Are Private Targets Better Buys?

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Abstract

Acquirers, on average, earn higher announcement-period returns when their targets are privately held than when their targets are publicly traded. We show that private targets have significantly more intangible assets than do public targets. We then develop a valuation model that is based on the fair values of the targets' tangible and intangible assets and demonstrate that relative to public targets, private targets, while commanding higher premiums over their stand-alone values, also generate higher synergies in the acquisitions. However, the higher synergies in private target acquisitions are not the result of the target status but are driven by the larger amount of intangible assets acquired in those deals. We also find that the variance of synergies in private targets is much larger than that in acquisitions of public targets. Finally, our results are robust for known effects such as mode of payment and expected growth.

JEL Classification: G14, G34, M41.

1. Introduction

Are private targets better buys than public targets? Research shows that on average acquirers earn higher announcement-period returns when the target is privately held than when it is publicly traded.[1] These results suggest that privately held (henceforth "private") targets are acquired more cheaply (relative to their unobservable stand-alone values) than publicly traded (henceforth "public") firms and/or acquisitions of private targets generate higher synergies than do the acquisitions of public targets. While prior literature provides some evidence suggesting that private targets are cheaper, it is silent on the reason why but assumes that this is due to diversification and liquidity discounts. In contrast, we focus on the synergies generated by the change in control.

Our re-examination is facilitated by SFAS 141 (and 141R) which require the recognition of the fair value of target-specific identifiable intangible assets, formerly included as part of goodwill. Intangible assets play a pivotal role in merger and acquisition transactions. In many cases, the acquisition of the target is carried out solely for the purpose of obtaining these intangibles (proprietary know-how, patents, brand-names etc.). Intangible assets allow the firms to generate future abnormal profits in the long-run due to the creation of effective barriers to entry. Because assessing whether private targets are better deals critically depends on estimating an unbiased stand-alone value of the target firms, incorporating the value of intangible into these values is important in order to attain such an unbiased estimate.

Our results can be summarized as follows: First, private targets have significantly more intangible assets than do public targets. Second, acquisitions of intangible assets create more synergies than acquisitions of tangible assets. Third, private targets are not cheaper than public targets. Fourth,

[1] Jensen and Ruback (1983); Jarrell, Brickley, and Netter (1988); Loughran and Vijh (1997); Andrade, Mitchell, and Stafford (2001); Moeller, Schlingemann, and Stulz (2005); Fuller, Netter, and Stegemoller (2002); Moeller, Schlingemann, and Stulz (2004); Faccio, McConnell, and Stolin (2006); Chang (1998); Poulsen and Stegemoller (2008).

private target are better buys because these additional synergies they generate more than offset their higher acquisition price. Finally, while private targets generate higher synergies than do acquisitions of public targets, these synergies are not the result of the target status but are the result of the larger intangible assets acquired in private transactions.

We estimate private target synergies as the sum of the acquiring firm wealth effect and the premium paid for the target. In order to estimate the premium paid for the target firm, we develop a valuation model to estimate its stand-alone value. Our model relies on appraised asset values,[2] allowing tangible and intangible assets to have different valuation multiples. This is an important innovation because we show that, even after controlling for industry and size, private targets have significantly more intangible assets than public targets and intangible assets have significantly larger valuation multiples than tangible assets.[3,4]

Using our synergies estimate we find that public-private acquisitions result in higher synergies than public-public acquisitions. Thus, while acquirers pay more for private targets, the synergies are sufficiently large to allow them to earn a higher return when compared with the relatively cheaper public targets. Simply put, when acquiring private targets, acquirers pay more but they also get more. However, we demonstrate that once we control for the larger amount of intangible assets acquired, the synergies generated in the acquisition are not correlated with the private versus public status of the target. In addition, that the variance of the distribution of the total synergies in public-private

[2] The purchase-price allocation required in SFAS 141 (and 141R) mandates that the acquirers obtain fair value estimates for the acquired assets. The fair value of tangible assets is estimated as either the replacement costs or the price at which they can be sold. Identifiable intangible assets are typically valued using a discounted cash flow approach.

[3] See "Valuing intangible assets" by Reilly (1999) and "Fair value measurements: practical guidance and implementation" by Zyla (2010).

[4] In addition, because we do not rely on matching, we can use a significantly larger sample of private targets and our approach is not sensitive to the choice of comparable firms, which can substantially affect the results (Kaplan and Ruback, 1995; Kim and Ritter, 1999), nor is it sensitive to outliers or the specific multiple used.

acquisitions is higher than the variance of the total synergies in public-public acquisitions, possibly as a result of higher information asymmetries.

We validate our ex-ante estimates of synergies with the (ex-post) operating performance of the combined firm. Our results indicate that the performance of the combined firm in the five years following the acquisition is higher when the target is private, consistent with our result that the synergies in public-private acquisitions are higher than in public-public acquisitions. Finally, our results are robust with respect to several effects observed in the literature, such as size (see Moeller, Schlingemann, and Stulz, 2004) and mode of payments.[5]

We make several contributions to the literature. First, to the best of our knowledge, we are the first to compute synergies created in deals involving private targets. Prior literature has focused exclusively on public targets (Bradley, Desai, and Kim, 1988; Kaplan, 2006; Bruner, 2004).

Second, we establish a more reliable metric to compare private and public deals. Our procedure differs from the traditional method of comparables —comparing accounting-based acquisition multiples for unlisted targets to average multiples for all comparable public firms with similar transaction size and industry (e.g., Koeplin, Sarin, and Shapiro, 2000; Kooli, Kortas, and L'Her, 2003; Officer, 2007; Officer, 2007; Gilson, Hotchkiss, and Ruback, 2000).

Finally, we offer a more nuanced explanation for the higher abnormal returns earned in private acquisitions: compared to public targets, private targets generate higher synergies that more than offset their higher premia relative to their stand-alone values.

There are several caveats to our research. First, we assume that the valuation multiples of the appraised values of tangible and intangible assets do not differ between public and private firms. While

[5] Prior research finds that acquirer returns in the announcement period and up to five years after closing are higher for cash deals than for stock acquisitions (e.g., Fuller et al., 2002; Shleifer and Vishny, 2003; Jensen 2005; Moeller et al., 2005; Lehn and Zhao, 2006).

this assumption is necessary, we do not believe that it biases our results for the following two reasons: (a) we control for industry and size (the traditional controls for growth); (b) our intangible asset valuation estimates capture the growth embedded in them. Second, our use of market returns during the acquisition period to estimate the synergies for the acquiring firms is based on market-efficiency assumption. Third, the fair market value of the target's identifiable tangible and intangible assets could be potentially biased because their values are estimated after the deal closed, once the consideration paid and the acquirer market reaction are observable. However, we do not have any reason to believe that even if such bias were to exist, it would systematically differ across acquirers of public and private targets. Finally, while we document a higher level of intangible assets in private targets, we do not provide an explanation as of why this is the case. Moreover, because our sample contains only private targets that were acquired, our result that private targets are better buys cannot be generalized to private companies at large.

The remainder of the paper is organized as follows: the next section of the paper provides background information on SFAS 141 and places this work in the context of prior research. Section 3 describes the data and section 4 provides our methodology for estimating the stand-alone value of private targets. Section 5 compares the acquisition premium across public and private targets, while section 6 contrasts the estimated synergies. Section 7 evaluates the operating performance of the combined firm, section 8 studies the relation between total transaction synergies and intangible assets acquired, and section 9 summarizes our findings and draws conclusions.

2. Background and Prior Research

2.1 The Recognition of Intangible Assets in M&A Deals

SFAS 141 has fundamentally changed the accounting for purchase price allocation with regard to intangible assets. Intangible assets purchased as part of an acquisition are now required to be

recognized separately from goodwill. Specifically, SFAS 141 and SFAS 141R require separate recognition for intangibles that fall into one of the following two categories:

(a) Contractual-legal criterion – the asset arises from contractual or other legal rights (even if the asset itself is not transferable or separable from the acquired entity or from other rights and obligations). Assets recognized under this category include lease rights (even though not transferable) or technology patent rights.

(b) Separability criterion - If an intangible asset does not arise from contractual or other legal rights, it is recognized as an asset apart from goodwill only if it is separable, that is, it is capable of being separated or divided from the acquired entity and sold, transferred, licensed, rented, or exchanged (regardless of whether there is an intent to do so).

SFAS 141 and SFAS 141R explain the main difference between goodwill and other intangible assets. While goodwill is combination-dependent, intangible assets stem from the stand-alone value of the target firm. Specifically, the values of many intangible assets arise from rights conveyed legally by contract, statute, or similar means. For example, trademarks and service marks may be registered with the government. Contracts are often negotiated with customers or suppliers. Technological innovations are often protected by patents. In contrast, the value of goodwill arises from the collection of assembled assets that make up an acquired entity or the value created by assembling a collection of assets through a business combination, such as the synergies that are expected to result from combining one or more businesses. In other words, unlike the intangible assets recognized, goodwill is likely to vary across bidders for the same target.

2.2 Prior research

Our research builds on four streams of research. The first examines acquirers' announcement-period returns for acquisitions of private targets (Chang, 1998; Fuller, Netter, and Stegemoller, 2002;

Moeller, Schlingemann, and Stulz, 2004; Faccio, McConnell, and Stolin, 2006; Cooney, Moeller, and Stegemoller, 2009). This research documents positive abnormal returns to acquirers of private targets. These returns contrast the generally zero-to-negative returns earned by acquirers of public targets (see Andrade, Mitchell, and Stafford, 2001 for a review). However, there is little understanding of why takeovers of private targets result in positive returns for acquirers while acquisitions of public targets do not.

The second stream of literature studies the recognition of intangible assets. One perspective taken by researchers is that intangible assets recognition, particularly the capitalization and amortization of R&D, improves the association of market value with book value and earnings and provides useful information to investors (e.g., Amir and Lev, 1996; Lev and Sougiannis , 1996; Barth and Clinch, 1998; Lev, 2001; Kallapur and Kwan, 2004)[6]. The alternative view is offered by the conservatism literature (e.g., Watts, 2003a, 2003b; Roychowdhury and Watts, 2007). Under this view, the value of these intangibles cannot be verified. This is because the future economic benefits generated by the costs of developing these assets are jointly created with other firm expenditures. As a result, any allocation of joint benefits or firm value to individual expenditures (i.e., intangible assets recognition) is arbitrary in nature. Under this view, only intangibles that can be sold separately from the firm should be recognized as assets.

Consistent with the latter perspective, Ramanna (2008) studies the lobbying process surrounding the evolution of SFAS 142, which uses unverifiable fair-value estimates to account for acquired goodwill. He finds that the lobbying firms supported the fair-value-based goodwill impairment test as a means to seek greater flexibility in accounting. Lys, Vincent and Yehuda (2012) study the conditions under which the accounting-based acquisition goodwill recognized by U.S. filers appropriately represents an

[6] Kallapur and Kwan (2004) study the association between recognized brand names and firms' market values for a sample of U.K. listed firms. While they document a significant and positive association, they also find that the reliability of intangible valuation varies with contracting considerations.

economic asset to the firm. The findings show that although 48% have a negative net present value consistent with overpayment for the target, the acquirer recorded accounting goodwill. Beatty and Weber (2006) investigate firms' choice upon the adoption of SFAS 142. They find that debt contracting, bonuses, CEO turnover, and exchange listing requirements affected the decision to record goodwill impairment in the transition period of SFAS 142. Zhang and Zhang (2006) and Shalev (2007) examine the allocation of the purchase price between goodwill, other indefinite life intangibles and the rest of the assets and liabilities of the target. They show that managers tend to overallocate to goodwill and indefinite life intangibles, resulting in acquirers' earnings per share being less affected by amortization charges.

A third stream of research investigates whether acquirers buy private firms at a discount relative to public firms. This literature estimates a "private-target discount" as the percentage difference in accounting-based acquisition multiples (e.g., enterprise value-to-assets, enterprise value-to-sales, price-to-book, etc.) of private and public targets, using a matched sample approach to control for the various multiple determinants (e.g. growth). The main explanation for the discount, assumed by these papers, is the demand for liquidity on the part of target firms' shareholders. Earlier papers (e.g., Koeplin, Sarin, and Shapiro, 2000; Kooli, Kortas, and L'Her, 2003; Officer, 2007) find that acquirers receive an average discount of 15% to 30% when purchasing private firms compared with equivalent public firms. At the same time, more recent studies (e.g. Comment, 2012) suggest that these numbers are too high and the discount is not larger than 5%-6%.

The approaches used to value the private targets in the prior literature, however, have significant shortcomings. First, these studies are based on accounting-based acquisition multiples which are not available for all private firms. In addition, the information that is available is based on historical cost and may not reflect the fair value of the firm. Second, while these studies match on size and industry, they may not capture more fundamental differences between public and private firms, such as the asset

composition (tangible vs. intangible). Capron and Shen (2007) note that that size and industry affiliations are not sufficient to differentiate acquisitions of private targets from those of public targets. Third, due to lack of market data on private firms, for size, these studies match either on accounting data (e.g., sales, total assets), which do not reflect the value of the target or on the transaction value, which is the dependent variable in this analysis. Fourth, the results are sensitive to the outlier removal method employed. Specifically, the valuation discount is calculated as the percentage difference between the transaction multiples of the private target and the average transaction multiple of the comparable firms. The distribution of the percentage difference is asymmetric and has a lower bound at -1, because a transaction multiple cannot be negative, but there is no upper bound. To overcome the asymmetry, these studies cap the right tail at 1. However, there is no theory that supports such a truncation. Because the truncation is one-sided, it substantially affects the results (we find this in untabulated tests). Fifth, the results are sensitive to the specific valuation multiple tested. Using price-to-book results in a private-firm premium, while using price-to-sales or earnings-to-price, result in a private-firm discount.

The fourth stream of research investigates the creation of synergies and their split among the merging firms. Two main methods are used to estimate the synergies created. The first relies on ex-ante stock returns, while the second uses ex-post operating performance. (See for Devos, Kadapakkam, and Krishnamurthy, 2007, for a review). Using the first method, Bradley, Desai, and Kim (1988) show that completed tender offers increase the combined value of the target and acquiring firms by an average of 7.4%. Berkovitch and Narayanan (1993) document a positive correlation between target gains and total gains in tender offers, consistent with the existence of synergies. Devos, Kadapakkam, and Krishnamurthy (2007) estimate the average merger synergies to range between 7.6% and 14.3% of the combined firms' pre-merger equity value.

Using the second method, several studies use future operating performance to infer synergies. Healy, Palepu, and Ruback (1992) and Heron and Lie (2002) rely on ex-post accounting performance and find that operating performance improves after a merger. Louis (2011) shows that, based on an analysis of acquirers' long-term stock performance, stock-for-stock acquirers of private targets tend to be even more overvalued than stock-for-stock acquirers of public targets. However, we are unaware of any study that compares the synergies created in public and private deals.

As for the division of synergies between the target and the acquiring firms, theoretical research suggests the acquisition method (i.e., negotiation vs. auctions) affects the division of the surplus between the target and the acquirer (e.g., Hirshleifer and Png, 1989; Bulow and Klemperer, 1996), with the target firm receiving a larger share in an auction because of the increased competition among bidders. Empirically, Bradley, Desai, and Kim (1988) and Cain, Macias, and Sanchez (2009) show that bidding wars increase the returns to targets and decrease the returns to acquirers.

3. Sample and Summary Statistics

3.1 Sample

To be included in our sample an acquisition must meet the following three criteria:

a) The ownership percentage sought in the deal is 100%;[7]
b) The acquiring firm must disclose enough information regarding its acquisition so that the total purchase price can be calculated. As a result, there is a presumption that the acquirer considered the acquisition material;[8]
c) The target must not be a subsidiary or a division.

We collected information about the target assets from public disclosures (10-Ks, merger fillings, etc.) made by the (public) acquirers.[9] We collected additional information about the target firm (i.e., total

[7] While we only include deals where the acquirers sought ownership of 100% equity of the target, the actual percentage acquired is often less than the percentage sought, as in cases of tender offers.
[8] For this reason, we did not impose a relative size requirement on the target despite our concern about the impact of relatively small acquisitions on our empirical results.

assets, book value, sales etc.) from Mergerstat. This information is available for all the public targets but for only some private ones.

Our overall sample consists of 1,481 acquisitions in the period 2002-2006, which were made by 1,004 unique public acquirers.[10] Of 1,481 acquisitions, 1,063 were acquisitions of private targets, and 418 were acquisitions of public targets—thus the acquisition of private targets is approximately 2.5 times more frequent than is the acquisition of public targets.

We focus on the value of the firm (i.e., the value of equity plus liabilities) and total purchase price paid (cash and securities received by target shareholders plus target total liabilities assumed by the acquirers), because we observe large cross-sectional variation in debt and equity in the capital structure of acquirers, targets, and consideration paid.

For acquirers and public targets, we compute pre-acquisition stand-alone value as the market value of equity 30 days before the first public announcement of the acquisition plus book value of total liabilities. For private targets, we estimate the stand-alone value using a procedure described in Section 4.1. Finally, because the characteristics of both acquirers and targets are highly skewed, we discuss both the means and the medians (and also report the 10^{th} and 90^{th} percentiles in the tables).

Table 1 provides summary information about the transaction values, size of acquirers, and targets. The mean (median) stand-alone value of the acquirers is $7,318.1 million ($655 million), and the total purchase price paid (cash and securities issued to target shareholders plus assumed liabilities) has a mean (median) value of $1,244.7 million ($66 million). The mean (median) ratio of the stand-alone value of the target to the pre-acquisition stand-alone value of the acquirer is 0.25 (0.07), indicating that acquirers are approximately four to 14 times larger than the targets they acquire. Finally, the total

[9] We thank Houlihan Lokey for providing us with this information. The original data set comprises 2,708 transactions identified from Mergerstat. We merge the sample with CRSP and COMPUSTAT based on the acquirer's CUSIP and name, resulting in a sample of 2,123 observations. We finally excluded targets that were subsidiaries and deals with ownership sought of less than 100%, resulting in 1,481 deals.

[10] Our estimation of stand-alone values relies on purchase-price allocation data that only became available in 2002 and later years.

purchase price paid to the acquirer stand-alone value is 0.37 (0.10), indicating that acquirers invest between 10% and about one-third of their stand-alone value in targets.

We report summary statistics for the 418 public-target acquisitions and 1,063 private-target acquisitions in Panel B of Table 1. (Unless otherwise noted, all reported differences between public and private targets are statistically significant at conventional levels.) Public targets have a mean (median) stand-alone value of $5,036.4 million ($491.2 million). In contrast, private targets have a mean (median) stand-alone value of $73.7 million ($21.1 million) and are between 23 and 68 times smaller than public targets. We find similar differences in the total purchase price paid, with a mean (median) of $4,133.6 million ($392.8 million) for the public targets and of $108.7 million ($39.5 million) for private targets.

A comparison of the stand-alone values of targets and their acquirers shows a mean (median) ratio of 0.51 (0.26) for public targets (i.e., acquirers are approximately two to four times larger) and a ratio of 0.14 (0.04) for private targets (i.e., acquirers are between 7 and 25 times larger).

Finally, as we report in the last row of Panel B, the mean (median) time from the announcement day to closing is 92.1 (81) days for public targets and 28.6 (13) days for private ones. Thus, public targets take approximately three to five times longer from announcement to closing than private targets.

In Panel C we report the composition of the consideration received by shareholders of public and private targets. We observe no statistically significant difference in the frequency of all-cash considerations received by public and private firm shareholders (35% versus 37%, respectively). In contrast, shareholders of public targets are 3.75 times more likely to receive an all-stock consideration than are shareholders of private targets (29% versus 8%, significant at conventional levels). The frequency of mixed consideration, at 32% versus 35%, is very similar across public and private firms. Finally, the composition of the consideration is undisclosed in 4% of the public target acquisitions and in 20% private target acquisitions.

3.2 Acquirer Announcement Returns by Target Status

In Panel A of Table 2, we report acquirer cumulative abnormal returns (CAR) and cumulative raw returns (CRR) from five days before the first public announcement (-5A) through: (a) one day after the first announcement (+1A) and (b) through one day after the closing (+1C). We also report the cumulative raw returns for the same event periods because they form the basis of our computation of synergies.

Consistent with Chang (1998), we observe a significantly higher acquirer CAR and CRR for deals involving private targets in the announcement-period event windows (-5A to +1A). For the longer event window (-5A to +1C) the median acquirer CAR is significantly larger for private acquisition. We find no significant differences for the CRR between public and private target acquisitions.[11]

In Panel B of Table 2, we split the sample based on the sign of the CRR in the announcement period (-5A to +1C); that is, whether investors' assessment is that the acquisition is value enhancing (i.e., investors believed that the acquirer underpaid) or value destroying (i.e., investors believed that the acquirer overpaid). Consistent with the results reported in Panel A of Table 2, we find a significantly higher frequency of underpayment in private (60%) than in public (57%) deals (at conventional levels). Moreover, we find that relative to the acquisitions of public targets, the acquisitions of private targets result in higher returns for underpayments and less negative for overpayments. Note that on average the size of deals involving private targets is considerably smaller than deals involving public targets, the difference in returns is even higher on a per dollar of total purchase price paid (that is, on a return-on-investment basis). In the next section, we present the empirical approach to estimate the stand-alone value of private and public targets.

[11] However, recall from Panel B of Table 1 that the window from announcement to closing is much longer for public targets, and the mean (median) return per day for public targets is 0.0004 (0.0002), which is significantly lower than the 0.0020 (0.0010) return per day of private targets.

4. The Stand-Alone Value of Private and Public Targets

We compute the acquisition premium by dividing the total purchase price by the stand-alone value. While the stand-alone value for public targets is readily available from market (equity) and book (total liabilities) data, we must estimate it for private targets.

Our approach relies on the appraised fair values of identifiable tangible and intangible assets at the merger date that we collect from the acquirers' purchase-price allocation. As discussed earlier, SFAS 141 requires acquirers to disclose the fair market values of a target's tangible and identifiable intangible (i.e., patents, copyrights, brand names, etc.) at the acquisition date. The valuations are performed by the acquiring firms, disclosed in the acquirers' 10K fillings, and are audited by the companies' independent auditors.

Under GAAP, the fair value of tangible assets is generally estimated using their replacement cost, while the fair value of intangibles is estimated using discounted future cash flows based on the future incremental income that these intangible assets are expected to generate. Hence, the valuation of intangible assets incorporates the valuation of growth opportunities embedded in them.[12] The valuations of the acquired tangible and intangible assets are performed post-merger when both the purchase consideration and the announcement returns are publicly available, and therefore may be biased. However, we see no reason why such a bias, if any, should differ between public and private targets. Therefore, we are unaware of any reason why estimation errors in the valuations of the tangible and the intangible assets would bias our results.

We model the target stand-alone value by first regressing the stand-alone value of public targets on the fair value of their respective tangible and intangible assets, controlling for industry:

[12] For public targets, we regress the fair value of intangible assets deflated by the book value of total assets on growth indicators of the firm (market-to-book, price-to-earnings) and find positive and significant coefficients in this regression, indicating that growth opportunities are captured by the intangible assets.

$$\frac{TSAV_j}{BVA_j} = \beta_{IND_j} + \beta_{TAN}\frac{TAN_j}{BVA_j} + \beta_{INTAN}\frac{INTAN_j}{BVA_j} + \varepsilon_j \quad (1)$$

Where for target *j*

TSAV	=	Target stand-alone value calculated as the sum of the market value of a the equity 30 days before the first acquisition announcement plus the book value of total liabilities
BVA	=	Book value of the assets acquired
TAN	=	The fair value of tangible assets acquired measured as of the date of the business combination
INTAN	=	The fair value of intangible assets acquired measured as of the date of the business combination
β_{IND}	=	Industry fixed effects

The two slope estimates β_{TAN} and β_{INTAN} provide us the mapping tangible and intangible fair values into market values (by industry). However, for approximately two-thirds of the private targets, the book value of assets (*BVA*) before the acquisition is unavailable. In those cases, we estimate the book value of total assets based on industry and the ratio of the book value and fair value of tangible assets of the private targets with available data. Specifically, for the 323 private targets with available total asset, we estimate:

$$\frac{TAN_j}{BVA_j} = \beta_{IND_j} + \varepsilon_j \quad (2)$$

We use the sum of the fair value of tangible assets (and omit the fair value of intangible assets acquired) to estimate the book value of the assets because GAAP does not allow the recognition of self-generated intangibles, and they are not included in the balance sheet. We estimate equation (2) for the sample of private firms only, for which the book value of the assets is available. Excluding public targets allows the sample to be more homogeneous. In addition, because private firms are less likely to acquire intangible assets, they better fit our estimation assumptions.[13] We then use the estimated industry coefficient to calculate the book value of total asset for the remaining private targets. (However, all our

[13] Acquired intangibles are recognized at fair value on the acquirer's balance sheet.

main conclusions remain unchanged when we delete the 740 private targets that did not report the pre-acquisition book value of total assets.)

In the third and final step, we apply the estimated parameters (β_{IND}, β_{TAN} and β_{INTAN}) from Equation (1) to estimate the stand-alone value of the private targets:

$$\frac{TSAV_j}{BVA_j} = \hat{\beta}_{IND_j} + \hat{\beta}_{TAN}\frac{TAN_j}{BVA_j} + \hat{\beta}_{INTAN}\frac{INTAN_j}{BVA_j} \quad (3)$$

Thus, while similar to the multiples approach used by Officer (2007), the two most important differences are: (a) we rely on estimates of the fair (as opposed to book) values of the assets and, more importantly, (b) we allow the proportion of tangible and intangible assets to vary by firm. This latter difference is important because, as we will discuss, private targets have approximately two times more intangible assets (relative to the appraised value of the tangible and intangible assets acquired) than public targets.[14]

5. The Acquisition Premium

Using the stand-alone enterprise value, we compute the acquisition premium as:

$$AP_j = \frac{TPP_j - TSAV_j}{TSAV_j} \quad (4)$$

where *AP* is the acquisition premium, *TPP* is the total purchase consideration and *TSAV* is the target stand-alone value. AP allows us to compare the premia across targets with different capital structures and does not depend of the amount of liabilities assumed in the acquisition.

[14] Graebner and Eisenhardt (2004) and Shen and Reuer (2005) show that membership might not be sufficient to establish comparability and therefore might not fully control for growth opportunities.

In Panel A of Table 3, we report the allocation of the *TPP* to the fair value of tangible (*TAN*) and intangible assets (*INTAN*) and to the goodwill (the excess of *TPP* over the previous two components).[15] We find a clear difference between public and private targets: for public targets, 50.3 cents (median = 43.7 cents) of each acquisition dollar are spent on tangible assets, 16.4 (median 10.2) cents are spent on intangible assets, and 33.3 (median 27.9) cents are spent on goodwill. In contrast, for private targets, only 33.7 (median 24.0) cents are spent on tangible assets, 23.9 (median = 19.6) cents on intangibles, and 42.4 (median = 45.9) cents on goodwill. Thus, relative to the purchase price, acquisitions of private targets result in significantly more intangible assets and goodwill and significantly fewer tangible assets.

In Panel B, we investigate whether the differences in asset composition between public and private targets are due to differences in the industry composition or target size. We regress the ratio of appraised value of intangible assets to the sum of the appraised value of the tangible and intangible assets on the target status, size and industry, that is:

$$\frac{INTAN_j}{TAN_j + INTAN_j} = \beta_{IND_j} + \beta_1 P_{Dummy_j} + \beta_2 TSAV_j + \beta_3 P_{Dummy_j} \times TSAV_j + \varepsilon_j \quad (5A)$$

$$\frac{INTAN_j}{TAN_j + INTAN_j} = \beta_{IND_j} + \beta_1 P_{Dummy_j} + \beta_2 (TAN_j + INTAN_j) + \beta_3 P_{Dummy_j} \times (TAN_j + INTAN_j) + \varepsilon_j \quad (5B)$$

where P_{Dummy_j} is a dummy variable equal to 1 if the target is private and zero otherwise, $TSAV_j$ is the target stand-alone value, and β_{IND_j} are industry fixed effects.

The results indicate that the coefficient on the dummy variable is positive and significant, suggesting private targets do have higher intangible asset proportion. In addition, the coefficient on the interaction between the target stand-alone value and the dummy variable is negative and significant, indicating that smaller targets have higher proportions of intangible assets. We document similar results when we

[15] We add IPR&D (the amount of intangible assets that the target would have expensed under US GAAP had it not been acquired) to the value of intangible assets. Please note that our results are not affected whether we treat IPR&D as a separate item.

repeat the analysis using the value of the assets, defined as the sum of tangible and intangible assets' valuations instead of the target stand-alone value.

In panel C, we first compute the target's asset synergy, defined as the difference between a target's stand-alone value and the fair value of the tangible and intangible assets. A positive difference indicates that the target stand-alone value exceed the values of its assets while a negative difference indicates that the appraised values exceed the stand-alone value, or, the parts of the target exceed the stand-alone value of the target.

To allow cross-sectional comparisons, we deflate the asset synergy by the targets' stand-alone value. The mean (median) asset synergy of the public targets is 17.8% (median = 15.1%) of the target value, indicating that appraised value of the assets is approximately 82.2% of the public target stand-alone value. (These results do not change when we use the estimated stand-alone value as opposed to the actual stand-alone value). In contrast, the mean (median) asset synergy of the private targets is 5.5% (median = 8.56%), with the mean significantly smaller than that of the public targets at conventional levels.

Next, we compare the composition of the stand-alone value between public and private targets. As indicated before, we find that public targets have significantly more tangible and significantly less intangible assets compared with private targets. Specifically, the mean (median) ratios of the appraised value of tangible assets to target stand-alone value is 60.9% (median = 56.9%) for public targets and 48.3% (median = 43.2%) for private targets. In contrast, the ratio of appraised values of intangible assets to target stand-alone value for public targets is 21.3% (12.0%) while for private targets it is 46.2% (39.2%), respectively. Thus, relative to the stand-alone values, private targets have approximately more than twice as many intangible assets as public targets.

In the last row of Panel C, we report the mean (median) ratio of the acquisition premium. For public targets, the acquisition premium is 30.0% (22.9%), while it is 100% (65.1%) for private targets, that is

relative to their respective stand-alone values, private targets are acquired at approximately three times larger premia (significant at conventional levels) than are public targets. In turn, this result implies that private targets are not acquired at a discount. Having documented that private targets command higher premia than public targets, we next analyze the total expected merger synergies and their allocation between targets and acquirers.[16]

6. Merger Synergies

We define expected synergies as the difference between the market value of the post-merger combined firm and sum of the stand-alone values of the acquirer and the target, with positive (negative) synergies implying that the value of the combined entity is greater (smaller) than the sum of the two stand-alone companies. Following Bradley, Desai, and Kim (1988), we estimate expected synergies as the sum of the change in the wealth of the stockholders of the target and acquiring firms:

$$SYN = \Delta W_A + \Delta W_T \quad (6)$$

where ΔW_A and ΔW_T are the changes in wealth of the stockholders of the acquirer and target respectively. ΔW_T represents the portion of synergies that were captured by target shareholders, while ΔW_A reflects the portion of the synergies that were retained by the shareholders of the acquiring firm.

[16] We evaluate the extent to which the difference between our conclusions and those of Officer (2007) are due to differences in the sample period, the valuation technique, or the sample composition. To this end, we replicate the method discussed in Officer (2007) to estimate private target discount, using our sample. Specifically, we match each private target acquisition to a portfolio of acquisitions of pubic targets included in Mergerstat that meet the following criteria: (1) the acquisition has a deal value, excluding assumed liabilities, within 20% of the deal value, excluding assumed liabilities, for the unlisted target (deal value measures are from Mergerstat); (2) the acquisition is in the same two-digit SIC code as the private target; (3) the acquisition is announced within the three calendar-year window centered on the announcement of the unlisted acquisition. Acquisitions of public firms are allowed to enter multiple comparable portfolios for unlisted targets (i.e., matching with replacement of comparable public targets). We then compute the acquisition discount or premium as the percent difference between the acquisitions multiple (price to book value of equity, deal value to EBITDA, or deal value to sales) for the private target and the average corresponding multiple for the portfolio of comparable publicly listed targets. We obtain the same results as Officer (2007) when we truncate the acquisition discount estimates at one - estimates larger than one are discarded from the sample. Thus, differences in results Officer (2007) are not the consequence of sampling differences. Rather, they result from the valuation method used, based on the fair value information available in our dataset.

For private targets ΔW_T is unobservable. We therefore use the acquisition premium (AP) as a measure of the change of target shareholder wealth for both private and public targets:

$$SYN = \Delta W_A + AP \quad (7)$$

We consider two main issues in estimating of the acquirer wealth effect. The first is the length of the estimation window. One alternative is to use the change in the acquirer's market value during a short window around the earliest announcement of the acquisition, thus basing the estimate on the market's initial reaction to the news. Measuring the return over a several day (3 to 7 days) window around the announcement as either the raw return or the abnormal return generally results in comparable inferences. The cumulative raw (or abnormal) returns over the short window are then multiplied by the market value of the acquirer's equity 30 days before the announcement to avoid any contamination of the price from the leakage of information about the acquisition. An increase (decrease) in the acquirer's stock price in the event window indicates underpayment (overpayment). The main advantage of this approach is that it includes the market reaction only to acquisition-related news. The disadvantage is that it includes the probability of deal completion, which is likely to differ across our sample firms.

Prior research has shown that the abnormal returns earned by acquiring firm shareholders are larger for private target acquisitions than for public target acquisitions (Fuller et al., 2002). In addition, the short window excludes any future changes in the transaction structure or the terms of the deal (Larcker and Lys, 1987). On the other hand, to the extent that the market assigns a positive probability that the outstanding offer will be topped by a higher-valued bid, the measure will be an overestimate.

Another alternative is to compound the acquirer's stock price returns over the long window from the first announcement of the deal through completion of the acquisition and multiply this cumulative return by the pre-acquisition stock price of the acquirer. This approach incorporates changes in the deal terms and 100% probability of deal completion. However, it also introduces noise in the form of non-acquisition related news, which may affect the acquirer's stock price, and thus contaminates the

computation of the announcement return. This is especially true in the case of private targets, where the value of the acquired target is relatively small compared with the value of the acquirer. At the same time, the length of time from announcement to completion is substantially shorter for private target acquisitions, which supports the use of a longer window in this case.

The second issue is the choice of raw versus abnormal returns. The arguments for using abnormal returns (e.g., market-adjusted returns) are well known: we want to capture the returns related to the event of interest and exclude any overall market movement. On the other hand, when there is a market-wide increase in prices, this would not only affect the announcement return but also the acquisition premium, because the market-wide increase may result in a higher total consideration. Thus using abnormal returns might inflate our overall measure of synergies.[17]

After weighing the advantages and disadvantages, we have chosen to calculate the acquirer wealth effect using the long-window approach and raw returns. Thus the synergies are measured as:

$$SYN = W_{Ai} \times CRR_{Ai} + AP \quad (8)$$

Where:

W_{Ai} = Market value or the acquiring firm 30 days before the first announcement made by the acquiring firm,

CRR_{Ai} = Compounded raw return to the acquiring firm from five trading days before the announcement of the first offer made by the firm through five trading days after the completion of the business combination.

In Table 4 Panel A, we present the results of estimating synergies for public and private targets. We begin by calculating overall synergies and show that relative to the stand-alone value of the target, private targets generate approximately twice the synergies that public targets do. However, as a

[17] A third approach would be to cumulate the returns/abnormal returns over event days with significant deal-related news. (See Lys and Vincent, 1995.) However, given the extensive sample size, this approach is very difficult to implement.

percentage of the target stand-alone value, synergies are higher for private deals: 44% compared with 134%.

We then calculate the mean synergies conditional on whether the synergies are positive or negative. The average synergistic gains as a percentage of the target stand-alone value are higher for deals involving private targets than for deals involving public ones. This suggests that conditional on the deal generating positive synergies, private deals are better on average. The average synergistic losses involving private targets are more negative than those for public targets. This suggests that, conditional on the deal generating negative synergies, private deals are worse on average. Collectively, these findings show that deals involving private targets result in more volatile synergies on average.

We confirm this result in Table 4 Panel B by showing that the variance of the synergies (relative to the stand-alone value of the target) is higher for private deals than it is for public deals. Thus the higher return on investment for private target acquisitions is accompanied by a higher risk.

Finally, in Table 5, we analyze the synergies by method of payment and target status. We find that the positive synergies created in cash acquisitions are higher for private targets. For stock deals, we find higher synergistic gains and lower synergistic losses for private targets' acquisitions. For mixed deals, we find similar pattern to the stock deals. This suggests that the main differences in synergies across public and private targets are not driven by the method of payment.

We perform several robustness checks on our results by computing the acquirer's wealth effect based on short-window returns (calculated as the cumulative return to the acquirer from five days before the announcement date until one day after the announcement date multiplied by the acquirer's market value of equity 30 days before the announcement date) as well as computing both long- and

short-window returns using abnormal (defined as size-adjusted) returns. The results from these sensitivity tests (untabulated) are not qualitatively different from those reported[18].

7. Target Status and the Combined Firm Future Operating Performance

Having documented higher synergies for the deals involving private targets, we now link our results to the future operating performance. The higher synergies imply that the post-acquisition performance should be higher in private target deals than in acquisitions of public targets.

In Table 6, we present information about the pre-acquisition performance of target firms as well as post-acquisition performance of the combined firm, at one- and five-years following the acquisition. We find that, on average, the combined firm performs better following acquisitions of private targets, even though private targets have lower pre-acquisition income (higher loss) than public targets. (Note that the pre-acquisition information about revenue and EBITDA is only available for 309 and 297 private targets, respectively.)

The difference in performance of deals involving private targets could be driven either by the acquisition (i.e., the target assets acquired and the synergies generated) or the acquirer pre-acquisition performance. In other words, because private targets are better deals, better performing acquirers might decide to acquire them. To distinguish between these two explanations, we regress the change in future performance around the acquisition year on the assets acquired in the deal as well as the change in the acquirer's pre-acquisition assets.

Specifically, we calculate the change in the operating performance as the difference between the five-year-ahead (one-year-ahead) EBITDA[19] and the EBITDA of the acquiring firm five (one) years before

[18] Note that according to table 2 the difference in CRR (-5A, +1C) between private and public target is insignificant, while the difference in other windows and in abnormal return is significant. This works against us in finding significant different in synergies, but the fact that we find such a difference suggests that this result is very robust.

[19] We use EBITDA rather than EBIT because depreciation and amortization are affected by the purchase price allocation decision.

the consummation of the business combination. We then regress the future-realized change in operating income (Δ*EBITDA*) on the fair value of the assets acquired plus the change in the assets held by the acquirer before the acquisition. For the acquired assets, we assume no opening balance; therefore, we use their value as of the acquisition date. We classify the assets acquired into tangibles (TAN), intangibles (INTAN), in process R&D (IPR&D), and accounting goodwill (GW). In process R&D are the R&D costs incurred by the target that are expensed by the acquirer.

$$\begin{aligned}\Delta OPRET_{i,t+1,5} = {} & \beta_0 + \beta_1 P + \beta_2 GW + \beta_3 SYN + \beta_4 TAN + \beta_5 INTAN + \beta_6 IPRD \\ & + \beta_7 \Delta ACQASSETS + \beta_8 P \times GW + \beta_9 P \times SYN + \beta_{10} P \times TAN \\ & + \beta_{11} P \times INTAN + \beta_{12} P \times IPRD + \beta_{13} P \times \Delta ACQASSETS + \varepsilon_{t+1,2}\end{aligned} \quad (9)$$

Where:

$\Delta OPRET_{i,t+1,5}$	=	The change in EBITDA between the first *n* fiscal years following the consummation of the business combination and the *n* years prior to the year of the business combination (*n*=1 or 5); EBITDA is earnings before interest, taxes, depreciation, and amortization
P	=	A dummy variable equal to one if the acquired target is a private firm
GW	=	Accounting goodwill recognized as part of the acquisition as of the date of the business combination
SYN	=	Total synergies created in the deal
TAN	=	The fair value of tangible assets acquired as part of the business combination as of the date of the business combination
INTAN	=	The fair value of intangible assets acquired as part of the business combination as of the date of the business combination
IPRD	=	The fair value of in-process research and development acquired as part of the business combination as of the date of the business combination
ΔACQASSETS	=	The change in total assets of the acquirer unrelated to the business combination, calculated as the acquirer's total assets as of the fiscal year-end of the year of the business combination (excluding the purchase consideration) and the total assets of the acquirer at the end of the year before the acquisition.

All variables are deflated by the acquirer's total assets at the end of the fiscal year of the acquisition. To facilitate easy interpretation of the marginal effect of the private status of the target firm on the change in future performance, all the continuous variables in equation (9) have a zero mean.

If acquisitions of private targets were better deals, we expect them to result in a higher increase in the acquirer's profitability. Because all the continuous variables have a mean zero, we would expect the indicator variable for private targets to be positive and significant. We expect the coefficient on each

asset category to be positive and significant. The accounting goodwill (*GW*) captures the synergies paid for; therefore, we expect it to be positive and significant on average. Because the accounting goodwill captures only the synergies paid for and not the total synergies, we repeat the estimation of equation (9) with total synergies (SYN) instead of the accounting goodwill.

Because we estimate equation (9) at the acquisition level, not at the firm level, and each acquirer might participate in multiple acquisitions, the residuals for acquirers of multiple targets might exhibit cross-correlation. We therefore report robust t-statistics, which are calculated using clustered standard errors by acquirer. (See Rogers, 1993; Petersen, 2009.)

We report the results of the estimation Table 7. In Panel A, we report the results for all firms, while we report the results separately for cash and stock deals in Panels B and C.

We document in Panel A, a positive and significant coefficient on the dummy for private targets in the one- and five-year window around the acquisition completion year, suggesting that the future performance of the combined firm is higher following these acquisitions. We find that the both the accounting goodwill, which captures the amount of the synergies paid for, and total synergies are positively related with future performance. However, the coefficient on total synergies in private deals is lower on average, suggesting a lower slope for these deals. The coefficient on tangible assets is also lower for acquisitions involving private targets.

For cash deals, the dummy for private status of the target is positive and significant at the 10% level, when total synergies are included in the regression. (See Panel B.) This suggests that, for cash deals, private target acquisitions are better. In addition, the coefficient on the interaction between the target status and total synergies is insignificant in the five-year-ahead regression, suggesting that there is no difference in the synergies effect on future performance between private and public deals.

In Panel C, we repeat this analysis for stock deals. We find that the dummy on acquisitions of private targets is insignificant. This implies that acquisitions of private targets paid with stock are similar, on average, to the acquisitions of public targets.[20]

8. Synergies, Future Performance and the Private/Public Status of Target Firms

Finally, we test whether the higher synergies of private target acquisitions are the result of the target status or the tangible/intangible asset mix. In Panel A of Table 8, we divide the total synergies created by the change in control into three equal sized groups. We then examine the ratio of the fair value of intangible assets to the stand alone value of the target firm. The percentage of intangible in the lower synergy group, has a mean (median) of 33.8% (19.6%), suggesting that the fair value of intangibles is roughly one-third of the value of the target. With 26.1% (15.4%), the fraction of intangible assets purchased is actually lower in middle synergy group (t-statistics of -3.54). However, with a mean (median) ratio of 52.8% (48.8%), we observe a significantly (t-statistics of 11.79) higher ratio of the intangible assets purchased in the high synergy group.

We further examine EBITDA returns in one-year and five-year following the acquisition. The mean EBITDA return in the one- and five-years following the acquisition are 7.56% (6.66%) and 46.4% (51.6%) for the low synergy group, respectively and 8.28% (8.28%) and 34.9% (50.9%) for the middle synergy group. Indeed, the EBITDA returns are not significantly different from each other in those two lower synergy groups. In contrast, we find significantly (t–statistics of 3.07 and 4.30, respectively) higher one- and five year ahead EBITDA returns in the high synergy groups. Specifically, the one- and five-year ahead EBITDA returns for the high synergy group are 13.1% (11.7%) and 70.2% (75.7%) and are approximately 50% higher than those in the lower two synergy groups. While the link between

[20] Because only 10% of the private target acquisitions are carried out in cash, we repeat the analysis with deals in which the percentage of consideration paid in stock is higher than 75% to increase the power of the test. The results are similar.

synergies and future performance has been well documented in prior research, this analysis also ties the higher value of intangibles acquired to the higher level of performance.

Having demonstrated the relation between total synergies and intangibles acquired, we further investigate it by controlling for the target status: In Panel B we report the results for the following regressions:

$$\frac{TOTAL\ SYN_j}{TSAV_j} = \beta_{IND_j} + \beta_1 P_{Dummy_j} + \beta_2 \frac{ITAN_j}{TAN_j + INTAN_j} + \varepsilon_j \quad (10A)$$

$$\frac{TOTAL\ SYN_j}{TSAV_j} = \beta_{IND_j} + \beta_1 P_{Dummy_j} + \beta_2 \frac{ITAN_j}{TSAV_j} + \varepsilon_j \quad (10B)$$

The regressions examine whether it is the public versus private status of the target or the intangibles acquired that drive the higher synergies.

The results reported in Panel B of Table 9 show that the amount of intangible assets acquired both as a percentage of the value of the assets (the sum of tangible and intangible assets) and as a percentage of the stand-alone value of the target are significantly correlated with the synergies created in the acquisition. At the same time, once we control for the proportion of intangible assets acquired, the private versus public dummy is no longer significant. Thus, these results suggest that the higher synergies generated in private target acquisitions are not the result of private targets being resource-constrained or undermanaged but are the result of the difference in the amount of intangibles acquired. Put differently, it is reasonable to expect higher value of intangible assets and higher growth embedded in the intangibles for private firms, which in turn drive the result of higher synergies for these firms.

9. Summary and Conclusions

We examine whether higher announcement returns of private target deals can be explained by the fact that they are simply "better buys." We use a novel data set, which includes individually appraised

tangible assets and identifiable intangible assets acquired, to estimate the stand-alone values of private targets.

We have four main findings. First, private targets have significantly more intangible assets than do public targets. Second, acquisitions of intangible assets create more synergies than acquisitions of tangible assets. Third, private targets are not cheaper than public targets. Fourth, private target are better buys because these additional synergies they generate more than offset their higher acquisition price. Consistent with that, we document higher post-acquisition operating performance for the business combinations involving private targets in the five years following the acquisition, compared with combination involving public ones.

Collectively, our findings show that private targets, while commanding higher premiums over their stand-alone values, generate higher synergies. Put differently, while private targets are more expensive relative to the stand-alone values, those costs are more than offset by higher synergies. Moreover, we show that the synergies that result from the acquisition are not related to the private versus public status of the targets but due to the higher amount of intangible assets that are being acquired.

TABLE 1
Sample Composition

The sample comprises 1,481 merger transactions for the period 2002–2006. All acquiring firms are public U.S. firms. To be included in the sample, the acquiring firm had to acquire 100% of a stand-alone target and to disclose the allocation of the total purchase price. Panel A presents information about the acquirer, while Panel B details information about the target by its status (i.e., public vs. private).

Panel A – Characteristics of Acquiring Firms

	10%	50%	90%	Mean
Acquirer stand-alone value ($ million)	83.4	655.0	10,469.7	7,318.1
Total purchase price ($ million)	8.5	66.0	905.4	1,244.7
Target stand-alone value/Acquirer stand-alone value	0.01	0.07	0.68	0.25
Total Purchase Price/Acquirer stand-alone value	0.01	0.10	0.78	0.37

Panel B – Characteristics of Target Firms

	Public Targets (n=418)				Private Targets (n=1,063)					
	10%	50%	90%	Mean	10%	50%	90%	Mean	t stat	Wilcoxon Z
Stand-alone value ($ million)	48.1	491.2	5,753.4	5,036.4	3.6	21.1	184.0	73.7	8.68	22.07
Total purchase price ($ million)	36.0	392.8	4,038.1	4,133.6	6.6	39.5	250.0	108.7	8.72	19.86
Target stand-alone value to acquirer stand-alone value	0.02	0.26	1.20	0.51	0.00	0.04	0.37	0.14	5.69	15.77
Days from announcement to completion	35.0	81.0	147.0	92.1	0.0	13.0	82.0	28.6	19.60	22.18

TABLE 1 (Cont.)

Panel C - Method of Payment Information

	Public Targets		Private Targets		
Method of Payment	N	%	N	%	χ^2
Pure Cash	145	35%	398	37%	0.97
Pure Stock	123	29%	80	8%	121.65
Mixed	132	32%	372	35%	0.95
Undisclosed	18	4%	213	20%	56.40
Total	418	100%	1,063	100%	

Variable Definitions:

Stand-alone value for Public firms	*Market value of the target equity 30 days before the first public announcement of the proposed transaction plus the book value of total liabilities*
Stand-alone value for private firms	*Estimated using the fair values of the acquired tangible and identifiable intangible assets; see section 4 for a description*
Total purchase price	*Cash and market value of the securities received by target shareholders plus target liabilities assumed by the acquirer*

TABLE 2
Acquirer Announcement Return by Target Status

The table contains descriptive statistics of the acquirer announcement returns. Panel A presents descriptive statistics by the target status. Panel B presents information on overpayment and underpayment in deals involving private and public targets.

Panel A – Acquirer Announcement Period Return by Target Status

	Public Targets (n=418)				*Private Targets (n=1,063)*					Wilcoxon
	10%	50%	90%	Mean	10%	50%	90%	Mean	T stat	Z stat
CAR (-5A,+1A)	-0.0979	-0.0132	0.0609	-0.0141	-0.0707	0.0083	0.1120	0.0144	-6.52	-6.62
CAR (-5A,+1C)	-0.2173	-0.0189	0.2176	-0.0067	-0.1336	0.0120	0.1658	0.0156	-6.13	-5.88
CRR (-5A,+1A)	-0.1083	-0.0079	0.0666	-0.0119	-0.0792	0.0113	0.1258	0.0173	-3.56	-3.43
CRR (-5A,+1C)	-0.1659	0.0219	0.2962	0.0412	-0.1310	0.0219	0.2080	0.0353	0.60	-0.29

Panel B – Overpayment/Underpayment by Target Firm Status

Underpayment / overpayment	Target Status	N	*Mean CAR (-5A,+1A)*	*Mean CRR (-5A,+1A)*	*Mean CAR (-5A,+1C)*	*Mean CRR (-5A,+1C)*
Underpayment	Public (57%)	238	0.0008	0.0808	0.0045	0.1605
	Private (60%)	638	0.0415	0.0831	0.0503	0.1219
Overpayment	Public (43%)	180	-0.0321	-0.1083	-0.0316	-0.0993
	Private (40%)	425	-0.0260	-0.0863	-0.0315	-0.0938

Variable Definitions:
CAR (-5A,+1A) Cumulative Abnormal Return between five days before and one day after the announcement date.
CRR (-5A,+1A) Cumulative Raw Return between five days before to one day after the announcement date.
CAR (-5A,+1C) Cumulative Abnormal Return between five days before the announcement date and one day after the closing date.
CRR (-5A,+1C) Cumulative Raw Return between five days before the announcement date and one day after the closing date.
Overpayment and underpayment are determined by the sign of the acquirer compounded return from 5 days before the deal announcement to one day after its completion.

TABLE 3
Asset Composition Break-Down by Target Status

The table presents information about the assets acquired in the deal by target status (i.e., public or private). Panel A shows the allocation of the total purchase price. Panel B shows the results of regressions of the proportion of intangible assets from the total asset value on the target status, size and industry. Panel C presents the breakdown of the target stand-alone value.

Panel A – Total Purchase Price Allocation (Percentages of Total Purchase Price)

	Public Targets				Private Targets					Wilcoxon
	10%	Median	90%	Mean	10%	Median	90%	Mean	T-Test	Z
Tangible assets (TAN)	11.7%	43.7%	89.0%	50.3%	4.70%	24.0%	88.2%	33.7%	9.64	9.57
Total intangibles (INTAN)	0.53%	10.2%	39.4%	16.4%	0.00%	19.6%	54.2%	23.9%	-6.04	-6.15
Goodwill	5.45%	27.9%	70.9%	33.3%	1.26%	45.9%	75.2%	42.4%	-6.06	-5.70

Panel B – Regression Analysis of Intangible Assets (Percentage of Total Asset Value)

	Dependent Variable = The ratio of Intangibles to total asset value	
Model	I	II
P	0.129 (7.561)	0.120 (7.021)
TSAV	0.0002 (0.518)	
Value of the assets		0.0002 (0.080)
P × TSAV	-0.0001 (-4.951)	
P × Value of the assets		-0.0001 (-3.306)
Industry Fixed Effects	Yes	Yes
R-squared	0.300	0.293

TABLE 3 (Cont.)

Panel C – Target Stand-Alone Value Break-Down (Percentages of Target Stand-Alone Value)

	Public Targets				Private Targets					Wilcoxon
	10%	Median	90%	Mean	10%	Median	90%	Mean	T-Test	Z
Asset Synergy	(21.1%)	15.1%	66.3%	17.8%	(22.0%)	8.56%	38.1%	5.5%	7.34	6.61
Tangible assets (TAN)	10.4%	56.9%	102%	60.9%	11.2%	43.2%	87.9%	48.3%	6.44	5.66
Total intangibles (INTAN)	0.54%	12.0%	51.0%	21.3%	0.00%	39.2%	98.8%	46.2%	-14.79	-10.37
Acquisition Premium (AP)	(13.9%)	22.9%	80.3%	30.0%	(7.77%)	65.1%	246%	100%	-15.15	-11.63

Variable Definitions:

TAN	*The fair value of tangible assets acquired as part of the business combinations, measured as of the date of the business combination*
INTAN	*The fair value of intangible assets acquired as part of the business combination measured as of the date of the business combination*
Goodwill	*Accounting goodwill recognized as part of the acquisition as of the date of the business combination*
Asset Synergy	*The difference between the target stand-alone value and the fair value of the tangible and intangible assets. A positive difference indicates that stand-alone value exceeds appraised value of the assets, that is, the stand-alone value of the target exceeds the sum of the parts.*
Acquisition Premium (AP)	*The difference between total purchase price and the target stand-alone value as a percentage of the target stand-alone value. Both variables are defined in Table 1.*
P	*A dummy variable equal to one if the acquired target is a private firm*
TSAV	*Target stand-alone value (See Table 1).*
Value of the Assets	*The sum of the fair value of tangible and intangible assets.*

TABLE 4
Synergies Generated in the Deal by Target Status

The table contains descriptive statistics for the overall synergies generated in the deal and the acquirer and target share of these synergies, by target status. Panel A presents estimation of overall synergies as well as positive and negative synergies by the target status (i.e., private vs. public). Panel B presents information on the synergy volatility by the target status and size.

Panel A – Mean Synergies by Target Status

All synergies

Target Status	Freq. of Positive Synergies	Total Synergies (SYN)	Target Stand-alone Value (TSAV)	Total SYN/TSAV	Acquirer SYN	Target SYN	Target SYN / Total SYN
Public	66%	264.42	963.14	0.44	53.60	210.82	0.37
Private	68%	56.44	75.50	1.34	21.44	35.00	0.26
T-stat	χ^2=0.57	3.16	8.28	-2.60	0.61	6.41	1.49

Positive Synergies

Target Status	Total Synergies (SYN)	Target Stand-alone Value (TSAV)	Total SYN/TSAV	Acquirer SYN	Target SYN	Target SYN / Total SYN
Public	669.21	1,151.98	1.75	360.85	308.36	0.63
Private	154.96	80.65	4.36	112.94	42.02	0.52
T-stat	7.13	7.08	-7.31	4.63	7.06	1.67

TABLE 4 (Cont.)

Negative Synergies

Target Status	Total Synergies (SYN)	Target Stand-alone Value (TSAV)	Total SYN/TSAV	Acquirer SYN	Target SYN	Target SYN / Total SYN
Public	-541.93	586.97	-2.19	-558.45	16.53	1.17
Private	-153.08	64.56	-5.09	-173.13	20.06	1.29
T-stat	-3.77	5.10	4.22	-3.61	-0.14	-0.93

Panel B – Synergy Volatility by Target Status

	Std of Total SYN/TSAV		
Target Status	Public	Private	*F-stat*
Std of SYN/TSAV	4.68	9.31	3.95

Target stand-alone value and Synergy Volatility by Target Status

TSAV	Public Targets Total SYN/TSAV			Private Targets Total SYN/TSAV		
Quintile	Std	Mean	N	Std	Mean	N
1 – lowest	9.62	-2.18	6	12.39	1.55	290
2	9.02	0.53	18	9.36	1.63	278
3	3.48	1.57	51	7.62	1.74	246
4	6.92	0.00	108	7.33	0.96	188
5 - highest	2.25	0.46	235	2.66	0.32	61

Variable Definitions:

Synergies (SYN) *The sum of the acquirer wealth effect and the acquisition premium.*

TABLE 5
Synergies Generated in the Deal by Method of Payment and Target Status

The table contains descriptive statistics for synergies by the method of payment and the target status. Panel A presents descriptive statistics about synergies in cash deals. Panel B shows descriptive statistics about synergies in mixed (cash and stock) deals. Panel C presents descriptive statistics about synergies in stock deals.

Panel A – Total Synergies in Cash Deals

	Total SYN/TSAV		
Target Status	Mean	Positive	Negative
Public	0.63	3.01	-3.71
Private	1.50	4.93	-6.11
T-stat	-1.16	-2.93	1.40

Panel B – Total Synergies in Mixed Deals

	Total SYN/TSAV		
Target Status	Mean	Positive	Negative
Public	0.09	0.66	-1.16
Private	1.32	3.57	-4.14
T-stat	-3.22	-7.20	3.71

Panel C – Total Synergies in Stock Deals

	Total SYN/TSAV		
Target Status	Mean	Positive	Negative
Public	0.44	1.36	-1.42
Private	-0.23	2.92	-4.63
T-stat	0.99	-2.72	3.34

Variable Definitions:
All variables are defined in Table 4

TABLE 6

Asset Premium, Target Pre-Acquisition Operating Performance, and Combined Firm Post-Acquisition Performance

The table contains information about pre-acquisition performance of the target firm as well as post-acquisition performance of the combined firm by the target status (i.e., private vs. public).

		Post-Acq. Performance of the Combined Firm		Pre-Acq Performance of the Target			
Target Status	Mean Acquisition Premium (AP)	Mean One year ahead EBITDA	Mean Five year ahead EBITDA	Mean Revenue	N	Mean EBITDA	N
Public	0.30	0.0827	0.4759	0.6946	418	-0.0169	418
Private	1.00	0.0926	0.6497	1.4348	309	-0.0626	297

Variable Definitions:

EBITDA is earnings before interest, taxes, depreciation, and amortization.

Revenue and EBITDA are deflated by total assets

TABLE 7
Future Operating Performance and Target Status

This table shows the regression results of the change in one-year- and five-year-ahead operating returns on the target status, acquired assets, total synergies, and the change in acquirer's assets before the acquisition.

$$\Delta OPRET_{i,t+1,5} = \beta_0 + \beta_1 P + \beta_2 GW + \beta_3 SYN + \beta_4 TAN + \beta_5 INTAN + \beta_6 IPRD + \beta_7 \Delta ACQASSETS + \beta_8 P \times GW + \beta_9 P \times SYN + \beta_{10} P \times TAN + \beta_{11} P \times INTAN + \beta_{12} P \times IPRD + \beta_{13} P \times \Delta ACQASSETS + \varepsilon_{t+1,2}$$

Panel A – All firms

	Dependent Variable = Change in			
Model	One-year-ahead EBITDA		Five-year-ahead EBITDA	
P	0.008	0.007	0.081	0.083
	(1.976)	(1.994)	(2.486)	(2.542)
GW	0.068		0.471	
	(2.456)		(2.148)	
SYN		0.050		0.423
		(4.033)		(3.456)
TAN	0.100	0.096	0.028	0.110
	(4.149)	(4.107)	(0.153)	(0.660)
INTAN	0.110	0.140	1.277	1.550
	(3.004)	(4.296)	(3.559)	(4.602)
IPRD	0.028	0.035	0.075	0.864
	(0.254)	(0.367)	(0.088)	(0.904)
ΔACQASSETS	0.081	0.069	0.289	0.102
	(3.722)	(3.476)	(1.732)	(0.726)
P × GW	0.051		-0.001	
	(1.157)		(-0.004)	
P × SYN		-0.037		-0.460
		(-2.371)		(-3.404)
P × TAN	-0.068	-0.063	-0.537	-0.456
	(-1.900)	(-1.777)	(-1.828)	(-1.548)
P × INTAN	-0.014	0.032	0.056	-0.022
	(-0.206)	(0.541)	(0.098)	(-0.042)
P × IPRD	0.180	0.238	0.747	-0.255
	(0.834)	(1.213)	(0.554)	(-0.172)
P × ΔACQASSETS	0.058	0.066	0.386	0.574
	(2.289)	(2.732)	(2.039)	(3.420)
Intercept	0.025	0.025	0.246	0.249
	(9.125)	(9.183)	(10.45)	(11.49)
Adjusted R^2	0.146	0.138	0.088	0.092

(Robust t-stats in parentheses clustered by acquirer.)

TABLE 7 (Cont.)

Panel B - Cash deals only

Model	Dependent Variable = Change in One-year-ahead EBITDA		Five-year-ahead EBITDA	
P	0.005	0.009	0.034	0.072
	(1.259)	(2.023)	(0.809)	(1.874)
GW	0.093		-0.047	
	(2.117)		(-0.155)	
SYN		0.034		0.015
		(4.403)		(0.108)
TAN	0.205	0.187	0.152	0.055
	(4.719)	(4.584)	(0.285)	(0.104)
INTAN	-0.048	0.068	2.880	2.508
	(-0.580)	(0.803)	(4.403)	(5.421)
IPRD	0.436	0.405	7.713	7.018
	(3.610)	(3.333)	(3.414)	(3.414)
ΔACQASSETS	0.064	0.053	0.821	0.632
	(3.279)	(2.817)	(4.120)	(3.491)
P × GW	0.047		1.539	
	(0.854)		(3.165)	
P × SYN		0.001		-0.009
		(0.049)		(-0.045)
P × TAN	-0.170	-0.135	-1.074	-0.825
	(-3.207)	(-2.800)	(-1.636)	(-1.296)
P × INTAN	0.244	0.224	-0.766	1.768
	(2.279)	(2.035)	(-0.799)	(1.811)
P × IPRD	-0.489	-0.107	-9.001	-7.847
	(-1.444)	(-0.302)	(-2.297)	(-2.400)
P × ΔACQASSETS	0.125	0.123	0.165	0.309
	(4.842)	(4.733)	(0.711)	(1.428)
Intercept	0.027	0.025	0.365	0.336
	(8.514)	(8.762)	(10.85)	(11.63)
Adjusted R^2	0.280	0.264	0.180	0.168

(Robust t-stats in parentheses clustered by acquirer.)

TABLE 7 (Cont.)

Panel C – Stock deals only

Model	Dependent Variable = Change in One-year-ahead EBITDA		Five-year-ahead EBITDA	
P	0.009	0.008	0.211	0.075
	(0.893)	(0.729)	(0.244)	(0.124)
GW	0.058		1.051	
	(1.777)		(3.345)	
SYN		0.025		0.209
		(1.284)		(1.069)
TAN	0.102	0.106	-0.033	-0.042
	(3.051)	(3.138)	(-0.223)	(-0.273)
INTAN	0.094	0.134	0.458	0.899
	(2.033)	(3.733)	(1.304)	(3.277)
IPRD	-0.067	-0.075	-0.194	-0.443
	(-2.409)	(-2.709)	(-0.446)	(-0.744)
ΔACQASSETS	0.086	0.077	0.436	0.205
	(2.985)	(2.610)	(2.482)	(1.246)
P × GW	0.074		-1.488	
	(0.768)		(-1.970)	
P × SYN		0.062		-0.668
		(1.458)		(-2.259)
P × TAN	-0.585	-0.665	-3.181	-1.772
	(-4.583)	(-4.033)	(-2.585)	(-1.343)
P × INTAN	0.049	0.394	1.283	-0.428
	(0.144)	(1.470)	(0.688)	(-0.324)
P × IPRD	-0.315	-0.372	7.373	1.778
	(-1.491)	(-2.016)	(0.331)	(0.115)
P × ΔACQASSETS	-0.174	-0.173	-0.909	-0.649
	(-4.097)	(-3.443)	(-3.439)	(-2.614)
Intercept	0.016	0.015	0.177	0.158
	(3.842)	(3.474)	(5.919)	(4.841)
Adjusted R^2	0.317	0.333	0.269	0.213

(Robust t-stats in parentheses clustered by acquirer.)

TABLE 7 (Cont.)

Variable Definitions:

$\Delta OPRET_{i,t+1,5}$	*The change in EBITDA between the first n fiscal years following the consummation of the business combination and the n years before the year of the business combination (n=1 or 5); EBITDA is earnings before interest, taxes, depreciation, and amortization*
P	*A dummy variable equal to one if the acquired target is a private firm*
GW	*Goodwill as part of the acquisition as of the date of the business combination*
SYN	*Total synergies created in the deal*
TAN	*The fair value of tangible assets acquired as part of the business combination as of the date of the business combination*
INTAN	*The fair value of intangible assets acquired as part of the business combination as of the date of the business combination*
IPRD	*The fair value of in-process research and development acquired as part of the business combination as of the date of the business combination*
ΔACQASSETS	*The change in total assets of the acquirer unrelated to the business combination, calculated as the acquirer's total assets as of the fiscal year-end of the year of the business combination (excluding the purchase consideration) and the total assets of the acquirer at the end of the year before the acquisition.*

All variables are deflated by the acquirer's total assets as of the end of the fiscal year of the acquisition.

TABLE 8
Synergies and Intangible Assets

The table presents descriptive statistics about the level of synergies and the amount of intangibles. Panel A shows information about the amount of intangibles and the future performance by the level of synergies. Panel B shows the results of regressions of total synergies on the level of intangible assets and the target status.

Panel A – Intangibles and Future Operating Performance by Synergy Level (Percentages of the Target Stand-alone Value)

Synergy Rank	Low Synergies		Medium Synergies		High Synergies	
	Mean	Median	Mean	Median	Mean	Median
Total intangibles (INTAN)	33.8%	19.6%	26.1%	15.4%	52.8%	48.8%
One year ahead ROA	6.66%	7.56%	8.28%	8.28%	11.7%	13.1%
Sum of Five year ahead ROA	51.6%	46.4%	50.9%	34.9%	75.7%	70.2%

Panel B – Regression Analysis of Total Synergies on Intangible Assets

	Dependent Variable = Total SYN/TSAV	
Model	I	II
P	1.548	1.261
	(1.139)	(0.925)
INTAN/Value of Assets	4.083	
	(2.001)	
INTAN/TSAV		4.277
		(2.235)
Industry Fixed Effects	Yes	Yes
R-squared	0.006	0.008

Variable Definitions:

All variables are defined in Table 3 and Table 6.

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