007	0.008
					(0.694)	(0.667)
Board size					-0.001	-0.001
					(0.597)	(0.563)
CEO Chair					0.001	0.001
					(0.837)	(0.694)
Board tenure					-0.000	-0.000
					(0.654)	(0.760)
Board busyness					-0.000	-0.001
					(0.353)	(0.283)
Board networks					0.004	0.005
					(0.342)	(0.245)
Board ability					-0.020*	-0.027**
					(0.080)	(0.012)
Board age					-0.001	-0.001
					(0.224)	(0.248)
Constant	0.073***	0.055**	0.082***	0.030	0.157*	0.126
	(0.002)	(0.015)	(0.001)	(0.186)	(0.089)	(0.151)
Observations	16,048	16,048	16,048	12,248	1,957	1,957
R-squared	0.045	0.044	0.043	0.042	0.114	0.078
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 6 Bid anticipation and announcement returns: Endogeneity

The table reports coefficient estimates of instrumental variable regressions (two-stage least squares (2SLS) and two-step generalised method of moments (GMM) models) exploring the relationship between bid anticipation and announcement abnormal returns (7-day CARs). The analysis uses different instruments including; Post-dormant deal, rival bidding activity and lags of bid anticipation. Full variable definitions are provided in Appendix A. $P-values$ computed from robust standard errors (clustered at the firm-level) are presented in parenthesis. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

	Two-stage Least Squares				**Two-step GMM**			
	First stage	Second stage	First stage	Second stage	First stage	Second stage	First stage	Second stage
Variables	Anticipation (1)	CAR (2)	Anticipation (3)	CAR (4)	Anticipation (5)	CAR (6)	Anticipation (7)	CAR (8)
Anticipation		-0.273***				-0.259***		-0.196***
		(0.000)				(0.000)		(0.001)
Anticipation (Extended)				-0.110**				
				(0.048)				
Post-dormant deal	-0.029***		-0.036***		-0.029***			
	(0.000)		(0.000)		(0.000)			
Rival bidding activity	0.012***		0.008***		0.012***			
	(0.000)		(0.000)		(0.000)			
$Anticipation_{t-1}$							0.454***	
							(0.000)	
$Anticipation_{t-2}$							0.160***	
							(0.000)	
$Anticipation_{t-3}$							0.080***	
							(0.000)	
$Anticipation_{t-4}$							0.075***	
							(0.000)	
$Anticipation_{t-5}$							0.031***	
							(0.003)	
Book to market	-0.010***	0.016	0.000	0.024***	-0.010***	0.019**	-0.010***	0.009
	(0.000)	(0.113)	(0.939)	(0.003)	(0.000)	(0.044)	(0.000)	(0.656)
Firm size	0.005***	-0.005***	0.013***	-0.005***	0.005***	-0.005***	-0.001***	-0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Free cash flow	0.087***	0.014	0.161***	0.004	0.087***	0.012	0.060***	0.008
	(0.000)	(0.325)	(0.000)	(0.773)	(0.000)	(0.392)	(0.000)	(0.721)
Growth opportunities	-0.005**	-0.022**	-0.029***	-0.009	-0.005**	-0.021**	0.005***	-0.022
	(0.035)	(0.041)	(0.000)	(0.224)	(0.035)	(0.050)	(0.000)	(0.310)
Relative size	0.002	0.001	0.005**	-0.002	0.002	0.001	0.000	0.002
	(0.166)	(0.403)	(0.032)	(0.153)	(0.166)	(0.399)	(0.709)	(0.169)
Deal Value	0.004***	0.006***	0.004***	0.006***	0.004***	0.006***	0.001***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cross-border	0.007***	-0.000	0.009***	-0.001	0.007***	0.000	0.002**	-0.000
	(0.000)	(0.975)	(0.000)	(0.801)	(0.000)	(0.969)	(0.035)	(0.966)

Table 6 Bid anticipation and announcement returns (Cont'd)

	Two-stage Least Squares				Two-step GMM			
	First stage	Second stage	First stage	Second stage	First stage	Second stage	First stage	Second stage
Variables	Anticipation (1)	CAR (2)	Anticipation (3)	CAR (4)	Anticipation (5)	CAR (6)	Anticipation (7)	CAR (8)
Cash deal	0.002***	0.004**	0.007***	0.005***	0.002***	0.004***	-0.000	0.004**
	(0.005)	(0.015)	(0.000)	(0.008)	(0.005)	(0.010)	(0.850)	(0.047)
Competing bids	-0.011***	-0.010	-0.010	-0.008	-0.011***	-0.010	0.002	-0.013
	(0.007)	(0.234)	(0.114)	(0.310)	(0.007)	(0.239)	(0.414)	(0.135)
Previous deals	0.001	-0.000	0.003**	-0.000	0.001	-0.000	0.003***	-0.002
	(0.230)	(0.848)	(0.041)	(0.866)	(0.230)	(0.821)	(0.001)	(0.577)
Public target	-0.006***	-0.030***	-0.006***	-0.026***	-0.006***	-0.030***	0.000	-0.026***
	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)	(0.000)	(0.962)	(0.000)
Same state	0.003**	0.005*	-0.000	0.000	0.003**	0.005*	0.001	0.010**
	(0.022)	(0.070)	(0.885)	(0.908)	(0.022)	(0.092)	(0.505)	(0.012)
Constant	-0.008	0.041**	-0.131***	0.020	-0.008	0.039**	0.020***	0.058***
	(0.662)	(0.011)	(0.000)	(0.287)	(0.662)	(0.014)	(0.000)	(0.005)
Observations	16,048	16,048	12,248	12,248	16,048	16,048	9,654	9,654
R-squared		0.034		0.033		0.034		0.043
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sanderson-Windmeijer multivariate F test of excluded instruments								
F stat		559.290		223.030		559.290		1,159.130
χ^2 *p-value*		(0.000)		(0.000)		(0.000)		(0.000)
Under-identification test								
Kleibergen-Paap rk LM stat		860.644		387.645		860.644		1,596.809
χ^2 *p-value*		(0.000)		(0.000)		(0.000)		(0.000)
Weak-identification test								
Cragg-Donald Wald F stat		429.555		226.168		429.555		2,127.574
Kleibergen-Paap rk Wald F stat		559.290		223.030		559.290		1,159.129
Over-identification test								
Hansen J statistic		0.497		0.156		0.497		6.635
χ^2 *p-value*		(0.481)		(0.693)		(0.481)		(0.157)

Table 7 Abnormal returns to rivals of acquiring firms

The table reports results from OLS regressions exploring whether the market's assessment of the likelihood that rivals will subsequently initiate takeover bids explains the spillover abnormal returns (7-day CARs) to close rivals of acquirers. "Years since last industry bid" captures merger intensity, with smaller values indicating higher intensity. "Future bidder" is an indicator variable for rivals who initiate a bid within one year. "Anticipation" captures the likelihood that the rival will initiate a deal over the next year. Full variable definitions are provided in Appendix A. $P-values$ computed from robust standard errors (clustered at the firm-level) are presented in parenthesis. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	**CAR** (1)	**CAR** (2)	**CAR** (3)	**CAR** (4)	**CAR** (5)
Years since last industry bid	-0.008***				
	(0.000)				
Future bidder		0.004***			
		(0.000)			
Anticipation			0.125***		0.086***
			(0.000)		(0.005)
Anticipation (Extended)				0.060***	
				(0.000)	
Profitability	-0.006	-0.008***	-0.009***	-0.010**	-0.015
	(0.197)	(0.008)	(0.002)	(0.012)	(0.135)
Tobin's Q	-0.001	-0.001**	-0.002***	-0.002***	0.001
	(0.269)	(0.017)	(0.000)	(0.000)	(0.636)
Growth opportunities	0.002	-0.000	0.000	-0.001	-0.002
	(0.454)	(0.899)	(0.955)	(0.597)	(0.718)
Sales growth	-0.001	-0.002**	-0.004***	-0.003***	-0.015***
	(0.776)	(0.037)	(0.000)	(0.004)	(0.000)
Liquidity	0.025***	0.010***	0.011***	0.014***	0.007
	(0.000)	(0.002)	(0.001)	(0.000)	(0.342)
Leverage	-0.006	0.004*	0.013***	0.011***	0.013*
	(0.191)	(0.054)	(0.000)	(0.000)	(0.052)
Firm size	-0.001**	-0.002***	-0.003***	-0.003***	-0.001
	(0.028)	(0.000)	(0.000)	(0.000)	(0.435)
Free cash flow	0.017*	0.001	-0.007	-0.005	-0.005
	(0.067)	(0.905)	(0.223)	(0.518)	(0.804)
Tangible assets	0.002	-0.005***	0.001	-0.004	-0.003
	(0.629)	(0.006)	(0.776)	(0.144)	(0.634)
Firm age	-0.002*	-0.002***	-0.001	-0.002**	-0.002
	(0.091)	(0.001)	(0.294)	(0.036)	(0.470)
Concentration	-0.018***	-0.018***	-0.019***	-0.022***	-0.010
	(0.003)	(0.000)	(0.000)	(0.000)	(0.131)
Board females					0.002
					(0.863)
Board ownership					0.009
					(0.406)
Equity compensation					0.002
					(0.541)
Block holding					0.005
					(0.577)
Board independence					0.011
					(0.307)
Board size					-0.001**
					(0.023)
CEO Chair					0.000
					(0.898)
Board tenure					0.000
					(0.148)
Board busyness					0.000
					(0.670)
Board networks					-0.000
					(0.936)
Board ability					-0.011**
					(0.045)
Board age					-0.001***
					(0.004)
Constant	0.037**	0.048***	0.064***	0.067***	0.075***
	(0.017)	(0.000)	(0.000)	(0.000)	(0.007)
Observations	9,552	53,197	53,191	41,660	4,893
R-squared	0.030	0.012	0.013	0.016	0.023
Year FE	Yes	Yes	Yes	Yes	Yes

Table 8 Acquisitiveness, anticipation and abnormal returns

The table presents results of Sobel-Goodman mediation test exploring the extent to which bid Anticipation mediates the relationship between a firm's acquisitiveness and abnormal returns (7-day CARs) earned when deals are announced. The models (1-3) are shown in equation (5), 6 and 7, respectively. $P-values$ computed from robust standard errors (clustered at the firm-level) are presented in parenthesis. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	**CAR** (1)	**Anticipation** (2)	**CAR** (3)
Acquisitiveness	-0.008**	0.043***	-0.001
	(0.039)	(0.000)	(0.760)
Anticipation			-0.161***
			(0.000)
Book to market	0.020***	-0.012***	0.018*
	(0.000)	(0.000)	(0.081)
Firm size	-0.007***	0.005***	-0.006***
	(0.000)	(0.000)	(0.000)
Free cash flow	-0.009	0.073***	0.003
	(0.182)	(0.000)	(0.803)
Growth opportunities	-0.024***	0.001	-0.024**
	(0.000)	(0.668)	(0.033)
Relative size	0.000	0.002	0.001
	(0.344)	(0.201)	(0.532)
Deal Value	0.005***	0.005***	0.006***
	(0.000)	(0.000)	(0.000)
Cross-border	-0.001	0.003**	-0.000
	(0.728)	(0.018)	(0.874)
Cash deal	0.004*	0.000	0.004**
	(0.055)	(0.682)	(0.032)
Competing bids	-0.006	-0.009**	-0.007
	(0.523)	(0.016)	(0.365)
Public target	-0.028***	-0.008***	-0.029***
	(0.000)	(0.000)	(0.000)
Same state	0.006***	0.001	0.007**
	(0.007)	(0.474)	(0.024)
Constant	0.075***	-0.044**	0.068***
	(0.003)	(0.032)	(0.001)
Observations	16,048	16,048	16,048
R-squared	0.037	0.375	0.042
Industry FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Sobel-Goodman Mediation Tests			
	Coef	**Std Err**	**(p-value) sig.**
Indirect effect (IE)	-0.010	0.001	(0.000)***
Direct effect (DE)	-0.002	0.004	(0.564)
Total effect (TE)	-0.012	0.004	(0.002)***
Sobel test stat	-0.010	0.001	(0.000)***
Aroian test stat	-0.010	0.001	(0.000)***
Goodman test stat	-0.010	0.001	(0.000)***
Extent of mediation			
Proportion of total effect that is mediated			0.813
Ratio of indirect to direct effect			4.346
Ratio of total to direct effect			5.346

Table 9 Abnormal returns to portfolios of serial acquirers

The table presents Fama & French three-factor and Carhart four-factor regression models estimating abnormal returns to serial acquirers during and after the periods of serial acquisition activity (i.e., active *vs.* break periods). $P-values$ computed from robust standard errors are presented in parenthesis. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

	Active period		**Break period**	
	(1)	(2)	(3)	(4)
Market risk premium (Rm-Rf)	0.971***	0.963***	1.026***	1.056***
	(0.000)	(0.000)	(0.000)	(0.000)
Small-Minus-Big (SMB)	0.662***	0.669***	0.747***	0.736***
	(0.000)	(0.000)	(0.000)	(0.000)
High-Minus-Low (HML)	0.193***	0.174***	0.627***	0.663***
	(0.000)	(0.000)	(0.000)	(0.000)
Momentum (UMD)		-0.055*		0.103**
		(0.068)		(0.017)
Alpha (Constant)	0.001***	0.001***	0.000	0.000
	(0.000)	(0.000)	(0.214)	(0.269)
Observations	5,041	5,041	4,025	4,025
Adjusted R-squared	0.404	0.404	0.569	0.571
F Stat	773.5	585.2	1,499	1,145
Prob > F	(0.000)	(0.000)	(0.000)	(0.000)

Appendix A Variable descriptions

Variable	Description
Panel A: Firm variables	
Profitability	The ratio of earnings before interest and tax to total capital employed.
Tobin's Q	The sum of the book value of debt and the market value of equity, scaled by the book value of assets.
Book to market	The ratio of book value of equity to market value of the firm.
Sales growth	Percentage change in total sales.
Growth opportunities	The ratio of "firm value absent growth opportunities" (Ohlson, 1995) to the market value of the firm. Consistent with Richardson (2006), we estimate "firm value absent growth opportunities" as; $$V_{AIP} = (1 - \alpha r)BV + \alpha(1 + r)X - \alpha r d \quad (8)$$ where, $\alpha = (\omega/(1 + r - \omega))$ $r = 12\%$ and $\omega = 0.62$. Here, r is the discount rate (12%), ω is the abnormal earnings persistence parameter (0.62), BV is the book value of common equity, X is operating income after depreciation and d is the annual dividend.
Liquidity	The ratio of cash and short term investments to total assets.
Leverage	The ratio of long term debt to total assets.
Growth Resource	A dummy that takes a value of one if a firm has high growth and low resources or vice versa, and a value of zero otherwise. "High" and "low" are defined relative to the 4-digit SIC code industry-year median values.
Industry disturbance	A dummy variable that takes a value of one if a firm is in a 4-digit SIC code industry which has experienced an M&A deal in the previous year.
Firm size (square)	The natural log of total assets (squared).
Free cash flow	Cash flow from operations less capital expenditures normalised by total assets.
Tangible assets	The ratio of property, plant and equipment to total assets.
Firm age	The natural log of (the number of years since listing plus 0.0001).
Industry concentration	Herfindahl-Hirschman index; sum of the squared market shares (proxied by total revenues) of all listed firms in the 4-digit SIC code industry.
Panel B: Deal attributes	
Bid	An indicator variable that takes a value of one if a firm makes a control bid (i.e., one which, if successful) will lead to >50% ownership of the target) and a value of zero otherwise.
Acquisitiveness	The average number of deals completed per year since the start of the sample period.
Anticipation	An estimate of a firm's likelihood of initiating a bid as a function of its characteristics (see equation (2)).
Q1 (Q5)	The quintile (20%) of acquirers with the lowest (highest) bid likelihood.
D1 (D10)	The decile (10%) of acquirers with the lowest (highest) bid likelihood.
Anticipation (Extended)	An estimate of a firm's likelihood of initiating a bid as a function of its characteristics (see equation (3)).
7-day CAR	Cumulative abnormal returns for the period starting 3 days before the deal announcement day and ending 3 days after the deal announcement i.e., (-3,+3).
5-day CAR	Cumulative abnormal returns for the period starting 2 days before the deal announcement day and ending 2 days after the deal announcement i.e., (-2,+2).
3-day CAR	Cumulative abnormal returns for the period starting 1 day before the deal announcement day and ending 1 day after the deal announcement i.e., (-1,+1).
Post-dormant deal	The first M&A deal after a 12-month period of no deals in each 4-digit SIC code industry.
Rival bidding activity	A dummy variable that takes a value of one if an acquirer's rival announced a bid in the last year.
Years since last industry bid	The number of years since a deal was announced in a firm's 4-digit SIC code industry.
Future bidder	An indicator variable that takes a value of one if a firm initiates a bid in the next year and a value of zero otherwise.

Appendix A Variable descriptions (cont'd)

Variable	Description
Panel B: Deal attributes (cont'd)	
Deal value	The natural log of the value (at offer price) of the M&A transaction.
Relative size	The ratio of the deal value to the market value of acquirer.
Cash deal	A dummy variable that takes a value of one if the deal is fully paid in cash and a value of zero otherwise.
Stock deal	A dummy variable that takes a value of one if the deal is fully paid in stock and a value of zero otherwise.
Private target	A dummy variable that takes a value of one if the target is unlisted and a value of zero otherwise.
Public target	A dummy variable that takes a value of one if the target is listed and a value of zero otherwise.
Non-diversifying deal	A dummy variable that takes a value of one if the target and acquirer are in the same 2-digit SIC code industry and a value of zero otherwise.
Diversifying deal	A dummy variable that takes a value of one if the target and acquirer are in different 2-digit SIC code industries and a value of zero otherwise.
Competing bids	A dummy variable that takes a value of one if there were multiple bidders for the same target and a value of zero otherwise.
Cross-state	A dummy variable that takes a value of one if the headquarters of the target and acquirer are located the different US states and a value of zero otherwise.
Same state	A dummy variable that takes a value of one if the headquarters of the target and acquirer are in the same US state and a value of zero otherwise.
Domestic	A dummy variable that takes a value of one if the target is a US-based company and a value of zero otherwise.
Cross-border	A dummy variable that takes a value of one if the target is a foreign company and a value of zero otherwise.
Previous deals	An indicator variable that takes a value of zero for first time acquirers and a value of one otherwise.
Full (acquisition)	A dummy variable that takes a value of one if an acquirer seeks to own 100% of the target and a value of zero otherwise.
Active period	A five-year period during which a firm (serial acquirer) initiates five or more bids.
Break period	A period during which a (previously) serial acquirer initiates no bids. The period starts two years after the last bid initiated by the acquirer.
Panel C: Governance characteristics	
Board females	The proportion of female directors on the board.
Board ownership	The proportion of shares in the company owned by board members.
Board independence	The proportion of independent directors on the board.
Board size	Total number of directors (executive and independent) on the board.
Board tenure	The average length of time (years) that directors have held their board sits.
Board busyness	The average number of outside board positions held by board members.
Board networks	The sum of the networks of all board members. Each board member's network captures the number of overlaps (with other outside directors) through employment, other activities, and education.
Board ability	The Demerjian et al. (2012) measure of managerial ability (MA score). We are grateful to Peter Demerjian for making the measure freely available from: webpage.
Board age	The average age of directors on the board.
Block holding	The proportion of total shares held by shareholders with large shareholding (of at least 5%).
CEO Chair	An indicator variable for firms in which the roles of CEO and board chair are held by the same individual.
Equity compensation	The average proportion of board members' compensation comprising of long term incentive plans.

Appendix B M&A likelihood and Economic Value created

The table presents average dollar gains (in millions) to acquirers across different quintiles of bid likelihood. Dollar gains are computed as the product of the acquirer's market value in dollars and the market model abnormal returns generated in the 7, 5 and 3 days the bid, as well as on the bid announcement day. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Quintiles	**3-day ($million)** (1)	**5-day ($million)** (2)	**7-day ($million)** (3)
Q1	43.900	33.730	10.170
Q2	5.500	0.493	-9.431
Q3	-31.830	-36.390	-43.450
Q4	-0.992	-3.188	-3.045
Q5	-21.650	-30.550	-35.200
All	-12.510	-18.440	-23.550

Appendix C Deal characteristics and 7-day CARs

The table reports the mean and median abnormal returns (CAR) generated by acquirers in the 7 days centred on the bid announcement CAR(-3,+3) for deals with different deal characteristics. CAR is generated using the market model and represents the cumulative abnormal returns in the three-day period surrounding the bid. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

	All		**Q1**		**Q5**		**Diff (sig.)**	
	Mean	**median**	**Mean**	**median**	**Mean**	**median**	**Mean**	**median**
Cash	0.011	0.005	0.047	0.015	0.004	0.004	0.043***	0.011
Stock	0.010	0.002	0.061	0.014	0.014	0.001	0.047***	0.013***
Public target	-0.012	-0.010	0.014	0.012	-0.015	-0.011	0.029*	0.023
Private target	0.015	0.007	0.063	0.016	0.006	0.005	0.057***	0.011*
Diversifying	0.011	0.003	0.082	0.017	0.002	0.002	0.080***	0.015**
Non-diversifying	0.010	0.004	0.039	0.014	0.003	0.003	0.036***	0.011*
Cross-state	0.010	0.004	0.044	0.010	0.003	0.003	0.041***	0.007
Same state	0.012	0.002	0.096	0.031	0.001	0.000	0.095***	0.031**
Cross-border	0.007	0.003	0.080	0.009	0.003	0.003	0.077***	0.006
Domestic	0.011	0.004	0.056	0.016	0.002	0.002	0.054***	0.014***