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Sell Side School Ties

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ABSTRACT

We study the impact of social networks on agents' ability to gather superior information about firms. Exploiting novel data on the educational backgrounds of sell-side equity analysts and senior officers of firms, we test the hypothesis that analysts' school ties to senior officers impart comparative information advantages in the production of analyst research. We find evidence that analysts outperform on their stock recommendations when they have an educational link to the company. A simple portfolio strategy of going long the buy recommendations with school ties and going short buy recommendations without ties earns returns of 5.40% per year. We test whether Regulation FD, targeted at impeding selective disclosure, constrained the use of direct access to senior management. We find a large effect: pre-Reg FD the return premium from school ties was 8.16% per year, while post-Reg FD the return premium is nearly zero and insignificant.

JEL Classification: G10, G11, G14

Key words: Social networks, connections, analysts, directors

Certain agents play key roles in revealing information into securities markets. In the equities market, security analysts are among the most important. A large part of an analyst's job (perhaps the majority) is to research, produce, and disclose reports forecasting aspects of companies' future prospects, and to translate their forecasts into stock recommendations. Therefore, isolating how, or from whom, analysts obtain the information they use to produce their recommendations is important.

In this paper we investigate ties between sell-side analysts and management of public firms, and the subsequent performance of their stock recommendations. We exploit common past experiences, namely attendance at identical educational institutions, to identify firms where analysts are more likely to gain direct access to senior management. An advantageous aspect of our network ties is that they are formed far before the information likely being transferred across them, and that the underlying tie (ex. alumni link) is not directly related to the type of information likely being transmitted years later (ex. company related information).

Our main goal is to test the hypothesis that analysts gain comparative information advantages through their social networks; specifically, their educational ties with senior officers and board members of firms that they cover. We test this hypothesis by building portfolios that replicate sell-side analysts' recommendations and by comparing how analysts perform on firms to which they have ties, relative to those firms to which they do not. We test this hypothesis for the universe of sell-side analysts and publicly traded domestic firms for which we are able to collect data on the educational background of both the analyst and senior officers of the firm she covers.

To better understand our approach, consider the following example. In 1992, two sell-side analysts covered XYZ Corp.¹ One analyst, Mr. Smith, shares a connection with the firm, defined as having attended the same academic institution as a member of the board of directors or a senior officer. Among the other stocks he covers, Mr. Smith is also linked to CFM Corp., another large cap stock in the

¹ This example comes directly from our sample, however we mask the firms' and analysts' names. We also altered the calendar dates.

same industry. The second analyst, Mr. Jones, shares no educational link to either firm. As of December 1996, both analysts and the IBES consensus (median) rate the stock as a "HOLD".²

On February 10th, 1993, prior to market opening, Mr. Smith deviated from the consensus and upgraded XYZ to a BUY rating. He held the BUY rating until the stock delisted in December 1993. Mr. Jones maintained (and later reiterated) a HOLD rating, reflecting the consensus recommendation. Mr. Jones eventually dropped the stock from coverage, while the consensus recommendation remained a HOLD until the delisting date.

Following Mr. Smith's upgrade, two major events pushed up XYZ's stock price. Immediately after the upgrade, on February 11, 1993, XYZ reported higher fourth-quarter and full-year earnings, beating the consensus expectation. In October 1993, CFM Corp. announced its intention to acquire XYZ. XYZ's price rose 15.7% on the news. The merger was completed in December 1993. Figure 1 illustrates this timeline of events.

Between February 10th, 1993 and December 1993 XYZ's stock price rose by 78.6%. An investor who purchased the stock after Mr. Smith's bullish call would have outperformed a characteristic-adjusted benchmark by 52.9% over an 11-month period.

More generally, XYZ and CFM are not the only securities with an educational connection to Mr. Smith. Between 1993 and 2006, Mr. Smith covered a variety of stocks. Looking at his recommendations over time reveals his tendency of producing superior advice on stocks where he shares a school link with a member of the board of directors or a senior officer of the firm. Between 1993 and 2006 a calendar time portfolio replicating his BUY recommendations (with a 1 day lag) in stocks to which he shares a link outperformed a characteristic-adjusted benchmark portfolio by 1.17% per month; the corresponding abnormal returns on his non-linked calls was only 0.01%.

The results in this example represent a much more systematic pattern

² The consensus rating refers to the average across all analysts covering the stock; we do not have educational information on the remaining analysts.

across the universe of sell-side equity analysts. Consistent with the hypothesis that educational ties facilitate the transmission of private information, we find that analysts produce significantly superior recommendations in firms to which they have an educational tie, relative to those firms to which they do not.

Analysts' buy recommendations on school tied stocks outperform buy recommendations on non-tied stocks by an average of 45 basis points per month ($t=3.87$), using 12-month calendar time portfolios following the recommendations. Therefore, a calendar time portfolio strategy exploiting only this informational advantage on buys, translates into roughly 5.40% outperformance per year. The return differential is largely unaffected after controlling for other determinants of returns such as size, book-to-market, and momentum.

However, we do not find this same pattern on the analysts' sell recommendations. Analysts' school tied sells perform roughly the same as their non-tied sell recommendation stocks following the recommendations. One explanation consistent with this finding is that managers are willing to reveal positive (but not negative) information about their firms. Alternatively, this would be consistent with analysts obtaining both good and bad news from their school tied firms, but perhaps as part of a tacit agreement, acting only on the positive news.

There could be a number of mechanisms that allow information to be transferred along the networks. It may be that the networks allow analysts cheaper access to firm-level material information, which then allows them to form superior recommendations. For example, the analyst may have access to explicitly private conference calls with firm officials, or the network may simply reduce the cost to the analyst of obtaining or analyzing information about the firm (ex. the analyst can obtain information about upcoming earnings with fewer calls to the firm). Alternatively, the education network may simply allow analysts to better assess managerial quality. Under this mechanism, there is not a constant flow of information in the network from the firm to the analyst, but instead some inherent information within the network about managerial quality (ex. all members of the Dartmouth network know that the Dartmouth CEO of firm ABC is quite good,

while the Dartmouth CEO of XYZ is not).

In order to distinguish between these two alternatives, we exploit a regulation introduced during our sample period explicitly aimed at blocking the former mechanism of selective information transfer: Regulation FD, instated by the SEC in October of 2000. The regulation quite openly gave as its aim the ending of selective disclosure by firms to a subset of market participants. For instance, in the SEC release regarding Regulation FD, the aim was given to stop the occurrence that: "a privileged few gain an informational edge -- and the ability to use that edge to profit -- from their superior access to corporate insiders, rather than from their skill, acumen, or diligence." The SEC went on to caution that it was these selective disclosure relationships that allowed agents to: "exploit `unerodable informational advantages´ derived not from hard work or insights, but from their access to corporate insiders."³ Our educational social networks may represent exactly this type of `unerodable informational advantage´ that the SEC targeted with Regulation FD. Specifically, if the channel that allows analysts to produce superior recommendations on school tied stocks is selective disclosure, we may expect this superior ability to be attenuated post-Regulation FD. However, if the education network simply measures analysts' increased ability to assess managerial quality for CEOs they attended school with, it is not clear this would be affected at all by Regulation FD.

We test this hypothesis by splitting our sample to observe analysts' ability on school tied stocks pre- and post-Regulation FD. All of our evidence points to selective disclosure being the main mechanism of information transfer along the network. All of our effects are positive, large, and significant pre-Regulation FD, and small and insignificant post-Regulation FD. The monthly returns of the long-short calendar time portfolio on the differences between school tied and non-school tied stocks pre-Regulation FD is 68 basis points per month ($t=4.36$), or 8.16% per year. Post-Regulation FD, this difference is only 14 basis points per month, and statistically indistinguishable from zero ($t=0.84$). Further, the difference between

³ Selective Disclosure and Insider Trading, SEC Release Nos. 33-7881, 34-43154, IC-24599, 65 Fed. Reg. 51716 (Aug. 24, 2000).

the long-short portfolio returns in the two periods is large (55 basis points) and statistically significant ($t=2.38$). To test this more carefully, we also run panel regressions of returns on buy recommendations on a connection dummy variable, a post-Reg FD dummy variable, an interaction term (connected*post-Reg FD), and a host of firm, brokerage, and analyst-level control variables. Consistent with our results from the calendar-time portfolios, we find that the coefficient on the interaction term is strongly negative, while the combined effect (interaction term+connected) is small (10bp) and insignificant (F-statistic of 1.18), indicating that the school tie premium is largely absent in the post-Reg FD period. In a separate set of regressions, we also show that the number of school ties an analyst possesses strongly increases the likelihood of becoming an "All-Star" analyst (a 2 standard deviation increase in connections more than doubles the probability from 9.2% to 20.1%), but *only* in the pre-Reg FD period; this result further highlights the value of social networks precisely during those times when selective disclosure is least inhibited.

We construct an out-of-sample test of the impact of Reg FD by replicating our results in the United Kingdom, where there was no such law enacted at this time.⁴ Over the entire sample period, we again find a large school tie return premium on buy recommendations for UK-listed stocks: a long-short portfolio that purchases linked buy recommendations and shorts non-linked buy recommendations earns 187 basis points per month ($t=2.79$) in raw returns, and 167 basis points per month ($t=2.20$) in abnormal returns. However, unlike in the US, we see no significant difference in this premium between the pre- and post-Reg FD time periods.

Lastly we perform a number of robustness checks. We find that the school tie outperformance is present in both large and small cap stocks, and for stocks with both high and low analyst coverage. In addition, the effect is present in both

⁴ Regulations prohibiting the selective disclosure of material information by UK-listed firms have been a part of UK law for decades since rules on insider dealing came into force in the 1980s. Conversations with practitioners in the UK indicate that although clarifications and enhancements to these norms were put into effect in 2001 (through the Financial Services and Markets Act) and 2005 (via the Market Abuse Directive), these acts were generally not viewed as structural shifts in the disclosure environment in the same way that Regulation FD in the US was designed to be.

Ivy league and non-Ivy league connections between analyst and firm, and is nearly unaffected by controlling for school-level returns at the stock level.

The remainder of the paper is organized as follows. Section I of the paper provides a brief background and literature review, while Section II describes the data on both firms and analysts. Section III provides the main results on analyst ability and sell-side school ties. Section IV explores the mechanism for information transfer across the network, while Section V examines alternative hypotheses. Section VI concludes.

I. Background and literature review

The opinions of sell-side equity analysts are among the most widely solicited, anticipated, and dissected news items in the stock market each day. Further, since analyst data is available in large quantities and in relatively standardized formats, the sell-side analyst industry offers an ideal testing ground for a number of theories of economic behavior. In this paper we use this testing ground to investigate the idea that agents' educational ties facilitate the transmission of private information into security markets.

A large literature on analyst performance supports the idea that analysts bring valuable information to the market, and have incentives to do so. Numerous studies document the potential profitability of trading on analyst recommendations (see, for example, Womack (1996), Barber et al. (2001, 2003), Jegadeesh et al. (2004)) and earnings forecast revisions (see Stickel (1991) and Gleason and Lee (2003), among others).⁵ Of course, sell-side analysts have an incentive to produce unbiased forecasts and recommendations for investors only if they are compensated for such behavior. Due to a lack of data on direct compensation, the literature generally tests this idea by linking analyst behavior to measures of implicit incentives or career concerns. Stickel (1992) finds that highly rated "All-American"

⁵ See also Michaely and Womack (2007), who combine information from recommendations and earnings forecasts data and show that the subset of upgraded/downgraded recommendations "supported" by an earnings forecast revision in the same direction are the most profitable recommendations.

analysts (who are typically better compensated than other analysts) are more accurate earnings forecasters than other analysts, suggesting that accuracy is rewarded. Similarly, Mikhail, Walther, and Willis (1999) document that poor relative performance leads to job turnover.

An important strand of the literature, however, suggests that analysts' career concerns and the conflicts of interest inherent in equity research create an agency problem, potentially at the expense of investors who trust analyst research to be unbiased. Hong, Kubik, and Solomon (2000), find that younger analysts deviate less from the consensus than their older counterparts, consistent with the predictions of reputation-based herding models.⁶ Hong and Kubik (2003) report that controlling for accuracy, analysts who are optimistic relative to the consensus are more likely to experience favorable job separations. They also find that analysts are judged less on accuracy than optimism when it comes to stocks underwritten by their employers, supporting allegations that analysts suffer from a conflict of interest when covering stocks affiliated with their brokerage houses.⁷ Since we can control for investment banking affiliations, we can distinguish information effects from agency effects throughout the paper.

Our paper is unique in that we try to isolate a channel through which analysts acquire valuable information. As such, our work is related to the recent passage of Regulation FD. Effective October 23, 2000, companies must reveal any material information to all investors and analysts simultaneously in the case of intentional disclosures, or within 24 hours in the case of unintentional disclosures. According to SEC Proposed Rule S7-31-99, regulators believe that allowing selective disclosure is "not in the best interests of investors or the securities markets generally." Several recent papers examining the impact of Regulation FD on the behavior of equity analysts conclude that the law has in fact been effective in curtailing selective disclosure to analysts (see, for example, Mohanram and Sunder (2006), Agrawal, Chadha, and Chen (2006), and Gintchel and Markov

⁶ Chevalier and Ellison (1999) and Lamont (2002) find similar results for mutual fund managers and macroeconomic forecasters, respectively. Also see Holmström (1999) and Scharfstein and Stein (1990) for related work on career concerns.

⁷ Lin and McNichols (1998), Michaely and Womack (1999), and Lin, McNichols, and O'Brien (2005) also report evidence in support of this view.

(2004)). Since our tests explore a specific possible channel of selective disclosure, they are relevant to this debate.⁸

Our empirical strategy is similar to Cohen, Frazzini, and Malloy (2007), who exploit educational connections between mutual fund managers and corporate board members to identify information transfer through social networks. The use of corporate board linkages as a measure of personal networks is common in the network sociology literature (see, for example, Mizruchi (1982, 1992), Useem (1984)). Board linkages are typically isolated by looking at direct board interlocks between firms (as in Hallock (1997), "back-door" links among directors across firms (as in Larcker et al. (2005) and Conyon and Muldoon (2006)), or direct and indirect links between board members and government agencies or officials (as in Faccio (2006) and Fisman et al. (2006), among others), and have shown to be important mechanisms for the sharing of information and the adoption of common practices across firms.⁹ Our approach is different in that we focus on direct links between board members and equity analysts via shared educational backgrounds.

II. Data

The data in this study is collected from several sources. We search public filings and other miscellaneous information available over the World Wide Web to construct a novel database of educational backgrounds of sell-side analysts issuing recommendations on US domestic stocks.

We start by identifying all sell-side analysts on the I/B/E/S tape who provide at least one recommendation on a domestic stock between 1993 and 2006. For each analyst, I/B/E/S provides a numeric identifier, the analyst's last name, the initial of his/her first name, and a code corresponding the analyst's brokerage firm. We use the broker translation file to reconstruct the name of the brokerage

⁸ See also Malloy (2005), who shows that geographically proximate analysts produce more accurate forecasts, but do so both before *and* after the enactment of Regulation FD; as well as Groyberg, Healy, Chapman, Shanthikumar, and Gui (2007), who document a decline in the forecast accuracy advantage of sell-side analysts over buy-side analysts after the enactment of Regulation FD.

⁹ Examples of the latter include the adoption of poison pills (Davis (1991)), corporate acquisition activity (Haunschild (1993)), CEO compensation (Khurana (2002)), and the decision to make political contributions (Mizruchi (1992)).

house. Since our data construction methodology involves name searches, we delete observations with multiple names for a given numeric identifier or multiple identifiers for a given name. Finally, we discard teams, since I/B/E/S provides only the team members' last names but not their first name. This leads to an initial list of 8,620 analysts issuing recommendations between 1993 and 2006.

We hand-collect analysts' educational backgrounds from a variety of sources. Our main data source is Zoominfo.com, a search engine that specializes in collecting and indexing biographical and employment data from publicly available documents over the Web. From this site, we obtain each analyst's full name, job title, present and past employment history and the stocks covered in order to correctly identify an analyst in our initial set. We supplement the initial search with the BrokerCheck search engine available on the Financial Industry Regulatory Authority website, which contains background information on current and former FINRA-registered security investment professionals. Finally, if we are unable to determine the analyst's educational background using our primary sources, we use other available sources over the Web on a case-by-case basis to collect additional information. In building our final sample we use a conservative approach and discard observations where we are unable to uniquely associate an analyst with a specific educational background. This occurs either due to disagreement between multiple sources, or because we are unable to correctly identify the analyst.¹⁰

For each analyst we collect all the undergraduate and graduate degrees received, the institution granting the degree and (where available) the year the degree was awarded or the date range the analyst attended a particular institution.

One drawback of our data is that date ranges or graduation years are missing for 70% of the final sample since most of the data is extracted from company releases or other public filings, which tend to omit graduation years. Although date ranges can be obtained from the academic institution's alumni network, we are currently unable to collect graduation years since most universities

¹⁰ For example, if according to I/B/E/S a person named A. Summer covers technology stocks for Goldman Sachs in 1999, but our web searches uncover an Alan Summer and an Amy Summer, both of whom were analysts for Goldman Sachs covering technology stocks in 1999, we would not be able to uniquely match this analyst.

restrict access to their alumni network, and some require written consent of the alumnus before releasing this information. We are in the process of collecting this additional data item and hope to be able to include graduation years in future drafts of this paper.

Biographical information for boards of directors and senior company officers is provided by Boardex of Management Diagnostics Limited. The data contain relational links among board of directors and other corporate officials. Links in the dataset are constructed by cross-referencing employment history, educational background and professional qualifications. For each firm, we use the link file to reconstruct the annual time series of identities and educational background of board members and senior officers (defined as CEO, CFO or Chairman).

The final data contain current and past roles of company officials with start-year and end-year, a board dummy, all the undergraduate and graduate degrees received, the year in which the degrees were granted, and the institution granting the degree. We hand match institutions and degrees from our analyst data and Boardex and create a unique numeric identifier. We group the degrees into 6 categories: (i) business school (MBA), (ii) medical school, (iii) general graduate (MA or MS), (iv) PhD, (v) law school, and (vi) general undergraduate.¹¹

Finally, we match the firms associated with all company officials and sell-side analysts to accounting and stock return data from CRSP/COMPUSTAT. Our final sample includes educational background data on 1,820 analysts issuing a total of 56,994 recommendations over 5,132 CRSP stocks between October 30th, 1993 and December 20th, 2006.

Table I reports summary statistics for the matched samples of firms-boards-analysts. From Panel A, we average 604 analysts and 5,746 recommendations per year, which comprise 23% of the universe of sell-side analysts and 23% of the total number of recommendations per year. Our sample of firms averages 1,705 per year, which comprise 74% of total market value of CRSP stocks covered by sell-side analysts.

¹¹ See also Cohen, Frazzini, and Malloy (2007) for additional details on data construction and matching using the BoardEx data.

In Panel B we report summary statistics by firm-year or analyst-year. The typical analyst in our sample covers 14 stocks while the mean coverage per firm is around 5 analysts. The average size percentile is 0.78 while the average book-to-market percentile is 0.37, reflecting the known fact that analyst coverage tends to be skewed towards larger cap growth stocks.

Table II reports summary statistics on our sample, broken down by academic institution. Panel A reports the average number of analyst ties to senior corporate officials, while Panel B reports the average number of analyst ties to firm boards of directors. Harvard University accounts for 18.53% of analyst ties to senior officials in our sample, and 18.22% of analyst ties to corporate boards; Ivy League schools in general account for 43.72% of analyst ties to senior officials, and 48.51% of analyst ties to corporate boards.¹²

III. Results: Returns to sell-side recommendations

In this section we examine the stock return performance of recommendations by sell-side analysts on securities to which they have school ties. We formally test the hypothesis that recommendations issued on stocks with school ties outperform recommendations issued on stocks without ties.

To assess the relative performance of sell-side recommendations we use a standard calendar time portfolio approach.¹³ We classify a stock as having educational ties to the analyst if he/she attended the same institution of a senior officer (defined as either the CEO, CFO, or Chairman of board) or a board member.

We use the I/B/E/S numeric recommendation code to assign each recommendation to one of two portfolios: (1) a BUY portfolio consisting of all stocks upgraded relative to the previous recommendation, or initiated, resumed or reiterated coverage with a buy or strong buy rating, and (2) a SELL portfolio, consisting of all stocks downgraded relative to the previous recommendation,

¹² Note that our results are not driven by a few particular schools (e.g., Ivy League), as we show later in the paper.

¹³ See also Barber, Lehavy, and Trueman (2005), and Barber, Lehavy, McNichols, and Trueman (2005).

initiated, resumed or reiterated coverage with a hold, sell or strong sell rating, or dropped from coverage by the analyst. We also consider a version of both portfolios using only upgrades or downgrades. If the brokerage house does not report a stock as dropped from coverage and a recommendation is not revised or reiterated within twelve months, we let it expire.

Our portfolios are constructed as follows. For the BUY portfolio, we begin by identifying each BUY recommendation as described above. For each buy recommendation, we skip a trading day between the recommendation date t and investment, and purchase the recommended stock at the close of day $t+1$. By waiting a trading day we exclude the recommendation-date returns and ensure that the portfolios are based on available information.¹⁴ Each recommended stock remains in the portfolio until it is either downgraded, dropped from coverage, or the underlying recommendation expires. Again, we skip a day between an event that causes a stock to be unloaded and the actual disinvestment: e.g. if a stock is downgraded at date t , we unwind the position at the close of date $t+1$. If more than one analyst recommends a particular stock on a given date, then the stock will appear multiple times in the portfolio, once for each recommendation.

Finally, we compute value weighted calendar time portfolios by averaging across analysts, weighting individual recommendations by the analyst's recommendation code. For the BUY portfolio, we reverse-score the recommendation codes so that a Strong Buy is set equal to 5 (instead of 1, as it is in the raw data) and a Strong Sell is set equal to 1, so that a higher weight indicates a relatively more bullish recommendation. We use the exact same method for the SELL portfolio, with the exception that in the final step we use the actual recommendation codes as portfolio weights; i.e., a Strong Buy is set equal to 1 and a Strong Sell is set equal to 5, so that a higher weight indicates a relatively more bearish recommendation.

This approach yields a time series of returns for each portfolio and has the advantage of corresponding to a simple investment strategy of following sell-side

¹⁴ I/B/E/S does not provide a time stamp, hence for recommendations issued prior to 9.30am this approach excludes the first two trading days' returns.

recommendations, mimicking both the directional advice and the holding period implied by the timing of the revisions.

For each stock, we compute risk-adjusted ("DGTW") returns as in Daniel et al. (1997) by subtracting the return on a value weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-to-book ratio, and one year momentum quintile, from the stock's raw return. We update the 125 characteristic portfolios at the end of June of each year using conditional sorts, and adjust the market-to-book ratios using the 48-industry classifications from Ken French's website.¹⁵

Table III presents calendar time portfolio returns for our sample of BUY recommendations, and illustrates one of our main results. BUY recommendations with school ties earn 1.49% per month in raw returns, while BUY recommendations without school ties earn 1.04%. A long/short portfolio which purchases stocks after BUY recommendations by school-tied analysts and shorts stocks after BUY recommendations by non-school-tied analysts earns 45 basis points per month ($t=3.87$), which translates into an annual premium of 5.40%. If we restrict the sample to ties to senior officials only (rather than to senior managers or anyone on the board of directors), the return on this long-short portfolio increases to 55 basis points per month ($t=3.75$). The risk-adjusted abnormal returns are given in the third and fourth columns of Table III. The buy recommendations on stocks without school ties earn basically a zero abnormal return. In contrast, the buy recommendations on stocks where the analyst has school ties continue to outperform in abnormal returns, resulting in the school tied premium being largely unaffected by the other return determinants (40 basis points, ($t=4.63$)).

The last two columns of Panel A report portfolio returns for the subset of upgrades only (i.e., upgrades to buy or strong buy only, excluding initiations and reiterations). The long-short portfolio of tied minus untied upgrades again earns large returns, ranging from 30 to 37 basis points per month over the full sample period.

¹⁵ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Panel B of Table III presents results for the sample of SELL recommendations. Column 2 of Panel A indicates that we are unable to reject the hypothesis of no difference between the raw returns of sell recommendations by analysts with school ties and those without. The next two columns extend these findings to DGTW-adjusted returns. For the sample of analysts with links to the board of directors, the returns on sell recommendations by analysts with school ties are actually significantly higher than those by analysts without ties. However, this result is not robust to the subsample of downgrades, or the subsample of ties to senior officials; the magnitude on the long-short portfolio is also fairly modest.

Overall, our calendar time portfolio tests on the buy recommendations of linked analysts reveal an economically and statistically significant channel through which analysts produced superior recommendations. Our results on sell recommendations suggest that either this information advantage does not extend to negative information, or that incentives not to reveal such negative information are strong.

IV. Mechanism

Our results on the outperformance of buy recommendations by analysts with school ties suggest a statistically and economically important channel for the transfer of private information. In this section we explore possible hypotheses regarding the manner in which this information might be conveyed, the impact of school ties on analyst status, and the types of information being transferred across these networks.

As noted above, our main test to distinguish between direct information transfer as the driver of our findings versus superior assessments of managerial quality is to split the sample pre- and post-Reg FD. The pre-Reg FD period was allegedly a time period plagued with problems of selective disclosure between firms and equity analysts, and the law put in place was expressly designed to curb these practices. Table IV shows that the large returns to school ties on buy recommendations are concentrated in the pre-Reg FD period (68 basis points per month, or 8.16% ($t=4.36$) per year, pre- Reg FD for the long-short portfolio return,

compared to only 14 basis points ($t=0.84$) post-Reg FD). The average monthly difference between the long-short portfolio returns in the two periods is large, 55 basis points, and statistically significant ($t=2.38$). Table V reports results for sell recommendations, splitting the sample in the same way; not surprisingly given our earlier results on sells, we find no significant differences between the two periods for sell recommendations.

The motivation expressed by the SEC in their release¹⁶ of Regulation suggests the school ties we identify in our tests are exactly the sort of private information channel between firms and analysts that the regulation was designed to address. The fact that our results are significantly weaker in the post-Reg FD period suggests that the regulation was effective in curbing the apparent information advantage that analysts gain through their school networks.

To test this idea more formally, we employ panel regressions of returns on buy recommendations on a connection dummy variable, a post-Reg FD dummy variable, an interaction term (connected*post-Reg FD), and a host of firm, broker, and analyst-level control variables. The dependent variables are either returns (Ret) or abnormal returns (Xeret), where indicated; abnormal returns are daily DGTW-adjusted returns. Control variables include: a measure of analyst experience, equal to the number of years an analyst has been making recommendations on I/B/E/S; an affiliation dummy, equal to one if the analyst is employed by a bank that has an under-writing relationship with the covered firm¹⁷; an All-Star dummy variable, equal to one if the analyst is listed as an "All-Star" in the October issue of Institutional Investor magazine in that year¹⁸; a measure of brokerage size, equal to the total number of analysts that work for a given analyst's brokerage house; and fixed effects for recommendation date and industry, where indicated. Regressions are run daily, but the coefficients reported in Table VI are converted to represent monthly returns (in percent); all standard errors are adjusted for clustering at the recommendation date level.

¹⁶ Selective Disclosure and Insider Trading, SEC Release Nos. 33-7881, 34-43154, IC-24599, 65 Fed. Reg. 51716 (Aug. 24, 2000).

¹⁷ The list of affiliated analysts is from Ljungqvist et al. (2006).

¹⁸ The list of "all-star" analysts is from Ljungqvist et al. (2007).

Table VI reports the regression results. Columns 1-3 show that the coefficients on the connection dummy variables are positive, significant, and of the same order of magnitude as the return results from the portfolios (between 38-50 basis points per month), again indicating that buy recommendations by analysts with school ties earn significantly higher returns than those by analysts without such ties. Columns 4-6 report similar results when excess returns are used as the dependent variable instead of raw returns, and when industry fixed effects and analyst-level control variables are included in the regressions.¹⁹

Columns 7 and 8 present the key test of the impact of Reg FD on the school tie return premium. We include a post-Reg FD dummy variable plus an interaction term (Conn. Either*post-Reg FD) designed to capture the effect of school ties in the post-Reg FD time period.²⁰ Consistent with the results from our portfolio tests, we find that the coefficient on the interaction term is strongly negative and significant, while the combined effect (i.e., [Conn. Either*post-Reg]+[Connected_to_Either]) is small (10bp=-42bp+52bp) and insignificant (F-statistic of 1.18), indicating that the school tie premium is largely absent in the post-Reg FD period.

In summary, all of our findings indicate that Regulation FD had a large impact on the school tie premium that we identify in this paper, suggesting that the most likely mechanism driving the superior performance of analysts on their school-tied recommendations is direct information transfer.²¹

Another way to quantify the value of the social networks we isolate in this

¹⁹ Replacing raw returns (columns 1-3) as the dependent variable with abnormal returns (columns 4-8) results in the constant term becoming insignificant, which indicates that the DGTW characteristic-adjustment does a good job of capturing most of the unexplained variation in daily returns.

²⁰ We exclude day fixed effects in these regressions because the model cannot be estimated with a post-Reg FD dummy and day fixed effects jointly (as they are collinear).

²¹ Note that Cohen, Frazzini, and Malloy (2007) do not find a large impact of Reg FD on the return premium that mutual fund managers earn on their school-connected stocks relative to their non-connected stocks. This could be due to a different mechanism at work in the case of mutual fund managers. It could also be due to the fact that equity analysts were under intense scrutiny during this time period, not only as a result of Reg FD, but also due to alleged conflicts of interest that led to several new policy measures being enacted by the SEC, NASD, and NYSE, and which culminated in the Global Settlement of 2003.

paper to the analyst is to test the extent to which school ties predict the probability of that analyst's becoming an All-Star. As in our prior tests, All-Star status is defined as being listed as an "All-Star" in the October issue of Institutional Investor magazine in a given year. All-Star status is a sought-after designation among analysts, and is typically associated with higher-compensation (Stickel (1992)).²² To assess the predictive power of an analyst's network, we regress a dummy variable for All-Star status in a given year on the average number of school ties per analyst per year (Num Conn) plus a host of control variables at the analyst- and stock-level. The dependent variable is a dummy variable equal to one if the analyst was voted as an All-Star analyst for that year. We employ a similar set of control variables as in Table VI, with the exception that affiliation status is now measured as the average percentage of stocks (over the year) in an analyst's portfolio that have an underwriting relationship with the analyst's brokerage. Plus we also include a control variable for covered firm size, equal to the average size of the firms covered by the analyst in that year. All observations are at the analyst-year level; fixed effects at the year and analyst level are included where indicated, and all standard errors are adjusted for clustering by year.

Table VII reports the coefficient estimates from these predictive regressions. Columns 1-5 are OLS panel regressions, while Column 6 is a probit regression where coefficient estimates are the marginal effects on the probability of being an All-Star. Columns 1-3 indicate that the number of school ties (to senior officers, to members of the board, or to either) are a strong positive predictor of the likelihood of being an All-Star. The coefficient on connections in Column 3 implies that a 2 standard deviation move in connectedness through school ties more than doubles the probability of being an All Star, from 9.2% to 20.1%. Columns 4 and 5 illustrate the effect of Reg FD on this result: we include a post-Reg FD dummy variable plus an interaction term (Conn. Either*post-Reg FD) designed to capture

²² Stickel (1992) shows that All-Star analysts also produce more accurate earnings forecasts than other analysts, suggesting a link between reputation and performance. Interestingly, in unreported tests we find that the All-Star analysts in our sample do not outperform other analysts on their buy/sell recommendations.

the predictive impact of the number of school ties on All-Star status in the post-Reg FD time period.²³ Once again the interaction term is strongly negative, and the combined effect ($[\text{Conn. Either} * \text{post-Reg FD}] + [\text{Num. Conn. to Either}]$) is close to zero, indicating that the number of school ties have no effect on being an All-Star in the post-Reg FD period. The fact that school ties predict All-Star status only before the imposition of Reg FD further highlights the value of social networks precisely during those times when selective disclosure is least inhibited.

We construct an out-of-sample test of the impact of Reg FD by replicating our results in the United Kingdom, where there was no such regulation enacted at this time. Again we form buy-sell portfolios of linked and non-linked recommendations, but we now restrict our analysis to UK-listed stocks for which we have analyst recommendations on I/B/E/S and available educational background information on both the analyst and the senior officers of the firm.²⁴ Table VIII shows that over the entire sample period, we again find a large school tie return premium on buy recommendations for UK-listed stocks: a long-short portfolio that purchases linked buy recommendations and shorts non-linked buy recommendations earns 187 basis points per month ($t=2.79$) in raw returns, and 167 basis points per month ($t=2.20$) in abnormal returns. Again we find no significant school tie premium on sell recommendations. However, unlike in the US, we see no significant difference in the school tie premium on buy recommendations between the pre- and post-Reg FD time periods.²⁵ The point estimates of the school tie premium are actually slightly higher (although not significantly) in the post Reg FD time period. This gives confirming evidence that

²³ Again we do not include year fixed effects in these specifications, because the model cannot be estimated with year fixed effects and the post Reg FD dummy variable included together. We do include analyst fixed effects in Columns 5 and 6.

²⁴ Analogous to our US sample, we collect educational data on I/B/E/S analysts issuing recommendations on stocks traded in the UK, as defined by the I/B/E/S country exchange code. We hand matched firms from the Boardex sample to I/B/E/S using company names. Daily returns (in local currency) are from Factset. Market equity and book equity are from Compustat Global. Note that the coverage of our sample is sparse for non-US data: By requiring educational information on I/B/E/S analysts covering UK stocks, we limit our sample to an average of approximately 30 analysts, 77 stocks, and 175 recommendations per year over the 1993-2006 time period.

²⁵ For brevity we only report results for links to senior management, and for raw returns (in Panel B). Results are very similar for the full set of specifications used earlier.

the Reg FD effect we find in the main (US) sample is in fact driven completely by this new regulation against selective disclosure. In the absence of regulatory change, school ties still appear to confer significant benefits to analysts.

In order to better understand the type of information being transferred across the networks, we also examine the relative forecast accuracy of analysts with school ties, under the hypothesis that the information advantage gained by linked analysts is specifically related to information that would allow an analyst to better predict earnings per share numbers reported by firms. In unreported results, we find no significant differences in relative forecast accuracy (or relative forecast optimism) between the forecasts of analysts with school ties and those without.²⁶ These results suggest that the school tie return premium we document in Section III is unlikely to relate to information obtained about future earnings per share numbers. In unreported tests we also look at the propensity of buys among school tied and non tied firms that later announce a merger, as well as merger-related-news return decompositions, and find little difference, suggesting that the passing of merger-related information is unlikely to fully explain our findings.

V. Robustness

In this section we perform a variety of robustness checks. First we compute event-time cumulative abnormal returns (CAR) for our various categories of stock recommendations. Abnormal returns are defined as DGTW characteristic-adjusted returns. Table IX reports event-time CARs for upgrades and downgrades only, broken down by school ties and time period. These event-time results, which we also plot in Figures 2 to 4 are consistent with the findings from our calendar time portfolio tests. Over the full sample period, upgrades by analysts with school ties earn a premium of 35 basis points over other upgrades in the 2 days around the

²⁶ Following Malloy (2005) and Clement (1999) and using 1- and 2-year ahead earnings forecasts drawn from the I/B/E/S Detail File, we run Fama-MacBeth cross-sectional regressions of demeaned absolute forecast error (*DAFE*), proportional mean absolute forecast error (*PMAFE*), and relative optimism (*OPT*) on a variety of analyst characteristics plus a dummy variable equal to one if the analyst is linked to the board of directors or a senior officer of the firm being covered. Although the sign on the dummy variables in the *DAFE* and *PMAFE* regressions is consistently negative (indicating that linked analysts are more accurate), the coefficients are generally insignificant. These results are available on request.

event, and a premium of almost 400 basis points over the calendar year after the recommendation change. In the pre-Reg FD period, this premium increases to over 700 basis points over the calendar year after the change. Figures 2 and 3 show that much of the upgrade return premium associated with school ties is concentrated between 60 and 250 days after the recommendation, suggesting that whatever information these linked analysts obtain does not get revealed into prices until several months after the recommendation change.

Table IX and Figures 2 to 3 also paint a consistent picture of the differential impact of sell recommendations by our two types of analysts. As with the calendar time portfolio tests, our event time results indicate that the performance of sell recommendations by linked analysts is not significantly different from our control sample of non-linked sell recommendations.

Table X presents a series of robustness checks designed to ensure that our results are not driven by particular types of analyst, firms, or academic institutions. In general, our results are robust to a variety of breakdowns; further, our findings are typically concentrated in precisely those areas where one might expect information asymmetry to be most pronounced, and hence the return premium associated with school ties to be largest. For example, Panel A of Table X shows that the long-short portfolio return of linked buy recommendations minus non-linked buy recommendations earns 89 basis points per month in a subsample of small stocks (below the NYSE median market capitalization) over the full sample period, and 144 basis points per month in the pre-Reg FD period.

Panel B presents a series of breakdowns by type of analyst. First we separate affiliated and unaffiliated analysts. The long-short portfolio return of linked buy recommendations minus non-linked buy recommendations of non affiliated analysts earns 44 basis points per month over the entire sample, 67 basis points per month in the pre-Reg FD period and an insignificant 13 basis points post reg-FD. Returns for affiliated analysts are similar in magnitude but insignificant. Splitting the sample by the size of the brokerage house, the connection premium appears concentrated in those analysts at the larger brokerage houses.

Panel C shows that our results are not driven by a particular type of

academic institution, although the school tie premium is larger among Ivy League institutions (57 basis points per month, compared to 36 basis points for Non-Ivy League institutions, over the full sample period). School adjusted returns, defined as the raw return minus the average return of a portfolio of all firms where at least a senior official (CEO, CFO or Chairman) or a board member received a degree from the same institution, are similar to our full sample results in Table III, indicating that individual school effects do not drive our results. Finally, as with our earlier findings, the results for sell recommendations are mixed, and generally insignificant.

VI. Conclusion

In this paper we investigate information dissemination in security markets. We use the recommendations of sell-side equity analysts as a laboratory to study the impact of social networks on agents' ability to gather superior information about firms. In particular, we test the hypothesis that analysts' school ties to senior corporate officers impart comparative information advantages in the production of analyst research. Our main result is that equity analysts outperform on their stock recommendations when they have an educational link to that company. A simple portfolio strategy of going long the buy recommendations of analysts with school ties and going short the buy recommendations of analysts without ties earns returns of 5.40% per year in the full sample.

This result suggests that analysts' social networks facilitate the direct transfer of information, or that these networks simply allow analysts to better assess managerial quality. In order to distinguish between these two alternatives, we exploit a regulation introduced during our sample period explicitly aimed at blocking the former mechanism of selective information transfer: Regulation FD, instated by the SEC in October of 2000. We find a large effect of the law: pre-Reg FD the return premium from school ties is 8.16% per year, while post-Reg FD the return premium is nearly zero and insignificant. A similar test in the UK, which did *not* experience a change in the disclosure environment at this time, reveals a

large and significant school tie premium for buy recommendations over the entire sample period, both pre- and post-2000.

Taken together, our findings suggest that agents in financial markets can gain informational advantages through their social networks. In addition, laws designed to block these types of information pathways can be effective in curbing selective disclosure. The magnitude of our results indicates that informal information networks are an important, yet under-emphasized channel through which private information gets revealed into prices. Identifying the types of information transferred across social networks and the extent to which social networks are important in other information environments can provide us with a richer understanding of information flow, and price evolution, in security markets.

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Table I: Summary statistics

This table reports summary statistics for the sample of sell side analysts and their covered stocks between 1993 and 2006. The sample of analysts include all sell side analysts from the merged CRSP/IBES/BOARDDEX issuing recommendations on US stocks between 1993 and 2006. The sample of stocks includes the stocks from the merged CRSP/IBES/BOARDDEX data with non missing information on the educational background of members of the board of directors and senior officers of the firm (CEO, CFO or Chairman). Panel A reports the data coverage as a fraction of the total number of IBES analysts, the total number of recommendations (%Reccs) and total market value of covered stocks (%ME). Panel B reports pooled means. Analyst coverage is the # of analysts providing recommendations for a given stock in the prior 12 months; # of stocks is the # of stocks for a given analyst with a valid recommendation in the prior 12 months.

Panel A: coverage of IBES/CRSP universe							
year	# analysts	#stocks	# Reccs	% analysts	% stocks	% ME	% Reccs
1993	153	650	1,066	0.14	0.22	0.52	0.10
1994	243	883	2,468	0.15	0.25	0.54	0.12
1995	283	1,022	2,701	0.16	0.28	0.56	0.12
1996	349	1,166	2,785	0.17	0.28	0.55	0.13
1997	402	1,396	3,339	0.17	0.33	0.66	0.15
1998	516	1,574	4,104	0.19	0.37	0.72	0.16
1999	602	1,737	4,897	0.21	0.44	0.75	0.19
2000	645	1,915	5,562	0.23	0.52	0.84	0.24
2001	682	1,905	6,397	0.25	0.61	0.86	0.28
2002	756	2,203	10,218	0.27	0.68	0.90	0.30
2003	813	2,167	8,829	0.30	0.71	0.90	0.33
2004	958	2,340	9,081	0.33	0.73	0.86	0.36
2005	1,078	2,474	9,374	0.36	0.76	0.88	0.40
2006	971	2,441	9,623	0.33	0.74	0.88	0.38
Average	604	1,705	5,746	0.23	0.49	0.74	0.23
Panel B: pooled observations			mean	median	min	max	std
Analysts coverage			4.97	4.00	1.00	32.00	3.84
# firms per analysts			13.87	12.00	1.00	122.00	10.12
Size percentile			0.78	0.84	0.01	1.00	0.20
Book-to-market percentile			0.37	0.33	0.01	1.00	0.25
12-month return percentile			0.52	0.53	0.01	1.00	0.29
# of schools per year			766	766	707	796	28
# of board members per year			8,388	8,160	2,355	14,389	4,176
# of senior officers per year			3,769	3,963	1,183	5,832	1,624

Table II: Links Between Sell Side Analysts and Firm's Management by Academic Institution

This table shows summary statistics of the ties among sell side analysts and US traded firms based on educational backgrounds between 1993 and 2006. The sample of analysts includes all sell side analysts from the merged CRSP/IBES/BOARDDEX issuing recommendations on US stocks between 1993 and 2006. The sample of stocks includes the stocks from the merged CRSP/IBES/BOARDDEX data with non missing information on the educational background of members of the board of directors and senior officers of the firm (CEO, CFO or Chairman). In Panel A we classify a stock as having educational ties to the analyst if he/she attended the same institution as a senior officer (defined as either the CEO, CFO or Chairman of board). In panel B we classify a stock as having educational ties to the analyst if he/she attended the same institution as a member of the board of directors. The table reports the distribution of the total number of educational links between 1993 and 2006 by academic institution.

Panel A: Analyst tied to firm's senior officers				Panel B: Analyst tied to board of directors			
Rank	Academic institution	# of ties	% of total	Rank	Academic institution	# of ties	% of total
1	Harvard University	941	18.53	1	Harvard University	2,300	18.22
2	University of Pennsylvania	522	10.28	2	Columbia University	1,139	9.02
3	New York University	350	6.89	3	University of Pennsylvania	1,065	8.44
4	Stanford University	311	6.12	4	New York University	1,006	7.97
5	Columbia University	288	5.67	5	Yale University	717	5.68
6	Cornell University	173	3.41	6	Stanford University	597	4.73
7	M.I.T.	168	3.31	7	M.I.T.	491	3.89
8	Yale University	155	3.05	8	Cornell University	437	3.46
9	University of Chicago	140	2.76	9	UC Berkeley	347	2.75
10	UT Austin	137	2.7	10	University of Chicago	317	2.51
Others		1,893	37.28	Others		4,205	33.32
Ivy League		2,220	43.72	Ivy League		6,122	48.51
All		5,078	100	All		12,621	100

Table III: Returns to School Ties, 1993–2006

This table shows calendar time portfolio returns. We classify a stock as having educational ties to the analyst if he/she attended the same institution as a senior officer (CEO, CFO or Chairman) or a board member. Each recommendation is assigned to one of two portfolios: (1) a BUY portfolio consisting of all stocks upgraded with respect to the previous recommendation, or initiated, resumed or reiterated coverage with a buy (IBES code = 2) or strong buy (IBES code = 1) rating, and (2) a SELL portfolio, consisting of all stocks downgraded with respect to the previous recommendation, initiated, resumed or reiterated coverage with a hold (IBES code =3), sell (IBES code = 4) or strong sell (IBES code = 5) rating or dropped from coverage. If the brokerage house does not report the stock as dropped from coverage and a recommendation is not revised or reiterated within twelve months it is considered expired. We skip a trading day between recommendation and investment (disinvestment). For the BUY portfolio each recommended stock is held until it is either downgraded, dropped from coverage, or the recommendation expires. We compute value weighted portfolios by averaging across analysts, weighting individual recommendations by the IBES recommendation code; for the BUY portfolio, we reverse these recommendation codes so that a strong buy is set to 5 and a strong sell is set to 1. The SELL portfolio is constructed in a similar fashion with the exception that that the original IBES recommendation codes (i.e., strong sell=5, and strong buy=1) are used as portfolio weight. We report average returns and DGTW-adjusted returns for the period 1993 to 2006. DGTW characteristic-adjusted returns are defined as raw returns minus the returns on a value weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-book, and 1-year momentum quintile. Returns are in monthly percent. L/S is the average return of a zero cost portfolio that holds the portfolio of linked stocks and sells short the portfolio of non-linked stocks. t-statistics are shown below the coefficient estimates, and 5% statistical significance is indicated in bold.

Panel A: Buy recommendations	Buy recommendations (level)				Only upgrades			
	Raw returns		Abnormal returns		Raw returns		Abnormal returns	
No shared educational background	1.04 (1.97)		0.04 (0.43)		1.35 (2.81)		0.31 (3.14)	
Linked recommendations		L/S		L/S		L/S		L/S
Analyst linked to senior Management or board of directors	1.49 (2.91)	0.45 (3.87)	0.44 (3.24)	0.40 (4.63)	1.70 (3.35)	0.35 (2.32)	0.62 (3.49)	0.31 (2.30)
Analyst linked to senior management	1.59 (3.04)	0.55 (3.75)	0.51 (3.19)	0.47 (3.96)	1.65 (3.16)	0.29 (1.71)	0.61 (2.86)	0.30 (1.93)
Analyst linked to board of directors	1.47 (2.91)	0.43 (3.16)	0.45 (3.20)	0.41 (4.30)	1.72 (3.36)	0.37 (2.16)	0.62 (3.18)	0.31 (2.02)

Table III: Returns to School Ties, 1993–2006 (continued)

Panel B: Sell recommendations	Sell recommendations (level)				Only downgrades			
	Raw returns		Abnormal returns		Raw returns		Abnormal returns	
No shared educational background	1.03 (1.83)		-0.17 (-1.31)		1.06 (1.81)		-0.21 (-1.45)	
Linked recommendations		L/S		L/S		L/S		L/S
Analyst linked to senior Management or board of directors	1.08 (2.08)	0.05 (0.46)	0.05 (0.37)	0.22 (2.21)	1.09 (2.05)	0.03 (0.22)	0.05 (0.34)	0.26 (1.82)
Analyst linked to senior management	1.10 (2.05)	0.07 (0.46)	0.10 (0.61)	0.27 (1.92)	1.26 (2.20)	0.20 (0.85)	0.25 (1.01)	0.46 (1.94)
Analyst linked to board of directors	1.12 (2.18)	0.09 (0.77)	0.10 (0.76)	0.27 (2.45)	1.07 (2.04)	0.02 (0.09)	0.03 (0.21)	0.24 (1.69)

Table IV: Buy Recommendations, Returns to School Ties Pre and Post- REG FD

This table shows calendar time portfolio returns. We classify a stock as having educational ties to the analyst if he/she attended the same institution as a senior officer (CEO, CFO or Chairman) or a board member. Each recommendation is assigned to one of two portfolios: (1) a BUY portfolio consisting of all stocks upgraded with respect to the previous recommendation, or initiated, resumed or reiterated coverage with a buy (IBES code = 2) or strong buy (IBES code = 1) rating, and (2) a SELL portfolio, consisting of all stocks downgraded with respect to the previous recommendation, initiated, resumed or reiterated coverage with a hold (IBES code =3), sell (IBES code = 4) or strong sell (IBES code = 5) rating or dropped from coverage. If the brokerage house does not report the stock as dropped from coverage and a recommendation is not revised or reiterated within twelve months it is considered expired. We skip a trading day between recommendation and investment (disinvestment). For the BUY portfolio each recommended stock is held until it is either downgraded, dropped from coverage, or the recommendation expires. We compute value weighted portfolios by averaging across analysts, weighting individual recommendations by the IBES recommendation code; for the BUY portfolio, we reverse these recommendation codes so that a strong buy is set to 5 and a strong sell is set to 1. The SELL portfolio is constructed in a similar fashion with the exception that that the original IBES recommendation codes (i.e., strong sell=5, and strong buy=1) are used as portfolio weight. We report average returns and DGTW-adjusted returns for the period 1993 to 2006. DGTW characteristic-adjusted returns are defined as raw returns minus the returns on a value weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-book, and 1-year momentum quintile. Returns are in monthly percent. L/S is average return of a zero cost portfolio that holds the portfolio of linked stocks and sells short the portfolio of non-linked stocks. Pre- and Post REG FD indicates returns for recommendations issued prior and subsequent to the introduction of regulation Full Disclosure on October 23, 2000. t-statistics are shown below the coefficient estimates, and 5% statistical significance is indicated in bold.

Panel A: Raw returns	Pre REG FD		Post REG FD		Difference		Only Upgrades		
							Pre REG FD	Post REG FD	Diff
No shared educational background	1.25 (1.93)		0.76 (0.87)		0.50 (0.46)				
Linked recommendations		L/S		L/S		L/S	L/S	L/S	L/S
Analyst linked to senior Management or board of directors	1.94 (3.12)	0.68 (4.36)	0.90 (1.05)	0.14 (0.84)	1.04 (1.01)	0.55 (2.38)	0.53 (2.30)	0.11 (0.64)	0.43 (1.41)
Analyst linked to senior Management	2.03 (3.12)	0.78 (3.50)	1.02 (1.19)	0.26 (1.51)	1.01 (0.95)	0.51 (1.73)	0.64 (2.44)	-0.14 (-0.68)	0.80 (2.24)
Analyst linked to board of Directors	1.94 (3.17)	0.69 (3.71)	0.84 (1.00)	0.09 (0.45)	1.10 (1.08)	0.60 (2.24)	0.56 (2.17)	0.12 (0.58)	0.45 (1.30)

Table IV: Buy Recommendations, Returns to School Ties Pre and Post- REG FD (continued)

Panel B: Abnormal returns	Pre REG FD		Post REG FD		Difference		Only upgrades		
No shared educational background	0.27 (2.09)		-0.26 -(2.08)		0.53 (2.89)		Pre REG FD	Post REG FD	Diff
Linked recommendations	L/S		L/S		L/S		L/S	L/S	L/S
Analyst linked to senior Management or board of directors	0.82 (4.38)	0.55 (4.62)	-0.05 -(0.27)	0.21 (1.71)	0.87 (3.26)	0.34 (1.94)	0.50 (2.36)	0.08 (0.50)	0.42 (1.54)
Analyst linked to senior Management	0.95 (4.14)	0.67 (3.97)	-0.07 -(0.35)	0.19 (1.29)	1.01 (3.26)	0.48 (2.04)	0.68 (3.10)	-0.19 -(0.83)	0.91 (2.75)
Analyst linked to board of Directors	0.84 (4.40)	0.57 (4.39)	-0.06 -(0.33)	0.20 (1.46)	0.91 (3.30)	0.37 (1.95)	0.50 (2.06)	0.07 (0.45)	0.42 (1.35)

Table V: Sell Recommendations, Returns to School Ties Pre- and Post- REG FD

This table shows calendar time portfolio returns. We classify a stock as having educational ties to the analyst if he/she attended the same institution as a senior officer (CEO, CFO or Chairman) or a board member. Each recommendation is assigned to one of two portfolios: (1) a BUY portfolio consisting of all stocks upgraded with respect to the previous recommendation, or initiated, resumed or reiterated coverage with a buy (IBES code = 2) or strong buy (IBES code = 1) rating, and (2) a SELL portfolio, consisting of all stocks downgraded with respect to the previous recommendation, initiated, resumed or reiterated coverage with a hold (IBES code =3), sell (IBES code = 4) or strong sell (IBES code = 5) rating or dropped from coverage. If the brokerage house does not report the stock as dropped from coverage and a recommendation is not revised or reiterated within twelve months it is considered expired. We skip a trading day between recommendation and investment (disinvestment). For the BUY portfolio each recommended stock is held until it is either downgraded, dropped from coverage, or the recommendation expires. We compute value weighted portfolios by averaging across analysts, weighting individual recommendations by the IBES recommendation code; for the BUY portfolio, we reverse these recommendation codes so that a strong buy is set to 5 and a strong sell is set to 1. The SELL portfolio is constructed in a similar fashion with the exception that that the original IBES recommendation codes (i.e., strong sell=5, and strong buy=1) are used as portfolio weight. We report average returns and DGTW-adjusted returns for the period 1993 to 2006. DGTW characteristic-adjusted returns are defined as raw returns minus the returns on a value weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-book, and 1-year momentum quintile. Returns are in monthly percent. L/S is average return of a zero cost portfolio that holds the portfolio of linked stocks and sells short the portfolio of non-linked stocks. Pre- and Post REG FD indicates returns for recommendations issued prior and subsequent to the introduction of regulation Full Disclosure on October 23, 2000. t-statistics are shown below the coefficient estimates, and 5% statistical significance is indicated in bold.

Panel A: Raw returns	Pre REG FD		Post REG FD		Difference		Only Downgrades		
No shared educational background	0.92 (1.57)		1.18 (1.12)		-0.26 (-0.23)		Pre REG FD	Post REG FD	Diff
Linked recommendations		L/S		L/S		L/S	L/S	L/S	L/S
Analyst linked to senior Management or board of directors	1.07 (1.87)	0.16 (1.12)	1.09 (1.16)	-0.09 (-0.53)	-0.01 (-0.01)	0.25 (1.13)	0.11 (0.47)	-0.06 (-0.29)	0.17 (0.52)
Analyst linked to senior Management	1.20 (1.99)	0.29 (1.31)	0.97 (1.00)	-0.21 (-1.08)	0.24 (0.22)	0.50 (1.65)	0.53 (1.39)	-0.22 (-0.90)	0.74 (1.54)
Analyst linked to board of Directors	1.13 (1.97)	0.21 (1.52)	1.10 (1.20)	-0.08 (-0.40)	0.03 (0.03)	0.29 (1.25)	0.07 (0.30)	-0.05 (-0.23)	0.12 (0.37)

Table V: Sell Recommendations, Returns to School Ties Pre- and Post- REG FD (continued)

Panel B: Abnormal returns	Pre REG FD		Post REG FD		Difference		Only Downgrades		
No shared educational background	-0.20 -(1.79)		-0.13 -(0.48)		-0.08 -(0.30)		Pre REG FD	Post REG FD	Diff
Linked recommendations	L/S		L/S		L/S		L/S	L/S	L/S
Analyst linked to senior Management or board of directors	0.05 (0.32)	0.25 (1.95)	0.04 (0.21)	0.17 (1.11)	0.01 (0.05)	0.09 (0.45)	0.31 (1.40)	0.21 (1.20)	0.09 (0.32)
Analyst linked to senior Management	0.23 (1.10)	0.43 (2.25)	-0.07 (-0.28)	0.05 (0.27)	0.30 (0.93)	0.38 (1.34)	0.73 (1.94)	0.11 (0.45)	0.62 (1.31)
Analyst linked to board of Directors	0.13 (0.76)	0.34 (2.35)	0.05 (0.27)	0.17 (1.04)	0.08 (0.33)	0.16 (0.74)	0.26 (1.28)	0.22 (1.09)	0.05 (0.16)

Table VI: School Tie regressions

This table reports panel regressions of returns on buy recommendations of analysts. The dependent variables are either returns (Ret) or Abnormal returns (Xeret), where indicated. Xeret are defined as size-BM-momentum adjusted returns as in Daniel et. al (1997). The regressions were run daily, but coefficients have been adjusted to represent monthly returns (abnormal returns) in percent. The first 3 variables are categorical variables of whether or not the analyst is connected in an education network to the given firm on which she is making a recommendation: (i) *Connected to Either* indicates the analyst is connected to either the senior officers or board of directors, (ii) *Connected to Mgmt* indicates the analyst is connected to the senior officers, and (iii) *Connected to Board* indicates the analyst is connected to the board of directors. *Post Reg-FD* is a categorical variable equal to 1 for all recommendations made after Regulation FD came into effect (Oct 23, 2000), and 0 for all recommendations made before. *Conn. Either*Post Reg-FD* is the interaction term between *Connected to Either* and *Post Reg-FD*. *Analyst Experience* is equal to the number of years the analyst has been making recommendations recorded in I/B/E/S. *Affiliation* is a categorical variable that measures whether or not the given firm has an underwriting relationship with the analyst s brokerage. *All Star* is a categorical variable equal to 1 if the investor was voted an all star analyst in the October issue of Institutional Investor magazine for the given year. *Brokerage Size* is the total number of analysts that work at the given analyst s brokerage house. Fixed effects for recommendation date (Rec Dt) and for industry (Indus) using the Fama-French industry definitions, are included where indicated. All standard errors are adjusted for clustering at the recommendation date level, and t-stats using these clustered standard errors are included in parentheses below the coefficient estimates. 5% statistical significance is indicated in bold.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ret	Ret	Ret	Xeret	Xeret	Xeret	Xeret	Xeret
Connected to Either	0.42 (5.75)			0.36 (4.53)	0.36 (3.74)	0.36 (3.80)	0.50 (4.06)	0.52 (3.65)
Connected to Mgmt		0.50 (4.11)						
Connected to Board			0.38 (4.78)					
Post Reg-FD							-0.42 (5.51)	-0.46 (4.97)
Conn. Either* Post-RegFD							-0.34 (2.28)	-0.42 (2.44)
Analyst Experience					0.02 (1.80)	0.02 (1.45)		0.04 (2.92)
Affiliation					-0.58 (2.78)	-0.58 (2.75)		-0.36 (1.95)
All Star					-0.10 (0.72)	-0.08 (0.55)		-0.20 (2.05)
Brokerage Size					0.00 (0.11)	0.00 (0.06)		0.00 (1.25)
Constant	1.14 (85.30)	1.18 (152.51)	1.16 (99.51)	0.00 (0.31)	0.08 (0.46)	-0.08 (0.17)	0.24 (3.92)	0.34 (1.82)
Fixed Effect	Rec Dt	Rec Dt	Rec Dt	Rec Dt	Rec Dt	Rec Dt		
Fixed Effect							Indus	Indus
							Indus	Indus

Table VII: All-Star Status and School Ties

This table reports the effect of being connected on All-Star status. The dependent variable in each regression is a categorical variable for All Star status, which is equal to 1 if the analyst was voted an all star analyst in the October issue of Institutional Investor magazine for the given year. All observations are thus at the analyst-year level. The first 4 variables are variables that measure the average connectedness of an analyst to the portfolio of firms that she covers. (i) *Num. Conn. to Both* indicates the number of firms the analyst covers to whom he is connected to both the senior officers or board of directors, (ii) *Num. Conn. to Mgmt* indicates the number of firms the analyst covers to whom he is connected to the senior officers, (iii) *Num. Conn. to Board* indicates the number of firms the analyst covers to whom he is connected to the board of directors, and (iv) *Num. Conn. to Either* indicates the number of firms the analyst covers to whom he is connected to either the senior officers or board of directors. *Post Reg-FD* is a categorical variable equal to 1 for years after Regulation FD came into effect (2000), and 0 for all years before. *Conn. Both*Post Reg-FD* is the interaction term between *Connections to Both* and *Post Reg-FD*. *Covered Firm Size* is the average size of firm covered by the given analyst in the given year. *Analyst Experience* is equal to the number of years the analyst has been making recommendations recorded in I/B/E/S. *Affiliation* is the average percentage of stocks in an analyst s portfolio that have an underwriting relationship with the analyst s brokerage. *Brokerage Size* is the total number of analysts that work at the given analyst s brokerage house. Fixed effects at the year (Year) and analyst (Analyst) level are included where indicated. Columns 1-6 are OLS panel regressions, while Column 7 is a probit regression, where coefficient estimates shown are the marginal effects on the probability of being an All Star. All standard errors are adjusted for clustering by year, and t-stats using these clustered standard errors are included in parentheses below the coefficient estimates. 5% statistical significance is indicated in bold.

	(1)	(2)	(3)	(4)	(5)	(6) Probit
Num. Conn. to Board	0.033 (4.54)					
Num. Conn. to Mgmt		0.061 (5.42)				
Num. Conn. to Either			0.030 (4.58)	0.032 (6.00)	0.031 (5.29)	0.013 (10.84)
Conn Either*				-0.025 (3.92)	-0.025 (3.93)	-0.008 (5.36)
Post Reg-FD				0.014 (1.06)	0.037 (2.27)	-0.089 (5.10)
Covered Firm Size					-0.003 (0.55)	0.015 (7.38)
Brokerage Size					0.000 (2.12)	0.001 (11.99)
Affiliation					0.112 (2.06)	0.088 (5.67)
Analyst Experience					-0.004 (0.65)	0.009 (4.56)
Constant	0.060 (8.97)	0.067 (15.18)	0.057 (7.72)	0.064 (10.81)	0.056 (1.53)	
Fixed Effect	Year	Year	Year	Year		
Fixed Effect					Analyst	

Table VIII: Returns to School Ties, UK Evidence, 1993–2006

This table shows calendar time portfolio returns (in local currency). We classify a stock as having educational ties to the analyst if he/she attended the same institution of a senior officer (CEO, CFO or Chairman) or a board member. Each recommendation is assigned to one of two portfolios: (1) a BUY portfolio consisting to all stocks upgraded with respect to the previous recommendation, or initiated, resumed or reiterated coverage with a buy (IBES code = 2) or strong buy (IBES code = 1) rating, and (2) a SELL portfolio, consisting of all stocks downgraded with respect to the previous recommendation, initiated, resumed or reiterated coverage with a hold (IBES code =3), sell (IBES code = 4) or strong sell (IBES code = 5) rating or dropped from coverage. If the brokerage house does not report the stock as dropped from coverage and a recommendation is not revised or reiterated within twelve months it is considered expired. We skip a trading day between recommendation and investment (disinvestment). For the BUY portfolio each recommended stocks is hold until is either downgraded, dropped from coverage or the recommendation expires. We compute value weighted portfolios by averaging across analysts, weighting individual recommendations by the IBES recommendation code, reversing the ranking from 1 (strong sell) to 5 (strong buy). The SELL portfolio is constructed in a similar fashion with the exception that that the original IBES recommendation code from 5 (strong sell) to 1 (strong buy) is used as portfolio weight. We report average returns and DGTW-adjusted returns in the period 1993 to 2006. DGTW characteristic-adjusted returns are defined as raw returns minus the returns on a value weighted portfolio of all I/B/E/S firms traded in the UK in the same size, (industry-adjusted) market-book, and 1-year momentum quintile. Returns are in monthly percent. L/S is average return of a zero cost portfolio that holds the portfolio of linked stocks and sells short the portfolio of non-linked stocks. Pre- and post REG FD indicates returns for recommendations issued prior and subsequent to the introduction of regulation Full Disclosure on October 23, 2000. t-statistics are shown below the coefficient estimates, and 5% statistical significance is indicated in bold.

Panel A: All Sample 1993-2006	Buy recommendations				Sell recommendations							
	Raw returns		Abnormal returns		Raw returns		Abnormal returns					
No shared educational background	0.71 (1.41)	L/S	-0.13 -(0.51)	L/S	0.45 (0.78)	L/S	-0.24 -(0.91)	L/S				
Analyst linked to senior Management	2.58 (3.11)	1.87 (2.79)	1.54 (2.09)	1.67 (2.20)	-0.34 -(0.39)	-0.79 -(1.06)	0.02 (0.04)	0.26 (0.46)				
Panel B: Pre and Post- REG FD	Pre REG FD		Post REG FD		Pre REG FD		Post REG FD		Difference			
No shared educational background	0.54 (0.71)	L/S	0.91 (1.47)	L/S	0.37 (0.36)	L/S	0.38 (0.47)	0.57 (0.80)	L/S	0.19 (0.16)	0.38 (0.47)	
Analyst linked to senior management	2.32 (1.98)	1.78 (2.11)	2.90 (2.48)	1.99 (1.82)	0.58 (0.34)	0.21 (0.15)	-0.48 -(0.52)	-0.86 -(1.18)	-0.08 -(0.04)	-0.65 -(0.40)	0.41 (0.23)	0.21 (0.14)

Table IX: Returns to School Ties, Event-time returns (upgrades/downgrades only)

This table shows event time cumulative abnormal returns. We classify a stock as having educational ties to the analyst if he/she attended the same institution as a senior officer (CEO, CFO or Chairman) or a board member. Each recommendation is assigned to one of two portfolios: (1) a BUY portfolio consisting to all stocks upgraded with respect to the previous recommendation, and (2) a SELL portfolio, consisting of all stocks downgraded with respect to the previous recommendation. We report event-time average cumulative abnormal returns (CAR). Abnormal returns are defined as DGTW characteristic-adjusted returns: daily returns minus the returns on a value weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-book, and 1-year momentum quintile. Returns are in percent, standard errors are clustered by calendar date, and t-statistics are shown below the coefficient estimates. 5% statistical significance is indicated in bold. Panel B and panel C reports results prior and subsequent to the introduction of regulation Full Disclosure on October 23, 2000, respectively.

CAR _[t,t+k]	Buy recommendation				Sell recommendations			
	[0, 1]	[2,125]	[2,250]	[0,250]	[0, 1]	[2,125]	[2,250]	[0,250]
Panel A: full sample								
No shared educational background	2.49 (35.40)	1.56 (4.08)	2.02 (3.19)	4.51 (7.07)	-2.37 (-23.39)	-1.11 (-2.88)	-1.13 (-1.89)	-3.50 (-5.77)
Analyst linked to senior Management or board of directors	2.83 (20.92)	2.62 (3.54)	3.99 (3.23)	8.47 (6.82)	-2.65 (-14.44)	0.12 (0.17)	1.01 (0.96)	-1.65 (-1.55)
Difference	0.35 (2.29)	1.06 (1.27)	1.96 (1.41)	3.96 (2.84)	-0.28 (-1.34)	1.23 (1.57)	2.14 (1.77)	1.86 (1.52)
Panel B: pre REG FD								
No shared educational background	1.95 (17.84)	3.85 (5.29)	5.36 (4.52)	7.31 (6.14)	-2.33 (-15.52)	-1.04 (-1.46)	-1.93 (-1.70)	-4.26 (-3.71)
Analyst linked to senior Management or board of directors	2.33 (11.58)	5.16 (4.10)	12.09 (5.68)	14.53 (6.80)	-2.38 (-8.89)	-0.40 (-0.32)	2.27 (1.15)	-0.11 (-0.05)
Difference	0.38 (1.66)	1.31 (1.98)	6.73 (2.77)	7.22 (2.95)	-0.05 (-0.15)	0.64 (0.45)	4.20 (1.84)	4.16 (1.81)
Panel A: post RED FD								
No shared educational background	2.76 (30.70)	0.37 (0.83)	0.24 (0.33)	3.00 (4.06)	-2.39 (-18.54)	-1.14 (-2.46)	-0.81 (-1.15)	-3.20 (-4.48)
Analyst linked to senior Management or board of directors	3.13 (17.37)	1.08 (1.19)	-0.89 (-0.60)	4.48 (3.00)	-2.77 (-11.70)	0.32 (0.40)	0.53 (0.43)	-2.24 (-1.80)
Difference	0.38 (1.88)	0.71 (0.70)	-1.14 (-0.69)	1.48 (0.89)	-0.38 (-1.41)	1.46 (1.56)	1.34 (0.95)	0.96 (0.67)

Table X: Robustness Checks

This table shows calendar time portfolio returns. We report average the DGTW-adjusted return of a zero cost portfolio that holds the portfolio of linked stocks and sells short the portfolio of non-linked stocks between 1993 to 2006. In this table links are defined as recommendations by an analyst who is linked either to the firm’s senior management or to the firm s board of directors. "Pre" and "Post" REG FD refers to the introduction of regulation Full Disclosure on October 23, 2000. IPO are stocks with less than 24 months from the IPO date. Panel A reports results broken down by stock characteristic. "IPO"s are stocks that are less than 24 months removed from the IPO date. Panel B reports results broken down by analyst characteristics. "Affiliated" analysts belong to a bank that has an under-writing relationship with the covered firm. Brokerage houses are classified as "large" or "small" based on the median number or analysts issuing recommendations in the current calendar year. Panel C reports results by institutions. School adjusted returns are defined as raw returns minus the average return of a portfolio of all firms where at least a senior official (CEO, CFO or Chairman) or a board member received a degree from the same institution. “Top 5 most connected” are academic institutions, ranked by the total number of links in table II over the period 1990 to 2006. t-statistics are shown below the coefficient estimates, and 5% statistical significance is indicated in bold.

BUY recommendations, linked recommendations minus not linked							
Abnormal returns	Full sample	Pre REG FD	Post REG FD		Full sample	Pre REG FD	Post REG FD
Panel A1: Stocks characteristics							
Large cap stocks above NYSE median	0.45 (3.69)	0.62 (3.31)	0.23 (1.69)	Small cap stocks above NYSE median	0.89 (3.22)	1.44 (3.71)	0.18 (0.47)
IPO <24 months from IPO	0.87 (2.62)	0.98 (2.11)	0.75 (1.56)	Not IPO >24 months from IPO	0.28 (3.11)	0.49 (3.76)	0.02 (0.15)
High analysts coverage above NYSE median	0.34 (3.10)	0.48 (3.21)	0.14 (0.95)	Low analysts coverage Below NYSE median	0.45 (3.78)	0.67 (3.99)	0.17 (1.04)
Panel B1: analysts characteristics							
Affiliated	0.62 (1.42)	0.82 (1.70)	-0.04 (-0.05)	Non affiliated	0.44 (3.67)	0.67 (4.14)	0.13 (0.79)
Large brokerage firm	0.46 (3.92)	0.69 (4.31)	0.16 (0.97)	Small brokerage firm	-0.39 (-0.66)	0.03 (0.04)	-0.94 (-1.17)
Panel C1: institutions characteristics							
Ivy league	0.57 (3.55)	0.98 (4.65)	0.03 (0.12)	Not ivy league	0.36 (3.02)	0.49 (2.95)	0.20 (1.15)
Top 5 most linked	0.38 (2.16)	0.67 (2.95)	-0.01 (-0.04)	Not Top 5 most linked	0.52 (4.12)	0.75 (4.16)	0.23 (1.35)
School adjusted returns Senior management	0.38 (4.14)	0.53 (4.03)	0.20 (1.61)	School adjusted returns Board	0.42 (4.05)	0.64 (4.31)	0.16 (1.15)

Table X: Robustness Checks (continued)

SELL recommendations, linked recommendations minus not linked

Abnormal returns	Full sample	Pre REG FD	Post REG FD		Full sample	Pre REG FD	Post REG FD
Panel A2: Stocks characteristics							
Large cap stocks above NYSE median	0.17 (1.73)	0.30 (1.65)	0.02 (0.11)	Small cap stocks above NYSE median	0.05 (0.17)	-0.02 (-0.04)	0.15 (0.47)
IPO <24 months from IPO	-0.30 (-0.73)	-0.14 (-0.20)	-0.48 (-1.21)	Not IPO >24 months from IPO	0.10 (0.90)	0.20 (1.34)	-0.04 (-0.25)
High analysts coverage above NYSE median	0.15 (1.31)	0.32 (2.25)	-0.07 (-0.38)	Low analysts coverage below NYSE median	0.02 (0.18)	0.07 (0.46)	-0.05 (-0.25)
Panel B2: analysts characteristics							
Affiliated	-0.46 (-0.80)	-0.43 (-0.67)	-0.54 (-0.42)	Non affiliated	0.07 (0.64)	0.18 (1.26)	-0.07 (-0.41)
Large brokerage firm	0.10 (0.84)	0.32 (1.99)	(0.19) (-1.22)	Small brokerage firm	0.79 (1.20)	0.72 (0.90)	0.88 (0.80)
Panel C2: institutions characteristics							
Ivy league	0.23 (1.47)	0.54 (2.38)	-0.17 (-0.83)	Not ivy league	-0.05 (-0.35)	-0.06 (-0.34)	-0.03 (-0.14)
Top 5 most linked	-0.03 (-0.18)	0.06 (0.30)	-0.14 (-0.64)	Not Top 5 most linked	0.18 (1.36)	0.34 (1.88)	-0.03 (-0.16)
School adjusted returns Senior management	0.06 (0.62)	0.15 (1.24)	-0.06 (-0.41)	School adjusted returns Board	0.08 (0.80)	0.20 (1.55)	-0.07 (-0.44)

Figure 1: XYZ Corp

This figure shows returns of the XYZ Corp. around the upgrade by a linked analyst and return on its corresponding DGTW benchmark



Figure 2: Returns to School Ties, Event-time returns, 1993-2006

This figure shows event time cumulative abnormal returns. We classify a stock as having educational ties to the analyst if he/she attended the same institution of a senior officer (CEO, CFO or Chairman) or a board member. Each recommendation is assigned to one of two portfolios: (1) a BUY portfolio consisting of all stocks upgraded with respect to the previous recommendation, and (2) a SELL portfolio, consisting of all stocks downgraded with respect to the previous recommendation. We report event-time average cumulative abnormal returns (CAR). Abnormal returns are defined as DGTW characteristic-adjusted returns: daily returns minus the returns on a value weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-book, and 1-year momentum quintile. Returns are in percent.

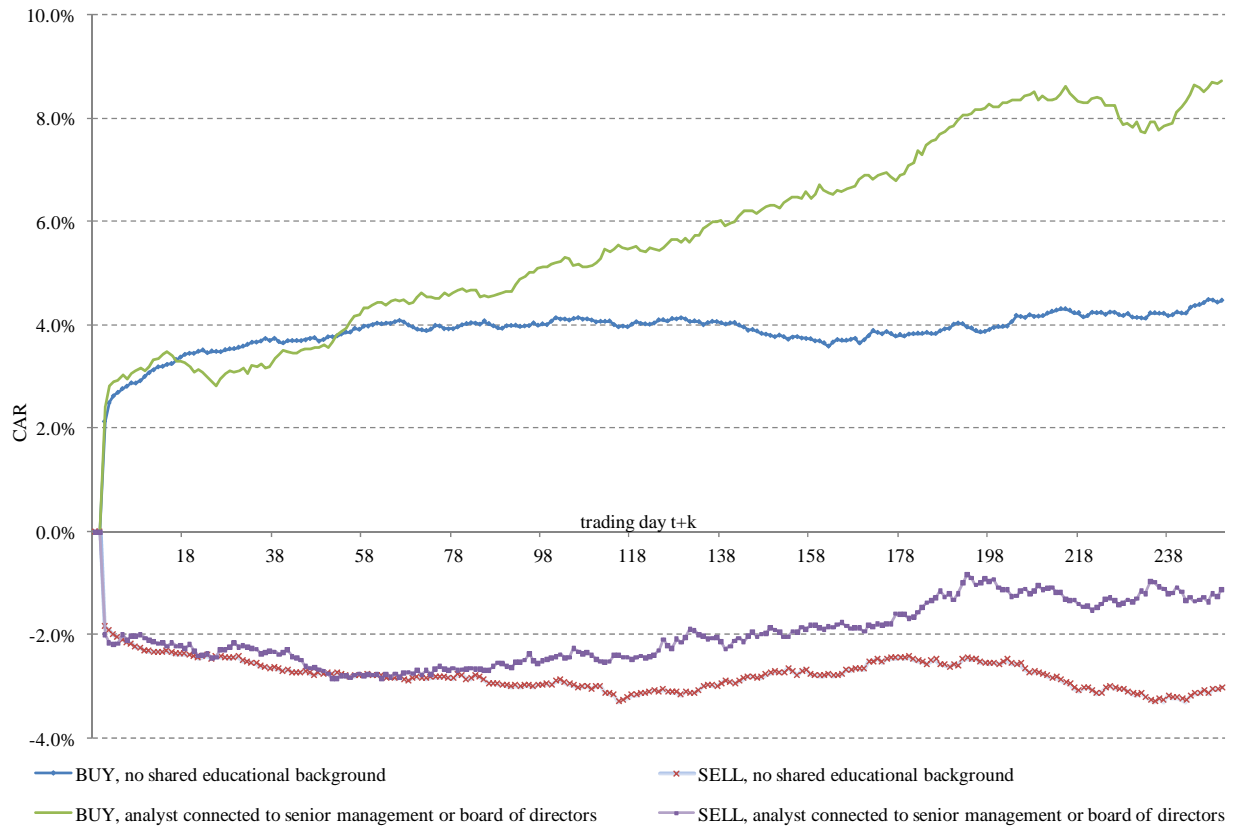


Figure 3: Returns to School Ties, Event-time returns, pre Reg. FD

This figure shows event time cumulative abnormal returns. We classify a stock as having educational ties to the analyst if he/she attended the same institution of a senior officer (CEO, CFO or Chairman) or a board member. Each recommendation is assigned to one of two portfolios: (1) a BUY portfolio consisting of all stocks upgraded with respect to the previous recommendation, and (2) a SELL portfolio, consisting of all stocks downgraded with respect to the previous recommendation. We report event-time average cumulative abnormal returns (CAR). Abnormal returns are defined as DGTW characteristic-adjusted returns: daily returns minus the returns on a value weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-book, and 1-year momentum quintile. Returns are in percent.

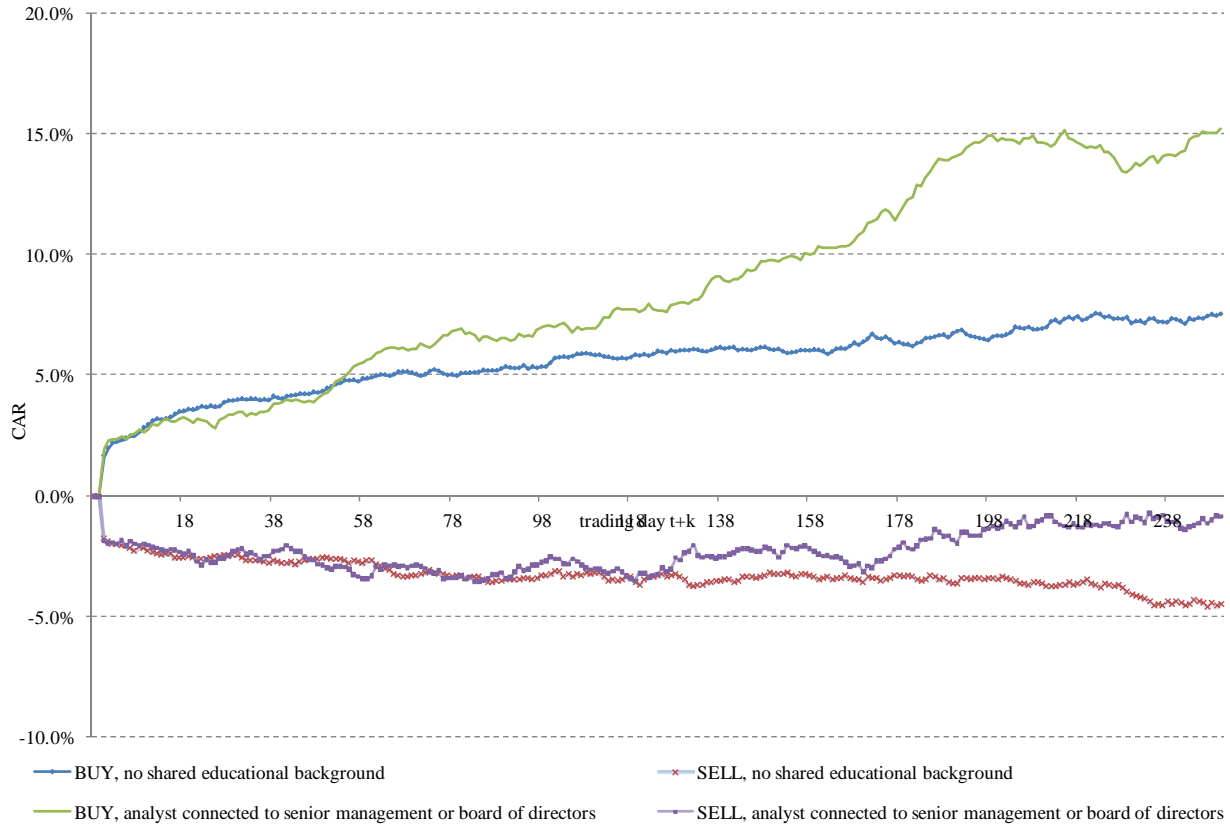


Figure 4: Returns to School Ties, Event-time returns, post Reg. FD

This figure shows event time cumulative abnormal returns. We classify a stock as having educational ties to the analyst if he/she attended the same institution of a senior officer (CEO, CFO or Chairman) or a board member. Each recommendation is assigned to one of two portfolios: (1) a BUY portfolio consisting of all stocks upgraded with respect to the previous recommendation, and (2) a SELL portfolio, consisting of all stocks downgraded with respect to the previous recommendation. We report event-time average cumulative abnormal returns (CAR). Abnormal returns are defined as DGTW characteristic-adjusted returns: daily returns minus the returns on a value weighted portfolio of all CRSP firms in the same size, (industry-adjusted) market-book, and 1-year momentum quintile. Returns are in percent.

