The Negative Effects of Mergers and Acquisitions on the Value of Rivals

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November 28, 2018

Abstract

Horizontal M&A announcements induce negative average industry peer revaluations in a large sample of public and private M&A transactions. The average peers' revaluation is a strong predictor of future industry returns. Moreover, peers that are potentially more overvalued experience a stronger negative revaluation around horizontal deals. The revaluation of peers also depends on the public status of the target (positive when the target is public and negative when the target is private) and varies systematically with proxies for overall market misvaluation. Our findings are consistent with the idea that investors incorporate new information about industry-wide misvaluation into the valuation of non-merging firms.

Keywords: Merger & acquisitions; Information; Revaluation; Stock returns; Peers
JEL classification: G34

1. Introduction

There is mounting evidence that an active market for mergers and acquisitions (M&As) is pivotal to foster real efficiency and economic growth. Indeed, a liquid market for secondary real assets improves the allocation of assets to their best use (e.g., Maskimovic and Phillips (2001)), enhances managers' incentives through takeover threats (e.g., Bertrand and Mullainathan (2003)), or lowers firms' cost of capital through greater liquidity (e.g., Ortiz-Molina and Phillips (2014)). In this paper, we investigate another potential benefit associated with an active market for real assets: whether it improves the informational efficiency of financial markets – i.e. the ability of asset prices to reflect accurately fundamentals.

This question takes roots in two well-known observations. First, announcements of M&A transactions are important events that are closely followed by market participants such as investors, analysts, regulators, or the media, as they reveal new information about the merging firms (e.g., their expected synergies), but also about their respective industries (e.g., Song and Walkling (2000)). As such, M&A announcements typically trigger assets' revaluations (i.e., announcement returns). Second, Shleifer and Vishny (2003) show that M&A transactions tend to occur when the market prices of real assets diverge from their fundamental values, i.e., when firms' stocks are temporary mispriced by investors. To the extent that corporate managers (i.e., insiders) are better informed about fundamentals than investors (i.e., outsiders) they can profit from their informational advantage by either acquiring assets using their overvalued stocks as currency (e.g., Dong, Hirshleifer, Richardson, and Teoh (2006)), or by buying undervalued assets (e.g. Edmans, Goldstein, and Jiang (2012)).

On this ground, if insiders exploit their private information about assets' misvaluation by buying or selling real assets, the revaluations observed around deals' announcements might partly reflect new information about these financial inefficiencies to outsiders. Indeed, a central pillar of financial economics is that information-based trading renders financial markets more informationally efficient (e.g., Grossman and Stiglitz (1980)). Trading in real assets by informed managers might have similar implications. This is the novel hypothesis we test in this paper (the "misvaluation" hypothesis). Although intuitive and plausible, testing whether M&A announcements reveal new information about firms' misvaluation is challenging because of the difficulty to identify the underlying information to which the market responds. Indeed, while announcement returns could reflect the impounding of new information about deviations from fundamentals in stock prices

(i.e., trigger a correction), they could also reflect the *fundamental* implications of the transactions, such as expected operational synergies, the price paid for the assets, or possible management changes.

To mitigate these concerns, our empirical strategy focuses on the announcement returns observed in horizontal transactions for the industry *peers* of the acquirer and target that are not involved in any restructuring transactions. Focusing on industry peers, as opposed to firms directly involved in the transaction, offers two important advantages. First, announcement returns of peers are arguably less related to the arrival of information specific to the context of the transaction and the involved firms (e.g., amount paid, the method of payment, the allocation of synergies, or bargaining power), and thus are more likely to capture new information pertaining to the value of assets in the industry (e.g., Cai, Song, and Walkling (2011)). Second, focusing on the returns of industry peers around horizontal deals enables us to exploit important cross-sectional variation to better pin down the origins of market reactions (e.g., controlling for deals' or peers' specificities), and rule out alternative (and non-mutually exclusive) explanations. Our main test thus assesses whether horizontal M&As lead investors to incorporate new information about industry-wide misvaluation into the valuation of non-merging firms.[1] We provide several pieces of evidence supporting this claim.

To do so, we assemble a large sample comprising all economically relevant transactions (i.e., deals with a value above $10 million involving U.S. private and public firms) that includes 7,994 horizontal transactions (i.e., deals involving firms in the same four-digit SIC industries) over the period 1990-2015. Using a standard event-study methodology to compute cumulative abnormal returns (CARs) for peers around deals' announcements, we observe announcement returns for 4,318 distinct peers, amounting to 252,979 unique CARs. Consistent with the idea that the announcement of horizontal deals reveals new information about the industry, peers experience a negative and significant average revaluation following deal announcements. Over the period of ten days surrounding the announcement date, the average peers' abnormal return is -0.15% and the median is -0.40%, both statistically significant.[2] Taken at face value, the negative revaluation of peers suggests that the announcements of horizontal transactions reveal that corporate insiders view the market value

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[1] Evidence on industry-wide misvaluation includes Hoberg and Phillips (2010).

[2] We are not the first to focus on the market reaction of industry peers. Although our focus is different, the main difference between our sample and that used in previous research is the size and comprehensiveness. We focus on private and public deals, while existing papers almost exclusively focus on deals involving public acquirers and targets. For comparison, Eckbo (1983) uses 259 transactions, Song and Walkling (2000) use 141, Fee and Thomas (2004) use 554, and Shahrur (2005) uses 463. Another paper looking at rivals' stock market reactions is Bernile and Lyandres (2016) with 453 deals.

of assets in the corresponding industry as exceeding fundamentals, triggering an overall downward price correction.

The average negative revaluation resulting from horizontal transactions is highly robust and economically large. It holds with different methodologies to compute CARs (e.g., different risk adjustments, event windows, or estimation methods), across different thresholds for the size of transactions (e.g., deals larger than $500 million), and is not driven by economically irrelevant peers. Aggregated across all deals in our sample, the total revaluation of industry peers triggered by horizontal transactions amounts to $2.8 trillion (in 2015 dollars), equivalent to about 50 basis points of peers' stock market capitalization every year. Further consistent with the idea that peers' revaluation around horizontal deals are indicative of industry-wide misvaluation, we find that the average peers' revaluation observed in a given industry-month is a strong predictor of future returns of that industry (over the next three, six, or twelve months). Precisely, industry-months in which the average peers' revaluation around horizontal deals is negative (positive) are followed by negative (positive) industry returns. This predictability holds with raw industry returns as well as with returns adjusted for risk using the four-factor adjustment proposed by Daniel, Grinblatt, Titman, and Wermers (1997), as well as when we control for current industry returns to capture potential momentum effects.

Although consistent with our hypothesis, the overall negative revaluation of peers around horizontal transactions could arguably reflect fundamental information about expected industry-wide changes that are unrelated to current misvaluation. For instance, the announced deals could signal the enhanced competitive position of the merged entity (e.g., through efficiency gains or increased market power) which could harm industry peers, or the lower expectation of merger activity (i.e., because the best firms are already picked up). To disentangle possible explanations for peers' revaluation, we study the determinants of peers' announcement returns as a function of their characteristics and deals' specificities. In line with our misvaluation hypothesis, we first find that peers' revaluation around deals' announcements is strongly negatively related to their valuation prior to the events. That is, peers that are potentially over-valued (e.g., high market-to-book ratio) experience a stronger negative revaluation around horizontal deals. In sharp contrast, peers' announcement returns appear largely unrelated to fundamental variables such as peer size, age, profitability, or access to finance.

To further test the misvaluation hypothesis, we exploit a unique feature of our sample: we observe peers' announcement returns around the acquisition of both public and private targets in their industry. This offers a useful contrast as existing research suggests that the acquisition activities of public and private firms have very distinct origins (e.g., Maksimovic, Phillips, and Yang (2013), or Bargeron, Schlingemann, Stulz, and Zutter (2008)). We posit that observing acquisitions of private or public assets in a given industry reveals differential information about the overall misvaluation of that industry's assets, and should thus trigger revaluations in opposite direction. Indeed, whereas the fundamentals of similar private and public firms from the same industry (e.g., same size or market shares) should be relatively close, the valuations of public firms are subject to non-fundamental fluctuations. Hence, public firms have to be taken over (at least) at their public valuation, which may be above or below their fundamental value. If corporate managers (of private or public firms) see through misvaluation (i.e., our hypothesis), they will only purchase a public firm if it is undervalued. If instead public firms are overvalued, informed managers are more likely to acquire substitutable private assets.[3] Therefore, the misvaluation hypothesis predicts that, all else being equal, horizontal acquisitions of public targets should trigger positive peers' revaluations, while acquisitions of private targets should elicit negative revaluations. Crucially, this contrast is unique to the misvaluation hypothesis, as there is little reason to expect differential peers' response otherwise.[4]

We find strong differences in peers' revaluations across public and private transactions. As predicted, the average revaluation of peers is positive and significant following the acquisition of a public firm in their industry (which accounts for 12% of all deals and about half of total dollar transaction value in the sample), and negative after deals involving private targets. The magnitude of the difference is quite large, with an average announcement return of 0.15% after public deals compared to -0.20% after private deals. We continue to observe a large difference in peers' revaluations in multivariate tests in which we regress peers' announcement returns on a dummy variable identifying horizontal acquisitions of public firms as well as peers' (e.g., their size, age, profitability etc.) and deal characteristics (e.g., the value of the transaction). The point

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[3] In this simple view, the value at which private firms can be acquired is always exactly their fundamental value. In fact, the valuation of private firms is probably influenced to some extent by that of public firms. One mechanism through which this could happen is that in case of overvaluation of public firms, private firms can take advantage of the misvaluation by going public before they are acquired. For our misvaluation explanation to hold, we only need that the misvaluation of public firms is not fully reflected in the price paid to acquire private firms in M&A transactions with private targets.

[4] For instance, if mergers and acquisitions generate stronger competitors, we should observe negative peers' revaluations irrespective of the public status of the acquired firms.

estimate indicates a peers' revaluation "spread" (between public and private deals) of about 0.40% for a period of ten days surrounding the announcement date. In contrast, the public status of the acquirer has no effect on peers' revaluation.

In a sample of public deals, Song and Walkling (2000) report that peers' positive revaluations at the time of the announcements reflect the market anticipation that the peers will become takeover targets themselves. While such an anticipation effect is comprised in our misvaluation hypothesis – because current undervaluation should predict future transactions – one may still worry that the observed positive peers' revaluation spread is merely an artefact of the anticipation of future deals, if only acquisitions of public targets predict future acquisition activity. We provide evidence that this is not the case. First, we include in our specifications variables capturing whether peers will be the target of an acquisition in the future, and continue to find a significant revaluation spread. Second, we report that the estimated revaluation spread remains positive and significant when we include industry peer × year fixed effects in our specifications, which isolate variation in revaluation for a peer experiencing both public and private transactions in its industry in a given year. Therefore, the peers' revaluation spread is truly due to the public-private nature of transactions and is not driven by unobserved time-varying characteristics of peers (i.e., their fundamentals or future takeover activity).

Further dissecting the dynamics of peers' revaluations around M&A announcements, we show that their magnitude varies systematically with well-known proxies for overall market misvaluation. For instance, we estimate that the average peers' revaluation is significantly more negative when acquisitions occur in periods characterized by high market-level investor sentiment (as defined by Baker and Wurgler (2006)) or high dispersion of analysts' forecasts. Investors thus appear to be more responsive to information about mispricing revealed by M&As when the market value of assets is likely to deviate more from fundamentals. Similarly, we show that peers' revaluation spreads widens at times of high sentiments and disagreement.

In the last part of the paper, we perform four ancillary analyses to assess the possibility that peers' revaluations reflect information about expected fundamental industry-wide changes. Overall, we find very little support for this interpretation. First, we analyze the real consequences of horizontal transactions for future industry outcomes (e.g., sales growth, margins, or investment). Indeed, while we argue that the differential revaluation of peers observed around acquisitions of public and private targets is hard to square with expected

fundamental industry-wide changes, it remains possible that both types of deals have different fundamental implications. Inconsistent with this view, we find no significant difference between the future outcomes of industries that experience more acquisitions of public targets compared to industries with more private targets. However, consistent with our misvaluation hypothesis, firms in industries characterized by more acquisitions of public targets in a given year experience significant increases in valuation in the following years. Second, we check whether peers' revaluation depends on the competitive structure of their industry (e.g., Song and Walking (2000)). We use different measures to capture competitive forces (e.g., industry concentration or average markups), but find no significant relationship. Third, we investigate how peers' revaluation is correlated with the revaluations of the targets and acquirers actually involved in the M&A transaction. If the M&A transaction results in a stronger firm, we would expect the revaluations of industry peers and targets and acquirers, respectively, to be negatively correlated. We find the opposite, which is inconsistent with a competitive story. Fourth, we analyze peers' stock price reactions around announcements that the previously announced transaction is withdrawn (e.g., the negotiation failed) or challenged by antitrust authorities (i.e., the Department of Justice (DoJ) or the Federal Trade Commission (FTC)). If the observed initial peers' revaluations were reflecting the value implications of the transactions (e.g., the creation of a stronger competitor), we should observe significant and opposite revaluations around withdrawals' (e.g., Malmendier, Opp, and Saidi (2016)) or challenges' announcements (e.g., Eckbo (1983)). We find no significant revaluations of peers around these events. Collectively, these findings are hard to reconcile with the idea that peers' revaluation reflects information about operational changes induced by the announced transactions.

The results in this paper contribute to different strands of the literature. First, it adds to the literature studying the implications of M&As. Despite ample evidence indicating that M&As are driven by firms' misvaluation (e.g., Rhodes-Kropf and Vishwanathan (2004), Dong, Hirshleifer, Richardson, and Teoh (2006), or more recently Edmans, Goldstein, and Jiang (2012)), little is known about whether the resulting transactions reveal new information about the value of firms' assets to market participants. In line with this view, our results suggest that corporate transactions indeed reveal information about the value of assets within industries. As such, our paper is related to Malmendier, Opp, and Saidi (2016), who exploit failed takeover attempts to show that cash bids reveal information about the undervaluation of targets, and Song and Walkling (2000), who find that firms' stock prices increase following the acquisition of their rivals.

Our findings also add to the studies that focus on the valuation effects of M&As on rivals, customers, and suppliers (e.g., Eckbo (1983), Eckbo (1985), Stillmann (1983), Song and Walkling (2000), Fee and Thomas (2004), Shahur (2005), DeBodt and Roll (2014), and Bernile and Lyandres (2016)). While this literature has documented positive valuation effects of M&As on industry peers, we show by contrast that average peers announcement returns are negative. Our results are based on a much larger sample of M&A deals that also includes private targets and acquirers. These findings advance this literature by proposing and testing a misvaluation-based hypothesis to explain peers' revaluation.

The rest of the paper is organized as follows. The next section presents the data and the sample, and describes the construction of the main variables. Section 3 presents the main results indicating that peers' revaluation around transactions reveals information about industry-wide misvaluation. Section 4 discusses and tests alternative explanations, and Section 5 concludes.

2. Sample and Variables

2.1. Data sources

Our sample covers U.S. domestic mergers and acquisitions between 1990 and 2015. We collect all deals (i.e., involving U.S. public and private firms) announced between 1990 and 2015 and completed by the end of 2015 from the Thomson's Security Data Corporation's (SDC) Merger and Corporate Transactions database. We exclude all deals involving firms in the financial or utilities industries, and deals in which the target or the acquirer is a government agency. Similar to Erel, Liao, and Weisbach (2012), and Netter, Stegemoller, and Wintoki (2011), we further exclude leveraged buyouts, spinoffs, recapitalizations, self-tender offers, exchange offers, repurchases, partial equity stake purchases, acquisitions of remaining interest, privatizations, buybacks, and non-controlling acquisitions.

Because our main focus is on the information that corporate transactions reveal to the market about the value of industry assets, we focus on horizontal deals, which we define as deals between firms in the same four-digit SIC industry. Moreover, to avoid that our results are driven by very small deals, we only keep deals with a transaction value of at least USD 10 million. Additionally, we exclude a small number of deals occurring

in industries featuring less than three public firms. Our final sample includes 7,994 transactions. Table 1 describes in detail how we get to this number of transactions after applying the filters above.

[Insert Table 1 here]

Next, for each deal, we identify the peers of the firms involved in the transaction as all the other firms operating in the same industry as the target (and the acquirer). For each transaction, we obtain the four-digit SIC code of the target and acquirer from SDC. We restrict ourselves to firms that are active in CRSP at the time the transaction is announced and that have the same four-digit SIC code as the target. We eliminate stocks that are not actively traded, i.e., stocks with fewer than 100 return observations in the year preceding the transaction and stocks with missing returns between five days before and five days after the deal. These filters yield a sample of 4,318 unique peers and 252,979 deal-peer observations. For peers and for publicly listed acquirers and targets, we collect daily stock prices and market values of the value-weighted market index from CRSP. We complement this dataset with the SMB, HML, and MOM factors from Kenneth French's website.[5] We then merge the stock price data with firm-level accounting data from Compustat.

[Insert Table 2 here]

In subsequent tests, we use variables that capture characteristics of the transaction, the peers, and the firms involved in the transaction whenever they are publicly listed companies. All these variables are defined in the Appendix A. All continuous variables are winsorized at the 1st and the 99th percentiles. We present summary statistics of these variables in Table 2. They are in line with the existing literature.

2.2. Peers' Announcement Returns

Our main variable of interest is the revaluation of peers when an acquisition is announced in their industry. We obtain it using the abnormal returns for peers computed in a standard way over the 6 days (-3 to +3) and 10 days (-5 to +5) surrounding the announcement date of each transaction. Abnormal returns are the difference between realized returns and expected returns, calculated in two ways. First, we use a standard market model in which the market return is the return of the CRSP value-weighted index. Second, we use a

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[5] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

four-factor model ("FF") in which we add to the previous model the three factors SMB, HML, and MOM. Our estimation period spans from 251 days to 21 days before the deal announcement. We cumulate the abnormal returns over the relevant window to obtain cumulative abnormal returns (CARs). Similarly, we calculate the CARs of publicly listed acquirers and targets for the 10-day window around the deal announcement dates. To avoid outliers, we winsorize peers, targets, and acquirers revaluations at the 1st and the 99th percentiles.

Table 3 presents summary statistics for peers' revaluation around deal announcements. For each window size and each estimation model, we present two sets of results: One in which the unit of observation is each individual peer in each transaction (peer-deal level), and one with equally-weighted portfolios containing all the peers of each target, in which the unit of observation is therefore the transaction (deal level). The existing literature typically uses the latter method because it eliminates concerns of correlations across peers' returns at the deal level. We also consider individual peers returns because our goal is to explore the determinants of individual peer's revaluation and in particular the cross-sectional variation between peers for the same deal. To take into account possible correlations of peers' returns in this context, we obtain the average peers' CARs and the associated standard errors by running OLS regressions of peers' CARs on a constant term and clustering the standard errors at the deal level. For all returns, we also present medians and estimate the statistical significance using a sign test.

[Insert Table 3 here]

Consistent with the idea that horizontal acquisitions reveal new information about the value of industry assets, Panel A of Table 3 shows that peers' revaluations are significantly negative on average. This result holds across the four specifications (two window sizes and two abnormal return specifications), although the magnitude of the CARs increases with the length of the time window, varying from -0.02% to -0.15%. The sign and magnitude of the CARs are similar for individual peers and for the portfolios. The magnitude of the CARs tends to be larger for the 10-day window around the transaction announcement dates. Returns using wider windows seem to capture more of the information revealed in deal announcements, perhaps because some announcements are anticipated or because announcement dates in SDC are noisy. Therefore, we use the wider 10-day window in the rest of the analysis. Panel A of Table 3 also shows that peers' revaluations exhibit large standard deviations (between 9% and 12% for individual peers' returns, and between 3% and 5% for

portfolio returns). However, all median CARs are negative and statistically significant at standard confidence levels, as well as four out of the eight average CARs reported.

The revaluations we estimate are rather small at the level of each individual peer firm. However, when we estimate the aggregate value implications for all peers and for all transactions by multiplying the estimated CAR of each peer and each deal by its market capitalization (in 2015 US dollars), and then taking the sum across all observations in the sample, we obtain an impressive total value of about -$2.77 trillion. For our sample period of 26 years, this represents an average loss for investors of $100 billion per year. Compared with the average total market capitalization of the U.S. stock market over that period (around $15 trillion), our estimates suggests that domestic horizontal M&A transactions trigger peers' revaluations representing about 50 basis points of the market capitalization annually.

Panel B of Table 3 presents statistics on peers' CARs by year (at the peer-deal level) between 1990 and 2015. This table shows no clear trend. Two years are characterized by large negative average peer CARs: 2000 (-1.18%) and 2014 (-1%), while some years exhibit small positive average peers' revaluation. Overall, the sign of the average revaluation of peers fluctuates over time, and is significantly negative in seven years and significantly positive in five years. Median CARs provide a slightly more consistent picture, as twenty of them are significantly negative while only two years exhibit significantly positive median peers' revaluations, again with no clear trend.

Before turning to our main analysis, it is relevant to note that the negative announcement returns of peers around M&A announcements are in sharp contrast with the evidence from most of the existing literature. Papers in this literature consistently find positive stock price reactions of industry peers around M&A announcements. These papers differ to varying degrees from our paper in the sample period, the way they select transactions, the identification of peers, and the way they calculate returns. The table in the Appendix B presents summary information on sample period, sample construction, identification of M&A transactions and rivals, sample sizes, and the main results of four representative papers in the existing literature: Eckbo (1983), Song and Walkling (2000), Fee and Thomas (2004) and Shahrur (2005). Eckbo (1983) uses a sample of 191 horizontal and 68 vertical mergers in the mining and manufacturing sectors in the 1936-1978 period, most of which involve publicly listed companies. Song and Walkling (2000) study 141 transactions between 1982 and

1991 in which targets are public companies. The sample in Fee and Thomas (2004) includes 554 horizontal transactions with publicly listed targets and acquirers in the 1980-1997 period. Finally, Shahrur (2005) uses a sample of 463 transactions between 1987 and 1999 and focuses on cases in which both the target and the acquirer are publicly listed companies. In other words, all four papers use samples that are much smaller than ours is, and mostly consider public firms. All four papers find positive average CARs of industry peers, with magnitudes ranging between 0.2% and 2% depending on the paper and specification. There are only two subsamples in which these papers document negative peers' CARs: When the deal is horizontal in Song and Walkling (2000), which represents only 11 deals in their sample; and when the combined CAR of the target and acquirer is negative around the M&A announcement in Shahrur (2005).[6] Overall, unlike the above papers, we focus on a large and comprehensive sample of acquisitions and peers in the U.S., and we do not restrict the analysis to specific deal (i.e., public deals) or firm characteristics.

3. Peers' Revaluation and Misvaluation

Our main hypothesis is that the revaluations of peers around horizontal transactions partly reflect new information about the fundamental value of assets in the industry (the misvaluation hypothesis). Interpreted in light of this conjecture, the overall negative revaluations observed for peers suggests that, on average, the announcements of horizontal acquisitions reveal that corporate insiders view the market value of assets in the industry as too high compared to fundamentals. Yet, the overall negative revaluation of peers around horizontal transactions could arguably reflect fundamental information about expected industry-wide changes that are unrelated to current misvaluation. This section provides a series of specific tests assessing the misvaluation hypothesis.

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[6] More generally, in the large literature on peers' stock price reactions to M&A announcements, we have been able to identify only two studies in which peers' revaluations are negative: Eckbo (1992) finds significantly negative peers' CARs in a sample of large Canadian transactions from the 1960s and the 1970s. Aktas, de Bodt and Roll (2007) analyze peers' CARs in a sample of large European transactions and find negative but statistically insignificant peers' CARs.

3.1. Peers' Revaluation and Future Industry Returns

First, to assess whether peers' revaluations around horizontal transactions truly contain information about a valuation component common to all firms in the industry in which the horizontal acquisition is taking place, we examine whether peers' revaluations predicts future industry returns. This test rests on the idea that the information about misvaluation contained in the deal announcements is incomplete and is thus unlikely to trigger a complete price correction. Yet, as the industry-wide misvaluation is gradually corrected over time (e.g., Baker and Wurgler (2006)), peers' revaluations should systematically predict future industry returns. In other words, a positive average peers' revaluation in a given industry indicates that assets in that industry are under-valued. A gradual correction of this industry-wide under-valuation will trigger positive future industry returns (until the mispricing disappears). Hence, the misvaluation hypothesis predicts a positive relation between peers' revaluation and the future returns of their industry.

To test this prediction, we aggregate peers' CARs into average industry-month CARs across all deals and all peers in the industry-month pair (i.e., Mean CAR(-5,5)), if there is at least one M&A announcement in the industry that month. This procedure identifies industry-months with positive average revaluations (i.e., under-valued industry assets) and negative average revaluations (i.e. over-valued assets). We replace Mean CAR(-5,5) by zero if no horizontal deals took place in a given industry-month. Next, we regress industry (equally weighted) returns computed over various horizons (one-month, three-months, six-months, and 12-months) on the average revaluation in each industry-month. We consider raw industry returns as well as risk-adjusted industry returns, where we adjust firms' returns using the method in Daniel, Grinblatt, Titman and Wermers (1997) prior to aggregation. We make this adjustment to ensure that variation of peers' revaluations does not reflect any remaining risk factor (not captured in the CARs computation).[7] We include year-month fixed effects in all specifications in order to capture time-variation in industry returns that are common to all industries.

[Insert Table 4 here.]

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[7] These regressions with risk-adjusted returns have a smaller number of observations because we were able to obtain the factors used to construct adjusted returns up to 2010 only.

Table 4 presents the results. Panel A reveals a clear positive relation between peers' revaluations in a given industry-month and future returns of that industry. The positive relation holds for all horizons and for raw and risk-adjusted returns. In panel B, we further include current industry returns in the specifications to control for the possible effect of industry momentum (e.g. Moskowitz and Grinblatt (1999)). We continue to observe a positive predictability of peers' revaluations, indicating that these revaluations provide information that is not contained in current industry returns. Consistent with our misvaluation hypothesis, these results confirm that the sign and magnitude of peers' revaluation around horizontal transactions (i.e. a signal about misvaluation) predict the direction and size of the observed stock price corrections (i.e., future industry returns).

3.2. *The Determinants of Peers' Revaluations*

Next, we exploit the large cross-sectional variation in our sample (i.e., we have multiple peers for each deal) to study the determinants of peers' revaluations. We do so by regressing peers' announcement returns for each deal (i.e. CAR(-5,5) FF) on several peer and deal characteristics. If peers' revaluations capture information about the value of industry assets, they should be particularly sensitive to current valuation metrics. To capture this idea, we include peers' market-to-book ratio measured prior to each transaction as a key explanatory variable. As peers' revaluation might also capture expected changes in fundamentals, we also include proxies for peers' fundamentals, also measured prior to the announced deals. We consider size, age, cash and debt ratios, as well as profitability. In addition, we control for the value of the deal, as well as past deal activity in the industry using the logarithm of the number of M&A transactions in the same four-digit SIC code as the target of the acquisition in the year preceding it, and the logarithm of the total value of these deals. In all specifications, we conservatively cluster standard errors at the four-digit SIC code level. Our results hold if we alternatively use clustering at the peer or at the deal level instead.

[Insert Table 5 here]

In addition, we take advantage of our large sample by using various fixed effects structures and analyze the determinants of peers' revaluations across different dimensions. Table 5 presents the results. In the first column, we simply include year fixed effects and thus purely focus on the variation of all peers' revaluation in

a given year. In column (2), we include industry × year fixed effects and focus on variation among peers active in a given industry and year. In column (3), we further add peer fixed effects to absorb time-invariant firm-level characteristics that can explain the revaluation of a given peer in a series of transactions. Finally, in column (4), we include deal fixed effects to control for all deal-specific factors, and focus on the variation of peers' revaluation among affected peers only (i.e., which peer is most affected by a given transaction).

Despite using different sources of variation, the results in Table 5 are quite homogenous. Consistent with the misvaluation hypothesis, peers' revaluations around horizontal deals are very sensitive to their pre-deal valuation. Across all specifications, the coefficients on peers' market-to-book ratio are negative and statistically significant. Peers' revaluation occurs in the opposite direction compared to their pre-deal valuation levels. In other words, the peers that present the highest pre-deal valuation (in absolute terms or compared to other firms in the industry) – potentially the most over-valued peers – experience the strongest negative revaluations when new information arrives to the market. Remarkably, this conclusion holds across all peers, but also across peers within a given deal.

In sharp contrast, peers' revaluation appears largely unrelated to variables that proxy for fundamentals (except for profitability in two specifications). The revaluation of peers in horizontal deals is similar for small and large firms, young and old, cash-rich or cash-poor firms. In the last two columns, we also include acquirers' characteristics as additional controls and estimate the specification across deals involving public acquirers only. Results are unaffected. Importantly, the inclusion of fundamental variables in the specifications mechanically absorb the variation in peers' valuation that is related to these variables (e.g., Rhodes-Kropf and Vishwanathan (2004)). Hence, one can truly interpret the coefficients on peers' market-to-book in Table 5 as the sensitivity of peers' revaluations to the non-fundamental component of their valuation. Taken together, the cross-sectional determinants of peers' revaluation appear largely consistent with our misvaluation hypothesis.

3.3. A Unique Test: Revaluations around Deals Involving Public vs. Private Targets

To better isolate the valuation hypothesis in the data, we take advantage of the fact that we observe peers' announcement returns around the acquisitions of both public and private targets in their industry. This contrast represents a useful laboratory to test unique implications of the misvaluation hypothesis. Indeed,

existing research suggests that the acquisitions activities of public and private firms have very distinct origins (e.g., Maksimovic, Phillips, and Yang (2013), or Bargeron, Schlingemann, Stulz, and Zutter (2008)). We argue that observing acquisitions of private or public assets in a given industry reveals differential information about the overall misvaluation of that industry's assets, and should thus generate revaluations in opposite the direction.

Indeed, while the fundamentals of similar private and public firms from the same industry (e.g., same size or market shares) should be relatively close, the valuations of public firms are subject to non-fundamental fluctuations. This fluctuation implies that public firms have to be taken over (at least) at their public valuation, which may be above or below their fundamental value. If corporate managers (of private or public firms) detect the misvaluation, they will only purchase a public firm if they perceive it as being undervalued. If instead public firms are viewed as overvalued, informed managers are more likely to acquire private assets. On this ground, the misvaluation hypothesis predicts that, all else being equal, horizontal acquisitions of public targets should trigger positive peers' revaluations, while acquisitions of private targets should lead to negative revaluations.

[Insert Table 6 here]

To have a first look at this unique prediction, Table 6 tabulates summary statistics for peers' revaluations across public and private transactions. Across all deals in our sample, 5,210 involve public acquirers and 2,784 are done by private acquirers. The large majority of targets is private, with 7,008 acquisitions of private firms, and 986 acquisitions of public targets. We note important differences in the triggered revaluations of peers across these groups. As predicted by our misvaluation hypothesis, the average revaluation of peers is positive and significant following the acquisition of a public firm in their industry. The average estimated peers' CAR is 0.33% across all deals involving public targets, and 0.42% across deals involving public targets and public acquirers. As discussed in Section 2 above, the positive peers' revaluations observed in these specific subsamples are consistent with the results in prior research (e.g., Eckbo (1983), Song and Walkling (2000), Fee and Thomas (2004)). By contrast, the average peers' revaluation is significantly negative in all partitions involving the acquisition of private targets, irrespective of the public status of the acquirers. In line with the misvaluation hypothesis, the public status of targets in horizontal deals provide

distinct information about the under- or over-valuation of industry's assets. As such, peers' revaluations have opposite signs.

[Insert Table 7 here]

We further evaluate this difference in peers' revaluations in a multivariate setting that we present in Table 7. To do so, we estimate specifications similar to those reported in Table 5, but add indicator variables identifying the public status of the target and the acquirer in each deal. We include the same set of independent variables as in Table 5 to make sure that the distinction between public and private acquisitions is not correlated with specific peers' and deals traits (e.g., the size of the transaction). As before, we use different fixed effects structures to focus on different sources of variation in the data, and cluster the standard errors by industry. Corroborating the univariate results, the coefficients on the indicator variable identifying deals with public targets are positive and statistically significant in all specifications. The coefficients on the indicator variable identifying the public status of acquirers are however insignificant. The positive coefficients for public target deals confirm the existence of a peers' revaluation "spread" between public and private acquisitions. The magnitude of this revaluation spread is non-trivial, as it amounts to more than 0.40% on average, measured over a period of ten days around deal announcement dates.

It is important to note that the estimated peers' revaluation spread holds with different fixed effects structures. Remarkably, it holds in column (4) of Table 7 when we include peer $\times$ year fixed effects, which essentially exploits variation in a given peer's revaluations around different public and private horizontal deals occurring in its industry in a given year. This result is important as it indicates that the estimated peers' revaluation spread is solely due to the differential information revealed by public and private deals (after accounting for observables traits like their size), but unrelated to the fundamental unobserved specificities of peers. Therefore, these results are especially hard to reconcile with explanations for peers' revaluations based on future fundamental changes induced by the announced transactions.

3.4. Revaluation Spread and the Anticipation of Future Acquisitions?

Our evidence of a positive peers' revaluation spread around horizontal deal announcements indicates that peers' revaluations capture a great deal of new information that the type of deals (public or private) reveals

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to market participants. While the direction (i.e. sign) of peers' revaluations is consistent with the type of deal announced revealing information about over- or under-valuation of industry's assets, the public or private nature of the announced deals might arguably contain information about something else. In particular, Song and Walkling (2000) report that peers' stock prices respond positively to the announcement of deals in their industry. Their explanation is that, because acquisitions occur in waves, observing transaction announcements increases the probability of observing another announcement in the near future in the same industry. Since acquisitions are typically done at a premium relative to the market value of targets, an increased probability of observing an acquisition in an industry triggers a positive revaluation of all firms in the industry. They refer to this mechanism as the "anticipation" effect.

One may thus reasonably worry that the positive and large peers' revaluation spread we uncover above arise simply because public acquisitions in an industry predict future acquisitions of public firms, but private acquisitions do not. After all, Maksimovic, Phillips, and Yang (2013) report that waves of acquisitions involving public firms no not coincide with waves involving private firms. Before formally showing that the peers' revaluation spread is not explained by the anticipation of future acquisitions, it is important to note that the anticipation effect is fully consistent with our misvaluation hypothesis. Indeed, because deviations of prices from fundamentals drive corporate transactions, it is natural to expect more future transactions in periods in which the market learns about current misvaluation by observing an active market for real assets. Therefore, the anticipation effect identified by Song and Walkling (2000) might be broadly capturing the revelation of information about the intrinsic value of industries' assets.

[Insert Table 8 here]

To evaluate whether and how much of the peers' revaluation spread is explained by the anticipation of future acquisitions, we follow Song and Walkling (2000) and identify peers that will become takeover targets in the future. For each peer-deal observation, we create binary variables that are equal to one if that peer will be targeted in the next 12 months or in the next 60 months. We then include these variables as additional controls in the regressions of peers' revaluations on the public status of acquirers and targets, similar to those reported in Table 7. We display the results in Table 8. In the first three columns, we control for takeover likelihood in the next 12 months, and observe insignificant results. That is, peers that will become targets

within a year do not experience different revaluations at the time horizontal deals are announced in their industry. In columns (4) to (6), we consider a takeover likelihood in the next 60 months. Consistent with the anticipation effect of Song and Walking (2000), we estimate that the revaluation of peers around deals' announcement in their industry is positively related to future acquisition activity. However, across all specifications, we continue to observe a positive and significant revaluation spread between public and private target deals. Remarkably, the magnitude of the revaluation difference remains unaffected by the inclusion of the future takeover controls.

3.5. The Dynamics of the Revaluation Spread

Our central argument is that, by their very nature, horizontal corporate transactions reveal information about the value of assets in the industry at large. The importance of this information, and thus its impact on stock prices, should be more pronounced when overall observed valuations are further away from fundamental valuations and/or when there is less agreement about industry valuations.

To test this idea, we identify two situations in which this is likely to be the case. First, we rely on the investor sentiment index defined by Baker and Wurgler (2006). They show that in periods of high investor sentiment, stocks prices are likely to be above their fundamental value, as they are systematically followed by low subsequent returns. In contrast, low sentiment periods are followed by high stock returns. We obtain the sentiment index from Jeffrey Wurgler.[8] Second, we use the dispersion of analyst forecasts to identify situations during which investors are more likely to disagree on the correct value of assets within industries (e.g. Diether, Malloy, and Scherbina (2002)). We compute the dispersion of analyst earnings forecasts as the standard deviation of one-year ahead earnings forecasts in the month of the deal announcement, based on data from IBES.

[Insert Table 9 here]

To assess the role of sentiment and dispersion on peers' revaluation and the revaluation spread, we augment our baseline specification (i.e. reported in Table 7) with both variables, as well as their interactions

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[8] http://people.stern.nyu.edu/jwurgler/

with the binary variable identify acquisitions of public targets. Results are reported in Table 9. In the first three columns, we observe that the coefficients on sentiment are negative and significant. In high sentiment periods – in which assets are more likely to be over-valued – the announcement of horizontal deals trigger more negative peers' revaluations. We also note that the coefficient on the interaction between whether a deal involves a public target and sentiment is positive and significant across all three columns. Hence, the peers' revaluation spread is wider at times of high investor sentiment, consistent with the idea that investors are more responsive to information about mispricing when the overall market value of assets is more likely to deviate from fundamentals. In columns (4) to (6), we find no significant association between peers' revaluation and the dispersion of analyst forecasts. Yet, the interaction terms between dispersion and whether deals involve public targets is positive and significant. Similar to the sentiment results, the peers' revaluation spread is wider at times of high disagreement about asset valuation in the industry. In fact, the variable identifying deals with public target is not significant on its own, suggesting that the revaluation spread is mostly materializing when disagreement is high.

4. Alternative Explanations

Taken together, the results so far are consistent with the hypothesis that M&A transactions reveal information about the industry-wide misvaluation of assets. Yet, revaluation of industry peers around M&A announcements could still partly reflect information about expected industry-wide changes that are unrelated to any financial inefficiency. In this section, we perform four tests to assess this possibility. First, we analyze changes in industry real outcomes as a function of the intensity of M&A activity. Second, we check whether peers' revaluation depends on the competitive structure of their industry. Third, we investigate how peers' announcement returns are correlated with those of the targets and acquirers involved in the transactions. Fourth, we analyze peers' stock price reactions around announcements that previously announced transactions are withdrawn or challenged by antitrust authorities. Overall, we find very little support for the interpretation that peers' revaluations are related to changes in industries' fundamentals.

4.1. Industry Real and Financial Outcomes

First, we look at the dynamics of industry outcomes. Indeed, if the average negative peers' revaluation reflects anticipated changes in industry fundamentals (e.g., consolidation or reallocation of economic power), the announcement returns of peers should be correlated with future changes in the operating performance (e.g., sales, margins or cash flows) of firms in the industry in the years following the transaction. In particular, if the large differential revaluation of peers observed around acquisitions of public and private targets (i.e., the revaluation spread) reflects differences in anticipated industry fundamentals, the real effects observed in the years following M&A announcements should differ depending on the public status of target.

We explore this possibility in Table 10. To do so, we collect data on outcome variables for every firm in each industry from Compustat. We focus on sales growth, EBITDA margin, capex-to-assets, and R&D-to-sales. Next, we compute averages of each variables for each industry-year observation. We then regress the industry-level outcome variables on the fraction of horizontal M&A transactions in the industry that have public targets in a given year (say year 0), on event-time (year) dummies from two years before to two years after year 0, and on the interaction between the fraction of public targets and the event-time dummies. We also include year and industry fixed effects in the regressions. Note that the direct effects of the event-time dummies and the fraction of public targets are absorbed by the year and industry fixed effects, respectively. All coefficients reported in Table 10 are expressed relative to time t = -3.

[Insert Table 10 here]

In columns (2) to (5) of Table 10, none of the interaction variables are significantly related to any of the outcome variables. This is true in columns (2) and (3), in which the dependent variables measure operating performance at the industry level (i.e., sales growth and EBITDA margin). This is also true in the last two columns, where the dependent variables measure broader potential consequences of changes in the competitive environment of the industry such as changes in investment. These results are inconsistent with the view that public and private target transactions have different fundamental implications for industries.

In the first column of Table 10, the dependent variable is the average market-to-book ratio of firms in the industry. If a higher fraction of public target transactions is an indeed an indication of industry-wide under-valuation in public markets, the misvaluation hypothesis predicts that the valuation of firms in industries

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experiencing a large fraction of public horizontal acquisitions should increase after announcements, as the under-valuation gets slowly corrected (i.e., returns should increase). This is indeed what we find. The coefficients of the interaction terms between the fraction of public targets and the event-time dummies are positive and statistically significant for the years 0, 1, and 2, and insignificant for the years before the deals. That is, we only start observing significant increases in industry-wide valuation in the year of the deal announcement and the following two years when the fraction of deals' announcements with public targets is high. We do not observe significant changes in valuation before. This finding is also consistent with our result that positive peers' revaluations are associated with higher future industry returns.

4.2. Peers' Revaluations and Competitive Structure

Second, we assess whether peers' revaluation varies with the competitive structure of their industry. The logic of this investigation is that if the observed revaluation of industry peers around horizontal transactions reveals information about the competitive implications induced by the transactions (e.g., the emergence of a strong rival or an overall change in market power), the announcement returns of industry peers should be predictably related to current measures of competition. To test whether this is the case in the data, we regress peers' revaluation on four different measures of competition. First, we use the sales-based Herfindahl index for each four-digit SIC industry (e.g., Song and Walkling (2000)). Second, we measure competition as the logarithm of the number of peers per industry (e.g., Song and Walkling (2000)). Third, we rely on the industry-level EBIT margin as another measure of competition (e.g., Nickel (1996)). Finally, we use the product market fluidity as a proxy for the intensity of competition (Hoberg, Philipps, and Prabhala (2014)). This measure is based on product descriptions from firm 10-Ks and captures the structure and evolution of the product space occupied by firms.

[Insert Table 11 here.]

Table 11 presents the results. All specifications control for peer and deal characteristics of our baseline specification as well as year fixed effects. In all four columns, the coefficients on the proxies for competition are not statistically significant. For instance, peers' revaluations are similar following the announcement of a deal in an industry that is highly concentrated compared to a similar announcement in an industry that is highly

competitive. The unimportance of product market structures in explaining peers' revaluation is largely inconsistent with the idea that competitive forces are systematically related to the announcement returns of industry peers.

4.3. Peers' Revaluations and Announcement Returns of Acquirers and Targets

Third, we analyze how peers' announcement returns are correlated with the announcement returns for the acquirers and targets that are involved in M&A transactions. We conjecture that if the announced transaction results in a stronger competitor that could harm industry peers, the revaluation of peers should be inversely related to that of acquirers and targets. That is, if the newly created firm benefits at the expense of industry peers, we should observe prices of targets and peers moving in opposite directions at the announcement of the transaction. To examine this claim, we compute the announcement returns (i.e., CARs) for public acquirers and targets in the same way as we compute the CARs for industry peers: we use a 10-day window around the announcement date (-5 days/+5 days) and adjust returns using a four-factor model. We then simply regress industry peers' CARs on the CARs of acquirers and targets, as well as the usual peers' and deals' control variables. We also include industry × year fixed effects in all specifications.

[Insert Table 12 here]

Table 12 presents the results. In columns (1) and (3), the coefficient on acquirer CARs is positive and marginally significant. This finding is hard to reconcile with an explanation for peers' revaluation based on the transaction revealing the buildup of a stronger rival. In fact, this result is consistent with our misvaluation hypothesis. If managers of acquiring firms are better informed about the fundamentals of the target than investors are, the acquisition announcement will partly reveal this private information and investors will revalue the publicly traded acquiring firm accordingly. In columns (2) and (3), the correlation between peers' revaluation and target revaluation is also positive and statistically significant (in column (2) only). Again, this finding is inconsistent with a competition view. If the target becomes a stronger competitor because of the acquisition, industry peers would be hurt, which would imply a negative correlation between peer and target CARs. Column (4) confirms this result using the value-weighted combined acquirer and target CARs as a regressor. Overall, the analysis of the correlation between peers and acquirer and target announcement returns

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does not support the view that the announced transactions are associated with detrimental effects for peers because of resulting changes in the competitive forces in the industry.

4.4. Peers' Revaluations Around Deal Challenges and Deal Withdrawals

As a final analysis to assess the possibility that peers' revaluation reflects information about expected fundamental industry-wide changes, we analyze peers' stock price reactions around announcements that the previously announced M&A transaction is withdrawn or challenged by antitrust authorities. If the initial peers' announcement return reflects the value implications of the transaction, i.e. the creation of a stronger competitor, we should observe significant and opposite revaluations around withdrawal (Malmendier, Opp, Saidi (2016)) or challenge announcements (Eckbo (1983)).[9]

To test this conjecture, we collect all withdrawn deals from SDC over the period 1990 to 2015. We also assemble data on challenged deals from the Department of Justice and the Federal Trade Commission. These agencies review merger cases from an antitrust perspective, classify deals according to whether a deal is challenged or not, and make the data publicly available. We compute the CARs for industry peers around withdrawal and deal challenge announcements in the same way as we compute the CARs around M&A announcements: we use a 10-day window around the announcement date (-5 days/+5 days) and adjust returns using a four-factor model. Table 13 presents results of regressions of peers' revaluations around these announcements on a constant only (columns (1) and (3)) that capture average peers' revaluation, and the usual set of peers' and deal's control variables (columns (2) and (4)).

[Insert Table 13 here.]

The first column of Table 13 shows that peers' average revaluation around deal challenge announcements is negative (-0.788%) but not statistically significant. Similarly, peers' average revaluation around deal withdrawal announcements is also negative but not statistically significant (-0.161%). These results are inconsistent with the idea that the initial peers' M&A announcement returns reflect the value implications of the initially announced transaction. In fact, not observing significant revaluations around

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[9] Aktas, de Bodt and Roll (2007) show for the European M&A market that challenges are often triggered by complaints of rival firms threatened by the emergence of a stronger competitor.

challenge and withdrawal announcements is broadly consistent with the misvaluation hypothesis, as these events should not reveal any new information about the intrinsic value of assets in the industry. The estimates in columns (2) and (4) are also consistent with the misvaluation hypothesis. Indeed, since the announcement of a deal challenge by antitrust authorities or the announcement of a deal withdrawal is unlikely to be systematically related to industry misvaluation, we do not expect the peers' that are potentially more over-valued (i.e., high market-to-book ratio) to respond differently to the challenge or withdrawal announcement. This is exactly what we find. The coefficients on the peer market-to-book ratio are not statistically significant. Overall, these findings are hard to reconcile with the idea that peers' revaluation reflects fundamental changes in the peers' industries.

5.   Conclusions

TBD

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Appendix A: Definition of Variables

Variable	Definition	Data Source
CAR(-3,3)	Cumulative abnormal return between three days prior to the announcement and three days after the announcement of the deal. The predicted returns are based on the market model on stock return data between 251 and 21 days before the deal	CRSP
CAR(-3,3) FF	Cumulative abnormal return between three days prior to the announcement and three days after the announcement of the deal. The predicted returns are calculated by estimating a four factor model including the Fama-French factors SMB, HML, and MOM on stock return data between 251 and 21 days before the deal	CRSP, Kenneth French's website
CAR(-5,5)	Cumulative abnormal return between five days prior to the announcement and five days after the announcement of the deal. The predicted returns are calculated by estimating the market model on stock return data between 251 and 21 days before the deal	CRSP
CAR(-5,5) FF	Cumulative abnormal return between five days prior to the announcement and five days after the announcement of the deal, the predicted returns are calculated by estimating a four factor model including the Fama-French factors SMB, HML, and MOM on stock return data between 251 and 21 days before the deal	CRSP, Kenneth French's website
DGTW returns	Returns adjusted using the method in Daniel et al. (1997).	CRSP
Log(number of deals)	Logarithm of the number of deals during the last year in the same 4-digit SIC industry as the current deal	SDC
Log(transaction value)	Logarithm of the deal value	SDC
Log(value of deals)	Logarithm of the total transaction value of all deals during the last year relative to the deal	SDC
Public acquirer	A dummy variable equal to one if the acquirer is in CRSP during the acquisition year	CRSP
Public target	A dummy variable equal to one if the target is in CRSP during the acquisition year	CRSP
Log(total assets)	Logarithm of total assets	Compustat
Market-to-book ratio	Market value of assets / book value of assets	Compustat
Cash-to-asset ratio	Cash and equivalents / total assets	Compustat
Ebitda-to-asset ratio	Operating income before depreciation / total assets	Compustat
Debt-to-asset ratio	Total debt / total assets	Compustat
Age	Age since IPO	Compustat
Raw return (1 month, 3 months, 6 months, 12 months)	Four-digit SIC industry raw returns between the current month and one, three, six, and twelve months ahead	CRSP

Mean CAR(-5,5) FF	Average CAR(-5,5) – FF across all deals in the month of the deal announcement of the current deal across all rivals of the target	CRSP
Target within next year	A dummy equal to one if the rival is a target of a deal that takes place within one year from the current deal	SDC
Target within 5 years	A dummy equal to one if the rival is a target of a deal that takes place within the next two years from the current deal	SDC
Frac pub	Fraction of deals with public targets out of the total number of deals in the same four-digit SIC industry as the current deal	SDC
Dispersion	A dummy equal to one for all peers whose analyst forecast dispersion of earnings per share is above the median for a given deal	IBES
Sentiment	Sentiment index from Baker and Wurgler (2006)	Wurgler's website
SIC4 HHI	Sales-based four-digit SIC code Herfindahl-Hirschmann index	Compustat
Log(number of peers)	Logarithm of the number of peers	CRSP
SIC4 Ebit margin	Average of operating income / sales	Compustat
Product market fluidity	Product market fluidity measure of Hoberg, Phillips and Prabhala (2014)	http://hobergphillips.usc.edu/

Appendix B: Past studies on rival reactions

This table presents information about the sample construction, methodology and results in a few selected papers analyzing stock price reactions of rivals around M&A announcements

Study	Sample period	Data source	Deal type	Target / Bidder selection	Rival selection	Sample size	Window for CARs	Results
Eckbo (1983)	1963-1978	Federal Trade Commission report	Large horizontal and vertical deals with at least the bidder or the target and one rival in CRSP	Manufacturing and mining sectors	Same SIC 4 as the target	333 deals	Various window sizes	Positive CARs for targets, slightly positive CARs for bidders. Rival CARs positive, between 0.2% and 2% depending on subsamples and specifications.
Song and Walkling (2000)	1982-1991	W.T. Grimm's Mergerstat Review + target listed in Value Line	All types	One of the companies is domestic, no regulated industries	Same Value Line industry as the target	141 deals, 2,459 rivals	[-1;0] and [-5;+5]	Target CARs = 17%, Rival CARs is small but significant (0.35% to 0.56% depending on window length). In horizontal deals, positive mean / negative median return.
Fee and Thomas (2004)	1980-1997	SDC	Announced horizontal mergers (at least one segment with common 4-digit SIC code) / announced	Domestic, public firms, outside the financial or regulated sectors	At least one segment in common with the bidder and the target (same 4-digit SIC code)	554 deals (391 eventually completed)	[-1;+1]	Combined CAR = 3.06% (+19% for targets, -0.58% for bidders) Rival CAR = +0.54% (single-segment rivals), +0.24% (all rivals)
Shahrur (2005)	1987-1999	SDC	Horizontal deals (same 4-digit SIC code)	Domestic, public firms, successful deals only with ownership going from below 15% to above 15%	Single-segment firms in CRSP and Compustat with same 4-digit SIC code	463 deals (including 325 mergers, 111 tender offers)	[-1;0] and [-2;+2]	Combined CAR = 2.25% (+15% for targets, -0.61% for bidders). Rival CARs = 0.39% in the [-2 day; +2 day] window. Positive when combined CAR is positive, negative when it is negative.

Table 1: Sample selection

This table presents the sample selection. The average transaction value is reported in 2009 million US dollars using the BEA price deflator.

Selection criteria	Number of deals	Average transaction value ($m)
Deals announced between 1990 and 2015 and effective as of 2015	184,151	280.72
Excluding deals in the financial and utilities industries	113,899	271.68
Excluding privatizations	113,347	270.59
Excluding acquisitions of remaining interest, certain assets, self-tenders, exchange offers	109,904	272.18
Excluding LBOs and MBOs	109,743	272.32
Excluding deals involving government agencies	109,451	272.67
Excluding buybacks and recapitalizations	106,408	257.39
Excluding minority acquisitions	103,964	261.40
Excluding acquisitions with missing sic code	103,778	261.60
Excluding non-horizontal deals with less than three rivals	30,665	360.72
Excluding deals without transaction value or a transaction value below USD 10m	7,994	515.74

Table 2: Summary statistics

This table presents summary statistics of the main variables. All the variables are defined in Appendix A.

Variable	N	Mean	Median	S.D.	p10	p90
Log(number of deals)	7,994	3.881	3.892	1.283	2.197	5.908
Log(value of deals)	7,994	7.923	8.233	2.208	4.910	10.490
Log(transaction value)	7,994	4.406	4.120	1.507	2.690	6.447
Public acquirer	7,994	0.652	1	0.476	0	1
Public target	7,994	0.123	0	0.329	0	1
Industry peers' characteristics						
Log(total assets)	24,891	6.010	5.989	2.167	3.181	8.906
Market-to-book ratio	23,867	2.134	1.562	1.710	0.945	3.949
Cash-to-asset ratio	23,704	0.148	0.079	0.179	0.008	0.395
Ebitda-to-asset ratio	23,820	0.029	0.105	0.274	-0.274	0.226
Debt-to-asset ratio	23,779	0.233	0.192	0.227	0	0.541
Age	23,378	13.374	10	11.938	1	32
Public acquirer characteristics						
Log(total assets)	4,509	6.879	6.795	1.714	4.742	9.237
Market-to-book ratio	4,507	2.253	1.686	1.722	1.053	4.028
Cash-to-asset ratio	4,471	0.108	0.060	0.125	0.005	0.278
Ebitda-to-asset ratio	4,489	0.105	0.116	0.132	-0.012	0.226
Debt-to-asset ratio	4,488	0.269	0.252	0.224	0	0.575
Age	4,421	11.010	7	11.216	1	29

Table 3: Announcement returns of peers

This table presents summary statistics of cumulative abnormal returns (CARs, in %) of industry peers (four-digit SIC code) of the target around M&A announcements between 1990 and 2015. In Panel A, we use four measures of peer's CARs. The measures vary in the length of the window over which the stock price reaction is calculated (announcement date –3 days / +3 days in the first two lines; announcement date –5 days / +5 days in the last two lines) and in the model used to estimate predicted returns (the market model in lines 1 and 3, a four-factor model using the value-weighted market index and the HML, SMB and MOM factors in lines 2 and 4). Each measure is presented separately for all industry peers and for equal-weighted portfolios including all industry peers for each deal. *, **, and *** indicate that the mean and median are statistically different from 0 at the 10%, 5%, and 1% level, respectively. The mean at the peer-deal level is the constant of an OLS regression with no explanatory variables, and significance is calculated clustering standard errors at the deal level. The significance of medians is obtained with a sign test. Panel B shows mean and median CARs of industry peers by year (the unit of observation is industry peer). Panel C shows the ten industry-years with the most negative average value-weighted industry peer portfolio CARs.

				Panel A: CARs of peers – full sample			
CARs	Unit of observation	N	Mean	Median	S.D.	p10	p90
CAR (-3,3)	Peer-deal	252,979	-0.057	-0.358***	9.200	-9.903	9.799
	Deal	7,994	-0.022	-0.069*	4.038	-4.438	4.251
CAR(-3,3) FF	Peer-deal	252,979	-0.106**	-0.340***	9.169	-9.948	9.692
	Deal	7,994	-0.071*	-0.127***	3.706	-4.107	3.923
CAR (-5,5)	Peer-deal	252,979	-0.098	-0.430***	11.606	-12.648	12.452
	Deal	7,994	-0.086	-0.167***	5.134	-6.011	5.642
CAR(-5,5) FF	Peer-deal	252,979	-0.150***	-0.397***	11.547	-12.735	12.318
	Deal	7,994	-0.134**	-0.167***	4.700	-5.350	5.075

Panel B: CARs(-5,5) FF of peers by year

Year	Number of deal-rival	Number of deals	Mean	Median
1990	3,621	122	-0.812	-1.345***
1991	4,062	160	-0.426	-0.804***
1992	3,910	180	0.586*	0.144
1993	5,774	253	-0.397	-0.683***
1994	6,769	337	-0.201	-0.376***
1995	6,982	360	0.120	-0.266***
1996	9,260	473	0.603***	0.258***
1997	11,948	583	-0.417**	-0.601***
1998	9,028	552	-0.755**	-0.833***
1999	9,007	549	0.260	-0.261**
2000	9,231	525	-1.175***	-1.356***
2001	13,451	323	-0.181	-0.668***
2002	11,964	294	0.283	0.000
2003	12,427	333	-0.170	-0.801***
2004	12,896	336	-0.802***	-0.720***
2005	16,071	382	-0.028	-0.167***
2006	14,063	367	-0.223	-0.420***
2007	14,504	351	-0.395**	-0.387***
2008	11,065	266	0.271	0.179
2009	9,500	206	0.774*	-0.325***
2010	10,094	247	0.033	-0.251***
2011	9,959	260	-0.744**	-0.931***
2012	10,780	261	-0.016	-0.224***
2013	9,457	233	0.570***	0.083
2014	11,480	276	-1.000***	-0.704***
2015	5,676	162	1.027***	0.398***

Table 4: Announcement returns and future industry returns

This table reports OLS regressions of future four-digit SIC industry returns on the CARs of the target, measured by CAR(-5,5), in the industry across all deals announced during the current month. The unit of observation is industry-month. The Mean CAR(-5,5) FF is the average CAR(-5,5) FF across all deals in the month of the deal announcement across all industry peers of the target. We only include industry-months with at least one M&A transaction. The first four columns present raw returns between 1990 and 2015 and the second four columns present DGTW returns (i.e., returns adjusted the same way as in Daniel et al. (1997)) between 1990 and 2010. The dependent variable in columns (1) and (5) is the one-month future industry return; in columns (2) and (6) the three-month future industry return; in columns (3) and (7) the six-month future industry return; in columns (4) and (8) the twelve-month future industry return. Panel A is only includes year-month fixed effects. Panel B includes year-month fixed effects and controls for current industry returns. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Future industry returns and average peers' CARs

	Future industry returns							
Dependent variable	Raw returns				DGTW returns			
	1 month	3 months	6 months	12 months	1 month	3 months	6 months	12 months
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean CAR(-5,5) FF	0.001**	0.002**	0.002**	0.004***	0.001	0.001*	0.002*	0.004***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,883	4,883	4,883	4,883	4,059	4,001	3,923	3,841
Adjusted R^2	0.43	0.50	0.45	0.39	0.36	0.39	0.32	0.24

Panel B: Future industry returns and average peers' CARs with inclusion of current industry returns as control variable

	Future industry returns							
Dependent variable	Raw returns				DGTW returns			
	1 month	3 months	6 months	12 months	1 month	3 months	6 months	12 months
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean CAR(-5,5) FF	0.001**	0.001*	0.001*	0.004***	0.001	0.001*	0.001	0.004***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Current industry return	-0.037	0.052	0.117	0.094	-0.021	0.012	0.104	-0.045
	(0.035)	(0.048)	(0.078)	(0.126)	(0.037)	(0.052)	(0.060)	(0.075)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,883	4,883	4,883	4,883	4,047	3,989	3,911	3,840
Adjusted R^2	0.43	0.50	0.45	0.39	0.36	0.39	0.32	0.24

Table 5: Explaining announcement returns with deal, peer, and acquirer characteristics

This table reports OLS regressions of industry peer CARs (in %) on deal, industry peer, and acquirer characteristics for M&A deals completed between 1990 and 2015. The dependent variable is the CAR(-5,5) FF, calculated over the period announcement date –5 days / +5 days. Expected returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB and MOM factors. Control variables are lagged by one year. All variables are described in Appendix A. The six columns present regressions with different fixed effects: Year fixed effects (Y) in column 1, industry × year fixed effects (I × Y) in columns 2 and 5, industry × year and peer fixed effects (indicated with a "P") in columns 3 and 6, and deal fixed effects in column 4. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5) FF					
	(1)	(2)	(3)	(4)	(5)	(6)
Peer Market-to-book ratio	-0.277***	-0.278***	-0.485***	-0.278***	-0.259***	-0.457***
	(0.028)	(0.018)	(0.032)	(0.018)	(0.026)	(0.045)
Peer Log(total assets)	0.015	0.011	-0.198***	0.013	0.052***	-0.129**
	(0.017)	(0.015)	(0.056)	(0.016)	(0.014)	(0.058)
Peer Cash-to-asset ratio	-0.006	0.010	-0.313	0.059	0.110	-0.325
	(0.232)	(0.204)	(0.253)	(0.220)	(0.232)	(0.266)
Peer Age	-0.001	-0.000	-0.020	-0.001	-0.003	-0.001
	(0.002)	(0.002)	(0.020)	(0.002)	(0.002)	(0.027)
Peer Ebitda-to-asset ratio	-0.483**	-0.241	-0.903**	-0.236	-0.125	-0.686
	(0.240)	(0.235)	(0.433)	(0.235)	(0.233)	(0.437)
Peer Debt-to-asset ratio	-0.043	0.050	0.095	0.030	0.254	0.159
	(0.121)	(0.157)	(0.272)	(0.152)	(0.155)	(0.262)
Acquirer Market-to-book ratio					-0.044	-0.045
					(0.030)	(0.030)
Acquirer Log(total assets)					-0.092*	-0.095*
					(0.054)	(0.056)
Acquirer Cash-to-asset ratio					-0.970**	-0.969**
					(0.437)	(0.440)
Acquirer Age					-0.008	-0.008
					(0.007)	(0.008)
Acquirer Ebitda-to-asset ratio					0.015	0.023
					(0.688)	(0.693)
Acquirer Debt-to-asset ratio					-0.268	-0.257
					(0.261)	(0.267)
Log(number of deals)	0.063	-0.652	-0.716		1.237*	1.167
	(0.067)	(0.863)	(0.851)		(0.739)	(0.736)
Log(value of deals)	-0.068	-0.432***	-0.425***		-0.698***	-0.686***
	(0.049)	(0.153)	(0.157)		(0.161)	(0.165)
Log(transaction value)	-0.001	-0.005	-0.004		0.014	0.016
	(0.086)	(0.084)	(0.085)		(0.145)	(0.147)
Fixed effects	Y	I × Y	I×Y and P	Deal	I × Y	I×Y and P
Observations	242,660	242,634	242,109	242,589	137,996	137,407
Adjusted R2	0.01	0.01	0.02	0.07	0.01	0.02

Table 6: Announcement returns for peers by public status

This table shows mean and median industry peer CARs FF (in %) for different subsamples of deals for M&As announced between 1990 and 2015. Industry peer CARs are calculated over the period announcement date –5 days / +5 days. Expected returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB and MOM factors. Each measure is presented separately for all industry peers and for equal-weighted portfolios including all industry peers in each deal. The mean at the peer-deal level is the constant of an OLS regression with no explanatory variables, and significance is calculated clustering standard errors at the deal level. The significance of medians is obtained with a sign test. The last column presents aggregate value gains, calculated as the sum of the peer CAR times the market value 5 days before the announcement of the deal across all peers of the target and expressed in trillions of 2015 US$. *, **, and *** indicate that the mean and median are statistically different from 0 at the 10%, 5%, and 1% level, respectively.

Deal characteristics	Unit of observation	N	Mean	Median	Aggregate dollar value (in $tn)
Public acquirer	Peer-deal	167,247	-0.184***	-0.447***	-1.98
	Deal	5,210	-0.154**	-0.165**	
Private acquirer	Peer -deal	85,663	-0.082	-0.312***	-0.80
	Deal	2,784	-0.098	-0.178**	
Private target	Peer -deal	219,753	-0.196***	-0.413***	-2.29
	Deal	7,008	-0.201***	-0.209***	
Public target	Peer -deal	33,226	0.154	-0.278***	-0.49
	Deal	986	0.337**	0.255**	
Public acquirer – public target	Peer -deal	28,157	0.238	-0.252***	-0.30
	Deal	856	0.421***	0.292**	
Public acquirer – private target	Peer -deal	139,159	-0.270***	-0.482***	-1.68
	Deal	4,354	-0.267***	-0.242***	
Private acquirer – public target	Peer -deal	5,069	-0.314	-0.383***	-0.19
	Deal	130	-0.218	-0.427	
Private acquirer – private target	Peer -deal	80,594	-0.068	-0.308***	-0.61
	Deal	2,654	-0.092	-0.172**	

Table 7: Explaining announcement returns with the public status of the target

This table reports OLS regressions of industry peer CARs FF (in %) on indicator variables for the public status of the target and the acquirer for M&A deals completed between 1990 and 2015. The dependent variable is the CAR(-5,5) FF, calculated over the period announcement date –5 days / +5 days. Expected returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB and MOM factors. Public target is an indicator variable equal to one if the target in the deal is public, and zero otherwise. Public acquirer is an indicator variable equal to one if the acquirer is public, and zero otherwise. All regressions control for the lagged peer controls (market-to-book ratio, log(total assets), cash-to-asset ratio, age, ebitda-to-asset ratio, and debt-to-asset ratio), and deal characteristics (logarithm of the number and value of deals last year, and logarithm of the transaction value). Colums 5 and 6 include controls for acquirer characteristics. All variables are described in Appendix A. The six columns present regressions with different fixed effects: Year fixed effects (Y) in column 1, industry × year fixed effects (I × Y) in columns 2 and 5, industry × year and peer fixed effects (indicated with a "P") in columns 3 and 6, and year × peer fixed effects (Y × P) in column 4. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5) FF			
	(1)	(2)	(3)	(4)
Public target	0.466***	0.416***	0.420***	0.424***
	(0.084)	(0.070)	(0.070)	(0.071)
Public acquirer	-0.066	-0.067	-0.067	-0.061
	(0.115)	(0.144)	(0.146)	(0.150)
Deal controls	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Acquirer controls	No	No	No	No
Fixed effects	Y	I × Y	I×Y and P	Y × P
Observations	242,660	242,634	242,109	236,704
Adjusted R2	0.01	0.01	0.02	0.04

Table 8: Announcement returns, anticipation, and public status of the target

This table reports OLS regressions of industry peer CARs FF (in %) on indicator variables for the public status of the target and the acquirer and on the probability of becoming a takeover target over the next year or next five years for M&A deals completed between 1990 and 2015. The dependent variable is the CAR(-5,5) FF, calculated over the period announcement date –5 days / +5 days. Expected returns are calculated with a four factor model using the value-weighted market index and the HML, SMB and MOM factors. Public target is an indicator variable equal to one if the target in the deal is public, and zero otherwise. Public acquirer is an indicator variable equal to one if the acquirer is public, and zero otherwise. All regressions control for the lagged peer controls (market-to-book ratio, log(total assets), cash-to-asset ratio, age, ebitda-to-asset ratio, and debt-to-asset ratio), and deal characteristics (logarithm of the number and value of deals last year, and logarithm of the transaction value). All variables are described in Appendix A. The six columns present regressions with different fixed effects: Year fixed effects (Y) in columns 1 and 4, industry × year fixed effects (I × Y) in columns 2 and 5, and industry × year and industry peer fixed effects (indicated with a "P") in columns 3 and 6. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5) FF					
	(1)	(2)	(3)	(4)	(5)	(6)
Public target	0.465***	0.416***	0.421***	0.464***	0.416***	0.420***
	(0.084)	(0.070)	(0.070)	(0.084)	(0.070)	(0.070)
Public acquirer	-0.066	-0.067	-0.067	-0.068	-0.067	-0.067
	(0.115)	(0.144)	(0.146)	(0.115)	(0.144)	(0.146)
Target within next year	0.396	0.314	-0.481			
	(0.257)	(0.220)	(0.497)			
Target within 5 years				0.648***	0.516***	0.301
				(0.122)	(0.123)	(0.182)
Deal controls	Yes	Yes	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y	I × Y	I×Y and P	Y	I × Y	I×Y and P
Observations	242,660	242,634	242,109	242,660	242,634	242,109
Adjusted R2	0.01	0.01	0.02	0.01	0.01	0.02

Table 9: Announcement returns, misvaluation, and public status of the target

This table reports OLS regressions of industry peer CARs FF (in %) on indicator variables for the public status of the target and the acquirer, on the interaction between the public target dummy and the Baker and Wurgler (2006) sentiment index, and the interaction between the public target dummy and the standard deviation of one-year ahead analysts' EPS forecasts for M&A deals completed between 1990 and 2015. The dependent variable is the CAR(-5,5) FF, calculated over the period announcement date –5 days / +5 days. Expected returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB and MOM factors. Public target is an indicator variable equal to one if the target in the deal is public, and zero otherwise. All regressions control for the lagged peer controls (market-to-book ratio, log(total assets), cash-to-asset ratio, age, ebitda-to-asset ratio, and debt-to-asset ratio), and deal characteristics (logarithm of the number and value of deals last year, and logarithm of the transaction value). All variables are described in Appendix A. The six columns present regressions with different fixed effects: Industry × year fixed effects (I × Y) in columns 1 and 4, industry × year and peer fixed effects (indicated with a "P") in columns 2 and 5, and year × peer fixed effects (Y × P) in columns 3 and 6. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5) FF					
	(1)	(2)	(3)	(4)	(5)	(6)
Public target × Sentiment	0.374**	0.374**	0.363**			
	(0.174)	(0.175)	(0.178)			
Public target × Dispersion				0.412**	0.418**	0.394**
				(0.192)	(0.175)	(0.181)
Sentiment	-1.043***	-1.050***	-1.043***			
	(0.162)	(0.162)	(0.171)			
Dispersion				-0.020	0.167	0.149
				(0.137)	(0.210)	(0.234)
Public target	0.318***	0.322***	0.328***	-0.047	-0.042	-0.027
	(0.099)	(0.100)	(0.102)	(0.151)	(0.173)	(0.179)
Deal controls	Yes	Yes	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	I × Y	I×Y and P	Y × P	I × Y	I×Y and P	Y × P
Observations	241,906	241,386	235,968	134,891	134,483	131,439
Adjusted R2	0.01	0.02	0.04	0.01	0.02	0.05

Table 10: Real effects for industry peers

This table shows industry-level regressions of the market-to-book ratio, sales growth, Ebitda margin, capex-to-assets, and R&D to sales on the interactions between the fraction of M&A transactions in the industry that have public targets in year 0 (Frac pub) and dummy variables that capture the distance in years from year 0. The coefficient estimates are relative to time t = -3. The dependent variable in column 1 is the market-to-book ratio, in column 2 sales gowth, in column 3 Ebitda margin, in column 4 capex-to-assets, and in column 5 R&D-to-sales. All regressions include four-digit SIC and event time fixed effects. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	MB-ratio	Sales growth	EBITDA margin	Capex to assets	R&D to sales
	(1)	(2)	(3)	(4)	(5)
Time dummy -2 x Frac pub	0.099	-0.016	0.027	-0.003	0.065
	(0.137)	(0.049)	(0.111)	(0.012)	(0.053)
Time dummy -1 x Frac pub	0.248	-0.050	0.137	0.003	0.096
	(0.264)	(0.083)	(0.168)	(0.019)	(0.069)
Time dummy 0 x Frac pub	0.499*	0.103	0.200	-0.008	-0.006
	(0.298)	(0.085)	(0.218)	(0.015)	(0.030)
Time dummy +1 x Frac pub	0.757*	0.049	0.141	-0.005	-0.020
	(0.386)	(0.068)	(0.170)	(0.020)	(0.031)
Time dummy +2 x Frac pub	0.428**	0.124	0.218	-0.009	-0.049
	(0.206)	(0.078)	(0.246)	(0.018)	(0.048)
Fixed effects	I and Y	I and Y	I and Y	I and Y	I and Y
Observations	1,382	1,378	1,379	1,382	1,378
Adjusted R^2	0.76	0.25	0.84	0.76	0.96

Table 11: Announcement returns and competition

This table reports OLS regressions of industry peer CARs FF (in %) on proxies for product market competition for M&A deals completed between 1990 and 2015. The dependent variable is the CAR(-5,5) FF, calculated over the period announcement date –5 days / +5 days. Expected returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB and MOM factors. All regressions control for the lagged peer controls (market-to-book ratio, log(total assets), cash-to-asset ratio, age, ebitda-to-asset ratio, and debt-to-asset ratio), and deal characteristics (logarithm of the number and value of deals last year, and logarithm of the transaction value). All variables are described in Appendix A. All columns include year fixed effects. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5) FF			
	(1)	(2)	(3)	(4)
SIC4 HHI	0.154			
	(0.368)			
Log(number of peers)		0.061		
		(0.092)		
SIC4 Ebit margin			-0.220	
			(0.244)	
Product market fluidity				0.022
				(0.027)
Deal controls	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Fixed effects	Y	Y	Y	Y
Observations	242,505	242,660	242,497	71,022
Adjusted R2	0.01	0.01	0.01	0.01

Table 12: Announcement returns of peers, acquirers and targets

This table reports OLS regressions of industry peer CARs FF (in %) on the CARs of acquirers and targets for M&A deals completed between 1990 and 2015. The dependent variable is the industry peer CAR(-5,5) FF. Industry peer, acquirer, and target CARs are calculated over the period announcement date –5 days / +5 days. Expected returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB and MOM factors. All regressions control for the lagged peer controls (market-to-book ratio, log(total assets), cash-to-asset ratio, age, ebitda-to-asset ratio, and debt-to-asset ratio), and deal characteristics (logarithm of the number and value of deals last year, and logarithm of the transaction value). All variables are described in Appendix A. All columns include industry × year fixed effects (I × Y). Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5) FF			
	(1)	(2)	(3)	(4)
Acquirer CARs(-5,5) FF	0.053*		0.049*	
	(0.029)		(0.026)	
Target CARs(-5,5) FF		0.015***	0.005	
		(0.004)	(0.005)	
Combined CARs(-5,5) FF				0.059**
				(0.028)
Deal controls	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Fixed effects	I × Y	I × Y	I × Y	I × Y
Observations	146,828	29,908	23,723	23,723
Adjusted R2	0.01	0.01	0.01	0.01

Table 13: Announcement returns around deal challenges and withdrawals

This table reports OLS regressions of industry peer CARs FF (in %) around the announcement of a deal challenge or a deal withdrawal on and control variables for M&A deals completed between 1990 and 2015. The dependent variable is the industry peer CAR(-5,5) FF, calculated over the period announcement date –5 days / +5 days. Expected returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB and MOM factors. In columns 1 and 2, the CARs are around the announcement of a deal challenge by the Department of Justice or the Federal Trade Commission. In columns 3 and 4, the CARs are around the announcement of a deal withdrawal. All variables are described in Appendix A. Columns 2 and 4 include industry and year fixed effects. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5) FF			
	Challenge		Withdrawal	
	(1)	(2)	(3)	(4)
Constant	-0.788		-0.161	
	(0.538)		(0.228)	
Peer Market-to-book ratio		-0.071		-0.174
		(0.204)		(0.110)
Peer Log(total assets)		0.299		-0.166**
		(0.316)		(0.077)
Peer Cash-to-asset ratio		-1.848		-0.572
		(2.405)		(1.472)
Peer Age		0.024		0.019
		(0.040)		(0.015)
Peer Ebitda-to-asset ratio		-0.133		-0.162
		(1.470)		(0.488)
Peer Debt-to-asset ratio		-4.745***		0.645
		(0.795)		(0.612)
Log(number of deals)		-2.319		0.220
		(2.093)		(0.623)
Log(value of deals)		0.396*		-0.385
		(0.212)		(0.426)
Log(transaction value)		2.025***		-0.388***
		(0.584)		(0.121)
Fixed effects	No	I and Y	No	I and Y
Observations	1,126	1,096	9,462	8,961
Adjusted R2	0.00	0.05	0.00	0.01