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# Investment Banking and Analyst Objectivity: Evidence from Forecasts and Recommendations of Analysts Affiliated with M&A Advisors

Adam Kolasinski and S.P. Kothari

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## Evidence from Forecasts and Recommendations of Analysts Affiliated with M&A Advisors

By

Adam C. Kolasinski
MIT Sloan School of Management
50 Memorial Drive, E52-458
Cambridge, MA 02142-1261
(617) 253-3919
ack@mit.edu

S.P. Kothari
MIT Sloan School of Management
50 Memorial Drive, E52-325
Cambridge, MA 02142-1261
(617) 253-0994
kothari@mit.edu

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# Abstract

Previous research finds some evidence that analysts affiliated with equity underwriters issue more optimistic earnings growth forecasts and optimistic recommendations of client stock than unaffiliated analysts. Unfortunately, these studies are unable to discriminate between three competing hypotheses for the apparent optimism. Under the bribery hypothesis, underwriting clients, with the promise of underwriting fees, coax analysts to compromise their objectivity. The execution-related conflict of hypothesis postulates that the investment banks employing analysts who are more bullish on a particular stock are better able to execute the deal, and so the banks pressure their analysts to be bullish in order to enhance their execution ability. Finally, the selection bias hypothesis postulates that analysts are objective, but because of the enhanced execution ability, banks with more optimistic analysts are more likely to get selected as underwriters. We test these hypotheses in a previously unexplored setting, namely M&A activities. Depending on whether an analyst is affiliated with the target or the acquirer and whether the analyst report is about the target or the acquirer, the hypotheses predict analyst optimism in some cases and pessimism in other. Therefore, examining the issue of analyst bias in the M&A context allows us to shed some light on alternative explanations for the impact of analyst affiliation on the properties of analyst forecasts and recommendations.

# Investment Banking and Analyst Objectivity:
## Evidence from Forecasts and Recommendations of Analysts Affiliated with M&A Advisors

### 1. Introduction

Analysts play an important role in the securities underwriting business, and this role has become a topic of increasing interest to regulators and academics. Several studies find evidence that analysts affiliated with investment banking firms ("affiliated analysts") issue positively biased recommendations and overly optimistic long-term earnings growth forecasts of stocks underwritten by their employers.[1] Lin, McNichols and O'Brien (2003) find that affiliated analysts are slower to downgrade their recommendations of client firms than unaffiliated analysts, and Bradshaw, Richardson and Sloan (2003) offer evidence that analysts' consensus growth forecast for firms issuing securities is more optimistic than for firms not issuing any securities.

Consistent with the academic research suggesting that economic incentives stemming from investment-banking relations and brokerage commission revenues optimistically skew the tone of affiliated analysts' research, the New York State Attorney General recently reached a settlement with several investment banks. As per the settlement, in addition to paying a fine, the banks agreed to remove as a factor in analyst compensation the generation of investment banking revenue. The investment banks settled, it appears, largely because of the discovery of internal

[1] See Lin and McNichols (1998), Michaely and Womack (1999), Dechow, Hutton and Sloan (2000), Dugar and Nathan (1995).

memos in which, in order to maintain their employers' investment banking relationships with the issuers, the analysts admitted to recommending stocks they believed to be unsound investments.[2]

In the equity underwriting context, corporate managers are alleged to seek optimistic analyst coverage in the hope that it would enable the company to issue shares at a higher price. Furthermore, it is alleged that managers reward optimistic analyst coverage by giving their equity underwriting business to the investment-banking firm employing the analyst. Seeking to gain such rewards, analysts might compromise their objectivity when issuing forecasts and recommendations of firms from which their employers' investment banking departments are seeking to obtain business. Optimistic analyst coverage also benefits managers in ways in addition to pushing up new issue prices. Previous research demonstrates superior stock price performance associated with favorable analyst coverage (e.g., Womack, 1996). Therefore, managers have an incentive to do whatever they can to generate favorable analyst coverage, including rewarding firms who provide such coverage with M&A business.

In this paper we examine whether M&A relationships affect analyst objectivity. Studying analyst objectivity in the M&A context has several advantages. First, the M&A context allows for more powerful tests of the effect of investment banking revenue on analyst forecasts and recommendations than does the equity issuance context. The tests are more powerful because depending on the M&A relationship with the target or acquirer the analyst might have an incentive to bias the research optimistically or pessimistically. Second, M&A transactions are much more frequent than equity issuances, and M&A fees make up at least as large a portion of investment banking revenue as underwriting fees. Thus, the incentives M&A fees provide for analysts to compromise their objectivity are potentially as large as that of stock

[2] "Chronology of the Merrill Lynch Probe." *The Associated Press*. May 21, 2002. Also see the reports of the New York State Attorney General on his website: http://www.oag.state.ny.us/.

issuances. Third, the number of firms engaging in M&A transactions is greater than the number issuing equity in any one year. Therefore, M&A-driven analyst optimism or pessimism, if it were to exist, would be a more pervasive problem than equity underwriting-driven analyst optimism. Finally, and most importantly, unlike the equity underwriting context, the M&A context allows us to discriminate between competing hypotheses that predict a positive association between investment banking relationships and analyst optimism or pessimism.

At least three hypotheses are consistent with the finding that affiliated analysts are more optimistic in their coverage of underwriting clients. The first hypothesis, the "bribery hypothesis," postulates that managers reward favorable analyst coverage by giving underwriting business to their employers, and analysts taint their reports in order to gain this reward. The next two hypotheses rely on the premise that an investment bank with an optimistic analyst is better able to execute an underwriting deal. Under the "execution-related conflict of interest hypothesis," underwriter-affiilated analysts taint their reports in order to enhance their employer's ability to execute a deal effectively, thereby increasing the likelihood that they get the deal. Just because an investment bank can better execute a deal if its analyst is optimistic does not mean it will necessarily pressure an analyst to taint his reports. It is possible that the costs of exerting such pressure, such as jeopardizing the reputation of the research department, may outweigh the benefits. The fact that a bank does not exert such pressure, however, does not change the fact that its ability to sell an issue is enhanced by the optimism of its analyst about the issuer. Therefore banks with a more optimistic analyst, even if they do not pressure their analysts to be optimistic, are more likely to be selected to do a deal. We will refer the this last hypothesis as the "execution-related selection bias hypothesis." No study that finds a relation

between underwriter affiliation and analyst optimism is able to distinguish between these three hypotheses.

The M&A context allows us to distinguish the bribery hypothesis from the alternatives because it allows us to identify situations where neither analyst optimism nor pessimism can impact the execution ability of the M&A advisor employing the analyst. If neither execution-related bias is present, then the only possible explanation for an association between analyst optimism (or pessimism in some cases) and M&A fees can be the bribery hypothesis. We outline these situations in section 2. Unfortunately, the M&A context does not allow us to discriminate between the two execution-related hypotheses.

***Summary of results.*** We obtain information on every M&A deal completed between 1993 and 2001. Using OLS analysis, we test whether analysts working for firms that collect M&A fees, or have an M&A relationship, issue more or less biased forecasts relative to consensus. Notwithstanding the large sample size, and therefore high power, we fail to find significant evidence of bias in affiliated analyst forecasts. Using ordered logit analysis, we conduct a similar test on the recommendations of target or acquirer stock issued by affiliated analysts and find weak evidence in favor of either the execution-related hypotheses and no evidence in favor of the bribery hypothesis.

As we explain in the next section, the potential for bribery in the M&A context is just as high as in the underwriting context. We also show that the effect of analyst optimism or pessimism on an investment bank's execution ability is muted in the M&A context relative to the underwriting context. Therefore, our results cast doubt on the notion that association between analyst optimism and underwriting relationships found in previous studies is due to bribery. We cannot, however, say whether it is execution-related conflict of interest or selection bias. While

we can rule out the notion that CFO's bribe investment banks with underwriting business in return for favorable analyst coverage, and that investment banks in turn pressure their analysts to provide such coverage in response, we cannot rule out the possibility that investment banks pressure analysts to be optimistic in order to enhance their ability to sell a new issue, and hence win underwriting business. We note, however, that while the latter sort of behavior may be unethical and of genuine concern to regulators, it does not seem to us to be as destructive and corrupt as the former.

Ours is not the first study to cast doubt on the allegation of analyst corruption. Cowen, Gorysberg, and Healy (2003) as well as Agrawal and Chen (2003) find that analysts employed by investment banks on average issue forecasts that are no more optimistic than those issued by analysts employed by pure-play brokerage or independent research firms. Unfortunately, it is difficult to draw conclusive inferences from these results because the bulk firms covered by investment bank-employed analysts are may not be clients or potential clients, leaving the tests in these studies with little power. Furthermore, as we shall see in section 2, an investment banking relationship in some instances may give an analyst an incentive to be pessimistic rather than optimistic, making it unclear whether the conflicts of interest due to investment banking would on average make analysts employed by investment banks optimistic or pessimistic. Our study, in addition to discriminating against competing hypotheses, avoids these pitfalls.

This study proceeds as follows. Section 2 explains the advantages of studying analyst objectivity in the M&A context and describes how the case of M&A relationships allows us to distinguish between the bribery, as well as execution related conflict of interest and selection bias hypotheses. Section 3 describes our data and presents descriptive statistics and preliminary analysis based on such statistics. Section 4 describes our ordinary least squares analysis of EPS

and growth forecasts and presents the results. Section 5 describes our ordered logit analysis of recommendations and presents the results. Section 6 concludes.

## 2. M&A Context to Study Analyst Objectivity

In this section we discuss four topics. First, we describe how the M&A context allows us to design more powerful tests. Second, we explain why the potential for bribery is just as strong in the M&A context. Third, we demonstrate that M&A advisory activity is more pervasive than equity underwriting. Finally, we show that the M&A context allows us to distinguish between the bribery hypothesis and the two execution related hypotheses.

### 2.1 More Powerful Tests

Previous research suggests that analysts optimistically bias their research to generate equity underwriting business (e.g., Michaely and Womack, 1999). For reasons specific to the M&A context, managers would desire optimistic coverage of their own firm and, in some cases, pessimistic coverage of the counterparty's firm. If optimistic (pessimistic) coverage were to positively (negatively) influence the stock price, favorable coverage of the acquirer around the time of a stock M&A deal should improve the terms of the deal for the acquirer. By contrast, pessimistic coverage of the acquirer before the transaction is complete would sweeten terms for a target in a stock deal, since target shareholders want to get as many acquirer shares as possible. Similarly, optimistic coverage of the target firm would be good for target shareholders but bad for acquiring shareholders in both cash and stock deals. Therefore, if analysts bias their reports to please M&A clients, in some instances their reports will be optimistic, and in other instances they will be pessimistic. The optimism or pessimism would depend on which advisor the analyst is working for, whose stock he is covering, and the type of deal. The greater variety of predicted

biases enhances the power of the tests of analyst bias in the M&A context than in the equity underwriting context where analyst reports are always expected to be optimistically biased.

### 2.2 The Potential for Bribery: a Comparison of the M&A and Equity Underwriting Contexts

Stock issuances generate underwriting revenue for investment banking firms. However, these are rare events in the life of a firm; the vast majority of firms only have one, and only a few have more than two. By contrast many firms make multiple acquisitions in their lifetime, and at any given time the probability of being acquired is high for a large number of firms. The volume of M&A activity is an order of magnitude higher than equity underwriting. For instance, in 1999, one of the biggest equity issuance years in history, our analysis of the SDC equity issuance database shows that public equity offerings in which an investment bank was hired raised just under $200 billion in aggregate proceeds. By contrast, in 1999 the aggregate transaction value of M&A deals in which at least one investment bank was hired as an advisor exceeded $1.8 trillion.

Not only do the number and dollar amounts of M&A transactions far exceed those of equity issuances, M&A fees in aggregate are also as important, if not more important, to investment banking firms than equity underwriting fees. According to Freeman & Co. estimates, and as illustrated in figure 1, in every year since 1994, M&A fees in the US have been at least as large as equity underwriting fees, and in recent years significantly larger. Since M&A fee revenues are just as important to the investment bankers as are underwriting revenues, if corporations use the promise of equity underwriting fees to coax investment banks into providing desired analyst coverage, then they are just as likely to use M&A fees. Since M&A transactions occur more frequently, the promise of M&A business would give acquiring firms' managers even more leverage. Such a promise would mean repeat business for the investment bank, rather than a one-time equity underwriting fee. Furthermore, there is no reason why profit-maximizing

investment banks that pressure analysts to provide desired coverage in order to obtain underwriting business would not do the same in order to obtain M&A business, provided M&A clients reward desired coverage with M&A business.[3]

**[Figure 1]**

As counter-argument, one might point out that analysts are involved in the equity issuance process but are kept out of the M&A process. That is, analysts find out about equity underwriting deals earlier than M&A deals, about which they only officially learn after the public announcement. Hence, it might be argued that analysts have a greater opportunity to compromise their objectivity in the equity issuance context than in the M&A context. Conversations with practitioners and personal experience in the investment banking industry on the part of one of the authors, however, reveal that this argument has little validity.[4] Analysts are typically brought on board on equity deals late in the process, just before the deals are made public. Therefore, they do not learn about them much earlier than the public, at least officially. Furthermore, SEC regulations prohibit analysts from reporting on client firms from the time they have been brought on board an equity deal until the end of the SEC-mandated "quiet period" of 25 days after the deal.[5] By contrast, there are no regulations or internal policies prohibiting analysts affiliated with M&A advisors from issuing reports on client or counterparty firms at any

[3] There may be institutional reasons why investment banks might pressure analysts to generate underwriting business but not M&A business. For instance, the M&A and research departments may not be linked in the same manner as the underwriting and research departments, so the structure of the institution may not allow for analysts to be rewarded for generating M&A revenue as for underwriting revenue, even though such rewards would be profit-maximizing. We ignore such questions here, leaving them for future research.

[4] We are grateful to Kevin Rock for his elucidation of the institutional details. William Fronhoefer also provided valuable insights. Adam Kolasinski worked in the investment banking division of Wasserstein Perrella & Co. from 1998-1999.

[5] See SEC rule 174 of the Securities Act of 1933 and the 1988 revision of rule 174.

time.[6] Thus, there may be a greater opportunity for analysts to bias their forecasts and recommendations around the time of M&A deals than equity underwriting deals. The New York State Attorney General considers potential for conflict of interest problems generated by M&A relationships strong enough that the state's settlement with the various securities firms requires analysts to disclose in their reports M&A relationships as well as equity underwriting relationships.[7]

From the above analysis, we can see that M&A fees constitute an enormous amount of revenue for investment banking firms. In fact, since these fees constitute an even greater share of investment banking revenue than underwriting fees, the promise of M&A business has the potential of giving M&A clients just as much, if not more leverage over investment bank-affiliated affiliated analysts as does the promise of underwriting business. Therefore, if the bribery hypothesis holds in the underwriting context, it should also hold in the M&A context.

### 2.3 The Pervasiveness of M&A Activity

Analyst bias in the M&A context is important from the standpoint of public policy. The proportion of firms undergoing or likely to undergo an equity issue at any given point in time is small relative to the total number of public firms. Using the CRSP and SDC databases, we calculate that in 1999, one of the biggest equity issuance years in history, the year-end aggregate market capitalization of US firms undergoing at least one equity offering was $2.25 trillion. This amount, while not an inconsiderable number, was only 13% of the value of aggregate US equity market capitalization as calculated using CRSP data. By contrast, the total 1999 year-end aggregate market value of public firms that engaged in an M&A transaction in which an advisor

[6] Investment banks almost universally have compliance policies that restrict analysts' direct communications with M&A client firms, but lack of such communications does not stop them from issuing reports about M&A clients.

[7] John Goff, "Wall? What Chinese Wall?" *CFO.com,* April 22, 2002.

was hired was $5.15 trillion, or 34.25% of aggregate US market capitalization. Figure 2 plots the historical share of aggregate US equity market capitalization represented by firms undergoing equity offerings and M&A transactions. If M&A relationships taint analyst forecasts and recommendations, there would potentially exist a (policy) problem of massive proportions.

**[Figure 2]**

### 2.4 Distinguishing Between Competing Hypotheses

As discussed in the introduction, the association between analyst optimism and underwriting relationships found in previous research is consistent with three different hypotheses: the bribery hypothesis, and the execution-related conflict of interest and selection bias hypotheses. In this section, we note how previous research fails to distinguish between these hypotheses (section 2.4.1), derive predictions for the different hypotheses (sections 2.4.2 and 2.4.3), and demonstrate how, in some circumstances, the bribery hypothesis makes different predictions from the other two hypotheses in the M&A context (see section 2.4.4). Section 2.4.5 compares the institutional setting surrounding M&A transactions against equity underwriting activities and demonstrates that the execution-related conflicts of interest and selection biases are likely to be muted in the M&A context relative to the equity underwriting context. Section 2.4.6 summarizes and concludes the section.

#### 2.4.1 Treatment of Competing Hypotheses in Previous Research

To date, research comparing the forecasts and recommendations of affiliated analysts with those of unaffiliated analysts has not managed to empirically distinguish between the three aforementioned hypotheses. With most papers the inability to distinguish between hypotheses is obvious, and we shall not discuss them in detail here. Most of this research only entertains the bribery or execution-related conflict of interest hypothesis and tests whether affiliated analysts' forecasts are more optimistic than those of unaffiliated analysits. There are, however, two papers

whose research design attempts to distinguish between hypotheses. Below we explain why they do not succeed in their attempts.

Lin, McNichols, and O'Brien (2003), henceforth "LMO," report that affiliated analysts are slower to downgrade client firms in response to bad news. They interpret this evidence as supportive of either bribery or execution-related conflict of interest and inconsistent with the selection bias. We believe this conclusion is premature. An analyst who is optimistic about a firm's prospects is likely to give less weight to bad news, and hence would be slower to downgrade a firm. Thus LMO cannot rule out selection bias as an explanation for their results.

To justify their interpretation, LMO state, "To incorporate our evidence into the underwriter selection story, one must assume that managers choose underwriters both on their observable optimism and on the unobservable strength of their beliefs." We believe it is likely that managers choose underwriters based on the strength of their beliefs for at least two reasons. First, an analyst's observable optimism and the strength of his beliefs are likely to be correlated, especially for IPO firms. There is little data other than *a priori* beliefs upon which to base an assessment of an IPO firm. Second, there is reason to believe managers do select underwriters based on the strength of beliefs. Managers of issuing firms typically meet in person with the analysts employed by prospective issuers, at which point they have an opportunity to ascertain the strength of their beliefs.

Bradshaw, Richardson, and Sloan (BRS) find that the consensus forecasts and recommendations of firms that are about to become net issuers of equity are more optimistic than those of firms that are not. BRS conclude that this result is evidence in favor of either bribery and/or execution-related conflict of interest and cannot be explained by selection bias. They reason that before an equity issue, many investment banks compete to become the manager of

the issue. Thus, conflict of interest or bribery may drive optimism in the forecasts and recommendations of both affiliated and unaffiliated analysts, resulting in a more optimistic consensus. The selection bias hypothesis as outlined above is a less compelling explanation of the BRS results because the reports of analysts whose employers were not selected as underwriters are included in the consensus. It is important to note, however, that this methodology only reduces, but does not eliminate the selection bias effect since affiliated analysts' reports are also part of the consensus, which for many firms includes no more than two or three analysts.

Another competing hypothesis, however, can explain the BRS results. McNichols and O'Brien (1997) find that those analysts who are less optimistic about a firm are less likely to cover it. Thus the distribution of analyst forecasts and recommendations is censored on the left, thereby making it appear that analysts on average are optimistically biased. It is reasonable to conjecture that this phenomenon, henceforth the "self-selection phenomenon," is less pronounced for larger, better-established firms. Analysts less optimistic about a given firm may be more likely to cover it if it is larger and better established. Firms issuing equity tend to be smaller, and less well established, so finding greater optimism in analyst reports on firms issuing equity could be a result of the self-selection phenomenon rather than execution related conflict of interest or bribery. The self-selection phenomenon, coupled with significant statistical biases inherent to BRS's methodology, renders problematic any conclusions drawn from their results about the validity of the conflict of interest or bribery hypotheses.[10]

[10] BRS introduce statistical biases in their calculation of the optimism of analyst long-term EPS growth forecasts. First, in calculating the benchmark long-term growth rate used to estimate analyst optimism, they implicitly assume that analyst growth forecasts are continuously compounding rates. If analyst forecasts are of an annually compounding rate, a more reasonable assumption, BRS severely underestimate the benchmark rate and hence overestimate analyst optimism. Further, this overestimate is higher for high-growth firms, i.e., those more likely to issue securities, than low growth firms. Second, they calculate the benchmark long-term growth rate by using a log transformation of EPS, which also causes them to overestimate analyst optimism, and this overestimate is also

### 2.4.2 Bribery in the M&A Context

***Analysts affiliated with the acquirer M&A advisor***. Since mangers like optimistic analyst coverage of their firms, the conflict of bribery hypothesis predicts that analysts affiliated with acquirer advisors, in both cash and stock deals, would be optimistic about acquirer stock. Many firms make multiple acquisitions during their lifetimes. Therefore, if analysts can be swayed by investment banking business, the promise of repeat buy-side M&A business would be an effective means for managers to obtain optimistic coverage. This and other predictions under the bribery and execution-related hypotheses are presented in table 1. Since acquiring firms' managers seek to purchase the target at as low a price as possible, the bribery hypothesis also predicts that analysts affiliated with the acquirer advisor, in both cash and stock deals, would tend to be pessimistic about target stock.

[Table 1]

***Analysts affiliated with the target advisor***. Since target managers want to obtain as high a price as possible, the bribery hypothesis predicts that analysts affiliated with target advisors, in both cash and stock deals, will be optimistic about the target (see table 1). In cash deals under the bribery hypothesis, we predict neither optimism nor pessimism on the part of target-affiliated analysts reporting on acquirer stock because the acquirer's stock is irrelevant to target managers and shareholders. In stock deals, by contrast, target shareholders and managers do have an interest in acquirer stock since they desire as many acquirer shares to be exchanged for each target share as possible. Therefore, before the transaction, they will want pessimistic coverage of the acquirer. Since immediately after the transaction, target shareholders and managers become acquirer shareholders, they will want optimistic coverage of the acquirer. Hence in stock deals,

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higher for high-growth firms. Together, these biases can explain much of their results related to long-term growth forecasts.

the bribery hypothesis predicts pessimism before the transaction and optimism after the transaction on the part of target-affiliated analysts reporting on the acquirer.

The target ceases to exist after the transaction, and hence cannot offer repeat business to the target advisor. Therefore, one might argue that the target advisor has no incentive to pressure its analyst into favorable coverage of the acquirer after the transaction. However, since target shareholders like positive analyst coverage of acquirer stock after a stock transaction, and if a target advisor makes it a policy to provide favorable coverage, it will be more likely to be selected as an advisor by other targets in the future.

### 2.4.2 Execution-related Conflict of Interest and/or Selection Bias in the M&A Context

To understand how execution-related conflict of interest and selection bias may work in the M&A context, we outline the duties of M&A advisors and the various regulations involved. Our discussion is based on conversations with practitioners and the personal experience of one of the authors (see earlier footnote). Target and acquirer advisors are typically hired some time before the transaction is announced. In friendly deals, negotiations between a target and an acquirer begin typically before the transaction announcement. The target advisor's job is to get as high a price for the target stock as possible, and in a stock deal it also involves making a case for as low a valuation of the acquirer stock as possible. The lower the valuation of acquirer stock, the greater the number of acquirer shares exchanged for target shares. The acquirer advisor's job is the opposite: to argue for as low a valuation as possible for the target stock, and in a stock deal to also argue for as high a valuation as possible for the acquirer stock. Both acquirer and target advisors typically must also convince their clients' boards that the terms of the deal are satisfactory. Analysts affiliated with either advisor are free to issue reports on both

target and acquirer stock so long as they are kept out of the M&A process and given no inside information. These conditions are nearly always met.

***Analysts affiliated with the target advisor.*** It is reasonable to expect that the opinion of an analyst in an advisor's employ affects the latter's ability to make the case for a low or high valuation of a given stock, and hence the advisor's execution ability. Therefore, analyst opinion is likely to influence a prospective M&A client's choice of advisor. The selection bias hypothesis thus predicts that target advisor-affiliated analysts would tend to be optimistic about target stock (see Table 1). The execution-related conflict of interest hypothesis would also predict the target advisor would pressure its analysts to be optimistic about the target in order to enhance its execution ability. In stock deals, the target advisor must make the case for a low acquirer valuation, so selection bias predicts that analysts affiliated with target advisors will tend to be pessimistic about the acquirer in stock deals. The execution-related conflict of interest hypothesis makes a similar prediction, because analyst pessimism in this case enhances its execution ability. It is impossible for the target-affiliated analyst's reports on the acquirer issued after the deal to affect the target advisor's execution ability, so under both the selection bias and execution-related conflict of interest hypotheses in a stock deal the target-affiliated analyst should remain pessimistic about the acquirer after the transaction. In cash deals, the acquirer's stock is irrelevant, so the hypotheses make no predictions of target advisor-affiliated analyst pessimism or optimism about acquirer stock.

***Analysts affiliated with the acquirer advisor.*** The execution related conflict of interest and selection bias hypotheses predict that an acquirer advisor in a stock deal would tend to have optimistic analysts in its employ, since the acquirer advisor wants to make the case for a high valuation of acquirer stock in order to obtain a favorable exchange rate. However, in cash deals,

the hypotheses predict that acquirer advisor-affiliated analysts will be neither pessimistic nor optimistic since in cash deals the acquirer stock is irrelevant. If employing an analyst who is pessimistic about the target makes it easier for the acquirer advisor to argue for a low target valuation, the hypotheses predicts that analysts affiliated with acquirer advisors will be pessimistic about target stock.

### 2.4.4 Where the Bribery Hypothesis Makes Different Predictions

As we have seen, the bribery hypothesis predicts that acquirer advisor-affiliated analysts will be optimistic, but the execution-related hypotheses predict neither optimism nor pessimism. Before a stock transaction, all three hypotheses predict that target advisor-affiliated analysts will be pessimistic about acquirer stock, but after the transaction the bribery hypothesis predicts optimism and the execution-related hypotheses predict pessimism. By examining whether analysts are optimistic or pessimistic in these scenarios, we can help distinguish the bribery hypothesis from the other two.

### 2.4.5 Comparison of the Institutional Details of the M&A Advisory and Equity Underwriting Businesses

Comparing the institutional setting in M&A and equity underwriting activities, we believe there to be less of a reason for either execution-related conflict of interest or selection bias in M&A relationships than in equity underwriting relationships. Legally, investment banks are obliged to keep their research activity separate from their M&A and underwriting activity. This institutional separation is often referred to as the "Chinese Wall." If an analyst in some way becomes involved in an M&A or underwriting transaction, he is prohibited from writing reports about parties to the transaction while involved in it and for a period afterward. However, in almost all equity underwriting deals, analysts are "brought over the wall" and heavily involved.

Their participation in the underwriter's sales pitch to the public is essential to the success of the deal. Krigman, Shaw, and Womack (2001) find that the promise of quality analyst coverage significantly influences underwriter choice. Since the analyst is so heavily involved in selling the deal, it seems that an underwriter with more optimistic analysts will be better able to execute a stock issuance, and hence selection bias should be significant in the underwriting context, and the potential for execution-related conflict of interest his high.

In the case of M&A transactions, however, analysts are seldom if ever "brought over the wall." Since the analyst is not in any way involved in the M&A advisor's attempts to make the case for a low or high valuation of an acquirer's or target's stock, it does not seem likely that the analyst opinion has a large effect on the advisor's ability to make such a case. Furthermore, the case for a low or high valuation typically has to be made to a board, and not the public. Since boards have inside information about all firms involved that no analyst has access to, it seems unlikely that boards would be swayed by analyst opinion nearly to the same extent as the average investor in an equity issue. Of course, the board does eventually have to make the case for the deal to the public, which is influenced by analyst opinion. Therefore some potential for execution-related conflict of interest or selection bias, albeit more muted than in the underwriting context, still exists in the M&A context.

**Wrap-up of section 2.4**

To summarize, the bribery hypothesis and the two execution-related hypotheses make different predictions about analyst optimism or pessimism, depending on the analyst affiliation, the subject of the analyst report, and the currency used in the deal. In most of these scenarios, all the hypotheses imply the same level of analyst optimism or pessimism. However, in two scenarios where analyst optimism or pessimism does not affect advisor execution ability, the

bribery hypothesis makes a different prediction than the two execution-related hypotheses. When an acquirer-affiliated analyst reports on a cash acquirer, we predict optimism under the bribery hypothesis and no bias under the other two. When a target-affiliated analyst issues a report on the target after a stock transaction is announced, we predict optimism under the bribery hypothesis and pessimism under the other two. We note, however, that the analyst's outlook is not likely to affect advisor execution ability very much in any case, so that the biases resulting from selection or execution-related conflict of interest are not likely to be very large.

## 3. Data and Descriptive Statistics

***M&A deal data***. We obtain M&A transaction data from Securities Data Corporation (SDC) for years 1993 to 2001. Our sample solely consists of statutory mergers, acquisitions of assets, and acquisitions of certain assets.[11] Thus we exclude from our sample buybacks, acquisitions of partial interest, recapitalizations, spin-offs, split offs, exchange offers, and acquisitions of remaining interest because analyst incentives in such deals are unclear. We also limit the sample to deals in which either the target or acquirer or both are public. Finally, we only include completed deals for which fee information is available. The number of deals that meet our sample selection criteria comes to 2,922. In 1,713 of these deals the acquirer paid more than 50% of the acquisition price in stock. In 1,201 the acquirer paid 50% or more in cash or other non-stock currency (usually assumed debt). In 18 deals no information is provided on currency. In the entire sample, 44 of the deals are acquisitions of assets, 2887 are statutory mergers, and one deal is an acquisition of certain assets.

[11] To implement our sample selection, include only SDC deals in which the field "form of deal" is labeled as 'AA', 'AC', or 'M.' These labels correspond to "acquisition of assets," "acquisition of certain assets," and "statutory merger", respectively. This method of sample selection is the same as excluding deals whose "form of deal" field is labeled 'A', 'AR', 'AP', 'R', 'B', and 'EO,' which correspond to spin-offs, acquisitions of remaining interest, acquisitions of partial interest, recapitalizations, buybacks, and exchange offers.

The requirement that a deal have information on fees causes us to throw out a substantial number of deals from our sample. In total, we drop 6,918 deals because no information is available on fees. The deals with no information on fees tend to be smaller, and are more likely to be cash deals. The mean total consideration paid by the acquirer was $396 million for cash deals without fee information versus $909 million for cash deals that had fee information. For stock deals, consideration paid by the acquirer was $910 million for deals without fee information and $1.6 billion for deals with fee information. 68% of the deals without fee information were cash deals, whereas 54% of deals with fee information were stock deals.

While the number of deals we lose because of the fee requirement is great, there is no reason to believe such data attrition should substantially affect our results. If anything, such data attrition should enhance our power to detect bribery since such conflicts are likely to be greater for large deals, and the deals with fees tend to be larger.

***Analyst forecasts and recommendations***. From I/B/E/S we obtain all available one- and two-year-ahead EPS forecasts, long-term growth forecasts, and recommendations for all acquirers, targets, and their immediate and ultimate parents (as defined by SDC) published within one year of each of the 2,922 transactions in our sample. We restrict our attention to the above forecasts because they are widely available for nearly every firm in our sample. Forecasts for horizons longer than two years are available for relatively few firms, which are analyzed separately without the results being tabulated in the paper. We also restrict our sample to deals for which estimates for either the acquirer or target stock are available. In addition we obtain from I/B/E/S the closing price and shares outstanding of the stock on the last trading day of the calendar month in which the forecast was published. If a price for this day is not available, we take the closing price on the day closest to it, provided it is within 30 days. If we cannot obtain

price or share data for a given deal, we drop it from our sample. After applying the above sample criteria, the number of deals remaining in our sample drops from 2,922 to 2,555. Table 2 presents descriptive statistics on analyst forecasts and recommendations.

In order to ensure that the dropping of deals without fee information from our sample does not greatly bias our results, we compare descriptive statistics on forecasts and recommendations for the sample in which fees are and are not available. There are no significant differences between the two distributions of recommendations or forecasts.

[Table 2]

Table 3 presents descriptive statistics on the total consideration, in cash, stock and assumed debt, that acquirers paid for targets for the deals remaining in our sample. Consistent with the stylized facts about M&A deals, the majority of deals in our sample are stock deals, and stock deals are, on average, dramatically larger than cash deals. The average stock deal value is approximately $1.7 billion, whereas the average cash deal value is just a little larger than $600 million. The same pattern holds in the medians, but it is less dramatic.

[Table 3]

Table 4 contains the descriptive statistics on the M&A fees paid to targets and acquirers for different subsets of our sample. The average fee tends to be between $2 and $5 million and does not differ very much according to the currency of the deal or whether it is paid to the target or the acquirer.

[Table 4]

***Analyst Affiliation***. Next we determine the affiliation of each analyst who issued a forecast or recommendation in our sample. This task is not complicated in principle. SDC lists all M&A advisors retained on a deal, and I/B/E/S provides the name of the securities firm, which

it calls the "broker," employing each analyst issuing a forecast or recommendation. Unfortunately, the SDC codes for M&A advisors and I/B/E/S codes for brokers are different, and there is no mapping between the two coding systems. Hence, we must individually match I/B/E/S brokers and SDC advisors by hand using their corporate names. In most instances, the names in the two databases are qualitatively the same and can be matched by sight.

In many other instances, however, the broker listed in the I/B/E/S database may be a subsidiary of an advisor in the SDC database, or vice-versa, and the names of the broker and advisor bear no similarities. In some instances, the SDC advisor and I/B/E/S broker are subsidiaries, with completely different names, of the same parent company. To check for such affiliations, we look up each I/B/E/S broker in Hoovers Online, the Directory of Corporate Affiliations, as well as Lexus-Nexus and corporate webpages. This search ascertains whether an I/B/E/S broker has subsidiary-parent or common parent affiliations with one of the SDC advisors in our sample. We also look up each SDC advisor in our sample. Through this method, we are able to detect subsidiary-parent and common parent affiliations that continue until the present. Unfortunately, we have no way of detecting affiliations that were terminated in the past, unless there were news stories about them. Since our sample begins only as recently as 1993, this problem is unlikely to be serious.

***Measuring optimism or pessimism in affiliated analyst forecasts and recommendations.*** In all of our tests, we seek to determine whether forecasts and recommendations issued by analysts affiliated with M&A advisors ("affiliated analysts") are optimistic or pessimistic relative to consensus. We take the following two precautions in calculating the consensus. First, we do not want any forecast in our consensus to be contaminated by M&A affiliation. Hence we exclude from consensus any forecasts or recommendations issued by analysts affiliated with an

M&A advisor that was retained within one year of the forecast date by either the firm whose EPS is being forecasted or stock is being recommended, the counterparty to the M&A transaction, or the parents or subsidiaries of such firms. Second, recent research indicates that herding behavior may be economically significant. Scharfstein and Stein (1990) initiated the herding literature with their model of firm manager herding, which Trueman (1994) applies to analysts. Hong and Kubik (2000) as well as Welch (2000) find evidence that analysts do indeed exhibit herding behavior. Hence to make sure that herding by unaffiliated analysts does not taint our estimate of the unaffiliated consensus, we exclude from our consensus estimate any forecast or recommendation issued after the one issued by the affiliated analyst.

In the case of forecasts, to calculate the consensus, we average all the unaffiliated forecasts and/or recommendations for a given firm issued within a calendar month and before the affiliated analyst's. We then calculate the difference between the affiliated analyst's forecast or recommendation and the consensus. In the case of EPS forecasts, we normalize the difference by the closing price as of the end of the month. If there is no closing price for the last trading day of the month, we use the closing price on the day closest to the last trading day for which one is available, provided this day is less than 30 days away from the last trading day. We also calculate each unaffiliated analyst's deviation from consensus in the same manner, except we define consensus in this case as the average of all other unaffiliated analysts' recommendations or forecasts. However, the results are not sensitive to alternative definitions of the consensus, e.g., median of all other unaffiliated analysts' forecasts and recommendations.

***Descriptive Statistics***. Table 5 presents the price-scaled average deviation from consensus of affiliated analyst one and two-year-ahead EPS forecasts, as well the raw deviation from consensus of long-term growth forcasts and recommendations. The statistics are presented

for subsamples sorted by the currency used in the deal, analyst affiliation, the target or acquirer status of the firm upon which analyst is reporting, as well as whether the report was issued before or after the M&A transaction.

[Table 5]

Table 5 shows little, if any, association between analyst affiliation and relative optimism in forecasts. With forecasts, in all but 2 instances, we cannot reject the null hypothesis, even at the 10% level, that the mean is zero. In many cases the estimate average deviation has a sign opposite to that predicted by the bribery hypothesis. Where the bribery hypothesis provides a prediction of the sign of the mean, we report significance level using a one-sided t-test. The mean is statistically significant in the direction predicted by the bribery hypothesis is the case of target-affiliated analysts forecasting acquirer one-year-ahead EPS in stock deals. Here the bribery hypothesis predicts a negative sign, and indeed the mean price-scaled deviation from consensus is -0.11%, with a p-value of 0.01. The median, however, is equal to zero to within two decimal places. Furthermore, while a mean price-scaled deviation of -0.11% from consensus is statistically significant, it does not seem economically significant. The other instance in which the mean is statistically significant is the case where acquirers are forecasting target EPS. This mean, however, is even smaller with a value of -0.04 and has a median of 0 as well, so it too is not economically significant, The failure to reject the null in other instances in panels A and B of table 5 is unlikely due to the power of the tests. Overall, we conclude that the descriptive statistics on forecast deviations from consensus fail to support the bribery hypothesis.

In the case of recommendations, the deviation from consensus is statistically significant, at the 5% level or better, in the direction of the bribery hypothesis in 4 out of 6 instances. In three 3 of these 4 instances, it is significant at a level better than 1%. The largest mean deviation

is 0.21, which implies the deviation from consensus is about one fifth of a recommendation grade. This mean deviation is also significant in two of the cases where the bribery and selection bias hypotheses provide different predictions. Thus, these descriptive statistics do provide some support for the bribery hypothesis.

It is difficult, however, to draw conclusive inferences from the descriptive statistics for recommendations for two reasons. First, in all cases the median deviation equals zero to within two decimal places. Thus, it is possible that our rejection of the null of zero deviation from consensus is the result of distributional properties of recommendations. Second, recommendations are ordinal and discrete, but in calculating a mean deviation from consensus we treat them as if they were cardinal and continuous, possibly distorting our results. We address both of these problems with an ordered logistic analysis later in the paper, and we find that these results are not robust.

Thus far, we find limited evidence of an association between M&A relationships and analyst optimism or pessimism relative to consensus. While the analysis of mean optimism/pessimism is instructive, it fails to take into account the numerous factors, such as investment banking fees, which might affect the degree to which an M&A relationship will affect analyst objectivity. It also has the limitation of treating all variables in a binary fashion. For instance, we either classify a deal as a cash deal or stock deal, yet in many deals the acquirer pays for the target with some combination of stock and cash.

## 4. Ordinary Least Squares Analysis of Forecasts

In this section we use regression analysis to determine whether there is an association between M&A relationships and the relative optimism of EPS and long-term growth forecasts of analysts affiliated with M&A advisors. We use two regression specifications. Sections 4.1 and

4.2 define and discuss the first specification, or "Model 1," which simply examines whether or not there is an association between M&A fees and optimism and/or pessimism. Sections 4.3 and 4.4 are devoted to the second specification, or "Model 2," which expands Model 1 and tests whether the interaction between fees, deal currency and forecast timing affect optimism. It is in Model 2 where we distinguish the bribery hypothesis from the execution related hypotheses. Finally, in section 4.5, we discuss the robustness of our results.

**4.1 The Specification of Model 1**

To see how investment banking fees affect analyst forecasts, we estimate the following regression separately using EPS forecasts and long-term growth forecasts:

$$O = \alpha + AF_a\,\beta_1 + (1\text{-}A)F_a\,\beta_2 + AF_t\,\beta_3 + (1\text{-}A)F_t\,\beta_4 + (365\text{-}d)\mathbf{Va} + L\mathbf{Vb} + M\mathbf{Vc} + N\mathbf{V\delta} + \varepsilon \quad \text{(Model 1)}$$

Each forecast in our sample consists of a Where variables O, A, $F_a$, $F_t$, d, L, M, N and the vector **V** are defined in Table 6.

[Table 6]

Note that *O,* the analyst's forecast optimism relative to consensus, is normalized by the month-end stock price in the case of EPS forecasts. $\beta_1$, $\beta_2$, $\beta_3$, and $\beta_4$ are regression coefficients. We interact the fee variables, $F_a$ and $F_t$, with *A* and 1-*A*, dummies that indicate whether the subject of the forecast is the target or acquirer. Our specification consists of interaction terms because, based on our hypotheses, our predictions depend on who is paying fees as well as whose earnings are being forecast. For instance, it follows from the bribery as well as the execution-related hypotheses that analysts receiving fees from the acquirer should be more optimistic about acquirer EPS or growth, and therefore we predict $\beta_1$ to be positive. Likewise, based on these hypotheses, we predict $\beta_4$ to be positive, $\beta_2$ to be negative, and the predicted sign on $\beta_3$ is ambiguous.

**a**, **b**, **c**, and **δ** are column vectors of regression coefficients corresponding to the interactions of **V** with our control variables, d, M, N, and L, defined in Table 6. We include (365-*d*), a measure of the time between forecast date and the M&A transaction date as a control because affiliated analyst forecasts, if they are optimistically or pessimistically biased, are more likely to be biased closer to the transaction date. We include L, the length of the analysts career, because recent research shows that more experienced analysts are more likely to deviate from consensus (Hong, Kubik, and Solomon, 2000). Mikhail, Walther, and Willis (1997 and 2003) also find that analyst accuracy improves with experience. M, the market capitalization of the firm that is subject to the forecast, because it proxies for uncertainty about future earnings, which is likely lower for larger firms. Finally, we include N, the total number of analysts following the company, because a greater number of analysts increases the likelihood of herding and therefore lessens dispersion in analyst forecasts.

We interact all our control variables with the elements of **V** because our control variables influence the variance, rather than the mean of the distribution of analyst forecasts. Thus these control variables only affect the expected value of a given analyst's deviation from the consensus (or mean) if we already have a prior as to whether his forecast is likely to be greater or smaller than consensus. In our analysis, our priors are based on affiliation as well as whether the firm that is the subject of the forecast is an acquirer or target, criteria indicated by the elements of **V**.

**4.2 Results for Model 1**

***The Regression Samples.*** In order to estimate model 1, we take the Cartesian product of every analyst forecast with every M&A transaction in our database to which a firm whose EPS or growth is being forecast was a party. Thus we obtain observations for every forecast-transaction pair possible. Note that the same forecast may appear in multiple observations since

some firms engage in multiple M&A transactions during the course of a year. We only include in our sample EPS or growth forecasts or recommendations of targets and acquirers, excluding their parents. As noted earlier, in calculating the consensus, we exclude forecasts and recommendations of analysts who are affiliated with the parent of a company that is being reported on.

***The Estimation Procedure.*** To ensure that cross-sectional error correlation does not bias our standard error estimates, we estimate model 1 using quarterly Fama-MacBeth ordinary least squares regressions. The following describes this procedure in detail. First we sort the data by calendar quarter and estimate the parameters for each quarter using ordinary least squares. We then compute the sample means of the time series of quarterly estimates, weighted by the number of observations in each quarter. The standard errors and p-values are also calculated using this quarterly time-series of parameter estimates, also weighting by number of observations in each quarter. Unreported results show that equally weighting the quarters reduces power but does not materially change the results.

***Statistical significance of the coefficient estimates.*** Our estimates of the parameters of model 1, with standard errors and p-values, appear in Table 7, in the columns labeled "model 1." We estimate model 1 separately for one- and two-year-ahead EPS and long-term growth forecasts. We used one-sided tests when the sign of a coefficient is predicted under the bribery hypothesis. None of the coefficient estimates in the "model 1" columns of the table is statistically significant in the predicted direction, even at the 10% level. Thus, based on our results for model 1, we cannot reject the null hypothesis of no relation between analyst optimism and investment banking fees.

[Table 7]

***Economic significance of coefficient estimates where deviation from the consenus EPS forecast is the dependent variable.*** In our assessment, seven out of eight of the coefficient estimates are economically as well as statistically insignificant. The largest in absolute magnitude of the seven insignificant coefficient estimates, 0.0034, is that of $(1\text{-}A)F_a$ for two-year-ahead EPS forecasts. A coefficient of this size means that $1 million in fees from the acquirer on average prompts acquirer-affiliated analysts to make their two-year-ahead EPS forecast to be higher than that of unaffiliated analysts by only 0.34% of the stock price, an amount that is fairly small compared to the mean two-year-ahead EPS forecast of 6.21% of the stock price. In addition to being economically small, the sign of this estimate is opposite to that predicted by all three hypotheses, and it is statistically insignificant.

The coefficient estimate largest in absolute magnitude in the regressions that uses deviation from consensus EPS forecasts as a dependent variable is that of $AF_a$ for two-year ahead EPS forecasts. This estimate equals -0.019. Thus, on average, $1 million in fees from the acquirer prompts acquirer-affiliated analysts to make their 1-year ahead forecast of acquirer EPS to be lower than the forecast of unaffiliated analysts by -1.9% of the stock price, an economically significant amount. This estimate, however, has the sign opposite to that predicted by all 3 hypotheses, and a standard error of 0.0431 makes this estimate statistically insignificant. The large standard error, however, also suggests low power.

***Economic significance of coefficient estimates where deviation from the consenus growth forecast is the dependent variable.*** Three out of four of the coefficient estimates in this category are economically insignificant. Of these three estimates, the largest in absolute magnitude is the estimate corresponding to $AF_a$, which equals -0.11. Thus, on average, $1 million in fees from the acquirer prompts acquirer-affiliated analysts to make their acquirer long-

term growth forecasts to be 0.11 percentage points lower than those issued by unaffiliated analysts. In addition to being economically negligible and statistically insignificant, this estimate has a sign opposite to that which the bribery hypothesis predicts.

The only coefficient estimate of an economically significant magnitude is the coefficient estimate corresponding to $(1\text{-}A)F_t$, which equals -0.59. Thus, on average, $1 million in fees from the target prompts target-affiliated analysts to make their forecasts of target growth to be lower than unaffiliated analysts' forecasts by fifty-nine hundredths of a percentage point. fifty-nine hundredths of a percentage point per million in fees is small, but not negligible, compared to the average 18.5% growth forecast. However, this estimate is statistically insignificant.

***Power in regressions where deviation from consensus EPS forecast is the dependent variable.*** In our assessment, for seven out of eight coefficient estimates in these regressions, the standard errors are economically negligible, so our power to reject the null is high for these coefficients. Of these seven coefficient estimates, the estimate with the largest standard error corresponds to $(1\text{-}A)F_t$ in the regression where two-year-ahead EPS is the dependent variable. The standard error of this estimate equals 0.0025. Thus we would be able to detect, at the 10% level of significance, affiliated analyst deviation from the consensus forecast of two-year ahead target EPS by 0.3% or more of the stock price per $1 million in M&A fees received from the target. Such a deviation is modest compared to the mean two-year ahead EPS forecast of 6.21% of the stock price. The only coefficient estimate that has an economically large standard error corresponds to $AF_a$. This standard error equals 0.0431. A standard error of this magnitude implies we would be unable to detect an affiliated analyst deviation from consensus of smaller than approximately 6.5% of the stock price per $1 million in fees at the 10% level of significance

with a one-sided test. A deviation of 6.5% is large, so our power to reject the null hypothesis for this coefficient is low.

Bradshaw, Richardson, and Sloan (2003), henceforth BRS, is the only study that finds any evidence of an association between equity underwriting activity and analyst bias in EPS forecasts. They find that 1-year ahead forecasts of the EPS of firms issuing equity tend to be higher by 2% of price than that firms that of firms not issuing equity. If analysts affiliated with M&A advisors tended bias their 1-year-ahead EPS forecasts by this magnitude, we would be able to detect it at the 1% percent level or better in every scenario tested in model 1. BRS find that 2-year-ahead EPS forecasts of equity-issuing forms are higher by 3.2% of price than those of firms not issuing equity. If analysts affiliated with M&A advisors tended to bias their 2-year-ahead EPS forecasts by this magnitude, we would be able to detect it at the 1% level in all by one scenario: that of acquirer-affiliated analysts forecasting acquirer EPS. Unfortunately, for this scenario, the bias would have to be 6.5% of price or larger in order for us to detect it even at the 10% level.

***Power in regressions where deviation from the consensus growth forecast is the dependent variable.*** Where we analyze optimism in long-term growth forecasts, our standard errors are not greater than 0.678. With a standard error of 0.678, affiliated analysts' deviation from consensus for every $1 million received in investment banking fees could be as low as 1.12 percentage points, and we would still be able to detect it at the 10% level of significance using a one-sided test. A 1.12 percentage point deviation is small compared to the mean 18.5% long-term growth forecast.

The bias of underwriter-affiliated analysts' long-term growth forecasts detected in previous studies ranges from 18 percentage points in BRS, to 6.4 percentage points in Dechow,

Hutton, and Sloan (2000), to 1 percentage point in Lin and McNichols. Even for our coefficient estimate with the largest standard error, we could detect a bias of the magnitude in the first two studies at the 10% level. We would just barely miss detecting a bias as small as found by Lin and McNichols, but a 1 percentage point bias does not strike as large.

**4.3 The Specification of Model 2**

While the analysis based on model 1tests for the association between investment banking fees and analyst optimism in forecasts, it does not discriminate between the bribery and execution-related hypotheses discussed in the previous section. Since we fail to find significant association, however, it does not matter that we fail to distinguish between hypotheses since the result of no association is consistent with neither hypothesis. Still, it is useful to test the hypotheses separately, and for this purpose we develop model 2, which we discuss in this section.

The type of consideration paid may alter affiliated analysts' incentives, and thus we use a measure of their incentive to help distinguish the bribery hypothesis from the other two. We define two interaction terms:

$$I_{tb} = BASF_t$$
$$I_{ta} = (1\text{-}B)ASF_t$$

where B is a dummy equal to 1 if the forecast was issued before the transaction announcement date and zero otherwise, and S is the percentage of consideration paid for in stock. These two interaction terms seek to measure the association between the relative optimism of the target-affiliated analyst's estimate of acquirer EPS and i) target fees paid and ii) the percentage of the consideration paid in stock. $I_{tb}$ measures this association when the estimate date falls before the announcement date, $I_{ta}$ measures it when the estimate date falls after the announcement date. As explained in section 2, under the selection bias hypothesis, analysts affiliated with the target in a

stock deal issue pessimistic forecasts of acquirer EPS and growth, so under this hypothesis the coefficient on both these interaction terms should be negative. In section 2 we also saw that under the bribery hypothesis, analysts affiliated with the target advisor in a stock deal should be optimistic about acquirer EPS and growth, at least after the transaction, so the coefficient on $I_{ta}$ should be positive. If the execution-related as well as bribery effects are present, the coefficient on $I_{tb}$ should be less than $I_{ta}$. If the bribery hypothesis dominates, the coefficient on $I_{tb}$ should be negative and the coefficient on $I_{ta}$ positive.

Finally, we define a third interaction term:

$I_{ac} = A(1\text{-}S)F_a$.

This interaction term measures the association between the acquirer-affiliated analyst's bias in estimating acquirer EPS and growth and the percentage of consideration paid in a manner other than acquirer stock as well as the fees paid by the acquirer. Recall from section 2 that there should be no selection bias or execution-related conflicts of interest in forecasts of acquirer EPS issued by acquirer-affiliated analysts in cash deals. Hence, if bribery does not affect analyst objectivity, the coefficient on this term should be zero. If bribery problems exist and managers of acquiring firms reward analysts for favorable coverage with M&A business, it should be positive. Selection bias and execution-related conflicts of interest should not affect the coefficient, for reasons given in section 2. We thus have another regression specification:

$$O = \alpha + \beta_1 AF_a + \beta_2(1\text{-}A)F_a + \beta_3 AF_t + \beta_4(1\text{-}A)F_t + (365\text{-}d)\mathbf{Va} + L\mathbf{Vb} + M\mathbf{Vc} + N\mathbf{V\delta} + \gamma_1 I_{ac} + \gamma_2 I_{tb} + \gamma_3 I_{ta} + \varepsilon \quad \text{(Model 2)}$$

where $\gamma_1$ , $\gamma_2$ , and $\gamma_3$ are regression coefficients. Table 6 contains detailed definitions of all variables in model 2.

**4.4 Estimating Model 2**

As with model 1, we estimate Fama-MacBeth regressions of model 2 . Our estimates of the parameters of model 2 are presented in Table 7 in the columns labeled "model 2," along with standard errors and p-values. None of our estimates is significant at the 10% level or better. Hence we cannot reject the null of no bribery bias. As before, our power to reject is high in most cases. Where optimism in EPS forecasts is the dependent variable, the standard errors are no bigger than 0.0077.

In the case where optimism in long-term growth forecasts is the dependent variable, the standard errors are qualitatively similar to those of model 1 for all coefficient estimates except for those of terms interacting target fees and A, the dummy indicating that the acquirer's growth is being forecast. The high standard error in these cases is driven by the fact that we have four variables interacted with target fees, and these four variables are likely to be highly correlated.

**4.5 Robustness**

A potential problem with our analysis lies with the possibility that the relationship between affiliated analyst deviation from consensus and investment banking fees may be nonlinear. It is possible that fees influence deviation from consensus only by large increments. To account for this possibility, for each year we rank target and acquirer fees and compute fee terciles. For each fee tercile, we then examine how much affiliated analysts deviate from consensus. Even at the tercile level of aggregation, we do not find that the affiliated analysts' deviation from the consensus is increasing in the fees. For example, target long-term growth forecasts issued by target-affiliated analysts receiving fees in the top tercile are 0.13 percentage points above consensus, which is lower than the 0.19 percentage point deviation for target-affiliated analysts receiving fees in the bottom tercile. The difference is not statistically

significant. Comparisons of the mean deviation from consensus by fee tercile in other affiliation/forecast subject categories yield similar results.

We also examine whether our regression specification is sensitive to potential nonlinearities. We re-estimate models 1 and 2 using interactions of fee terciles, as opposed to fees, as independent variables. We define a variable, t_feerank, which takes the value of the tercile to which the fees received from the target belong. We define a second variable, a_feerank, which takes the value of the tercile to which the fees received from the acquirer belong. a_feerank or t_feerank equal zero if the analyst is unaffiliated with the acquirer or target, respectively. We re-estimate models 1 and 2, substituting a_feerank and t_feerank for $F_a$ and $F_t$. The results for this specification are qualitatively similar to the results from the linear one, except that the standard errors are higher, indicating that the linear specification is probably more appropriate. For reasons of brevity, we do not report the results from the non-linear specification.

In summary, we are not able to detect a consistent relation between affiliated analyst deviation from consensus and fees. This finding raises questions whether bribery systematically taints analyst forecasts and recommendations and whether a bribery problem is pervasive in underwriting and M&A settings. Our results also suggest that execution-related conflicts of interest and/or selection bias may not be salient in the M&A context. However, the latter finding is not surprising given our discussion in section 2 that execution-related issues are likely to be muted in the M&A context.

**5. Ordered Logistic Regression Analysis of Recommendations**

Recommendations, unlike forecasts, are discrete and ordinal. Ordinary least squares analysis, however, treats dependent variables as though they are continuous and cardinal,

yielding biased and inconsistent results in cases where the dependent variable is discrete and ordinal. Therefore, in order to analyze the effect of M&A relations on recommendations, we use ordered logistic regression analysis, which treats dependent variables as discrete and ordinal. In section 5.1, we discuss our logistic specifications, and in Section 5.2 we discuss the results.

### 5.1 Ordered Logistic Specifications

The discrete and ordinal nature of recommendations, in addition to making OLS an inappropriate technique for analyzing recommendations, makes deviation from the consensus a suspect measure of analyst optimism (or pessimism). Therefore, the dependent variable in all of our logistic regressions is the analyst recommendation itself. Recommendations are assigned a value of 0 if the analyst issues a strong-sell recommendation and are assigned a value of 4 if the analyst issues a strong buy. Buy, hold, and sell recommendations are assigned values of 3, 2, and 1, respectively. We order recommendations in this way so that optimism is positive.

In order to assure that the estimates of the coefficients of our independent variables are valid measures of those variables' impact on analyst optimism relative to consensus, we also include as independent variables the number of strong buy, buy, hold, sell and strong sell recommendations previously issued by unaffiliated analysts. These 5 variables are included in a vector labeled **U**. The three logit models we estimate are described below:

| Logit Model | Independent variables |
|---|---|
| 1 | **U** |
| 2 | **U**, $AF_a$, (1-$A$)$F_a$, $AF_t$, (1-$A$)$F_t$, (365-$d$)$V$, $L$**V**, $M$**V**, $N$**V** |
| 3 | **U**, $AF_a$, (1-$A$)$F_a$, $AF_t$, (1-$A$)$F_t$, (365-$d$)$V$, $L$**V**, $M$**V**, $N$**V**, $I_{ac}$, $I_{tb}$, and $I_{ta}$ |

Logit models 2 and 3, in addition to **U**, contain the same independent variables as the OLS model (1) and (2) in Section 4. We include logistic model 1 to estimate the extent to which an analyst's

unaffiliated colleagues' recommendations explain his own recommendations. With the inclusion of **U** as an independent variable in logit models 2 and 3, our estimates of other coefficients measure the extent to which other factors influence analyst optimism relative to consensus.

Unfortunately, we cannot estimate our logistic models using Fama-McBeth type methodology because in some calendar quarters there are too few observations to compute parameter estimates, so we estimate our logistic models using the full panel of data. If errors are cross-correlated, our standard error estimates will be biased toward zero, which makes it more likely to erroneously reject the null hypothesis of no conflict or interest. Notwithstanding the bias, we fail to find evidence suggesting a bribery problem.

### 5.2 Results

The results of our estimates of logistic models 1-3 appear in Table 8. Collectively, they results constitute powerful evidence against the bribery hypothesis. We report odds ratio estimates along with the standard error of the odds ratio and the p-value. For parsimony, we do not report results for the control variables, which are available upon request. We estimate the odds ratio standard error using the delta method, and we estimate p-values using the logit parameter estimates and their standard errors, which we do not report since their economic interpretation is not as intuitive as that of the odds ratio. Since the ratio of a logit parameter estimate to its standard error, under reasonable assumptions, is Gaussian, we use a Gaussian, rather than t, CDF to compute p-values.

[Table 8]

***Unaffiliated analysts' recommendations (Vector* U*).*** As expected, the odds ratio estimates corresponding to **U** are statistically and economically significant in the predicted direction. For example, the odds ratio corresponding to the number of strong sell colleague

recommendations equals 0.653 and has a p-value less than 0.0001. Thus, by including the vector **U** as a control variable, our estimates of the odds ratios corresponding to other independent variables are good measures of how much these other variables prompt affiliated analysts to make recommendations that are different from their those of their colleagues. Henceforth our discussion will focus on odds ratio estimates that are relevant to testing the hypotheses, that is, odds ratio estimates other than those that correspond to **U**.

***Statistical significance.*** In models 2-3, all but one of the odds ratio estimates relevant to testing the hypotheses are statistically insignificant and economically small. In both models, the one statistically significant odds ratio, that which corresponds to $(1\text{-}A)F_a$, is consistent with the bribery as well as both the execution related hypotheses. Thus our results provide limited evidence in favor of the execution-related hypotheses and no evidence in favor of bribery.

***Economic Significance.*** All but one of the relevant odds ratio estimates deviate from one by no more than .028 in each model. Thus $1 million in fees make affiliated analysts on average only 2.8% more likely to give a different recommendation than their unaffiliated colleagues. Furthermore, with a standard error of 0.022, these estimates have p-values greater than 0.1. The only statistically significant odds ratio estimate in model 1 and 2, the one corresponding to $(1\text{-}A)F_a$, equals 0.904 in both models. An estimate of this magnitude means that $1 million in fees paid by the acquirer make an acquirer-affilaited analyst 9.6% more likely to give a worse recommendation of the target than his colleagues, a value that does not seem very large to us.

***Power.*** All our standard error estimates are small, so the power to reject the null is high. The largest standard error is 4.3%, meaning that if $1 million in investment banking fees were to make analysts at least (approximately) 5.6% more likely to give a higher (or lower) recommendation, it would be detected at the 10% level of significance.

***Overall Inference.*** Our only statistically significant odds ratio estimate relevant to our hypotheses can be explained by selection bias and is not extraordinarily large in magnitude. The other estimates, in addition to being statistically insignificant, are economically insignificant. All standard error estimates are low. Combined, the above results constitute powerful evidence against the bribery hypothesis.

***Robustness.*** As with our analysis of forecasts, our analysis of recommendations may suffer from the possibility that the relationship between investment banking fees and the probability of an analyst deviating from consensus is non-linear. As with the OLS models in section 4, we re-estimate all the models in this section substituting a_feerank and t_feerank for $F_a$ and $F_t$, respectively. The results are qualitatively similar, except that the standard errors of the parameter estimates of the new specification are higher. For reasons of brevity we do not report these results.

## 6. Summary and Conclusions

Our analysis fails to uncover consistent evidence that M&A advisory relationships cause analyst optimism or pessimism that would be consistent with a bribery problem. Our results suggest that if there is evidence that biased analyst forecasts and recommendations are associated with investment banking relationships, such as equity underwriting relationships, it is likely due to execution-related conflict interest or selection bias and not bribery. In order to draw this conclusion, we must assume that M&A relationships provide similar opportunities for managers to coax analysts into to tainting their reports as do equity relationships. Given the magnitude of M&A fees in the investment banking industry, we believe this is a reasonable assumption. The role of an M&A advisor is different from an equity underwriter, so it is possible that managers may not be want to M&A relationships to coax analysts to bias their reports in the same manner

that they use equity underwriting relationships. While we see no reason to believe that this is the case, we leave the task of comparing the magnitude of incentives in different contexts to future research.

Our results do not necessarily indicate that there are no potential bribery problem. As mentioned previously, "Chinese Wall" regulations restrain communication between investment bankers and analysts, so it is possible that the potential for bribery exists but is being successfully thwarted.

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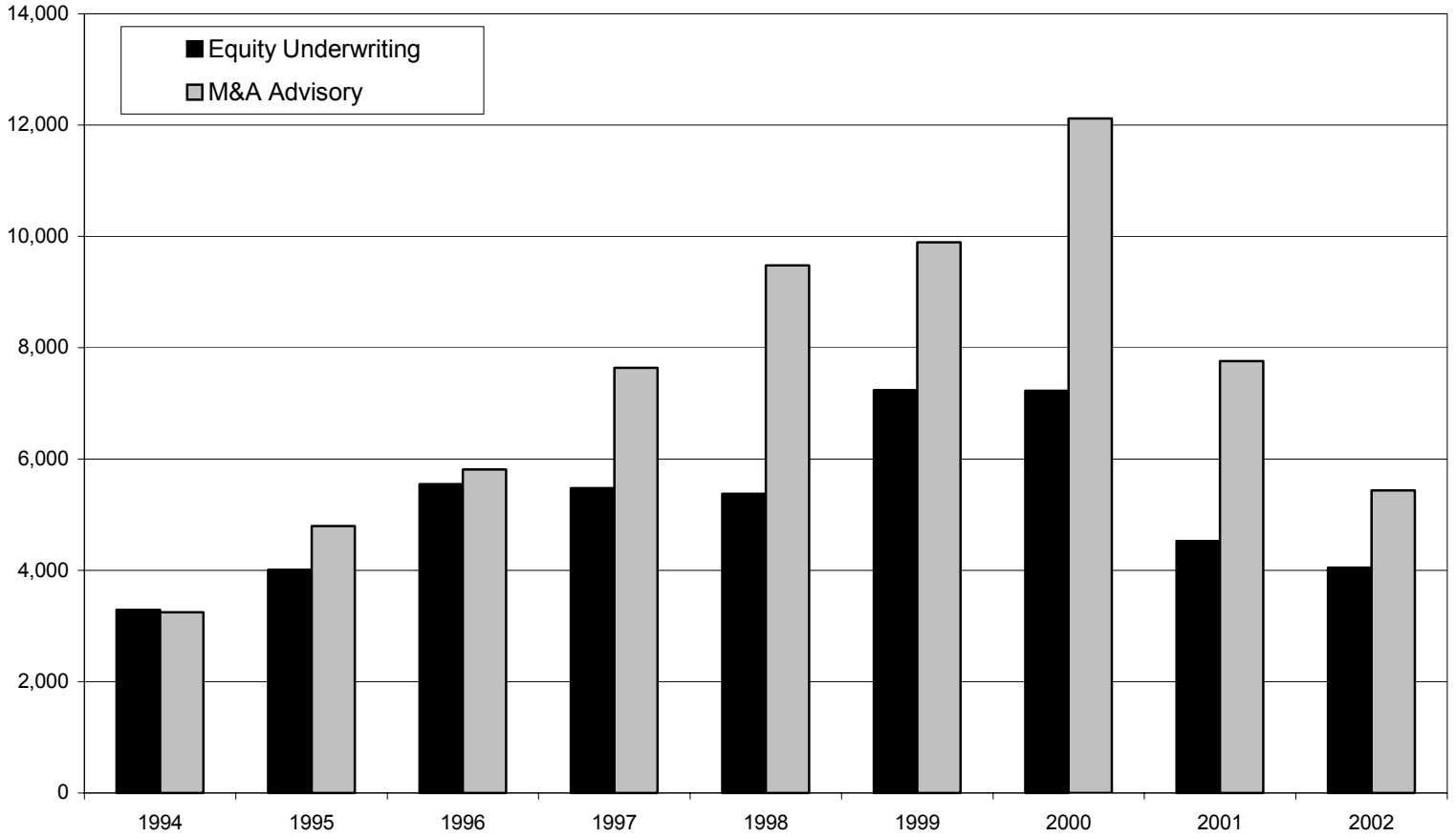
**Figure 1: Aggregate US Investment Banking Fee Revenues ($Millions)**




Source: Freeman & Co. estimates. Freeman & Co. compiles its estimates using Captial IQ, Bloomberg, Thomson Financial, and SDC

**Figure 2: Market Capitalization of Firms Issuing Equity vs. Firms Engaging in M&A Activity as a % of Aggregate Equity Market Capitalization**

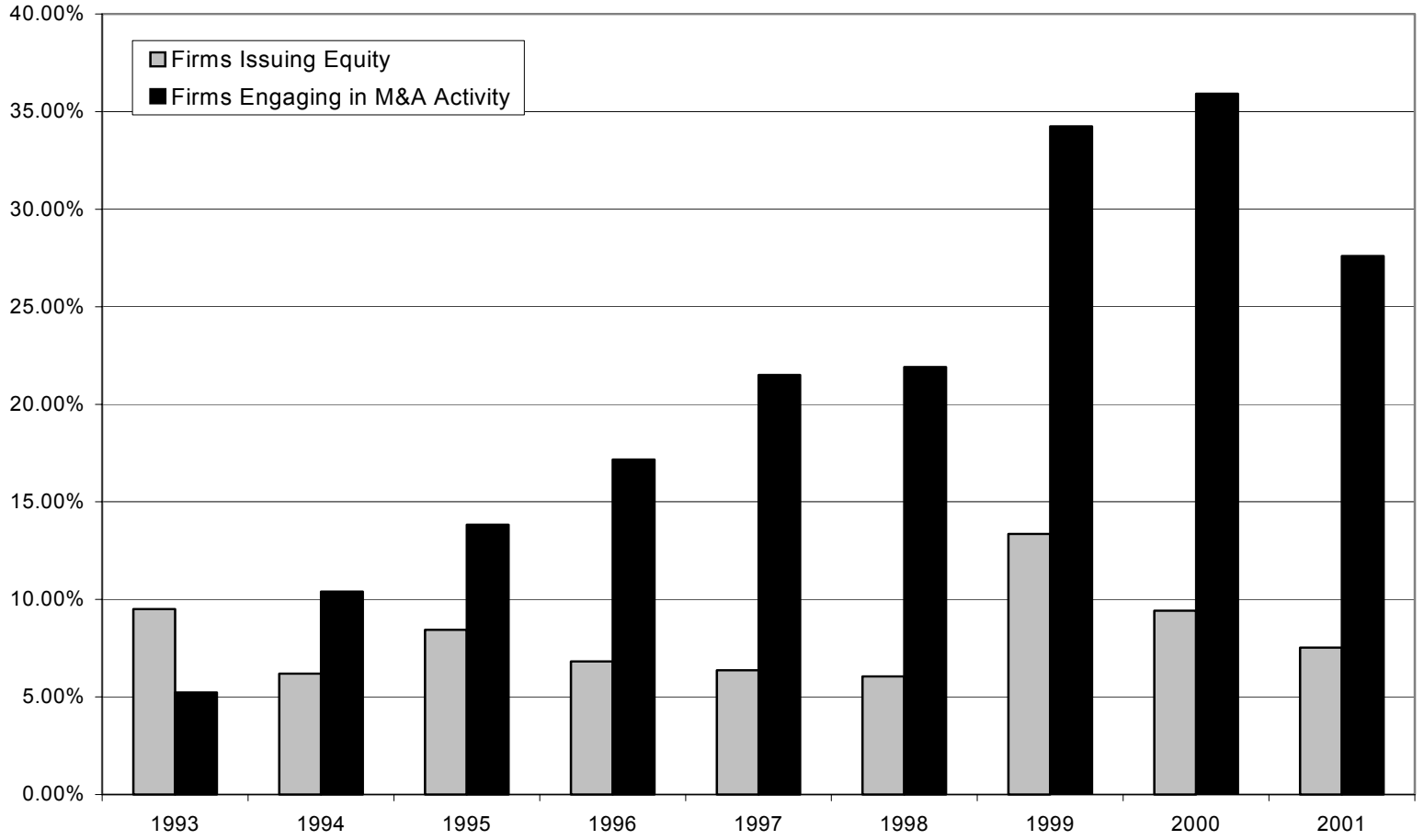


**Table 1**
**Predictions of Affiliated Analyst Deviation from Consensus the Bribery and Execution-Related Hypotheses**

**Panel A: Predictions in cases of stock deals**

| | | Subject of Report and Hypothesis | | | |
|---|---|---|---|---|---|
| **Affiliation** | **Time of Analyst Report** | **Target: Execution-Related** | **Target: Bribery** | **Acquirer: Execution-Related** | **Acquirer: Bribery** |
| Target | After transaction | Optimism | Optimism | Pessimism | Pessimism |
| Target | Before transaction | Optimism | Optimism | **Pessimism** | **Optimism** |
| Acquirer | | Pessimism | Pessimis | Optimism | Optimism |

**Panel B: Prediction in cases of cash deals**

| | Subject of Report and Hypothesis | | | |
|---|---|---|---|---|
| **Affiliation** | **Target: Execution-Related** | **Target: Bribery** | **Acquirer: Execution-Related** | **Acquirer: Bribery** |
| Target | Optimism | Optimism | No Bias | No Bias |
| Acquirer | Negative | Negative | **No Bias** | Optimism |

**Table 2**
**Descriptive Statistics on Analyst Forecasts and Recommendations**

One and two-year ahead EPS forecasts are given as a percentage of price. Long-term growth forecasts are in percentage points. We provide frequencies for strong sell, sell, hold, buy, and strong buy recommendations. Statistics are calculated for the sample of fees and recommendations where M&A fees paid by firm being reported are and are not available.

| | Descriptive Statistics for Forecast Sample Where Fees are not Available | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | Standard Deviation | 25th Percentile | Median | 75th Percentile | Min | Max |
| Long-Term Growth Forecasts | 28,355 | 20.20 | 12.80 | 12.00 | 17.00 | 25.00 | -50.00 | 267.23 |
| One-Year Ahead EPS Forecasts | 359,333 | 4.32 | 6.36 | 2.14 | 4.56 | 7.00 | -50.00 | 384.59 |
| Two-Year Ahead EPS Forecasts | 308,545 | 5.50 | 5.59 | 3.14 | 5.64 | 8.17 | -49.91 | 387.56 |
| Total | 696,233 | | | | | | | |

| | Descriptive Statistics for Forecast Sample Where Fees are Available | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | Standard Deviation | 25th Percentile | Median | 75th Percentile | Min | Max |
| Long-Term Growth Forecasts | 13,068 | 18.50 | 10.96 | 12.00 | 15.00 | 23.00 | -14.00 | 170.00 |
| One-Year Ahead EPS Forecasts | 169,533 | 5.12 | 4.49 | 2.93 | 5.00 | 7.44 | -50.00 | 49.51 |
| Two-Year Ahead EPS Forecasts | 147,641 | 6.37 | 4.35 | 3.98 | 6.21 | 8.73 | -49.90 | 55.59 |
| Total | 330,242 | | | | | | | |

| | Descriptive Statistics for Recommendations | | | | | |
|---|---|---|---|---|---|---|
| | N | % Strong Sell | % Sell | % Hold | % Buy | % Strong Buy |
| Fees Unavailable | 60,329 | 1.36 | 1.90 | 31.76 | 35.89 | 29.09 |
| Fees Available | 27,281 | 1.38 | 1.85 | 33.18 | 34.43 | 29.15 |
| Total | 87,610 | | | | | |

**Table 3**
**Descriptive Statistics on Deal Values in $millions**

Summary statistics on the value of total consideration paid by acquirers in all M&A deals in our sample. To be in our sample, information on fees as well as EPS or growth forecasts must be available for either the target or the acquirer, or both. Currency for a deal is classified as "stock" if 50% or more of the consideration is paid for in stock and "cash" otherwise. For the purposes of classification, we treat assumed debt and other non-stock forms of consideration as cash.

**Panel A: Deals Where Forecasts are Available for Target or Acquirer**

| Currency | N | Mean | Standard Deviation | 25th Percentil | Median | 75th Percentile | Min | Max |
|---|---|---|---|---|---|---|---|---|
| Cash | 900 | 635 | 1,417 | 72 | 198 | 613 | 1 | 25,065 |
| Stock | 1,655 | 1,617 | 6,886 | 64 | 202 | 790 | 2 | 164,746 |

**Panel B: Deals Where Forecastsare Are Available for Acquirer**

| Currency | N | Mean | Standard Deviation | 25th Percentil | Median | 75th Percentile | Min | Max |
|---|---|---|---|---|---|---|---|---|
| Cash | 649 | 559 | 1,431 | 53 | 164 | 474 | 1 | 25,065 |
| Stock | 1,606 | 1,593 | 6,934 | 64 | 201 | 768 | 2 | 164,746 |

**Panel C: Deals Where Forecasts are Available for Target**

| Currency | N | Mean | Standard Deviation | 25th Percentil | Median | 75th Percentile | Min | Max |
|---|---|---|---|---|---|---|---|---|
| Cash | 586 | 888 | 1,681 | 155 | 360 | 938 | 12 | 25,065 |
| Stock | 901 | 2,689 | 8,842 | 214 | 561 | 1832 | 6 | 164,746 |

**Table 4: Descriptive Statistics on Fees in $millions**

Panel A: 1 Year Ahead EPS Sample

| Payer | Deal Currency | #Deals | Mean | Stdev. | 25th pctile | Med. | 75th pctile | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| Target | Cash | 816 | 3.44 | 4.71 | 0.65 | 1.85 | 4.43 | 0.01 | 47.31 |
| Target | Stock | 1207 | 3.75 | 6.10 | 0.40 | 1.46 | 4.15 | 0.01 | 60.00 |
| Acquirer | Cash | 229 | 2.72 | 2.77 | 0.95 | 2.00 | 3.00 | 0.03 | 20.00 |
| Acquirer | Stock | 308 | 2.43 | 4.67 | 0.30 | 0.85 | 2.30 | 0.02 | 35.00 |

Panel B: 2 Year Ahead EPS Sample

| Payer | Deal Currency | #Deals | Mean | Stdev. | 25th pctile | Med. | 75th pctile | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| Target | Cash | 973 | 3.48 | 4.65 | 0.70 | 2.00 | 4.25 | 0.01 | 47.31 |
| Target | Stock | 1433 | 3.87 | 6.37 | 0.45 | 1.55 | 4.35 | 0.01 | 60.00 |
| Acquirer | Cash | 93 | 2.62 | 2.39 | 0.78 | 3.00 | 3.00 | 0.05 | 13.05 |
| Acquirer | Stock | 97 | 2.74 | 5.76 | 0.25 | 0.75 | 2.50 | 0.01 | 35.00 |

Panel C: Long-term Growth Sample

| Payer | Deal Currency | #Deals | Mean | Stdev. | 25th pctile | Med. | 75th pctile | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| Target | Cash | 367 | 3.84 | 5.14 | 0.75 | 1.91 | 5.00 | 0.01 | 45.12 |
| Target | Stock | 589 | 3.48 | 5.13 | 0.50 | 1.68 | 3.98 | 0.01 | 40.20 |
| Acquirer | Cash | 205 | 4.12 | 4.18 | 1.30 | 2.80 | 5.50 | 0.05 | 26.40 |
| Acquirer | Stock | 402 | 5.68 | 7.29 | 1.00 | 3.00 | 7.50 | 0.05 | 60.00 |

Panel D: Recommendation Sample

| Payer | Deal Currency | #Deals | Mean | Stdev. | 25th pctile | Med. | 75th pctile | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| Target | Cash | 830 | 4.12 | 5.19 | 1.00 | 2.72 | 5.10 | 0.01 | 47.31 |
| Target | Stock | 1389 | 4.28 | 6.57 | 0.60 | 2.00 | 5.00 | 0.01 | 60.00 |
| Acquirer | Cash | 357 | 3.77 | 3.67 | 1.50 | 3.00 | 4.60 | 0.03 | 26.40 |
| Acquirer | Stock | 602 | 4.92 | 6.82 | 0.75 | 2.50 | 6.00 | 0.03 | 60.00 |

**Table 5**
**Descriptive Statistics on Affiliated Analyst Deviation from Consensus**

Panel A: 1 Year Ahead EPS Forecasts (As Percent of Price)

| Analyst Affiliation | Analyst Circumstances | N | Prediction under execution-related hypotheses | Prediction under bribery | Mean | Std. Dev. | 1-sided pvalue | 25th pctile | Med. | 75th pctile | Min | Max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target | Forecasting Acquirer EPS Before Stock Deal | 1031 | <0 | <0 | **-0.11** | 1.67 | **0.01** | -0.09 | 0.00 | 0.07 | -48.74 | 3.08 |
| Target | Forecasting Acquirer EPS After Stock Deal | 1106 | <0 | >0 | -0.04 | 0.97 | 0.90 | -0.14 | 0.00 | 0.09 | -10.25 | 14.46 |
| Target | Forecasting Target EPS | 1208 | >0 | >0 | -0.05 | 1.27 | 0.91 | -0.19 | 0.00 | 0.14 | -9.72 | 14.41 |
| Acquirer | Forecasting Acquirer EPS, Cash Deal | 1263 | 0 | >0 | -0.14 | 2.25 | 0.99 | -0.27 | -0.02 | 0.14 | -43.39 | 21.57 |
| Acquirer | Forecasting Acquirer EPS, Stock Deal | 2325 | >0 | >0 | -0.03 | 0.84 | 0.96 | -0.12 | 0.00 | 0.11 | -14.03 | 8.38 |
| Acquirer | Forecasting Target EPS | 720 | <0 | <0 | **-0.04** | 0.80 | **0.08** | -0.17 | 0.00 | 0.11 | -5.58 | 7.05 |

Statistics on affiliated analysts' deviation from consensus 1-Year ahead EPS forecasts. Data are partitioned according to analyst affiliation and the circumstances surrounding the forecast

**Table 5, Continued**
**Descriptive Statistics on Affiliated Analyst Deviation from Consensus**

Panel B: 2 Year Ahead EPS Forecasts (As Percent of Price)

| Analyst Affiliation | Analyst Circumstances | N | Prediction under execution-related hypotheses | Prediction under bribery | Mean | Std. Dev. | 1-sided pvalue | 25th pctile | Med. | 75th pctile | Min | Max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target | Forecasting Acquirer EPS Before Stock Deal | 971 | <0 | <0 | -0.03 | 0.88 | 0.13 | -0.16 | 0.01 | 0.17 | -10.78 | 8.51 |
| Target | Forecasting Acquirer EPS After Stock Deal | 930 | <0 | >0 | -0.01 | 1.30 | 0.62 | -0.18 | 0.00 | 0.20 | -9.43 | 15.37 |
| Target | Forecasting Target EPS | 959 | >0 | >0 | 0.00 | 1.59 | 0.54 | -0.25 | 0.00 | 0.31 | -18.22 | 16.37 |
| Acquirer | Forecasting Acquirer EPS, Cash Deal | 1201 | 0 | >0 | -0.12 | 2.95 | 0.93 | -0.26 | -0.02 | 0.33 | -55.00 | 49.74 |
| Acquirer | Forecasting Acquirer EPS, Stock Deal | 2071 | >0 | >0 | 0.00 | 1.00 | 0.47 | -0.18 | 0.00 | 0.20 | -13.02 | 7.59 |
| Acquirer | Forecasting Target EPS | 569 | <0 | <0 | -0.06 | 1.86 | 0.21 | -0.27 | -0.01 | 0.20 | -28.93 | 10.60 |

Statistics on affiliated analysts' deviation from consensus 2-Year ahead EPS forecasts. Data are partitioned according to analyst affiliation and the circumstances surrounding the forecast

**Table 5 Continued**
**Descriptive Statistics on Affiliated Analyst Deviation From Consensus**

Panel C: Long-term Growth Forecasts (in Percent)

| Analyst Affiliation | Analyst Circumstances | N | Prediction under execution-related hypotheses | Prediction under bribery | Mean | Std. Dev. | 1-sided pvalue | 25th pctile | Med. | 75th pctile | Min | Max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target | Forecasting Acquirer Growth Before Stock Deal | 95 | <0 | <0 | -0.64 | 6.21 | 0.16 | -3.10 | 0.00 | 2.60 | -24.00 | 21.00 |
| Target | Forecasting Acquirer Growth After Stock Deal | 99 | <0 | >0 | -0.64 | 9.91 | 0.74 | -3.00 | 0.00 | 3.00 | -47.00 | 30.00 |
| Target | Forecasting Target Growth | 86 | >0 | >0 | 0.22 | 6.89 | 0.38 | -3.00 | 0.00 | 2.50 | -20.00 | 26.00 |
| Acquirer | Forecasting Acquirer Growth, Cash Deal | 81 | 0 | >0 | -0.27 | 5.85 | 0.66 | -4.00 | 0.00 | 3.00 | -15.00 | 15.00 |
| Acquirer | Forecasting Acquirer Growth, Stock Deal | 217 | >0 | >0 | 0.53 | 6.64 | 0.12 | -2.00 | 0.00 | 3.00 | -22.00 | 40.00 |
| Acquirer | Forecasting Target Growth | 57 | <0 | <0 | -2.07 | 14.81 | 0.15 | -2.50 | 0.00 | 3.00 | -100.00 | 20.00 |

Statistics on affiliated analysts' deviation from consensus long-term growth forecasts. Data are partitioned according to analyst affiliation and the circumstances surrounding the forecast.

**Table 5, Continued**
**Descriptive Statistics on Affiliated Analyst Deviation from Consensus**

Panel D: Recommendations

| Analyst Affiliation | Analyst Circumstances | N | Prediction under execution-related hypotheses | Prediction under bribery | Mean | Std. Dev. | 1-sided pvalue | 25th pctile | Med. | 75th pctile | Min | Max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Target | Recommending Acquirer Before Stock Deal | 174 | <0 | <0 | 0.04 | 1.08 | 0.71 | -1.00 | 0.00 | 1.00 | -2.00 | 4.00 |
| Target | Recommending Acquirer After Stock Deal | 232 | <0 | >0 | **0.12** | 1.06 | **0.04** | -0.82 | 0.00 | 1.00 | -2.00 | 3.00 |
| Target | Recommending Target | 187 | >0 | >0 | **0.21** | 0.96 | **0.00** | -0.25 | 0.00 | 1.00 | -3.00 | 2.25 |
| Acquirer | Recommending Acquirer, Cash Deal | 208 | 0 | >0 | **0.21** | 0.85 | **0.00** | 0.00 | 0.00 | 1.00 | -2.00 | 2.00 |
| Acquirer | Recommending Acquirer, Stock Deal | 395 | >0 | >0 | **0.15** | 1.00 | **0.00** | -0.50 | 0.00 | 1.00 | -3.00 | 3.00 |
| Acquirer | Recommending Target | 103 | <0 | <0 | 0.38 | 1.01 | 1.00 | 0.00 | 0.00 | 1.00 | -2.00 | 3.00 |

Statistics on affiliated analysts' deviation from the consensus recommendation. Data are partitioned according to analyst affiliation and the circumstances surrounding the recommendation.

**Table 6**
**Variable Definitions**

| Variables | Definition |
|---|---|
| O | Optimism: Individual analyst's forecast less unaffiliated consensus, scaled by calendar month-end stock price in the case of EPS forecasts. Used as the dependent variable in the OLS regressions. |
| $F_a$ | Fees received from acquirer, in millions. |
| $F_t$ | Fees received from target, in millions. |
| A | Dummy indicating that the acquirer is the subject of a forecast or recommendation |
| S | Percentage of the consideration paid by acquirer in acquirer stock. |
| B | Dummy indicating that the forecast or recommendation is issued before the M&A transaction announcement date. |
| $I_{ac}$ | An interaction term: $I_{ac} = A(1-S)F_a$ |
| $I_{tb}$ | An interaction term: $I_{tb} = BASF_t$ |
| $I_{ta}$ | An interaction term: $I_{ta} = (1-B)ASF_t$ |
| d | Absolute number of days between the forecast and the M&A transaction announcement date. |
| L | Length of an analyst's career, defined as the amount of time, in years, between the current forecast and the analyst's first ever forecast recorded in the I/B/E/S database. |
| M | Market capitalization of stock that is subject of analyst forecast as of the end of the calendar month |
| N | Total number of analysts covering a stock, defined as the number of analysts issuing forecasts within a calendar month |
| $D_a$ | Dummy indicating that the analyst is affiliated with the acquirer advisor |
| $D_t$ | Dummy indicating that the analyst is affiliated with the target advisor |
| **V** | A vector of interaction terms: $\mathbf{V} = < AD_a, (1-A)D_a, AD_t, (1-A)D_t >$ |

**Table 7**
**OLS Results**

The table presents results from OLS regressions for the following 2 specifications:

Model 1: $O = \alpha + AF_a\,\beta_1 + (1\text{-}A)F_a\,\beta_2 + AF_t\,\beta_3 + (1\text{-}A)F_t\,\beta_4 + (365\text{-}d)\mathbf{Va} + L\mathbf{Vb} + M\mathbf{Vc} + N\mathbf{V\delta} + \varepsilon$

Model 2: $O = \alpha + AF_a\,\beta_1 + (1\text{-}A)F_a\,\beta_2 + AF_t\,\beta_3 + (1\text{-}A)F_t\,\beta_4 + + \gamma_1 I_{ac} + \gamma_2 I_{tb} + \gamma_3 I_{ta} + (365\text{-}d)\mathbf{Va} + L\mathbf{Vb} + M\mathbf{Vc} + N\mathbf{V\delta} + \varepsilon$

See Table 6 for variable definitions. We use the Fama-McBeth method to compute all estimates and statistics: we run OLS regressions for each calendar quarter, from 1992 to 2001, and then calculate estimates and standard errors for the whole sample, displayed below, from the time series of quarterly estimates. The number of observations refers to the number of all analyst forecasts in the sample. We do not display coefficient estimates and standard errors corresponding to interaction terms that contain the control variables d, L, M and N.

| | Prediction | 1-Year Ahead EPS | | 2-Year Ahead EPS | | Long-Term Growth | |
|---|---|---|---|---|---|---|---|
| | | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| $AF_a$ | >0 | -0.0003 | -0.0036 | -0.0194 | 0.0001 | -0.1113 | -0.4206 |
| *Standard Error* | | *0.0006* | *0.0077* | *0.0431* | *0.0019* | *0.6631* | *1.1089* |
| *Pvalue* | | *0.70* | *0.68* | *0.67* | *0.47* | *0.57* | *0.65* |
| $(1\text{-}A)F_t$ | >0 | 0.0003 | 0.0003 | -0.0015 | -0.0015 | -0.5916 | -0.5916 |
| *Standard Error* | | *0.0006* | *0.0006* | *0.0025* | *0.0025* | *0.6781* | *0.6781* |
| *Pvalue* | | *0.31* | *0.31* | *0.72* | *0.72* | *0.81* | *0.81* |
| $AF_t$ | 0 | 0.0001 | 0.0001 | 0 | -0.0001 | -0.0346 | -23.07 |
| *Standard Error* | | *0.0001* | *0.0001* | *0.0002* | *0.0002* | *0.2777* | *24.947* |
| *Pvalue* | | *0.34* | *0.67* | *0.95* | *0.55* | *0.90* | *0.36* |
| $(1\text{-}A)F_a$ | <0 | 0.0002 | 0.0002 | 0.0034 | 0.0034 | -0.0142 | -0.0141 |
| *Standard Error* | | *0.0002* | *0.0002* | *0.0021* | *0.0021* | *0.1449* | *0.1449* |
| *Pvalue* | | *0.83* | *0.83* | *0.94* | *0.94* | *0.46* | *0.46* |
| $I_{tb}$ | <0 | . | 0.0016 | . | 0.0001 | . | 28.517 |
| *Standard Error* | | . | *0.0033* | . | *0.0002* | . | *31.366* |
| *Pvalue* | | . | *0.68* | . | *0.63* | . | *0.82* |
| $I_{ta}$ | >0 | . | 0.0003 | . | 0.0002 | . | 38.387 |
| *Standard Error* | | . | *0.0002* | . | *0.0005* | . | *30.001* |
| *Pvalue* | | . | *0.12* | . | *0.32* | . | *0.10* |
| $I_{ac}$ | >0 | . | 0.002 | . | -0.0034 | . | -0.5743 |
| *Standard Error* | | . | *0.0056* | . | *0.005* | . | *1.6985* |
| *Pvalue* | | . | *0.36* | . | *0.75* | . | *0.63* |
| Observations | | 163,050 | 163,050 | 141,931 | 141,931 | 12,525 | 12,525 |

## Table 8
## Logistic Regression Results

The following table presents results from logit regressions in which analyst recommendations are the dependent variables, and various interaction terms are the independent variables, as defined in Table 5, as well as the frequency of unaffiliated colleague recommendations of various types (#strongbuy, #buy, #hold, #sell, and #strongsell). Terms involved the control variables d, L, M and N are also included in the analysis, but their coefficient estimates and standard errors are not displayed.

| | Prediction | Model 1 | Model 2 | Model 3 |
|---|---|---|---|---|
| #strongbuy | >1 | 1.207 | 1.207 | 1.207 |
| *Standard Error* | | *0.017* | *0.017* | *0.017* |
| *Pvalue* | | *0.00* | *0.00* | *0.00* |
| #buy | >1 | 1.068 | 1.072 | 1.072 |
| *Standard Error* | | *0.015* | *0.015* | *0.015* |
| *Pvalue* | | *0.00* | *0.00* | *0.00* |
| #hold | <1 | 0.761 | 0.763 | 0.763 |
| *Standard Error* | | *0.009* | *0.009* | *0.009* |
| *Pvalue* | | *0.00* | *0.00* | *0.00* |
| #sell | <1 | 0.548 | 0.549 | 0.549 |
| *Standard Error* | | *0.031* | *0.031* | *0.031* |
| *Pvalue* | | *0.00* | *0.00* | *0.00* |
| #strongsell | <1 | 0.645 | 0.653 | 0.653 |
| *Standard Error* | | *0.043* | *0.043* | *0.043* |
| *Pvalue* | | *0.00* | *0.00* | *0.00* |
| $AF_a$ | >1 | . | 0.980 | 0.983 |
| *Standard Error* | | *.* | *0.020* | *0.022* |
| *Pvalue* | | *.* | *0.84* | *0.78* |
| $(1-A)F_t$ | >1 | . | 1.028 | 1.028 |
| *Standard Error* | | *.* | *0.022* | *0.022* |
| *Pvalue* | | *.* | *0.10* | *0.10* |
| $AF_t$ | None | . | 1.003 | 0.992 |
| *Standard Error* | | *.* | *0.010* | *0.022* |
| *Pvalue* | | *.* | *0.78* | *0.74* |
| $(1-A)F_a$ | <1 | . | 0.904 | 0.904 |
| *Standard Error* | | *.* | *0.041* | *0.041* |
| *Pvalue* | | *.* | *0.01* | *0.01* |
| $I_{tb}$ | <1 | . | . | 1.006 |
| *Standard Error* | | *.* | *.* | *0.026* |
| *Pvalue* | | *.* | *.* | *0.59* |
| $I_{ta}$ | >1 | . | . | 1.019 |
| *Standard Error* | | *.* | *.* | *0.026* |
| *Pvalue* | | *.* | *.* | *0.24* |
| $I_{ac}$ | >1 | . | . | 0.989 |
| *Standard Error* | | *.* | *.* | *0.043* |
| *Pvalue* | | *.* | *.* | *0.60* |
| R-square | | 3.893% | 4.241% | 4.245% |
| Observations | | 26,863 | 26,786 | 26,786 |