



## Analyst conflicts of interest in the M&A context

### Abstract:

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This paper examines the conflict of interest analysts face as a result of their affiliation with the firms they cover through mergers and acquisitions (M&A) advisory. I find that acquirer-affiliated analysts issue more positive recommendations on acquirers before the deal exchange rate is determined and more negative after the exchange rate is set. The results show that target-affiliated analysts issue more positive recommendations on targets compared to unaffiliated analysts. I find that acquirer-affiliated analysts are negatively biased in the recommendations they issue on targets before the exchange rate of the deal is set, and positively biased after the exchange rate is set. For target-affiliated analysts issuing recommendations on acquirers the findings suggest the opposite relation. The results indicate that analysts are negatively biased in the earnings forecasts they issue on the firms they are affiliated with. Lastly, I find evidence that increasing the probability of deal completion is an incentive for affiliated analyst to optimistically bias recommendations but not to pessimistically bias recommendations.

*Keywords:* Security analysts, recommendations, earnings forecasts, investment banks, mergers and acquisitions, conflict of interest, M&A compensation, M&A affiliation

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## 1. Introduction

The past two decades, the financial press and regulators have expressed concerns about the objectivity of investment analysts. They argue that analysts that work for investment banks face a conflict of interest and are biased in their recommendations and earnings forecasts. For example, analysts that are tied to a firm through equity underwriters have the incentive to issue positive reports on this firm, because the underwriters intent to follow these recommendations.

Several studies examined the investment banking activities that could drive biases of analysts. They found that analysts affiliated with equity underwriters provide more favorable recommendations than unaffiliated analysts (O'Brien et al., 2005) (Dugar & Natha, 1995) (Dechow et al., 2000) (Lin & McNichols, 1998). Michaely and Womach (1999) found that the stocks, covered by analysts that are tied through equity underwriters, perform worse than the stocks that are covered by nonaffiliated analysts (Michaely & Womack, 1999). Agrawal and Chen (2007), Dugar and Nathan (2010) and Bradshaw, Richardson and Sloan (2003) among others, find that analysts affiliated with investment banks in general are more optimistic in their recommendations compared to unaffiliated analysts. The evidence does not always point in the same direction, as others did not find any biases in the recommendations of affiliated analysts (Cowen, Groyberg, & Healy, 2006) (Jacob, Rock, & Weber, 2003).

This paper examines the conflict of interest faced by analysts in the context of mergers and acquisitions (M&A). Among other investment banking activities, investment banks advice firms in M&A deals. Conflicts of interest might arise from several investment banking activities, but those resulting from M&A advisory affiliations might be explicitly large. First of all, the largest part of the revenues for investment banks comes from M&A services. Moreover, between 1994 and 2007, M&A advisory fees increased globally from \$3 billion to \$45 billion (Becher & Jeurgens, 2009). Since analysts' compensation is largely dependent on these M&A revenues and most compensation structures for M&A advisors contain fees that are contingent upon deal completion, analysts are incentivized and able to increase the probability of deal completion by biasing their research in favor of affiliated bankers and their clients.

Kolasinski and Kothari (2008) were one of the first to study the analyst conflict of interest arising from M&A affiliation and found that analysts affiliated with acquirers tend to be more positive in their research on acquirers compared to unaffiliated analysts and also analysts affiliated with targets issue more positive recommendations on targets, after the exchange rate of the deal is determined (Kolasinski & Kothari, 2008). These findings suggest that M&A relations

significantly influence analysts' recommendations. Becher and Jeurgens (2009) and Hausholter and Lowry (2008) come to similar conclusions.

In this thesis I will provide new evidence on the analyst conflict of interest that arises from M&A advisory affiliation. The first part of this paper answers the question whether analysts affiliated with the firms they cover through M&A advisory are biased in their recommendations and earnings forecasts on these firms. The analysis is based on a dataset of U.S. mergers and acquisitions that took place between 2010 and 2014 and a dataset of analyst recommendations and short-term earnings forecasts on the firms from the M&A dataset in the same period. I choose a period starting in 2010 to eliminate most of the effects of the financial crisis of 2008. To answer the research question, I construct four hypotheses in which I make a distinction between acquirer- and target-affiliated analysts on the one hand and positive and negative biases on the other hand. Since affiliated analysts face different incentives before the exchange rate of the M&A deal is determined, compared to after this rate is set, I also make a distinction between these two periods in the hypotheses. This means that in some situations the conflict of interest is expected to result in a positive bias and in other situations the conflict of interest would cause a negative bias. All four hypotheses describe the expected effect of acquirer- or target-affiliation on analyst recommendations and earnings forecasts, before and after the exchange rate of the deal is set. I test these hypotheses by using ordinal logistic regressions and ordinary least squares regressions and add several control variables.

The results suggest that recommendations issued by acquirer-affiliated analysts on acquirers are more optimistic than those issued by unaffiliated analysts before the exchange rate of the deal is determined, and more pessimistic after this took place. This is partly consistent with the findings of Kolasinski and Kothari (2008) and Hausholter and Lowry (2008), who found that affiliated analysts issue more optimistic recommendations than unaffiliated analysts and that earnings forecasts issued by acquirer-affiliated analysts are more optimistic before the exchange rate of the deal is set and more pessimistic after the exchange rate is set, which suggests that affiliated analysts have the incentive to help increase the probability of deal completion by issuing recommendations in favor of the firms they are affiliated with.

I find that target-affiliated analysts issue more positive recommendations on target firms, which is consistent with the findings of Kolasinski and Kothari and Hausholter and Lowry (2008), who found that these analysts are positively biased.

In line with the expectations, I find that acquirer-affiliated analysts issue more negative recommendations on target firms, before the exchange rate of the deal is determined and more

positive recommendations after the exchange rate is set. I do not find a similar pattern for the research of target-affiliated analysts on acquirers.

I find that acquirer-affiliated analysts are negatively biased in the earnings forecasts they issue on acquirers and target-affiliated are negatively biased as well in the earnings forecasts they issue on target. This is not in line with the hypotheses, but it confirms the findings of Malmendier and Shantikumar (2007), who found that analysts affiliated through equity underwriting are generally negatively biased in the earnings forecasts they issue. Target-affiliated analysts that issue earnings forecasts on acquirers after the deal exchange rate is determined are positively biased in their earnings forecasts on acquirers, which is in line with hypothesis 4b. I do not find any significant relation between acquirer-affiliation and earnings forecasts on targets nor do I find any evidence for significant bias in the earnings forecasts of target-affiliated analysts on acquirers before the exchange rate of a deal is determined.

In the second part of this paper, I examine whether analysts bias their recommendations in an attempt to ensure deal completion. To this end, I test if positive recommendations of affiliated analysts result in a higher probability of deal completion compared to negative recommendations, in the situations that a positive bias would be expected and whether negative recommendations of affiliated analysts are related to a higher probability of deal completion when a negative bias is assumed.

The findings suggest that positive recommendations from target-affiliated analysts on acquirers after the exchange rate of the deal is set, are related to a higher probability of deal completion, which suggests that only the incentive to ensure deal completion plays a dominant role. The findings suggest that negative biasedness does not result in a higher probability of deal completion, which suggests that the negative biases that are observed in this paper, cannot be explained only by the incentive to ensure deal completion that affiliated analysts face.

This paper contributes to the existing literature on analyst conflicts of interest in several ways. First, it contributes to the overall discussion on the conflict of interest facing analysts who are affiliated with investment banks through all kinds of investment banking activities. This paper explores an alternative cause for the conflict of interest than equity underwriting by focusing on affiliation through M&A advisory. Therefore it provides additional evidence to the relatively small number of papers that have already explored analyst behavior around mergers and acquisitions (e.g. Kolasinski and Kothari, 2008 and Hausholter and Lowry, 2008).

Furthermore, I hypothesize that analyst incentives vary over time and therefore make a distinction between the effect of analyst affiliation before and after the exchange ratio of the deal is set. In addition to testing for a positive recommendation bias, I also examine whether there is a

negative recommendation bias. Importantly, I do not only examine whether analyst biases exist, but also whether the reason for these biases is to ensure deal completion.

The results of this paper have implications for investors and regulators. First of all, the biases that exist for affiliated analysts, seem to be the result, at least for some part, of the incentive that analysts face to increase the probability of deal completion. This incentive, but also the incentive to increase the transaction value of M&A deals, is directly related to the fee structures of analysts and M&A advisors. Mitigating these incentives would thus directly affect the incentive to bias recommendations. Therefore a solution could be to change the way analysts and/or M&A advisors are compensated, which is a task for regulators. Regulators might also advocate a split between M&A advisory activities of investment banks and research departments. Investors need to be aware of the biases that exist in the recommendations and earnings forecasts of affiliated analysts in order to evaluate research reports of analysts correctly.

The remainder of this paper is structured as follows. Section 2 describes the research context and discusses previous research on analyst conflicts of interest and the contributions of this thesis to the existing literature. Section 3 describes the expectations and the formulated hypotheses for this research. Section 4 describes how the hypotheses will be tested and section 5 then describes the data and sample selection and presents some descriptive statistics. Section 6 presents the results of the ordinal logistic regressions, ordinary least squares regressions and probit regressions. Section 7 concludes.

## **2. Research context and literature review**

This section consists of two parts: first, I describe the role of financial advisors in M&A transactions and their incentives, the incentives of affiliated analysts and the conflict of interest that arises. Secondly, I discuss the existing literature on the conflict of interest for analysts.

### **2.1 Conflict of interest**

For investment banks, compensation from M&A advisory is nearly twice as large as compensation from banking services. Moreover, between 1994 and 2007, M&A advisory fees increased globally from \$3 billion to \$45 billion (Becher & Jeurgens, 2009). M&A advisory is thus an important source of income for investment banks. A conflict of interest may arise that is related to the compensation structure of analysts.

#### ***Compensation analysts***

Analysts employed by investment banks provide stock recommendations and earnings forecasts for their clients, based on the research they do on these firms. They are compensated in the form of a share in the fees that are earned by the investment bank for its M&A advisory services, which are dependent on deal frequency or deal size, or they receive a percentage of the compensation that is earned by the bank through trading.

#### ***Compensation M&A advisors***

M&A advisors, who also work for investment banks, mostly earn a success fee in combination with a retainer if they advise on selling a firm. The way these fees are structured has a large impact on the incentives of M&A advisors and therefore also on the incentives of analysts, since the compensation of analysts depends on the investment bank's income from M&A advisory. The retainer is a fee that is earned by the M&A advisor as a compensation for the work that is done for the transaction. The amount of the retainer depends on the riskiness of the deal and is determined upfront. Target advisors earn the most from the additional success fee, which can be structured in many ways. Often the success fee is contingent upon closing the deal successfully. In this case, M&A advisors and therefore also affiliated analysts have the incentive to increase the probability of deal completion.

Another often used method is the Lehman formula. Under this method, advisors receive a decreasing percentage on every extra million of dollars that is paid for the acquisition. For



example, the advisors earn 5 percent on the first million of dollars, 4 percent on the next million of dollars and so forth. The Lehman formula is a very popular and often used compensation structure, but it does not give an incentive to the advisors to maximize the transaction value of the deal, since for every incremental increase in value, the M&A advisor receives a smaller compensation. Therefore the main incentive for M&A advisors and affiliated analysts is to ensure deal completion, which is also argued by Becher and Jeurgens (2009).

The Lehman formula and variations on it are still very popular M&A fee structures. Different structures are getting more popular as well. For example, some success fees increase as the transaction value of the deal increases. In short, most compensation structures result in incentives for target advisors to successfully close deals. Since analysts earn a share of the fees that the investment bank receives, affiliated analysts are incentivized as well to ensure deal completion.

Acquirer advisors, either earn a retainer in combination with a fixed success fee as a percentage of the transaction value, or a success fee, which is a percentage of the savings that are achieved from the offered price. Acquirer advisors are thus inclined to close deals successfully and to drive the deal towards superior terms and a good acquisition price for the acquirer.

Research has shown that there are costs and benefits for analysts related to inaccurate and accurate forecasts and recommendations respectively. Analysts that are less accurate in their forecasting compared to peers, are more likely to turn over (Mikhail, et. al, 1999). Accurate reporting analysts are more likely to experience favorable career opportunities (Hong & Kubik, 2003). However, analysts are exposed to incentives that make them willing to sacrifice their forecast accuracy. Analysts who are relatively optimistic in their reports are more likely to experience favorable job prospects (Hong & Kubik, 2003). Also, analysts are incentivized to provide optimistic forecasts to please managers of the firms they cover, in order to get access of private inside-firm information (Ke & Yu, 2006). In short, securities analysts can be seen as economic agents, which respond to incentives that are given to them through other activities that the investment bank they work for is engaged in.

## **2.2 Literature review**

Previous studies have examined the analyst conflicts that arise from the affiliation of analysts through other services of their investment banks. Some studies have focused on the underwriting activities of investment banks that cause biases in analyst recommendations, others have included

all investment banking services in their research and more recently, research has explored the analyst biases that stem from affiliation through M&A advisory.

Agrawal and Chen (2007) have studied conflicts of interest that arise from all investment banking activities that generate revenue, which include equity underwriting services, M&A advisory services, restructuring services and other corporate control advice in the period 1994-2003 (Agrawal & Chen, 2008). They find that the level of analyst recommendations is positively related to the amount of conflicts of interest they are exposed to.

Dugar and Nathan (2010) compare the recommendations and earnings forecasts of analysts from investment banks to those of noninvestment banking analysts and find that investment bank analysts are more positive in their research opinions (Dugar & Nathan, 1995).

Bradshaw, Richardson and Sloan (2003) also examine the relation between all corporate finance activities of investment banks and analyst research (Bradshaw et al., 2003). Their results provide evidence for overoptimism of recommendations and earnings forecasts of analyst that are affiliated through any kind of investment banking activities.

These studies do not make a clear distinction between the different investment banking activities and therefore fail to relate the biases to a specific form of analyst affiliation, neither do they acknowledge that analyst incentives are dependent on the timing of a recommendation.

Derrien (2006) examines whether positive recommendations of analysts for recent IPO's result in a higher probability of the analysts' investment banks to obtain mandates for future IPOs (Derrien, 2006). He finds that optimistic recommendations for recent IPOs increases the probability that the analyst's bank is selected to co-manage a future IPO, managed by the same underwriter, but only when both banks are prestigious. Positive recommendations to an analyst's own IPOs are found to increase the probability of obtaining mandates from issuers in future IPOs, but only for the least prestigious banks.

Lin and McNichols (1998) examine the conflict of interest arising from the affiliation with underwriting activities of investment banks (Lin & McNichol, 1997). They find that analysts affiliated with lead- and co-underwriters are more optimistic in their recommendations and earnings forecasts compared to unaffiliated analysts.

Michaely and Womack (1999) also look at the potential bias of analysts that are affiliated through underwriting activities of their investment banks. Their findings show significant evidence for such a bias, since the stocks that are covered by affiliated analysts perform more poorly in comparison to the stocks that are covered by unaffiliated analysts.

Malmendier and Shantikumar (2007) find that analysts affiliated through equity underwriting are more optimistic in their recommendations but more negative in their earnings forecasts compared to unaffiliated analysts (Malmendier & Shanthikuma, 2007). They explain this latter finding by stating that analysts may be negatively biased in their earnings forecast in order to let management beat the forecast. Also, affiliated analysts might be more willing to distort their recommendations than their earnings forecasts, since it is harder to objectively determine recommendations.

Some studies do not find evidence that affiliated analysts are biased in their recommendations. Cowen, Groyberg and Healy (2006) find that analysts who are affiliated through underwriting and trading activities do not issue overly optimistic recommendations and earnings forecasts compared to unaffiliated analysts, which they attribute to the risk of endangering firm reputation. Jacob, Rock and Weber (2003) find that earnings forecasts of affiliated analysts are more accurate and less optimistic than those of independent analysts.

### ***Conflict of interest arising from M&A affiliation***

There is another form of analyst-affiliation, which can cause a bias in recommendations. This paper examines the conflict of interest that may arise from the affiliation of analysts through M&A advisory. Although a substantive amount of papers have explored analyst conflicts of interest and investment banking, the literature on this form of analyst conflicts is limited.

As noted before, the conflict of interest that arises from M&A affiliation is related to the compensation structure of analysts and M&A advisors. Since analysts' compensation depends on the number of deals that is completed by their investment banks, analysts want to increase the probability that these deals are completed. Rhodes-Kropf et al. (2005) find evidence that the higher the currency of the acquisition or the lower the price that needs to be paid for the target, the more likely this deal will be completed (Rhodes-Kropf et al., 2005).

Becher and Jeurgens (2009) find that positive recommendations on the acquirer, which increase the acquisition currency and negative recommendations on the target, which decrease the price that needs to be paid for the target, are positively related to the probability of deal completion (Becher & Jeurgens, 2009).

Kolasinski and Kothari (2008) find evidence that supports this new conflict of interest of analysts (Kolasinski & Kothari, 2008). They find that analysts affiliated with acquirers through M&A advisory increase their valuation of the acquirer's stocks around M&A deals. Furthermore they find that analysts that are affiliated with targets issue more positive recommendations after

the exchange ratio of the deal is determined. Hausholter and Lowry (2008) find that affiliated analysts issue more optimistic recommendations around M&A deals compared to unaffiliated analysts (Hausholter & Lowry, 2008).

Although this paper relates to all the above-mentioned literature, it mainly builds on the papers of Kolasinski and Kothari (2008) and Hausholter and Lowry (2008), since I examine analyst objectivity in the M&A context. Consistent with Hausholter and Lowry (2008) I also examine whether the incentive to ensure deal completion causes the potential biasedness of affiliated analysts. I follow the findings of Becher and Jeurgens (2009) and Rhodes-Kropf et al. (2005) that suggest that the observed biases in recommendations result in a higher probability of deal completion.

The purpose of this paper is to examine the analyst conflict of interest in the M&A context. I follow the findings of Becher and Jeurgens (2009) which suggest that the main incentive for M&A advisors and affiliated analysts is to ensure deal completion. Since most fee structures contain a form of a compensation contingent upon deal completion or the often used Lehman formula, I assume that the fee structure for the M&A advisors in the datasets do as well and thus the main incentive for analysts is to ensure deal completion.

**Table 1: Summary of previous literature**

| <b>Author</b>                         | <b>Conflict of interest arising from</b>             | <b>Findings conflict of interest</b>   |
|---------------------------------------|--|--|
| Agrawal & Chen (2007)                 | All revenue-generating investment banking activities | Positive bias in recommendations from affiliated analysts  |
| Derrien (2006)                        | Obtaining IPO mandates                               | Positive recommendations result in an increased probability of obtaining IPO mandates  |
| Dugar and Nathan (2010)               | Investment banking activities                        | Positive bias in recommendations from investment banking analysts  |
| Lin and McNichols (1998)              | Equity underwriting activities                       | Positive bias in recommendations from affiliated analysts  |
| Michaely and Womack (1999)            | Equity underwriting activities                       | Positive bias in recommendations from affiliated analysts  |
| Becher and Jeurgens (2009)            | M&A advisory fees                                    | Positive recommendations on the acquirer and negative recommendations on the target are positively related to the probability of deal completion.  |
| Kolasinski and Kothari (2008)         | M&A affiliation                                      | Positive bias in recommendations from acquirer-affiliated analysts on the acquirer and positive bias in recommendations from target-affiliated analysts on the acquirer after the exchange ratio of the deal is set. |
| Bradshaw, Richardson and Sloan (2003) | Corporate finance activities                         | Positive bias in recommendations and earnings forecasts of affiliated analysts   |
| Malmendier and Shantikumar (2007)     | Equity underwriting activities                       | Positive bias in recommendations and negative bias in earnings forecasts of affiliated analysts  |
| Cowen, Groysberg and Healy (2006)     | Equity underwriting activities                       | No bias  |
| Hausholter and Lowry (2008)           | M&A affiliation                                      | Positive bias in recommendations of affiliated analysts around M&A deals   |
| Jacob, Rock and Weber (2003)          | Corporate finance activities                         | No bias and more accurate recommendations of affiliated analysts   |

### 3. Hypotheses

Analyst incentives to issue either optimistically or pessimistically bias research reports, depend on which advisor – target or acquirer – the analyst is working for and on the timing of the report – before or after the exchange ratio of the deal is set. In this context, I constructed four hypotheses that describe the expectations of the relation between M&A advisory affiliation and analyst recommendations and earnings forecasts.

#### 3.1 The effect of acquirer-affiliation on acquirer recommendations and earnings forecasts

In transactions where the acquirer pays for the stock of the target with stock, the stock prices of the acquirer and the target determine the exchange rate of the transaction. Positive recommendations and forecasts for the acquiring firm are likely to increase the firm's stock price, and therefore reduce the amount of stock that needs to be paid by the acquirer for the transaction if the recommendation is done before the exchange ratio is set. Shareholders of the acquirer are more likely to approve the deal, since less shares need to be paid for the target. Shareholder approval increases the chances of success of the deal and is therefore beneficial for the acquirer advisors and the analysts who both benefit from the fixed fee that is contingent upon deal completion.

One could argue that, after the exchange ratio is set, acquirer-affiliated analysts have an incentive to issue negative recommendations, because this would lead to a decrease in the acquirer's stock price, which implies that a lower price is paid for the target. This would only be an artificial price decrease, but it is possible that analysts consider this as an incentive to issue negative recommendations. Kolasinski and Kothari (2008) mention this effect as well, but do not examine it in their paper, since they assume this happens with limited frequency. I choose to take into account this possibility in my analysis. To test the aforementioned expectations, I constructed hypothesis 1a and 1b:

*H1a: Analysts that are affiliated through M&A advisory with acquirers, issue more optimistic recommendations and earnings forecasts for acquirers, before the exchange ratio of the deal is determined.*

*H1b: Analysts that are affiliated through M&A advisory with acquirers, issue more pessimistic recommendations and earnings forecasts for acquirers, after the exchange ratio of the deal is determined.*

Analysts are likely to perceive less incentives if they are affiliated through M&A transactions that are paid only in cash, since the effect of recommendations on the stock price does no longer influence the exchange rate for the M&A deal. However, optimistic recommendations still increase shareholder approval and manager compensation. Therefore incentives to bias analyst recommendations also exist in all-cash deals.

### **3.2 The effect of target-affiliation on target recommendations and earnings forecasts**

Analysts that are affiliated with target firms have an incentive to issue positive recommendations on these firms, since this will increase the target's stock price and result in a better exchange rate for the target. Optimistic recommendations also increase the probability of shareholder approval and higher manager compensation, which are other incentives for target-affiliated analysts that could cause them to bias their recommendations optimistically. Therefore, target-affiliated analysts are still incentivized to issue positive recommendations on the target after the exchange ratio of the deal is set. Hypothesis 2 formulates the above:

*H2: Analysts that are affiliated through M&A advisory with targets, issue more optimistic recommendations and earnings forecasts for targets, at any time.*

### **3.3 The effect of acquirer-affiliation on target recommendations and earnings forecasts**

Analysts are likely to issue pessimistically biased reports for target firms, if they are affiliated with the acquiring firm, since this would decrease the stock price of the target and reduce the amount of stock that the acquirer needs to pay for the acquisition. This reasoning only holds for recommendations that are done before the exchange ratio of the deal is determined. Pessimistic target recommendations decrease the probability of shareholder approval, since a stock price decrease of the target firm is usually related to a less favorable deal. Therefore, analysts have an incentive to issue positive recommendations after the exchange ratio of the deal is set. This will increase the probability of deal completion. Hypothesis 3a and 3b express these expectations:

*H3a: Analysts that are affiliated through M&A advisory with acquirers, issue more pessimistic recommendations and earnings forecasts for targets, before the exchange ratio of the deal is determined.*

*H3b: Analysts that are affiliated through M&A advisory with acquirers, issue more optimistic recommendations and earnings forecasts for targets, after the exchange ratio of the deal is determined.*

### **3.4 The effect of target-affiliation on acquirer recommendations and earnings forecasts**

Analysts that are affiliated with the target, have the incentive to issue negative recommendations on the acquirer. This will lead to a decrease in the acquirer’s stock price and result in a more favorable exchange ratio for the acquirer. After the exchange rate of the deal is set, analysts are incentivized to issue positive recommendations on the acquirer, since this will increase the acquirer’s shareholders’ approval and the probability of deal completion. Hypothesis 4a and 4b represent these expectations:

*H4a: Analysts that are affiliated through M&A advisory with targets, issue more pessimistic recommendations and earnings forecasts for acquirers, before the exchange ratio of the deal is determined.*

*H4b: Analysts that are affiliated through M&A advisory with targets, issue more optimistic recommendations and earnings forecasts for acquirers, after the exchange ratio of the deal is determined.*

**Table 2: Expected biases under conflict of interest hypothesis**

“Expected bias” refers to the bias in the recommendations and earnings forecasts of affiliated analysts.

| <b>Analyst affiliation</b> | <b>Report on</b> | <b>Before/After deal announcement</b> | <b>Expected bias</b> |
|----------------------------|------------------|---------------------------------------|----------------------|
| Acquirer                   | Acquirer         | Before                                | Positive             |
| Acquirer                   | Acquirer         | After                                 | Negative             |
| Target                     | Target           | Any time                              | Positive             |
| Acquirer                   | Target           | Before                                | Negative             |
| Acquirer                   | Target           | After                                 | Positive             |
| Target                     | Acquirer         | Before                                | Negative             |
| Target                     | Acquirer         | After                                 | Positive             |

### **3.5 The effect of analyst affiliation on deal completion**

As noted before, one of the incentives that analysts face as a result of the compensation structures for M&A advisors and analysts themselves, is to increase the probability of deal completion. To test whether this incentive is in fact the reason for analysts to issue biased recommendations and earnings forecasts, I will examine whether biased recommendations of affiliated analysts result in a



higher probability of deal completion, compared to recommendations of unaffiliated analysts. I will test the following hypothesis:

*H5: Biased recommendations of affiliated analysts result in a higher probability of completion of M&A deals, compared to recommendations of unaffiliated analysts.*

## 4. Methodology

Based on several datasets of U.S. M&A deals and analyst recommendations and earnings forecasts between 2010 and 2014, I use ordinary least squares (OLS) and ordinal logistic regressions to test the hypotheses formulated in the previous chapter. In this section I will describe the regressions I employed.

### 4.1 Analyst bias

In order to examine whether biases exist in the recommendations and earnings forecasts of affiliated analysts, I run several regressions. To examine the relation between analyst-affiliation and recommendations, I run ordinal logistic regressions and ordinary least squares regressions, in which I use a categorical variable and a binary variable respectively for analyst recommendations as dependent variable. I use a variable that is equal to 1 for a ‘strong buy’ recommendation, equal to 2 for a ‘buy’ recommendation, equal to 3 for a ‘hold’ recommendation, equal to 4 for a ‘sell’ recommendation and equal to 5 for a ‘strong sell’ recommendation and I use a binary variable that is equal to 1 for ‘sell’ and ‘strong sell’ recommendations and equal to 0 for ‘strong buy’, ‘buy’ and ‘hold’. I make a distinction between recommendations that are issued on acquirers and those that are issued on targets. I construct dummy variables for acquirer-affiliation and target-affiliation, which are equal to one for recommendations that are issued by analysts that are working for investment banks that were also advising the acquirer or target respectively on which the recommendations are issued, in an M&A deal.

I regress both categorical variables on analyst recommendations on the dummy variables for acquirer- and target-affiliation separately and control for other factors that could affect analyst recommendations by including several control variables in the regressions.

I use a similar approach to examine the relation between analyst-affiliation and earnings forecasts. I run regressions, using ordinary least squares (OLS), in which I use a continuous variable for the earnings per share (EPS) forecasts for one year and two years ahead, as dependent variables separately. I construct dummy variables for acquirer-affiliation and target-affiliation, which are equal to one for earnings forecasts that are issued by analysts that are working for investment banks that were also advising the acquirer or target respectively on which the earnings forecasts are issued, in an M&A deal.

I regress the variables on one-year and two-year earnings forecasts separately on the dummy variables for acquirer-affiliation and target-affiliation separately and control the same set of control variables. In the following subsections I elaborate on the specific regression models I estimate.

#### 4.1.1 The effect of acquirer-affiliation on acquirer recommendations

In order to examine the relation between acquirer-affiliation and acquirer recommendations, I estimate the following regression:

$$RECacq = \alpha + \beta_1 AFFILacq + \beta_2 \log DAYS + \beta_3 \log SIZE + \beta_5 \log VALUE + \beta_6 \log VALUE * AFFILacq + \beta_7 EVENT + \varepsilon \quad (1)$$

Where *RECacq* refers to the categorical variable or the binary variable for analyst recommendations issued on acquirers and *AFFILacq* is a dummy variable, which is equal to one for recommendations issued by acquirer-affiliated analysts. Since the categorical outcome variable for recommendations is constructed in a way that the lower the value of this variable, the higher is the level of optimism of a recommendation, I expect that the coefficient for acquirer-affiliation is negative before the exchange rate of the deal is set and positive after the exchange rate of the deal is set, suggesting a positive and negative bias in recommendations of affiliated analysts respectively.

I add the following control variables to the regression. I control for the number of days between the announcement date of the recommendation and the announcement date of the transaction, for which I construct the variable *DAYS*. I expect that analysts are more biased in their recommendations the closer they are to the transaction date. As I expect that a larger number of days between a recommendation and a transaction decreases the analyst's bias in his recommendations, I expect the coefficient of this control variable to have the opposite sign as the affiliation variable.

I control for firm size, by adding the variable *SIZE* to the regression, which is the average market capitalization for each firm over the period 2010-2014. I add this variable to control for the uncertainty about future earnings, which I expect to be lower for larger firms. Hence, I expect firm size to be positively related to recommendations, which means a negative coefficient for this variable.

I control for the total transaction value of the deal, which is the total price the acquirer paid for the acquisition. I construct an interaction value between the transaction value (VALUE) and the dummy variable for acquirer-affiliation and add it to the regression. I expect the incentive for affiliated analysts to bias recommendations to be larger for larger transaction values, hence I expect the coefficient of this interaction variable to have the same sign as the affiliation variable, as it would strengthen the effect of affiliation on recommendations. I also control for the transaction value separately in the regression. Lastly, I add event fixed effects to the regressions by controlling for the effect of every specific deal event. This means that I control for unobserved heterogeneity within each M&A deal over time.

#### 4.1.2 The effect of acquirer-affiliation on acquirer earnings forecasts

For examining the relation between acquirer-affiliation and earnings forecasts on acquirers, I estimate the following regression, using ordinary least squares (OLS):

$$EPS_{iacq} = \alpha + \beta_1 AFFILacq + \beta_2 \log DAYS + \beta_3 \log SIZE + \beta_5 \log VALUE + \beta_6 \log VALUE * AFFILacq + \beta_7 EVENT + \varepsilon \quad (2)$$

Where  $EPS_{iacq}$  is the earnings per share forecast on the acquirer for year  $i$  and all other variables are as defined in the previous section. I estimate this regression for one-year and two-year earnings per share forecasts on the acquirer as dependent variables. I expect the coefficient for acquirer-affiliation to be positive before the exchange rate of the deal is determined and negative after this rate is determined.

#### 4.1.3 The effect of target-affiliation on target recommendations

In a similar way I examine the relation between target-affiliation and target recommendations. I estimate the following regression:

$$RECTar = \alpha + \beta_1 AFFILtar + \beta_2 \log DAYS + \beta_3 \log SIZE + \beta_5 \log VALUE + \beta_6 \log VALUE * AFFILtar + \beta_7 EVENT + \varepsilon \quad (3)$$

As formulated in hypothesis 2, I expect the coefficient of target-affiliation to be negative, suggesting a positive bias in the recommendations on targets issued by target-affiliated analysts.

#### 4.1.4 The effect of target-affiliation on target earnings forecasts

In the same manner I examine the relation between target-affiliation and target earnings forecasts. I perform the following regression using OLS:

$$EPS_{itar} = \alpha + \beta_1 AFFILtar + \beta_2 \log DAYS + \beta_3 \log SIZE + \beta_5 \log VALUE + \beta_6 \log VALUE * AFFILtar + \beta_7 EVENT + \varepsilon \quad (4)$$

I expect the coefficient of target-affiliation to be positive, suggesting that target-affiliated analysts issue more positive earnings forecasts on targets compared to unaffiliated analysts.

#### 4.1.5 The effect of acquirer-affiliation on target recommendations/earnings forecasts

I perform the previously defined regressions again after adjusting them accordingly to the relations I examine under hypothesis 3. For the relation between acquirer-affiliation and target recommendations and earnings forecasts, as described in hypothesis 3, I run the following regressions:

$$RECTar = \alpha + \beta_1 AFFILacq + \beta_2 \log DAYS + \beta_3 \log SIZE + \beta_5 \log VALUE + \beta_6 \log VALUE * AFFILacq + \beta_7 EVENT + \varepsilon \quad (5)$$

$$EPS_{itar} = \alpha + \beta_1 AFFILacq + \beta_2 \log DAYS + \beta_3 \log SIZE + \beta_5 \log VALUE + \beta_6 \log VALUE * AFFILacq + \beta_7 EVENT + \varepsilon \quad (6)$$

I expect the relation between acquirer-affiliation and analyst recommendations on the target firm to be negative before the exchange rate of the deal is determined and positive after this exchange rate is set. Given that a higher categorical value of the recommendation variable refers to a more negative recommendation, I thus expect a positive coefficient for the affiliation variable in regression 5 before the exchange rate of the deal is set and a negative coefficient after the exchange rate of the deal is set. In regression 6 I expect a negative coefficient for the affiliation variable before the exchange rate of the deal is set and a positive coefficient after the exchange rate of the deal is set.

#### 4.1.6 The effect of target-affiliation on acquirer recommendations/earnings forecasts

Lastly, I run the previously used regressions in order to examine the relation between target-affiliation and acquirer recommendations and earnings forecasts as described in hypothesis 4. I adjust the regressions to the following:

$$RECTacq = \alpha + \beta_1 AFFILtar + \beta_2 \log DAYS + \beta_3 \log SIZE + \beta_5 \log VALUE + \beta_6 \log VALUE * AFFILtar + \beta_7 EVENT + \varepsilon \quad (7)$$

$$EPS_{iacq} = \alpha + \beta_1 AFFILtar + \beta_2 \log DAYS + \beta_3 \log SIZE + \beta_5 \log VALUE + \beta_6 \log VALUE * AFFILtar + \beta_7 EVENT + \varepsilon \quad (8)$$

I expect the coefficients of the affiliation variables in regression 7 and 8 to have the same signs as in regressions 5 and 6.

#### 4.2 The effect of biased recommendations on deal completion

After examining whether affiliated analysts bias their research, I examine whether these biases stem from the incentive of affiliated analysts to ensure deal completion. Therefore I test whether biased recommendations are related to a higher probability of deal completion. On the one hand I will test whether the positive recommendations of affiliated analysts under hypothesis 2 and 4b are related to a higher probability of deal completion compared to the negative recommendations of affiliated analysts. On the other hand I will test whether negative recommendations of affiliated analysts under hypothesis 1b and 4a are related to a higher probability of deal completion compared to the positive recommendations of affiliated analysts. I test this by running probit and ordinary least squares regressions:

$$COMP = \alpha + \beta REC_p + \varepsilon \quad (9)$$

$$COMP = \alpha + \beta REC_n + \varepsilon \quad (10)$$

The analysis is based on data samples with only recommendations of affiliated analysts. *COMP* is a dummy variable, which is equal to one if a deal is completed. *REC<sub>p</sub>* refers to a dummy variable, which is equal to one if a recommendation is positive, so for all ‘buy’ and ‘strong buy’ recommendations. If the coefficient of this variable turns out to be positive, this means that if I expect affiliated analysts to positively bias their recommendations, these positive recommendations result in a higher probability of deal completion compared to negative recommendations. This would be evidence that the reason for analysts to positively bias recommendations comes from the incentive to ensure deal completion. *REC<sub>n</sub>* refers to a dummy variable, which is equal to one if a recommendation is negative, so for all ‘sell’ and ‘strong sell’ recommendations. If the coefficient of this variable is positive, this means that under the circumstances in which a negative bias in the recommendations of affiliated analysts is expected, negative recommendations result in a higher probability of deal completion, suggesting that the incentive to ensure deal completion is the reason for affiliated analysts to negatively bias recommendations.

## 5. Data

### 5.1 M&A transactions

The data consists of mergers and acquisitions between 2010 and 2014, for which the target was situated in the United States and the acquisition was paid in stock, obtained from the Securities Data Corporation (SDC). I selected this time period in order to make sure that large effects of the financial crisis are excluded from the dataset.

Following Kolasinski and Kothari (2008), I only used data on statutory mergers and acquisitions, because the analyst incentives in these deals are the least ambiguous. Therefore I do not include buybacks, recapitalizations, spin-offs, split-offs, exchange offers, and acquisitions of remaining interest in the sample (Kolasinski & Kothari, 2008). I also limit the sample to M&A deals for which at least one party is publically listed. The initial dataset of M&A deals contains 17,062 transactions.

Table 3 contains descriptive statistics on the transaction values of the M&A deals in the dataset, which is the total price paid by acquirers. As can be seen from the large standard deviation, the transaction values of the deals in the dataset vary in magnitude substantially.

**Table 3: Descriptive statistics on Transaction Values (in millions of dollars)**

Summary statistics on the transaction values of all deals in the M&A dataset, for which the transaction value is available information. The dataset consists of all statutory U.S. deals that took place between 2010 and 2014, for which either the target or acquirer is publically listed.

| Variable          | Obs   | Mean    | Std. Dev. | Min  | Max     |
|-------------------|-------|---------|-----------|------|---------|
| Transaction value | 9,625 | 433.843 | 2276.331  | .001 | 77567.8 |

Table 4 contains frequency statistics on the status of the M&A deals in the sample. As can be seen in this table, most deals in the sample are already completed. The information on deal status is needed to examine whether biases in the recommendations of affiliated analysts stem from the incentive of analysts to increase the probability of deal completion.



**Table 4: Frequency statistics on Deal Status**

Frequencies of the categorical variable “Deal Status”, which has 10 different categories. If a deal falls in another than ‘Completed’ I consider the deal to be uncompleted.

| Deal Status    | Freq.  | Percent | Cum.   |
|----------------|--------|---------|--------|
| Completed      | 13,430 | 78.71   | 78.71  |
| Dis Rumor      | 46     | 0.27    | 78.98  |
| Intended       | 225    | 1.32    | 80.30  |
| Intent W       | 6      | 0.04    | 80.34  |
| Pending        | 2,570  | 15.06   | 95.40  |
| Rumor          | 9      | 0.05    | 95.45  |
| S Buyer        | 53     | 0.31    | 95.76  |
| S Buyer W      | 10     | 0.06    | 95.82  |
| Status Unknown | 230    | 1.35    | 97.17  |
| Withdrawn      | 483    | 2.83    | 100.00 |
| Total          | 17,062 | 100.00  |        |

## 5.2 Analyst recommendations and earnings forecasts

The data on analyst recommendations for all firms in the M&A dataset in the period 2010-2014 comes from the Institutional Broker’s Estimate System (IBES). The data on analyst recommendations are constructed as a categorical variable, which is equal to 1 for a ‘strong buy’ recommendation, equal to 2 for a ‘buy’ recommendation, equal to 3 for a ‘hold’ recommendation, equal to 4 for a ‘sell’ recommendation and equal to 5 for a ‘strong sell’ recommendation. I use this categorical variable as outcome variable for regression 1-4, running ordinal logistic regressions. In order to provide additional evidence, I also run ordinary least squares regressions, using a binary variable for analyst recommendations as outcome variable. This binary variable is equal to one for ‘sell’ and ‘strong sell’ recommendations and equal to zero for ‘buy’, ‘strong buy’ and ‘hold’ recommendations.

Table 5 contains statistics on the frequency and proportions of the 5 recommendation categories. More than 40% of all recommendations contain the advice to ‘hold’ and only 8% of all recommendations contain a ‘sell’ or ‘strong sell’ advice.

**Table 5: Frequencies on analyst recommendations**

Frequencies on all analyst recommendations for the firms in the M&A deals between 2010 and 2014. Note that more than 90% of all recommendations are positive or neutral and only 8% of the recommendations contain negative analyst opinions.

| <b>Recommendation</b> | <b>Freq.</b> | <b>Percent</b> | <b>Cum.</b> |
|-----------------------|--------------|----------------|-------------|
| 1 (strong buy)        | 28,481       | 19.66          | 19.66       |
| 2 (buy)               | 41,839       | 28.89          | 48.55       |
| 3 (hold)              | 62,823       | 43.37          | 91.92       |
| 4 (sell)              | 9,160        | 6.32           | 98.25       |
| 5 (strong sell)       | 2,536        | 1.75           | 100.00      |
| Total                 | 144,839      | 100.00         |             |

Furthermore, I add data on the earnings per share (EPS) forecasts of the firms in the M&A dataset in the 2010-2014 period for 1 year (EPS1) and 2 years (EPS2) into the future. Unfortunately, the recommendations and earnings forecasts cannot be matched directly to the investment banks advising the firms in the M&A dataset, since the codes for the investment banks from SDC do not match those of the analysts in IBES. Therefore I collected data on the brokerage firms to which the analysts of IBES are related and manually adjust them to the names that are used for the investment banks in the M&A dataset. With this information I can match each firm to the brokerage house or investment bank that covers its recommendations and EPS forecasts and determine which recommendations and forecasts are issued by affiliated analysts.

Table 6 contains summary statistics on the one-year and two-year earnings per share forecasts of the acquirers and targets of the M&A sample. The datasets contain a few very negative earnings forecast of -7650, -3978 and -892, but since these are just a limited amount of outliers I do not omit them from the dataset.

**Table 6: Summary statistics Earnings forecasts (in dollars)**

Summary statistics on the available one-year and two-year earnings forecasts on the acquiring and target firms from the M&A dataset.

| <u>Panel A: Acquiring firms</u> |         |          |           |       |     |
|---------------------------------|---------|----------|-----------|-------|-----|
| Variable                        | Obs     | Mean     | Std. Dev. | Min   | Max |
| One-year EPS forecast           | 154,231 | 2.244882 | 19.77186  | -7650 | 120 |
| Two-year EPS forecast           | 148,149 | 2.737706 | 11.05225  | -3978 | 263 |

| <u>Panel B: Target firms</u> |        |          |           |      |      |
|------------------------------|--------|----------|-----------|------|------|
| Variable                     | Obs    | Mean     | Std. Dev. | Min  | Max  |
| One-year EPS forecast        | 96,001 | 1.271357 | 6.089358  | -892 | 212  |
| Two-year EPS forecast        | 89,967 | 1.857351 | 11.20862  | -231 | 2713 |

### 5.3 Analyst affiliation

Next I define which recommendations are done by affiliated analysts. I consider the recommendations that are done by analysts that were working for investment banks that were also acting as advisors for the covered firm in an M&A deal, to be affiliated. I need to make a distinction between recommendations of target-affiliated and acquirer-affiliated recommendations. The recommendations in the sample that are done by analysts that were never a financial advisor for the covered firm in the period that is examined here, I consider to be unaffiliated.

#### *The effect of acquirer-affiliation on acquirer recommendations*

To test hypotheses 1 and 2, I constructed 2 datasets. First I combined the M&A dataset with the dataset of analyst recommendations based on the acquirer company codes. I excluded the data items without information on the acquirer's financial advisors. After adjusting the names of the acquirer advisors manually in order to match them with the names of the brokerage houses in the recommendations dataset, I constructed a dummy variable for acquirer-affiliation, which is equal to one if one of the acquirer's financial advisors is the brokerage firm whose analysts are also covering the acquiring firm. Next, I added the collected data on the short-term earnings forecasts of the firms in this dataset. This results in a dataset with 317,473 recommendations and EPS forecasts, of which 11,698 are done by acquirer-affiliated analysts.

I calculated the number of days between the announcement date of each deal and the announcement date of each recommendation (DAYS1) and EPS forecast (DAYS2) respectively, since I will control for the effect of these variables. I find that part of the recommendations and

forecasts in this dataset are done after or on the same day as the M&A transaction went effective. Since I am only interested in the recommendations and forecasts that are done before the M&A deal went effective, I excluded these data items. After doing this, I am left with a dataset of 273,551 recommendations and earnings forecasts of which 9,857 are done by acquirer-affiliated analysts.

As a last step, I split the dataset into two parts: one with recommendations or earnings forecasts that are done before the exchange ratio of the deal was determined and one with recommendations or earnings forecasts that are done after the exchange ratio of the deal was determined. I consider the announcement date of the deal to be the date on which the exchange ratio is set, since this happens for 78% of the deals (Mitchell et al., 2002). This results in one dataset of 273,551 recommendations and one of 264,023 earnings forecasts done before the announcement date of the deal and one dataset of 43,336 recommendations and one of 52,192 earnings forecasts done after the announcement date of the deal.

### ***The effect of target-affiliation on target recommendations***

I constructed a second dataset by combining the M&A dataset with the dataset of analyst recommendations based on the target company codes. Again I excluded the data items with missing values on the target's financial advisors. I adjusted the names of the brokerage houses in both parts of the dataset to be able to construct a dummy variable. I constructed a variable for target-affiliated recommendations, which is equal to one if one of the target's financial advisors is the same brokerage house whose analysts are also covering the target firm. Again I added the data on EPS forecasts to the dataset.

Again I calculated the number of days between the announcement date of each deal and the announcement date of each recommendations and EPS forecast and dropped the observations for which the recommendation or forecast was done after or on the same date the deal went effective. This resulted in a dataset of 193,583 recommendations and forecasts of which 6,951 are done by target-affiliated analysts.

### ***The effect of acquirer-affiliation on target recommendations***

To test hypothesis 3, I use the same dataset as the one I use for hypothesis 2, since this dataset contains all recommendations on target firms. I removed all items without information on the acquirer advisors. Then, I constructed a dummy variable that is equal to one if an analyst, who is

covering a target firm, is affiliated through M&A advisory with an acquiring firm. I find that only 56 out of the 11,887 recommendations on target firms in the dataset are done by acquirer-affiliated analysts. Again I add the data on EPS forecasts to the sample.

After excluding the recommendations that are done after or on the same date the deal went effective, I am left with a sample of 151,855 recommendations and forecasts of which 130 are done by acquirer-affiliated analysts.

Lastly, I split the dataset into two parts again. This results in one dataset of 120,354 recommendations and one of 129,543 earnings forecasts done before the announcement date of the deal and one dataset of 28,058 recommendations and one of 21,857 earnings forecasts done after the announcement date of the deal.

### ***The effect of target-affiliation on acquirer recommendations***

To test hypothesis 4, I use the same dataset as the one I use for hypothesis 1, since I want to examine the effect on recommendations on acquiring firms. I removed all data items without information on the target advisors, which limits the dataset to 16,507 recommendations. I constructed a dummy variable that is equal to one if an analyst, who covers an acquiring firm, is affiliated through M&A advisory with a target firm. I find that 607 out of the 16,507 recommendations on acquiring firms in this dataset are done by target-affiliated analysts. After excluding the recommendations that are done after or on the same date the deal went effective, I am left with a sample of 259,357 recommendations and earnings forecasts of which 11,271 are done by target-affiliated analysts.

I split the dataset into two parts again, which results in one dataset of 224,287 recommendations and one of 218,059 earnings forecasts done before the announcement date and one dataset of 34,238 recommendations and one of 40,206 earnings forecasts done after the announcement date of the deal.

### **5.4 The effect of affiliated recommendations on deal completion**

To test hypothesis 5, I use the datasets from hypothesis 1, 2 and 4, but limit them to the recommendations from affiliated analysts. I do not use the dataset from hypothesis 3, since this dataset contains a very limited amount of recommendations of affiliated analysts. I will first test whether positively biased recommendations result in a higher probability of deal completion. Under

hypothesis 2, analysts always have the incentive to optimistically bias their recommendations. I limit dataset 4 to all recommendations that are done after the announcement date of the M&A deal, since under this hypothesis, analysts have the incentive to optimistically bias their recommendations after the exchange ratio is set. Next, I construct a dummy variable (RECP), which is equal to one for all ‘hold’, ‘buy’ and ‘strong buy’ recommendations.

I will also test whether negatively biased recommendations result in a higher probability of deal completion. To test this, I limit dataset 1 to all recommendations that are done after the announcement date of the M&A deal and I limit dataset 4 to all recommendations that are done before the announcement date of the M&A deal, since in these circumstances a negative bias is expected. In these data samples I construct a dummy variable (RECN), which is equal to one for all ‘sell’ and ‘strong sell’ recommendations. In all datasets I construct a dummy variable (COMP), which is equal to one if a deal is completed. In table 7, frequencies of the dummy variable in the constructed datasets are presented.

**Table 7: Frequencies of completed deals covered by affiliated analysts**

Frequencies of all deals covered by affiliated analyst that are completed. “COMP” refers to the dummy variable equal to one if a deal is completed. Dataset 5a and 5b refer to the situations in which a positive bias in recommendations from affiliated analysts is expected. Dataset 5c and 5d refer to the situations in which a negative bias in recommendations from affiliated analysts is expected.

| <u>Dataset 5a</u> |              |                 | <u>Dataset 5b</u> |              |                 |             |
|-------------------|--------------|-----------------|-------------------|--------------|-----------------|-------------|
| <b>COMP</b>       | <b>Freq.</b> | <b>Percent.</b> | <b>Cum.</b>       | <b>Freq.</b> | <b>Percent.</b> | <b>Cum.</b> |
| 0                 | 657          | 6.67            | 6.67              | 1,119        | 57.56           | 57.56       |
| 1                 | 9,200        | 93.33           | 100               | 825          | 42.44           | 100         |
| <b>Total</b>      | 6,454        | 100             |                   | 1,944        | 100             |             |
| <u>Dataset 5c</u> |              |                 | <u>Dataset 5d</u> |              |                 |             |
| <b>COMP</b>       | <b>Freq.</b> | <b>Percent.</b> | <b>Cum.</b>       | <b>Freq.</b> | <b>Percent.</b> | <b>Cum.</b> |
| 0                 | 11,006       | 50.68           | 50.68             | 7,129        | 6               | 6           |
| 1                 | 10,709       | 49.32           | 100               | 111,684      | 94              | 100         |
| <b>Total</b>      | 21,715       | 100             |                   | 118,813      | 100             |             |

## 5.6 Control variables

I collect additional data to test the effect of other variables on the recommendations and earnings forecasts of analysts. From Compustat I collect data on the total market capitalization of the firms in the samples. I use the average market capitalization between 2010 and 2014 for each firm and add this variable (SIZE) to all datasets. I also collect data on the value of the M&A transactions

(VALUE) from SDC, which is the total price paid for the acquisition. I find that for a substantial part of the firms in the datasets, Compustat does not contain information about firm size and/or transaction value. Since I want to create a data sample with comparable firms and avoid a biased sample, I choose to leave out all data items without information on firm size and transaction value in Compustat. This decreases the data samples but makes sure that comparable firms are examined in order to answer the research question.

## 6. Results

This chapter consists of two main sections, in which I will test the aforementioned hypotheses. In the first section I will examine if there is a relation between analyst-affiliation and analyst recommendations and earnings forecasts, by running ordinal logistic regressions and ordinary least squares regressions. In the second section, I test whether biased recommendations of affiliated analysts result in a higher probability of deal completion. I use ordinary least squares and probit regression analysis to test this.

### 6.1 Acquirer affiliation and acquirer recommendations and earnings forecasts

In this section I test whether there is a relation between acquirer-affiliation and analyst recommendations and earnings forecasts on the acquirer. Table 8 presents descriptive statistics of the variables in the dataset that I use for testing this. Important to note is the large values of DAYS1 and DAYS2 that are present in the dataset. Apparently, the dataset contains recommendations and earnings forecasts that are done up to 5 years before and after the announcement date of the deal. Also the standard deviation of these variables and of the firm size and transaction value variables are large, indicating that the volatility in these variable is high in the dataset.

**Table 8: Descriptive statistics hypothesis 1**

Descriptive statistics on all variables that will be used in the regressions on acquirer-affiliation (regression 1, 2, 4 and 5). “Acquirer-recommendations” refers to the categorical variable of the recommendations on the acquirers. “Acquirer-affiliation” is a dummy variable equal to one if a recommendations is done by an analyst affiliated with the acquirer. “Firm size” refers to the average market capitalization of a firm over the period 2010-2014. “Transaction value” refers to the price paid by the acquirer for the acquisition. Large volatility exists in the number of days between the announcement dates of the recommendations and earnings forecasts and the announcement date of the M&A deals, the size of the firms in the dataset and the value of the transactions.

| Variable                                | Obs     | Mean  | Std. Dev. | Min   | Max    |
|---|---------|-------|-----------|-------|--------|
| Acquirer recommendations                | 310,330 | 2.430 | .936      | 1     | 5      |
| Acquirer-affiliation                    | 310,330 | .038  | .190      | 0     | 1      |
| Days between recommendation and deal    | 310,330 | 596   | 454.25    | 0     | 1806   |
| Days between earnings forecast and deal | 310,330 | 563   | 436.58    | 0     | 1817   |
| Firm size                               | 159,288 | 20533 | 40659     | .53   | 227618 |
| Transaction value                       | 268,649 | 2891  | 6829      | 1.30  | 77568  |
| One-year EPS forecast                   | 150,787 | 2.25  | 19.99     | -7650 | 119.6  |
| Two-year EPS forecast                   | 144,816 | 2.75  | 11.17     | -3978 | 262.5  |



Figure 1 in the appendix shows the density curves of the control variables. As can be observed from these graphs, all control variables are right-skewed. In my regressions, I will therefore use the natural logarithm of these variables, which normalizes the distribution of these variables. I will use the logarithm of these variables in all regressions in order to keep the interpretation of the coefficients of the variables the same for all regressions.

As noted before, to test the effect of acquirer-affiliation on acquirer recommendations and earnings forecasts, I divide the dataset into recommendations and forecasts issued after and before the announcement date of the M&A deal. I run regressions, with and without control variables, for both split samples.

### **6.1.1 Acquirer affiliation and acquirer recommendations**

I will first perform regression 1, using the categorical variable and binary variable for recommendations on acquirers as dependent variables separately. Since a low value of this categorical outcome variable corresponds with a positive recommendation, I expect the coefficient of the acquirer-affiliation variable to be negative for hypothesis 1a and positive for hypothesis 1b. This implies that the chances of a positive recommendation, hence a lower recommendation category, would increase if these recommendations are coming from acquirer-affiliated analysts before the exchange ratio is determined and would decrease if these are issued after the exchange ratio is determined. I perform regression 1 for the recommendations issued before the deal announcement and after the deal announcement separately.

Table 9 presents the results of these regressions. The model shows highly significant results for all variables. I find a negative coefficient for the affiliation variable under hypothesis 1a, but this coefficient becomes positive after adding control variables and fixed effects to the regression, suggesting that acquirer-affiliated analysts are more negative in their recommendations on the acquirer before the announcement date of the deal. This contradicts the expectations and the findings of Kolasinski and Kothari (2008) and Hausholter and Lowry (2008), who found a positive bias in the recommendations of affiliated analysts.

**Table 9: Results acquirer-affiliation and acquirer recommendations with categorical outcome variable**  
**Ordinal logistic regression analysis (regression 1) on the relation between acquirer-affiliation and recommendations on the acquirer. 1a and 1b refer to the results for regression 1 for the recommendations issued before and after the announcement date of the deal respectively. “Log of transaction value \* Acquirer-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for acquirer-affiliation. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| <b>Recommendations on Acquirer (categorical)</b> | <b>(1a)</b>          | <b>(1a)</b>         | <b>(1b)</b>        | <b>(1b)</b>        |
|--|----------------------|---------------------|--------------------|--------------------|
| Acquirer-affiliation                             | -1.170***<br>(0.000) | 1.172***<br>(0.000) | .860***<br>(0.000) | 1.194**<br>(0.015) |
| Log of Days between recommendation and deal      |                      | -.007<br>(0.181)    |                    | .375***<br>(0.000) |
| Log of firm size                                 |                      | .073***<br>(0.000)  |                    | .137***<br>(0.000) |
| Log of transaction value                         |                      | -.058***<br>(0.000) |                    | -.020*<br>(0.066)  |
| Log of transaction value * Acquirer-affiliation  |                      | -.199***<br>(0.000) |                    | -.023**<br>(0.735) |
| Deal fixed effects                               | No                   | Yes                 | No                 | Yes                |
| Number of observations                           | 121,216              | 121,216             | 22,829             | 22,829             |
| Pseudo R-squared                                 | 0.0001               | 0.0060              | 0.0040             | 0.1147             |

Under hypothesis 1b, I find a positive coefficient for the affiliation variable as expected, also when I add control variables to the model. This suggests that acquirer-affiliated analysts issue more negative recommendations for the acquirers compared to unaffiliated analysts, after the announcement date of the deal.

The negative relation between acquirer-affiliation and acquirer recommendations in regression 1a do not support hypothesis 1a, since this hypothesis expressed the expectation of a positive relation. Possibly, I do not find a positive bias because other incentives besides the incentive to ensure deal completion or access to private inside information play a role. The negative relation that I found in regression 1b are consistent with the expectations. Also, the results reveal that the coefficient for acquirer-affiliation in regression 1b is more negative than in regression 1a, which confirms the argument that after the announcement date of the deal, recommendations of affiliated analysts are more negative compared to before the announcement date of the deal.

Additionally, I run ordinary least squares regressions, while using the binary variable for analyst recommendations as dependent variable, to test hypothesis 1a and 1b. Table 10 presents the results of these regressions.

**Table 10: Results acquirer-affiliation and acquirer recommendations with binary outcome variable**  
**Ordinary least squares regression (regression 1) on the relation between acquirer-affiliation and recommendations on the acquirer. 1a and 1b refer to the results for regression 1 for the recommendations issued before and after the announcement date of the deal respectively. “Log of transaction value \* Acquirer-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for acquirer-affiliation. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| <b>Recommendations on Acquirer (binary)</b>     | <b>(1a)</b>        | <b>(1a)</b>        | <b>(1b)</b>         | <b>(1b)</b>         |
|---|--------------------|--------------------|---------------------|---------------------|
| Acquirer-affiliation                            | .098***<br>(0.000) | -.049**<br>(0.011) | -.051***<br>(0.000) | .692***<br>(0.000)  |
| Log of Days between recommendation and deal     |                    | .015***<br>(0.000) |                     | .011***<br>(0.000)  |
| Log of firm size                                |                    | .040***<br>(0.000) |                     | .017***<br>(0.000)  |
| Log of transaction value                        |                    | .021***<br>(0.000) |                     | -.008***<br>(0.000) |
| Log of transaction value * Acquirer-affiliation |                    | 0.002<br>(0.404)   |                     | -.100***<br>(0.000) |
| Deal fixed effects                              | No                 | Yes                | No                  | Yes                 |
| Number of observations                          | 121,216            | 121,216            | 22,829              | 22,829              |
| Adjusted R-squared                              | 0.0041             | 0.0707             | 0.0014              | 0.1535              |

Under hypothesis 1a, the coefficient for acquirer-affiliation remains positive, suggesting a negative bias in the recommendations of acquirer-affiliated analysts. The coefficient for acquirer-affiliation under hypothesis 1b is also positive after adding control variables but becomes less strong compared to the regression with the categorical outcome variable. Overall the findings are somewhat mixed, but seem to suggest a negative bias in the recommendations on acquirers of acquirer-affiliated analysts.

### **6.1.2 Robustness check**

I note that the sign of the coefficient of interest, that of acquirer-affiliation, changes after adding control variables to the regressions. The reason for this could be multicollinearity between the affiliation variable and the interaction term in the regressions. I find that the affiliation variable is highly correlated with the interaction term of acquirer-affiliation and transaction value, since I find high values for the Variance Inflation Factor (VIF). As an additional robustness check, I therefore perform mean centering to the affiliation variable and the transaction value variable, by subtracting the means from the correlated variables, and run the ordinal logistic regressions again. The results

are summarized in table 11. Correcting for collinearity through mean centering prevents the sign of the affiliation coefficient to change after adding control variables. Before the announcement date of the deal, the coefficient remains negative, and after the announcement date the coefficient remains positive. These findings are consistent with what is expected and expressed in hypothesis 1a and 1b.

**Table 11: Mean centering as robustness check for regression 1**

**Ordinal logistic regression analysis (regression 1) on the relation between acquirer-affiliation and recommendations on the acquirer. 1a and 1b refer to the results for regression 1 for the recommendations issued before and after the announcement date of the deal respectively. The variables for acquirer-affiliation and log transaction value are centered, by subtracting the mean of the variables from each data item. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| <b>Recommendations on Acquirer (categorical)</b>           | <b>(1a)</b>         | <b>(1b)</b>        |
|--|---------------------|--------------------|
| Acquirer-affiliation (centered)                            | -.141***<br>(0.000) | 1.037**<br>(0.000) |
| Log of Days between recommendation and deal                | -.007<br>(0.181)    | .375***<br>(0.000) |
| Log of firm size   | .073***<br>(0.000)  | .137***<br>(0.000) |
| Log of transaction value (centered)                        | -.066***<br>(0.000) | -.021*<br>(0.058)  |
| Log of transaction value * Acquirer-affiliation (centered) | -.199***<br>(0.000) | -.023**<br>(0.735) |
| Deal fixed effects   | Yes                 | Yes                |
| Number of observations                                     | 121,216             | 22,829             |
| Pseudo R-squared   | 0.0060              | 0.1147             |

### 6.1.3 Acquirer affiliation and acquirer earnings forecasts

Next I test the relation between acquirer-affiliation and acquirer short-term and long-term earnings forecasts, using OLS regressions. Table 12 presents the results of these regressions. After adding control variables to the model, I find a positive and significant coefficient for the affiliation variable under hypothesis 1a. This suggests that acquirer-affiliated analysts issue more positive earnings forecasts compared to unaffiliated analysts, before the announcement date of the deal. However, the coefficient is negative before adding control variables to the regression. After the announcement date of the deal, the coefficient of affiliation becomes negative and remains negative after adding control variables for the one-year earnings per share forecasts, which suggests that acquirer-affiliated analysts issue more negative earnings forecasts after the announcement date of the deal. For the two-year earnings forecasts, the sign of the coefficient switches again after adding control variables.

Therefore I will correct for multicollinearity again through mean centering and run the regressions again. Table 13 shows that the sign of the affiliation variable does not switch anymore after adding control variables to the regressions. In all regressions, the coefficient remains negative, suggesting a negative bias in the earnings forecasts on acquirers of acquirer-affiliated analysts.

The results are not consistent with the expectations and do not support the hypothesis that analysts that are affiliated through M&A advisory with acquiring firms are positively biased in their earnings forecasts on these firms before the announcement date of the deal and negatively biased after the announcement date of the deal. The findings are not completely consistent with the results of the regressions in the previous section, since there I found a negative relation between acquirer-affiliation and acquirer recommendations after the announcement date of the deal, but a positive relation before the announcement date of the deal. Apparently, affiliated analysts issue more negative earnings forecasts but at the same time more positive recommendations before the deal announcement date. The negative bias in earnings forecast is consistent with the findings of Malmendier and Shantikumar (2007), who argued that analysts might always be negatively biased in their earnings forecasts in order to let management beat the forecast and because differences between small and large investor reactions provide incentives to positively bias recommendations, but not earnings forecasts.

Table 12: Results acquirer-affiliation and acquirer earnings forecasts

Ordinary least squares regression analysis (regression 2) of short-term earnings per share forecasts on the acquirer on acquirer-affiliation and control variables. Regressions under sub a refer to hypothesis 1a, which describes the period before the announcement date of the M&A deal. Regressions under sub b refer to hypothesis 1b, which describes the period after the announcement date of the M&A deal. “EPS1” and “EPS2” refer to the one-year and two-year earnings forecasts respectively, as dependent variables of the regressions. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| EPS forecast on Acquirer                      | EPS1<br>(2a)         | EPS1<br>(2a)        | EPS2<br>(2a)         | EPS2<br>(2a)        | EPS1<br>(2b)        | EPS1<br>(2b)        | EPS2<br>(2b)        | EPS2<br>(2b)        |
|---|----------------------|---------------------|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Acquirer-affiliation                          | -1.124***<br>(0.000) | 2.719***<br>(0.000) | -1.326***<br>(0.000) | 3.150***<br>(0.000) | -.715***<br>(0.000) | -.093<br>(0.868)    | -.900***<br>(0.000) | .467<br>(0.355)     |
| Log of Days between EPS forecast and deal     |                      | -.213***<br>(0.000) |                      | -.220***<br>(0.000) |                     | -.062***<br>(0.000) |                     | -.060***<br>(0.000) |
| Log of firm size                              |                      | .411***<br>(0.000)  |                      | .408***<br>(0.000)  |                     | .262***<br>(0.000)  |                     | .216***<br>(0.000)  |
| Log of transaction value                      |                      | .210***<br>(0.000)  |                      | .291***<br>(0.000)  |                     | .180***<br>(0.000)  |                     | .263***<br>(0.000)  |
| Log of transaction value*Acquirer-affiliation |                      | -.562***<br>(0.000) |                      | -.658***<br>(0.000) |                     | -.108<br>(0.156)    |                     | -.218***<br>(0.001) |
| Deal fixed effects                            | No                   | Yes                 | No                   | Yes                 | No                  | Yes                 | No                  | Yes                 |
| Number of observations                        | 57,492               | 57,492              | 54,862               | 54,862              | 12,500              | 12,500              | 12,114              | 12,114              |
| Adjusted R-squared                            | 0.0039               | 0.0879              | 0.0034               | 0.0634              | 0.0017              | 0.1015              | 0.0038              | 0.1364              |

Table 13: Mean centering as robustness check for regression 2

Ordinary least squares regression analysis (regression 2) of short-term earnings per share forecasts on the acquirer on acquirer-affiliation and control variables. Regressions under sub a refer to hypothesis 1a, which describes the period before the announcement date of the M&A deal. Regressions under sub b refer to hypothesis 1b, which describes the period after the announcement date of the M&A deal. “EPS1” and “EPS2” refer to the one-year and two-year earnings forecasts respectively, as dependent variables of the regressions. The variables for acquirer-affiliation and log transaction value are centered, by subtracting the mean of the variables from each data item. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| EPS forecast on Acquirer                                 | EPS1                 | EPS1                | EPS2                 | EPS2                 | EPS1                | EPS1                | EPS2                | EPS2                |
|--|----------------------|---------------------|----------------------|----------------------|---------------------|---------------------|---------------------|---------------------|
|  | (2a)                 | (2a)                | (2a)                 | (2a)                 | (2b)                | (2b)                | (2b)                | (2b)                |
| Acquirer-affiliation (centered)                          | -1.124***<br>(0.000) | -.994***<br>(0.000) | -1.326***<br>(0.000) | -1.203***<br>(0.000) | -.715***<br>(0.000) | -.834<br>(0.868)    | -.900***<br>(0.000) | -1.207<br>(0.355)   |
| Log of Days between EPS forecast and deal                |                      | -.213***<br>(0.000) |                      | -.220***<br>(0.000)  |                     | -.062***<br>(0.000) |                     | -.060***<br>(0.000) |
| Log of firm size   |                      | .411***<br>(0.000)  |                      | .408***<br>(0.000)   |                     | .262***<br>(0.000)  |                     | .216***<br>(0.000)  |
| Log of transaction value (centered)                      |                      | .210***<br>(0.000)  |                      | .291***<br>(0.000)   |                     | .180***<br>(0.000)  |                     | .263***<br>(0.000)  |
| Log of transaction value*Acquirer-affiliation (centered) |                      | -.562***<br>(0.000) |                      | -.658***<br>(0.000)  |                     | -.108<br>(0.156)    |                     | -.218***<br>(0.001) |
| Deal fixed effects                                       | No                   | Yes                 | No                   | Yes                  | No                  | Yes                 | No                  | Yes                 |
| Number of observations                                   | 57,492               | 57,492              | 54,862               | 54,862               | 12,500              | 12,500              | 12,114              | 12,114              |
| Adjusted R-squared                                       | 0.0039               | 0.0879              | 0.0034               | 0.0634               | 0.0017              | 0.1015              | 0.0038              | 0.1364              |

## 6.2 Target-affiliation and target recommendations and earnings forecasts

Next I will examine whether there is an association between target-affiliation and the recommendations and earnings forecasts on targets. Table 14 presents the descriptive statistics of the variables in the relevant dataset.

Table 14: Descriptive statistics hypothesis 2

Descriptive statistics on all variables that will be used in the regressions on target-affiliation (regression 3, 7 and 8). “Target-recommendations” refers to the categorical variable of the recommendations on the target. “Target-affiliation” is a dummy variable equal to one if a recommendations is done by an analyst affiliated with the target. “Firm size” refers to the average market capitalization of a firm over the period 2010-2014. “Transaction value” refers to the price paid by the acquirer for the acquisition. Large volatility exists in the number of days between the announcement dates of the recommendations and earnings forecasts and the announcement date of the M&A deals, the size of the firms in the dataset and the value of the transactions.

| Variable                                | Obs     | Mean    | Std. Dev. | Min     | Max      |
|---|---------|---------|-----------|---------|----------|
| Target recommendations                  | 186,787 | 2.57    | .93       | 1       | 5        |
| Target-affiliation                      | 186,787 | .04     | .19       | 0       | 1        |
| Days between recommendation and deal    | 186,787 | 551.74  | 443.91    | 0       | 1808     |
| Days between earnings forecast and deal | 186,787 | 552.87  | 435.59    | 0       | 1808     |
| Firm size                               | 91,737  | 4073.56 | 5905.67   | .5338   | 37123.77 |
| Transaction value                       | 165,197 | 6036.06 | 11212.09  | .856    | 77567.8  |
| One-year EPS forecast                   | 92,562  | 1.23    | 6.16      | -891.66 | 211.88   |
| Two-year EPS forecast                   | 86,834  | 1.83    | 11.39     | -231    | 2713     |

### 6.2.1 Target-affiliation and target recommendations

Table 15 presents the results of the ordinal logistic regressions that I ran to test the effect of target-affiliation on target recommendations. The model shows significant results for all variables, however the variable for target-affiliation has a positive coefficient after adding control variables to the regression, suggesting a negative relation between target-affiliation and recommendations on the target. This is not consistent with the expectations of hypothesis 2. Again it seems that affiliated analysts face other incentives that have an opposite effect on their recommendations.



**Table 15: Results target-affiliation and target recommendations with categorical outcome variable**  
Ordinal logistic regression analysis (regression 3) on the relation between target-affiliation and recommendations on the target. “Log of transaction value \* Target-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for target-affiliation. 3b refers to regression 3 with mean centering of the target-affiliation variable and the transaction value variable. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| <b>Recommendations on Target (categorical)</b> | <b>(3)</b>                        | <b>(3)</b>                      | <b>(3b)</b>                       |
|--|-----------------------------------|---------------------------------|-----------------------------------|
| Target-affiliation                             | <b>-.704***</b><br><b>(0.000)</b> | <b>.318**</b><br><b>(0.019)</b> | <b>-.496***</b><br><b>(0.000)</b> |
| Log of Days between recommendation and deal    |                                   | -.212***<br>(0.000)             | -.212***<br>(0.000)               |
| Log of firm size                               |                                   | .419***<br>(0.000)              | .419***<br>(0.000)                |
| Log of transaction value                       |                                   | -.160***<br>(0.000)             | -.160***<br>(0.000)               |
| Log of transaction value * Target-affiliation  |                                   | -.110***<br>(0.000)             | -.110***<br>(0.000)               |
| Deal fixed effects                             | No                                | Yes                             | Yes                               |
| Number of observations                         | 87,539                            | 87,539                          | 85,551                            |
| Pseudo R-squared                               | 0.0033                            | 0.0455                          | 0.0455                            |

Running the same regressions using ordinary least squares and a binary outcome variable for target recommendations leads to similar results. I find a negative coefficient for target-affiliation, which changes to positive after adding control variables. The results are depicted in table 16.

Additionally, I centered the log of transaction value variable and the target-affiliation variable to their means in order to solve problems around multicollinearity and ran the regression again. The results are depicted in the third column of table 15. The mean centering caused the coefficient of the target-affiliation variable to remain negative after adding control variables, suggesting a positive bias in the recommendations of target-affiliated analysts on targets.

**Table 16: Results target-affiliation and target recommendations with binary outcome variable**  
**Ordinal least squares regression analysis (regression 3) on the relation between target-affiliation and recommendations on the target. “Log of transaction value \* Target-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for target-affiliation. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| <b>Recommendations on Target (binary)</b>     | <b>(3)</b>          | <b>(3)</b>          |
|---|---------------------|---------------------|
| Target-affiliation                            | -.113***<br>(0.000) | -.223***<br>(0.000) |
| Log of Days between recommendation and deal   |                     | -.018***<br>(0.000) |
| Log of firm size                              |                     | .040***<br>(0.000)  |
| Log of transaction value                      |                     | -.040***<br>(0.000) |
| Log of transaction value * Target-affiliation |                     | .018***<br>(0.000)  |
| Deal fixed effects                            | No                  | Yes                 |
| Number of observations                        | 85,551              | 85,551              |
| Pseudo R-squared                              | 0.0059              | 0.0524              |

## 6.2.2 Target-affiliation and target earnings forecasts

Next I test the relation between target-affiliation and target earnings forecast. Table 17 presents the results of the OLS regressions that test this. The findings are mixed. I find a significant negative relation between target-affiliation and earnings forecasts for 1 year ahead but the relation between target-affiliation and earnings forecasts for 2 years ahead becomes positive after adding control variables to the regression.

Correcting for multicollinearity through mean centering again results in negative coefficients for the target-affiliation variable, also after adding control variables to the regression. Consistent with the findings in section 6.2.3, the results indicate a negative relation between target-affiliation and target earnings forecasts, suggesting a negative bias. This is again consistent with the findings of Malmendier and Shantkumar (2007) who found that analysts affiliated through equity underwriting are more pessimistic in their earnings forecasts, in order to let management beat the forecasts. The results do not indicate that affiliated analysts are less willing to distort earnings forecasts than recommendations because of bank reputation, since the negative relation between target-affiliation and earnings forecasts is stronger than between target-affiliation and recommendations.

**Table 17: Results target-affiliation and target earnings forecasts**

Ordinary least squares regression analysis (regression 4) on the relation between target-affiliation and earnings forecasts. EPS1 and EPS2 refer to the one-year and two-year earnings forecasts respectively, as dependent variables of the regression. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| Earnings forecasts target                     | EPS1<br>(4)         | EPS1<br>(4)         | EPS2<br>(4)         | EPS2<br>(4)         |
|---|---------------------|---------------------|---------------------|---------------------|
| Target-affiliation                            | -.685***<br>(0.000) | -1.265**<br>(0.030) | -.543***<br>(0.000) | .447*<br>(0.065)    |
| Log of Days between EPS forecast and deal     |                     | .059**<br>(0.007)   |                     | -.034***<br>(0.000) |
| Log of firm size                              |                     | .415***<br>(0.000)  |                     | .443***<br>(0.000)  |
| Log of transaction value                      |                     | .109***<br>(0.000)  |                     | .077***<br>(0.000)  |
| Log of transaction value * Target affiliation |                     | .117<br>(0.140)     |                     | -.101***<br>(0.001) |
| Deal fixed effects                            | No                  | Yes                 | No                  | Yes                 |
| Number of observations                        | 43,284              | 43,284              | 40,422              | 40,422              |
| Adjusted R-squared                            | 0.0007              | 0.0228              | 0.0027              | 0.1253              |

**Table 18: Mean centering as robustness check for regression 2**

Ordinary least squares regression analysis (regression 4) on the relation between target-affiliation and earnings forecasts. EPS1 and EPS2 refer to the one-year and two-year earnings forecasts respectively, as dependent variables of the regression. The variables for acquirer-affiliation and log transaction value are centered, by subtracting the mean of the variables from each data item. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| Earnings forecasts target                                | EPS1<br>(4)         | EPS1<br>(4)         | EPS2<br>(4)         | EPS2<br>(4)         |
|--|---------------------|---------------------|---------------------|---------------------|
| Target-affiliation (centered)                            | -.685***<br>(0.000) | -.397***<br>(0.001) | -.543***<br>(0.000) | -.306***<br>(0.000) |
| Log of Days between EPS forecast and deal                |                     | .059**<br>(0.007)   |                     | -.034***<br>(0.000) |
| Log of firm size   |                     | .415***<br>(0.000)  |                     | .443***<br>(0.000)  |
| Log of transaction value (centered)                      |                     | .109***<br>(0.000)  |                     | .077***<br>(0.000)  |
| Log of transaction value * Target affiliation (centered) |                     | .117<br>(0.140)     |                     | -.101***<br>(0.001) |
| Deal fixed effects                                       | No                  | Yes                 | No                  | Yes                 |
| Number of observations                                   | 43,284              | 43,284              | 40,422              | 40,422              |
| Adjusted R-squared                                       | 0.0007              | 0.0228              | 0.0027              | 0.1253              |

### 6.3 Acquirer-affiliation and target recommendations and earnings forecasts

In this section I will examine whether there is an association between acquirer-affiliation on one hand and recommendations and earnings forecasts on target firms on the other hand.

#### 6.3.1 Acquirer-affiliation and target recommendations

First I will examine whether acquirer-affiliated analysts are more pessimistic in their recommendations on targets, before the announcement date of the deal and more optimistic in their recommendations on targets after the announcement date of the deal. In table 19, the results of the ordinal logistic regression on acquirer-affiliation and target recommendations are depicted.

In line with expectations, I find a positive coefficient for the affiliation variable in the first model, which implies a negative effect of acquirer-affiliation on recommendations for the target before the announcement date of the M&A deal and a negative coefficient for acquirer-affiliation after in regression 5 after the announcement date of the deal, suggesting a negative bias. The findings support hypothesis 3a and 3b, although the evidence for 3b is less significant.

**Table 19: Results acquirer-affiliation and target recommendations with categorical outcome variable Ordinal logistic regression analysis (regression 5) on the relation between acquirer-affiliation and recommendations on the target. “Log of transaction value \* Acquirer-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for acquirer-affiliation. 5a and 5b refer to the results for regression 5 for the recommendations issued before and after the announcement date of the deal respectively. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| Recommendation on target (categorical)          | (5a)                | (5a)                | (5b)               | (5b)                |
|---|---------------------|---------------------|--------------------|---------------------|
| Acquirer-affiliation                            | 1.036***<br>(0.000) | 3.066***<br>(0.000) | -1.658*<br>(0.067) | -2.938<br>(0.515)   |
| Log of Days between recommendation and deal     |                     | -.206***<br>(0.000) |                    | .065***<br>(0.000)  |
| Log of firm size                                |                     | .029***<br>(0.000)  |                    | -.315***<br>(0.000) |
| Log of transaction value                        |                     | .084***<br>(0.000)  |                    | -.021<br>(0.262)    |
| Log of transaction value * Acquirer-affiliation |                     | -.338**<br>(0.002)  |                    | .127<br>(0.858)     |
| Deal fixed effects                              | No                  | Yes                 | No                 | Yes                 |
| Number of observations                          | 62,224              | 62,224              | 12,543             | 12,543              |
| Pseudo R-squared                                | 0.0002              | 0.0092              | 0.0001             | 0.0613              |

I run the regressions again using ordinary least squares and the binary outcome variable for target recommendations. The results, depicted in table 20, show negative but insignificant coefficients for acquirer-affiliation before and after the deal announcement date, although the sign becomes positive after adding control variables in regression 5b. The results do not support the findings of the ordinal logistic regressions and do not reveal a clear bias in the recommendations on targets of acquirer-affiliated analysts.

**Table 20: Results acquirer-affiliation and target recommendations with binary outcome variable**  
**Ordinary least squares regression analysis (regression 5) on the relation between acquirer-affiliation and recommendations on the target. “Log of transaction value \* Acquirer-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for acquirer-affiliation. 5a and 5b refer to the results for regression 5 for the recommendations issued before and after the announcement date of the deal respectively. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| <b>Recommendation on target (binary)</b>        | <b>(5a)</b> | <b>(5a)</b> | <b>(5b)</b> | <b>(5b)</b> |
|---|-------------|-------------|-------------|-------------|
| Acquirer-affiliation                            | -.040*      | -.095       | -.098       | .031        |
|   | (0.072)     | (0.270)     | (0.569)     | (0.970)     |
| Log of Days between recommendation and deal     |             | .007***     |             | .026***     |
|   |             | (0.000)     |             | (0.000)     |
| Log of firm size                                |             | .006***     |             | -.033***    |
|   |             | (0.000)     |             | (0.000)     |
| Log of transaction value                        |             | -.008***    |             | .025***     |
|   |             | (0.000)     |             | (0.000)     |
| Log of transaction value * Acquirer-affiliation |             | .010        |             | -.011       |
|   |             | (0.411)     |             | (0.927)     |
| Deal fixed effects                              | No          | Yes         | No          | Yes         |
| Number of observations                          | 62,224      | 62,224      | 12,543      | 12,543      |
| Adjusted R-squared                              | 0.0000      | 0.0039      | 0.0000      | 0.0039      |

### 6.3.2 Robustness check

Although the coefficients are more consistent, since they do not switch signs after adding control variables, there is still collinearity between the interaction term and acquirer-affiliation. Therefore I control again for multicollinearity by running the ordinal logistic regressions with mean centered variables. The results support the earlier findings, suggesting a negative bias in the recommendations of acquirer-affiliated analysts before the announcement date of the deal and a positive bias after the announcement date of the deal. These findings are consistent with the expectations and support hypothesis 3a and 3b. The results can be found in table 21.

Table 21: Mean centering as robustness check for regression 5

Ordinal logistic regression analysis (regression 5) on the relation between acquirer-affiliation and recommendations on the target. “Log of transaction value \* Acquirer-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for acquirer-affiliation. 5a and 5b refer to the results for regression 5 for the recommendations issued before and after the announcement date of the deal respectively. The variables for acquirer-affiliation and log transaction value are centered, by subtracting the mean of the variables from each data item. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| Recommendation on target (categorical)                     | (5a)                              | (5a)                              | (5b)                             | (5b)                            |
|--|-----------------------------------|-----------------------------------|----------------------------------|---------------------------------|
| Acquirer-affiliation (centered)                            | <b>1.036***</b><br><b>(0.000)</b> | <b>0.500***</b><br><b>(0.148)</b> | <b>-1.658*</b><br><b>(0.067)</b> | <b>-1.969</b><br><b>(0.515)</b> |
| Log of Days between recommendation and deal                |                                   | -.206***<br>(0.000)               |                                  | .065***<br>(0.000)              |
| Log of firm size   |                                   | .029***<br>(0.000)                |                                  | -.315***<br>(0.000)             |
| Log of transaction value (centered)                        |                                   | .084***<br>(0.000)                |                                  | -.021<br>(0.262)                |
| Log of transaction value * Acquirer-affiliation (centered) |                                   | -.338**<br>(0.002)                |                                  | .127<br>(0.858)                 |
| Deal fixed effects   | No                                | Yes                               | No                               | Yes                             |
| Number of observations                                     | 62,224                            | 62,224                            | 12,543                           | 12,543                          |
| Pseudo R-squared   | 0.0002                            | 0.0092                            | 0.0001                           | 0.0613                          |

### 6.3.3 Acquirer-affiliation and target earnings forecasts

Next I will examine the relation between acquirer-affiliation and earnings forecasts on targets. The results of the OLS regressions are depicted in table 22. The findings are mixed. Firstly, I find a negative but insignificant relation between acquirer-affiliation and short-term earnings forecasts before the announcement date of the M&A deal, which is consistent with the expectations, although the sign of the coefficient becomes positive for the two-year earnings forecasts after adding control variables to the regression. The insignificant relation could suggest that affiliated analysts do not bias their earnings forecasts because they are not willing to distort their earnings forecasts to protect the bank’s reputation. Contrary to the expectations, the relation becomes even more negative after the announcement date of the deal, but again the relation is insignificant, suggesting that there is no clear bias in the earnings forecasts of affiliated analysts.

Although the relation is insignificant, the negative sign of the relation is consistent with the findings of Malmendier and Shantikumar (2007) who found that analysts affiliated through equity underwriting are negatively biased in their earnings forecasts, possibly in order to let management beat the consensus.

Table 22: Results acquirer-affiliation and target earnings forecasts

Ordinary least squares regression analysis (regression 6) of short-term earnings per share forecasts on the target on acquirer-affiliation and control variables. Regressions under sub a refer to hypothesis 3a, which describes the period before the announcement date of the M&A deal. Regressions under sub b refer to hypothesis 3b, which describes the period after the announcement date of the M&A deal. “EPS1” and “EPS2” refer to the one-year and two-year earnings forecasts respectively, as dependent variables of the regressions. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| EPS forecast on target                        | EPS1              | EPS1               | EPS2               | EPS2                | EPS1              | EPS1                | EPS2              | EPS2                |
|---|-------------------|--------------------|--------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
|   | (6a)              | (6a)               | (6a)               | (6a)                | (6b)              | (6b)                | (6b)              | (6b)                |
| Acquirer-affiliation                          | -1.077<br>(0.227) | -.314<br>(0.910)   | -.732**<br>(0.036) | .723<br>(0.420)     | -1.466<br>(0.146) | -10.598<br>(0.309)  | -1.206<br>(0.355) | -3.687<br>(0.751)   |
| Log of Days between EPS forecast deal         |                   | -.068**<br>(0.037) |                    | -.120***<br>(0.000) |                   | -.136***<br>(0.000) |                   | -.103***<br>(0.000) |
| Log of firm size                              |                   | .363***<br>(0.000) |                    | .367***<br>(0.000)  |                   | .466***<br>(0.000)  |                   | .497***<br>(0.000)  |
| Log of transaction value                      |                   | .089**<br>(0.008)  |                    | .105***<br>(0.000)  |                   | .245***<br>(0.000)  |                   | .207***<br>(0.000)  |
| Log of transaction value*Acquirer-affiliation |                   | .051<br>(0.923)    |                    | -.087<br>(0.596)    |                   | 2.262<br>(0.277)    |                   | .966<br>(0.664)     |
| Deal fixed effects                            | No                | Yes                | No                 | Yes                 | No                | Yes                 | No                | Yes                 |
| Number of observations                        | 32,650            | 32,650             | 31,091             | 31,091              | 5,871             | 5,871               | 5,079             | 5,079               |
| Adjusted R-squared                            | 0.000             | 0.115              | 0.0001             | 0.0849              | 0.0002            | 0.3870              | 0.0000            | 0.4587              |

Table 23: Mean centering as robustness check for regression 6

Ordinary least squares regression analysis (regression 6) of short-term earnings per share forecasts on the target on acquirer-affiliation and control variables. Regressions under sub a refer to hypothesis 3a, which describes the period before the announcement date of the M&A deal. Regressions under sub b refer to hypothesis 3b, which describes the period after the announcement date of the M&A deal. “EPS1” and “EPS2” refer to the one-year and two-year earnings forecasts respectively, as dependent variables of the regressions. The variables for acquirer-affiliation and log transaction value are centered, by subtracting the mean of the variables from each data item. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| EPS forecast on target                                   | EPS1              | EPS1               | EPS2               | EPS2                | EPS1              | EPS1                | EPS2              | EPS2                |
|--|-------------------|--------------------|--------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
|  | (6a)              | (6a)               | (6a)               | (6a)                | (6b)              | (6b)                | (6b)              | (6b)                |
| Acquirer-affiliation (centered)                          | -1.077<br>(0.227) | .075<br>(0.964)    | -.732**<br>(0.036) | .061<br>(0.909)     | -1.466<br>(0.146) | 6.324<br>(0.309)    | -1.206<br>(0.228) | 3.539<br>(0.491)    |
| Log of Days between EPS forecast deal                    |                   | -.068**<br>(0.037) |                    | -.120***<br>(0.000) |                   | -.136***<br>(0.000) |                   | -.103***<br>(0.000) |
| Log of firm size   |                   | .363***<br>(0.000) |                    | .367***<br>(0.000)  |                   | .466***<br>(0.000)  |                   | .497***<br>(0.000)  |
| Log of transaction value (centered)                      |                   | .089**<br>(0.008)  |                    | .105***<br>(0.000)  |                   | .245***<br>(0.000)  |                   | .207***<br>(0.000)  |
| Log of transaction value*Acquirer-affiliation (centered) |                   | .051<br>(0.923)    |                    | -.087<br>(0.596)    |                   | 2.262<br>(0.277)    |                   | .966<br>(0.664)     |
| Deal fixed effects                                       | No                | Yes                | No                 | Yes                 | No                | Yes                 | No                | Yes                 |
| Number of observations                                   | 32,650            | 32,650             | 31,091             | 31,091              | 5,871             | 5,871               | 5,079             | 5,079               |
| Adjusted R-squared                                       | 0.000             | 0.115              | 0.0001             | 0.0849              | 0.0002            | 0.3870              | 0.0000            | 0.4587              |



Again, I perform a sanity check by running the same regressions after having centered the variables with high collinearity. This changes sign of the affiliation coefficients before and after the announcement date of the deal. I find a positive coefficient now, which would suggest a positive bias in the earnings forecasts of affiliated analysts, however the relation is still insignificant. Also the signs of the coefficient are not consistent, since it changes from negative to positive after adding control variables that are mean centered. The coefficients of these regressions are depicted in table 23.

## **6.4 Target-affiliation and acquirer recommendations and earnings forecasts**

In this section I will examine whether target-affiliated analysts bias their recommendations and earnings forecasts on acquirers.

### **6.4.1 Target-affiliation and acquirer recommendations**

I will first examine whether target-affiliated analysts issue more negative recommendations on acquirers before the announcement date of the deal and more positive recommendations after the announcement date of the deal. In table 24, the results of the ordinal logistic regression on target-affiliation and acquirer recommendations are depicted.

In the first model, I find a strong negative relation between target-affiliation and acquirer recommendations, which implies a positive bias for target-affiliated analysts in their recommendations on the acquirer, before the announcement date of the M&A deal. This is not consistent with the expectations expressed in hypothesis 4a, since a positive bias in acquirer recommendations does not result in a better deal exchange rate for the target. In the second model, this relation becomes even more negative after adding the control variables to the model. This negative coefficient is consistent with hypothesis 4b, which states that target-affiliated analysts have a positive bias in their recommendations for the acquirer after the announcement date of the deal. However, the coefficient is not consistent since its sign changes. The results suggest that target-affiliated analysts have a strong positive bias in their recommendations on the acquirer in general, which is not completely consistent with the expectation that target-affiliated analysts would be negatively biased before the announcement deal in order to improve the exchange ratio for the target.

**Table 24: Results target-affiliation and acquirer recommendations with categorical outcome variable**  
Ordinal logistic regression analysis (regression 7) on the relation between target-affiliation and recommendations on the acquirer. “Log of transaction value \* Target-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for target-affiliation. 7a and 7b refer to the results for regression 7 for the recommendations issued before and after the announcement date of the deal respectively. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| Recommendation on Acquirer (categorical)     | (7a)                | (7a)                 | (7b)                | (7b)                 |
|--|---------------------|----------------------|---------------------|----------------------|
| Target-affiliation                           | -.222***<br>(0.000) | -4.850***<br>(0.000) | 1.594***<br>(0.000) | -18.298**<br>(0.000) |
| Log of Days between recommendations and deal |                     | -.075***<br>(0.000)  |                     | .322***<br>(0.000)   |
| Log of firm size                             |                     | .011***<br>(0.003)   |                     | -.009***<br>(0.000)  |
| Log of transaction value                     |                     | .034***<br>(0.000)   |                     | -.011***<br>(0.000)  |
| Log of transaction Value*Target-affiliation  |                     | .787***<br>(0.000)   |                     | 2.361**<br>(0.002)   |
| Deal fixed effects                           | No                  | Yes                  | No                  | Yes                  |
| Number of observations                       | 106,286             | 106,286              | 20,751              | 20,751               |
| Pseudo R-squared                             | 0.0002              | 0.0080               | 0.0140              | 0.0670               |

### 6.4.2 Robustness check

For robustness I run the regressions again with the binary variable for recommendations as outcome variable, using ordinary least squares. Again I find negative, but less strong, relations between target-affiliation and recommendations, suggesting a positive bias before and after the determination of the deal exchange rate. Table 25 summarizes the results.

I find that the affiliation variable is strongly correlated with the interaction term, with a VIF of 225.75. Therefore I perform mean centering for the affiliation variable and the transaction value variable, and run additional regressions. The results are depicted in table 26. The results show much smaller coefficients for the affiliation variable, suggesting a much weaker bias for affiliated analysts.

**Table 25: Results target-affiliation and acquirer recommendations with binary outcome variable**  
**Ordinary least squares regression analysis (regression 7) on the relation between target-affiliation and recommendations on the acquirer. “Log of transaction value \* Target-affiliation” refers to an interactive variable between the natural logarithm of the transaction value and the dummy variable for target-affiliation. 7a and 7b refer to the results for regression 7 for the recommendations issued before and after the announcement date of the deal respectively. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| <b>Recommendation on Acquirer (binary)</b>   | <b>(7a)</b>         | <b>(7a)</b>         | <b>(7b)</b>        | <b>(7b)</b>         |
|--|---------------------|---------------------|--------------------|---------------------|
| Target-affiliation                           | -.077***<br>(0.000) | -.163***<br>(0.000) | .582***<br>(0.000) | -2.756**<br>(0.000) |
| Log of Days between recommendations and deal |                     | .034***<br>(0.000)  |                    | .028***<br>(0.000)  |
| Log of firm size                             |                     | .005***<br>(0.000)  |                    | -.061***<br>(0.000) |
| Log of transaction value                     |                     | .004<br>(0.000)     |                    | .084***<br>(0.000)  |
| Log of transaction Value*Target-affiliation  |                     | .018**<br>(0.002)   |                    | -.551***<br>(0.000) |
| Deal fixed effects                           | No                  | Yes                 | No                 | Yes                 |
| Number of observations                       | 106,286             | 106,286             | 20,751             | 20,751              |
| Adjusted R-squared                           | 0.0027              | 0.0226              | 0.1575             | 0.2783              |

**Table 26: Mean centering as robustness check for regression 7**  
**Ordinary least squares regression analysis (regression 7) on the relation between target-affiliation and recommendations on the acquirer. 7a and 7b refer to the results for regression 7 for the recommendations issued before and after the announcement date of the deal respectively. The variables for acquirer-affiliation and log transaction value are centered, by subtracting the mean of the variables from each data item. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| <b>Recommendation on Acquirer (categorical)</b>        | <b>(7a)</b>         | <b>(7a)</b>         | <b>(7b)</b>         | <b>(7b)</b>         |
|--|---------------------|---------------------|---------------------|---------------------|
| Target-affiliation (centered)                          | -.222***<br>(0.000) | -.967***<br>(0.000) | 1.594***<br>(0.000) | .504**<br>(0.000)   |
| Log of Days between recommendations and deal           |                     | -.065***<br>(0.000) |                     | .595***<br>(0.000)  |
| Log of firm size                                       |                     | -.003***<br>(0.427) |                     | -.423***<br>(0.000) |
| Log of transaction value (centered)                    |                     | .069***<br>(0.000)  |                     | .544***<br>(0.000)  |
| Log of transaction Value*Target-affiliation (centered) |                     | -.387***<br>(0.000) |                     | .395**<br>(0.000)   |
| Deal fixed effects                                     | No                  | Yes                 | No                  | Yes                 |
| Number of observations                                 | 106,286             | 106,286             | 20,751              | 20,751              |
| Pseudo R-squared                                       | 0.0002              | 0.0149              | 0.0140              | 0.0875              |

### **6.4.3 Target-affiliation and acquirer earnings forecasts**

Next, I will test whether there is a relation between target-affiliation and the earnings forecasts on the acquirer, before and after the announcement date of the deal. In table 27, the results of the OLS regressions on the earnings forecasts are depicted. The results indicate a negative relation between target-affiliation and acquirer earnings forecasts before the announcement date of the deal, although this relation is not significant and not consistent. After the announcement date of the deal, the relation becomes even more negative, suggesting that target-affiliated analysts are always negatively biased in their earnings forecasts on the acquirer. However, these coefficients are also not consistent as the switch signs after adding control variables to the model.

Running the regressions again, after having centered the affiliation variable and the transaction value variable to its means, results in coefficients that are more consistent. The results can be found in table 28. I find a consistently negative relation before the announcement date of the deal, suggesting a negative bias of target-affiliated analysts and a consistently positive relation after the announcement date of the deal, suggesting a positive bias. These findings are consistent with the expectations expressed in hypothesis 4a and 4b. The findings are contradictory to the findings in the previous section, since the results in that section suggested that target-affiliated analysts are positively biased in their recommendations on the acquirer before the announcement date of the deal and negatively biased after the announcement date.

**Table 27: Results target-affiliation and acquirer earnings forecasts**

Ordinary least squares regression analysis (regression 8) of short-term earnings per share forecasts on the acquirer on target-affiliation and control variables. Regressions under sub a refer to hypothesis 4a, which describes the period before the announcement date of the M&A deal. Regressions under sub b refer to hypothesis 4b, which describes the period after the announcement date of the M&A deal. “EPS1” and “EPS2” refer to the one-year and two-year earnings forecasts respectively, as dependent variables of the regressions. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| EPS forecasts on acquirer                   | EPS1                | EPS1               | EPS2               | EPS2                | EPS1                | EPS1                 | EPS2                | EPS2                 |
|---|---------------------|--------------------|--------------------|---------------------|---------------------|----------------------|---------------------|----------------------|
|   | (8a)                | (8a)               | (8a)               | (8a)                | (8b)                | (8b)                 | (8b)                | (8b)                 |
| Target-affiliation                          | -.138***<br>(0.120) | .271<br>(0.695)    | -.357**<br>(0.003) | -.147<br>(0.864)    | 1.484***<br>(0.000) | -4.464***<br>(0.000) | 1.696***<br>(0.000) | -5.244***<br>(0.000) |
| Log of Days between EPS forecast and deal   |                     | -.220***<br>(0.00) |                    | -.235***<br>(0.000) |                     | -.059***<br>(0.000)  |                     | -.055***<br>(0.000)  |
| Log of firm size                            |                     | .484***<br>(0.000) |                    | .508***<br>(0.000)  |                     | .223***<br>(0.000)   |                     | .177***<br>(0.000)   |
| Log of transaction value                    |                     | .096***<br>(0.000) |                    | .134***<br>(0.000)  |                     | .227***<br>(0.000)   |                     | .291***<br>(0.000)   |
| Log of transaction value*Target-affiliation |                     | -.060<br>(0.605)   |                    | -.013<br>(0.926)    |                     | .954***<br>(0.000)   |                     | 1.119***<br>(0.000)  |
| Deal fixed effects                          | No                  | Yes                | No                 | Yes                 | No                  | Yes                  | No                  | Yes                  |
| Number of observations                      | 50,805              | 50,805             | 48,289             | 48,289              | 11,204              | 11,204               | 10,964              | 10,964               |
| Adjusted R-squared                          | 0.0000              | 0.0784             | 0.0002             | 0.0537              | 0.0117              | 0.1042               | 0.0202              | 0.1417               |

Table 28: Mean centering as robustness check for regression 8

Ordinary least squares regression analysis (regression 8) of short-term earnings per share forecasts on the acquirer on target-affiliation and control variables. Regressions under sub a refer to hypothesis 4a, which describes the period before the announcement date of the M&A deal. Regressions under sub b refer to hypothesis 4b, which describes the period after the announcement date of the M&A deal. “EPS1” and “EPS2” refer to the one-year and two-year earnings forecasts respectively, as dependent variables of the regressions. The variables for acquirer-affiliation and log transaction value are centered, by subtracting the mean of the variables from each data item. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| EPS forecasts on acquirer                              | EPS1             | EPS1             | EPS2            | EPS2             | EPS1            | EPS1             | EPS2            | EPS2             |
|--|------------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
|  | (8a)             | (8a)             | (8a)            | (8a)             | (8b)            | (8b)             | (8b)            | (8b)             |
| Target-affiliation (centered)                          | <b>-0.138***</b> | <b>-0.142</b>    | <b>-0.357**</b> | <b>-0.239</b>    | <b>1.484***</b> | <b>2.209***</b>  | <b>1.696***</b> | <b>2.583***</b>  |
|  | <b>(0.120)</b>   | <b>(0.318)</b>   | <b>(0.003)</b>  | <b>(0.864)</b>   | <b>(0.000)</b>  | <b>(0.000)</b>   | <b>(0.000)</b>  | <b>(0.000)</b>   |
| Log of Days between EPS forecast and deal              |                  | <b>-0.220***</b> |                 | <b>-0.235***</b> |                 | <b>-0.059***</b> |                 | <b>-0.055***</b> |
|  |                  | <b>(0.00)</b>    |                 | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |
| Log of firm size                                       |                  | <b>.484***</b>   |                 | <b>.508***</b>   |                 | <b>.223***</b>   |                 | <b>.177***</b>   |
|  |                  | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |
| Log of transaction value (centered)                    |                  | <b>.096***</b>   |                 | <b>.134***</b>   |                 | <b>.227***</b>   |                 | <b>.291***</b>   |
|  |                  | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |
| Log of transaction value*Target-affiliation (centered) |                  | <b>-0.060</b>    |                 | <b>-0.013</b>    |                 | <b>.954***</b>   |                 | <b>1.119***</b>  |
|  |                  | <b>(0.605)</b>   |                 | <b>(0.926)</b>   |                 | <b>(0.000)</b>   |                 | <b>(0.000)</b>   |
| Deal fixed effects                                     | No               | Yes              | No              | Yes              | No              | Yes              | No              | Yes              |
| Number of observations                                 | 50,805           | 50,805           | 48,289          | 48,289           | 11,204          | 11,204           | 10,964          | 10,964           |
| Adjusted R-squared                                     | 0.0000           | 0.0784           | 0.0002          | 0.0537           | 0.0117          | 0.1042           | 0.0202          | 0.1417           |

The findings for hypothesis 1-4 are summarized in table 29. Overall, the findings are mixed, since the coefficient of the affiliation variable is often not consistent. The relation between analyst affiliation and recommendations that I find after correcting for multicollinearity, is often in line with the hypotheses. I find that acquirer-affiliated analysts issue more optimistic recommendations on acquirers before the announcement date of the deal and more pessimistic recommendations after the announcement date of the deal. The results show that target-affiliated analysts are positively biased in their recommendations towards targets. Furthermore, I find that acquirer-affiliated analysts are more pessimistic in their recommendations towards targets before the announcement date of the deal and more optimistic after the announcement date of the deal. The findings concerning the relation between target-affiliated analysts that issue recommendations on acquirers are not in line with the hypotheses. I find that target-affiliated analysts are positively biased before the announcement date of the deal and negatively biased after the announcement date, which is the opposite effect of what was expected.

I find that affiliated analysts are negatively biased in the earnings forecasts that they issue, at almost all times, except for target-affiliated analysts that issue earnings forecasts on acquirers after the announcement date of the deal. These findings are consistent with the findings of Malmendier and Shantikumar, who found that affiliated analysts are negatively biased in the earnings forecasts that they issue, possibly because they want to let managers beat these forecasts.

**Table 29: Summary of findings regressions 1-4**

**Summary of the findings on the relation between analyst affiliation and recommendations on the one hand and earnings forecasts on the other hand. The findings in bold are consistent with the expectations expressed in the hypotheses.**

|     | Expected relation | Recommendations (categorical outcome) | Recommendations (binary outcome) | Mean centering       | Earnings forecasts   | Mean centering       |
|-----|-------------------|---------------------------------------|----------------------------------|----------------------|----------------------|----------------------|
| H1a | +                 | Mixed                                 | Mixed                            | <b>Positive bias</b> | Mixed                | Negative bias        |
| H1b | -                 | <b>Negative bias</b>                  | Mixed                            | <b>Negative bias</b> | <b>Negative bias</b> | <b>Negative bias</b> |
| H2  | +                 | Mixed                                 | <b>Positive bias</b>             | <b>Positive bias</b> | Negative bias        | Negative bias        |
| H3a | -                 | <b>Negative bias</b>                  | <b>Negative bias</b>             | <b>Negative bias</b> | <b>Negative bias</b> |                      |
| H3b | +                 | <b>Positive bias</b>                  | Mixed                            | <b>Positive bias</b> | Negative bias        |                      |
| H4a | -                 | Positive bias                         | <b>Positive bias</b>             | Positive bias        | <b>Negative bias</b> | <b>Negative bias</b> |
| H4b | +                 | Negative bias                         | Mixed                            | Negative bias        | Mixed                | <b>Positive bias</b> |

## 6.5 The effect of affiliated recommendations on deal completion

In this section, I examine whether biased recommendations of affiliated analysts result in a higher probability of deal completion, compared to unbiased recommendations of affiliated analysts. I do this by running the following regressions using the model of ordinary least squares and the probit model:

$$COMP = \alpha + \beta REC_p + \varepsilon \quad (9)$$

$$COMP = \alpha + \beta REC_n + \varepsilon \quad (10)$$

I perform regression 9, two times, with two different datasets, and regression 10, two times, with two different datasets described in chapter 4 for each regression model. In the datasets, only recommendations of affiliated analysts are included. In regression 9 I test whether positive recommendations of target-affiliated analysts on the target and positive recommendations of target-affiliated analysts on the acquirer, issued after the exchange rate of the deal is set, result in a higher probability of deal completion compared to negative recommendations in these situations. In other words, I test whether positively biased recommendations of affiliated analysts are positively related to the probability of deal completion. The results of the OLS regressions are depicted in table 30.

**Table 30: Results OLS regression 9**

Ordinary least squares regression analysis (regression 9) on the relation between positive recommendations (REC<sub>p</sub>) of affiliated analysts on the probability of deal completion (COMP), described in section 5.4. 9a and 9b refer to the results for regression 9 in dataset 2 and 4b respectively. “Positive recommendations” is a dummy variable equal to one if a recommendation contains a ‘hold’, ‘buy’ or ‘strong buy’ advice. “Probability of completion” is a dummy variable equal to one if a deal was completed. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| Probability of deal completion | 9a              | 9b                 |
|--------------------------------|-----------------|--------------------|
| Positive recommendations       | .004<br>(0.957) | .677***<br>(0.000) |
| Number of observations         | 6,904           | 1,944              |
| Adjusted R-squared             | 0.0000          | 0.4675             |

The findings show a positive, but insignificant relation between positive recommendations of affiliated analysts and the probability of deal completion for regressions 9a. This suggests that



ensuring deal completion is not achieved by target affiliated analyst through optimistically biasing their recommendations on target firms. Since I did find evidence that target-affiliated analysts positively bias their recommendations on targets, there must be another incentive besides increasing the probability of deal completion for these analysts to bias their recommendations.

The findings show a stronger and significantly positive relation between positive recommendations of affiliated analysts and the probability of deal completion in regression 9b. This would imply that the incentive to ensure deal completion could be a reason for target-affiliated analysts to optimistically bias their recommendations on acquirers after the announcement date of the deal, which is consistent with the findings under hypothesis 4 that these analysts positively bias their recommendations after the exchange ratio is set.

The results of running probit regressions are similar. Again I find a small and insignificantly positive relation in regression 9a and a strong significantly positive relation in regression 9b. The results of the probit regressions are summarized in table 31.

**Table 31: Results probit regression 9**

**Probit regression analysis (regression 9) on the relation between positive recommendations (RECp) of affiliated analysts on the probability of deal completion (COMP), described in section 5.4. 9a and 9b refer to the results for regression 9 in dataset 2 and 4b respectively. “Positive recommendations” is a dummy variable equal to one if a recommendation contains a ‘hold’, ‘buy’ or ‘strong buy’ advice. “Probability of completion” is a dummy variable equal to one if a deal was completed. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.**

| Probability of deal completion | 9a              | 9b                  |
|--------------------------------|-----------------|---------------------|
| Positive recommendations       | .010<br>(0.957) | 2.136***<br>(0.000) |
| Number of observations         | 6,904           | 1,944               |
| Pseudo R-squared               | 0.0000          | 0.3877              |

With regression 10 I test whether negative recommendations of acquirer-affiliated analysts on the acquirer, issued after the exchange rate of the deal is set and negative recommendations of target-affiliated analysts on the acquirer, issued before the exchange rate of the deal is set, result in a higher probability of deal completion compared to negative recommendations in these situations. In other words, I test whether negatively biased recommendations are related to a higher probability of deal completion. The results are presented in table 32.

**Table 32: Results OLS regression 10**

Ordinary least squares regression analysis (regression 10) on the relation between negative recommendations (RECn) of affiliated analysts on the probability of deal completion (COMP), described in section 5.4. 10a and 10b refer to the results for regression 10 in dataset 1b and 4a respectively. “Negative recommendations” is a dummy variable equal to one if a recommendation contains a ‘sell’ or ‘strong sell’ advice. “Probability of completion” is a dummy variable equal to one if a deal was completed. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| Probability of deal completion | 10a                 | 10b                  |
|--------------------------------|---------------------|----------------------|
| Negative recommendations       | -.378***<br>(0.000) | -.107 ***<br>(0.000) |
| Number of observations         | 21,715              | 118,813              |
| Adjusted R-squared             | 0.0682              | 0.0189               |

The findings show a significant and negative relation between the negative recommendations of affiliated analysts and the probability of deal completion. This suggests that acquirer-affiliated recommendations on acquirers, issued after the exchange rate of the deal is set and negative recommendations of target-affiliated analysts on the acquirer, issued before the exchange rate of the deal is set, result in a lower probability of deal completion compared to negative recommendations, which means that the incentive to ensure deal completion is not a reason for affiliated analysts to negatively bias their recommendations. These findings are consistent with the findings under hypothesis 4a, since the results suggested that target-affiliated analysts are positively instead of negatively biased in their recommendations on the acquirer before the announcement date of the deal. The findings are not consistent however with the findings under hypothesis 1b, since these findings did suggest that there is a negative bias for recommendations from acquirer-affiliated analysts on acquirers, after the announcement date of the deal. Hence, analysts face another incentive besides ensuring deal completion that should explain this negative bias.

Running probit regressions leads to similar results, as I find significantly negative relations between negative recommendations and the probability of deal completion again. The results of the probit regressions are depicted in table 33.

Table 33: Results probit regression 10

Probit regression analysis (regression 10) on the relation between negative recommendations (RECn) of affiliated analysts on the probability of deal completion (COMP), described in section 5.4. 10a and 10b refer to the results for regression 10 in dataset 1b and 4a respectively. “Negative recommendations” is a dummy variable equal to one if a recommendation contains a ‘sell’ or ‘strong sell’ advice. “Probability of completion” is a dummy variable equal to one if a deal was completed. Reported in parentheses are p-values. \*, \*\* and \*\*\* indicate the 10%, 5% and 1% significance levels respectively.

| Probability of deal completion | 10a                  | 10b                 |
|--------------------------------|----------------------|---------------------|
| Negative recommendations       | -1.080***<br>(0.000) | -.107***<br>(0.000) |
| Number of observations         | 21,715               | 118,813             |
| Pseudo R-squared               | 0.0533               | 0.0312              |

## 7. Conclusion

This paper examines the relation between analyst-affiliation through M&A advisory services and the recommendations and earnings forecasts they issue, for a sample of 17,000 M&A deals that took place between 2010 and 2014. I also examine whether biases in recommendations of affiliated analysts are caused by the incentive to ensure deal completion.

First of all, the findings suggest that acquirer-affiliated analysts are positively biased in their recommendations on acquirers before the exchange rate of the deal is determined. I find that acquirer-affiliated analysts are negatively biased in their recommendations on acquirers after the exchange rate of the deal is determined. These findings support hypothesis 1a and 1b. This also confirms the findings of Kolasinski and Kothari (2008) and Hausholter and Lowry (2008), who found that affiliated analysts issue more optimistic recommendations than unaffiliated analysts and that earnings forecasts issued by acquirer-affiliated analysts are more optimistic before the exchange rate of the deal is set and more pessimistic after the exchange rate is set.

Secondly, in line with hypothesis 2, I find that recommendations of target-affiliation is positively related to target recommendations, suggesting positive biasedness, which is consistent with the findings of Kolasinski and Kothari and Hausholter and Lowry (2008), who found similar results.

In line with hypothesis 3, I find that acquirer-affiliated analysts issue more negative recommendations on target firms, before the exchange rate of the deal is determined and more positive recommendations after the exchange rate is set. I do not find evidence that supports hypothesis 4, since I find an opposite pattern for the recommendations of target-affiliated analysts on acquirers.

I find that acquirer-affiliated analysts are negatively biased in the earnings forecasts they issue on acquirers and target-affiliated are negatively biased as well in the earnings forecasts they issue on target. This is not in line with the hypotheses, but it confirms the findings of Malmendier and Shantikumar (2007), who found that analysts affiliated through equity underwriting are generally negatively biased in the earnings forecasts they issue. Target-affiliated analysts that issue earnings forecasts on acquirers after the deal exchange rate is determined are positively biased in their earnings forecasts on acquirers, which is in line with hypothesis 4b. I do not find any significant results on the relation between acquirer-affiliation and earnings forecasts on targets nor do I find evidence for significant bias in the earnings forecasts of target-affiliated analysts on acquirers before the exchange rate of a deal is determined.

In the second part of this paper, I examine whether analysts bias their recommendations in an attempt to ensure deal completion. I therefore test if positive recommendations of affiliated analysts result in a higher probability of deal completion compared to negative recommendations, in the situations that a positive bias would be expected and whether negative recommendations of affiliated analysts are related to a higher probability of deal completion when a negative bias is assumed.

The findings suggest that only positive recommendations from target-affiliated analysts on acquirers after the exchange rate of the deal is set, are related to a higher probability of deal completion, but this relation is not always significant. The findings suggest that negative biasedness does not result in a higher probability of deal completion, which suggests that the observed negative biases are not caused by the incentive to increase the probability of deal completion. Biases in the recommendations of affiliated analysts can thus not be explained solely by the incentive to ensure deal completion.

The findings have implications for investors and regulators. Investors should be aware of the biases M&A affiliated analysts have in their recommendations and earnings forecasts and take this into account when evaluating the advice of affiliated analysts. Regulators might consider an actual split between the M&A advisory services of investment banks and research departments in order to prevent biases from occurring. While the results suggest that other incentives play a role, a way to eliminate the incentive to ensure deal completion is to change the way M&A bankers are compensated.

This paper has some limitations. Although I control for the number of days between the announcement date of recommendations and earnings forecasts on one hand and the announcement date of the mergers and acquisitions on the other hand, the dataset contains recommendations and forecasts that are issued up to 4 years before and after the related transaction. Furthermore, I did not have information on the fee structures that were applied for the compensation of M&A advisors in the dataset. Since the incentives of analysts are largely dependent on these fee structures, I would be more able to explain the results with information on this. Lastly, although I examine whether the reason for recommendation biases is the incentive to ensure deal completion, I cannot fully exclude selection bias as a cause for the biases in the recommendations of affiliated analysts.

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## 9. Appendix

**Table A1: Variable definitions**

**This table contains a description of the variables that are used in this paper.**

| Variable                          | Definition   |
|-----------------------------------|--|
| Acquirer-affiliation (AFFILacq)   | Dummy variable, which is equal to one if a recommendation or earnings forecast is issued by an analyst who is affiliated through M&A advisory with the acquiring firm.   |
| Target-affiliation (AFFILtar)     | Dummy variable, which is equal to one if a recommendation or earnings forecast is issued by an analyst who is affiliated through M&A advisory with the target firm.  |
| Acquirer recommendations (RECacq) | Categorical variable with five ordinal values on the recommendations that cover the acquiring firm, equal to 1 for a 'strong buy' recommendation, equal to 2 for a 'buy' recommendation, equal to 3 for a 'hold' recommendation, equal to 4 for a 'sell' recommendation and equal to 5 for a 'strong sell' recommendation. |
| Target recommendations (RECTar)   | Categorical variable with five ordinal values on the recommendations that cover the target firm, equal to 1 for a 'strong buy' recommendation, equal to 2 for a 'buy' recommendation, equal to 3 for a 'hold' recommendation, equal to 4 for a 'sell' recommendation and equal to 5 for a 'strong sell' recommendation.    |
| Firm size (SIZE)                  | The average market capitalization of a firm over the period 2010-2014.   |
| Transaction value (VALUE)         | The total price in dollars the acquirer has paid for the acquisition.  |
| Number of days (DAYS1 and DAYS2)  | The number of days between either a recommendation or earnings forecast and the announcement date of the M&A deal.   |

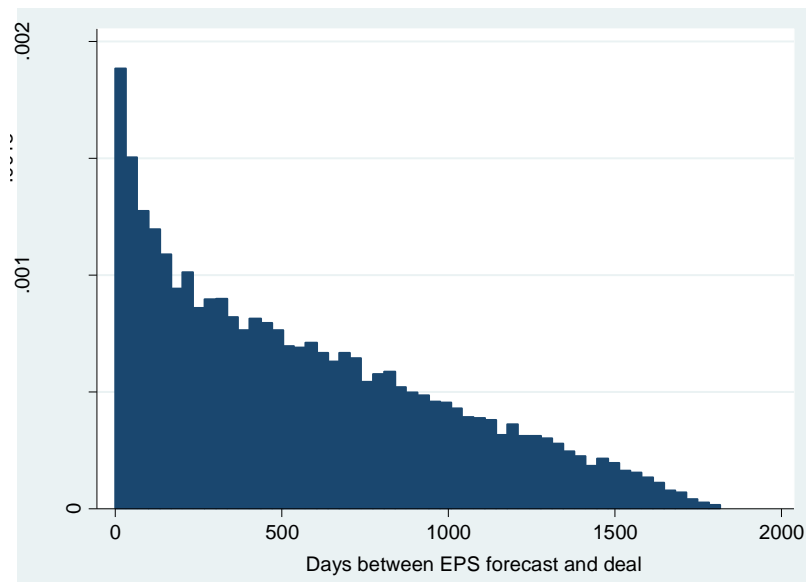
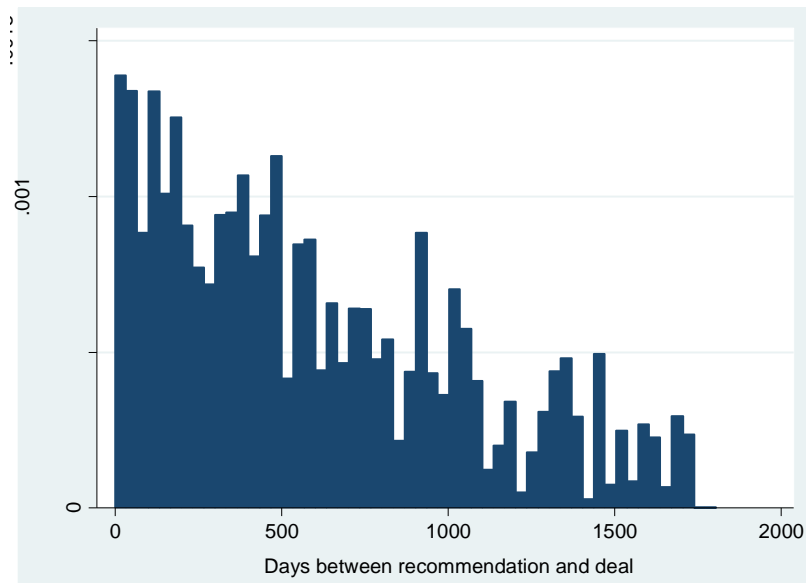


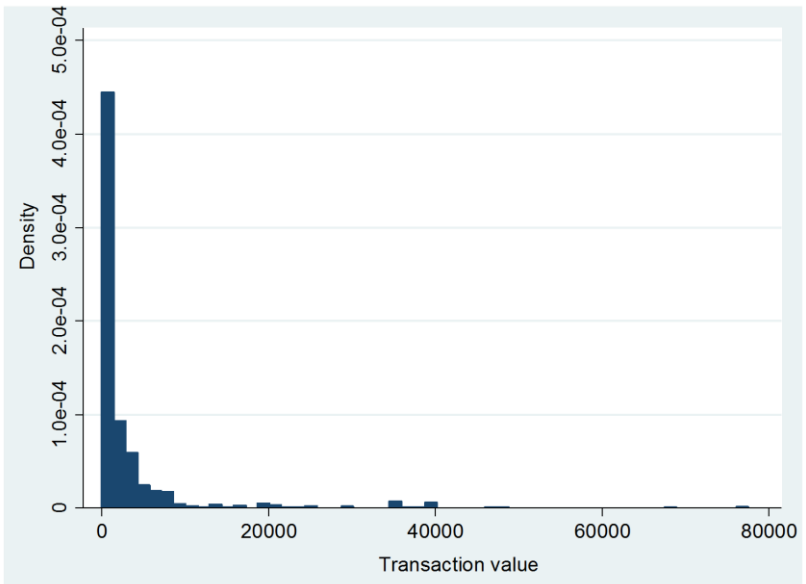
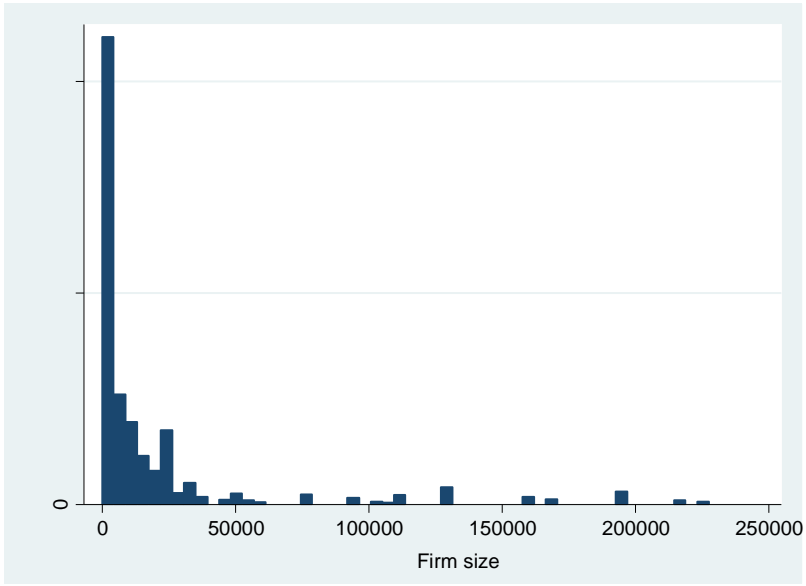
|                                       |  |
|---------------------------------------|--|
| One-year earnings per share (EPS1)    | Analyst forecast on the earnings per share of a firm, one year ahead.  |
| Two-year earnings per share (EPS2)    | Analyst forecast on the earnings per share of a firm, two years ahead.   |
| Probability of deal completion (COMP) | Dummy variable, which is equal to one if a deal was completed in the period 2010-2014.                                     |
| Positive recommendations (RECP)       | Dummy variable which is equal to one if a recommendation contained a 'buy' or 'strong buy' advice.                         |
| Negative recommendations (RECN)       | Dummy variable which is equal to one if a recommendation contained a 'sell' or 'strong sell' advice.                       |
| Cumulative abnormal returns (CAR)     | The cumulative abnormal returns on investments after the announcement dates of the recommendations of affiliated analysts. |

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Figure 1: Density curves control variables

The figures depict the density curves of the control variables firm size, transaction value, the number of days between the announcement date of the deal and the recommendations and earnings forecast respectively in dataset 1. The graphs show that these variables are all right skewed and therefore the logarithm of these variables is used in the regressions.





**Table A2: Variance Inflation Factors (VIF) affiliation variable and interaction term**

|               | <b>VIF</b> |
|---------------|------------|
| Regression 1a | 20.54      |
| Regression 1b | 62.85      |
| Regression 2a | 25.75      |
| Regression 2b | 15.94      |
| Regression 3  | 23.02      |
| Regression 4  | 23.02      |
| Regression 5a | 8.67       |
| Regression 5b | 24.38      |
| Regression 6a | 8.28       |
| Regression 6b | 152.75     |
| Regression 7a | 53.72      |
| Regression 7b | 224.90     |
| Regression 8a | 59.75      |
| Regression 8b | 98.17      |