# Target Firm Size, Public/Private Status, and the Returns to Acquirers[1]

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**Abstract**

We investigate the effect of the size of the target firm and its public/private status on the announcement day returns realized by acquirer's shareholders. Clearly, there is a correlation between target size and its listing status. This means that an investigation into one variable or the other (but not both) may capture the effect of both, exaggerating the effect of the measured variable on returns. Our contribution lies in separating the effects of target size and public/private status. We find that higher returns are generated from acquisitions of small firms and private firms. We advance a number of explanations for our findings, with the conclusion that there is a lower chance of overpayment for small and private firms.

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## 1. Introduction and Motivation

The decision to acquire another business is among the most strategically important for any firm. M&A is associated with large scale reallocation of resources and, accordingly, has the power to significantly affect shareholder returns. But all too often when acquisitions are announced shareholders of the acquiring firm see the value of their shares fall. Researchers have consistently produced empirical evidence which shows that acquisitions are value destroying for shareholders of the acquiring firm and value enhancing for shareholders of the target firm (Moeller, Schlingemann & Stulz, 2004). The implication is that the benefits from synergies which exist between merging firms, often cited as the reason for acquisitions, are not shared equally.

On the face of it this doesn't seem logical. If one company is acquiring another it's not unreasonable to assume that management are doing so because they believe it to be a positive net present value (NPV) opportunity. However, evidence shows that investors disagree with this rationale, tending to sell the acquirer and buy the target when acquisitions are announced. Why this occurs has been the subject of a number of studies and various explanations for M&A value destruction have been advanced by researchers. These include: CEO's are often over confident in their ability to add value to a target company (or they are ego driven) leading to overpayment (Hambrick & Hayward, 1997); the extent of the synergy which exists between two businesses is often overestimated, leading to overpayment (Chaterjee, 1986): and firms often fail to adequately integrate post-merger, affecting their ability to capitalise on existing synergies (Gleich, Kierans & Hasselbach, 2010). These explanations for M&A value destruction tend to revolve around one common issue – overpayment by the acquirer. In this context it is logical to explore the conditions under which acquirers would be less likely to overpay.

The purpose of this study is to address two factors which we believe may be key variables in determining whether an acquisition adds value for acquirers or destroys it: the size of the target firm and whether it is public or private. Prior studies often implicitly assume that conclusions drawn from analysis of large M&A transactions also apply to transactions in which the target is a small or private company. Given the qualitative differences between small and large, as well as public and private firms, this extrapolation may be inappropriate (Shen & Reuer, 2005). With the potential shortcoming of previous research in mind, we investigate the effect of the size of the target firm and its status as either a public or private company on the announcement day return for the acquirer.

Small firms and private firms both demonstrate characteristics which make them more attractive as acquisition targets. Acquirers may be less likely to overpay for small and private firms as buyers face less competition and sellers have less liquidity. Research has tended to show – although not unanimously – that acquirers tend to pay higher multiples for larger companies. Likewise, there is, on average, less liquidity for the owners of small and private businesses, which makes them more likely to accept a lower offer when it is made. In addition, the complexities of large scale M&As often lead to 'disappearing synergies', while the benefits of smaller acquisitions are more easily estimated.

One of the complicating factors in this study is the fact that the two variables we test, firm size and public/private status, interact. This is because small firms are more likely to be private and vice versa. It is therefore possible that the effect of one may override the other. For instance, if the acquirers of private firms do generate higher announcement day returns than the acquirers of public firms, this may have an effect on the firm size variable, indicating that the acquisition of small firms has a positive relationship with announcement day returns. In fact, firm size may not have this effect; rather, the result is generated because small firms are more often private than large firms. We address this concern in two ways: we create an

interaction variable, and regress announcement day returns with the target firm size variable, for both the private and public acquisitions separately.

The fact that acquiring firm shareholders tend to generate negative returns from M&A transactions is one of the most consistent features of this field of research. Some of the prominent studies in the field are Agrawal, Jaffe, and Mandelker (1992), Moeller, Schlingemann, and Stulz (2004), Andre, Kooli, and L'Her (2004). Some of the common explanations for overpayment have been linked to CEO overconfidence, and overestimation of synergies by management and advisers (Sirower, 1997).[4]

While there is a large amount of research on why acquiring firms, on average, lose value, there is little literature on what distinguishes a successful acquisitions (from acquirer's perspective) from unsuccessful ones. Massa and Xu (2009) found that acquirers tend to pay a higher premium for liquid targets. Martin and Shalev (2009) conclude that firms which are most transparent tend to command the highest premiums and may therefore induce overpayment from acquirers. Fuller et al. (2002) found that shareholders of target firms generally benefit from M&A when the target is public. However, when the target firm is a private firm or a subsidiary, the acquiring firms' shareholders generally benefit.

If we are to accept the contention that overpayment destroys value, it makes sense to then examine the conditions under which the acquirer is less likely to overpay. The Boston Consulting Group's study examined the differences between the acquisitions of large and small targets, providing evidence that smaller acquisitions are more value enhancing for the shareholders of the acquirer. Research also suggests that acquirers are less likely to overpay for small targets as they generally have lower profiles and potential acquirer's are less likely to face significant competition (Blees et al., 2012). Bloomberg (2002) refers to winners' curse

[4] The literature on overpayment is not unanimous. Alexandridis et al. (2013) found that acquirers paid lower premiums for large firms. The explanation for this finding was that acquirers of small firms were more likely to pay a premium for the growth potential they perceived.

as one of the primary reasons for the fact that 61% of the acquisitions in their sample delivered a negative return to the shareholders of the acquirer.

Empirical evidence suggests that the shareholders of acquirers of private targets tend to receive higher returns than those of acquirers of public firms on the day the acquisition is announced. The existing evidence, though it is not unanimous, suggests that the acquisition of small firms, relative to the size of the acquirer is more value enhancing for shareholders of the acquirer than the acquisition of large firms.

Small firms are more likely to be private firms and this may affect the two conclusions immediately above. However, the existing literature does not address this issue, leaving open the question of whether small firms deliver better results to acquirer shareholders because they are small or because they are more likely to be private (and vice versa).

This leads us to the following hypotheses:

- Deal size is negatively correlated with announcement day returns of the acquiring firm;
- There is an exponential element to the effect of the Deal Size on announcement day returns. The larger the acquisition, the greater the negative effect;
- A portion of the increased returns for acquirers of small firms is explained by the fact that small firms tend to be private.

The rest of the paper is organized as follows. Section 2 presents data and methodology. Section 3 describes the results. Section 4 concludes.

## 2. Data and Methodology

We drew the sample of M&A transactions from Thomson Reuters Eikon. The sample time frame is from 01/01/2000 to 31/12/2009. The decade long timeframe reflects an entire

business cycle and therefore should have no bias effect on the results. This is an important consideration, as the business and economic cycle are often closely followed by M&A activity.

The sample consists of 1035 transactions, all of which include a constituent of the S&P 500 as the acquiring party. There are no similar criteria for the target firm, although we eliminate all transactions which are below US$ 30 M. We also eliminate transactions in which less than 100% control of the company was gained through the acquisition as well as subsidiary buy-ins.

Data relating to the factor models (Fama French and Carhart) as well as acquirer share price data was downloaded from CRSP. The data downloaded from CRSP includes the Beta of the acquirer, the appropriate risk free rate and the market return on the day of the announcement. We use data for the preceding three years before the acquisition to account for the individual acquiring firms share price sensitivity to these factors.

We test the market's reaction to acquisitions on the day they are announced. Specifically, we test how the market's reaction differs between acquisition targets of different sizes and public/private statuses. The dependent variable is therefore the daily return to shareholders of the acquiring firm on the day an acquisition is announced. In order to account for movements in the aggregate market, we use the market model. This portion of the regression, represented by ***β1 (Rm - Rf),*** ensures that the observed movements in the share price on the day of the announcement are not the result of simple movements in the market as a whole.

Having accounted for movements in the aggregate market, we then add three variables to the regression. These variables represent the size of the acquisition ***α1 (Deal Size)***, the size of the acquisition squared and the status of the target firm as either a private or public company. The Deal Size squared variable ***α2 (Deal Size^2)*** reflects whether or not

there is an exponential aspect to the relationship between the market's reaction to an acquisition (announcement day return) and the size of the acquisition**.**

The final variable in the regression is a binary variable representing whether the target being acquired is public or private. It has been established, though not unanimously, in previous research that the acquisition of private companies tends to deliver higher returns to shareholders because, it is argued, they are less liquid and higher risk. This variable is represented in the regression by ***α3 (Public/Private)*** (target is public = 1, target is public = 0). This leads to the formal regression model:

$$R = \alpha + \beta 1\,(Rm - Rf) + \alpha 1\,(Deal\ Size) + \alpha 2\,(Deal\ Size\hat{}2) + \alpha 3\,(Public/Private) + \mathcal{E} \qquad (1)$$

## 2.1 Robustness Tests

In order to account for the possibility that any results generated by the above regression relate to factors beyond those represented by the variables in the regression, we first add two commonly-used Fama-French factors (representing size and value proxies):

$$R = \alpha + \beta 1\,(Rm - Rf) + \beta 2\,(SMB) + \beta 3\,(HML) + \alpha 1\,(Deal\ Size) + \alpha 2\,(Deal\ Size\hat{}2) + \alpha 3\,(Public/Private) + \mathcal{E} \qquad (2)$$

As a further robustness test, we also introduce the Carhart momentum variable to the above regression. This accounts for the documented tendency for stock prices to continue rising when they are going up and to continue declining when they are going down. This leads to the third formal regression model:

$$R = \alpha + \beta 1\,(Rm - Rf) + \beta 2\,(SMB) + \beta 3\,(HML) + \beta 4\,(Momentum) + \alpha 1\,(Deal\ Size) + \alpha 2\,(Deal\ Size\hat{}2) + \alpha 3\,(Public/Private) + \mathcal{E} \qquad (3)$$

## 2.2 Accounting For Interaction Between Variables:

Finally, we need to account for the interaction between the two variables in the regression, Deal Size and Public/Private Status. If it is the case that the acquisition of private companies leads to higher returns, then this effect may be captured by both variables. This is because

private companies are more likely to be private and large companies are more likely to be public. In this context a negative coefficient for the Deal Size variable may reflect its listing status.

In order to assess this issue, we first establish that there is in fact an interaction between the Deal Size variable and the Public/Private variable ***α3 (Deal Size x Public/Private).*** This leads to the following regression model:

$$R = \alpha + \beta 1\,(Rm - Rf) + \alpha 1\,(\text{Deal Size}) + \alpha 2\,(\text{Public/Private}) + \alpha 3\,(\text{Deal Size x Public/Private}) + \mathcal{E} \quad \textbf{(4)}$$

We then separate the two variables. we do this by regressing the announcement day return variable against the Deal Size variable for only public companies in the sample and (separately) for only private companies.

## 3. Results

Table 1 presents the results for the baseline regression. Deal Size variable is negative and statistically significant at 1% level, which is consistent with our hypothesis. Larger target size manifests into lower acquirers' returns. Similarly negative and statistically significant coefficient is observed for the Public/Private variable, implying lower announcement-day returns for acquiring firms' shareholders. The coefficient on a squared deal size is, however, not statistically significant, thus not providing evidence of any exponential effect of a deal size on returns.

Figure 1 further analyses the effect of target firm size on the returns generated by acquirers. The graph shows that the acquisition of larger target firms is associated with lower announcement day returns. The largest quartile of acquisitions (represented by the first quartile Deal Size) demonstrates significantly negative returns. The large difference between the mean and median average in announcement day returns for the largest quartile of

acquisitions is explained by the extremely negative returns of the largest Deal Sizes in the sample. As the size of acquisitions reduces (the fourth Deal Size represents the smallest acquisitions in the sample), the average announcement day return increases to become positive.

An important aspect of Figure 1 is the change of sign from negative to positive which is demonstrated as the Deal Size reduces (by quartile). One argument which could be used to explain the fact that smaller acquisitions destroy less value than large acquisitions is that the market interprets them in the same way, but the reduced impact of the transaction on the acquiring company's balance sheet or on the pro forma income statement is reduced. Therefore the magnitude of the change in share price would be different based on the size of the target even if the market reaction were not. The fact that smaller acquisitions are shown to generate a positive announcement day return, in comparison to large acquisitions which generate a negative announcement day return, reflects the fact that there is a difference in the markets interpretation of the benefits of the transaction, not just a difference in the magnitude of the reaction.

Figure 2 reflects the announcement day return to acquirers when the acquirers of private targets and public targets are separated. The graph demonstrates that the acquirers of public targets generate strongly negative returns. The large difference between the mean and median returns once again reflects the fact that there are a number of extremely negative returns in the largest group of transactions and therefore among the group of transactions involving the acquisition of public targets. As hypothesised, acquirers of private firms generate higher returns than those of public firms.

### 3.1 Robustness Tests

The previous test establishes a statistically significant negative relationship between the size of the target of an acquisition and the return derived by the acquirer on the announcement

day. It also establishes that the acquirers of private targets generate higher announcement day returns, a finding which is once again statistically significant.

In order to check that these findings are robust and are not the result of factors not captured by the regression, we introduce the Fama-French factors. The results are presented in Table 2. The coefficients on the variables of interest are virtually unchanged in terms of magnitude and statistical significance. The same applies when we add the Carhart momentum factor (Table 3).

### 3.2 Interaction Test

The results are represented in Table 4 (interaction variable highlighted). They demonstrate that there is an interaction between the two terms and that the interaction is statistically significant. It can be interpreted that the Deal Size has a stronger negative relationship with announcement day returns to acquirers when the target is public.

This result goes some way to support a notion that a portion of the effect of Deal Size on announcement day returns to the acquirer is explained by the fact that small firms are more likely to be private and large firms are more likely to be public.

Table 5 shows the results of the regression using only public acquisition targets. The magnitude of the Deal Size coefficient has somewhat increased relative to previous regressions reflecting the fact that the negative relationship between Deal Size and announcement day returns for the acquirer is stronger when public firms are acquired. Table 6 reports the results in the sample of private firms. The magnitude of the Deal Size coefficient is somewhat lower than in main regressions.

## Conclusion

We investigate the effect of the size of an acquisition and the status of the target as a public or private company on the announcement day returns generated by acquirers. Our results indicate a negative relationship between the size of an acquisition and the return received by

acquirers on the day an acquisition is announced. This implies that the acquisition of larger firms is associated with reduced announcement day returns for acquirers. Likewise, acquisition of private firms is associated with higher announcement day returns for acquirers than the acquisition of public targets. These results are statistically significant and are supported by robustness tests.

The most plausible explanation for these findings relates primarily to the notion of overpayment. The owners of both small firms and private firms are less likely to experience liquidity events and this lack of liquidity for the seller decreases the chance that an acquirer will overpay. Similarly, the buyers of smaller firms and private firms will, on average, face less competition to acquire them, once again reducing the chance that they will overpay. The uneven division of the gains from synergy also contributes to the negative relationship between announcement day returns and the size and status of the target. Ordinarily, the gains from synergy accrue primarily to the target, however, the dynamic which dictates how synergy benefits are divided is changed by the size and status of the target. The inherent complexity of M&A transactions may also explain the negative relationship between the acquirer's announcement day returns and the size and status of the target. The complexity of M&A is often cited by institutional investors as a reason for their dislike of acquisitions and this complexity is enhanced with the size of the transaction.

Finally, we establish an interaction between the variables representing the target firm size and public/private status. This interaction comes about because of the increased likelihood that small firms are private and that large firms are public. Previous studies have indicated that the acquirers of private firms tend to generate larger announcement day returns than the acquirers of public firms. The 'Private Firms Discount', referred to by Capron and Shen (2007), may therefore account for some or all of the effect of target firm size on announcement day returns. To this end, our results reflect the fact that the negative

relationship between target firm size and announcement day returns for acquirers is partially (but not entirely) explained by the fact that small firms are more likely to be private. Once again, this result is statistically significant.

Target specific variables, in particular the size of the target firm, have been overlooked in previous research on M&A. This study reflects the short term reaction of market participants to acquisition announcements based on the size and status of the target. A longer term study of the benefits to acquiring firm shareholders based on the size and status of the target represents a potential direction for further exploration of this research area.

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**Table 1**

| Announcement Day Return | Coefficient | t - Stat | P Value | 95% Conf. Interval |
|---|---|---|---|---|
| **Market - Rf Rate** | -0.2187023 | -0.25 | 0.806 | -1.962961 |
| **Deal Size** | -0.0001121 | -6.32 | 0.000 | -0.0001470 |
| **Deal Size Sq** | -3.380E-10 | -0.94 | 0.347 | -1.040E-09 |
| **Public/Private** | -1.2860000 | -14.13 | 0.000 | -1.4647660 |
| **_cons** | -0.1040000 | -1.66 | 0.097 | -0.2272501 |
| | | | **$R^2$** | 0.0861 |
| | | | **Adjusted $R^2$** | 0.0857 |

**Notes:** Table 1 reports the results of regression (1), where R = α + β(Mrkt Ret - Rf Rate) + α1(Deal Size) + α2(Deal Size^2) + α3(Public/Private) + Ɛ. The dependent variable, Acquirer Announcement Day Return, is regressed with the market model, the Deal Size, Deal Size Squared and the Public Private binary variable (Public = 1, Private = 0).

**Table 2**

| Announcement Day Return | Coefficient | t-Stat | P Value | 95% Conf. Interval |
|---|---|---|---|---|
| **Market -Rf Rate** | 0.9928718 | 0.95 | 0.344 | -1.0631040 |
| **SMB** | 2.2278100 | 2.09 | 0.037 | 0.1368186 |
| **HML** | 3.6000549 | 2.61 | 0.009 | 0.9013247 |
| **Deal Size** | -0.0001114 | -6.26 | 0.000 | -0.0001462 |
| **Deal Size Sq** | -3.560E-10 | -0.99 | 0.322 | -1.06E-09 |
| **Public/Private** | -1.2810220 | -14.07 | 0.000 | -1.4594320 |
| **_cons** | -0.1257217 | -1.99 | 0.047 | -0.2498144 |
| | | | **$R^2$** | 0.0869 |
| | | | **Adjusted $R^2$** | 0.0863 |

**Notes**: Table 2 reports the results of regression (2), where R = α + β(Mrkt Ret - Rf Rate) + β1(SMB) + β2(HML) + α1(Deal Size) + α2(Deal Size^2) + α3(Public/Private) + Ɛ. For robustness checks the Fama French variables are included, hence; The dependent variable, Acquirer Announcement Day Return, is regressed with the market model, the small firm effect Fama French variable (presented as SMB) and the value effect Fama French variable (presented as HML). Having accounted for the Fama French Factors the Announcement Day Return is also regressed with the Deal Size (representing the equity value of the target firm based on the offer by the acquiring firm), the Deal Size Squared and the Public/Private binary variable (Public = 1, Private = 0).

**Table 3**

| Announcement Day Return | Coefficient | t-Statistic | P Value | 95% Conf. Interval |
|---|---|---|---|---|
| **Market -Rf Rate** | 0.5210541 | 0.47 | 0.638 | -1.6514920 |
| **SMB** | 2.4970020 | 2.30 | 0.022 | 0.3680461 |
| **HML** | 3.1397620 | 2.21 | 0.027 | 0.3548591 |
| **Momentum** | -1.0093770 | -1.32 | 0.188 | -2.5119000 |
| **Deal Size** | -0.0001115 | -6.27 | 0.000 | -0.0001463 |
| **Deal Size Sq** | -3.5600E-10 | -0.99 | 0.322 | -1.0600E-09 |
| **Public/Private** | -1.2782130 | -14.04 | 0.000 | -1.4566640 |
| **_cons** | -0.1145936 | -1.79 | 0.073 | -0.2397820 |
| | | | **$R^2$** | 0.0871 |
| | | | **Adjusted $R^2$** | 0.0863 |

Notes: Table 3 reports the results of regression (3), where R = α + β(Mrkt Ret - Rf Rate) + β1(SMB) + β2(HML) + β3(Momentum) + α1(Deal Size) + α2(Deal Size^2) + α3(Public/Private) +Ɛ. Acquirer Announcement Day Return is regressed with the market model, the Fama French variables (SMB and HML) and a further robustness test is included (Momentum), from the Carhart Four Factor Model. This accounts for the observed effect of momentum on stock returns. The remaining variables are Deal Size, Deal Size Squared and the Public/Private binary variable (Public = 1, Private = 0).

**Table 4**

| Announcement Day Return | Coefficient | t - Statistic | P Value | 95% Conf. Interval |
|---|---|---|---|---|
| **Market - Rf Rate** | -0.2187023 | -0.34 | 0.890 | -1.967321 |
| **Deal Size** | -0.0001223 | -6.35 | 0.000 | -0.000147 |
| **Deal Size Sq** | -3.38E-10 | -0.94 | 0.347 | -1.04E-09 |
| **Public/Private** | -1.2761200 | -13.97 | 0.000 | -1.464766 |
| **Deal Size *Public/Private** | -0.0000137 | -4.30 | 0.001 | -1.4753788 |
| **_cons** | -0.1240000 | -1.63 | 0.077 | -0.2372641 |
| | | | **$R^2$** | 0.090 |
| | | | **Adjusted $R^2$** | 0.089 |

**Notes:** Table 4 reports the results of regression (4), where R = α + β (Mrkt Ret - Rf Rate) + α1 (Deal Size) + α2 (Public/Private) + α3 (Deal Size x Public/Private) + Ɛ. Acquirer Announcement Day Return is regressed with the market model, Deal Size, the Public/Private binary variable and the additional multiplicative variable which accounts for the interaction between the two terms.

**Table 5**

| Announcement Day Return | Coefficient | t - Stat | P Value | 95% Conf. Interval |
|---|---|---|---|---|
| **Market - Rf Rate** | -0.2737016 | -0.27 | 0.871 | -1.96342100 |
| **Deal Size (Public Targets Only)** | -0.0001354 | -6.70 | 0.000 | -0.00014700 |
| **_cons** | -0.1350000 | -1.67 | 0.079 | -0.22743000 |
| | | | **$R^2$** | 0.087 |
| | | | **Adjusted $R^2$** | 0.086 |

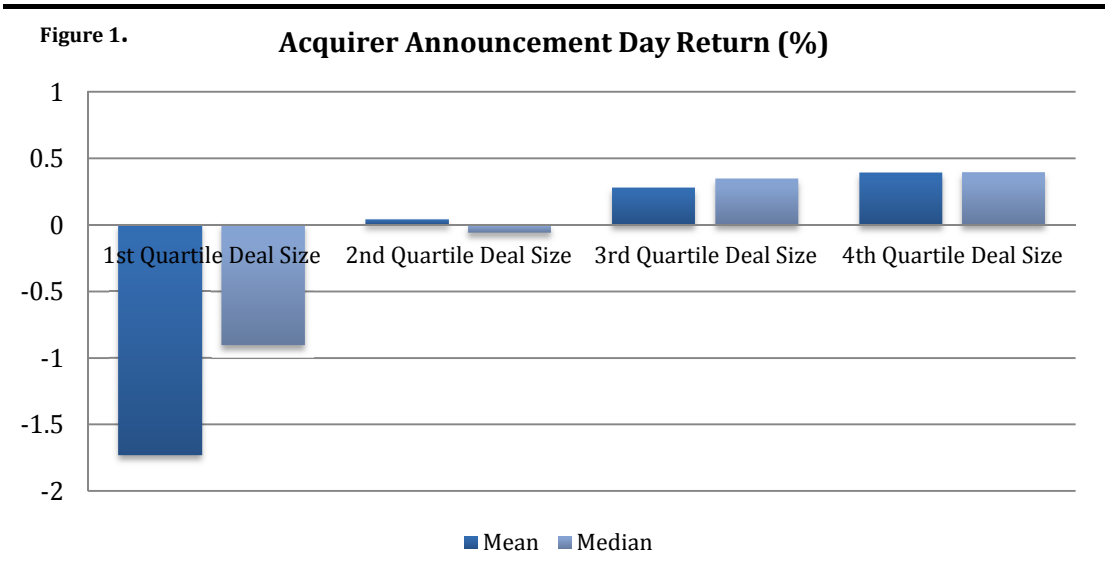
**Notes:** Table 5 reports the results of regression (5), where R = α + β(Mrkt Ret - Rf Rate) + α1(Deal Size [Public Targets Only]) + Ɛ. Acquirer Announcement Day Return is regressed with the market model and the Deal Size for only the public targets in the sample of transactions.

**Table 6**

| Announcement Day Return | Coefficient | t - Stat | P Value | 95% Conf. Interval |
|---|---|---|---|---|
| **Market - Rf Rate** | -0.21437000 | -0.25 | 0.743 | -1.9629610 |
| **Deal Size (Private Targets Only)** | -0.00011100 | -6.49 | 0.000 | -0.0001470 |
| **_cons** | -0.10400000 | -1.70 | 0.097 | -0.2285430 |
| | | | **$R^2$** | 0.088 |
| | | | **Adjusted $R^2$** | 0.087 |

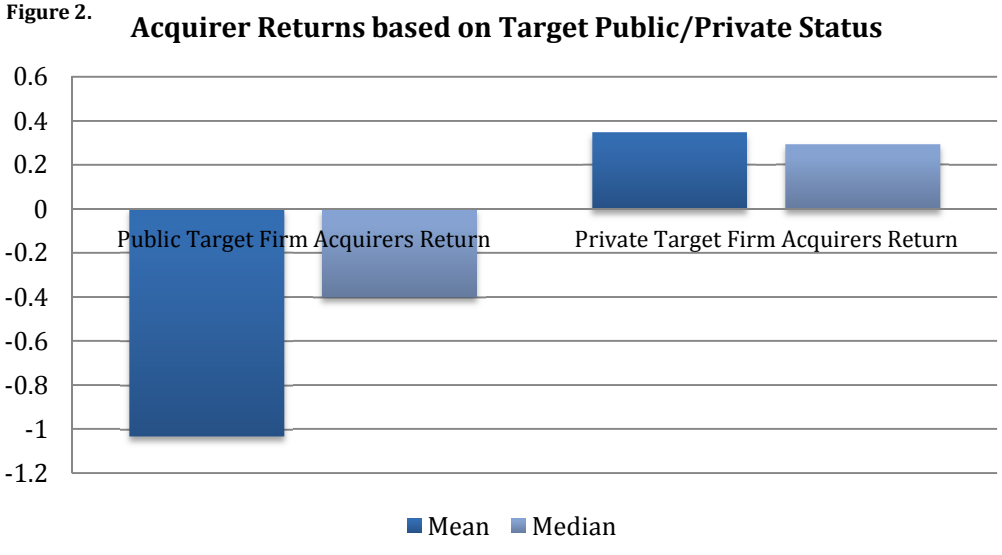
**Notes:** Table 6 reports the results of regression (6), where R = α + β(Mrkt Ret - Rf Rate) + α1(Deal Size [Public Targets Only]) + Ɛ. Acquirer Announcement Day Return is regressed with the market model and the Deal Size for only the private targets in the sample of transactions.

**Figure 1.**




Notes: Figure 1 presents the average announcement day returns to acquirers in the sample of 1,035 transactions, divided into quartiles according to the size of the acquisition target. The largest acquisitions are represented by the 1st quartile.

**Figure 2.**




Notes: Figure 2 presents the average announcement day return to acquirers in the sample of 1,035 transactions.