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Industry asset revaluations around public and private acquisitions

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ABSTRACT

Revaluations of industry peers around horizontal acquisitions are negative when targets are private, but positive when they are public. We posit this "revaluation spread" arises because acquiring managers favor private targets when public firms are overvalued. Targets' ownership status thus conveys information about industry assets' misvaluation and triggers predictable revaluations. Supporting this idea, private acquisitions occur when private targets appear "cheaper" than public firms based on valuation multiples or the trading activity of industry insiders. The revaluation spread varies with overall market misvaluation, predicts future industry returns, and is unrelated to peers' and industries' fundamentals.

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 (Maskimovic and Phillips, 2001), enhances managers' incentives through takeover threats (Bertrand and Mullainathan, 2003; Lel and Miller, 2015), fosters innovation (Phillips and Zhdanov, 2013), and lowers firms' cost of capital through greater asset liquidity (Ortiz-Molina and Phillips, 2014). In this paper, we propose and investigate another potential benefit associated with an active market for real assets: it improves the informational efficiency of financial markets – i.e., the ability of asset prices to accurately reflect fundamentals.

The motivation for our analysis takes root in two well-known observations. First, announcements of M&A transactions are important events that are closely followed by market participants, as they reveal new information not only about the value of merging firms (e.g., the expected synergies) but also about their respective industries (Song and Walkling, 2000). Second, M&A transactions tend to occur when the market prices of real assets diverge from their fundamental values (Shleifer and Vishny, 2003). To the extent that corporate insiders are better informed about fundamentals than investors (i.e., outsiders) are, they can profit by buying undervalued assets. We posit that when they do so, part of their private information is revealed to outsiders, who can then use this informa-

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tion to revalue other assets in the same industry. A central pillar of financial economics is that information-based trading renders financial markets more informationally efficient (Grossman and Stiglitz, 1980). In this paper, we investigate whether trading in real assets by informed corporate managers might have similar implications. We label this hypothesis the "revaluation" hypothesis.

Testing this hypothesis is challenging because stock prices are affected by both non-fundamental factors and information related to the *fundamental* implications of the transactions. For example, the revaluation of firms involved in a transaction could reflect expected operational synergies, the price paid for the assets, or anticipated management changes. To overcome this challenge, we study the revaluations of horizontal *peers* that are *not* involved in the transactions. This approach offers two important advantages. First, peers' revaluations are arguably less related to information specific to the transaction and the involved firms and are thus more likely to capture information pertaining to the stand-alone value of assets in the industry (Cai, Song, and Walkling, 2011). Second, we can exploit the variation in the revaluations across deals and peers to develop a novel discriminant prediction of the revaluation hypothesis: the sign of peers' revaluation around horizontal deals should depend on the ownership status of the target company (i.e., private or public).

Suppose that, for fundamental reasons (e.g., synergies), an acquirer is interested in purchasing one of two potential targets with identical fundamentals but distinct ownership status. One is public and the other is private. If the acquiring manager is perfectly informed about the targets' identical fundamentals, the choice solely depends on the purchase price. The price may differ across targets because the valuation of public firms is more sensitive to non-fundamental price fluctuations. Therefore, if the acquisition prices of the two targets differ only because investors' overall pricing of public firms deviates from fundamentals, observing the acquisition of the public or private target might reveal information about industrywide misvaluation. Because the acquiring manager knows the targets' fundamentals, the acquisition of the private (public) target indicates that the public target is overvalued (undervalued). If acquisitions reveal information about the valuation of related stand-alone assets, the sign of peers' revaluations should depend on the ownership status of targets, with investors revaluing peers positively around acquisitions of public targets, and negatively when targets are private. Crucially, this prediction is unique to our hypothesis, as peers' revaluations are unlikely to depend on the ownership status of the target if acquisitions reveal information about fundamental changes.

We provide evidence supporting this novel hypothesis based on a large sample comprising all economically relevant acquisition transactions involving U.S. private and public firms (deals above $10 million). We focus on horizontal transactions, in which the informational advantage of managers is likely to be more pronounced. The sample includes 7,994 horizontal transactions over the period 1990-2015. We define revaluations based on cumulative abnormal returns (CARs) for 4,318 distinct industry peers around acquisitions announcements (252,979 unique CARs). We find sharp differences in peers' revaluations across transactions involving public and private targets. The revaluation of peers is significantly negative after deal announcements involving private targets (88% of all deals and 50% of deal value in our sample), and positive following public acquisitions. The difference is economically large, with average peers' revaluations of -0.188% to -0.201% after private acquisitions compared to 0.023% to 0.337% after public ones. This revaluation "spread" between acquisitions of private and public targets remains when we control for peer characteristics (e.g., their size, age, profitability, market-to-book ratio) and deal characteristics (e.g., the value of the transaction, the status of acquirers, whether the deal occurs during an acquisition wave). Across different specifications the revaluation spread ranges between -0.364% and -0.710% and is highly robust. The spread is also present when we specifically compare peers' revaluation around private and public deals of similar size occurring in the same industry and period, and when we control for targets' sales, assets, and profitability prior to their acquisition to ensure that the private and public targets do not differ in their fundamentals.

We provide additional evidence supporting the hypothesis that the revaluation spread arises because the private or public nature of acquisition targets reveals information about the valuation of related stand-alone assets in the industry. Under this hypothesis, acquisitions of private targets should occur when acquiring managers perceive public firms in the industry as overvalued. A comparison between the valuation multiples of targets' peers at times of public and private acquisitions indicates that acquisitions of private targets tend to happen when public firms are more "expensive" based on earnings, assets, and sales multiples. Relatedly, we also show that the peers' revaluation spread varies systematically with the overall market sentiment and the dispersion of analysts' forecasts. Investors thus appear to be more responsive to the information revealed by corporate transactions when the value of assets is more uncertain and more difficult to assess.

A key assumption underlying our hypothesis is that the revaluation spread results from industrywide misvaluation that is detected by acquirers' insiders and (partly) conveyed to outsiders through their trading in real assets (i.e., the nature of targets' ownership). If that is indeed the case, we would expect the choice of targets' ownership by insiders to vary systematically with proxies for their informational advantage. We confirm this conjecture by examining the trading behavior of peers' insiders around horizontal acquisitions as a proxy for their informational advantage (e.g., Ali, Wei, and Zhou, 2011). Consistent with our hypothesis, we find that peers' insiders purchase their own stock significantly more in quarters featuring more acquisitions of public firms in their industry, which we argue arises when publicly traded assets (including their own firm) are undervalued. In contrast, they sell their firm's stocks more intensively in quarters featuring more acquisitions of private firms (i.e., when public firms are overvalued).

Furthermore, the average peers' revaluation in an industry-month significantly predicts the future returns of that industry over different horizons. Industry-months

displaying positive (negative) average peers' revaluations around M&A announcements are followed by positive (negative) industry returns. To the extent that misvaluation is gradually corrected over time (Baker and Wurgler, 2006), the sign and magnitude of peers' revaluations around horizontal transactions act as predictors of the direction and size of the observed overall stock price corrections (i.e., future industry returns). Our findings thus suggest that an active market for real assets helps incorporate information into stock prices.

We explore two plausible alternative explanations for our findings and provide evidence indicating that they are unlikely to explain the revaluation spread. First, as acquisitions typically occur in waves (e.g., Harford, 2005), the revaluation spread may arise if acquisitions of private or public targets provide differential signals about future acquisitions patterns in the industry. Focusing on acquisitions of *public* targets, Song and Walkling (2000) document positive revaluations of industry peers and argue that they reflect an "anticipation effect" driven by investors' updated anticipation that peers will become targets in the future. In our context, in which we study peers' revaluations around acquisitions of public and private targets, a revaluation spread between private and public transactions may arise if the timing of public and private acquisitions is informative about the *structure* of future acquisitions, i.e., if acquisitions of private targets *lower* investors' anticipation that public peers will be targeted in the future.[1] We provide several pieces of evidence inconsistent with this possibility. First, analyzing the joint dynamics of horizontal public and private transactions, we confirm the existence of merger waves. In other words, the number and value of past transactions in an industry help predict the number and value of future transactions in the same industry. However, this holds for both private and public transactions, and, importantly, the intensity of private acquisitions in a given quarter (in number and dollars) does not predict fewer public acquisitions in the future, a prerequisite to explain the revaluation spread. Second, the revaluation spread remains after controlling for proxies capturing peers' future takeover probability. Third, the revaluation spread holds when we control for various proxies of the intensity of merger activity at the industry level.

Alternatively, we perform several tests to assess the possibility that the spread in peers' revaluations reflects differences in the anticipated implications of horizontal transactions for peers' future fundamentals. For example, acquisitions of private targets could signal tougher competition and therefore generate negative revaluations. Overall, we find little support for this interpretation. First, we analyze the consequences of horizontal transactions for future industry real outcomes (e.g., sales growth, margins, or investment) and find little differences between industries experiencing more acquisitions of private or public targets. However, industries featuring more private acquisitions in a given year experience significant decreases in valuation in the following years, consistent with private acquisitions occurring when public firms in the industry are likely overvalued. Second, we find no evidence that the revaluation spread depends on the competitive structure of industries (e.g., industry concentration or markups), mirroring the mixed evidence on whether horizontal acquisitions affect firms' market power and competitive performance (Eckbo, 1983, 1985; Fee and Thomas, 2004; Shahrur; 2005; Bernile and Lyandres, 2019). Third, we show that the revaluation spread is unrelated to acquirers' revaluation. This suggests that the differential revaluation of peers following public or private acquisitions is not systematically related to investors' anticipated acquirer's gains, which could occur, for example, if acquisitions of public targets facilitate collusive behaviors.

The results in this paper add to the literature studying the implications of stocks' misvaluation in general, and its role in mergers and acquisitions. Despite ample evidence indicating that many transactions occur when firms' prices deviate from fundamentals (i.e., they are over- or undervalued), surprisingly little is known about whether the announcements of these transactions reveal information about firms' stand-alone values to investors (as suggested by Rhodes-Kropf and Viswanathan, 2004), and whether investors update their views and revalue related assets accordingly.[2] A notable exception is Malmendier, Opp, and Saidi (2016), who exploit failed takeover attempts to show that cash bids reveal relevant information about the undervaluation of targets.[3] Based on the distinction between acquisitions of private and public targets, our results advance this literature by showing that announcements of horizontal transactions reveal information about the industrywide misvaluation of assets, which triggers systematic revaluations within industries.

Our results also add to the literature studying how managers take advantage of temporary deviations of stock prices from fundamentals. Besides corporate acquisitions, managers exploit informational inefficiencies to issue and repurchase shares (Khan, Kogan, and Serafeim, 2012; Warusawitharana and Whited, 2016), trade for their own

[1] Note that the anticipation effect and our hypothesis are not mutually exclusive. For example, deviations of prices from fundamentals are known to drive corporate transactions (Edmans, Goldstein, and Jiang, 2012). Therefore, it is natural to expect more future transactions in periods in which outside investors learn about current industrywide misvaluation by observing an active market for real assets. Thus, the anticipation effect identified for public deals by Song and Walkling (2000) may reflect partly the revelation of information about the value of stand-alone industry assets around the announcement of public acquisitions.

[2] A large literature has studied how high valuations can affect the decision to acquire and the means of payments used for the acquisition (see, for instance, Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Harford, 2005; Rhodes-Kropf, Robinson, and Viswanathan, 2005; Dong, Hirshleifer, and Richardson, 2006). While the consensus is that overvalued firms tend to use their overvalued equity to acquire firms, recent papers challenge the view that this creates value for their shareholders (Fu, Lin, and Officer, 2013) and even question the argument that overvaluation is a key driver of important decisions like the means of payment used in acquisitions (Eckbo, Makaew, and Thorburn, 2018; Cousin et al., 2019). Our paper is not about how valuations affect the decision to acquire, but on the information that the decision reveals about relative valuations as in Wang (2018) and how it leads to revaluations of listed firms in the same industry.

[3] Notably, Servaes and Tamayo (2014) examine the possibility that the positive peers' revaluation in their sample of 202 hostile takeovers of public targets between 1983 and 2005 reflects industrywide undervaluation, but they do not find supporting evidence for this hypothesis.

account (Ali, Wei, and Zhou, 2011), expand abroad (Baker, Foley, and Wurgler, 2009), or initiate management buyouts (Harford, Stanfield, and Zhang, 2019). Our findings indicate that the opportunistic actions that managers take to exploit financial inefficiencies provide incremental information to investors, which in turn facilitates the correction of these price inefficiencies.

Finally, our analysis contributes to the literature studying the valuation effects of acquisitions on rivals, customers, and suppliers (Eckbo, 1983; Eckbo, 1985; Stillman, 1983; Song and Walkling, 2000; Fee and Thomas, 2004; Shahur, 2005; DeBodt and Roll, 2014; Servaes and Tamayo, 2014; Bernile and Lyandres, 2019; Fathollahi, Harford, and Klasa, 2018). Consistent with our finding that public acquisitions trigger positive peers' revaluations, this literature, which focuses predominantly on public acquisitions, documents positive peers' stock price reactions around M&As. Our paper complements this finding by showing that private acquisitions trigger negative peers' revaluations on average, and that these peers' reactions partly reflect information learned by market participants when they observe private or public acquisitions.

2. Hypothesis development

We posit that peers' revaluations occurring around announcements of horizontal acquisitions reflect the arrival of information about the stand-alone value of assets in the industry. We conjecture that corporate managers have superior information about the fundamental value of their firm and other firms in their industry, compared to outside investors. If acquisitions result from insiders exploiting their informational advantage, then deal announcements may partially reveal this information to outsiders, and trigger asset revaluations. Our main hypothesis is that observing the acquisition of a private or a public target in a given industry reveals differential information about the overall stand-alone value of assets in that industry and should thus generate peers' revaluations in opposite directions.

To illustrate the logic of our main test, consider an industry featuring an acquirer (firm A), two potential (horizontal) targets, and several other public and private peers. The two potential targets are identical and thus provide the same expected fundamental gains for firm A; that is, they have the same assets in place and the same potential synergies. Yet, their ownership structure is different, as one is publicly listed (T_{public}) whereas the other is privately owned ($T_{private}$). Outside investors are imperfectly informed about the fundamental value of these potential targets (θ_T) and other firms in the industry. Therefore, the market price of T_{public}, denoted P_{public}, contains a valuation error. Specifically, P_{public} (the minimal price to acquire T_{public}) is given by the sum of its fundamental value θ_T and a noise component $u_{T,pub}$, which can be positive ($u_{T,pub}>0$) or negative ($u_{T,pub}<0$). The noise component encapsulates, in reduced form, investors' imperfect information about the fundamental value θ_T. By construction, there is no market price for the private target $T_{private}$, but we assume that its acquisition price is less affected by noise ($u_{T,pri}$) than that of the public target, i.e., $|u_{T,pub}|>|u_{T,pri}|$, and is affected in the same direction. The manager of A perfectly observes the fundamental value of the two potential targets θ_T.[4] He can infer the noise component $u_{T,pub}$ from the publicly observable price of the public target. If this noise is positive, firm A optimally acquires the private target, which has a lower price than the otherwise similar public target. Indeed, if $u_{T,pub}>0$, then $P_{public}>P_{private}$. In other words, firm A optimally acquires $T_{private}$ when the public target is overvalued, with $u_{T,pub}>0$. In contrast, firm A acquires T_{public} if $P_{public}<\theta_T$, that is, when the public target is undervalued with $u_{T,pub}<0$.

While outside investors do not observe θ_T, they know that insiders possess superior information about it on average, so observing the ownership status of the acquired target provides them with information about the sign of the noise in stock prices, and by corollary about fundamentals. As outside investors are imperfectly informed about industry assets, we assume that the market price P_Z of a given industry peer Z is also subject to pricing errors, and that P_Z is given by the sum of a fundamental stand-alone component θ_Z and a noise component u_Z. Because misvaluation contains a strong industry-component (Rhodes-Kropf, Robinson, and Vishwanathan, 2005), we assume that u_Z is positively correlated with $u_{T,pub}$. Thus, the information revealed about $u_{T,pub}$ through the acquisition also provides information about the valuation of peer Z (and the other non-targeted public peers in that industry). Specifically, observing the acquisition of T_{public} reveals to outside investors that $u_Z<0$, triggering a positive revaluation ($\Delta P_Z/P_Z>0$) around the deal announcement. In contrast, observing the acquisition of $T_{private}$ signals to investors that $u_Z>0$, inducing them to update peer Z's valuation downward ($\Delta P_Z/P_Z<0$). Intuitively, the magnitude of the revaluation of peer Z depends on the strength of the correlation between $u_{T,pub}$ and u_Z (as perceived by outside investors). This logic forms the backbone of our main hypothesis.

Hypothesis 1 (revaluation hypothesis): If acquisitions reveal information about industrywide misvaluation to investors, acquisitions of private targets trigger negative revaluations of industry peers, whereas acquisitions of public targets trigger positive revaluations of industry peers.

It is important to note that we explicitly assume that the acquisition of target T by firm A does not generate real changes in the future fundamentals of peer Z (e.g., through changes in the competitive structure of the industry, or the emergence of a financially stronger new entity). More specifically, we posit that the acquisition of either $T_{private}$ or T_{public} by firm A does not *differently* alter the fundamental value of Z (θ_Z). If it did, observing a positive or negative revaluation of Z depending on the type of the target would not be sufficient to identify the revaluation effect, because the observed revaluation could reflect differential implications for fundamentals. However, we see little reason to expect the type of the target (public versus private) to affect θ_Z differentially. Various empirical tests (e.g., controlling for various targets' fundamental characteristics) largely confirm this view.

[4] Note that we only need the assumption that the manager has better information about θ_T than outside investors for our conclusion to hold. To simplify exposition, we assume that the manager perfectly observes θ_T.

The revaluation hypothesis has other implications. Peers' revaluations should be more pronounced when investors are more uncertain about peers' fundamental stand-alone value θ_Z. In that case, the information contained in the decision to acquire a public or a private target has a greater impact on investors' valuations of other public firms in the industry, because they rationally put more weight on this informative signal when uncertainty is higher. By contrast, when uncertainty about peers' fundamentals is low (i.e., investors have better information), the type of acquisition (private or public) is unlikely to be driven by misvaluation and more likely to be driven by other considerations (e.g., synergies between the merging firms). In the simple framework presented above, a greater industrywide uncertainty about misvaluation corresponds to a situation in which the average noise (u) of peer firms is larger, which leads to larger revaluations when an acquisition is announced.

Hypothesis 2: The revaluation of industry peers observed around the announcement of horizontal acquisitions is more pronounced in periods of greater uncertainty about the fundamental value of assets in the industry.

3. Sample and variables

Our sample covers all mergers and acquisitions announced between 1990 and 2015 and completed by the end of 2015 involving U.S. public and private firms 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. Like 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 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 occurring between firms in the same four-digit SIC industry. Moreover, we keep only deals with a transaction value of at least $10 million and exclude deals occurring in industries with less than three public firms. Our final sample includes 7,994 transactions. Appendix A describes our selection procedure.

For each deal, we identify the peers of the firms involved in the transaction (target and acquirer) as all the other public firms operating in the same industry, based on the four-digit SIC code of the target and acquirer from SDC. We restrict the sample to peer firms that are active in CRSP at the time the transaction is announced. We eliminate stocks that are not actively traded, i.e., stocks with fewer than 100 daily return observations in the year preceding the transaction, and stocks with missing returns between five days before and five days after the deal. These data screens yield a sample of 4,318 distinct peers. For all peers and for publicly listed acquirers and targets, we collect daily stock prices and market values. We complement this dataset with the SMB, HML, and MOM factors from Kenneth French's website. We also add firm-level accounting data from Compustat, as well as accounting data on a subsample of private targets from SDC and Capital IQ.

In our tests, we use variables that capture characteristics of the transactions, the peers, and the firms involved in the transactions whenever they are publicly listed companies. All these variables are defined in Appendix B. All continuous variables are winsorized at the 1st and the 99th percentiles. We present summary statistics at the deal level in Table 1. The statistics are consistent with the existing literature. The main variable in our study is the private target dummy, which equals one when the target is private and zero otherwise. The average for this variable is 87.7%. Deals with private targets thus clearly dominate our sample. In Panels B and C, we report similar statistics separately for deals featuring private and public targets, respectively. Transaction values are substantially larger for public acquisitions. As a result, private and public acquisitions have approximately the same cumulative dollar values in our sample. Public acquisitions are also more likely to have public acquirers and to be paid in stock. Peers' characteristics are broadly similar across both types of deals.

4. Peers' revaluation and the ownership status of the target

4.1. The "revaluation spread"

Our main hypothesis is that, if peers' revaluations result from the incorporation of information about errors in their pricing (i.e, u_Z), the revaluations should differ depending on the ownership status of the targeted firm. To test this hypothesis directly, we would ideally like to compare the revaluations of peers observed following the acquisition of a private (or public) target by a given acquirer to counterfactual revaluations that would have been observed if that acquirer had instead chosen to acquire a similar target that is publicly listed (or privately owned). Because we do not observe such counterfactual transactions, we follow a common approach and compare peers' revaluations across distinct private and public transactions while controlling for possible observable differences across deals.[5]

We define peers' revaluations as their abnormal returns computed over the two days (-1 to +1), six days (-3 to +3) and ten days (-5 to +5) surrounding the announcement of each transaction in their (four-digit SIC code) industry. Abnormal returns are the difference between realized and expected returns, calculated with a four-factor model in which we add to the market factor the three factors SMB, HML, and MOM. Our estimation period is from 251 days to 21 days before the deal announcement. We cumulate abnormal returns over the relevant window to obtain cumulative abnormal returns (CARs), and winsorize peer revaluations (CARs) at the 1st and the 99th percentiles.

Table 2 presents summary statistics of peers' revaluations separately for deals with private targets (Panel A) and deals with public targets (Panel B). Each panel presents the

[5] This approach is common in studies that analyze the implications of private versus public ownership, e.g., Gao, Harford, and Li (2013) and Michaely and Roberts (2012).

Table 1
Sample summary statistics
Panel A presents summary statistics of the main variables. Panel A shows the statistics for the full sample. The peers' characteristics are averaged at the deal level. Panel B shows the same statistics for deals with private targets. Panel C shows the statistics for deals with public targets. All the variables are defined in Appendix B. The sample includes all M&A deals announced and completed between 1990 and 2015.

Panel A: Full sample

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
Fraction of private deals (numbers)	7,994	0.877	0.954	0.194	0.667	1
Fraction of private deals (value)	7,994	0.698	0.896	0.349	0.128	1
Merger wave	7,994	0.227	0	0.419	0	1
Private acquirer	7,994	0.348	0	0.476	0	1
Private target	7,994	0.877	0	0.329	0	1
Percent stock payment	7,994	0.193	0	0.363	0	1
Peers' characteristics						
Market-to-book ratio	7,994	2.094	1.852	0.851	1.279	3.330
Log(total assets)	7,994	6.324	6.361	1.198	4.835	7.861
Cash-to-asset ratio	7,994	0.118	0.079	0.093	0.028	0.259
Age	7,994	12.395	12.079	5.458	5.800	18.833
EBITDA-to-asset ratio	7,994	0.060	0.097	0.123	-0.100	0.165
Debt-to-asset ratio	7,994	0.266	0.259	0.130	0.103	0.457
V/EBITDA	7,992	7.948	7.964	4.319	2.782	13.133
V/Sales	7,882	4.283	4.105	2.417	1.320	7.489
V/Assets	7,994	1.614	1.480	0.563	0.989	2.428
Public acquirer characteristics						
Market-to-book ratio	4,507	2.253	1.686	1.722	1.053	4.028
Log(total assets)	4,509	6.879	6.795	1.714	4.742	9.237
Cash-to-asset ratio	4,471	0.108	0.060	0.125	0.005	0.278
Age	4,422	11.015	7	11.211	1	29
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	0.000	0.575

Panel B: Deals with private targets

Variable	N	Mean	Median	S.D.	p10	p90
Log(number of deals)	7,008	3.880	3.892	1.273	2.197	5.883
Log(value of deals)	7,008	7.911	8.231	2.217	4.887	10.491
Log(transaction value)	7,008	4.181	3.949	1.312	2.655	5.993
Fraction of private deals (numbers)	7,008	0.896	0.968	0.163	0.723	1
Fraction of private deals (value)	7,008	0.721	0.947	0.338	0.163	1
Merger wave	7,008	0.226	0	0.418	0	1
Private acquirer	7,008	0.379	0.000	0.485	0.000	1.000
Percent stock payment	7,008	0.154	0.000	0.331	0.000	0.979
Peers' characteristics						
Market-to-book ratio	7,008	2.070	1.841	0.833	1.277	3.263
Log(total assets)	7,008	6.367	6.435	1.185	4.860	7.875
Cash-to-asset ratio	7,008	0.114	0.076	0.091	0.028	0.256
Age	7,008	12.372	12.107	5.470	5.667	18.833
EBITDA-to-asset ratio	7,008	0.063	0.098	0.120	-0.088	0.165
Debt-to-asset ratio	7,008	0.271	0.267	0.130	0.104	0.460
V/EBITDA	7,006	8.047	7.997	4.283	2.914	13.294
V/Sales	6,910	4.284	4.117	2.408	1.321	7.478
V/Assets	7,008	1.598	1.458	0.557	0.984	2.408
Public acquirer characteristics						
Market-to-book ratio	3,725	2.246	1.675	1.743	1.043	3.995
Log(total assets)	3,727	6.718	6.650	1.646	4.657	8.939
Cash-to-asset ratio	3,699	0.107	0.056	0.127	0.005	0.279
Age	3,648	10.252	6.000	10.766	0.000	27.000
EBITDA-to-asset ratio	3,712	0.103	0.115	0.134	-0.015	0.225
Debt-to-asset ratio	3,710	0.277	0.260	0.230	0.000	0.587

Panel C: Deals with public targets

Variable	N	Mean	Median	S.D.	p10	p90
Log(number of deals)	986	3.886	3.850	1.349	2.079	6.014
Log(value of deals)	986	8.009	8.251	2.145	5.063	10.488
Log(transaction value)	986	6.001	5.888	1.811	3.661	8.366
Fraction of private deals (numbers)	986	0.740	0.833	0.309	0	1
Fraction of private deals (value)	986	0.533	0.499	0.381	0	1
Merger wave	986	0.230	0	0.421	0	1

(*continued on next page*)

Table 1 (*continued*)

Variable	N	Mean	Median	S.D.	p10	p90
		Panel A: Full sample				
Private acquirer	986	0.132	0.000	0.338	0.000	1.000
Percent stock payment	986	0.471	0.459	0.445	0.000	1.000
Peers' characteristics						
Market-to-book ratio	986	2.263	2.048	0.953	1.288	3.581
Log(total assets)	986	6.012	5.842	1.241	4.680	7.655
Cash-to-asset ratio	986	0.144	0.116	0.104	0.031	0.285
Age	986	12.559	11.789	5.372	6.500	19
EBITDA-to-asset ratio	986	0.043	0.085	0.141	-0.150	0.167
Debt-to-asset ratio	986	0.231	0.202	0.125	0.097	0.412
V/EBITDA	986	7.248	7.676	4.509	1.388	12.083
V/Sales	972	4.269	4.034	2.479	1.315	7.574
V/Assets	986	1.728	1.691	0.593	1.019	2.572
Public acquirer characteristics						
Market-to-book ratio	782	2.287	1.731	1.617	1.086	4.231
Log(total assets)	782	7.648	7.605	1.825	5.286	10.254
Cash-to-asset ratio	772	0.113	0.077	0.116	0.009	0.266
Age	774	14.614	11.000	12.501	1.000	36.000
EBITDA-to-asset ratio	777	0.114	0.119	0.123	0.008	0.235
Debt-to-asset ratio	778	0.232	0.220	0.189	0.000	0.493

Table 2
Peers' revaluations

This table presents cumulative abnormal returns (CARs, in %) of industry peers (based on four-digit SIC codes) around the announcement date of a horizontal M&A transaction in their industry. The sample includes all M&A deals announced and completed between 1990 and 2015. The table shows three measures of peers' CARs. The measures vary in the length of the window over which the stock price reaction is calculated (announcement date –1 day / +1 day, announcement date –3 days / +3 days, or announcement date –5 days / +5 days). We compute the CARs using a four-factor model with the value-weighted market index and the HML, SMB, and MOM factors. Each measure is presented separately for all industry peers (i.e., at the peer-deal level), for equal-weighted (EW) and value-weighted (VW) portfolios including all industry peers for each deal. Panel A presents the statistics for deals where the target is privately held. Panel B presents the statistics for deals where the target is public. *, **, and *** indicate that the mean and median are statistically different from zero at the 10%, 5%, and 1% level, respectively. The means at the peer-deal (deal) level is the estimate of the constant from a regression with no explanatory variables, and significance is calculated by clustering standard errors at the deal (four-digit SIC industry) level. The significance of medians is obtained with a sign test.

Panel A: CARs for peers of privately held targets

CARs	Unit of observation	N	Mean	Median	S.D.	p10	p90
CAR(-1,1)	Peer-deal	219,753	-0.134***	-0.269***	6.006	-6.401	6.133
	Deal (EW)	7,008	-0.111***	-0.111***	2.421	-2.651	2.356
	Deal (VW)	7,008	-0.094**	-0.099***	2.493	-2.787	2.584
CAR(-3,3)	Peer-deal	219,753	-0.143***	-0.354***	9.055	-9.857	9.495
	Deal (EW)	7,008	-0.124**	-0.183***	3.702	-4.132	3.839
	Deal (VW)	7,008	-0.166***	-0.104***	3.676	-4.337	3.892
CAR(-5,5)	Peer-deal	219,753	-0.195***	-0.413***	11.407	-12.641	12.050
	Deal (EW)	7,008	-0.201***	-0.209***	4.708	-5.472	4.985
	Deal (VW)	7,008	-0.188**	-0.096*	4.692	-5.478	5.013

Panel B: CARs for peers of public targets

CARs	Unit of observation	N	Mean	Median	S.D.	p10	p90
CAR(-1,1)	Peer-deal	33,226	0.073	-0.133***	6.511	-6.912	7.118
	Deal (EW)	986	0.104	0.049	2.349	-2.414	2.612
	Deal (VW)	986	-0.130*	-0.143	2.589	-3.113	2.651
CAR(-3,3)	Peer-deal	33,226	0.135	-0.231***	9.891	-10.570	10.938
	Deal (EW)	986	0.307**	0.190**	3.718	-4.005	4.356
	Deal (VW)	986	-0.024	0.002	3.957	-4.377	4.332
CAR(-5,5)	Peer-deal	33,226	0.154	-0.278***	12.434	-13.336	13.948
	Deal (EW)	986	0.337*	0.255**	4.619	-4.791	5.829
	Deal (VW)	986	0.023	-0.006	4.927	-5.354	5.845

results for the three window sizes (-1 to +1 days, -3 to +3 days and -5 to +5 days) and for two levels of aggregation of CARs: individual peer level and portfolio level, both equal-weighted (EW) and value-weighted (VW). The existing literature typically uses the portfolio method because it eliminates concerns about correlations between peers' returns at the deal level. We also consider individual peers' revaluations because one of our objectives is to explore their cross-sectional determinants. To take into account possible correlations of peers' returns for a given deal, we obtain the average peers' CARs and the associated standard errors by regressing peers' CARs on a constant term and clustering the standard errors at the deal level. For all revaluations, we also present medians and estimate their statistical significance using a sign test.

Panel A shows that peers' revaluations are negative and significantly different from zero on average when the acquired company is private. This is true for individual peers and for peers' portfolios. This result holds across the three windows, although the magnitude of the revaluations tends to increase with the length of the time window, the mean varying from -0.094% to -0.201% and the median from -0.104% to -0.413%. Revaluations 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 contain some noise. Therefore, we use the wider 10-day window around the announcement date in the subsequent analyses.

By contrast, Panel B shows that peers' revaluations are overall positive on average around the announcement of acquisitions of public targets. The magnitude of peers' reactions varies from -0.130% to +0.337%. The mean and median reactions are significantly positive for equal-weighted portfolio returns in the two wider windows. At the peer level, mean returns are positive, while the median is significantly negative. This is similar to Song and Walkling (2000), who find positive average and negative median portfolio returns for horizontal public transactions. This pattern suggests that individual returns tend to be larger in small deals and in deals with a smaller number of peers, hence the need to control for time-varying industry and individual peer characteristics (as we do in subsequent tests). Peers' revaluations also exhibit large standard deviations when computed at the level of individual peers, where they vary between 2.349% and 12.434% in the two panels.[6]

Fig. 1 presents the deal-level cumulative average revaluations of peers between 10 days before and 10 days after deals' announcements separately for transactions with private and public targets. Consistent with our hypothesis and with the results in Table 2, we observe a stark contrast between peers' revaluations around acquisitions of private and public targets. Peers' revaluation for private target deals is negative and statistically significant after the announcement date, whereas the revaluation for public deals is positive and marginally significant after the announcement date.

To analyze further the revaluation spread observed between public and private acquisitions, we regress the average peer revaluation at the deal level on the private target dummy using several specifications. Table 3 presents the results. The coefficient of interest is that on the private target dummy, which measures the *spread* in peers' revaluations between acquisitions of private and public targets. All specifications confirm the existence of the revaluation spread. In column 1, we include year fixed effects but no control variables. The coefficient on the private target dummy is -0.507 and statistically significant, implying an economically non-trivial revaluation spread of -0.507%, consistent with Fig. 1. In column 2, we control for several deal characteristics that could correlate with the differential effect of public or private acquisitions on peers' revaluation. We control for (the log of) deal value; the percentage of stock payment; past acquisition activity in the industry using the (log of the) number and value of transactions in the same four-digit SIC industry in the year preceding the acquisition, as well as the repartition among acquisitions of public and private targets; and a dummy variable indicating whether a deal occurs during an industry merger wave following Harford (2005). Including these deals' characteristics helps to isolate the *incremental* information about industry misvaluation provided by targets' ownership status. The revaluation spread rises to -0.616% and continues to be statistically significant.

In column 3, we further control for acquirer characteristics (i.e., size, age, cash and debt ratios, profitability, and market-to-book ratio, measured prior to the transactions). Although the number of observations drops by about half due to the lower number of deals with public acquirers, this specification allows us to better control for acquirer peculiarities that could affect peers' revaluations. The revaluation spread continues to be negative and statistically significant, and its magnitude increases to -0.77%. In columns 4 to 6, we estimate the same specifications as in columns 1 to 3, but we include interactions between year and industry fixed effects, exploiting the variation in peers' revaluation across acquisitions of public and private targets in a given industry and year. The private target dummy continues to be negative and statistically significant.

[6] In the overall sample, which pools acquisitions of public and private targets, peers' revaluations are robustly negative. This finding is in sharp contrast with the evidence from most of the existing literature, which consistently finds positive revaluations of industry peers around deals' announcements. Papers in this literature 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. For example, 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. All four papers find positive average revaluations of industry peers in their main specification, with magnitudes ranging between 0.2% and 2%. This is consistent with our hypothesis that acquisitions of public firms, which represent most, or all of the samples used in these studies, are associated with positive peers' returns. It turns out that our larger sample contains mostly acquisitions of private targets, for which peers' revaluations are negative on average.

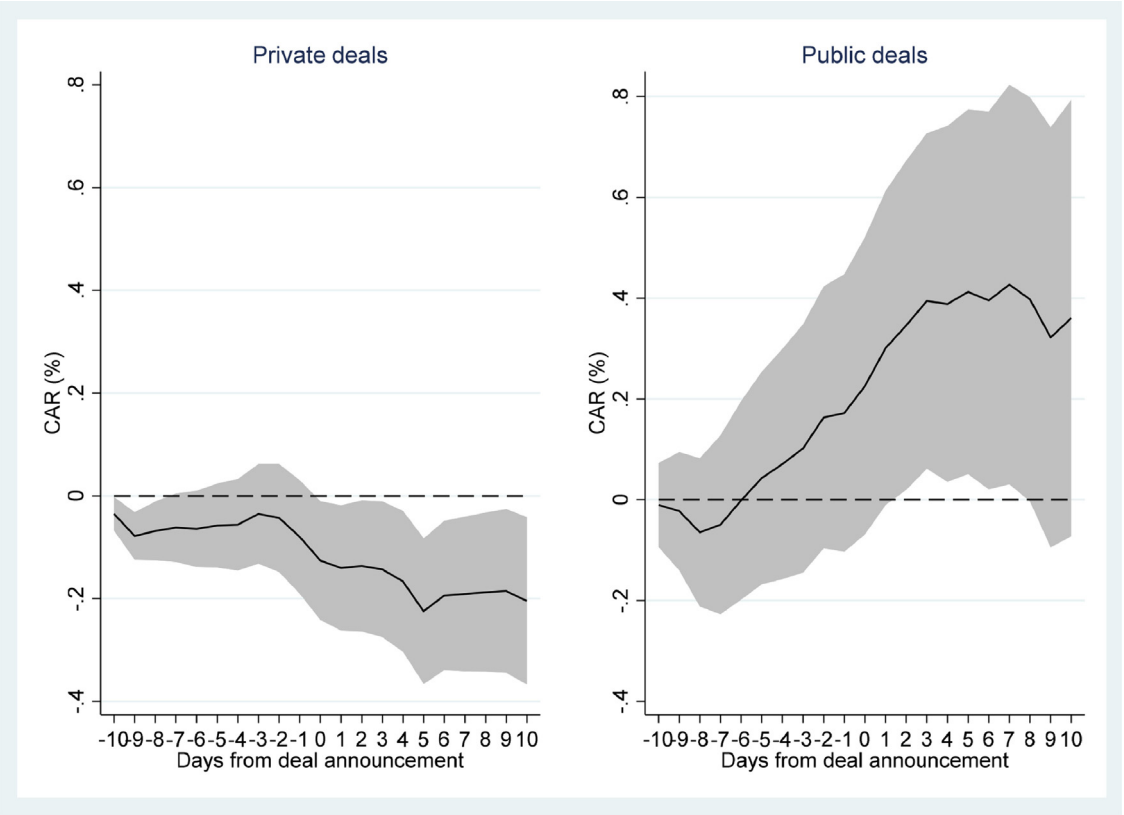

Fig. 1. Cumulative abnormal returns of peers for M&A transactions with private or public targets
This figure shows equal-weighted portfolio (deal level) average cumulative abnormal returns (CARs) of industry peers between -10 days and up to +10 days around the announcement date of a deal in their industry. The left panel presents the CARs for deals where the target is privately held, and the right panel presents the CARs for deals where the target is public. Abnormal returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB, and MOM factors. The sample includes all M&As announced and completed between 1990 and 2015. The shaded grey area indicates the 95% confidence interval.

Fig. 2 depicts the revaluation spread in event time around horizontal transactions, after removing the effect of deal and acquirer characteristics as well as year fixed effects (corresponding to specification 3 in Table 3). We observe no significant difference in peers' returns between private and public acquisitions until about three days before transactions. Then, the revaluation spread becomes significantly negative. Table 4 presents robustness tests of the results in Table 3, conservatively using the same specification as in the last column of Table 3, which controls for both deal and acquirer characteristics and includes industry × year fixed effects. First, in columns 1 to 3, we consider peers' revaluations computed over different windows: announcement date -/+ 3 days, -/+ 2 days, -/+1 day (as opposed to announcement date -/+ 5 days in Table 3). The private target dummy remains negative and statistically significant. In column 4, we define industry peers at the three-digit SIC code (as opposed to four-digit SIC code, as in Table 3). In columns 5 and 6, we focus on peers' revaluations in non-horizontal acquisitions (defined as acquisitions across different three-digit or four-digit SIC codes). In these three columns, we find a negative revaluation spread. However, compared to Table 3, the magnitude and significance of the coefficients on the private target dummy are lower (and the coefficient is insignificant in the last column). This attenuation probably reflects the increased heterogeneity across firms' fundamentals with less granular industry definitions.[7]

In Table 5, we exploit the variation in peers' revaluations within and across deals by regressing *individual* peers' revaluations on the private target dummy and control variables using various fixed effect structures. As in Table 3, we include deal and acquirer characteristics.[8] We

[7] Panel A of Appendix C shows another robustness test, in which we run the same tests as in Table 3 but double-cluster standard errors at the four-digit SIC industry level and at the announcement year level. This does not materially affect the statistical significance of our estimates. In untabulated tests, we further observe that the revaluation spread holds and that its magnitude tends to be larger when we consider only deals involving single-segment targets, or only the revaluation of single-segment peers. This is consistent with the view that fundamentals are more homogeneous across single-segment firms.

[8] As in Table 3, adding these deal-level controls allows us to isolate the incremental information about industry misvaluation contained in the ownership status of the target. For example, controlling for the mode of payment allows us to isolate the incremental effect of the nature of the target relative to a variable that has been shown to contain information about the valuation of firms involved in M&A transactions (see, for example, Shleifer and Vishny, 2003). In our tests (tables 3 and 5), the relation

Table 3
Private status of the target and peers' revaluation: deal-level regressions
This table reports coefficient estimates from regressions of peers' CARs (in %) on deal and acquirer characteristics for M&A deals announced and completed between 1990 and 2015. The dependent variable is the equal-weighted CAR(-5,5) at the deal level, 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. Private target is an indicator variable equal to one if the target is private, and zero otherwise. All variables are described in Appendix B. Columns 1 to 3 include year fixed effects. Columns 4 to 6 include industry × 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)					
	(1)	(2)	(3)	(4)	(5)	(6)
Private target	-0.507***	-0.616***	-0.770***	-0.400**	-0.342**	-0.759***
	(0.179)	(0.164)	(0.162)	(0.188)	(0.171)	(0.179)
Private acquirer		0.014			0.078	
		(0.111)			(0.119)	
Log(Number of deals)		0.046	0.133		-0.451	0.910
		(0.086)	(0.096)		(0.482)	(0.997)
Log(value of deals)		0.014	-0.056		-0.114	-0.341*
		(0.046)	(0.065)		(0.135)	(0.193)
Log(transaction value)		-0.039	-0.028		0.020	-0.051
		(0.050)	(0.082)		(0.063)	(0.086)
Percent stock payment		-0.243	-0.320		0.056	-0.143
		(0.257)	(0.210)		(0.211)	(0.211)
Frac. private deals (numbers)		-0.604	0.080		-0.991	0.031
		(0.613)	(0.648)		(1.141)	(1.398)
Frac. private deals (value)		0.312	-0.026		0.718	0.314
		(0.324)	(0.357)		(0.523)	(0.682)
Merger wave		-0.330*	-0.197		1.425*	1.361
		(0.177)	(0.178)		(0.851)	(0.929)
Acquirer Market-to-book ratio			-0.075*			-0.049
			(0.038)			(0.034)
Acquirer Log(total assets)			-0.040			-0.014
			(0.059)			(0.071)
Acquirer Cash-to-asset ratio			-0.291			-0.467
			(0.490)			(0.492)
Acquirer Age			0.003			-0.013
			(0.006)			(0.008)
Acquirer EBITDA-asset ratio			-0.126			-0.131
			(0.637)			(0.661)
Acquirer Debt-to-asset ratio			-0.071			-0.092
			(0.297)			(0.424)
Fixed effects	Y	Y	Y	I × Y	I × Y	I × Y
Observations	7,994	7,994	4,292	7,154	7,154	3,570
Adjusted R^2	0.01	0.02	0.02	0.10	0.10	0.09

also include a set of peer characteristics (measured prior to the deals) to capture the potential effects of expected changes in fundamentals (i.e, θ_Z) on their revaluation. We consider peers' size, age, cash and debt ratios, profitability, and market-to-book ratio. In these tests, we cluster standard errors at the deal level.[9] Table 5 confirms the peers' revaluation spread in peer-deal regressions. In the first column, we focus on the variation of peers' revaluations in a given industry-year (using interactions between year and industry fixed effects). In column 2, we further add peer fixed effects to absorb time-invariant firm-level characteristics that could explain the revaluation of a given peer in a series of transactions. In column 3, we include interactions between peer and year fixed effects, identifying regression coefficients using within-year and within-peer variations.[10] In columns 4 to 6, we repeat the specifications of columns 1 to 3 adding acquirers' characteristics. The estimated revaluation spread between private and public acquisitions holds in all specifications. Overall, despite different sources of variation, the magnitude of the revaluation spread ranges between -0.364% and -0.710%.

Remarkably, the revaluation spread holds when we include the interaction between peers and year fixed effects. In this specification (column 3), we exploit variation in a given peer's revaluations around different private and public deals occurring in its industry in the same year. The stock price reaction of a given peer is thus significantly more negative in a given year around the announcement

between the mode of payment turns out to have an unstable sign and to be statistically insignificant. Unreported tests indicate that the interaction between the private target dummy and the percentage of stock payment also has an insignificant effect on peers' revaluation, suggesting that acquisitions of private targets paid using buyers' equity do not provide a stronger negative signal about industry misvaluation.

[9] Like the previous deal-level tests, the results are robust to alternative clustering choices. Panel B of Appendix C shows the same regressions with double-clustering at the four-digit SIC industry level and at the announcement year level.

[10] In this specification, the fixed effects absorb peer characteristics, which are calculated at the yearly level, hence the missing coefficients on peer characteristics.

Table 4
Private status of the target and peers' revaluation: robustness
This table reports coefficient estimates from regressions of peers' CARs (in %) on deal and acquirer characteristics for M&A deals announced and completed between 1990 and 2015. The dependent variable is the equal-weighted CAR at the deal level, calculated over the period of announcement date –3 days / +3 days, –2 days / +2 days, and –1 days / +1 days in columns 1, 2, and 3, respectively. Expected returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB, and MOM factors. Private target is an indicator variable equal to one if the target is private, and zero otherwise. All regressions control for lagged acquirer controls (log(total assets), cash-to-asset ratio, age, EBITDA-to-asset ratio, debt-to-asset ratio, and market-to-book ratio), and deal characteristics (logarithm of the number and value of deals last year, logarithm of the transaction value, percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave). The specifications thus include the same deal and acquirer controls and the same fixed effects (industry × year) as column 6 of Table 3. In column 4 the dependent variable is the equal-weighted CAR(-5,5) at the deal level, calculated over the period announcement date –5 days / +5 days for peers defined as firms in the same three-digit SIC code as the target. In columns 5 and 6, the dependent variable is the equal-weighted CAR(-5,5) at the deal level, calculated over the period announcement date –5 days / +5 days for peers defined as firms in the same three-digit SIC code as the target, but only when targets are acquired by firms from different SIC4 or SIC3 industries. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. All variables are described in Appendix B. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable:	CAR(-3,3)	CAR(-2,2)	CAR(-1,1)	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)
Type of deals:	Horiz.	Horiz.	Horiz.	Horiz.	Non-Horiz.	Non-Horiz.
Industry Definition:	SIC4	SIC4	SIC4	SIC3	SIC4	SIC3
	(1)	(2)	(3)	(4)	(5)	(6)
Private target	-0.294*	-0.387**	-0.240*	-0.324*	-0.635***	-0.274
	(0.155)	(0.152)	(0.133)	(0.165)	(0.221)	(0.189)
Deal and acquirer controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	I × Y	I × Y	I × Y	I × Y	I × Y	I × Y
Observations	3,570	3,570	3,570	5,107	4,680	3,439
Adjusted R^2	0.08	0.07	0.04	0.12	0.09	0.12

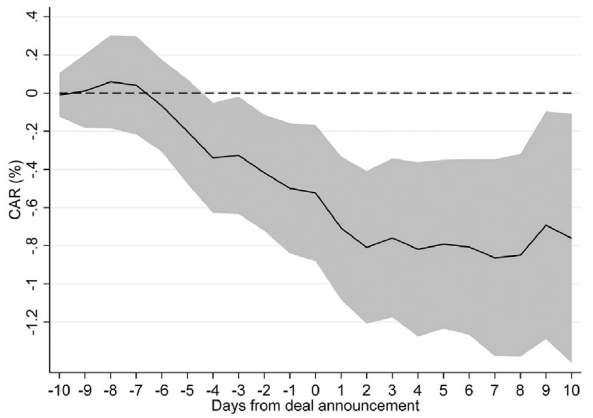

Fig. 2. Revaluation spread between private and public deals
This figure shows the difference in equal-weighted cumulative abnormal returns (CARs) of industry peers between deals with private and public targets from -10 days to +10 days around the announcement date of a deal. Abnormal returns are calculated with a four-factor model using the value-weighted market index and the HML, SMB, and MOM factors. For each event day, we regress the equal-weighted portfolio CARs on a private target indicator variable equal to one if the target in the deal is private, and zero otherwise. We control for deal characteristics (logarithm of value and number of deals, logarithm of transaction value, the percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave), acquirer characteristics (market-to-book ratio, log(total assets), cash-to-asset ratio, age, EBITDA-to-asset ratio, and debt-to-asset ratio), and announcement year fixed effects. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC level. The sample includes all M&As announced and completed between 1990 and 2015. The shaded grey area indicates the 95% confidence interval.

of a private acquisition than when a public acquisition is announced. This result is especially hard to reconcile with explanations for peers' revaluations based on future fundamental changes induced by the announced transactions or a specific sequential timing in public and private horizontal acquisitions (unless these fundamental changes or this timing vary with the public status of the target, two possibilities we study in the next sections).

Table 5 further indicates that peers' revaluations appear weakly related to variables that proxy for their fundamentals. Indeed, peers' cash holdings, leverage and age are insignificant in all specifications. Peers' size is significant in two specifications out of four (but with inconsistent signs). The coefficients on peers' profitability and market-to-book are negative and significant in most specifications, suggesting that profitable peers with better growth prospects are particularly sensitive to acquisition announcements. This might indicate that horizontal acquisitions happen at the expense of existing firms with higher potential, perhaps because of the emergence of a more powerful rival in the industry. However, further tests presented below indicate that the revaluation spread is largely unrelated to industry competitive structures.

4.2. Comparability of private and public transactions

When we interpret peers' revaluation spread as stemming from the incorporation of information about industry-level misvaluation, we assume that the assets acquired in private or public acquisitions are economic substitutes (i.e, θ_T is the same for the private and public target). We recognize, however, that private and public acquisitions might differ along various dimensions poten-

Table 5
Private status of the target and peers' revaluation: peer-level regressions
This table reports coefficient estimates from regressions of peers' CARs (in %) on deal, peer, and acquirer characteristics for M&A deals announced and completed between 1990 and 2015. The dependent variable is the individual peer's CAR(-5,5), 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. Private target is an indicator variable equal to one if the target is private, and zero otherwise. All regressions control for lagged peer controls (log(total assets), cash-to-asset ratio, age, EBITDA-to-asset ratio, debt-to-asset ratio, and market-to-book ratio), and deal characteristics (private acquirer dummy, logarithm of the number and value of deals last year, logarithm of the transaction value, percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave). Columns 4, 5, and 6 include controls for acquirer characteristics. All variables are described in Appendix B. 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 deal level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5)					
	(1)	(2)	(3)	(4)	(5)	(6)
Private target	-0.364**	-0.370**	-0.404**	-0.699***	-0.701***	-0.710***
	(0.182)	(0.183)	(0.185)	(0.223)	(0.226)	(0.232)
Peer Log(total assets)	0.012	-0.181***		0.051**	-0.115	
	(0.018)	(0.067)		(0.025)	(0.093)	
Peer Cash-to-asset ratio	0.014	-0.315		0.106	-0.339	
	(0.198)	(0.292)		(0.253)	(0.380)	
Peer Age	-0.000	-0.015		-0.003	0.001	
	(0.002)	(0.014)		(0.003)	(0.022)	
Peer EBITDA-to-asset ratio	-0.251	-0.882***		-0.132	-0.677*	
	(0.177)	(0.267)		(0.238)	(0.367)	
Peer Debt-to-asset ratio	0.014	0.109		0.211	0.162	
	(0.149)	(0.255)		(0.208)	(0.351)	
Peer Market-to-book ratio	-0.277***	-0.480***		-0.257***	-0.454***	
	(0.021)	(0.031)		(0.027)	(0.041)	
Log(number of deals)	-1.002*	-1.038*	-0.801*	0.946	0.923	1.056
	(0.600)	(0.605)	(0.454)	(0.795)	(0.807)	(0.811)
Log(value of deals)	-0.411***	-0.405***	-0.337**	-0.709***	-0.699***	-0.702***
	(0.143)	(0.144)	(0.144)	(0.179)	(0.182)	(0.189)
Log(transaction value)	-0.041	-0.042	-0.051	-0.077	-0.075	-0.073
	(0.047)	(0.047)	(0.048)	(0.069)	(0.070)	(0.072)
Percent stock payment	0.307*	0.306*	0.262	0.005	0.002	0.006
	(0.181)	(0.182)	(0.185)	(0.233)	(0.235)	(0.243)
Frac. private deals (numbers)	-1.115	-1.096	-1.475	-0.587	-0.694	-0.906
	(0.919)	(0.925)	(0.947)	(1.218)	(1.240)	(1.284)
Frac. private deals (value)	0.564	0.537	0.760*	0.062	0.060	0.147
	(0.440)	(0.444)	(0.456)	(0.561)	(0.570)	(0.595)
Merger wave	1.348***	1.279***	1.104***	0.982	0.904	0.730
	(0.441)	(0.438)	(0.423)	(0.598)	(0.598)	(0.596)
Private acquirer	0.086	0.086	0.067			
	(0.138)	(0.138)	(0.141)			
Acquirer Market-to-book ratio				-0.028	-0.029	-0.036
				(0.043)	(0.043)	(0.045)
Acquirer Log(total assets)				-0.075	-0.078	-0.075
				(0.060)	(0.061)	(0.062)
Acquirer Cash-to-asset ratio				-0.896	-0.900	-0.850
				(0.547)	(0.553)	(0.571)
Acquirer Age				-0.010	-0.009	-0.010
				(0.009)	(0.010)	(0.010)
Acquirer EBITDA-to-asset ratio				0.047	0.048	0.009
				(0.555)	(0.561)	(0.579)
Acquirer Debt-to-asset ratio				-0.219	-0.209	-0.274
				(0.472)	(0.478)	(0.493)
Fixed effects	I × Y	I × Y and P	Y × P	I × Y	I × Y and P	Y × P
Observations	243,422	242,897	246,549	138,464	137,874	135,262
Adjusted R^2	0.01	0.02	0.04	0.01	0.02	0.04

tially related to peers' revaluation. We perform two distinct analyses to minimize this concern. First, private and public transactions differ in size. While we control for deal size (and other deal characteristics) in our tests, we use a matching procedure to better capture the effect of transactions' size on peers' revaluations and ensure that the size difference between targets in private and public acquisitions is not driving our findings.

We match public deals to private deals by size, industry, and time. Specifically, for each acquisition of a public target, we identify all acquisitions of private targets occurring in the same three-digit SIC industry and within six months of that public acquisition. Then, we sort public-private target pairs by the absolute difference of their deal sizes (i.e., the log of transaction value) and match all public deals sequentially (i.e., without replacement), starting from the pair with the smallest size difference and keeping the closest private match still available for each public deal. Finally, we drop the resulting matched pairs for which the difference in size between the two deals is greater than 10% of their average. The final sample includes 279 public deals matched to 279 distinct private deals. Fig. 3 shows the kernel density estimates of deal size before and after the matching process. Panel A confirms that the size distributions are quite different across private and public transactions. After matching, however, the size distributions are similar, as we cannot reject the null hypothesis that the distributions, averages, and medians are equal. Panel A of Table 6 presents the results of specifications mimicking those of Table 5 but estimated on the sample of matched transactions.[11] Although the matching procedure reduces the sample size significantly, the spread between peers' revaluations around private and public transactions remains statistically significant. It is also 50% to 100% larger than the one obtained using the full sample.

Another potential concern is that target characteristics might differ across public and private deals, which could affect peers' revaluations through distinct expected changes in fundamentals. For example, private targets may be more profitable than public targets, and their acquisitions may create a more productive entity, potentially hurting the other firms in the industry (and hence explaining the negative revaluation around private transactions). Unfortunately, information about private targets is not readily available, which considerably restricts our ability to control for the characteristics of firms targeted in private and public transactions. Nevertheless, we gather accounting information for a subsample of private targets from SDC and Capital IQ. These two sources of data allow us to control for the sales, assets, and profitability (the ratio of EBITDA to total assets) of private and public targets in 200 matched deals (measured prior to their acquisition). Panel B of Table 6 reveals that the revaluation spread persists even after we control for these targets' characteristics, suggesting our results are not explained by observable fundamental differences across public and private targets. In these tests, the spread is again larger than in our baseline specifications (between -0.811% and -1.126%).

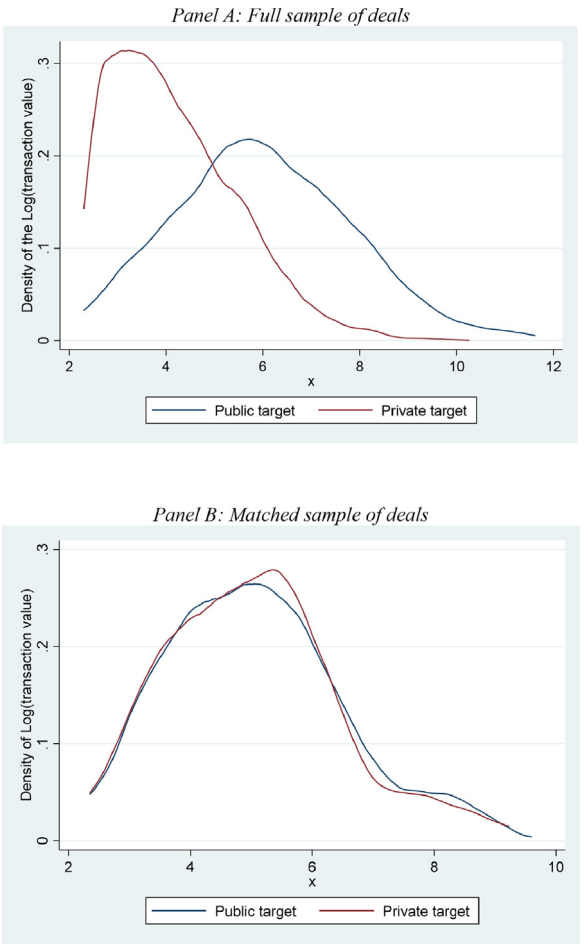

Fig. 3. Distribution of deal size for M&A transactions with public and private targets
This figure shows the kernel density estimates of the logarithm of the transaction value for M&A deals with a public or private target. The sample includes all M&As announced and completed between 1990 and 2015. Panel A includes all deals in the sample (7,994 deals), of which 986 have a public target and 7,008 have a private target. Panel B shows the kernel density estimates of the logarithm of the transaction value for a matched sample of deals. We match each deal with a public target to the closest private deal in the same three-digit SIC industry and within six months of the deal date based on deal size. From this sample, we drop the matched pairs for which the difference in size between the two deals is greater than 10% of the average of the two deal sizes. The final matched sample contains 279 deals with a private target and 279 deals with a public target.

4.3. Targets' type and peers' valuation multiples

To provide additional support for our hypothesis, we compare the valuation multiples of targets' peers observed across public and private transactions. Under our hypothesis, acquisitions of private targets occur when acquiring managers perceive potential public targets in the industry as overvalued, i.e., when private targets are "cheaper" than similar public firms are (when $u_{T,pub}>0$, or equiva-

[11] In this specification, we include industry and year fixed effects since the matching is done on both industry and time dimensions. Including the interaction between industry and year fixed effects yields similar conclusions, albeit slightly weaker statistical significance.

Table 6
Robustness: matched sample and target controls
This table reports coefficient estimates from regressions of peers' CARs FF (in %) on deal, peer, and acquirer characteristics for M&A deals announced and completed between 1990 and 2015. The dependent variable is the individual peer's CAR(-5,5), 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. Private target is an indicator variable equal to one if the target is private, and zero otherwise. All regressions control for lagged peer controls (log(total assets), cash-to-asset ratio, age, EBITDA-to-asset ratio, debt-to-asset ratio, and market-to-book ratio), and deal characteristics (private acquirer dummy, logarithm of the number and value of deals last year, logarithm of the transaction value, percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave). Columns 3 and 4 include controls for acquirer characteristics. All variables are described in Appendix B. The four columns present regressions with different fixed effects: industry and year fixed effects (I, Y) in columns 1 and 3 and industry, year, and peer fixed effects (I, Y, P) in columns 2 and 4. Panel A shows estimates based on a matched sample. For each deal involving a public target, we identify all deals involving private targets occurring in the same three-digit SIC industry and within six months of that deal. Then, we sort the pairs of public and private transactions by their absolute difference in deal size (log(transaction value)), and we match each public deal with a private deal starting from the pair with the smallest size difference, and keeping the closest private match still available for each public deal. Finally, we drop the resulting matched pairs for which the difference in size between the two deals is greater than 10% of the average of the two deal sizes. In Panel B, we use the matched sample and in addition control for the targets' EBITDA-to-asset ratio, log(sales), and log(total assets). Standard errors are adjusted for heteroscedasticity and clustered at the deal level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Matched private and public deal sample

Dependent variable	CAR(-5,5)			
	(1)	(2)	(3)	(4)
Private target	-0.813***	-0.795**	-1.014***	-0.996***
	(0.302)	(0.311)	(0.351)	(0.363)
Deal controls	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Acquirer controls	No	No	Yes	Yes
Fixed effects	I, Y	I, Y, P	I, Y	I, Y, P
Observations	26,588	26,337	19,600	19,215
Adjusted R^2	0.01	0.01	0.01	0.01

Panel B: Matched sample and target controls

Dependent variable	CAR(-5,5)			
	(1)	(2)	(3)	(6)
Private target	-0.811**	-0.812**	-1.126**	-1.089**
	(0.358)	(0.368)	(0.452)	(0.468)
Target EBITDA-to-asset ratio	0.398**	0.415**	0.221	0.208
	(0.183)	(0.187)	(0.215)	(0.211)
Target Log(sales)	-0.108	-0.101	-0.050	-0.024
	(0.157)	(0.166)	(0.155)	(0.161)
Target Log(assets)	0.138	0.127	0.018	0.006
	(0.205)	(0.214)	(0.246)	(0.258)
Deal controls	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Acquirer controls	No	No	Yes	Yes
Fixed effects	I, Y	I, Y, P	I, Y	I, Y, P
Observations	22,990	22,711	16,769	16,339
Adjusted R^2	0.01	0.02	0.01	0.02

lently $P_{public} > P_{private}$). If private deals indeed occur when public firms are more "expensive" than private firms, the *relative* valuation of public peers observed at the time of private transactions should be systematically larger than that observed at the time of public transactions.

To test this prediction, we consider three commonly used price multiples to measure peers' relative valuations, namely EBITDA, sales, and assets multiples. For each deal, we compute the average peers' multiples defined by the ratio of their market value of assets (using the market capitalization 20 days prior to the deal announcement plus last reported total debt) to their last reported EBITDA, sales, or assets. To capture the association between peers' relative valuation and transactions' type, we then regress

Table 7
Private status of the target and peers' valuation multiples
This table reports coefficient estimates from deal-level regressions of peers' average valuation multiples on the ownership status of targets. The dependent variable is either the EBITDA multiple (column 1), sales multiple (column 2), or the asset multiple (column 3). The valuation multiples for public peers are defined as market value of assets (market capitalization measured 20 days prior to the transaction announcement plus total debt) divided by the peer's EBITDA, sales, or total assets. Then, for each deal, we calculate the average peers' valuation multiple. Private target is an indicator variable equal to one if the target is private, and zero otherwise. All regressions control for deal characteristics (private acquirer dummy, logarithm of the number and value of deals last year, logarithm of the transaction value, percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave). All regressions include four-digit SIC 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	V/EBITDA	V/Sales	V/Assets
	(1)	(2)	(3)
Private target	0.283*	0.134**	0.056***
	(0.165)	(0.063)	(0.020)
Deal controls	Yes	Yes	Yes
Fixed effects	I and Y	I and Y	I and Y
Observations	7,815	7,832	7,838
Adjusted R^2	0.53	0.79	0.71

average peers' multiples on the private target dummy, deal controls, as well as industry and year fixed effects (and cluster standard errors at the industry level). Table 7 presents the results. In line with our conjecture, we observe positive and significant coefficients on the private target dummy, confirming that acquisitions of private targets tend to occur when public firms appear more "expensive" (i.e., when they trade at higher EBITDA, sales, and assets multiples) compared to the relative valuation that is typically observed around acquisitions of public targets.

4.4. Insider trading around private and public acquisitions

A key assumption underlying our revaluation hypothesis is that acquiring managers detect part of the industry-wide noise in stock prices and opportunistically decide on their acquisition targets (i.e., private or public) based on its sign. To provide empirical support for this assumption, we posit that if the ownership status of targets reflects insiders exploiting their private information about the noise in the prices of assets in their industry (i.e., u_Z), the choice of targets' ownership should vary systematically with insider trading, a widely used proxy for insiders' informational advantage (Ali, Wei, and Zhou, 2011; Dessaint, Foucault, Frésard, and Matray, 2019). We thus check whether net purchases by peers' insiders are lower (i.e., insiders sell more shares than they buy) in quarters in which there are more acquisitions of private firms in their industry (i.e., when related public firms are overvalued, or $u_Z>0$).

Considering every industry-quarter with at least one horizontal acquisition, we first regress the net purchases of the insiders of peers in a given quarter on the fraction of acquisitions of private targets in that industry-quarter, or equivalently a dummy variable for industry-quarters featuring solely acquisitions of private targets.[12] We define net buys as insiders' share buys minus sales divided by their stock's turnover (from Thomson Insider Data) and control for time (year-quarter) fixed effects. Panel A of Table 8 confirms that the choice of targets' ownership correlates with the direction of trading by peers' insiders, as the first two columns reveal that the coefficients on the fraction of private targets and the dummy variable are both negative (-0.028 and -0.017) and statistically significant.[13] In columns 3 to 6, we consider insiders' sales and purchases separately and find significantly more insiders' sales and fewer buys in quarters exhibiting more acquisitions of private targets.

In Panel B of Table 8, we perform a similar analysis, but we consider a window of four quarters around each industry-quarter featuring horizontal acquisitions. We then regress peers' net insiders' share buys on the fraction of acquisitions of public targets and private targets in that industry-quarter (i.e., equal to zero outside of event quarters) or the associated binary variables together with firm and time (year-quarter) fixed effects. We find again that insiders' trading patterns are systematically related to the type of horizontal acquisitions in their industry. The first column reports a positive coefficient on the fraction of public targets, indicating that managers buy significantly more of their firms' shares (compared to normal) when their industry experiences more public acquisitions. As expected, the coefficient on the fraction of private targets is negative, yet insignificant. We obtain similar results in column 2 with binary variables. When we decompose insiders' trades into sales and buys, we also observe significant increases in insider sales (compared to normal) in quarters featuring a higher fraction of private acquisitions in the industry. Insiders' buys increase with both private and public acquisitions, although more around public deals.

[12] We exclude from the sample the insider trading of firms involved in the horizontal deals. Insider trades include any open market stock transaction initiated by firms' top executives.

[13] We measure insider trading contemporaneously to the fraction of private acquisitions because the premise of this test is that both variables should be correlated with insiders' perceived industrywide misvaluation. Our results suggest that this is the case. They indicate that acquirers and peers' insiders respond to the same misvaluation signal, but also that insider trades are driven by the private or public nature of acquisitions in their industry. In unreported tests, we explore in more detail the timing of insider trades vis-à-vis the type of transactions in their industry. Peers' insider trading in a given quarter is not significantly correlated with the type of transactions in the previous or next quarter, suggesting that the timing of both acquisitions and trading corresponds to that of the perceived misvaluation.

Table 8
Insider trading around private and public acquisitions
This table reports coefficient estimates from regressions of peers' quarterly insider trading activity around private and public acquisitions in their industry. The dependent variables are the peers' insiders' buys, sales, and net buys (defined as buys minus sales). In Panel A, we consider every industry-quarter featuring at least one horizontal acquisition and regress the net buys (or buys or sales) of the insiders of peers on the fraction of acquisitions of private targets in that industry-quarter, or equivalently a dummy variable for industry-quarters featuring solely acquisitions of private targets. Each specification includes year-quarter fixed effects. In Panel B, we construct a firm-quarter panel to track variation in peers' insiders' trading over time around horizontal acquisition activity in their industry. We consider a window of four quarters around each industry-quarter featuring horizontal acquisitions, and regress peers' net insiders' buys (or sales) on the fraction of acquisitions of public targets and private targets in that industry-quarter (i.e., equal to zero outside of event quarters) or the associated binary variables. Each specification includes peer and year-quarter 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.

Panel A: Cross-sectional tests

Dependent variable	Net Buys		Buys		Sales	
	(1)	(2)	(3)	(4)	(5)	(6)
% Private Targets	-0.028**		-0.014*		0.014*	
	(0.012)		(0.009)		(0.008)	
Private Targets (Only)		-0.017**		-0.003		0.014***
		(0.007)		(0.005)		(0.005)
Fixed effects	Y × Q	Y × Q	Y × Q	Y × Q	Y × Q	Y × Q
Observations	12,918	12,918	12,918	12,918	12,918	12,918
Adjusted R^2	0.01	0.01	0.01	0.01	0.01	0.01

Panel B: Panel tests

Dependent variable	Net Buys		Buys		Sales	
	(1)	(2)	(3)	(4)	(5)	(6)
% Public Targets	0.027***		0.028***		0.000	
	(0.008)		(0.004)		(0.007)	
% Private Targets	-0.003		0.010***		0.013***	
	(0.003)		(0.001)		(0.003)	
Public Targets (Only)		0.032***		0.034***		0.001
		(0.009)		(0.005)		(0.008)
Private Targets (Only)		-0.004		0.010***		0.014***
		(0.003)		(0.002)		(0.003)
Fixed effects	Y × Q and P	Y × Q and P	Y × Q and P	Y × Q and P	Y × Q and P	Y × Q and P
Observations	61,285	61,285	61,285	61,285	61,285	61,285
Adjusted R^2	0.11	0.11	0.07	0.07	0.12	0.12

4.5. The revaluation spread, sentiment, and disagreement

Under our hypothesis, peers' revaluations should be more pronounced when uncertainty about the fundamental value of assets in the industry is higher. To test this hypothesis, 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, stock prices are likely to be above their fundamental value, as they tend to be followed by low subsequent returns. In contrast, low sentiment periods are followed by high stock returns. 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 (Diether, Malloy, and Scherbina, 2002). Specifically, we define a dummy variable equal to one for all peers whose analyst forecast dispersion of earnings per share the month before the transaction is above the median of firms in the same industry (SIC4) in the same month or is missing, and zero otherwise. Investor sentiment is related to valuation uncertainty at the industry level, while analyst forecast dispersion is firm specific.

To assess the role of sentiment and analyst dispersion for peers' revaluations and the revaluation spread, we augment our baseline specification of Table 5 with both variables, as well as their interactions with the private target dummy and present the results in Table 9. [14] In the first three columns, the coefficients on sentiment are negative and significant. In high sentiment periods (in which assets' valuation is more uncertain) the announcement of horizontal deals triggers more negative peers' revaluations. Notably, the coefficients on the interaction between the private target dummy and sentiment are negative and significant (at the 10% confidence level), confirming that the peers' revaluation spread is wider at times of high investor sentiment. In columns 4 to 6, we find a positive association between peers' revaluations and the dispersion of analyst forecasts. Yet the interaction terms between dispersion and whether the deal involves a private target are negative and significant (in two of three specifications), revealing that the revaluation spread is wider for peers on which analysts disagree more. In these regressions, the coefficient

[14] Because sentiment is measured monthly, we double-cluster standard errors at the industry and year-month levels in the tests using sentiment.

Table 9
Peer's revaluation, uncertainty, and the private status of the target
This table reports coefficient estimates from regressions of peers' CARs FF (in %) on deal and peer characteristics for M&A deals announced and completed between 1990 and 2015. The dependent variable is the individual peer's CAR(-5,5), 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. Private target is an indicator variable equal to one if the target is private, and zero otherwise. Sentiment is the sentiment index of Baker and Wurgler (2006). Dispersion is a dummy variable equal to one for peers with a standard deviation of analysts' EPS forecasts at the end of the month preceding the deal above the median or missing, 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 (private acquirer dummy, logarithm of the number and value of deals last year, logarithm of the transaction value, percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave). All variables are described in Appendix B. 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 double-clustered at the four-digit SIC industry level and year-month level in columns 1 to 3, and at the deal level in columns 4 to 6. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5)					
	(1)	(2)	(3)	(4)	(5)	(6)
Private target × Sentiment	-0.339*	-0.339*	-0.356*			
	(0.183)	(0.183)	(0.196)			
Private target × Dispersion				-0.451**	-0.478**	-0.322
				(0.194)	(0.194)	(0.205)
Sentiment	-0.860***	-0.860***	0.797***			
	(0.319)	(0.319)	(0.311)			
Dispersion				0.445**	0.606***	0.573***
				(0.179)	(0.180)	(0.194)
Private target	-0.268**	-0.274**	-0.301**	-0.026	-0.012	-0.163
	(0.136)	(0.139)	(0.130)	(0.234)	(0.235)	(0.243)
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	242,693	242,173	245,806	243,422	242,897	246,549
Adjusted R^2	0.01	0.02	0.04	0.01	0.02	0.04

on the private target dummy loses its significance, suggesting that the revaluation spread is mostly materializing for peers with a high disagreement among analysts.

4.6. Peers' revaluation and future industry returns

Next, we examine whether peers' revaluations predict future industry returns. Indeed, the information about industrywide misvaluation revealed by deal announcements is likely incomplete (i.e., u_T is an imperfect proxy for u_Z) and should thus not trigger a complete price correction in the short term. Yet, if the industrywide misvaluation is gradually corrected over time, the sign and magnitude of peers' revaluations should systematically predict the direction and magnitude of future industry returns, as in Harford, Stanfield, and Zhang (2019).

To test this prediction, we aggregate peers' revaluations across all deals and all peers in each industry-month. This allows us to identify industry-months with positive average peers' revaluations (i.e., presumably undervalued industry assets) and negative average revaluations (i.e., presumably overvalued assets). Next, we regress future industry (equal-weighted) returns computed over various horizons (one month, three months, six months, and 12 months) on the average of peers' CARs in each industry-month with non-missing information (i.e., with at least one transaction). We consider raw industry returns as well as risk-adjusted industry returns, where we adjust returns using the method in Daniel, Grinblatt, Titman, and Wermers (1997) prior to aggregation. We make this adjustment to ensure that the variation of peers' revaluations does not reflect any risk factor not captured in the CARs. We include year-month fixed effects in all specifications to capture time variations in industry returns that are common across all industries.

Table 10 presents the results. Panel A reveals a 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 (Moskowitz and Grinblatt, 1999). We continue to observe a positive predictability of peers' revaluations, indicating that these revaluations embed information not yet contained in current industry returns, and act as partial corrections of industry-level misvaluation.

5. Additional tests

The large and robust revaluation spread we have uncovered so far is largely consistent with the hypothesis that acquisition decisions by informed managers transmit incremental information about the industrywide misvaluation of assets (u_Z) to outside investors. Yet changes in the stock prices of peers around deal announcements and the differential effect of private and public deals could arguably have other origins. In particular, outside investors could

Table 10
Peers' revaluation and future industry returns
This table reports coefficient estimates from regressions of future four-digit SIC industry returns on average industry peers' CARs. The unit of observation is industry-month. The mean CAR(-5,5) is the average CAR(-5,5) 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), it is the three-month future industry return; in columns (3) and (7), it is the six-month future industry return; and in columns (4) and (8), it is the twelve-month future industry return. Panel A 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 (in %)

Dependent variable	Future industry returns							
	Raw returns				DGTW returns			
	1 month (1)	3 months (2)	6 months (3)	12 months (4)	1 month (5)	3 months (6)	6 months (7)	12 months (8)
Mean CAR(-5,5)	0.111**	0.161**	0.223**	0.434***	0.073	0.129*	0.152*	0.365***
	(0.046)	(0.066)	(0.095)	(0.116)	(0.052)	(0.068)	(0.088)	(0.104)
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 (in %) with inclusion of current industry returns as control variable

Dependent variable	Future industry returns							
	Raw returns				DGTW returns			
	1 month (1)	3 months (2)	6 months (3)	12 months (4)	1 month (5)	3 months (6)	6 months (7)	12 months (8)
Mean CAR(-5,5)	0.135**	0.127*	0.147	0.374***	0.087	0.121*	0.085	0.395***
	(0.057)	(0.068)	(0.090)	(0.127)	(0.063)	(0.073)	(0.092)	(0.116)
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

revalue peers because acquisitions of private or public targets provide signals about future acquisitions patterns in the industry, or because they generate different real implications for peers' future fundamentals (θ_Z), in addition to (or instead of) managers' private information about industrywide assets' valuation. While our main tests attempt to capture the potential impact of such fundamental changes through the inclusion of various control variables, we perform a battery of additional tests to evaluate the validity of alternative interpretations of our findings.

5.1. Acquisition timing and the anticipation effect

First, we assess whether the peers' revaluation spread could stem from the anticipation of future deal activity, such as a change in the probability that peers become targets in the near future. Song and Walkling (2000) and Servaes and Tamayo (2014) report that peers' stock prices respond positively to the announcement of acquisitions of public firms in their industry and suggest that public acquisitions signal an increased probability of observing more deals in the future. Since acquisitions are typically done at a premium relative to the market value of public targets, an increased probability of observing more acquisitions in an industry triggers a positive revaluation of all firms in that industry. Song and Walkling (2000) refer to this mechanism as the "anticipation effect". Because acquisitions tend to happen in waves (Harford, 2005), the revaluation spread we uncover across public and private targets may arise not because the ownership status of targets provides information about misvaluation of assets in the industry but because the timing of public and private acquisitions is informative about the structure of *future* acquisitions.

It is important to clarify that the anticipation effect and our hypothesis are not mutually exclusive. Indeed, because deviations of prices from fundamentals drive corporate transactions (Edmans, Goldstein, and Jiang, 2012), it is natural to expect more future transactions in periods in which outside investors learn about current industrywide misvaluation by observing an active market for real assets. Therefore, the anticipation effect identified for public deals by Song and Walkling (2000) might be partly due to the revelation of information about the value of industry assets around the announcement of public acquisitions. The finding that is more difficult to reconcile with the anticipation effect is the negative reaction of peer firms to announcements of private horizontal acquisitions, because it would require private acquisitions to systematically predict *fewer* public acquisitions in the future (and hence justify the observed downward price adjustments). This could happen, for instance, if acquisition waves within industries systematically start with public deals (i.e., when the wave is ris-

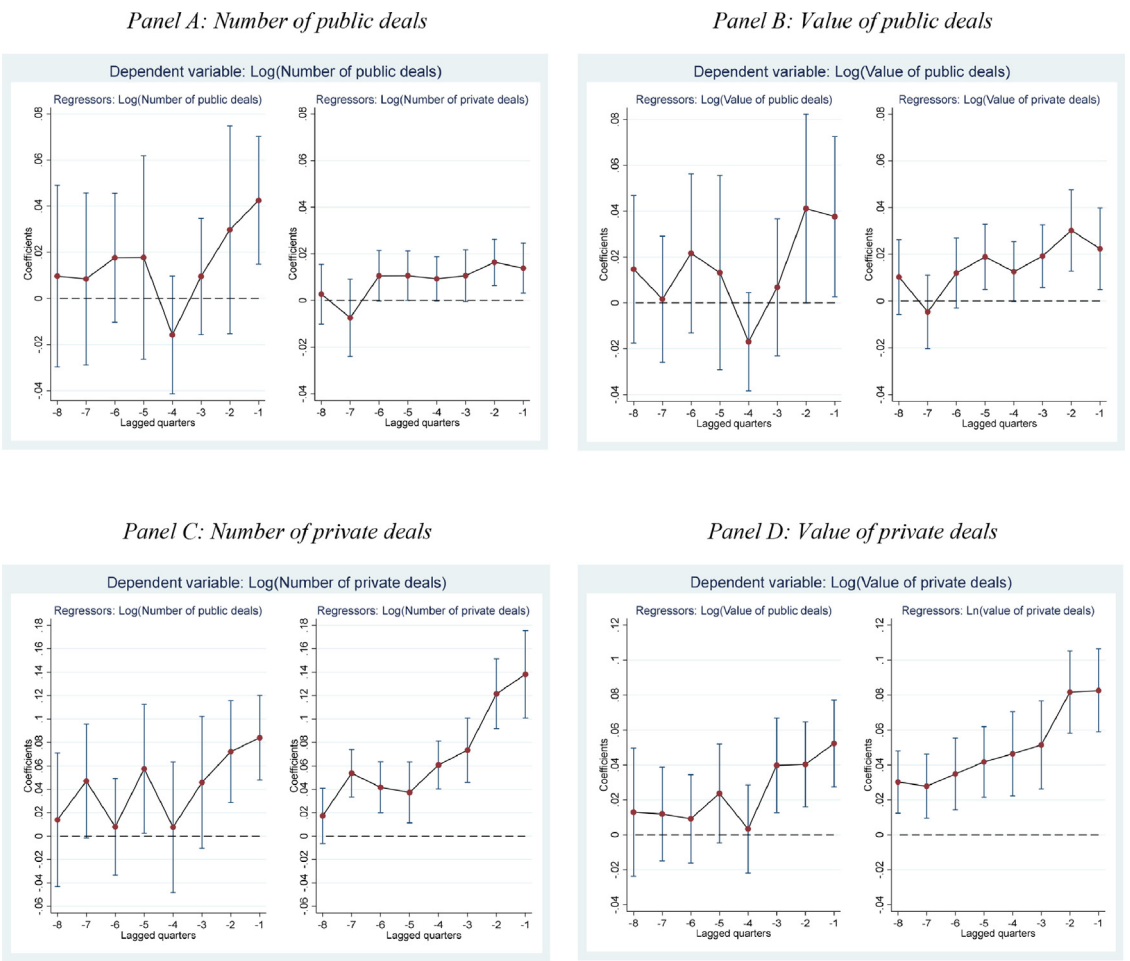

Fig. 4. Public and private merger waves
The figures report coefficient estimates from regressions of the number and value of public and private acquisitions in a given industry-quarter on lagged quarterly public and private acquisitions (in numbers and values), with lags of one to eight quarters. The dependent variable is the logarithm of the number or value of public (or private) deals. All regressions include four-digit SIC industry and year-quarter fixed effects. The coefficient estimates in each panel are from the same regression. For example, Panel A shows the coefficient estimates of regressing the logarithm of the number of public deals on eight lags of the logarithm of the number of public deals and eight lags of the logarithm of the number of private deals. Standard errors are adjusted for heteroscedasticity and clustered at the four-digit SIC industry level. The figures report the point estimates and the 95% confidence interval.

ing) and end with private deals (i.e., when the wave is fading).

To assess this possibility, we analyze the joint dynamics of horizontal public and private acquisitions by regressing the (log) number (and value) of public or private acquisitions in a given industry-quarter on their lags (up to eight quarters), together with industry and quarter fixed effects. Fig. 4 displays the estimated coefficients of these four regressions. Confirming the presence of public and private waves, we observe positive intertemporal associations between present and past public (private) acquisitions, with magnitudes declining with lags. Importantly, we do *not* find evidence supporting the claim that private acquisitions are *negatively* related with future public acquisitions. In Panels A and B of Fig. 4, the coefficients on the lagged number or value of *private* deals are positive and significant up to 2 or 3 lags. Overall, results in Fig. 4 confirm that public and private (horizontal) waves are, to a large extent, asynchronous (Maksimovic, Phillips, and Yang, 2013); thus, their timing is unlikely to explain the revaluation spread.[15]

To further evaluate whether and how much of peers' revaluation spread could be explained by the anticipation of future acquisitions, we follow Song and Walkling (2000) and directly control for the probability that peers will become takeover targets. We conjecture that if a given peer's revaluation occurs because of changes in investors' anticipation that it will be targeted in the future, its revaluation should be explained by the change of takeover probability. To test this conjecture, we consider

[15] Note that this conclusion is consistent with the results we report in Table 5, where we show that the revaluation spread remains significant in specifications that include industry×year and peer fixed effects.

Table 11
Peers' revaluation, anticipation, and the private status of the target
This table reports coefficient estimates from regressions of peers' CARs FF (in %) on deal and peer characteristics for M&A deals announced and completed between 1990 and 2015. The dependent variable is the individual peer's CAR(-5,5), 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. Private target is an indicator variable equal to one if the target is private, and zero otherwise. Ex ante target probability is the probability for the peer to become a target in the following year based on its characteristics and the characteristics of its industry at the time of the deal. Ex post target probability is a dummy equal to one if the peer is a target of a deal that takes place within one year from the current deal. 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 (private acquirer dummy, logarithm of the number and value of deals last year, logarithm of the transaction value, percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave). All variables are described in Appendix B. The four columns present regressions with different fixed effects: industry × year fixed effects (I × Y) in columns 1 and 3 and industry × year and peer fixed effects (indicated with a "P") in columns 2 and 4. Standard errors are adjusted for heteroscedasticity and clustered at the deal level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5)			
	(1)	(2)	(3)	(4)
Private target	-0.418**	-0.430**	-0.363**	-0.373**
	(0.205)	(0.206)	(0.182)	(0.183)
Ex ante target probability	-0.005	-0.012		
	(0.017)	(0.018)		
Private target × Ex ante target probability	0.010	0.011		
	(0.019)	(0.019)		
Ex post target probability			0.069	-1.114
			(0.743)	(0.765)
Private target × Ex post target probability			-0.058	0.471
			(0.796)	(0.807)
Deal controls	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Fixed effects	I × Y	I × Y and P	I × Y	I × Y and P
Observations	242,360	241,834	243,422	242,897
Adjusted R^2	0.01	0.02	0.01	0.02

two proxies for peers' takeover probability (for each peer-deal observation). First, we create a dummy variable equal to one if a peer becomes an actual ex post target in the next 12 months. Alternatively, we predict ex ante (based on OLS regressions), in a peer-year panel, whether peers will become acquisition targets in the next 12 months based on a set of predictive variables that are commonly used to explain acquisition incidence (i.e., peers' market-to-book ratio, log of total assets, cash-to-assets ratio, firm age, EBITDA-to-assets ratio, debt-to-assets ratio (following Dessaint, Olivier, Otto, and Thesmar, 2021), as well as the fraction of private horizontal acquisitions (in number and dollar value) in the previous 12 months and the merger wave flag of Harford (2005). We then use the predicted value as a proxy for their takeover probability. In Table 11, we introduce both proxies in our baseline specification (reported in Table 5) as well as their interaction with the private target dummy. Peers' revaluation around horizontal deal announcements is not significantly related to their takeover probability. Moreover, the revaluation spread does not appear to depend on peers' takeover probability, since the interaction terms are statistically insignificant with both measures. Remarkably, the coefficients on the private target dummy remain negative, large, and highly significant in all specifications, indicating that the revaluation spread is largely independent from potential takeovers' anticipation.[16]

5.2. Industry real and financial outcomes

Second, we study the dynamics of industry outcomes around horizontal acquisitions. We posit that if the differential revaluation of peers observed around acquisitions of private and public targets reflects differences in anticipated changes in peers' fundamentals, we should observe different average real outcomes following the acquisitions of private and public targets. We collect data on real and financial outcome variables for every firm in each industry from Compustat. We focus on sales growth, EBITDA margin, capex-to-assets, R&D-to-sales ratios, and market-to-book ratios. Like Servaes and Tamayo (2014), we consider averages of every variable for each industry-year observation. To measure whether the private or public status of targets is associated with different ex post outcomes, we regress each industry-level outcome variable on the interactions between event year indicators and a dummy variable that equals one when the fraction of deals with pri-

[16] We reach similar conclusions if we compute ex ante and ex post takeover probabilities over five years instead of one year.

Table 12
Real outcomes for industry peers
This table shows coefficient estimates from industry-level regressions of sales growth, EBITDA margin, capex-to-assets, R&D to sales, and the market-to-book ratio on the interactions between a dummy variable measuring a high fraction of private deals (fraction of private deals in an industry-year above 75%) and dummy variables for the years 0, +1, and +2 around the deal announcement date. The coefficient estimates are relative to year t = -1. The dependent variable in column 1 is average sales growth, in column 2 average EBITDA margin, in column 3 average capex-to-assets, in Column 4 average R&D-to-sales, and in column 5 average market-to-book ratio. All regressions include four-digit SIC industry (I), (calendar) year (Y), and event 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	Sales growth (1)	EBITDA margin (2)	Capex to assets (3)	R&D to sales (4)	Market-to-book ratio (5)
High Private fraction	0.016	0.033	-0.001	-0.027	0.055
	(0.015)	(0.044)	(0.002)	(0.020)	(0.035)
Year 0 × High Private fraction	-0.023	-0.030	0.001	0.007	-0.031
	(0.020)	(0.040)	(0.002)	(0.016)	(0.026)
Year +1 × High Private fraction	-0.016	-0.060	0.003	0.009	-0.081**
	(0.019)	(0.040)	(0.002)	(0.024)	(0.029)
Year +2 × High Private fraction	-0.029	-0.065	0.002	0.017	-0.116***
	(0.019)	(0.047)	(0.002)	(0.025)	(0.026)
Fixed effects	Event year Y and I	Event year Y and I	Event year Y and I	Event year Y and I	Event year Y and I
Observations	7,294	7,298	7,306	7,294	7,308
Adjusted R^2	0.18	0.63	0.66	0.74	0.60

vate targets in a given industry-year is 75% or higher. We also include (calendar) year, event year, and industry fixed effects in all specifications, and express all coefficients relative to time t = -1.

We present the results in Table 12. The first four columns reveal that none of the interaction variables is statistically significant when we focus on real industry outcomes. Thus, the dynamics of industry real outcomes appear largely unrelated to the prevalence of public or private acquisitions. These results are inconsistent with the view that private and public transactions trigger different fundamental implications for non-targeted industry peers. However, the last column of Table 12 indicates that the dynamics of industry market-to-book ratios are significantly related to the intensity of private acquisitions. The coefficients of the interaction terms between the prevalence of private deals and the event-time dummies are negative and statistically significant for years 1 and 2 and insignificant for the year preceding the deals. That is, we only start observing significant decreases in industrywide valuation in the years after the deal announcement when the fraction of deals with private targets is high. This finding is consistent with our revaluation hypothesis and mirrors the results on industry stock returns in Table 10.

5.3. Peers' revaluations and competitive structures

Third, we investigate whether peers' revaluations around horizontal acquisitions vary with different variables measuring the competitive structure of their industry. The logic of these tests is to assess whether the revaluation of industry peers reflects anticipations of (fundamental) competitive effects. Indeed, previous research (Eckbo, 1983; Eckbo, 1985; Fee and Thomas, 2004; Shahur, 2005; Bernile and Lyandres, 2019) suggests that horizontal acquisitions could create strong rivals and lower the future prospects of non-targeted peers (i.e., trigger negative revaluations) or, alternatively, strengthen existing oligopolies and facilitate collusion (i.e., trigger positive revaluations). The revaluation spread observed across acquisitions of private and public targets may thus arise if outside investors have different expectations about the implications of private or public acquisitions for the future competitive position of peers of acquisition targets.

We posit that if this is the case, peers' revaluations should vary systematically with measures of product market structures. Although our main results are robust to the inclusion of industry × year fixed effects, we directly assess whether the revaluation spread is related to industry structures by controlling for different (time-varying) product market measures in our main specifications and including their interactions with the private target dummy. First, we use the sales-based Herfindahl index for each four-digit SIC industry. Second, we rely on the industry-level EBIT margin, a measure of industry-level profitability (Nickel, 1996). Finally, we use product market fluidity from Hoberg, Phillips, and Prabhala (2014)), which measures the evolution of the product space occupied by firms based on their product descriptions. Table 13 reveals that the coefficients on the proxies for market structures and their interactions with the private target dummy are not statistically significant. Notably, the coefficients of the private target dummy remain negative, statistically significant, and of similar economic magnitude as in Table 5.

5.4. Peers' revaluations and announcement returns of acquirers

Last, we analyze the correlation between the revaluations of peers and those of the acquirers that are involved

Table 13
Peers' revaluation and industry characteristics
This table reports coefficient estimates from regressions of peers' CARs (in %) on deal, peer, and industry characteristics for M&A deals announced and completed between 1990 and 2015. The dependent variable is the individual peer's CAR(-5,5), 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. Private target is an indicator variable equal to one if the target is private, 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 (private acquirer dummy, logarithm of the number and value of deals last year, logarithm of the transaction value, percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave). All variables are described in Appendix B. All columns include year (Y) fixed effects. Standard errors are adjusted for heteroscedasticity and clustered at the deal level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5)		
	(1)	(2)	(3)
Private target	-0.479*	-0.413**	-0.517**
	(0.259)	(0.185)	(0.263)
SIC4 HHI	-0.130		
	(1.515)		
Private target × SIC4 HHI	0.822		
	(1.601)		
SIC4 EBIT margin		-0.201	
		(0.690)	
Private target × SIC4 EBIT margin		0.125	
		(0.770)	
Product market fluidity			-0.021
			(0.029)
Private target × Product market fluidity			0.014
			(0.031)
Deal controls	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes
Fixed effects	Y	Y	Y
Observations	240,483	243,327	239,601
Adjusted R^2	0.0	0.0	0.0

in transactions. Arguably, if the purchase of private or public targets has different competitive implications for peers (e.g., the creation of stronger competitors versus increased collusion), the revaluations of acquirers should correlate in opposite ways with peers' revaluation across both types of deals. We find, however, that this is not the case. To capture such correlations, we compute the revaluation of public acquirers the same way we compute the revaluations of industry peers: we use a 10-day window around the announcement date (-5 days/+5 days) and adjust returns using a four-factor model.

The first two columns of Table 14 report separately the (partial) correlations between peers and acquirers' revaluations for private and public acquisitions, obtained by including acquirers' revaluation in our baseline specification (excluding the private target dummy). We observe that the correlations between acquirers' and peers' revaluations are positive (and significant) for both private and public deals, with similar magnitudes (i.e., coefficients of 0.051 and 0.059, respectively). Outside investors revalue peers and acquirers in the same direction, consistent with our hypothesis predicting the revaluation of industrywide misvaluation through acquisition announcements.[17] In the third column, we estimate our baseline specification and include the revaluation of acquirers as an additional control variable and its interaction with the private target dummy. Notably, we continue to observe a negative and significant coefficient on the private target dummy, and the interaction term is statistically insignificant. The revaluation spread thus remains negative after controlling for acquirers' revaluation, which further indicates that the differential revaluation of peers across private and public acquisitions is not systematically related to investors' expected acquirers' gains.

6. Conclusions

In this paper, we show that peers' revaluations around horizontal acquisitions' announcements significantly depend on the ownership status of the target firm. For deals

[17] In an unreported test, we also document a positive correlation between peers' revaluations and targets' revaluations for the small sample of acquisitions of public targets.

Table 14
Peers' revaluations and announcement returns of acquirers
This table reports coefficient estimates from regressions of peers' CARs (in %) on deal and peer characteristics, and on the CARs of acquirers for M&A deals announced and completed between 1990 and 2015. The dependent variable is the individual peer's CAR(-5,5). Peer and acquirer 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. Private target is an indicator variable equal to one if the target is private, and zero otherwise. All regressions control for 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, logarithm of the transaction value, percentage of stock payment, percentage of the number and value of private deals over the last 12 months, and a dummy variable indicating whether the deal occurred during an industry merger wave). All variables are described in Appendix B. Column 1 includes all deals where the acquirer is public, and the target is private. Column 2 includes all deals where both the acquirer and the target are public. Column 3 includes all deals where the acquirer is public. All columns include industry × year fixed effects (I × Y). Standard errors are adjusted for heteroscedasticity and clustered at the deal level. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	CAR(-5,5)		
Deal type:	Private Targets	Public Targets	Private and public targets
	(1)	(2)	(3)
Acquirer CARs(-5,5)	0.051***	0.059***	0.055***
	(0.008)	(0.020)	(0.018)
Private target			-0.820***
			(0.209)
Private target × *Acquirer CARs(-5,5)*			-0.004
			(0.019)
Deal controls	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes
Fixed effects	I × Y	I × Y	I × Y
Observations	121,966	25,320	147,287
Adjusted R^2	0.02	0.02	0.01

involving publicly listed targets, peers' revaluations are positive; revaluations are negative when targets are privately owned. We interpret this revaluation spread to be consistent with a framework in which corporate insiders have superior information about the fundamental value of assets in their industry (compared to outside investors) and choose the type of targets (i.e., private or public) based on the deviation of stock prices from these fundamentals. As managers exploit their informational advantage by trading real assets, acquisitions of public firms signal to outsiders that public firms are likely undervalued, while acquisitions of private targets signal the opposite. The observed revaluations of peers thus reflect the incorporation of insiders' private information that is revealed through acquisitions. Several tests confirm this interpretation.

Taken together, our findings indicate that the average horizontal transaction reveals useful information to market participants about the valuation of stand-alone assets within industries. Therefore, our results suggest that a well-functioning and active acquisition market allows informed managers to take advantage of temporary misvaluation by trading real assets, which in turn allows market participants to learn about the fundamental value of assets in the industry. Through this revaluation mechanism, trading in real assets can improve the informational efficiency of secondary financial markets.

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Appendix A. Sample selection

This table presents the sample selection procedure. 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 peers	30,665	360.72
Excluding deals without transaction value or a transaction value below USD 10m	7,994	515.74

Appendix B. Definition of variables

Variable	Definition	Data source
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) 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
Percent stock payment	Percentage of the transaction financed with stock	SDC
Frac. private deals (numbers)	Fraction of horizontal acquisitions (in numbers) with a private target over the last 12 months	SDC
Frac. private deals (value)	Fraction of horizontal acquisitions (in value) with a private target over the last 12 months	SDC
Merger wave	A dummy variable equal to one when an industry experiences a merger wave, and zero otherwise, following Harford (2005)	SDC
Private acquirer	A dummy variable equal to one if the acquirer is not in CRSP during the acquisition year	CRSP
Private target	A dummy variable equal to one if the target is not 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
V/EBITDA	(Market capitalization measured 20 days prior to the transaction announcement plus total debt) / EBITDA	CRSP and Compustat
V/Sales	(Market capitalization measured 20 days prior to the transaction announcement plus total debt) / sales	CRSP and Compustat
V/Assets	(Market capitalization measured 20 days prior to the transaction announcement plus total debt) / total assets	CRSP and Compustat
Insiders' buys	Shares purchased by insiders / stock turnover	Thomson Insider Data
Insiders' sales	Shares sold by insiders / stock turnover	Thomson Insider Data
Net buys	Insiders' shares purchased minus shares sold / stock turnover	Thomson Insider Data
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 12 months ahead	CRSP
Mean CAR(-5,5)	Average CAR(-5,5) across all deals in the month of the deal announcement of the current deal across all peers of the target	CRSP
Ex ante target probability	The predicted probability that a peer becomes a target of a deal within one year	SDC, Compustat
Ex post target probability	A dummy equal to one if the peer is a target of a deal that takes place within one year, and zero otherwise	SDC
High public target	Dummy variable equal to one if the fraction of deals with public targets in a four-digit SIC industry-year is 50% or higher, and zero otherwise	SDC
Dispersion	A dummy equal to one for all peers whose analyst forecast dispersion of earnings per share the month before the transaction is above the median or is missing for a given deal, and zero otherwise.	IBES
Sentiment	Sentiment index from Baker and Wurgler (2006)	Wurgler's website
SIC4 HHI	Sales-based four-digit SIC industry Herfindahl-Hirschmann index	Compustat CRSP
SIC4 EBIT margin	Four-digit SIC industry average of operating income / sales	Compustat
Product market fluidity	Product market fluidity measure of Hoberg, Phillips, and Prabhala (2014)	http://hobergphillips.usc.edu/

Appendix C. Robustness to alternative clustering of standard errors

This table reports coefficient estimates from regressions of deal and individual peers' CARs (in %) on peers, deals, and acquirers characteristics for M&A deals announced and completed between 1990 and 2015. In Panel A, the dependent variable is the equal-weighted CAR(-5,5) at the deal level, 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. Private target is an indicator variable equal to one if the target is private, and zero otherwise. The specifications include the same deal and acquirer controls and the same fixed effects as in Table 3. Standard errors are adjusted for heteroscedasticity and double-clustered by four-digit SIC industry and announcement year. In Panel B, the dependent variable is the individual peer's CAR(-5,5), calculated over the period announcement date –5 days / +5 days. The specifications include the same peer, deal, and acquirer controls and the same fixed effects as in Panel A of Table 5. In Panel B, standard errors are adjusted for heteroscedasticity and double-clustered at the four-digit SIC industry and announcement year. All variables are described in Appendix B. ***, **, and * designate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Deal-level tests (like in Table 3) with standard errors double-clustered at both the four-digit SIC level and announcement year level

Dependent variable	CAR(-5,5)					
	(1)	(2)	(3)	(4)	(5)	(6)
Private target	-0.507***	-0.616***	-0.770***	-0.400**	-0.342*	-0.759***
	(0.168)	(0.170)	(0.225)	(0.161)	(0.184)	(0.273)
Deal controls	No	Yes	Yes	No	Yes	Yes
Acquirer controls	No	No	Yes	No	No	Yes
Fixed effects	Y	Y	Y	I × Y	I × Y	I × Y
Observations	7,994	7,994	4,292	7,154	7,154	3,570
Adjusted R^2	0.01	0.02	0.02	0.10	0.10	0.09

Panel B: Peer-level tests (like in Table 5) with standard errors double-clustered at both the four-digit SIC level and announcement year

Dependent variable	CAR(-5,5)					
	(1)	(2)	(3)	(4)	(5)	(6)
Private target	-0.364**	-0.370**	-0.404**	-0.699***	-0.701***	-0.710***
	(0.152)	(0.144)	(0.147)	(0.263)	(0.267)	(0.257)
Deal controls	Yes	Yes	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	No	Yes	Yes	No
Acquirer controls	No	No	No	Yes	Yes	Yes
Fixed effects	I × Y	I × Y and P	Y × P	I × Y	I × Y and P	Y × P
Observations	243,422	242,897	246,549	138,464	137,874	135,262
Adjusted R^2	0.01	0.02	0.04	0.01	0.02	0.04

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