Inside the Black Box of Financial Analysts: What drives systematic forecast optimism?

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นายคริสเตียน ชมิดท์

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> Christian Schmidt : Inside the Black Box of Financial Analysts: What drives systematic forecast optimism?. Advisor: Assoc. Prof. Dr. Kanis Saengchote, Ph.D.

Despite past failures and a higher standard of regulation, excessive forecast optimism among financial analysts is still observable. It is mainly attributed to incentives provided by an underlying affiliated relationship. This paper investigates diverse market settings in the Thai stock market between 2005 and 2017 to break down the incentive structure in the analysts' forecasting process. First, banks and brokerage houses with an affiliated mutual fund family show an extreme forecast behavior, especially when the fund family is backed by high capital and has a large stake in the covered firm. Secondly, full-service banks are among the most optimistic analysts in the market, particularly when they act as a lead underwriter during an IPO. However, lead underwriters tend to revert optimism to average level one year after the equity issuance. Banks acting as share distributors during an IPO are not necessarily more optimistic than the analysts' general favorable level of optimism. The paper concludes that the pressure for banks and brokerage houses to generate trading, enhance deal flows, and favor the management of the covered company impacts the forecasting behavior of individual analysts.
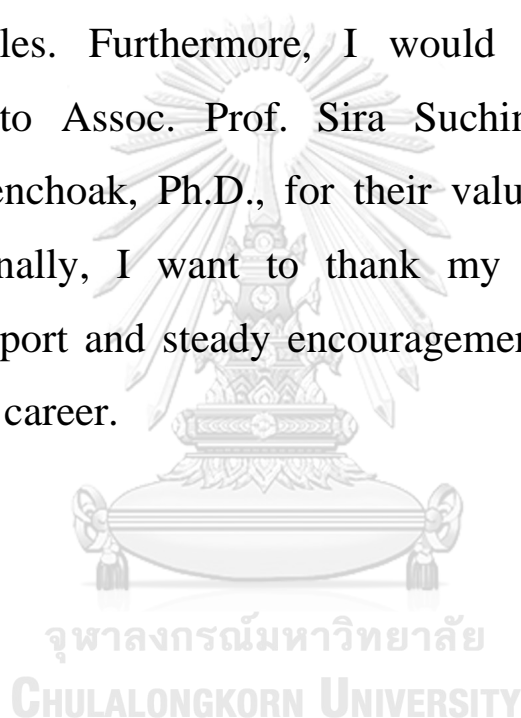
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Chapter 1 Introduction

1.1 Background and Significance of the Problem

The reputation of financial analysts has suffered in recent years as they seemed to have failed to execute their role as a financial intermediary in several settings. Analysts are meant to engage in information gathering and processing to reduce the information asymmetry in the market. Thus, they contribute to a well-functioning and efficient market to some extent, at least by theory. However, they were criticized for excess optimism during the Dot-Com Bubble in the late 1990s, and failure to detect several fraud scandals such as Enron (Cowen, Groysberg, & Healy, 2006). The phenomenon of overly optimistic behavior in forecasts is not just visible in the United States, but also globally, increasing the necessity to analyze the analysts.

Although laws and regulations try to anticipate the incentive structures in the equity research industry, they fail to directly address the fundamental problems: conflict of interests and affiliated relationships. The strive for generating deal flows and high returns puts pressure on brokerage houses to favor the company they cover. Underwriting relationships, share distribution, or affiliated mutual funds even force brokerage firms to be overly optimistic, helping to survive in a highly competitive environment (Lourie, 2019). Therefore, it becomes crucial to understand potential relationships between brokerage houses and covered firms.

Over the past, a lot of researchers investigated the forecasting behavior of financial analysts. First, the role of a financial analyst in the market was justified as they seem to outperform time-series models and, therefore, better predict the future. However, in subsequent years, the literature suggests that analysts have a high tendency towards optimism. In general, they issue more buy recommendations and are favorable with regards to the target price and earnings predictions. In recent years, analysts were assessed more carefully in the context of breaking down the incentive structure (e.g., (Bondt & Thaler, 1990), Schipper (1991)). Financial analysts turned out to benefit from the issuance of favorable forecasts, both in terms of higher bonuses and career perspectives, as their compensation is directly linked to their income and deal flow contribution.

The paper aims to follow up on providing additional evidence on the mechanisms behind the decision-making process of analysts. By separating the roles of banks and brokerage houses as lead underwriters, share distributors, or fund affiliate, the paper provides valuable insights into firms' incentives in different market settings. The firm-level incentives put pressure on individual analysts to adjust their forecasting behavior toward the firm's best interest, but also to their own benefit. Besides, the paper investigates in which market situations the forecast bias is extraordinarily severe. In other words, it gives more insights into the black box of financial analysts.

1.2 Objectives and Contribution

The objective of this paper is to provide a complete framework of the incentive structure in forecasting behavior. By looking at different brokerage houses and banks roles, potential relationships are investigated and to what extent the interests of the employer translate into incentives in the forecasting process of an individual analyst. Investors should carefully evaluate analysts' outcomes as they might not reflect unbiased recommendations. With the disclosure of potential concerns, the results lead to an important practical implication: An investor should not blindly follow analysts' recommendations without taking a closer look at potentially arising conflict of interests. Predicting the future is a difficult task, but a critical assessment of the assumptions helps to make better decisions.

The paper contributes in several ways to existing literature. First, it is one of the first papers investigating a more concentrated market. In Thailand, the top five lead underwriters comprise the major amount of equity issuances. Moreover, the total number of analysts and coverage is far lower compared to the United States. Secondly, the paper gives an extensive literature review with the significant findings and essential developments in empirical research regarding analysts' optimism. Finally, providing a complete framework offers substantial insights into the black box of financial analysts. Different market situations are investigated from diverse angles to give evidence on the forecasting incentives and foster the robustness of the results.

1.3 Research Hypothesis

The analysis of forecast optimism is decomposed into three main hypotheses with further sub-hypotheses to provide an in-depth understanding from diverse perspectives. First, the impact of a mutual fund affiliation is investigated. Secondly, lead underwriters' forecasting behavior is tested and in which setting the optimism is especially severe. Finally, banks acting as share distributors during an IPO are included in the analysis and to what extent the inaccuracy differs compared to lead underwriters.

Hypothesis 1: Brokerage houses with a mutual fund affiliation tend to be overoptimistic. The higher the stake of a mutual fund family in a stock, the higher the forecast error.

1.1 Analysts working for brokerage houses with a fund affiliation are excessively optimistic. Through the affiliation to the fund family, an analyst's compensation is directly linked to his contribution in generating trading volume. As investors show increased traffic in response to buy recommendations, the analyst tries to increase trading volume by favorable forecasts. In other words, the trading commission drives the analysts' optimism.

1.2 The higher the portfolio weight of a mutual fund family in a specific stock, the more optimistic the financial analysts are. Given the previous logic, a higher portfolio weight should translate in a higher responsibility of the analyst to promote the stock. Besides, commission incentives become more attractive as higher trading volume is expected. The issue is tested for analysts with a mutual fund affiliation and therefore comprises a subset of 1.1.

1.3 When a mutual fund family reduces its investment in a stock or completely divestitures, the analyst's incentive to bias upwardly should disappear. As the analyst is no longer a beneficiary of promoting the stock, there is no rational reason to do so. To test this issue, the forecasting behavior is investigated for those analysts and stocks, where the mutual fund family has a divesture. Hence, it is a sub-analysis of 1.2, enhancing the robustness of the results.

Hypothesis 2: Among all analysts, full-service banks are the most optimistic. Banks acting as lead underwriters even have a special responsibility to support the underlying stock. Given the strategic long-term incentives of lead underwriters, forecasts optimism is expected to remain even after two years.

2.1 Analysts employed at investment banks are more optimistic than other analysts. Given the composition of fees consisting of underwriting fees, management fees, brokerage fees, and selling concessions, investment banker analysts benefit the most from being optimistic. The strive for enhancing deal flows and building up a good relationship with management causes full-service banks to be excessively favorable.

2.2 Employees, changing employment from non-investment banks to full-service banks are expected to adjust their forecast behavior and become more optimistic. The firm-level incentives of investment banks directly translate into the forecasting behavior of the analysts. They are under pressure to contribute to revenue and enhancing deal flows.

2.3 Excess optimism of investment banks is particularly visible during initial public offerings, where the bank is the lead underwriter. Besides the before-mentioned monetary incentives, lead underwriters have a high interest in pleasuring the underlying firm for strategic reasons. By achieving favorable outcomes, banks build a good relationship with management, which helps to be considered for future deals. There is no room for sell recommendations as it would disrupt deal flows. The hypothesis compares the forecasting behavior of lead underwriters during IPO against non-IPO stocks, which have similar firm characteristics.

2.4 Investments banks have a long-term strategic alignment, and therefore, forecast optimism maintains up to two years after the first forecast in an IPO. Lead underwriters not only issue equity shares but also have the responsibility to create a liquid market for the underlying firm. Hence, forecast optimism is expected to remain, helping to promote the stock. Besides, banks hope to be considered as a primary partner for future equity and debt issuances. Given the strategic incentives, lead underwriters maintain their optimism. To test the long-term alignment, forecast

behavior of lead underwriters and their IPO firms are investigated for the first issuance and subsequent two years.

Hypothesis 3: Share distributors are more optimistic during an IPO to promote their stocks they distribute to clients. However, this optimism is expected to be of short-term nature.

3.1 A bank shows excessively positive projections during an IPO when it is involved in share distribution. The main incentive comprises the selling concession in return for distributing the shares. Hence, syndicates have a high interest in promoting the stock by issuing favorable forecasts. The analysis is an extension of 2.3 by adding a variable for syndicates to compare forecast behavior against non-syndicates and non-lead underwriters during an IPO.

3.2 In comparison to lead underwriters, syndicates do not maintain high optimism of stock after an IPO. The reason for this lies in the short-term incentives. Share distributors do not benefit from further optimism as the primary income source is the selling concession. To analyze this effect, the forecast error of the two successive years after an IPO is considered to compare syndicates' behavior during an IPO and afterward.

1.4 Conceptual Framework

In the context of research around forecast optimism, recent papers have put an increased focus on the relationship between the listed company and the different brokerage firm types. According to (Han, Jin, Kang, & Lobo, 2014), lead underwriters are directly related to the underlying company and, therefore, have the best access to management. Besides, the direct relationship, full-service banks might also be indirectly linked to the company through affiliated mutual funds, which might hold a stake in the company. The indirect relationship with the mutual fund family as an intermediary can also be found for syndicates and affiliated brokerage houses (Mola & Guidolin, 2009). Only independent research companies do not have a direct or

indirect link to the company. Hence, based on the framework, they should not have an incentive to rationally bias their forecasts (Cowen et al. 2006).
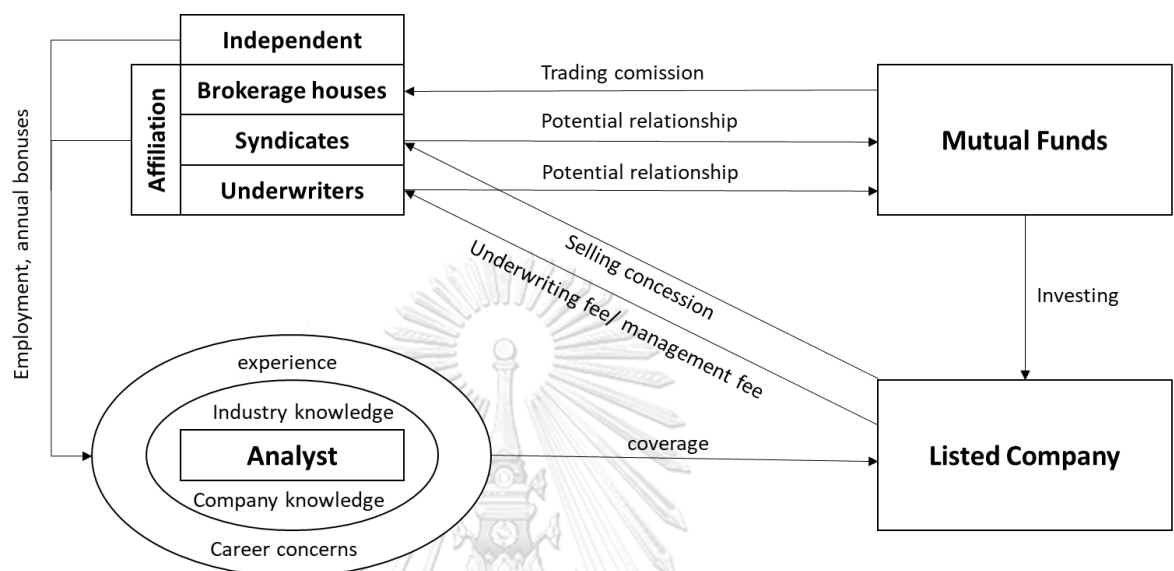
Modified from: Han et al. (2018) and Cowen et al. (2006)

After considering the different relationships between brokerage houses and the underlying company, the question is to what extent the ties translate into incentives of an individual analyst who is actually the one covering the company. In the first step, an analyst's decision-making is determined by the knowledge he has about the company and the industry. Secondly, the overall experience as an analyst and career concerns play an essential role when issuing a recommendation. Finally, the relationship to the employer drives the decision-making. As an employee, the analyst has some pressure to act in the best interest of his brokerage house. Through his coverage, he contributes to the generation of income, hence the overall deal flow. Besides, monetary incentives might impact the forecast recommendation because the salary and annual bonuses are closely linked to an analyst's revenue contribution. Thus, the paper's objective is to identify to what extent the different forms of affiliation influence an individual analyst's forecast.

Chapter 2 Literature Review

2.1 The Role of Financial Analysts in Financial Markets

The primary role of a financial analyst is to act as an intermediary in capital markets between corporations and investors. In general, information asymmetry between firms and investors might lead to a significant underpricing of a firm's stock as investors cannot identify the firm's true value. Hence, they require a discount to be compensated for the risk investing in a low-information environment. At this point, financial analysts intervene and can reduce the existing information asymmetry (Hall & Tacon 2010). The usefulness of a financial intermediary can be shown in two ways. First, financial analysts engage in an information discovery process. Their job is to discover information not readily available to the public (Chen et al. 2010). Second, based on their expertise in various industries and experiences over time, analysts are better at interpreting and processing public information in the decision-making process (e.g., Jegadeesh et al. 2004, Kim & Verrecchia 1994).

The justification of an analyst's role in financial markets constituted the primary research subject in earlier papers. By comparing the forecast accuracy against statistical time-series models, it was tested whether analysts are better in predicting the future and thus contribute to the information environment. In the early 1980s, researchers suggest that forecasts made by analysts outperform time-series models. Analysts have proven less error in absolute and relative terms (Fried & Givoly 1982, Imhoff & Pare 1982). While those studies were rather descriptive, Brown et al. (1987) revealed more insights into the origin of analysts' superiority. In their paper, they suggest two reasons leading to an outperformance: timing advantage and information advantage. The timing advantage refers to the issue that an analyst can time the issuance of his forecast and, therefore process information, that the time-series model does not contain. While the time-series model only covers past historical data, analysts can include further information in their analysis e.g., management information, current environment, and outlook. This pattern is also known as the information advantage. Based on the previous knowledge, O'Brien (1988) displayed that the most recent forecasts are more accurate than predictions earlier issued. This

observation led to the first practical implication. The results suggest that investors should not just rely on the average of all forecasts, also considered as consensus, but instead put a higher weight on the most recent estimates.

Despite the general acceptance that analysts have superior knowledge in processing information and predicting the future, De Bondt & Thaler (1990) laid out that financial analysts tend to be overly optimistic in their projections. An overreaction to past earnings changes primarily drives optimism. The study suggests that overreaction is a result of the brokers' interest in generating trading. Given that investors show more trading traffic when faced with buy recommendations, analysts are reluctant to issue pessimistic forecasts. Following up on this point, Schipper (1991) took a closer look at an analyst's environment. While accuracy matters, an analyst is also forced to generate income and maintain a good relationship with management. Despite the occurrence of potential conflict of interests, he argues that financial analysts still have an essential role in the financial market: They seek to acquire new information and therefore contribute to the well-functioning of market mechanisms.

In the following years, researchers started to recognize that financial analysts actually benefit from issuing optimistic forecasts. Therefore, literature has increased focus on the analyst's incentive structure and forecast behavior in different settings. It becomes crucial to understand the whole framework of the forecasting process and the environment in which he operates. Two points are important for consideration: how the brokerage house's incentives translate into pressure on the analyst and how analysts behave to fulfill personal desires such as higher salary and better career opportunities.

2.2 Analyst Optimism on the Firm-Level
In general, financial analysts have to align their interests to the benefit of their employer. Thus, different types of brokerage houses should result in different forecast behavior of analysts. Brokerage houses differ in their range of activities, funding of research, and incentive horizon. In their paper, Cowen et al. (2006) use a

classification of four firm types to investigate firm-level optimism. At this point, one should note that the classification is not non-exclusive, meaning that overlapping can occur. However, as the paper looks at specific settings and further narrowed subsets, this issue does not lead to biased results. The objective is rather to separate the different roles, banks and brokerage houses have.

<u>Lead underwriters</u>

Banks considered as full-service banks offer various services, including underwriting activities and brokerage services. When taking a lead underwriter role, investment banks provide full support during an IPO and help create a sustainable liquid market. In return, banks are remunerated with a commission consisting of an underwriting fee, management fee, and selling commission. This is translated into a large portion of the compensation of financial analysts employed by investment banks - the annual bonus. The amount of bonus paid correlates positively with the analysts' contribution to closing deals over the year. Therefore, the literature investigated whether these monetary incentives lead to biased recommendations of covered firms. Overall, the forces influencing an investment bank's analyst behavior can be summarized in three main categories: short-term benefits, strategic allocation, and reputation.

McNichols & Lin (1998) suggest that forecasts of lead underwriters are, in general, more favorable than those of other analysts. The excess optimism is especially observable in long-term growth forecasts and recommendations. Analysts at investment banks issue more frequently a buy recommendation for the underwritten firm. Besides, they are more reluctant to issue a sell recommendation for a firm they help in issuing securities. Therefore, investment bank analysts frequently go with a hold recommendation, although it would be a sell based on more realistic assumptions. This issue is observable by looking at three-day returns after an IPO. Following a hold recommendation of a lead underwriter leads to significant negative returns after the equity offering. Francis & Philbrick (1993) argue that the relationship between underwriting banks and firms plays an important role. Banks try to maintain a positive atmosphere by issuing favorable outcomes. According to Dugar & Nathan

(1995), analysts who do not expect to obtain future deals with the firm, have less incentive to bias their forecast. They assume that unaffiliated analysts are not rewarded for promoting a stock.

Full-service banks also use their forecasts for strategic reasons. Bradshaw (2002) demonstrates that growth forecasts for underwritten firms are higher compared to non-issuing firms. Favorable recommendations might attract future investment banking deals with the same firm or other corporations as well. Ellis et al. (2000) found a positive relationship between an optimistic forecast and the deal flow of a bank.

However, the incentive to bias recommendations upwardly is partly offset by the concern of reputation. Cowen et al. (2006) argue that corporations do not only choose banks by favorable optimism, but rather by the underwriter's ability to create a sustainable liquid market. Consequently, reputation, prior underwriting outcomes, and lending relationships are considered in the choice as well (Ljungvist et al. 2006), Clarke et al. 2007). Forecasts are more optimistic when reputation sensitivity is low.

Share distributors (Syndicates)

Banks that distribute newly issued shares to their clients but not directly participate in the book-building process are classified by Cowen et al. (2006) as syndicate banks. In general, lead underwriters assemble a selling group to distribute shares for which they get a selling concession in return. Typically, syndicates, also known as co-managers, do not bear the financial risk for not sold shares. The distribution fee is allocated to the syndicates dependent on their contribution (Torstila 2001). However, compared to the fee composition that lead underwriters charge, fees from distribution are low (Bloch 1989). Therefore, the literature suggests that incentive to bias forecast is less pronounced for co-managers.

Brokerage firms with affiliated mutual fund holding

Some brokerage houses distribute their earnings forecasts to mutual fund families. The existence of an affiliated relationship casts doubt on the accuracy of

delivered estimates. In the case of a positive recommendation, both parties, mutual fund and analyst, benefit. Reputation is essential for full-service banks, while it plays a minor role for brokerage analysts (Cowen et al. 2006). In his paper, Reuter (2006) shows that mutual funds play an essential role in investing in stocks and try to increase trading volume. Therefore, they are willing to pay a disproportionately high fee to the analysts. The analyst itself benefits from sales commissions and higher generated trading volume, as stated by Mahoney (2004). Based on Cho & Chung (2005) findings, analysts employed in brokerage houses actively cover stocks that are handled by affiliated dealers.

Mola & Guidolin (2009) investigated the incentives of affiliated brokers in more detail. They observed a higher frequency in the issuance of favorable ratings after the analysts' affiliated fund has invested in that stock. The positive relationship between fundholding and optimistic forecast becomes more substantial, the higher the portfolio weight of the mutual fund in the underlying firm is. Their results can be summarized in three main points. First, affiliated analysts report more frequently on the stocks hold by mutual funds. Second, the probability of upgrading the recommendation from a buy to a strong buy increases by 13%. Finally, when the mutual fund increases its holding in a stock by 1%, the probability of upgrading the recommendation to a strong buy increases by even 25%.

Independent research firms

Research firms primarily provide equity research to their clients. They are neither engaged in investment banking activities through underwriting or distribution activities nor do they have an affiliation to a mutual fund. Compared to the firm types mentioned before, pure research firms are usually paid on a fixed fee per report or charge an annual subscription. Cowen et al. (2006) suggest that research firms provide the lowest incentive to bias upwardly. As they do not benefit from a higher trading volume caused by the issuance of optimistic forecasts, there is no reason for rational overstating. Besides, accuracy determines the credibility of an independent research analyst.

2.3 Analyst Optimism on the Individual level

After considering various rational biases on a firm level, the paper also discusses individual analysts' incentives. Therefore, it is investigated why certain analysts are overly optimistic by looking at different analysts' characteristics and their career concerns. In their paper, Hong & Kubik (2003) discuss the relationship between earnings optimism and job separations. To investigate the impact of optimism on employment, they look at analysts' movement across brokerage houses. A high-status brokerage house is considered more favorable as an employer because it generally leads to higher compensation and prestige. Their findings suggest that accurate forecasters are more likely to get a job promotion by moving up to a high-status brokerage house. Extremely inaccurate analysts have a 60% higher probability of losing their job or moving down to a low-status brokerage house. In comparison, accurate forecasters have a 50% higher likelihood of climbing up the hierarchy.

However, Hong & Kubik also considered potential conflicts of interest as brokerage houses reward their analysts for promoting stocks. Controlling for accuracy, relatively optimistic forecasters compared to the consensus, have a 90% higher chance of getting promoted to high-status brokerage houses than analysts aligning with the consensus estimates. However, when considering the role of the analyst in the organization, results differ. When analysts work for institutions affiliated with the covered company, accuracy comprises a minor part in the work evaluation. Results suggest that underwriters maintain their job when they are more optimistic about their projections. Consequently, individual-level on forecast optimism is partly influenced by the firm level. Accuracy plays a crucial role in job promotion for analysts without affiliation. In contrast, higher optimism is required by firms having strong incentives to do so, e.g., full-service banks.

Besides the pressure from firm-level incentives, analysts' career concerns vary over different stages in life. Especially young inexperienced analysts are required to build up a good reputation by issuing accurate forecasts. Therefore, they frequently align their behavior and actions to what more experienced people do, a phenomenon known as herding behavior in the psychological literature (Scharfstein & Stein 1990). In the early career, accuracy plays an essential role in evaluating an analyst as they

face a higher sensitivity in the consequences of their actions. In other words, young analysts are more likely to be terminated from their job when issuing wrong or inaccurate forecasts than experienced analysts. To avoid the risk, young analysts are reluctant to issue bold predictions and rather align with the consensus estimate.

An earlier study by Hong, Kubik & Salomon (2000) confirmed the herding behavior of young analysts in the market and emphasized the importance of job considerations in their decisions. Moreover, they observed that inexperienced forecasters revise their forecasts more frequently and issue less timely forecasts. On the other side, experienced analysts can take on more risk, and issue estimates that deviate from the mean — the higher the experience, the lower the exposure to job termination for wrong actions. Besides, experienced analysts usually have more access to information, justifying bolder forecasts.

Another motive in terms of career concerns, independent of commission and trading incentives, comprises issuing optimistic forecasts to get promoted to a prestigious employer from a low-status brokerage house. Analysts who are already employed by bulge investment banks do not have further career concerns as they already have the highest job opportunities. In general, analysts try to pleasure the firms for which they issue forecasts. Horton et al. (2017) suggest that the incentive to do so is higher when the firm is a potential employer with its own equity research department. Consequently, more optimistic forecasts are issued to be perceived as an attractive employee. This observation is also defined by Lourie (2019) as the revolving-door phenomenon. Because analysts are often hired by firms they cover, analysts attribute higher growth prospects to the firm in their recommendation. Especially in the final year prior to the job change, analysts issue higher EPS and more upward target prices, while remaining relatively pessimistic for other firms. According to Ke & Yu (2006), analysts please the covered firms when initial forecasts are positively biased but are more pessimistic before earnings announcements. The interest of the firm lies in a positive earnings surprise on the earnings announcement date. Analysts who follow this procedure are less likely to be fired and rewarded with better management access.

Chapter 3 Data

The sample focuses on the Stock Exchange of Thailand, including the Market for Alternative Investments, between 2005 and 2019, with firms that have at least two or more analysts covering the stock. Target prices and recommendations of each analyst are extracted with the Analyst Recommendations function (ANR) from Bloomberg Terminal. Refinitiv IBES Detail History File provides the data for EPS forecasts. The sample is supplemented with each stock's historical actual prices and earnings to compare the performance of the analysts' estimates against actual outcomes. Stocks that provide less than two forecasts in a given year are excluded from the sample.

The Refinitiv SDC Platinum Global New Issues database provides information about all IPOs in Thailand during the past horizon. In particular, information about the lead underwriters (book-runners) and syndicates (co-managers) are relevant for analysis. IPOs with incomplete information are not included in the sample. Based on the firm name and information about underlying brokerage houses, it is possible to match IPO data with the above-mentioned individual analysts forecast data.

Fund-level reported holding for all stocks is extracted from the Morningstar database, to identify potential affiliated relationships between brokerage houses and mutual fund families. In the first step, it is examined which brokerage houses have an affiliated fund. Secondly, information about volume and percentage stake of mutual funds is determined and allocated to analysts' brokerage houses in given years. If a mutual fund family holds several funds, then the holdings of all funds are aggregated to ensure a firm-level analysis.

Chapter 4 Methodology

4.1 The Construction of the Analyst Forecast Optimism Variable

For the analysis of forecast optimism, three different indicators are used: predicted earnings per share (EPS), derived target price, and the issuance of a recommendation in terms of buy, hold and sell. In general, two measures are constructed: scaled absolute forecast error (SAFE) and scaled relative forecast optimism (SRFO). For both EPS and target price, SAFE and SRFO can be applied. Regarding the recommendations, another measure has to be derived.

The SAFE variable measures the error by how much the analyst is wrong compared to the actual outcome. To construct the variable, first, the absolute forecast error (AFE) is defined as the difference between the forecast (F) of analyst i on stock j in year t and the actual outcome (A) of stock j in year t:

$$AFE_{ijt} = F_{ijt} - A_{jt}$$

Secondly, the forecast error is scaled by the actual outcome:

$$SAFE_{ijt} = \frac{AFE_{ijt}}{A_{jt}}$$

According to Lourie (2019), one potential disadvantage of the SAFE measure is that it does not consider the case where an analyst's forecast is above the actual outcome, but still the most pessimistic compared to its peers. Hence, the relative forecast optimism (RFO) takes this sensibility into account by taking the difference between the forecast (F) of analyst i of stock j in year t and the consensus estimate (CE) of stock j in year t.

$$RFO_{ijt} = F_{ijt} - CE_{jt}$$

The relative optimism measure is then scaled by the consensus estimate of stock j in year t. Therefore, the scaled relative forecast optimism (SRFO) is derived as:

$$SRFO_{ijt} = \frac{RFO_{ijt}}{CE_{jt}}$$

Given the ordinal categorical nature of recommendation (buy, hold, sell), an ordered logistic approach is applied for empirical analysis. The recommendation is categorized in alignment with the method used by Kolasinski and Kothari (2008), Cowen et al. (2006), Lourie (2019). Therefore, 2 is allocated to a buy/strong buy recommendation, 1 for a hold, and 0 for a sell/underperform recommendation.

Table 1: Overview of forecast observations

Year	Index		Recommendation			Target Price	EPS
	SET	MAI	Buy	Hold	Sell	# obs.	# obs.
2005	694	4	459	125	108	692	290
2006	993	8	538	214	247	994	449
2007	1,608	20	846	431	345	1,625	491
2008	1,805	20	1,204	391	225	1,825	550
2009	1,786	25	909	428	449	1,805	603
2010	1,806	25	1,155	425	217	1,812	616
2011	1,762	15	1,174	388	162	1,766	668
2012	1,943	9	1,153	490	274	1,932	822
2013	2,028	13	1,214	498	302	2,027	918
2014	2,130	16	1,168	565	397	2,133	849
2015	1,981	33	1,103	536	351	1,001	905
2016	2,099	34	1,355	591	359	2,122	1038
2017	2,399	58	1,355	665	407	2,442	1116
2018	2,555	75	1,562	646	376	2,626	1115
2019	2,597	79	1,535	692	398	2,670	1061
Total	**28,186**	**434**	**16,730**	**7,085**	**4,617**	**27,472**	**11,491**

This table reports a summary of the forecast observations available per year. The first category (Index) divides the forecasts into the two stock exchanges with SET standing for the Stock Exchange of Thailand and MAI for the Market for Alternative Investment, consisting of small and medium-sized enterprises. The second category Recommendation shows the distribution of analysts' final suggestions in terms of Buy, Hold, and Sell. Although, some brokerage houses have different types of classification, they were consistently allocated to the before-mentioned three types of recommendation outcome. The third and fourth categories show the count of observations for each year in terms of target price and EPS forecast, respectively.

4.2 Development of Hypothesis

For the quantitative analysis, the before mentioned different market situations with their hypothesis are transformed into equations. The basic idea is to use

econometrical tools such as linear and ordered logistic regressions to investigate the relationship of different banks' incentives on the forecast behavior of individual analysts. As various measures for the dependent variable in terms of forecast error and optimism were introduced, the variable Y is used to represent them.

Hypothesis 1: Brokerage houses with a mutual fund affiliation tend to be overoptimistic. The higher the stake of a mutual fund in a stock, the higher the forecast error.

1.1 To investigate the impact of a mutual fund affiliation on forecast optimism, a dummy variable for affiliation (AFF) is created:

$$Y_{ijt} = \beta_0 + \beta_1 * AFF_{ijt} + control$$

1.2 In the second step, the portfolio weight of the affiliated fund family in a specific stock is considered to investigate whether the analyst's incentive to forecast upwardly increases. The portfolio weight of an affiliated fund family is determined by the variable STAKE, standing for a fraction of a the stock's holding value relative to the family's total asset value. Besides, the total family funds' volume measured as the total net asset value (TNA) is considered. The analysis comprises a sub-analysis of the previous hypothesis, as it only considers analysts with a fund who have at least a Stake > 0 in the underlying stock.

$$Y_{ijt} = \beta_0 + \beta_1 * LN(STAKE_{ijt}) + \beta_2 * LN(TNA_{ijt}) + control$$

1.3 Following up on the logic in 1.2, the incentive to bias forecasts upwardly, should disappear or at least become lower, when the affiliated fund family divestitures in a specific stock. To take the divestiture effect into account, a dummy variable DIV is constructed, that takes on the value of 1 when the affiliated fund stops holding shares of the investigated firm.

$$Y_{ijt} = \beta_0 + \beta_1 * DIV_{ijt} + control$$

Hypothesis 2: Among all analysts, full-service banks are the most optimistic, especially in an IPO. Given the long-term strategic incentives, forecasts optimism remains even after two years.

2.1 Previous literature suggests that full-service banks are evaluated by their optimism rather than accuracy, compared to other non-investment bankers. In the first step, the phenomenon is tested by introducing the dummy variable FULL_SERV to compare investment banks analysts against all other types of analysts.

$$Y_{ijt} = \beta_0 + \beta_1 * FULL\_SERV_i + control$$

2.2 The pressure on the full-service banks to be overly optimistic should be directly linked to their employees' forecast behavior. For robustness check of the results, the forecast optimism changes are investigated for employees before and after they change employment to an investment bank. The variable CHANGE is constructed, taking on the value 1 when the analyst changed employment and stands for the forecast behavior for all periods after the change.

$$Y_{ijt} = \beta_0 + \beta_1 * CHANGE_i + control$$

2.3 Further insights into full-service banks allows the analysis of their role as a lead underwriter during an IPO. The excess optimism of full-service banks is expected to be particularly visible when they underwrite a stock. Therefore, the dummy variable LEAD and IPO are used to provide evidence. Besides, an interaction term between IPO and LEAD is created to demonstrate the additional impact of a lead underwriter's incentives translating into higher forecast errors.

$$Y_{ijt} = \beta_0 + \beta_1 * IPO_j + \beta_2 * LEAD_i + control$$

2.4 Given the strategic incentives to generate deal flows and maintaining a good relationship with management, the forecast optimism is expected to remain even two years after the first forecast issuance in an IPO.

$$Y_{ijt+2} = \beta_0 + \beta_1 * Y_{ijt+1} + \beta_2 * Y_{ijt} + control$$

Hypothesis 3: Syndicate banks are more optimistic during an IPO to promote their stocks they distribute. However, this optimism is of short-term nature.

3.1 Following up on hypothesis 2.2, syndicate banks are added as a further firm type in investigating the forecasting behavior during an IPO.

$$Y_{ijt} = \beta_0 + \beta_1 * IPO_j + \beta_2 * SYND_i + \beta_3 * LEAD_i + control$$

3.2 In comparison to lead underwriters, the incentives of syndicates are just of short-term nature. The method is comparable to 2.3., but with the expectation that the forecast during the IPO year is not explaining the forecast optimism two years afterward.

$$Y_{ijt+2} = \beta_0 + \beta_1 * Y_{ijt+1} + \beta_2 * Y_{ijt} + control$$

4.3 Control for Analyst Characteristics

While investigating individual forecasts, an analyst's experience seems to be related to the optimism in several ways. An analyst's experience can be investigated in terms of two points: analyst company experience and analyst career experience.

The company experience is related to the concept of how many years an analyst is covering a particular stock. Analysts who covered a specific stock or industry for a more extended period are considered to have more information and can process information better in their analysis. Over time, they build up superior private details that a relatively unexperienced analyst does not have. This would suggest that experienced analysts are more accurate. On the other hand, experienced analysts might want to evolve a positive relationship with the management of covered companies. As a result, they are more reluctant to issue an outcome which casts doubts on management's performance. Therefore, the analyst company experience would be positively related to optimism. To investigate the direction of impact, the numbers of years between the first forecast of an individual analyst for a specific firm and the current forecast observation is used.

The second important experience control lies in the overall career experience and is closely related to the concept of analyst career concerns. While young analysts

are afraid of issuing bold forecasts, more experienced analysts face fewer consequences being inaccurate. Therefore, it is expected that advanced knowledge within the securities industry is used to be more optimistic and benefit from incentive structures. The number of years between the first forecast of an analyst and the current observation is built to examine this phenomenon (EXP_CAREER).

4.4 Control for Company Characteristics

Company characteristics can explain part of the forecast optimism and thus have to be included in analysis. If the information environment around a firm is low, forecast optimism is expected to increase. Ackert and Athanassakos (1997) suggest that higher uncertainty around a firm leaves more room for extreme forecasts. On the other hand, the accuracy of estimates should increase when more information is available. According to Lim (2011), the information environment tends to be higher for larger companies and more analysts covering the stock. In his paper, he uses the log of market capitalization as a proxy for the firm's size (LNSIZE) and the amount of recommendations (COVER) as an indicator for coverage. Both variables are expected to be negatively correlated to forecast bias.

A potential limit to forecast optimism comprises institutional ownership. Based on Bhushan (1989) and O'Brien and Bhushan (1990), demand for analysts and supply for coverage increases when institutional investors have a stake in the underlying stock. Given the proposition that institutional investors can differentiate between good and bad forecasts, less optimistic forecasts should occur. Ljungvist et al. (2007) also claim an adverse relationship between forecast bias and institutional ownership level in the underlying stock. If a company has a high stake of institutional investors involved, forecast optimism is lower. The reason is that optimistic forecasts are sorted out by institutional investors as they are considered to have more knowledge than the average investor about the stock. Therefore, biased estimates are more easily detected and anticipated in the decision-making process. On the other hand, this observation implies that the incentive to bias forecasts upwardly increases when analyst coverage and institutional ownership is lower.

Chapter 5 Results

5.1 Impact of Mutual Fund Affiliation on Forecasting Behavior

Table 2 reports the results of the impact of a mutual fund affiliation on the analyst forecast error and optimism. The sample compares the forecasting results of affiliated and non-affiliated brokerage houses for the firms, where a mutual fund's active involvement occurs. Overall, as expected, analysts' forecasting behavior seems to be related to the existence of an underlying affiliated fund family having a stake in the covered company. On average, affiliated analysts issue more favorable forecast outcomes in terms of the target price, looking at both absolute errors and compared to the consensus.

Although a significant error in the EPS forecast and corresponding actual EPS outcome is not existent, those analysts are still among the most optimistic compared to the market consensus. By looking at the recommendations, a mutual fund affiliation indeed increases the probability of the issuance of a buy recommendation. A sell recommendation of affiliated analysts with a mutual fund family is almost non-existent. For the most part, the results align with previous findings of Mola & Guidolin (2009). However, this investigation so far does not explain the incentive behind the results.

Table 2: Fund affiliation and forecast optimism

Affiliation	(1) SAFE Price	(2) SRFO Price	(3) SAFE EPS	(4) SRFO EPS	(5) Recommen-dation
Affiliation Dummy (AFF)	0.0241**	0.0632***	0.0320	0.0775***	0.347***
	(0.0096)	(0.0045)	(0.0796)	(0.0221)	(0.0586)
Career Experience (EXP_CAREER)	0.0042***	0.0008	0.0089	0.0021	-0.0174***
	(0.0011)	(0.0005)	(0.0093)	(0.0023)	(0.0064)
Company Experience (EXP_COMP)	0.0151	-0.0138*	0.0888	0.0131	-0.265***
	(0.0171)	(0.0081)	(0.291)	(0.0806)	(0.0822)
ln(Market	0.0188***	0.0004	0.0485*	0.0377***	0.137***

Capitalization) (LNSIZE)					
	(0.0031)	(0.0015)	(0.0285)	(0.0080)	(0.0185)
# Analyst Coverage (COVER)	-0.0004	0.0004**	-0.0008	0.0008	-0.0123***
	(0.0004)	(0.0002)	(0.0039)	(0.0011)	(0.0025)
Constant /Cut1 for (5)	-0.139***	-0.0049	-0.663	-0.542***	-0.972***
	(0.0383)	(0.0180)	(0.429)	(0.119)	(0.219)
/Cut2					0.516**
					(0.218)
Observations	7,848	7,848	3,794	3,707	7,848
Adjusted R-squared	0.008	0.027	0.005	0.011	

This table reports OLS regressions of fund affiliation and control variables on forecast errors and optimism. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to Buy, 1 to Hold, and 0 to Sell. The key independent variable comprises the fund affiliation, which takes on the value of 1 if the brokerage house has an affiliated fund with an active involvement in the underlying company. Given the availability of fund holding data, the sample is reduced to the years 2005-2016. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

After confirming the impact of a fund affiliation on the forecast behavior, further analysis is necessary to discover the origins of the underlying phenomenon. Therefore, the sample is reduced to the forecasts of affiliated analysts. Two additional variables are introduced to enhance the understanding in which situations affiliated analysts tend to be overoptimistic. First, by theory, a higher stake of the affiliated fund family in a stock (LNSTAKE) should translate into an increase in optimism. For the stake, the aggregate holding volume of the underlying mutual fund family is divided by the total asset volume. Secondly, the funds' total net asset value is expected to play a crucial role, as a percentage of a fund family backed with high

capital is considered to be more important than a small fund family. The underlying model assumes that the family funds' size and their stakes in the covered company already provide enough incentives for the analyst to be more favorable in his forecast. Hence, other fund-related characteristics, such as fund type and objectives, are neglected in the predictions.

By looking at the target price forecasts compared to the actual realized firm's outcome, the results suggest that both family fund size and stake have a statistically significant impact on forecasting behavior. When comparing the target price forecast to the consensus, only the total funds' volume can explain an over-optimism, while the stake impact becomes insignificant. The observations in terms of EPS give mixed results. Given the absolute EPS forecast error, neither fund size nor underlying stake can explain a significant deviation. However, compared to consensus, at least the stake provides a significant variable when investigating affiliated analysts' forecast optimism. The same goes for the issuance of recommendations. Similar to the results provided by Mola & Guidolin (2009), the higher the stake of the mutual fund family in stocks, the higher the affiliated analyst's likelihood to issue a Buy recommendation.

Table 3: Fund family characteristics and forecast behavior

Affiliation Stake and Volume	(1) SAFE Price	(2) SRFO Price	(3) SAFE EPS	(4) SRFO EPS	(5) Recommen-dation
ln(Holding Value/TNA) (LNSTAKE)	0.0197***	0.0005	0.106	0.0325**	0.203***
	(0.0064)	(0.0016)	(0.0805)	-0.0131	(0.0195)
ln(Total Fund NA) (LNTNA)	0.0148***	0.0052***	0.0034	0.0021	0.0081
	(0.0051)	(0.0013)	(0.0595)	-0.0096	(0.0163)
Career Experience (EXP_CAREER)	-0.0143***	0.0010	-0.0321	-0.0068	0.0164
	(0.0034)	(0.0009)	(0.0398)	-0.0065	(0.0103)
Company Experience (EXP_COMP)	-0.124	-0.196***	-0.271	0.0334	0.532
	(0.173)	(0.0436)	(2.147)	-0.348	(0.686)
ln(Market	-0.0504***	0.0038	0.0460	0.0298	0.0409

Capitalization)
(LNSIZE)

	(0.0103)	(0.0026)	(0.121)	-0.0197	(0.0320)
# Analyst Coverage (COVER)	-0.0004	-0.0001	0.0203	0.0027	-0.0051
	(0.0012)	(0.0003)	(0.0139)	-0.0023	(0.0037)
Constant /Cut1 for (5)	0.829***	0.0595	0.385	-0.172	-2.851***
	(0.258)	(0.0650)	(3.044)	-0.494	(0.915)
/Cut2					-1.447
					(0.914)
Observations	3,552	3,546	2,128	2,112	3,689
Adjusted R-squared	0.015	0.013	0.003	0.011	

This table reports OLS regressions of fund's stake and total fund volume as well as control variables on forecast errors and optimism. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to Buy, 1 to Hold, and 0 to Sell. The two main independent variables comprise the fund's stake (LNSTAKE), measured as the aggregate holding value of the brokerage houses' affiliated funds in the underlying stock divided by total funds' value, and the natural logarithm of combined funds' size measured as the total fund net assets (LNTNA). Given the availability of fund holding data, the sample is reduced to the years 2005-2016. For this analysis, the model only considers observations, where a affiliated fund family has an active stake in the company. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

As demonstrated, the family funds' size and percentage stake do not provide an entirely consistent explanation for an analysts' forecast behavior. The effect is mainly visible in the target price forecasts and recommendation issuance, but less in the EPS forecasts. A potential explanation is that financial analysts have more room for deviation in target price than in earnings predictions. However, the higher frequency of Buy issuances and generally higher target prices confirm the

expectations that the funds' characteristics put analysts under a certain pressure to be more favorable (Cowen et al. 2006, Mola & Guidolin 2009).

Based on the previous results, reversely, a divestiture of a fund family in stocks should result in less optimistic forecasts. The affiliated analyst, by theory, does not have an incentive to continue being overoptimistic. Table 4 compares the results of analysts' forecasts when the related fund has a stake in the company against the observations, where the affiliated fund family completely divestitures in the stock. In nearly all optimism measures, a divestiture seems is adversely related to forecasting optimism. Overall, the results strengthen the previous findings and contribute to the current literature by looking at the fund affiliation issue from a reverse angle.

Table 4: Fund family divestiture and adjustment of forecast behavior

Fund Divestiture	(1) SAFE Price	(2) SRFO Price	(3) SAFE EPS	(4) SRFO EPS	(5) Recommen-dation
Divestiture Dummy (DIV)	-0.0160	-0.0479***	-0.054**	-0.086***	-0.291***
	(0.0174)	(0.0078)	(0.0251)	(0.0197)	(0.0955)
Career Experience (EXP_CAREER)	0.0074***	0.0018*	-0.0018	-0.0054**	0.0160
	(0.0022)	(0.0010)	(0.0031)	(0.0024)	(0.0123)
Company Experience (EXP_COMP)	-0.496***	-0.463***	-0.0891	0.0510	-0.0586
	(0.118)	(0.0525)	(0.155)	(0.121)	(0.744)
ln(Market Capitalization) (LNSIZE)	0.0191***	0.0053**	0.0207**	0.0152**	0.231***
	(0.0057)	(0.0026)	(0.0084)	(0.0066)	(0.0326)
# Analyst Coverage (COVER)	-0.0001	-0.0001	-0.0014	0.0002	-0.0111**
	(0.0008)	(0.0003)	(0.0011)	(0.0009)	(0.0045)
Constant /Cut1 for (5)	0.371***	0.438***	-0.139	-0.186	0.302
	(0.134)	(0.0598)	(0.180)	(0.141)	(0.828)
/Cut2					1.606*
					(0.828)
Observations	2,274	2,271	1,417	1,412	2,524

Adjusted R-squared	0.019	0.053	0.010	0.024

This table reports OLS regressions of fund divestiture and control variables on forecast errors and optimism. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to Buy, 1 to Hold, and 0 to Sell. The main independent variable comprises the dummy variable (DIV), which takes on the value of 1 if the affiliated fund family completely divestitures in a stock, and 0 otherwise. Given the availability of fund holding data, the sample is reduced to the years 2005-2016. For this analysis, the model only considers observations, where an affiliated fund family has an active stake in the company and a divestiture at some point in time for the same company. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

5.2 Lead Underwriters Forecasting Role

Based on previous literature, full-service banks are considered to be excessively optimistic due to strategic pressure to enhance deal flows and maintain a good relationship with the companies' management. According to the Thai stocks sample between 2005 and 2017, full-service banks seem to issue even more favorable forecasts than analysts' overall optimistic level. The pattern is especially observable at the target price forecasts and statistically significant for the recommendation issuance. Overall, full-service banks are more reluctant to issue Sell recommendations, as suggested by McNichols & Lin (1998). However, excessive positivism is not noticeable at EPS forecasts. Compared to the actual outcome, full-service banks' error is not significantly higher compared to other brokerage houses. In comparison to the EPS consensus, investment banks are at least more optimistic at the 10% significance level.

Table 5: The optimism level of full-service banks

Full-service banks	(1) SAFE Price	(2) SRFO Price	(3) SAFE EPS	(4) SRFO EPS	(5) Recommen-dation
Full-Service Bank (FULL_SERV)	0.0403***	0.0483***	-0.285	0.0150*	0.446***
	-0.0071	-0.0034	-0.629	-0.0088	(0.0320)
Career Experience (EXP_CAREER)	0.0009	0.0005	0.0185	-0.002***	-0.0039
	-0.0007	-0.0003	-0.051	-0.0007	-0.0036
Company Experience (EXP_COMP)	0.0119	-0.0145**	0.332	-0.0089	-0.0527
	-0.015	-0.0072	-1.885	(0.0273)	(0.0619)
ln(Market Capitalization) (LNSIZE)	0.0095***	0.0045***	0.17	0.002	0.112***
	-0.0018	-0.0009	-0.15	-0.0021	-0.009
# Analyst Coverage (COVER)	0.0009***	-0.0003*	-0.0183	0.0005*	-0.0024*
	-0.0003	-0.0001	-0.0219	-0.0003	-0.0014
Constant/ Cut 1 for (5)	-0.0442*	-0.0732***	-2.132	-0.0402	-0.161
	(0.0255)	(0.0122)	-2.566	(0.0365)	(0.116)
Cut 2					1.086***
					(0.116)
Observations	18,928	18,892	8,956	8,634	22,882
Adjusted R-squared	0.003	0.012	0	0.001	

This table reports OLS regressions of full-service banks' forecasts compared to those of non-investment banks and control variables on forecast errors and optimism. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to Buy, 1 to Hold, and 0 to Sell. The main independent variable comprises the dummy variable (FULL-SERV), which takes on the value of 1 if the underlying brokerage house is defined as a full-service bank with the criteria to operate at least one time as a lead underwriter between 2005 and 2017. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well

as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

Building upon the hypothesis that firm-level incentives are the primary driver of analysts' forecast behavior, the subsequent analysis investigates whether analysts adapt their behavior when changing employment from a non-investment bank to a full-service bank. A higher optimism after the employment change would provide additional support for previous findings. Given the results of the table below, financial analysts indeed appear to be more optimistic when changing employment to a full-service bank. The pattern is especially noticeable for the issuances of target prices and Buy recommendations. There are two potential explanations for this pattern. First, the results confirm that financial analysts are concerned about their career as pointed out by Hong & Kubik (2003). Secondly, it seems like, firm-level incentives are the main driver in the forecasting process, supporting the findings of Cowen et al. (2006). In other words, analysts adapt their forecast behavior to the firm-level incentives of their employer. Given the fact that the compensation of an individual analyst is closely tied to the firm-level incentives, the results are not surprising.

Table 6: The adaption of firm-level incentives after employment change

Employment	(1) SAFE Target Price	(2) SRFO Target Price	(3) SAFE EPS	(4) SRFO EPS	(5) Recommen- dation
Employment Change (CHANGE)	0.134***	0.0585***	-0.0888	0.0306	0.227**
	(0.0189)	(0.0092)	(0.241)	(0.0461)	(0.0986)
Career Experience (EXP_CAREER)	0.00560***	0.0003	0.0029	-0.0018	-0.0046
	(0.0019)	(0.0009)	(0.0235)	(0.0045)	(0.0099)
Company Experience (EXP_COMP)	0.0200	-0.153**	-1.152	0.328	1.277
	(0.129)	(0.0634)	(2.009)	(0.384)	(1.028)
ln(Market Capitalization)	-0.0046	0.0062**	0.0694	0.0116	0.123***

(LNSIZE)					
	(0.0050)	(0.0024)	(0.0625)	(0.0121)	(0.0262)
# Analyst Coverage (COVER)	0.0001	-0.0002	0.0054	0.0006	0.0003
	(0.0007)	(0.0004)	(0.0088)	(0.0017)	(0.00384)
Constant/ Cut 1 for (5)	0.0055	0.0475	0.355	-0.526	1.300
	(0.139)	(0.0683)	(2.116)	(0.405)	(1.068)
Cut 2					2.280**
					(1.069)
Observations	2,877	2,876	1,789	1,788	3,112
R-squared	0.037	0.026	0	-0.002	

This table reports OLS regressions of employment changes from a non-investment bank to a full-service bank and control variables on forecast errors and optimism. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to Buy, 1 to Hold, and 0 to Sell. The main independent variable comprises the dummy variable (CHANGE), which takes on the value of 1 for all forecasts after an analyst changed employment to a full-service bank, and 0, for the forecasts at the former employer. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

To enhance the understanding of why full-service banks are more optimistic than others, the subsequent analysis narrows investment banks down to their role as lead underwriters in an IPO. Literature suggests that lead underwriters have a particular interest to favor the management, caused by the fee composition and the strategic alignment to be the first negotiation partner for future deals.

The first thing to notice is that financial analysts, in general, do not show significantly different behavior for firms in the process of an IPO compared to already listed companies. Both target price and EPS measures assume that an IPO does not impact analysts' forecast optimism. Nevertheless, the results show a relationship

between the IPO and the issuance of recommendation. As a whole, the probability of issuing a Buy recommendation is significantly higher for an IPO firm. In the second step, it becomes necessary to investigate how lead underwriters behave. Although an IPO does not influence the consensus forecast behavior, it significantly impacts the lead underwriters. As demonstrated in Table 7, lead underwriters appear to be excessively optimistic for their underlying IPO firm they cover, in terms of the target price, compared to other brokerage houses. The results align previous literature that suggest lead underwriters to have a special desire to favor the company they cover (McKnight et al. 2010, Francis & Philbrick 1993).

Table 7: Lead underwriters' forecasts behavior

	(1)	(2)	(3)	(4)	(5)
Lead underwriter	SAFE Price	SRFO Price	SAFE EPS	SRFO EPS	Recommen-dation
Lead underwriter (LEAD)	0.173*	0.402***	-0.468	0.0022	0.434
	(0.0977)	(0.0505)	(9.050)	-0.986	-0.669
Dummy for IPO (IPO)	-0.0113	-0.0274	1.187	0.117	1.034***
	(0.0391)	(0.0205)	(4.599)	-0.544	-0.24
Dummy for MAI Index (MAI)	0.0397	-0.0166	-3.673		0.437***
	(0.0302)	(0.0157)	(4.436)		-0.145
Company Experience (EXP_COMP)	0.009	-0.0219**	0.490	-0.217	-0.0675
	(0.0206)	(0.0106)	(3.428)	-0.362	-0.0777
Career Experience (EXP_CAREER)	0.003***	0.0006	0.0569	0.0022	0.0143***
	-0.0009	-0.0005	(0.083)	-0.0089	-0.0042
ln(Market Capitalization) (LNSIZE)	0.014***	0.0012	0.0153	-0.0102	0.0208
	-0.0033	-0.0012	(0.387)	-0.0417	-0.0148
# Analyst Coverage (COVER)	0.001***	0.0005***	-0.0187	0.002	-0.0019
	-0.0004	-0.0002	(0.0362)	-0.0034	-0.0012
Constant/ Cut 1 for (5)	0.212***	0.0076	-1.629	0.144	-1.258***

	(0.0370)	(0.0191)	(5.131)	-0.548	-0.159
Cut 2					-0.0563
					-0.159
Observations	13,789	13,779	5,464	5,378	17,055
Adjusted R-squared	0.004	0.006	0.001	0.001	

This table reports OLS regressions of lead underwriters' forecasts compared to the rest, on forecast errors and optimism. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to Buy, 1 to Hold, and 0 to Sell. The main independent variable comprises the dummy variable (LEAD), which takes on the value of 1 if the underlying brokerage house is the lead underwriter for bringing the company to the public. A further dummy variable (IPO) is introduced to compare forecast behavior for IPO and non-IPO firms. Therefore, the sample of non-IPO firms is reduced to companies that have similar firm characteristics. Consequently, all non-IPO stocks with a (LNSIZE) of over 11.5 and under 7 are dropped. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

The excessive over-optimism of lead underwriters is also confirmed by just looking at the IPO firms. Still, lead underwriters are more favorable based on absolute error and relative optimism in terms of the target price. For EPS forecasts and recommendations, the results do not indicate a significant deviation. Still, it is noticeable that the observed lead underwriters did not issue a sell recommendation, implying that they are reluctant to issue an unfavorable outcome (McNichols & Lin (1998). Out of the 21 unique lead underwriter forecast observations, only 4 issued a hold recommendation, with the remainder being buy recommendations.

Table 8: Excessive optimism of lead underwriters during IPO

	(1)	(2)	(3)	(4)	(5)
Lead underwriter IPO	SAFE Price	SRFO Price	SAFE EPS	SRFO EPS	Recommen-dation

Lead underwriter (LEAD)	0.279*	0.416***	-0.149	0.105	0.556
	(0.160)	(0.0736)	(0.143)	(0.143)	(0.685)
Dummy for MAI Index (MAI)	0.0361	0.0141	-0.305		0.238
	(0.270)	(0.135)	(0.309)		(1.153)
Career Experience (EXP_CAREER)	-0.0095	-0.0021	0.0132	-0.00152	-0.0135
	(0.0151)	(0.0070)	(0.0152)	(0.0145)	(0.0617)
ln(Market Capitalization) (LNSIZE)	-0.210***	0.0027	-0.0288	0.0281	-0.203
	(0.0486)	(0.0232)	(0.0841)	(0.0728)	(0.196)
# Analyst Coverage (COVER)	-0.00187	-0.0015	0.0085	0.014**	0.0372
	(0.0064)	(0.0029)	(0.0064)	(0.0067)	(0.0262)
Constant/ Cut 1 for (5)	2.263***	-0.0107	0.130	-0.606	-3.550*
	(0.474)	(0.228)	(0.911)	(0.767)	(1.923)
Cut 2					-2.853
					(1.912)
Observations	121	118	41	38	127
Adjusted R-squared	0.125	0.194	0.003	0.043	

This table reports OLS regressions of lead underwriters' forecasts compared to the forecasts of other analyst during an IPO, on forecast errors and optimism. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to Buy, 1 to Hold, and 0 to Sell. The main independent variable comprises the dummy variable (LEAD), which takes on the value of 1 if the underlying brokerage house is the lead underwriter for bringing the company to the public, and 0 otherwise. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). In this model, the variable (EXP_COMP) is dropped due to multi-collinearity with the (EXP_CAREER) variable. Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

Given the investigation of lead underwriters, the question remains whether lead underwriters have an incentive to stay optimistic over subsequent years, after issuing a forecast during an IPO year. As lead underwriters only appear to significantly deviate in target price, Table 9 reports the IPO year's impact on the issued forecasts two years after the IPO for the absolute and relative target price optimism. However, the model does not provide any explanatory power for the relationship. Hence, lead underwriters do not necessarily maintain an above-average optimism. But this finding does not mean that lead underwriters become more accurate. It just shows that the optimism level is not significantly higher two years after IPO, compared to what other analysts forecast.

Table 9: Continuity of lead underwriters' forecast optimism I

	(1)	(2)
	SAFE Target Price	SRFO Target Price
Forecast optimism t (SAFE_t)	-0.0765	0.0820
	(0.112)	(0.158)
Forecast optimism t+1 (SAFE_t+1)	0.124	1.112*
	(0.174)	(0.542)
Dummy for MAI Index (MAI)	-0.306	-1.576**
	(0.465)	(0.636)
Career Experience (EXP_CAREER)	0.0121	0.0307
	(0.0187)	(0.0194)
ln(Market Capitalization) (LNSIZE)	-0.135	-0.123*
	(0.0806)	(0.0670)
# Analyst Coverage (COVER)	0.00740	-0.0164
	(0.00810)	(0.0103)
Constant	1.345	1.299*
	(0.855)	(0.649)
Observations	19	19
R-squared	0.032	0.158

This table reports OLS regressions of lead underwriters' forecasts in the year of an IPO and subsequent year on forecast errors and optimism two years after the IPO. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to Buy, 1 to Hold, and 0 to Sell. The two main independent variables

comprise the variables Y_t and Y_t+1, standing for the forecast optimism in the year of the IPO and the subsequent year. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). In this model, the variable (EXP_COMP) is dropped due to multi-collinearity with the (EXP_CAREER) variable. Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

By looking at one year after the IPO, the hypothesis can still be not confirmed. Interestingly, the results even suggest an adverse relationship, meaning that a higher optimism in the IPO year leads to lower optimism in the subsequent year. In other words, lead underwriters tend to be excessively optimistic during the IPO but revert to consensus level afterward. There might be two potential reasons for this observation. First, banks are simply driven by the high fee composition in the IPO year (McNichols & Lin 1998). As the management and underwriting fee do not occur in the subsequent year, it might be not worth for the bank to stay extreme. Hence, they reduce optimism, but are still favorable as the forecast error compared to actual results suggest. Another reason comprises the reputation pressure on banks. If they are too often wrong in their forecasts, they lose credibility in the market. As a result, they would lose future deals to banks that are more accurate (Ljungvist et al. 2006, Clarke et al. 2007). Overall, both implications would project the same outcome: When banks are actively involved in an underwriting process, they are excessively favorable, but they also tend to reduce extremism when benefits are not high (Dugar & Nathan 1995).

Table 10: Continuity of lead underwriters' forecast optimism II

	(1)	(2)
	SAFE Target Price	SRFO Target Price
Forecast optimism t (SAFE_t)	-0.0988	-0.127*
	(0.177)	(0.073)
Dummy for MAI Index (MAI)	-0.293	0.944***

	(0.736)	(0.194)
Career Experience (EXP_CAREER)	-0.0209	-0.0143
	(0.0292)	(0.0091)
ln(Market Capitalization) (LNSIZE)	-0.06	0.0039
	(0.127)	(0.0343)
# Analyst Coverage (COVER)	0.0127	0.0120**
	(0.0124)	(0.0041)
Constant	0.939	-0.0525
	(1.337)	(0.332)
Observations	19	19
R-squared	0.1	0.61

This table reports OLS regressions of lead underwriters' forecasts in the year of an IPO on forecast errors and optimism one year after the IPO. For column 1, forecast optimism is defined for absolute error (compared to actual outcome) and for column 2 as relative deviation (compared to consensus forecast) in terms of target price. The main independent variable comprises the Y_t, standing for the forecast optimism in the year of the IPO. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). In this model, the variable (EXP_COMP) is dropped due to multi-collinearity with the (EXP_CAREER) variable. Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

As a further robustness check, the correlation among the forecasts of non-lead underwriters during the IPO and the subsequent two years is tested. Similar to lead underwriters, the forecast during the IPO year does not seem to impact the future forecast behavior. This would imply that financial analysts in general re-evaluate the performance of a company each year and are not mislead by previous forecasts.

Table 11: Continuity of nonlead underwriters' forecast optimism

	(1)	(2)
	SAFE Target Price	SRFO Target Price
Forecast optimism t (SAFE_t)	0.152	-0.0235
	(0.124)	(0.14)
Forecast optimism t+1 (SAFE_t+1)	0.389**	0.2
	(0.156)	(0.145)
Career Experience (EXP_CAREER)	-0.0152	0.0014

	(0.0182)	(0.0047)
ln(Market Capitalization) (LNSIZE)	0.027	0.0004
	(0.0603)	(0.0319)
# Analyst Coverage (COVER)	0.0096	0.0011
	(0.0082)	(0.003)
Constant	-0.183	-0.0049
	(0.599)	(0.344)
Observations	63	61
R-squared	0.151	0.034

This table reports OLS regressions of non-lead underwriters' forecasts in the year of an IPO and subsequent year on forecast errors and optimism two years after the IPO. For column 1 and 2, forecast optimism is defined for absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to BUY, 1 to Hold, and 0 to Sell. The two main independent variables comprise the variables Y_t and $Y\_t{+}1$, standing for the forecast optimism in the year of the IPO and the subsequent year. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). In this model, the variable (EXP_COMP) is dropped due to multi-collinearity with the (EXP_CAREER) variable. Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

5.3 Forecasting Behavior of Share Distributors during an IPO

Besides lead underwriters, investment banks acting as share distributors, comprise a crucial role in promoting the companies during the IPO process. Based on the distribution fee investment banks receive in return for the distribution of shares, the question arises whether this fee provides an incentive enough to become more optimistic and neglect accuracy. The subsequent analysis extends the previous investigations by adding a dummy variable for share distributors during an IPO. Results so far supported an excessive optimism of lead underwriters. However, for share distributors, a similar relationship can not be found. One potential explanation might be the limited number of IPO observations in the sample and the general high optimism level of analysts. As a result, share distributors are not necessarily excessively optimistic.

Table 12: Optimism level of share distributors

Share distributors	(1) SAFE Target Price	(2) SRFO Target Price	(3) SAFE EPS	(4) SRFO EPS	(5) Recommen- dation
Dummy for IPO (IPO)	0.0065 (0.0505)	-0.00928 (0.0264)	1.070 (5.734)	-0.0307 (0.731)	1.190*** (0.351)
Lead underwriter (LEAD)	0.161 (0.103)	0.366*** (0.0531)	-0.548 (9.577)	0.117 (1.200)	0.213 (0.719)
Share distributor (SYND)	-0.0445 (0.0796)	-0.0449 (0.0416)	-0.179 (9.048)	0.0696 (1.199)	-0.374 (0.519)
Dummy for MAI Index (MAI)	0.0393 (0.0303)	-0.0170 (0.0157)	-3.396 (4.236)		0.618*** (0.169)
Company Experience (EXP_COMP)	0.0033*** (0.0009)	0.000634 (0.0004)	0.0510 (0.0802)	-0.0048 (0.0099)	0.0115** (0.0045)
Career Experience (EXP_CAREER)	0.0090 (0.0206)	-0.0219** (0.0106)	0.457 (3.341)	-0.248 (0.414)	-0.153* (0.0911)
ln(Market Capitalization) (LNSIZE)	-0.0143*** (0.0033)	0.00168 (0.00169)	-0.0349 (0.370)	-0.0457 (0.0458)	0.0354** (0.0168)
# Analyst Coverage (COVER)	-0.0015*** (0.0004)	-0.000552*** (0.0002)	-0.0223 (0.0350)	0.0013 (0.0043)	-0.0026 (0.0018)
Constant/ Cut 1 for (5)	0.212*** (0.0370)	0.0081 (0.0191)	-0.788 (4.937)	0.635 (0.610)	-1.308*** (0.183)
Cut 2					-0.0229 (0.182)
Observations	13,789	13,779	5,670	5,747	
Adjusted R-squared	0.004	0.005	-0.001	-0.001	13,789

This table reports OLS regressions of share distributors' forecasts compared to the rest, on forecast errors and optimism. For column 1 and 2, forecast optimism is defined absolute error (compared to actual outcome) and relative deviation (compared to consensus forecast) in terms of target price, and column 3 and 4, in terms of EPS. For the issuance of Recommendations (Buy, Hold, Sell), column 5, an ordered logistics approach is applied by attributing the value 2 to BUY, 1 to Hold, and 0 to Sell. The main independent variable comprises the dummy variable (SYND), which takes on the value of 1 if the underlying brokerage house is a share distributor of the specific company during the IPO process. The dummy variable (LEAD) comprises a further differentiation and takes on the value of 1 if the brokerage house is a lead underwriter in the IPO. A further dummy variable (IPO) is introduced to compare forecast behavior for IPO and non-IPO firms. Therefore, the sample of non-IPO firms is reduced to companies that have similar firm characteristics. Consequently, all non-IPO stocks with a (LNSIZE) of over 11.5 and under 7 are dropped. Besides, extreme forecasts with a deviation of more than 100% in both, positive and negative direction, are excluded from the sample. Control variables include the career experience (EXP_CAREER) and company experience (EXP_COMP), measured in years, as well as company size proxied by the natural logarithm of market capitalization (LNSIZE) and numbers of analysts covering the stock in a specific year (COVER). The variable (MAI) differs between listed stock in the Mai Index and the Stock Exchange of Thailand. Standard errors of variables are denoted in parentheses. *, **, and ** stand for the 10%, 5%, and 1% significance level, respectively.

Chapter 6 Conclusion

The paper has demonstrated that excessive forecast optimism is also observable in the Thai stock market. The optimism is especially severe in target price forecasts and the probability of issuing a buy recommendation, but less in EPS forecasts. By looking at the different roles of banks and brokerage houses, the paper contributes to previous literature and provides more insights into the incentive structure of financial analysts. In a first setting, affiliated funds were allocated to the underlying brokerage houses. The results suggest that the fund family affiliation is related to overoptimism, even compared to the overall favorable level of analysts' forecasts. The optimism tends to increase with the size of affiliated family funds and with the stake in the covered company. In other words, the bigger the investment of the affiliated fund family in stocks, the higher the pressure for analysts to issue favorable projections. This result aligns with previous literature, claiming that the

compensation of affiliated analysts is closely linked to the generation of trading. When a fund ends its investment in a stock, analysts become less optimistic. They simply do not benefit any more from being optimistic.

A further investigation focuses on the forecast optimism level of full-service banks. The results suggest that analysts employed at full-service banks are among the most optimistic. Investment banks have a particular interest in maintaining a close relationship with the management of the firms they cover. A good relationship helps to attract future deals such as seasoned equity offerings, issuance of debt securities or consulting during acquisition processes. Given the competitive pressure, investment banks are forced to be favorable. To emphasize that firm-level interests are more severe than individual analysts' incentives, analysts' forecast behavior is compared when employed at a non-investment bank, and after they change to a full-service bank. The results confirm that analysts adapt their forecast behavior towards to the interest of their employer and become more optimistic.

The paper digs further down into full-service banks by considering their different roles as lead underwriters and share distributors during an IPO. When full-service banks act as lead underwriters, they even become more optimistic. Potential reasons are the high fees, desire to please the management, and enhancing future deal flows. However, the excessive forecast optimism does not necessarily remain two years after the IPO. Against expectations, lead underwriters converge their optimism to the average forecast optimism level one year after the issuance.

Also, when banks perform their role as a share distributor during an IPO, they are considered to be more optimistic, given the composition of distribution fees, at least by theory. The findings suggest that there is no relationship between share distributor and overoptimism. Hence, the distribution fee does not seem to be an incentive enough to neglect accuracy.

The paper achieved the objective to break down the incentive structure of financial analysts and their brokerage houses. An affiliated relationship is indeed likely to bias forecast results. The main practical implication for investors is to carefully access the outcome of financial analysts, especially when they act as lead

underwriters or have an underlying mutual fund investing in the stock. However, this paper does not investigate whether following analysts' biased recommendations leads to lower returns. But this would comprise an interesting topic for further research.

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