AN EMPIRCAL STUDY OF BANKING TIES AND ITS IMPLICATION FOR FURTHER RESEARCH

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ABSTRACT

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We study the effects of network connections between banks issuing stock recommendations and the corresponding board of directors. Based on data we extracted from the *Standard & Poor's Capital IQ* database, we empirically identify a large number of such banking ties forming a unique database. Following recent focus on social network studies and the need for more transparency in the financial market for investor protection, our database is the foundation for further study. We raise and propose relevant research question to be pursued.

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CHAPTER I

INTRODUCTION

1.1. Significance of the Proposed Study

Information is a key driver for analysts' stock recommendations and research reports generating business for the adjacent brokerage department. It can become an important competitive advantage if the received information is new and has not been spread entirely over diverse networks to all the market participants and, therefore, has not been fully incorporated into the market yet. The adoption of Regulation Fair Disclosure (Reg FD) states that such new insider information must be disclosed publicly accessible for over 3000 research analysts working for 350 banks on the sell-side in the US (Green et al., 2007). While research indicates that Reg FD has been successfully implemented and selective information disclosure on the market has been stopped (e.g. Gintschel and Markov (2004); Cohen et al. (2010); Fleischer (2011)), only few authors studied social network connections as a transmitter for proprietary information. A recent consent order issued by the *Massachusetts Security Division* to *Citigroup Global Markets Inc.* shows practical insides and evidence of how significant personal network ties can be for information exchange (Massachusetts, 2012). The investigation revealed the exchange of proprietary information (i.e. a selective disclosure) between a junior analyst and a third party alumni network connections.[1] We got excellent insights into the practical work of an sell-side analyst from James J. Valentine's best-practice recommendations, a top ranked Wall Street analyst (e.g. Exhibit 9.2: Assessing and Approaching Information Contacts in Valentine (2011)) reconfirming the significance of networking for analysts' provision of information. The following quote underlines this idea:

"*One of the primary reasons analysts with more experience are better than those with less, is the vast network of contacts they've developed over time* (…) *you need information to develop unique stock*

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[1] Email of a junior analyst to a TechCrunch.com employee: "*I am ramping up coverage on FB and thought you guys might like to see how the street is thinking about it (and our estimates). Any feedback on the investment positives and risks would be super helpful. I want to make sure I'm thinking about this the right way (…). This of course is confidential*" (Massachusetts, 2012).

insights, and the best way to get this information is through word of mouth; in this way there's a better chance it's not already in the market" (Valentine, 2011).

Since company information must be disclosed publicly by companies and is easily searchable and accessible online from almost all over the world nowadays, such information lost its inherent value since all market participants have it. Proprietary information via network ties, however, is only available to a limited audience and, therefore, has become even more important as a distinguishing stock research driver. Hence, our objective is to analyze the effects of such network ties for analysts' research and the actors that make use of it. More specifically, our objective is to empirically investigate the network ties to previous employer, which have been largely neglected by prior research. We build a unique database of network ties connecting board executives of United States (U.S.) traded companies to their prior employment with a bank. Such previous employment networks are relevant for cases where the previous employer issues research about the current employer's stocks. This happens because the board member has essential insider information that could be acquired by the research department of the old employer due to the densely connected network and the short distance between both parties.

We raise several relevant research questions for further study. To the best of our knowledge this is the first study that builds such a banking tie database using data gathered from *Standard & Poor's Capital IQ* database. Analysts' research reports offer the unique chance to evaluate performance since their reports give a clear recommendation and a price target that can be evaluated ex-post. We take up and propose a similar question to previous studies; however, our underlying data set is different. For example, previous studies observed the effects of BANKERS ON THE BOARD of public traded companies (e.g. Kroszner and Strahan (2001) or Dittmann et al. (2010)), whereas our dataset adds a new dimension to this research by also considering BANKERS ON THE BOARD with only a prior and not a current affiliation to a bank, a setting for which similar effects could be expected. One of our main questions, the bank's ability to gather superior information through the network tie, has already been studied by Cohen et al. (2010). Based on an alumni tie network, the authors confirm the significance of such ties as a possible competitive advantage. Nevertheless, the authors also indicate that this effect vanished by the legislative action of introducing Reg FD. Our study will investigate if the later effect also holds for an employment network or if the social network is indeed still relevant.

This thesis is organized as follows: In Chapter II, we first introduce the equity analyst research profession and work environment. We highlight key steps and drivers in the research process before elaborating typical conflicts of interests that analysts and company board members are exposed to in their daily work environment. We then raise the question of the informational value of analyst research as an essential premise for our study. An overview of network theory and a review of related studies lead us to our hypothesis (Chapter III) and the introduction to our methodology in Chapter IV. We conclude with an analysis of the data we collected (Chapter V) and provide an overview for future use of our data (Chapter VI).

CHAPTER II

LITERATURE REVIEW

We begin our review by discussing the analyst profession, the requirements and context of the job. Furthermore, we elaborate on the daily workflow and present how much is known about the underlying research process that analysts undertake to identify the key drivers and techniques for issuing recommendations. We follow up by providing an overview of various stimuli which influence analysts' perpetual neutrality. Many of these possible biases (e.g. favorably recommending clients of one's own investment banking department) have been discussed extensively in literature. We will highlight these biases and present the current *Status Quo* of research before we discuss analysts' research value. At last, we will respond to the question on the comparative advantage and information benefits of social ties in networks (private or within an organizational structure). This field is fairly challenging to assess due to the difficulty of mapping social ties. However, recent studies have found ways to uncover the impact of social ties in different contexts. We will mention the key results and then focus on ties of executive boards and in banking. For all of our literature review we restrict our work to the sell-side analyst's context but occasionally touch upon the buy-side.

Traditional research concerning financial analysts has been diverse and can be found along a chain that starts off with research about company information disclosure, continues with analysts' choice of coverage, the following information collection and ends with the decision process that leads to the research report. Major research has been done to analyze the value of research reports created by the analyst for potential investors. This research includes analysts' conflict of interest that naturally arises when handing out research reports and recommendation about third parties. Although analyst research has been extensively discussed in the last decades, many research questions still remain unanswered and warrant further research.[2]

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[2] Consult Ramnath et al. (2008) for an excellent review of financial analyst forecasting literature from the years 1992 – 2006, giving an overview over several broad areas for further research.

2.1   Sell-Side Analysts

2.1.1   Introduction

Analysts' main objective is to serve investors by conducting financial research to forecast and incorporate future trends and prospects of the financial market, specific sectors of industry and individual companies. Thereby, analysts seek to convey a stock's *true value* (e.g. stocks that the capital market mispriced) while also helping investors watch management closely. Diverse types of clients demand different types of research focus and scopes of operation. Some potential investors may seek stocks that have proven to have a continuous growth potential, while others may seek stocks that are currently undervalued and therefore have a long-term potential to converge to its real value. Sell-side analysts in investment banks focus on investment research reports that will attract customers and revenue (e.g. transaction fees) for its affiliated investment banking and brokerage department. Therefore, sell-side analysts naturally focus on *large cap* firms which promise to have high trading volumes (cp. Previts et al. (1994); Womack (1996); Irvine (2001); Barber et al. (2001)). Buy-side analysts, however, exclusively focus on supporting its direct clients for identifying investment opportunities for the portfolio that they (more precisely portfolio manager) are representing.[3] Therefore, research reports are only disclosed[4] to their clients and not to the general public. The interaction between buy-side and sell-side analysts[5] is important for both parties. The sell-side analyst would like to "*act on their research*" to promote their portfolio and possibly gain commissions (Jacobs, 2005). The buy-side analysts, on the contrary, profit from additional sector insights (e.g. sell-side assessment of industry dynamics) that they may not be able to explore otherwise due to lack of time or access to information (e.g. corporate senior management). In addition, buy-side analysts verify their own research[6] while also progressing faster in their research based on the industry sector's discussions with sell-side experts. While doing so, analysts not only need to appraise the informational value to avoid interference (e.g. false information), but also need to be resourceful regarding the time they are investing (Valentine, 2011). Independent analysts who are not affiliated to any particular employer or fund are perceived

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[3] Typically, buy-side analyst work for asset management firms or institutional investors that represent pension, mutual and private money funds, insurance companies or university endowments.

[4] We acknowledge that information, however, is always revealed through their trades to a certain extend.

[5] Compare to (Valentine, 2011) p.67ff for more information.

[6] Busse et al. (2012) for example argue that buy-side analyst follow the sell-side.

as free of typical investment banking-associated conflicts of interest. They are either institutional or individual investor-focused and try to fill niches (e.g. alternative industry sectors or portfolios) not covered by other analysts on the sell-side. Independent analysts sell their research as different products with different informational value (e.g. as simple newsletter or extensive reports). The stock coverage can be very detailed or more general and therefore include up to 200 stocks (portfolio manager), whereas buy-side analysts typically cover up to 40-60 stocks and sell-side analysts only cover 10-15 stocks (Green et al. (2007); Valentine (2011)).

Analysts act as financial intermediaries counterbalancing the asymmetrically distributed information in the capital market. Jurisdictions require companies listed in the stock exchange to disclose information in the form of quarterly reports according to *U.S. GAAP*[7] and the *Sarbanes-Oxley Act* of 2002. Accounting standards for publicly traded companies help the stakeholders get access to key relevant data in order to be able to continuously monitor their investment. However, companies most often refrain from revealing information to the market to protect themselves from their competitors but, therefore, also restrict stakeholder and potential investors in their decision making which then again may affect a company's cost of capital and stock liquidity (Healy and Palepu, 2001). However, the increase in company information disclosure may also not be unambiguously favorable based on the costs caused by agency problems (Hermalin and Weisbach, 2012).

In addition, publicly available information is susceptible to subjectivity. Companies exploiting legal accounting scope in publishing data for various reasons (e.g. to influence investors or for tax purposes) which frame the company in the most positive light.[8] Hence, analysts need to be aware of such accounting practices and interpret released information in-depth to evaluate past performance. In turn, companies profit from an informed and efficient market which makes their stock more liquid, less volatile, more valuable, and therefore decreases the firms' cost of capital. This is not only because of the additional stock promotion from the sell-side to new investors, but

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[7] The *Security Exchange Commission* (SEC) has been debating about switching to *the International Financial Reporting Standards* (IFRS) for the last years. IFRS is emerging to become the world's standard accounting principle. A decision is expected in the year 2012 which could constrain publicly traded companies in the U.S. to follow and adopt IFRS in the near future (U.S. Security and Exchange Commission, 2012).

[8] This practice has been referred to in literature as *cooking the books*, *aggressive accounting methods* or *creative* or *innovative accounting*. This is particularly true for earnings figures which can easily be manipulated (cp. Enron accounting scandal).

also because investors are better informed, and understand both the possible benefits and potential risks.

2.1.2   Analysts Research

It is vital to understand analysts' research process issuing stock recommendations, price targets, and earnings forecasts to determine research reports' credibility and informative value when making investment decisions. Firstly, we review literature on the sources and content of analyst report information, and summarize the drivers (e.g. what kind of information is needed and which sources are used) for successful research reports.[9] Secondly, we look at the analyst profession itself and review the qualifications top analysts share to better understand the analyst's personal impact (cp. APPENDIX E for an overview). By identifying valuable relevant attributes and drivers we can comprehend how the analyst exploits data (public or proprietary) and which information or skillset contributes and influences most of the report results. Analysts interact with several departments and people inside the bank (e.g. fund managers in the sales department and traders who buy and sell stocks) as well as outside the bank (e.g. other analysts) that all make decisions based on their research and recommendations. Therefore, forecasts based on bad assumptions will have a negative influence on their own work and reputation, and will directly affect the bank's clients. Hence, analysts need to rely on a key skill set and relevant information on-hand to predict the future the best way possible. Following a research process, most studies have relied on two main methods to conclude analysts' preferences regarding their information sources. First, several authors took a survey-based approach[10] to get individual analyst feedback and, second, other authors statistically analyzed the content of research reports[11] to infer the underlying research process. Both models offer an insight into the analyst profession, but are limited in reflecting the real world. Surveys provide direct information from the analyst, but might lack objectivity and, therefore, might not be conducive to insights in controversial issues. Content analysis, on the other hand, is limited to the information provided in the report and can only try to estimate the underlying information without being able to include additional research that analyst might consider without explicitly mentioning in their report.

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[9] The same question has been raised by studies analyzing research analysts and company management to discover how management *tune* company disclosures seeking better analyst reports.

[10] Gleason et al. (2012); Graham et al. (2002); Imam et al. (2008); Orens and Lybaert (2010); Groysberg et al. (2011a).

[11] Previts et al. (1994); Demirakos et al. (2004); Breton and Taffler (2001); Asquith et al. (2005); Imam et al. (2008).

Analyst's sources of information

We provide a brief overview to what has been published in scientific context.

Previts et al. (1994) refer to an analyst survey of the Financial Executive Research Foundation which lists the "*five most-used sources of information, in descending order as:*"

(1) *Company annual report*[12], (2) *Form 10-k*[13] (annual report), (3) *company quarterly report*, (4) *other analysts or professionals*, and (5) *company management*.

Despite the low frequency of the use of *company management* information, it was reported as the most relevant one. A more recent survey of Graham et al. (2002) confirms these results but do not break up their survey in *Frequency of Use* and *Most Important Information* but rather infer the importance by ranking the frequency of use (see APPENDIX D for a full overview of information sources and the corresponding frequency of use).

Public information and management findings are compromised and once on-hand, are systemically analyzed and interpreted for further use in models. The analyst evaluates quantitative and qualitative information sources, which can be categorized as:[14]

(1) Segment Reporting, (2) Core Earnings, (3) Earnings Quality, (4) Earnings Momentum, (5) Balance Sheet Related Findings, (6) Cash Flow Related Findings, (7) Common Size Reports, (8) Company Valuation, (9) Nonfinancial Information Findings, (10) Supplemental Findings, (11) Management Findings.

Analyst Research Report Content

The three typical and most known elements of analyst research reports are the stock recommendation (specific grade as well as movement), target price forecast[15] (point estimate) and earnings forecast (one-year or multiple). Asquith et al. (2005) provide a detailed statistical content analysis by sampling and categorizing 1126 analyst reports[16] in different components over change of recommendation. Besides the three typical aforementioned elements, the authors found in their

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[12] Includes *written statement*, *income statement*, *balance sheet*, *cash flow statement*, *auditor's report* and *segment reporting*.
[13] See Lehavy et al. (2011) for a study on readability and its implication for the readers of *10-k Forms*.
[14] Based on the readings of Previts et al. (1994) and Graham et al. (2002).
[15] The disclosure of price targets became increasingly popular since the mid-1990s (Gleason et al., 2012).
[16] Reports were all published by *All-American Research Team* members between 1997 - 1999.

sample that analysts almost always include the valuation model(s) used and their company affiliations (the latter is a required element). Less frequently mentioned was segment data (<10%), forecasts for income statement (28%), and cash flow statement (17.1%) as well as balance sheet forecasts (5.1%). Besides quantitative information, analysts almost always mention their justification (97%) for their recommendations, which most commonly were *increase in revenue* (37%) or *earnings* (30%), *expectation met* (31.5%), *cost efficiencies* (21%), *positive management* (20%), and *production introduction* (16%).[17] These results correspond to the qualitative results that Previts et al. (1994) had found in an earlier study. For a better company evaluation, analysts divide a corporation into its individual segments and, therefore, particularly value company disclosure of segment data (Valentine, 2011). More surprising is that this analysis is hardly ever mentioned in their reports (see above). This contributes to the notion that analysts generally consider much more information and analysis than is mentioned in their reports.

Analyst's choice of valuation methodology

Fundamental analysis is used to estimate a company's long-term value. Current quantitative data from company financial reports serve the analyst as input parameters for their models and the following analysis. However, the analysts controls for *noise* in the quantitative data first (i.e. determine the adjusted earnings or the earning's quality of a company for example), before incorporating it into the model (Graham et al., 2002). The most common used valuations methods that analysts rely on is *relative valuation to a peer* (single period) or *discounted cash flow valuation* (DCF) (multi-period) (see Valentine (2011, p. 257) for a discussion on benefits and limitation of both approaches). The latter is the more rigorous and advocated method in financial theory (Demirakos et al. (2004); Imam et al. (2008)).[18] Multi-period models bare the chance to incorporate future cash flows which lead to a more accurate long-term evaluation. However, this only holds when future cash flows as well as an appropriate discount factor can be assed consistently and reliably. In practice, however, Demirakos et al. (2004) provide evidence that the two most dominantly employed valuation methods[19] by analysts are the rather *unsophisticated* earnings (88.5%) and sales multiples (50%), whereas multi-period discounted cash flow models are only

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[17] Refer to Asquith et al. (2005), p. 252 ff. for more details.
[18] Imam et al. (2008), however, indicate that a residual income-based model "*provides superior firm valuation estimates to DCF models.*"
[19] The dominant method is the method (if they use more than one) that analyst base their decision on.

used in 4 out of 10 reports.[20] Hybrid valuation models have been found to account only for 17.3% of the reports.[21] This view has been shared by several survey-based papers in the 1980s and 1990s (Imam et al., 2008). However, Imam et al. (2008) indicate that DCF models seem to recently receive more and more attention in practice, following the recommendation by financial theory. The same authors emphasize that "*valuation models are very rarely used in isolation*" which Graham et al. (2002) survey results also confirm.[22] In addition, the choice of valuation model is not determined by solely choosing the *theoretical best model* but is also influenced by multiple aspects. This includes the expectations of internal and external clients, the consensus method used in that industry, the timely scope of the forecast, personal preference (e.g. what model is easier to communicate), and usability for performing the analysis. Ideally, the relative valuation heuristic and the fundamental valuation method will both point to the same conclusion. The nature of DCF models allows manipulation[23] which possibly induces the analyst to implement his prior personal opinion about the stock (Imam et al., 2008). The same could be done to yield for proprietary information on-hand (e.g. through banking ties) for which DCF allows to form an ex-post justification for price targets and recommendations without explicitly referring to the information that formed analysts' opinion.

In order to determine the final projection of the stock price, the analysts introduce models in which company parameters (e.g. trends, new products or company changes) can be periodically updated in the form of variables. Besides direct company-related projection, analysts incorporate the industry sector information as well as the overall economic outlook.

Qualification shared by top analysts

Analysts almost always share an academic background or even a certification as foundation for their research. However, there has not been a particular course of study as prerequisite necessary to work in the analyst profession. Current analysts usually have an academic background (BA or higher) in business, economics, or math in combination with technical knowledge or professional

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[20] Compare to Asquith et al. (2005) who report valuation model use as *earnings multiples* (99.1%), *discounted cash flow variations* (12.8%) and *asset multiples* (25.1%) in their sample.
[21] We acknowledge that different valuation methods are preferred for different sectors (depending on the availability of peers of foreseeable cash flows).
[22] The survey indicates that other models like *market-timing*, *multi-factor risk model* or *capital asset pricing model* do play a role. However, *financial statement analysis* is dominating analysts' research.
[23] Cash flows projection needs to create as well as finding the appropriate discount rate.

experience in one or more industry sectors like engineering, chemistry, biology, and computer science. Therefore, the backgrounds and depths of study can be very diverse among analysts, while these differences will converge as their on-the-job training and experience evolve and play a more significant role. Third-party certification and designation programs are becoming more important as a proven standard of knowledge not only for entering a job but also for investors trusting in analysts' research. Among others, these programs include designations like the *Chartered Financial Analysts* (CFA), *Certified European Financial Analyst* (CEFA), *Certified Alternative Investment Analyst* (CAIA) and *Certified International Investment Analyst* (CIIA). The daily routines of analysts differ and each analyst prioritizes differently. However, there are typical components of sell-side analysts' days. Analysts usually start the day early to be able to collect, assess, and comment on the newest press releases before the market opens. The following steps include communication with clients (e.g. memos or phone calls for newest updates), coordination with the sales department, as well as conveying ideas to the buy-side or to portfolio managers. During *roadshows* these discussions and promotions are held on-site. *Spare-time*, which does not require immediate reaction to new information, is used for research and modeling.[24]

Analysts are expected to understand the industry better than anyone else and potentially foresee innovations, trends, and other reasons as to why a stock could deviate from everyone's expectation. Communication, influencing, and promotion skills help to acquire the necessary information and promote their own research. Furthermore, Valentine (2011) argues that proper time management and prioritization of jobs provide competitive advantage. Since there is a lot of information on the market and a limited time available, it is important to narrow information and sources down to those that drive the stock and add value in interpreting and incorporating into the report. Very often such information is not found in the quantitative data released by the company. Therefore, it is not surprising that results by Imam et al. (2008) or Macfarquar and Tooley (2009) underline the significance of considering qualitative information[25] in forming target prices and recommendation in practice. Breton and Taffler (2001) even speak of non-financial qualitative factors as the "*most significant drivers of analyst judgement; in particular an analysis of corporate*

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[24] See Valentine (2011, p.29) for sell-side's and buy-side's time allocation of different jobs on a work day.
[25] Orens and Lybaert (2010) explain in which context this is the case and provide a categorized overview of qualitative information with 71 items in total.

management and strategy."[26] This is supported by Fleischer (2011) who see analysis and information as "*security analysts' primary competitive tools*." Qualititative information, however, is subject to biases as well unless, it comes from an analyst's trustworthy source. Therefore, analysts need to adjust for biases in information sources and counteract companies' self-marketing strategies, while carefully deciding how to weigh out each source. Getting the right information at the right time is "*critical to an analyst's success*" (Valentine, 2011).

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[26] Wasserman et al. (2010) p.49 argue for example that leadership characteristics accounts on average 14% of the company performance (conditional to the industry).

2.2 Analyst Biases and the Investment Value of Stock Research

2.2.1 Historic Changes On the Sell-Side

Regulation Fair Disclosure, introduced on October 23rd of 2000 by the governmental organization *Security and Exchange Commission* (SEC), fundamentally changed the analyst and company management relationship and ended the selective information disclosure by companies that previously allowed individual analysts and investors a competitive advantage by having superior information on-hand. This endorsed a timely advantage in estimating future market reaction to the information and, therefore, meant potential monetary benefits. However, this also meant that companies had a potential bargaining chip on-hand that they could use against beneficiaries of superior information (e.g. banks) to trigger favorable treatment to their benefits (e.g. favorable banking services or analyst research). Besides the regulatory change intended by Reg FD, other effects were observed. This included a higher variation of analyst opinions, each interpreting publicly disclosed information differently resulting in a total increase in trading volume right after the introduction (Bailey et al., 2003). In addition, Bailey et al. (2003) found that companies voluntarily disclosed more information for short-time earnings causing these forecasts to be stable. However, long term earnings forecasts diverted, clearly indicating analysts' difficulty to assess company disclosed information ex-post Reg FD.[27] Lastly, Kadan et al. (2009) report that many investment banks adopted a three-tier recommendation rating system in contrast to the previous five-tier rating system indicating a more distinct signal to the investor.

In order to prevent the occurrence of conflicts of interests, the *National Association of Securities Dealers* (NASD) and the *New York Stock Exchange's Regulatory Committee* (NYSE) released *Rule 2711* and *Rule 472*, respectively, in 2002. After the stock market crash in 2000-2001 and an increased concern of biased stock market research, this aimed to provide regulatory rules for internal and external communication, personal trading and ownership, and analyst's compensation. Today, it is the *Financial Industry Regulatory Authority* (FINRA), a private corporation overseen by SEC and a merger of NASD and NYSE, who continuously amends regulations to "*protect investors by maintaining the fairness of the U.S. capital markets.*"[28]

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[27] See also Feldman (2010) for a comment on the results of 10 years implementation of Reg FD.
[28] Compare to FINRA rule manual (finra.complinet.com).

The *Sarbanes-Oxley Act* (SOX) of 2002 set a new standard for the accuracy of disclosed information by setting higher accountability and penalties for fraudulent behavior of the parties involved (e.g. public companies, their management and auditors). Additionally, it also aimed to tighten investors trust to analyst reports by defining a *Code of Conduct* for analyst behavior regarding conflict of interests. Furthermore, it demanded companies to disclose more information while insuring accuracy and continuous updating.

The *Global Settlement Act* of April 2003 had the objective to further reduce analysts' conflict of interest and advocate analysts' integrity. Namely, this caused banks to separate their investment banking department from their research department whose interdependence influenced analysts' research objectivity. Hence, this followed in banks implementing new policies to not only physically separate the two departments but also prevent internal information flow between the two departments to occur. This is known as the *Chinese Wall* (cp. Kadan et al. (2009)).

Lastly, the *Dodd-Frank Wall Street Reform and Consumer Protection Act* of July 2010 take effect on the financial market as consequence of the recent financial crisis. It sets new standards and reforms the whole financial market including the rights of investors and the influence of the Security and Exchange Commission (*Investor Protection and Securities Reform Act 2010*).

2.2.2   Incentives for Biases

Research analysts act as third party evaluator for the companies they are performing research on while potentially also providing or attracting banking services at the same time. Naturally, diverse conflicts of interests arise for the analyst, the affiliated bank and the company, all conflicting with the investors' need for independent opinions on stocks' and industries' future performance (cp. APPENDIX C). Analysts and executives at companies are required to constantly balance their mutual dependency in order to maximize their individual benefit. Analysts rely on the good relationship to the company as information source while also representing the bank as a possible provider of banking services. Hence, the analyst is therefore stimulated to provide positive research reports to not upset board executives. On the contrary, the management board also faces similar incentives for maintaining a good connection to the bank (e.g. for good recommendations to raise money or good investment banking deal offers). One example of conflict of interest arises when the company uses their position (i.e. their insider information) to trigger sweetheart deals

from the bank. Clearly, there are generally several plausible strategies for which both actors can maximize their profits and be *pareto efficient* in their objective. However, other actors (e.g. investors or company stakeholders) may suffer from these allocations, which led the SEC to introduce new regulations and code of conducts in the past (e.g. *Chinese Wall*). Biases of market participants have been extensively studied by previous research. We will provide a concise overview and provide results of the recent findings. In particular, it is interesting to know if investors are aware of such biases and discount accordingly in their investment decisions.

There are various incentives for the bank to consciously or unconsciously influence their analysts causing research reports to be biased. Multiple authors have found recommendation optimism (i.e. not only providing more positive recommendations but also being more reluctant for recommendation changes downwards) to be a resulting phenomenon of this influence. There are three possible reasons analyst recommendations and earnings forecast may show optimism. First, the bank may want to maintain or improve their relationship and trigger favorable treatment (e.g. access to conference calls) leading to reduced analyst costs (e.g. time) and, hence, to better recommendation (Libby et al., 2008). Libby et al. (2008) also shows that past regulatory interventions did not completely stop this conflict from occurring, however, Kadan et al. (2009) show that the frequency of optimistic recommendation declined while also becoming more informative. Second, the bank is motivated to generate trade in order to profit from commissions. Irvine (2001) shows evidence that a bank can significantly increase their trading volume by performing research and covering the stock. Jackson (2005a) then shows that optimism in analysts' research further increases trading volume. Cowen et al. (2006) not only show that optimism does indeed drive income of trade commissions but also differentiate between the sources of income for the bank (e.g. trade commission or/and underwriting) to fund research (i.e. analyst compensation) and find that brokerage houses depending on trade commission show higher optimism than banks that perform both services (i.e. trading and underwriting). Irvine (2004) differentiates between optimism in recommendation or earnings forecast. His results confirm the correlation of recommendation optimism with future trade generation (either through buying or selling). Their research on forecasted earning, however, does not show any effects on trade. Third, banks interested in offering investment services to companies have implicit effects (i.e. optimism) on analysts' research (e.g. Dugar and Nathan (1995); Lin and McNichols (1998); Hong and Kubik (2003)). In cases where banks compete for initial public offerings (IPO) analyst research is most often not being influenced prior to the IPO since this is the point where most banks initiate coverage

(Ljungqvist et al., 2006). However, winning underwriting mandates might trigger favorable recommendations by the bank ex-post the IPO as a sort of repayment for winning the deal. The same is true for all other equity or debt offerings for which a bank could possibly strongly advertise itself as underwriter already before or also after the offering by giving optimistic recommendation. Michaely and Womack (1999) confirm the bank's optimism in recommending stocks for IPOs that have been taken out by them. Therefore, it is questionable if analysts' recommendations should be audited or approved by departments or supervisors in a bank that are involved in such investment services (cp. SEC regulations / *Chinese Wall*). Ljungqvist et al. (2006) do not find significant evidence that bold recommendation influences the probability of winning such lead-management offerings at a future point. In a later study, however, Ljungqvist et al. (2009) show that optimism increases likelihood to receive co-management positions in security offerings instead. This is an important immediate step to a future security offering for the bank to become lead-manager because a relationship has already been established, and, therefore, chances of winning are higher. Shen and Chih (2009) point out another conflict of interest arising within a bank. Their observed stock sample shows abnormal returns, specifically, in the time window between seven days prior to and two days after the banks buy recommendation and negative for the days following. Hence, the banks that engage in selling their own stocks may have the chance to profit from their own recommendation. In addition to conforming to the optimism in analysts' recommendation, the study also reveals that market participants do account for the optimism and are not being fooled.

Agrawal and Chen (2005) summarize all the previously mentioned conflicts of interests with the investment banking division (but also the not mentioned M&A transactions) as well as brokerage, and develop a quantitative measure to control for the influence that analysts are facing. In addition to conform the optimism in analysts' recommendation, the study also reveals that market participants account for the optimism so that investors are not being fooled.

Sell-side analysts are in a multifaceted role serving multiple people and are not only prone to employer-related incentives. There are also various incentives that motivate the analyst individually to engage in optimism. First of all, analysts are being paid and rewarded by their employer and their corresponding income source (e.g. investment banking deals) which encourages the analyst implicitly for optimism (cp. Groysberg et al. (2011b)). There are only little incentives for the analyst to produce negative recommendation (cp. Mayew (2008); Westphal and Clement

(2008)) which is supported by the fact that only a relatively small fraction of outstanding recommendation are actually negative (i.e. sell recommendations) (Barber et al., 2006).[29] In fact, analysts' sell recommendation might penalize analysts' reputation since they are not as frequent and more strongly perceived by the market (Womack, 1996). Jackson (2005a), however, found that analysts could be motivated to be accurate in their research in order to generate personal reputation (e.g. external rankings and surveys). This fact is critical since it might lead to a dilemma for the analyst contradicting with the bank's objective. This is particularly true since analysts also hold positions of high responsibility with firms (Graham et al., 2002). Hong and Kubik (2003) also found that analysts are being rewarded for accurate forecasting in finding better future employment. Nevertheless, the study revealed also that analyst experienced such rewards based on their optimism as well. Westphal and Clement (2008) show that the social influence by the covered firm is relevant for the recommendation course. Companies' management has incentives and means (e.g. support the analyst in networking) to influence the analyst. The study shows that analysts react positively (i.e. optimism) to courtesies made by management and that negative recommendations by the analyst cause management's reluctance. The later has also been shown by Mayew (2008), who observed a decrease in information access through management. Management's punishment towards the analyst alarms other analysts, and reduces their likelihood of downgrading the company (Westphal and Clement, 2008).

Generally, an analyst might also divert the attention unevenly to only selected parts of his portfolio. It is reasonable to think that an analyst uses extra care in research for customer-related stocks. For example, a bank might put its own money at risk handing out problematic research to a bank's lender-affiliated stock. Ergungor (2011) found that banks do show more accurate earnings forecast for lender-affiliated stocks, which can be derived by the additional insights that the bank gets after establishing the lending agreement. However, the authors found that optimism in stock recommendations and growth continues to exist.

All in all, research has found different settings where analyst biases are likely to appear. As shown earlier, the process of forming research reports is a complex sequence of known information combined with multiple assumptions. The latter can easily be amended to change the research into a different direction (Hough, 2012). The banks' influence and the absence of regulations might not be the only factors leading to the occurrence of biases. Analysts are choosing the portfolio of firms that

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[29] This is partly due to the fact that market has a tendency to go up as argued by Valentine (2011).

they are covering, so optimism might arise naturally for the favored firms or might simply be the result of human error (poor judgment in the evaluation process).

After all, as indicated by Cowen et al. (2006) and other studies, successful banks might be motivated to refrain from too much optimism to prevent a downgrade of their reputation and customer's trust. In the next section we will discuss the relevance and value of stock research as an essential foundation for our study.

2.2.3 The Investment Value of Stock Research

In 2.1.2 we identified information sources and analyst skills that drive analysts' reports. The following section will now discuss the question of the investment value of their reports and elaborate on the scientific evidence found in the literature. One could think that analysts only reproduce many of the public capital market information (e.g. quarterly reports) which, in fact, has already been incorporated in the stock price. In addition to this supposedly low value adding, the biases we reviewed in the previous section may contribute to the distortion of analysts' research insights. Therefore, it is legitimate to question if recommendation, earnings forecasts, and price targets add any investment value to the publicly available information on the capital market or if their research is too ambiguous for any practical use. However, the decisive factors for the valuation of a company requires adjustments to the available fundamental firm data (e.g. earnings forecasts for DCF use) and also incorporate many uncertain non-quantitative data (e.g. management information) that represent non-manifestly readable numbers (e.g. future market trends or capital market behavior). Such uncertain input values for models compromise the value of the analysts' research additionally and raises doubt on its quality again.

Much of academic research focused on the use of analyst research reports or past-performance stock characteristics to find indicators or strategies in order predict the best stock investment at a given point in time. For example, Lakonishok et al. (1993), looking at past-performance stock performance of over two decades ago, show that the strategic investment in value stocks[30] can outperform the strategy in building portfolio investments of glamour stocks. The reason is market participants' entrenched overestimation of glamor stock growth rates relative to

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[30] Value investing has been proposed by Benjamin Graham & David Dodd (1934) (Graham and Dodd, 2009). For another reference example on value-investing refer to Klarman (1991).

value stocks in addition to the higher risk that glamor stock bear. Several other studies looked at the use of analyst research as a source of information for profitability of trading. Stickel (1995) finds that analysts' stock research does affect the stock prices (i.e. the stock is mispriced) in a short and long-term perspective and, hence, that there is a pay-off in analysts' work. Their results show that an analysts' recommendation can have an average return as high as 4.61 percent in the period of [-5; +5] days of the recommendation. Such price effects were observed for a certain analyst setting working with a large bank, a significant recommendation change to *(strong) buy*, a positive revision in an earnings forecast, a smaller company that is being recommended, and an analyst with a high reputation. This setting describes key determinants influencing short-term price reactions. Womack (1996) confirms the relevance of stock prices. First, his results show that stock prices change the following months, on average, by +5% and -11% for a recommendation change to *buy* or *sell*, respectively. Large returns have been found within a three day period of the recommendation and stay significant for excess returns the month after (*change to buy*) and six month after (*change to sell*). Nevertheless, the authors also found that there is a "*considerable postrecommendation drift*" describing the fact that market participants are changing their opinion, however, this was not based on new public information. This underlines the fact that, even though analysts' research shifts a stocks' price to its *real* value, the price is still not reflecting all information. Barber et al. (2001) again confirm such price effect but are taking a different approach by not looking at the average price influence of an analysts' individual recommendation but rather at a whole investment portfolio. Their results also confirm the value that analysts create in their information collection and interpretation process. Their strategy of investing in the most favorable consensus recommendations with a continuous portfolio update yields an average annual abnormal gross return of 4.13 percent. In a later study, Barber et al. (2006) use the distribution of banks' stock ratings as underlying source to analyze analyst recommendation profitability. In agreement with their hypothesis that conservative analysts with less frequent updates to a *buy* recommendation should be of higher value than those from optimistic analysts with relative more *buy* recommendation, the authors find that such information helps investors in their stock evaluation. However, these findings are based on market data prior to the implementation of NASD *Rule 2711* in 2002, which required the disclosure of such recommendation distributions thereafter. The ex-post analysis of *Rule 2711* revealed that the differences between the two types of analysts significantly shrank, indicating the success of the rule and the convergence of the analysts in their recommendation scale use. Gleason et al. (2012) further investigate the value of analysts' price target and how the underlying valuation model used

by the analyst influence the investment value of their price target opinions. The author's sixteen year stock sample confirms the analysts' ability to predict future stock returns reflected in their price targets. Furthermore, the authors endorse the importance of choice of valuation methodology for maximizing investment prospects. As seen in Imam et al. (2008), the authors see in a fundamental residual stock valuation technique superior forecasts. Lin and McNichols (1998) study how a bank's underwriting relationship to a company and the recommendation optimism that it causes will affect investors' performance in the stock, compared to following the recommendation of an unaffiliated bank. The results of their data suggest, in spite of the optimism of affiliated banks, that there is no significant difference in expected return following either bank. However, investors see a more negative stock signal in *hold* recommendations of affiliated banks to those of their corresponding unaffiliated banks.

All in all, we can assume that analysts' research and recommendations are relevant by providing new information to the market as well as by their expertise in interpreting company and industry information. This is an important result of our literature review since it renders research on analysts' biases more significant and meaningful. We assume that public information is made available to the capital market participants in a delayed fashion and, therefore, analysts' research reduces information asymmetries and reveals additional value for market participants. Hence, we assume that the market is not entirely efficient[31] and that not all information is incorporated into the stock price at a given point in time. Hence, it is only logic to assume that analysts' acquired insights lose their value over time since information is spread by other sources, reaching all market participants. Other important results of our review include, first, that *sell* recommendations are more predicative than *buy* recommendations since the analyst faces more *resistance* in announcing negative recommendations (e.g. Asquith et al. (2005) or Frankel et al. (2006)). Second, stock prices develop towards the change of recommendation, but only for a short amount of time with the highest yield expected around the time of recommendation revision (e.g. Hough (2012)). Third, besides recommendation revisions, price target revisions are a significant stock performance indicator (Asquith et al., 2005). Fourth, analysts' rationales for their research results have also been found to be of significant value for investors (Asquith et al., 2005). Lastly, besides investors' benefit of the analysts' expertise, covered companies benefit from increased capitalization.

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[31] The question if the capital market *misprices assets* has been discussed in literature controversially. This discussion includes the question if the analyst is able to uncover such stocks. If analyst only rely on non-proprietary information all information should already be incorporated in the current stock price.

Investors that are aware of known analyst biases (cp. 2.2.2.) may arbitrage at least part of incorporated inefficiencies for increased investment prospects.

2.3 Network Effects and Economic Outcomes

2.3.1 Social Network Theory

Network science has advanced rapidly in the last two decades and continuous to grow at a fast pace (Borgatti and Foster, 2003). The formulation of the first research problem dates back to the 1950's (cp. *The small world problem* (de Sola Pool and Kochen, 1978)) and is followed by the inclusion of research questions in various disciplines, such as computer science and sociology or in the context of mathematical graph theory for example.[32] The common ground is the connection and interaction between different entities or actors forming a network. Most research so far analyzed its formation process in addition to characteristics and efficiency of the overall network[33] but failed to a great extent investigating more insides in the maintenance and dissolution process of networks (Monge, 2001). For our review, we restrict ourselves to the context of social networks[34] whose interest has increased nowadays even more due to the ease of maintaining friendships and professional contacts through advanced telecommunication and electronic resources like online networking and platforms (cp. Ellison et al. (2007)). The new multimedia application and the increased mobility of people change the traditional picture of social networks (cp. Mesch and Talmud (2006); Stegbauer (2010)). We usually find interpersonal ties to be poorly documented and most often only see certain settings captured. Examples of the evolution of traceable social ties are often activity and membership related (e.g. Fracassi (2012) who categorizes ties in "*Past Employment Network*", "*Education Network*" and "*Other Activities Network*") or originate from electronic sources or applications (cp. Ankolekar et al. (2009)). However, privacy requirements often limited the access of such data for research[35] and, hence, survey-based approaches as well as

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[32] Relevant network science research is currently undertaken for example in the context of epedimics, terrorism, social mobility, power grids or neural and genetic networks. See Watts (2003) as a reference for further insights into the field of network science.

[33] See Jackson (2005b) for more information on the formal modeling and its context in different fields.

[34] See Scott (1988) for early research developments of social networks.

[35] Sample data released from telecommunication companies and online platforms is increasing becoming available promising enormous research opportunities (Birke, 2009).

publicly available biography (bio) data had been the traditional approach to identify social networks.

We first focus on the key findings of network theory and the contribution by sociology before we review social ties in different contexts to demonstrate its power and the benefits for participants, highlighting relevant research in the banking and management board context.[36] Social network theory has found five distinctive structural commonalities between networks.[37] These structural properties help to understand how networks typically evolve and how people are interconnected on micro and macro levels. First, the famous experimental study (*Small World Problem*) of Travers and Milgram (1969) showed that the median number of intermediaries or friendships between two individuals (vertex) has a diameter as small as 6 steps (six degrees of separation).[38] Second, analyses of social networks have shown that the number of acquaintances of people follow a "*heavy tail*" distribution (also known as power-law distribution) supporting the idea of hubs in social structures. That is, the number of network connection for most people is within a similar range, whereas there are also few individuals with a significantly higher degree of connectivity that serve as a *hub* for the network (e.g. Freeman (1978); Dodds et al. (2003); Jackson and Rogers (2007)). Third, several studies have found that social networks have a high tendency of connecting people with similar attributes (HOMOPHILY) (e.g. McPherson et al. (2001); Jackson and Rogers (2007)).[39] Fourth, similar people not only connect with each other, but also have other common friends that both are connected to. Therefore, the two friends of a friend are very likely to be friends again (TRANSITIVITY) (e.g. Watts (1999); de Sola Pool and Kochen (1978); Granovetter (1983)). This increases the tendency to form separate networks with more dense ties compared to ties outside the network (CLUSTERING) (e.g. Mishra et al. (2007); Krivitsky et al. (2009)). Lastly, social networks have a tendency to either form reciprocal relationships or none at all. Friendship reciprocity between two persons describes, once one person claims to be friends with the other, the likelihood that the other person is also confirming this friendship tie. In the context of our study, reciprocity between banks and industry describes the fact that once a link between a bank and a

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[36] Review Brass et al. (2004) and Monge (2001) for a more detailed theory in communication networks in organizations.
[37] This trend is particularly true and has been observed in larger networks on macroscopic level.
[38] Several more recent studies supports the experiment with very similar results for the same experiment but the same setting (cp. Dodds et al. (2003); Backstrom et al. (2012)).
[39] "*HOMOPHILY is the principle that a contact between similar people occurs at a higher rate than among dissimilar people*" (McPherson et al., 2001).

management board is created (i.e. a banker switching employment), the likelihood increases for mutual information transfer between bank and management board (Easley and Kleinberg, 2010).

Network Centrality Theory describes different methods in order to distinguish networks' members based on its network position and, therefore, is able to infer their significance regarding different attributes. This is known in literature as the concept of centrality[40] based on the approaches of closeness, degree, betweenness or eigenvector[41] whereas the former is most important for the acquisition of information. A network member that is, on average, closer to all other members than everyone else has an advantage in acquiring information and has increased chances of getting unaltered information from the information sources based on fewer intermediary network members. This has been confirmed by Sorenson et al. (2006) who find that socially closer actors can profit over distant actors for information that is of "*moderate complexity.*" By weighing ties and neighbors (cp. eigenvector centrality) it is possible to also account for the quality of neighbors (cp. Freeman (1978); Opsahl et al. (2010)).

The distinction between STRONG TIES and WEAK TIES has been important in research regarding information transfer within networks. Measuring the strength of a two-way tie is challenging because it mutually differs and depends on many continuously-changing factors. Granovetter (1973) define "*the 'strength' of an interpersonal tie*" as a "*probably linear*" function "*of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie.*" Mesch and Talmud (2006) confirm the importance of the duration of a relationship and add additional drivers (e.g. "*shared social actions*") underlining the importance of social similarity. Another definition of strength proposed by Granovetter (1973) does not look directly at the tie itself, but implicitly concludes its strength. This is based on the number of common network ties that both friends share. One might think that STRONG TIES, the people that we most frequently connect to, are the most important for information acquirement. However, following the argumentation of Granovetter (1983), it becomes clear why this is most often not the case. As stated earlier, STRONG TIES are usually found within clusters of densely-tied people, whereas weak ties are mostly found directing to people in other networks or clusters, with each of these ties being unknown to each other. Granovetter points out that new information is not acquired within the cluster but rather from the outside. Therefore, WEAK TIES are significant as a "*crucial*

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[40] Several authors have introduced different measures in literature for each category.
[41] Eigenvector is a special form of closeness accounting for the quality of neighbors (cp. page ranking algorithms).

bridge" to other clusters or networks (cp. job search example in Granovetter (1973); Granovetter (1983); Dodds et al. (2003)). Nahapiet and Ghoshal (1998) give an excellent overview of social capital theory and provide three crucial dimensions for the creation of intellectual capital:

(A) Structural Dimension (Network Ties, Network Configuration, Appropriable organization)

(B) Cognitive Dimension (Shared Codes and Language, Shared Narratives)

(C) Relational Dimension (Trust, Norms, Obligations, and Identification)

The knowledge that people are expecting to find by consulting others has been studied by Cross et al. (2001) and was categorized as information leading to:

(1) Solutions, (2) Meta-knowledge, (3) Problem Reformulation, (4) Validation, (5) Legitimation.

Their network analysis suggests that people choose different people from their portfolio for the different kinds of information they are seeking. This contact is then being chosen based on the characteristics of the relationship rather than the formal status or the expertise.

2.3.2   Significance of Social Network Ties

In recent years, several authors have studied the value of social network connections in different contexts identifying significant effects on personal rewards or penalties, firm performance, deal terms and conditions as well as the general actor's biases caused by the social network. Based on his previous findings, Granovetter (2005) provides an excellent overview of the sociologist contribution to this discussion and its impact on economic outcomes. We exemplarily look at some of the most recent research results in different contexts to show the relevance and impact of social ties.

The debate of shareholder rights and corporate governance provided incentives for research for further investigation of the relationship between the board of directors, the CEO, and outside members confirming the influence of social ties on corporate governance. Three recent studies looked at the impact of social ties between the board of directors and the firm's CEO. First, Nguyen (2011) shows that poor performance of connected CEOs are more tolerated than for the independent CEOs. And if a CEO change has been put through, a connected CEO is more likely to find a good replacement for his lost position. Second, Fracassi and Tate (2012) related connected CEO's to more frequent acquisitions and, on average, diminishing shareholder value. In addition,

such influential CEOs tend to choose new directors who already show a common existing network connection. Third, by introducing their own measure of social strength Hwang and Kim (2009) underline that social ties must be seen as an additional dimension to conventional interlocks of directors to a CEO. Their findings also suggest that social ties have an impact on the effectiveness of board monitoring with consequences on compensation of CEO performance evaluation. The results of Andres and Lehmann (2011) suggest that highly connected directors (i.e. *busy* board members with several board appointments) have a negative impact on the monitoring in firms which follows in higher compensation and worse firm performance. This is consistent with the results of Horton et al. (2012), however, their interpretation of higher compensation is a reward for bringing the firm into a more central position rather than a "*rent extraction by executives.*" In contrast to other studies (e.g. Andres and Lehmann (2011)), their results suggest that board connections are not necessary but rather improve their company performance.

Social connections not only affect corporate governance but also affect managers' decisions directly. Fracassi (2012) provides evidence that corporate finance decision-making in large companies is influenced by their network connections by showing a reduced diversity of corporate finance policies between two companies when sharing increasingly network connections. This is due to the fact that connected executives between firms can easily exchange information and, therefore, their decision-making converges. In addition, the authors confirm the importance of central network positions for a company (i.e. they are socially more connected) leading to an economic payoff and a competitive advantage.

Hochberg et al. (2007) provide another interesting context where the impacts of social connections have been studied. Based on network centrality measures, the study shows that investment funds of connected venture capital firms outperform their less connected peers while also having a higher probability of seeing through their companies in their portfolio for future investments. The authors credit the improved performance to value adding in the form of venture capital syndicates providing additional resources (e.g. information or research) or access to other partners (e.g. investment banks), which highlight the importance of network connections and centrality.

In the context of network connection to banks, we would like to highlight several studies relating to some aspects of our study. Mizruchi and Stearns (2001) focus on decision-making within banks and analyze what types of networks bankers construct. Their results suggest that bankers rely,

facing risky deals, on few close network ties for which trust has been established rather than consulting multiple coworkers with only a weak connection. In a later study, Mizruchi et al. (2011) focus on the incentives for bankers to construct networks and concludes with two types of networks that are being constructed, each proven to be rewarding, however, for two different purposes. The first type aims to build both diverse and strong ties to coworkers leading to a portfolio of trustworthy information sources, which is then being rewarded based on a better individual performance. The second type suggests forming a densely-connected network to actors of higher hierarchy provoking favorable performance assessments apart from objective measures. Their authors work suggests that neither of the two social network types alone will automatically lead to personal success of the banker, but the combination of the two promise better performance and personal career advantages. Berger et al. (2011) study how social network connections in banks influences the appointment of new executives and find that similarity in age and gender to existing executives and "*better embeddedness in the social system of the bank*" increases chances to be appointed as outside applicant. Pre-existing social ties as well as better network connections (measured by the authors as applicant from a larger institution) have the similar effects for the applicant underlining the power of HOMOPHILY and the significance of network connections as a vital social capital.

Fleischer (2011) takes a more network theory related approach and analyze joint stock coverage ties of analysts extracted from Thomson's IBES database. Their finding documents two fundamental changes of network effects that came with the introduction of Reg FD. First, whereas analysts could profit from an advantage of network effects in the form of superior information in a central analyst co-coverage network position (*closeness centrality*) prior to Reg FD, this effect diluted, measured by the analyst's earnings estimates and their likelihood of being risky, after Reg FD was introduced and information was mandated to flow publicly. Second, in the selective information disclosure network prior to Reg FD, multi-market analysts made use of the selective information on-hand for estimates standing-out from others, not participating in mutual forbearance.[42] Since Reg FD caused the circulation of the same public available information in the analyst network and, hence, the individual superior information foundation for risky estimates has

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[42] Mutual forbearance is the phenomena of actors' decreased competitive behavior towards each other actors when competing in different markets together. This stands in contrast to single market competitor for which no forbearance is observed.

been diminished, analysts prefer to commit to mutual forbearance with their peers after Reg FD (Fleischer, 2011).

2.3.3 Most Related Previous Research

We are focusing on interpersonal ties between banks and management boards and want to analyze the effects of the network positions in this setting on analyst recommendations, investment services, and other areas (cp. Research Outlook). Limited amount of research has been carried out in this context, and we have few sources of previous research relating to our area of study.

First, Engelberg et al. (2012) analyze lending agreement outcomes and the potential harm of the bank's shareholder caused by the relationship. The data was extracted from BoardEx and custom data from Management Diagnostic Limited combining firm executive bio data with those from commercial banks. This resulted in a database identifying interpersonal linkages based on "*school*" and "*third-party past professional connections.*" Their results confirm that connected firms are "*associated with substantially lower interest rates, fewer covenants, and larger loan amounts.*" In addition, their research shows that the company continues to benefit over the lifetime of the relationship by better credit ratings and improved stock returns. Following intuition, the authors point out that the utility of the personal relationship peaks for "*critical companies*", firms for which banks' risks are higher and insights into the firm are most valuable in evaluating creditworthiness. Counter-intuitively, the study finds that the favorable behavior also results in better company performance concluding that such network ties may improve monitoring and information flow.

Second, the study of Brochet (2011) underlines the significance of social networks between analysts and executives of companies which they cover. Their study reveals that this network tie is indeed important for their company coverage decision, based on the fact that analysts have a tendency to change company coverage when executives travel to a different company. This effect has been particularly observed for executive job changes in the same industry. Even more interesting is the fact that, first, analysts that follow executives "*exhibit more intense and accurate coverage*" compared to their peers and their residual stock coverage and, second, the implementation of Reg FD does not show any consequences on the author's results. Both results indicate to either an excellent analyst knowledge or judgment about the executive's performance and decision making or point towards a close network tie which allows excellent performance.

Third, Cohen et al. (2010) identify sell-side school ties between senior management and sell-side analysts and find that analysts with an alumni connection outperform their peers based on their recommendations. This result was significant before the implementation of Reg FD but not afterwards. Furthermore, the authors show that the number of school-ties that an analyst has in place does influence the probability of becoming an *All-Star* analyst. Both results show the value of social network connections for the sell-side analyst.

CHAPTER III

HYPOTHESIS

3.1. Context and Objective

As seen in our introduction, information access is the foundation and a key driver for analyst research. Analytical tools are widely available and research has focused on highlighting strengths and weaknesses. Therefore, analysts share a common platform and set of analytical tools (e.g. fundamental analysis or valuation methods) whereas input parameters of these tools differentiate analysts from each other. Assessing these factors is critical for the modeling of a stock. Analysts with different information on-hand may estimate timing and magnitude of key factors differently and, therefore, assign different weights to different information (cp. Chen and Jiang (2006)), which then leads to different outcomes. Diligent working analysts generally can reach out to the same public information since SEC adopted Regulation FD promising that information are fairly disclosed and selective information release generally is restricted. Hence, it should be the analyst's skillset, knowledge of the particular industry as well as selection of information sources that makes the analyst stand-out.

Proprietary information, however, is an additional driver and has the potential to turn around analysts' research by providing insights that can change the prospects of a company (e.g. successful medicament research for a pharmaceutical company or an upcoming acquisition of a competitor).[43] This is particularly true for our highly globalized and competitive economy, which is changing at a high pace. After all, it is the early information that deviates from the consensus and the market knowledge that makes recommendations very valuable.[44] Seeking proprietary information is useful for various reasons. First, such information is acquired before it possibly reaches the market. Getting the information early will provide the analyst with a timely advantage which will help them stand-out from the crowd, supporting personal and professional success, and reputation. Second, the

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[43] E.g. investors in growth stocks would like to know when the stock is approaching the peak. Hence, analysts' information about critical factors driving the stock will further approximate stock forecasts.

[44] Compare to the notion of bold estimates in Fleischer (2011).

analyst may be able to access more information[45] or selectively choose information that is needed in the research process. Third, proprietary information may very often have the benefit of being of higher quality than other sources. Lastly, analysts may be able to verify their key assumptions in their report and make their research more robust and meaningful (cp. Cross et al. (2001)). All in all, proprietary information of any kind will lead to a comparative advantage over analysts that base their research only on public information and therefore have a higher cost of some form (e.g. longer research process). Hence, various incentives are given to establish, make use of, and maintain such information channels.

From our literature review it is apparent that a lot of research of sell-side analysts focused on the wide range of biases that analysts are exposed to and the analysis of identifying reports that bring most information to the market at a given point in time (e.g. change or revision of recommendation). This extensive research is the logical consequence of investors' need to understand the value of research reports to identify their best investment. We would like to contribute to this discussion by taking social networks into consideration. The ability to model such social networks is, as mentioned earlier, often limited based on the availability of data. Our research focuses on a setting that allows extracting and filtering data describing social network connections between banks and the management board of U.S. traded companies, which we use as proxy for social ties. As other authors, we refer to such a setting as BANKERS ON THE BOARD or BANKING TIE (cp. Kroszner and Strahan (2001) or Dittmann et al. (2010)).[46]

The foundation of our study relies on this BANKING TIE NETWORK and, more specifically, on the interpersonal affiliation of a board member to a bank which also provides analyst recommendation to the corresponding company. As we shall see later, we empirically identify a large set of board members on publicly traded companies with a social network to such a bank. Although job changes from the banking sector to the board of an industrial company is not necessarily logically connected at first glance, there are good reasons why companies decide to do so. The financial expertise of bankers, customer experience, knowledge, and networks within different industries is the right foundation to be able to make and drive strategic decisions. Research

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[45] As described in Valentine (2011) we agree that an analyst has to prioritize and won't be able to incorporate all information due to timely constraints. Cross et al. (2001) underline that such meta-information "*increases (…) efficiency in responding to problems.*"

[46] We will often refer to this setting simply as a banking or social tie.

Analyst Stuart Jeffrey brings it to the point in his job description and the questions of movements in the career of a research analyst:

"You understand the company, you understand to communicate with senior management (…), it is quite an easy step to go from one of the companies that you cover to then go and work for them. An easy step is that each of these companies then has a customer relations department and that is the point of contact for any investor or Analyst, and many of those roles are then filled with Analysts, who then if they do well, move on to more strategic roles within that company" (Jeffrey, 2009).

To clarify our setting we describe our research context (Cohen et al., 2010). Bob's performance at bank X refers him to be elected to serve on the board of company Y (while giving up or continuously keeping all position at bank X). Bob has been working at bank X for many years serving in multiple management positions, which have helped him to create a professional and social network to numerous departments and subsidiaries within the bank. Edgar and Alice are sell-side analysts performing research on large cap companies including company Y. Both follow management conference calls and new market information closely for handing out the most accurate recommendation possible. Company Y recently pushed investments in research for optimizing its inventory and stochastic supply lead times allowing to reduce procurement and safety stock costs and, hence, increase efficiency and margins significantly. Edgar works for bank X as well and shares a banking tie and social network with Bob. Edgar is pushing his research and consults his network for insights. He receives information indicating the newly improved prospects. Alice, however, who is working for another bank, does not yet have access to this new information and is reiterating her recommendation whereas Bob is updating his recommendation to 'buy'. In the next quarterly statement, Y is incorporating the new expected cost savings in companies earnings forecast which let the stock rise. The significantly improved prospects lets Alice update her recommendation only after the stock had already risen considerably and the new information has already been incorporated into the stock price.

There are several plausible scenarios how information gets transmitted through a common social network. First of all, the banking research department might still be directly linked to the former employee (as the above example describes). Such a strong tie or two-way interaction could be kept for example through continuous banking services, close friendship, or ongoing common social events. Secondly, insights could also flow through an intermediate network member connecting both parties indirectly. Valentine (2011) provides a good example for such a situation:

"Don't dismiss any contact as too insignificant. I made a contact with a frontline employee during a tour of the Port of Los Angeles who later was very helpful in confirming port congestion problems, which I used to help support a big stock call for the railroads that haul the containers from the port."

For cases, in which a direct contact between analyst and board member has been lost or has never been established, the common social network stimulates the analyst to retroactively connect to the banking tie either directly or through an intermediate close network member (e.g. through online networking tools (Ellison et al., 2007)). Local search in the close network promises to provide insights (cp. Sorenson et al. (2006)).

Reg FD requires the fair and public disclosure of information; however, we think that social or banking ties have the potential to bypass such regulation based on the close relationship and the common network and previous experience. Reg FD may have indeed strengthened such unconventional information channels while counter-intuitively also strengthening traditional information sources (e.g. Investor Relations Department (Kirk and Vincent, 2011)). In the following section, we will state our hypotheses prior to describing our methodology for creating a new database of banking ties.

3.2. Hypothesis

Much of previous research studied social network ties and their effects using data based on alumni ties (e.g. Cohen et al. (2008); Cohen et al. (2010); Cohen (2010); Ellison et al. (2007)[47]), joint stock coverage (e.g. Zuckerman (2004); Fleischer (2011)), director and analyst interlocks (Horton (2010); Horton et al. (2010); Horton et al. (2012)), stock coverage change (e.g. Brochet (2011)) or mix of social connections[48] (e.g. Hwang and Kim (2009)[49]; Berger et al. (2011); Engelberg et al. (2012); Fracassi and Tate (2012); Fracassi (2012)). However, to the best of our knowledge, the way in which a bank's relationship and connection to a company can influence its recommendations towards this firm has not been fully discussed yet. More specifically, we seek to

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[47] In the context of Facebook friends.
[48] This includes similar or common past employment settings.
[49] Hwang and Kim (2009) for example propose a measure based not only on HOMOPHILY (e.g. education) but also on confounding (e.g. regional origin) as indicator for a social network distance.

characterize if a connection between a bank and a firm remains in cases where bankers change their employer and become members of a board of a company for which its former employer issues stock recommendations (*Banking Tie without Having a Banker on the Board*). The thesis' goal is to empirically investigate whether the relationships to former managers are kept or resumed after the job change and whether consequently biases the bank's analysts' recommendation compared to the consensus. This specific context has only been attempted by Cohen et al. (2010) based on alumni network connections. The influence and impact of BANKING TIES to the company (i.e. the mutual return premium), therefore, still remain unanswered to a large extent.

Hypothesis:

It is hypothesized that a bank affiliated board member which has a tie to his old employer remaining in form of a social network triggers a conflict of interest and creates an agency problem. Namely, the analyst may gain access to superior information than publicly available on the market. Therefore, this banking tie is a value driver and translates to a comparable advantage for stock research. Furthermore, the network effects might have strong implication on banking investment service deals and the corporate governance debate.

The banking tie dataset differs from a tradition relationship dataset. The number of acquaintances that is implied by a banking tie is much larger than the one implied by a two-node relationship. If we take the example of an alumni tie between management board and the bank, we can easily see the connection between both actors for which both might use the connection for a mutual benefit (e.g. closing a banking deal and cheaper lending). This might lead to an agreement for which both parties profit. However, the board member only has limited influence (only his one relationship) on the favorable outcome of the deal. With a banking tie, on the other hand, the board member has a higher number of network connections (e.g. to higher management and to different departments) to the bank and therefore higher leverage not only to get a favorable banking deal, but also to promote his interests inside the bank. On the contrary, any bank employee has a direct or very short network distance to the company's board. This is underlined by the quote of Valentine (2011):

"If you could build a mosaic by speaking with four colleagues in your network or learn about a new concept by reading the Wall Street Journal, which is more likely to help generate alpha?"

For the setting of a bank and a company that consists of two separate networks with one or more *hubs* connecting and interlocking both networks, we expect the network distance to be very small. Based on the close relationship, the distance could either be direct (no intermediaries) or very short (one or two intermediaries). In reality, it is part of an analyst's job to network within and outside the company. The same is true for the new board member who in most of the cases automatically created a large network working his way up to a board member position. Therefore, we expect the degrees of freedom (the number of direct contacts) for both to be very high and therefore act as a *hub* or *connector*, increasing the chance for a direct connection between both vertexes. This notion is supported by the study of McPherson et al. (2001), who discuss networks in the context of HOMOPHILY. The authors argue that people with similar backgrounds have a higher probability to relate than others. This indicates that banking ties do not solely rely on a (previous) common employment at a bank, but might rather be reinforced or easy to reactivate based on other similar backgrounds. In the employment context, these factors are in particular similar backgrounds in education, occupation, and organizational structural position that underline the build-up of strong network ties.

Previous research has shown that network connections allow direct information flow (e.g. Gintschel and Markov (2004); Cohen et al. (2010)) between analyst and companies' management. Our research is therefore relevant for further insights into the financial market, how analysts perform their research and the effects after the implementation of Reg FD. It contributes to the literature of social network ties, bank biases, investor and shareholder rights, and the information value of analysts' research report.

CHAPTER IV

METHODOLOGY

4.1. Sample Selection

For our analysis, we selected a large set of companies to allow us to find a significant large sample of connections between company boards to a bank. The companies we selected are representing the most relevant stocks traded on the U.S. stock market. This includes the *Dow Jones Composite Average* (prominent companies), *NASDAQ Composite* (technology and growth companies), *S&P 500* (large-cap companies), *S&P 1000* (small and mid-cap companies). For these companies, we extracted all board executives (prior or current appointments) listed in *Capital IQ*'s database (cp. APPENDIX F). We assume that persons holding executive positions in a company's board have the relevant expertise and influential power inside the firm to be of significant importance as a network connection to a bank. Also, we expect bankers that take on industry executive board positions directly or via intermediate positions in the firm, to have had a relevant position at the bank that recommended them for the new job position (cp. APPENDIX G). We also expect these individuals to have professional and social networks over several departments and subsidiaries to the old employer. We assume that direct or very short distance network connections will increase the likelihood for the banking tie to stay active, to be reactivated, or to be established to initiate information exchange when needed (e.g. stock analyst contacts board member for information retrieval).

For each identified board member, the *S&P Capital IQ* database provided us with the following important information (each in a separate column in Microsoft Excel):

(1) Board Member Name
(2) Company Name
(3) Board Job Function Title
(4) Other Board Members (only current)
(5) Bank Names and Analysts that cover the company
(6) All Company Affiliation (prior or current appointments)
(7) All Board Memberships (prior or current appointments)
(8) Board Member's Biography

In the following we would like to provide a prominent example to illustrate the information that we worked with. We present the information in the same order as the above mentioned categories:

(1) *"Gates, William Henry (Board)"*

(2) *"Microsoft Corporation (NasdaqGS:MSFT)"*

(3) *"Member of the Board of Directors; Chairman of the Board."*

(4) *"Gates, William Henry (Board); Ballmer, Steven A. (Board); Dublon, Dina (Board); Gilmartin, Raymond V. (Board); Marquardt, David F. (Board); Noski, Charles H. (Board); Panke, Helmut (Board); Hastings, Reed (Board); Klawe, Maria M. (Board)."*

(5) *"Arete Research Services LLP (Shepherd, Adam: May-12-2011); Argus Research Company (Bonner, Joseph F.: Sep-03-2009); Ascendere Associates LLC (Castellano, J. Stephen: May-18-2011); Atlantic Equities LLP (Hickey, Christopher: Apr-23-2010); Axia Financial Research (Spagna, Fabrizio: Jun-29-2010); Barclays Capital, Research Division (Hernandez, Israel: Feb-16-2010); BofA Merrill Lynch, Research Division (Rangan, Kash G.: Apr-15-2010); (…)."*

(6) *"Corbis Corporation (Board); Microsoft Corporation (NasdaqGS:MSFT) (Board); Berkshire Hathaway Inc. (NYSE:BRK.A) (Board); Bill & Melinda Gates Foundation (Board); Bill & Melinda Gates Foundation Asset Trust (Board); ICOS Corporation (Prior Board)."*

(7) *"Berkshire Hathaway Inc. (NYSE:BRK.A); Bill & Melinda Gates Foundation; Bill & Melinda Gates Foundation Asset Trust; Corbis Corporation; Microsoft Corporation (NasdaqGS:MSFT); ICOS Corporation (Prior)."*

(8) *"Mr. William Henry Gates, III is the Co-Founder and Chairman of Microsoft Corp. He co-founded the firm in 1975 and was appointed as the Chairman of the firm in 1981. Mr. Gates served as its Chief Software Architect from January 2000 to June 2006 and as the Chief Executive Officer of Microsoft Corp., from 1981 to January 2000. His foresight and his vision for personal computing have been central to the success of Microsoft corp. and the software industry and under his leadership; (…). Mr. Gates has been a Member of the Board of Directors of Berkshire Hathaway Inc., since December 14, 2004. He served as Director of ICOS Corp., from July 1990 to February 2005 (…)."*

The Excel dataset retrieved from *S&P Capital IQ* included 55724 such data entries representing 33206 current and 21766 prior board members of 3560 individual companies (cp. Table 1).

Criteria	Quantity
Current Board Members	33206
Prior Board Members	21766
Prior Board, Deceased	551
Not categorized	201
Companies with no analyst coverage	9275
Number of individual companies	3560
Total Number banks providing recommendations	347

Table 1 – *Capital IQ* Dataset Statistic (Data retrieved: June 2011)

4.2. Methodology and Implementation Steps

In order to identify a current board member as a banking tie, our dataset allowed us to search for indications in two of the categories: (1) *All Company Affiliation* (2) *Board Member's Biography*. The former includes listed entries of all prior and current board members' company affiliations. The biography is a short full written text as typically found in annual reports or other official company disclosures. Unfortunately, the two categories are not always consistent and, hence, most often include different information about employment history. Therefore, we looked at both categories to find prior employment indication. For biographies it is inherently difficult to scan for information (cp. APPENDIX B) due to its lack of categorization and spelling differences (e.g. full company name or only abbreviation). Hence, a programming algorithm to filter results is to be viewed critically since it is limited to scan the information (certain Words or *Strings*) and particularly is not able to evaluate biographical content.

Company networks are closely intertwined and we can assume that bankers are not only creating a banking tie when switching directly from the bank (parent company) into the industrial position, but also when switching from banks' subsidiaries into the board position. Hence, we complemented the 347 banks providing the recommendation to the 3560 companies with information of their *current subsidiaries* and *operating units* totaling to 28188 subsidiaries (cp. Figure 1). Intuitively, the largest banks also have the most subsidiaries.
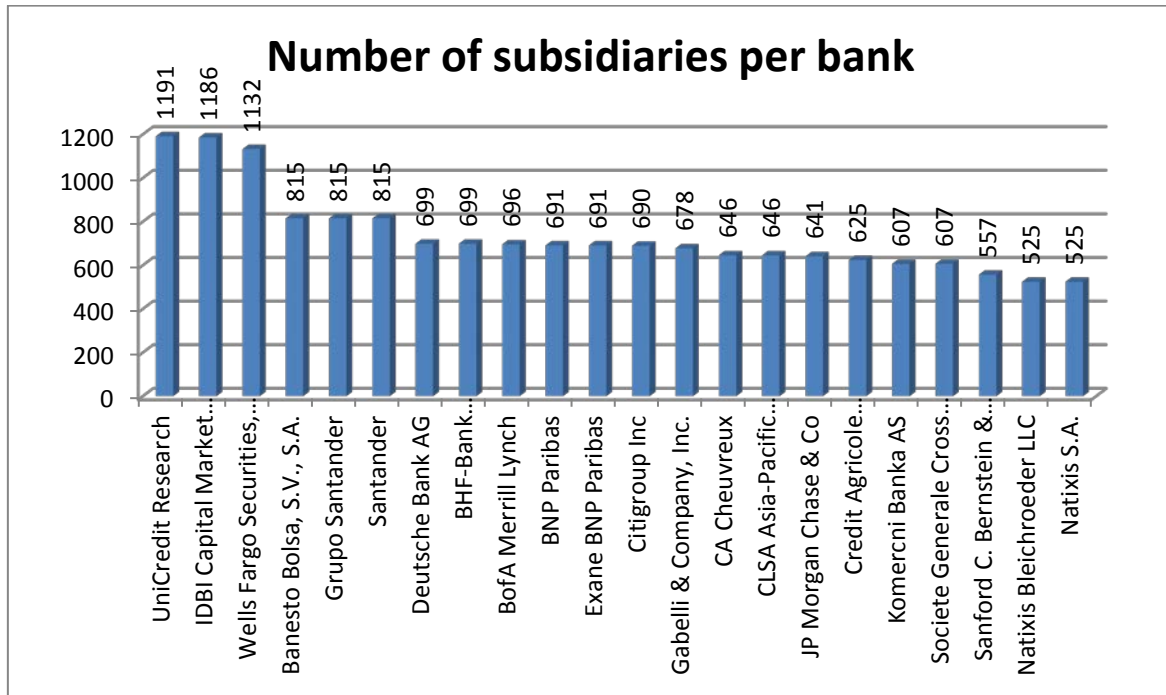
Figure 1 – Number of Subsidiaries per Bank

For the identification of banking ties, we manually filtered the 55724 entries for each of the banks handing out recommendations. This resulted in smaller datasets, which we then further narrowed down by searching for the corresponding bank name and its subsidiaries. *Deutsche Bank AG, Research Division* with its 699 subsidiaries, for example, narrowed down our original dataset to a number of PARTIAL RESULTS of 12279 board members. For each subsidiary name, we searched the *All Company Affiliation* and *Biography* column of the PARTIAL RESULTS and manually verified the results. For example, searching for *Deutsche*[50] resulted in 129 board members when filtering in *All Company Affiliation* and 144 board members when filtering *Biography* column. We read through all the results and extracted the data entry if it was identified as a banking tie.

Criteria	Quantity
Total number of PARTIAL RESULTS	459 073
Total number of current subsidiaries and operating units	28188

Table 2 – *Capital IQ* Filter Statistic

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[50] We typically shortened the search string from case to case to possibly not miss any results. *Deutsche* is often used as abbreviation for *Deutsche Bank*.

CHAPTER V

EMPIRICAL ANALYSIS

5.1 Results

We have to point out the fact that our database is based on relationships and connections that have been established before they are likely to become relevant[51] for agency problems or conflict of interests. This is advantageous for our upcoming research question for which we do not expect to account for correlation that would possibly occur when beneficial banking services agreements cause a personal relationship (i.e. endogenous, reverse banking tie). Hence, it is the banking tie that causes the conflict of interests and not the better terms of a banking deal that are creating this connection (i.e. exogenous banking tie).[52] Nevertheless, we do not know the reasoning leading the banker to switch, but the creation of a banking tie seems to be unlikely.

Criteria	Quantity
Current Board Members	1510
Prior Board Members	1162
Prior Board, Deceased	30
Not categorized	13
Total number of banking ties	**2715**

Table 3 – BANKING TIE Results

In our filtering process we identified 2715 banking ties (cp. Table 3) which consists of 1510 current board members (as of June 2011) and 1162 board members that served the board prior to June 2011.

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[51] For connection where the banker simultaneously serves the board as well as the bank, banking would need to be evaluated on an individual basis to check if our assumption holds.
[52] Compare to discussions in Engelberg et al. (2012) and Brass et al. (2004).

We identified banking ties using the *All Company Affiliation* and *Biography Column*. Most of the banking ties we found provided indication for a tie in the *Biography Column*. About half of our banking ties provided indication for a banking tie in both categories (cp. Table 4).

Criteria	Quantity
BANKING TIE info found in *All Company Affiliation*	1620
BANKING TIE info found in *Biography*	2476
BANKING TIE info found in *All Company Affiliation* and *Biography*	1382
BANKING TIE info only found in *All Company Affiliation*	236
Total number of banking ties	**2715**

Table 4 – BANKING TIE Info Distribution

One very good example of a banking tie would be *Dr. Eric Chen*, board member of *Varian Semiconductor Equipment Associates Inc. (NasdaqGS:VSEA)*. Varian Semiconductor receives recommendation from a total of 12 different analysts, including *Christopher Blansett* who is the analyst for *JP Morgan Chase & Co, Research Division*. Both categories provide an obvious signal for a banking tie (highlighted in boldface). For this particular banking tie, the bio information even reveals the board member's history in the analyst department and profession:

All Company Affiliation Column

'Silver Lake Partners; **J.P. Morgan Partners, LLC (Prior)***; BofA Merrill Lynch (Prior); Brion Technologies Inc. (Board); Varian Semiconductor Equipment Associates Inc. (NasdaqGS:VSEA) (Board);* **JP Morgan Chase & Co, Research Division (Prior)'**

Biography Column

'Dr. Eric Chen is a Managing Director at Silver Lake Partners. He has been at the firm since 2008 and is based in the Hong Kong office. (..) **Prior to that, Dr. Chen was a Senior Vice President at J.P.Morgan, where he coordinated the global research effort in the**

*electronics sector and conducted equity research for a number of technology segments. Previously, he was a Senior **Financial Analyst** at Merrill Lynch Investment Bank. Dr. Chen served was a Senior Vice President at J.P. Morgan's global research effort in the overall electronics arena. During this time, **Mr. Chen served as the Lead Research Analyst for the semiconductor and semiconductor equipment sectors and he advised J.P. Morgan's multi-billion-dollar global investment arm for venture and private equity investments in the general semiconductor sector.** His was also employed at Motorola (…)'*
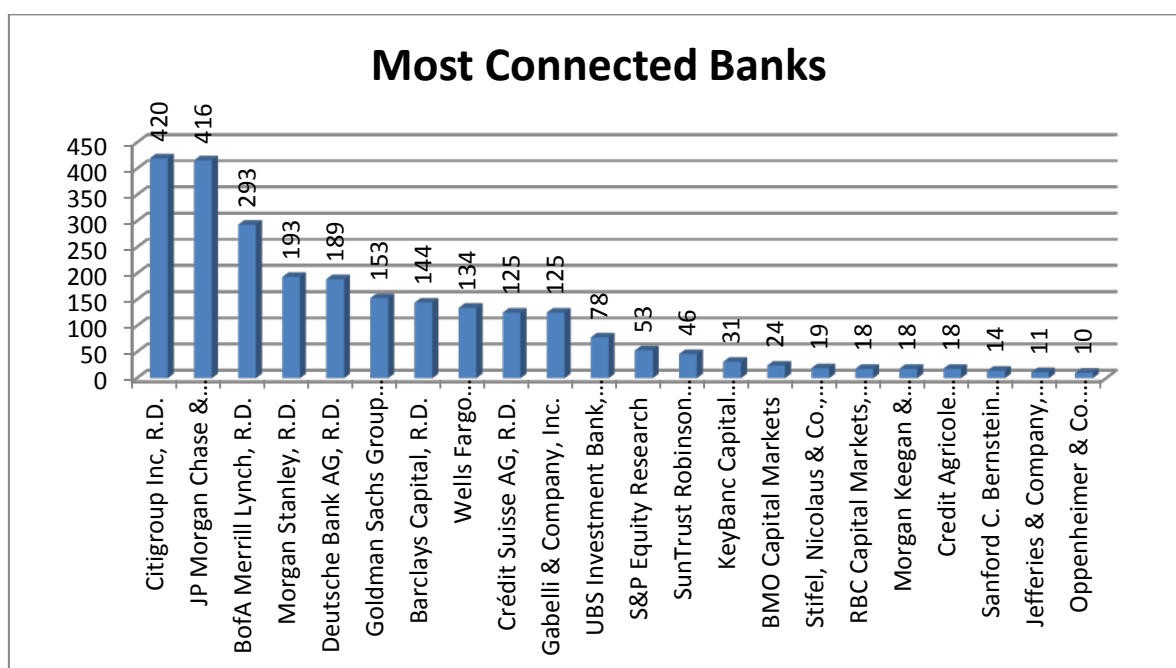
Figure 2 – Most Connected Banks[53]

Figure 2 shows the banks in our dataset with most of the banking ties. It is striking that the most famous investment banks have the highest number of banking ties. Intuitively, one might think that the number of subsidiaries a bank has provides a strong indication for the number of banking ties to be found. However, if we compare the results of Figure 2 with the banks with the highest

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[53] Some of the research divisions belong to the same parent company (e.g. *BHF-Bank Aktiengesellschaft* and *Deutsche Bank AG, Research Division*; *CA Cheuvreux, Research Division* and *CLSA Asia-Pacific Markets, Research Division*; *IIFL Research* and *India Infoline Ltd, Research Division*) for which this figure does not account for.

number of subsidiaries in Figure 1, we can see that this is not always the case. *UniCredit Research* and *CLSA Asia-Pacific Markets, Research Division* and with 1191 and 646 subsidiaries, respectively, have each only one banking tie.

Figure 3 provides an overview over the companies with prior or current board members connected to a bank. Not surprising, these are often prestigious banks for which job turnovers of bankers into better positions are expected. However, it is striking that most of the firms are big industrial corporations.
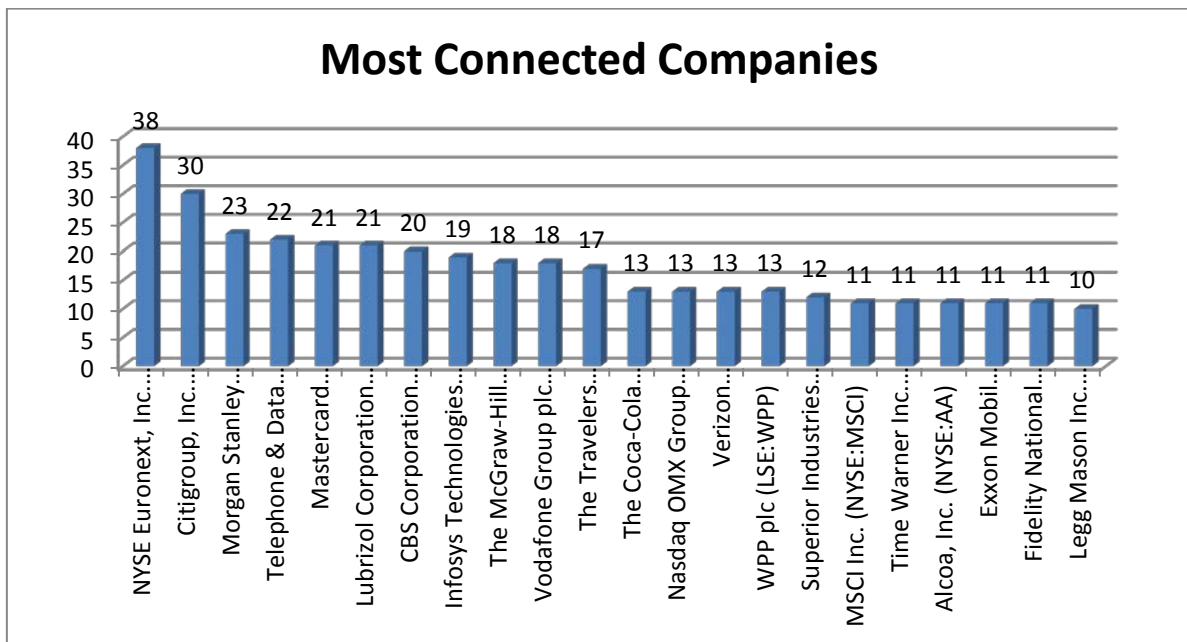

Figure 3 – Most Connected Companies

Lastly, we analyzed the board members and found that there are a significant number of executives with multiple prior or current board appointments that also form banking ties. Figure 4 gives an overview over the most connected board members.
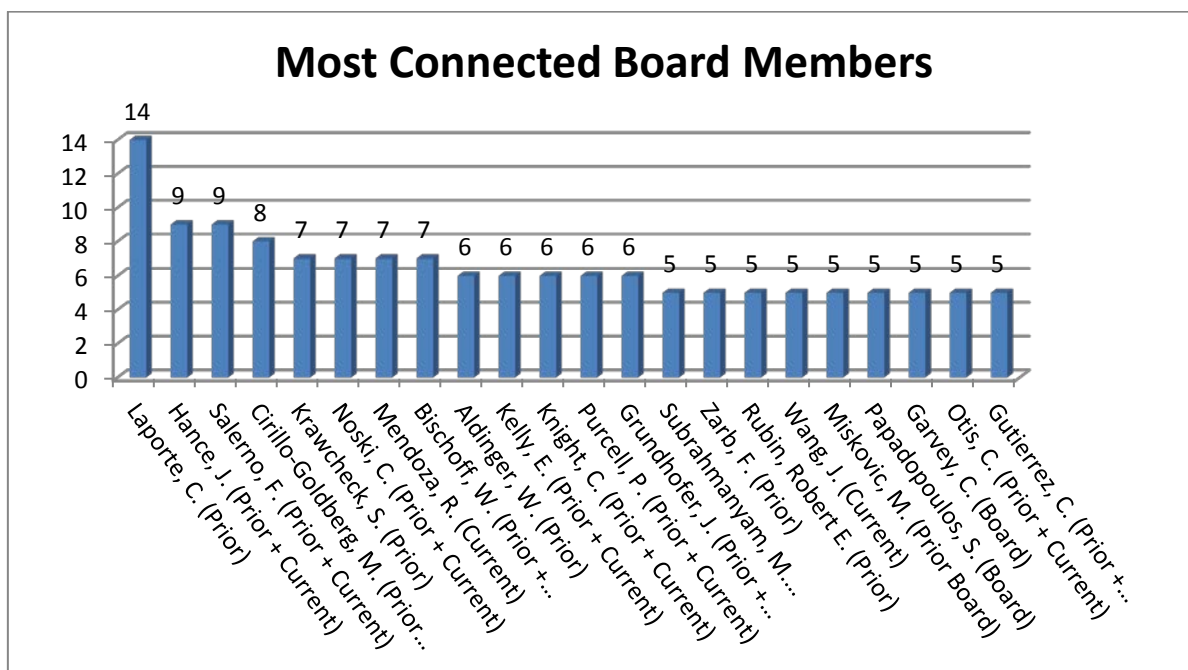
Figure 4 – Most Connected Board Members

We propose to add the following columns to our banking tie database in order to achieve a better understanding of the characteristics of our banking ties and complement our database:

(1) Relationship to research department (parent company or subsidiary?)

(2) Position held in the bank (analyst?)

(3) Start date, end date (last proven contact), and duration of employment at bank

(4) Analyst name(s)

(5) Total number of analysts covering the firm

(6) SIC Code of the firm

(7) Market capitalization of the firm

(8) Employment history as analyst?

(9) Start date, end date, and duration of board appointment (for *prior board* banking ties)

(10) Type of investment banking relationship with the bank, if any

Since we need to extract this information from the *Biography Column*, we might not be able to fill all categories for every banking tie. However, our current dataset provides information in the *Biography Column* for 91% (cp. Table 4) of all results. Missing data need to be extracted from other

sources and researched individually. For example, the above mentioned banking tie example does not clearly indicate the time frame that *Dr. Eric Chen* spent at J.P. Morgan. However, using information provided by *LinkedIn*, we can trace back *Dr. Chen's* employment at J.P. Morgan to be between 1998 and 2002.

We learned from Granovetter (1973) and Granovetter (1983) that weak ties can be an important source for new information coming into the personal network. In our context, this has been underlined by the example of Valentine (2011) who got significant information from a company employee (cp. Quote p.36). For a banking tie, however, it might provide an indication for the relevance of the banking tie. Similar to the regression made in Hwang and Kim (2009) we can define a measure of tie strength between board member *i* and bank *j* at time *t*.

$$\text{Tie Strength}_{i,j,t} = \alpha_1 \omega_1 + \alpha_2 \omega_2 + \alpha_3 \omega_3 + \alpha_4 \omega_4 + \alpha_5 \omega_5 \tag{1}$$

ω_1: *Relevance of affiliation/subsidiary*
ω_2: *Relevance of previous position*
ω_3: *Relevance of duration of previous employment*
ω_4: *Last contact to previous employment*
ω_5: *Other influences*
a_1- a_5: *Individual weight*

ω_1 measures the network distance from the previous employment. Employment settings at research or investment banking departments at the parent companies are more likely to create relevant network ties for information transfer than employment settings in subsidiaries. ω_2 indicates how relevant the previous bank employment was. We can assume that executive positions in the bank are of higher value than others since the centrality of such positions is higher and, therefore, more network connections within the bank are being made. In addition, the duration of employment plays a significant role for the number of people a banker will connect to (ω_3). Furthermore, the last contact to the old employer (ω_4), is an indicator for the network strength, which can be assumed to decrease over time. At last, there might be other influences such as other network ties (e.g. alumni ties) that strongly influence the network strength (ω_5) and, therefore, should be weighted (a_1- a_5) stronger.

CHAPTER VI

IMPLICATION FOR FUTURE RESEARCH

6.1. Research Proposal

As next step of our study we would like to test our hypothesis if banking ties facilitate the transmission of proprietary information or if such a past employment network vanishes instead when the banker switches into an executive board position. We would like to outline the path for further research using analyst recommendations as proxy to test our hypothesis by comparing recommendations made by banks that facilitate a banking tie with the consensus of recommendations without a banking tie. Our literature review indicates that the implementation of Reg FD was successful (e.g. Cohen et al. (2010); Kirk and Vincent (2011)). Hence, we can assume the expected differences between consensus and the individual recommendation to be more robust since statistical noise due to other sources of information is reduced. Using our research design we seek to contribute to previous papers that study the analyst research process, conflicts of interest, and the value of recommendations. By following the recommendations and comparing the stock performance we can find the premium of the banking tie to the old employer.

Analysts provide a clear advice to the investor by prompting a specific course of action. Besides specific values for earnings estimates and price targets, recommendations are given on a scale from [1 = *strong buy*; 2 = *buy*; 3 = *hold*; 4 = *sell*; 5 = *strong sell*]. Historic analyst recommendations are available from different sources (cp. Table 5).

Database	Study
THOMSON REUTERS First Call	Womack (1996); Barber et al. (2006); Barber et al. (2007); Michaely and Womack (1999).
THOMSON REUTERS I/B/E/S	Busse et al. (2012); Agrawal and Chen (2005); Kadan et al. (2009); Ertimur et al. (2011); Ljungqvist et al. (2006).
THOMSON Research Investext	Asquith et al. (2005); Wahlen and Wieland (2011).
ZACKS Investment Research	Asquith et al. (2005); Barber et al. (2001); Chen and Jiang (2006); Jegadeesh et al. (2004).

Table 5 – Historic Analyst Recommendations Data Sources Used by previous Studies

We expect analysts with banking ties to issue better recommendation and outperform their peers based on the superior information via the banking tie. This fact will reward the analyst and the bank with increased reputation and trading commissions. However, in return, the analyst or bank might be biased for future banking services to the banking tie's company.

For our approach we follow the methodology of previous studies of Barber et al. (2007) and Cohen et al. (2010) and use a standard calendar time portfolio approach to assess analysts' recommendation performance with a banking tie relative to the consensus with no banking tie. We built two different portfolios representing the two different courses of actions: (1) *adding a new stock* or (2) *dropping a stock from the investment portfolio*. The former is represented by analysts who initiate, reiterate or upgrade stocks with the rating of *buy* or *strong buy*. The latter is represented by analysts' opposite courses of action (i.e. initiating, reiterating or downgrading a stock with *sell* or *strong sell*). In addition, analysts may not update or drop a stock from their coverage which can be accounted for by setting a fixed time constrained (e.g. 12 months in Cohen et al. (2010)) after which the stock automatically gets dropped from the portfolio (if not updated or not stated as dropped earlier). Each stock enters the portfolio the day after the recommendation announcement to provide enough time for the information to be incorporated into the market. Hence, following previous studies, we do not include the first-day returns of following the stock.[54] For the *buy* portfolios we can calculate the daily return R_t at the close of trading day t as follows (Barber et al., 2007):

$$R_t = \frac{\sum_{i=1}^{n_t} \sum_{j=1}^{n_j} x_{ijt} \cdot r_{it} \cdot \omega_{ijt}}{\sum_{i=1}^{n_t} \sum_{j=1}^{n_j} x_{ijt}} \tag{2}$$

where r_{it} is our return of stock i on trading day t, ω_{ijt} is the recommendation scale weight of analyst j for stock i on day t, and x_{ijt} is a binary variable indicating if the stock is being covered by analyst j. Averaging over all analysts covering one particular stock and all other stocks being covered, we receive the daily return of the portfolio. Similarly, we can calculate the return of our *sell* portfolio

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[54] Compare to the studies of Stickel (1995) and Womack (1996) reporting past stock returns within in a short time frame of the announcement.

but reverse the recommendation scale weight so that a higher value corresponds to a more unfavorable recommendation (cp. Cohen et al. (2010)).

Using this method, we will receive time series of changing returns for each portfolio for which we can compare the investment performances of connected analysts compared to their peers without a banking tie. In addition, we will calculate the risk-adjusted abnormal returns as presented in Daniel et al. (1997) and Carhart (1997) for a better comparison. To further understand our results, we can employ panel regression to our two portfolios (cp. Cohen et al. (2010)) and control for the influence of different characteristics of our banking ties (e.g. previous position in the bank, brokerage size, firm size, analyst rating, tie strength). For the sensitivity analysis we need to check the potential influence of a banking tie premium is still significant when removing the most prominent and best connected analysts from our two portfolios.

Our categorization into the two portfolios yields to analysts' advice for recommendations as well as the time span that lies between recommendation revisions. Alternations can be done by only analyzing portfolios recommendations changes, excluding coverage initiation and resumptions.

Stock recommendations are one of the measures to compare *privileged* analysts (with a banking tie) to the consensus. For further evaluation we would also like to study the other key elements of an analyst report, (1) *Price Target* (e.g. Asquith et al. (2005) or Bonini et al. (2010)) and (2) *Earnings Estimate* (e.g. Fleischer and Baum (2010) or Horton (2010)) and compare the performance of connected analysts with their peers with no banking tie.

6.2   Research Outlook

Our database of banking ties allows us to look at multiple other interesting research topics. Many of them had been previously attempted, but can now be further elaborated in the context of our new underlying source of information. Banking ties may affect all dimensions of companies' and banks' businesses, potentially leading to a number of conflicts of interests for both involved parties. The banking tie can be seen as a driver for the bank's business improving the efficiency in information flow, research, and risk evaluation. Since most valuable information through this channel would ignore disclosure laws and firm internal policies (cp. (Massachusetts, 2012)), it can be assumed that bankers only consult the banking tie when expecting a personal reward or benefit. This could be in the form of creating better research reports or by establishing new investment deals to customers

and, therefore, promoting the personal career. This automatically translates to banks benefits of winning business deals, new customer relationships and, hence, additional revenue, which then also induces a firm's management to only loosely enforce laws. The same logic holds for the board member expecting similar rewards of the network connection. For example, the banking tie may allow the banker to evaluate the risk of potential customers more accurately by having better informational access to customer's business.[55] The board member is being rewarded since the bank is able to offer better banking deal conditions (e.g. for a lending relationship) and, therefore, has a competitive advantage in costs over competitors. However, besides legal consequences, drawbacks include, for example, the bank evaluating risk incorrectly (i.e. deceptive information from the banking tie) which causes liability issues for shareholders.

A social network mapping of the relationship of a bank to the company could bring new insights to the table. Ideally, we would not only like to know which banks are connected to which companies, but we would also like to get more detailed information on a personal level (who knows each other? Who were likely to meet? Are there any other network connection between people besides employment?). Without having additional information on-hand, this will be a challenging assignment. However, corporate structures (i.e. organizational chart) could be used as a proxy to map people working in the same department or supervising others. But as pointed out by Nohria (1998)[56] "*hidden networks*" (e.g. alumni ties) should also be considered where possible to get a better picture how banking ties look in practice.

A number of research questions related to our study that we would like to consider in the future are listed below. Ultimately, we would like to estimate the value of a banking tie for each of the participants to infer the competitive advantage that banking ties generate.

(1) The bank has an interest in promoting its own business as lender. Following Kroszner and Strahan (2001) and Dittmann et al. (2010) who find that *"banks do tend to lend more to the industries of firms on which the bank has board representation",* we would like to investigate if their results also hold for banking ties that are not employed with the bank anymore, but might have other (personal) incentives to promote their old employer as a

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[55] This is particularly true for our dataset since the banking tie is always to the management board of the company.
[56] *"Informal or 'emergent' network relationships (...) are just as important in understanding networks in organizations. (…) Identifying and analyzing these 'hidden' networks can be of great significance in understanding organizations."*

lender. The conflict of interests involved might bias the board member and might have consequences for the company's shareholders.

(2) A bank might not only promote the lending business, but might also use the investment service as part of a sweetheart deal triggering services in return (a company might do the same). A banking tie offers a bank a more intimate insight into a company (i.e. more available information and increased trust to the company based on the personal connection). For lending agreements, such insights are highly valuable for evaluating the risks and might allow the bank to offer preferred credit ratings and lending terms. As presented in the work of Engelberg et al. (2012), our banking tie dataset allows us to analyze if connected banks are being favorably treated as borrowers ex-ante (i.e. better lending terms), if their performance justifies this behavior ex-post the banking service and relate the company to the other banking services (e.g. recommendations).

(3) Similar questions arise for other investment banking service like M&A advisory (or underwriting relationships). Does a banking tie influence the board's decision for M&A advisors (e.g. as a favor to a friend in the bank)? Dittmann et al. (2010) indicate that current BANKERS ON THE BOARD do promote M&A advisory proving motivation for further research. We would like to know if a banking tie causes the same results or if it differs from bankers that are still employed by the bank (cp. Kroszner and Strahan (2001) or Dittmann et al. (2010)).

(4) Does analysts' optimistic behavior change (e.g. when competing for investment services) based on the connection to the board? Do investors recognize such well-connected and less optimistic analysts?

(5) Following the findings of Malloy (2005) showing that geographically proximate analysts demonstrate a competitive advantage in their performance, we would like to analyze such effects for proximate banking ties as well. The geographical distance might have an increased effect on top of the close network distance.

(6) What are the trade-offs for the bank and the board executive in deal-making? What are the risks involved and how are deals made? Are surrounding network connections aware of a banking tie and does a banking tie cause banks' employees to hide these connections? Analysts, for example, might be overcautious to protect the banks and their own reputation and, therefore, cause a contrary effect. However, as seen in 2.1.2, proprietary and

advantageous information can be *hidden* in model assumptions. Hence, justifications mentioned in research reports might differ for connected analysts and could therefore also be used as proxy.

(7) How does the one-sided network influence the deal? The board member has access to a wide network (i.e. the past employment network connections in the bank) whereas the bank only has access to a comparably smaller network in the company (i.e. to the one board member). How does this situation affect the analysts' biases and the deal-making? Is the board member using its multiple network connection bank executives in different departments to establish sweetheart deals?

(8) As indicated earlier, we would also like to take a more sociological perspective, possibly complement our dataset more data (e.g. alumni connections or connections within a bank). Social network theory (cp. 2.3.1) provides some powerful tools to analyze networks on centrality and interlocked networks (cp. for example Mariolis and Jones (1982)) for which our new underlying data source could bring new insights. A visual mapping (e.g. using the open source *Gephi* software package) of banking ties would be desirable for further insights.

(9) We would like to understand what kind of information is being transferred through banking ties. In particular, we would like to find out if actors are behaving self-serving (i.e. potentially damaging a friends or network contact interests) and only reveal positive news via the banking tie and withholding information that could harm their firm's or personal success. Cohen et al. (2010) found that network members may, in fact, only reveal positive news which raises the question of the credibility and usefulness of banking tie information.

(10) Does the number of banking ties in analyst's stock coverage portfolio influence the probability of becoming an *All-Star* analyst? This question has been pursued by Cohen et al. (2010) and proven to be true for the case of school-ties.

(11) Previous studies have shown the influence of external network ties on the corporate governance debate (e.g. Kroszner and Strahan (2001); Fracassi and Tate (2012)). Our dataset raises similar questions. Are companies headhunting bankers on purpose for board appointments? Does this banking increase a bank's or company's shareholders' risk?

(12) As shown in Brochet (2011), analysts' stock coverage decisions are influenced by the network members they are connected to (i.e. analysts have a tendency to change coverage if executives travel). We would like to investigate if analysts change their coverage decision

when the banker switches into the board of a company (or when he or she gets promoted into the board if there is an intermediate job position). Do analysts base their coverage on banks' banking ties in place? Are analysts covering stocks that do not fit into their portfolio based on the banking tie? Do analysts show improved performance after the banking tie has been established (for stock overages that were in place before and after the banker's job change).

(13) Are companies with a banking tie more prone to trading restricted securities? Insider trading is legally restricted and is therefore, by nature, not traceable. However, insiders may buy or sell stocks if they comply with SEC's *Rule 144*. Part of the regulations is that insiders are required to announce their sale of security and by filling *Form 144.57*. Fillings can be accessed in the SEC's *EDGAR* database and used to analyze whether increased *legal insider trading* occurred which can be interpreted as a proxy for information flow between analyst and board member for which the latter might profit from early research results (i.e. did the banking tie sell stocks before or after analyst announcement?).

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[57] Compare to: http://www.sec.gov/investor/pubs/rule144.htm [accessed 11/01/2012].

CHAPTER VII

LIMITATIONS & CONCLUSION

LIMITATIONS

As mentioned earlier and listed in Watts (2003, p.20ff) research in social network theory has "*suffered from a number of methodological and phenomenological difficulties.*" Our empirical work provides a unique dataset with a large number of banking ties. However, our database is limited in revealing pairs of interconnected networks separated by a direct link or a short chain of intermediaries. It does not indicate how intertwined the networks and the strength of the tie between two particular networks are. Analyst recommendations can be used as proxy for the information flow that the analyst is receiving through the network. However, we cannot prove if analyst and board member are directly connected or if the short network distance through intermediate network members (i.e. common friends in the bank) allows valuable information to be transmitted. This is particularly true for situations where the board member came from a subsidiary, or if the time of employment of analyst and board member at the bank did not overlap, meaning that both have never worked together at the bank at a given point of time. Pursuing our outlined research outlook (e.g. price target or analyst recommendation comparison) lets us further investigate our strong hypothesis and will allow us to give more precise statements about the strength of the banking ties. We agree with the notion of Fleischer (2011) that such network effects are only advantages if the information being transferred through the banking tie is selective and restricted to a very small part of the network since the informational advantage would otherwise vanish.

For the case of analyst recommendations, it is unclear if a connected analyst is outperforming non connected colleagues based on the selective information disclosure or if the analyst might just be able to assess management performance better based on the prior common work experience.

CONCLUSION

We reviewed three different research fields in the context of our study. First, we studied the analyst profession and what is known on their current best practices in performing stock research. We identified qualitative information as one of the main drivers for stock research's success. Second, the review of analysts' biases revealed analyst's multifaceted role leading to various conflicts of interests. Third, social network theory and related studies gave us the necessary insights and proved the power and influence of social networks. We identified 2715 BANKERS ON THE BOARD with previous employment at a bank using personal information from 55724 prior and current board members of 3560 U.S. listed firms. We created a new and unique database of such banking ties that maps direct or short distance network ties of company board members to a bank performing investment research for their company. We presented multiple incentives for bankers or board members to take advantage of these networks by using these channels for information exchange and benefits. This allowed us to outline several relevant research questions for the future study of banking biases. We illustrated the path for one of the research questions – biases in analyst recommendation. Our empirical work is the foundation for pursuing these questions.

APPENDIX

APPENDIX A
ABBREVIATIONS

- Biographical (bio)

- Discounted Cash Flow (DCF)

- Financial Industry Regulatory Authority (FINRA)

- Initial Public Offering (IPO)

- International Financial Reporting Standards (IFRS)

- National Association of Securities Dealers (NASD)

- New York Stock Exchange's Regulatory Committee (NYSE)

- Regulation Fair Disclosure (Reg FD)

- Sarbanes-Oxley Act (SOX)

- Securities and Exchange Commission (SEC)

- Standard & Poor's (S&P)

- United States (U.S.)

APPENDIX B
DATA SET LIMITATIONS

(1) In our data collection for banks' subsidiaries, we excluded *Current Investments*, *Current Investments*, *Current Investment Arms* and *Merged Entities*.

(2) We excluded connections for which we were not sure if subsidy and biographical information fitted (e.g. subsidy: *Van der Woolen Specialist* and biographical entry: *Van der Woolen Holding*). In such cases we consulted internet sources and only included the matching if we found a strong indication for a common bond.

(3) We also excluded matchings for which the affiliation to the bank was very weak and not based on an active employment (e.g. Mrs. XY was guest speaker at Bank of America).

(4) We accounted for merging or acquisition of banks if it was indicated by the biographical data (e.g. "*Ms. Elliott served for four years at Boatmen's National Bank (now Bank of America)*"). We can assume that the network connections also moved and, therefore, are relevant.

(5) We cannot guarantee that we inferred all connections in our dataset to a full extend. Some biographical entries include outdated company/bank designations or abbreviations for which cannot guarantee that we all covered.

(6) Bio data might sometimes just indicate the name of the parent company and not the division or subsidiary. In such cases we consulted the *World Wide Web* and other indication in the biographical information for clear indication on the connection. For example, while searching *Citigroup, Research Division* and its subsidiary *Primerica Financial Services Insurance*, we found the bio entry "*He was joined Primerica Corporation, a diversified financial services company, in 1982 and served in various positions until 1988*", which did not provided a clear signal for a banking tie.

(7) Bio data do not have a standard format. First, bio data, include spelling mistakes or typos which we couldn't account for. Second, different word orders are sometime used in the bio data which we accounted for by searching only for a single string (e.g. subsidy *Putnam Lovell*, bio entry of *Putnam, Lovell* and search for *Putnam*). Third, bio data include abbreviations (e.g. *AAMC* for *American Association for Medical Colleges*) which might

have caused data loss. Fourth, different spelling of company (*Credit Agricole* instead of *Crédit Agricole*) names might have caused data loss.

(8) While consulting the *World Wide Web*, we occasionally found updates to the subsidiary structure or indications for a banking tie (e.g. *Lockhart, H. Eugene* connected to *Argus Information & Advisory Services* which is part of *Argus Research Company*).

(9) We found errors in the robustness of our dataset retrieved from the *Capital IQ* database. For example, the subsidiary excel file of *Banco Santander* includes multiple rows of the same content (rows 466 - 484 matches rows 508 – 522). Also, we found random Chinese characters in the bio information of *McCourt, David C. (Prior Board)* which caused Excel to crash and we, therefore, deleted the data entry.

APPENDIX C
INVESTOR'S NEEDS

Rank	Attribute
1	Integrity / Professionalism
2	Industry knowledge
3	Accessibility / Responsiveness
4	Special services (company visits, conferences, etc.)
5	Written reports
6	Management access (one-to-one)
7	Useful / Timely calls & visits
8	Local market knowledge / Country knowledge
9	Financial models
10	Idea generation
11	Research delivery (entitlement, technology & customization of buy-side needs)
12	Earnings estimates

Table 6 – Survey All-American Investor Team-What Investors really Want[58]

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[58] Investor (2011)

APPENDIX D
INFORMATION CHANNELS

Information Source	Used *frequently* or *always*
• Income Statement	100%
• Balance Sheet	100%
• Cash Flow Statement	97.1%
• Financial Statement Footnotes	97%
• Management Discussion & Analysis	94.2%
• Company Management	94.1%
• Industry Reports	88.3%
• Form 10-K Report	82.4%
• Form 10-Q Report	76.4%
• Other Analysts' Research	73.6%
• Preliminary Financial Figures	72.7%
• Information from other Companies in the same (or related) industry	70.6%
• Consensus Earnings Forecast	67.7%
• Consensus Earnings Forecast	67.7%
• Financial Press	58.8%
• Users of a Company's Products/Services	47%
• Other sources	Not asked in the survey

Table 7 – Key Information Sources Used for Analyst Research[59]

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[59] Based on the survey of 34 analysts in the study of Graham et al. (2002). We listed the accumulated percentage of analysts who responded to use the information source as *frequently* or *always*. Other options were given as *sometimes*, *rarely* or *never*.

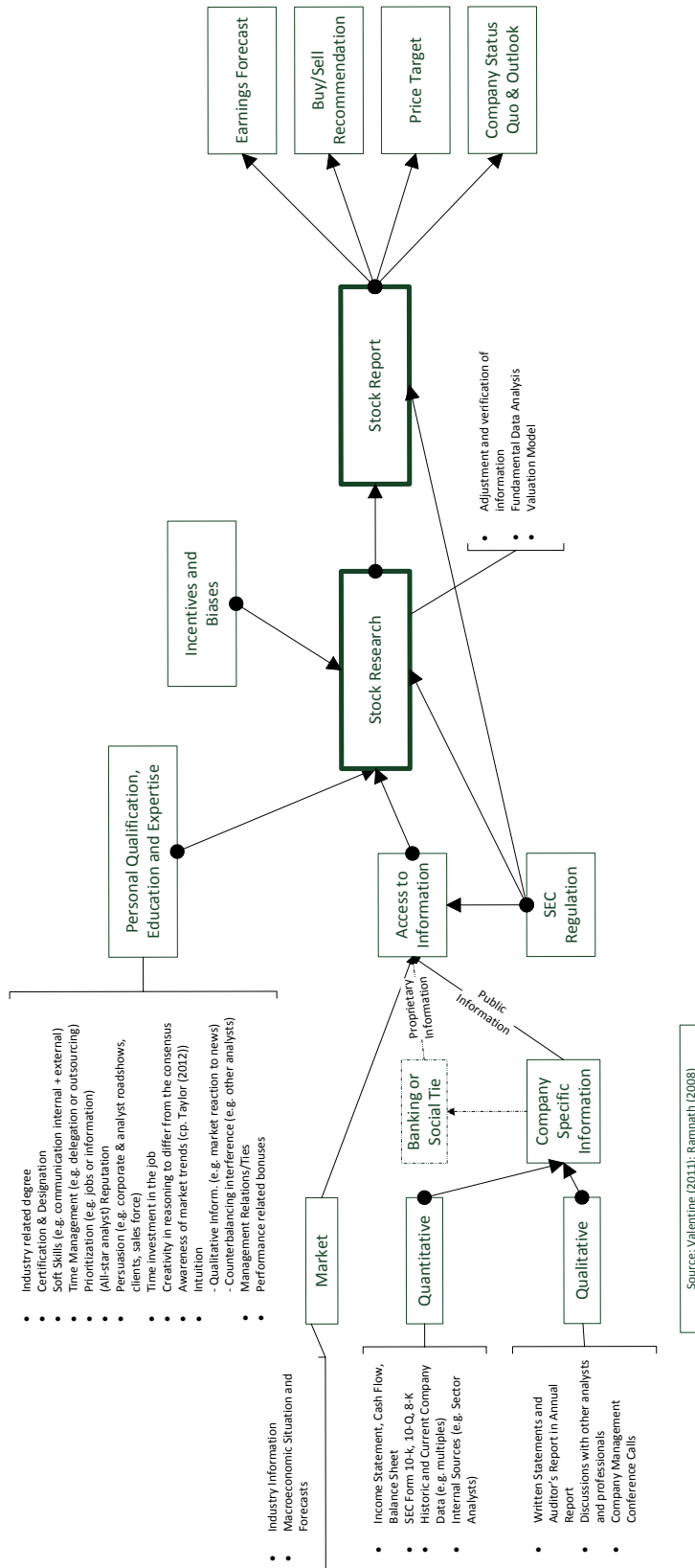# APPENDIX E
STOCK RESEARCH DRIVERS & LIMITATIONS

Figure 5 – Stock Research Drivers & Limitations

APPENDIX F

CAPITAL IQ SCREENING CRITERIA

Criteria	Filter
Index	Dow Jones Composite Average || NASDAQ Composite || S&P 500 || S&P 1000
Board Job Function	Vice Chairman || Chairman Emeritus || Chairman of the Board || Co-Chairman of the Board || Member of the Board of Directors || United Board Members || Vice Chairman Emeritus || Director Emeritus || Member of Management Board || Member of Supervisory Board || Member of Advisory Board || Chairman of Supervisory Board || Member of Corporate Board || Vice Chairman of Supervisory Board || Vice Chairman of Management Board || Chairman of Management Board || Chairman of Advisory Board || Chairman of Corporate Board || Co-Chairman of Advisory Board || Co-Chairman of Corporate Board || Co-Chairman of Management Board || Co-Chairman of Supervisory Board || Vice Chairman of Advisory Board || Vice Chairman of Corporate Board
Geographic Location	Europe || Asia / Pacific || Africa / Middle East || United States and Canada || Latin America and Caribbean
Industry Classification	Energy || Materials || Industrials || Consumer Discretionary || Consumer Staples || Healthcare || Financials || Information Technology || Telecommunication Services || Utilities || Biographies: Keyword: bank || # of analysts: ≥ 0
Key Developments	All History

Table 8 – *Capital IQ* Screening Criteria[60]

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[60] Data retrieved: June 2011

APPENDIX G

BOARD MEMBERS' PREVIOUS BANKING POSITIONS

We collected typical previous or current employment positions of company board members at a bank (as mentioned in the bio information). This includes:

- Director, Lead Director, Lead Independent Director, Independent Director, Managing Director, Advisory Director, Independent Non-Executive Director
- President, Vice President, Executive Vice President, Executive Vice President-Operations, Group Vice President
- Chief Executive Officer, Group Chief Risk Officer, Chief Financial Officer
- (Vice-) Chairman, Chairman of Leadership Foundation, Deputy Chairman
- Head of Finance Group, Global Head
- Member of the Executive Council, Member of the Advisory Board, Member of the Beirat, Member of the Executive Committee
- Advisor, Senior Advisor, Investment Advisor, Special Advisor, Chief Science Advisor
- Manager, Deputy Branch Manager; Deputy Branch Office Manager, Investment Manager, Risk Manager, Managing Member, Portfolio Manager
- Member of the Management Board, Board Member
- Controller
- Officer, Principal Accounting Officer
- Investment Banker, Commercial Banker
- (Global) Head / Co-Head of a department
- Equity Analyst, M&A Analyst, Technology Analyst
- (Independent) Trustee
- Principal (in Institutional Equity)
- Partner, General Partner, Operating Partner
- Consultant
- Associate
- Founder (of a department/company), Founding Member
- Treasurer
- Head of Corporate Clients
- Various senior positions
- No job description

  (e.g. "*Mr. Griffin served in the Project Finance Advisory Group of UBS from 1993 to 1996*")

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