Mutual Funds and Affiliated Analyst Recommendations:

Optimism or Information Sharing?

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Abstract

This study examines whether the group affiliation between asset management firms and brokerage firms influences sell-side analyst recommendations. Using fund holdings data of mutual funds firms belonging to business groups in Korea (i.e., chaebols), we examine whether affiliated analysts differently treat stocks held by fund management firms in the same chaebol from other stocks. Our main results show that analysts provide more accurate forecasts on affiliated stocks, indicating that analysts take advantage of information on those stocks shared with their affiliated fund managers. Although our overall results support the information sharing argument, analysts are found to be selectively optimistic about highly valuable stocks to affiliated fund managers.

Keywords: analyst optimism; stock recommendations; mutual fund; business group

1. Introduction

Financial analysts face conflicts of interest in various situations. The previous studies report that affiliated analysts' recommendations can be influenced by investment banking relationships (e.g., Dugar & Nathan, 1995; Lin & McNichols, 1998; Michaely & Womack, 1999; O'Brien, McNichols, & Hsiou-Wei, 2005), an access to exclusive information (e.g., Das, Levine, & Sivaramakrishnan, 1998; Francis & Philbrick, 1993; T. Lim, 2001), and trading commissions (e.g., Beyer & Guttman, 2011; Cowen, Groysberg, & Healy, 2006). More recently, research shows that a pressure from the buy side also influences analysts' forecasting incentives (e.g., Firth, Lin, Liu, & Xuan, 2013; Gu, Li, & Yang, 2013). That is, an analyst may bias their opinions in favor of client institutional investors who trade via the analyst's brokerage firm.

Our paper questions whether a different dimension of conflicts of interest exists for sell-side analysts due to a business group affiliation between asset management firms and brokerage firms. In particular, we focus on family-controlled industrial conglomerates in Korea called *chaebol*. In a chaebol group, member firms keep close business ties and engage in mutual cross-debt guarantees with their fellow member firms. Interlocking ownership along with various business ties allows controlling families to exert substantial influences over all member firms of the same chaebol group (Bae, Kang, & Kim, 2002). This study aims to investigate reporting incentives of affiliated analysts who are employed by a brokerage firm in a business group where the group holds both an asset management firm and a brokerage firm.[1]

[1] In our research setting, we define an affiliated analyst as a person who works for a brokerage firm belonging to a business group. The affiliated stocks are those included in mutual funds managed by an asset management firm in the same business group as the analyst's brokerage firm. Affiliated analysts in the chaebol brokerage firm, therefore, may cover affiliated stocks as well as unaffiliated ones.

In the US, mutual fund families have multiple distribution channels for their funds such as direct sales, fund supermarkets, or institutional sales. However, similar to European countries Korean fund management firms are heavily reliant on large banks, insurance companies or brokerage firms for their fund sales.[2] Brokerage firms, therefore, are one of the most important marketing channel for mutual fund managers. In turn, mutual fund managers use brokerage service to trade, which makes them to be the most vital client to brokerage firms as well. Ideally, fund managers should use brokerage firms which provide the most accurate research reports and the most competitive brokerage fees, while brokerage firms recommend the funds managed by the best performing asset management firms. The problem is that the large business groups in Korea are allowed to retain substantial ownership in both brokerage firms and asset management firms, making those separate independent entities, by law, to be under influence of the same controlling families.[3] This institutional structure restricts the chaebol member firms from following the ideal process in finding their business partners for brokerage services and fund distributions.

Both a brokerage firm and an asset management firm in the same business group can benefit by closely working with each other. First, brokerage firms can secure a steady stream of commissions from their affiliated asset management firms. A chaebol brokerage firm is typically given a large share of the daily trades ordered by an affiliated asset management firm. Evidence shows that from 2007 to 2012, average 54.4% of all shares traded by top 5 asset management firms belonging to chaebol groups were exclusively commissioned to affiliated

[2] "An introduction to UCITS for US asset managers", 2015, Ernst and Young Global Ltd., source: http://eyfinancialservicesthoughtgallery.ie/introduction-ucits-us-asset-managers/

[3] The financial regulations in Korea prior to 2009 prohibited financial institutions from providing both brokerage service and asset management service by the same firm.

brokerage firms.[4] By commissioning a majority of the transactions to a fellow member firm, the asset management firm can also prevent their investment strategies from being leaked to other competitors in the market. Secondly, asset management firms can secure a well-established distribution channel to promote their mutual funds. In 2014, Korea has the world largest number of funds offered to the market with around 9,857 funds available. The competition in the fund sales market, thereby, is highly intense. Through the long-term partnership and internal cooperation, affiliated brokerage firms can act as strong promoters of the funds managed by their fellow member firms (hereafter, affiliated funds). Indeed, from 2007 to 2012 average 55% of the funds managed by top 10 mutual fund firms are sold via their affiliated firms. Employees in chaebol brokerage firms are also put under pressure to sell affiliated funds. Some firms even set the target number of affiliated funds for each employee to sell and whether to meet the target or not is reflected in employee performance evaluations.[5] To compensate brokerage firms for such aggressive marketing practices, asset management firms set higher sales fees but lower fund management fees for the funds sold via affiliated brokerage firms compared to those sold by unaffiliated brokerage firms. For example, in 2012, Korea Investment & Securities Co. paid sales fees of 1.057% on average for funds sold via affiliated brokerage firms but paid sales fees of 0.939% on average for funds sold via non-affiliated brokerage firms.[6]

In the presence of the close business tie and group affiliation between a brokerage firm

[4] Source: Korea Capital Market Institute, 2012, "Chaebol asset management firms' fund sales and trade commissions".

[5] Such practice is called "Campaign" in industry. The Campaign focuses on the affiliated funds being intensively promoted in the market but also generates high sales fees for the brokerage firm when a sale occurs. See "Securities firms, sales firms, asset management firms should do their own job", Dec 2008, Shin-Dong-A, source: http://shindonga.donga.com/Library/3/03/13/108026/3 (written in Korean)

[6] "Affiliated funds paid more fees", July, 2012, Chung-ang ilbo, source: http://news.joins.com/article/8764691

and an asset management firm, we conjecture two competing reporting incentives of affiliated analysts as follows. To boost performance of affiliated fund management firm, analysts may give more optimistic opinions for affiliated stocks than other stocks (analyst optimism hypothesis). On the other hand, affiliated analysts may utilize information advantages through the research pools provided by financial firms within the same chaebol and produce more accurate forecasts (information sharing hypothesis). Employees in the same chaebol can communicate more frequently via the internal media/portal services and through close business ties and employee movements between member firms. Furthermore, chaebol groups tend to strategically locate their financial firms in the vicinity for better communications between employees within the group.[7] Therefore, affiliated mutual fund managers can share exclusive information about the performance and the prospects of invested stocks more easily with affiliated analysts.

By using analyst reports and the mutual fund holding data from July 1, 2000 to February 28, 2008, we calculate relative recommendations and forecast accuracy of affiliated and non-affiliated analysts. Our results show that more accurate and less biased earnings forecasts issued by the affiliated analysts on affiliated stocks, consistent with the information sharing hypothesis. Although our overall empirical results support the information sharing argument, we find that analysts selectively benefit their affiliated mutual fund managers. In particular, we find that affiliated analysts make more optimistic recommendations for affiliated stocks when the funding amounts on those stocks are high, when higher asset management fees

[7] Samsung group, for example, relocated Samsung Securities, Samsung Asset Management and Samsung Life Insurance into the same building. The main reason for the move is to create a synergy among employees in the financial industry through close cooperation and frequent meetings. (“Samsung Group's Financial Units Open "Seocho-dong" Era”, The Korea Economic Daily, August 16, 2016, source: http://english.hankyung.com/business/2016/08/16/1137001/span-classkeywordsamsungspan-groups-financial-units-open-span-classkeywordseochospandong-era)

are charged on the funds including those stocks and when those stocks are newly included to the fund held by affiliated mutual fund managers. We also find that our main results are not affected by favoritism toward non-financial chaebol member firms (see Lim and Jung (2012) and Song et al. (2012)). Finally, we examine the market reactions to the affiliated analysts' recommendations and find that market participants discount the affiliated analysts' buy recommendations due to a possible bias caused by the group affiliation. However, they react more strongly to sell recommendations by affiliated analysts as they seldom release such negative recommendations.

Our paper makes the following contributions to the extant literature. First, we investigate potential agency conflicts that analysts face caused by the business group affiliation between brokerage firms and asset management firms. Previous studies like Firth et al. (2013) and Gu et al. (2013) investigate analyst optimism resulted from commission income generated from clients of brokerage firms, documenting more favorable recommendation toward the stocks held by the client mutual fund managers. However, our study particularly focuses on the cooperative relationship between an asset management firm and a brokerage firm in the same business group. When an asset management firm and a brokerage firm are owned by the same controlling family, both firms would have no intention to break the partnership by searching for a better partner. In this case, our results exhibit more accurate earnings forecasts by affiliated analysts on the affiliated stocks than other stocks, rejecting the analyst optimism argument. Furthermore, analysts may try to find a balance between being accurate to establish their reputation and providing optimistic opinions to generate trading commissions (Hong & Kubik, 2003; Jackson, 2005). Our findings confirm that analysts become selectively optimistic to benefit affiliated mutual fund managers while maintain their reputation by providing more accurate forecasts for affiliated stocks in general. The optimistic bias is found in highly

valuable stocks to affiliated fund managers such as stocks with a high level of investments in the funds or stocks firstly included in mutual fund portfolios. In addition, our findings contribute to the stream of literature on the investment strategies of mutual fund families. Mutual fund managers in US may face agency conflicts between their clients and mutual fund family that they belong to (e.g., Bhattacharya, Lee, & Pool, 2013; Chevalier & Ellison, 1997; Gaspar, Massa, & Matos, 2006). The fund families are suspected to organize investment strategies across the member mutual funds to maximize the total group profit (Elton, Gruber, & Green, 2007; Gaspar et al., 2006). Our study presents a special case where mutual fund managers strategically cooperate with affiliated analysts to maximize the total profits of their affiliated firms. Such tactical collaboration can also be used as window dressing purposes by mutual fund managers (Agarwal, Gay, & Ling, 2014) as we find the analyst recommendations are biased in favor of highly valuable stocks to affiliated fund managers. Finally, our findings extend evidence of analyst favoritism toward other group member firms documented by Lim and Jung (2012) and Song et al. (2012). These previous studies investigate the situation where non-financial chaebol companies are permitted to own securities firms as well as non-financial firms. This means that an analyst working in a securities firm owned by a chaebol group can issue recommendations on other member firms within the same group as well as chaebol members' direct competitors in the market. Our research can be differentiated in that our focus is the affiliation between brokerage firms and asset management firms, not that between brokerage firms and other affiliated non-financial firms.

This paper is structured as follows. Section 2 presents hypotheses followed by data and descriptive statistics in Section 3. The results are presented in Section 4 with additional tests in Section 5. Finally, Section 6 concludes the paper.

2. Contextual Review and Hypothesis Development

The worldwide total net asset value (NAV) invested in mutual funds at the end of 2015 was around 32.2 trillion US dollars. The country with the largest NAV is the US mutual fund market which accounts for 48.7% of the total worldwide investments in 2015. Compared to the US market, the Korean fund market has 340 billion US dollars of NAV invested in 2015, which is ranked fourteenth globally and third in the Asia region. When the number of funds is considered, the Korean market offers the largest number of funds in the world as of 2014. One key feature of the Korean mutual fund market is that it is one of the fastest growing markets in the world. During our sample period of 2001 to 2008, the Korean market grew a staggering 83.1% (on average 11.9% per annum) in local currency terms, whereas the US market during the same time only grew 37.8% (on average 5.4% per annum). Until 2015, the Korean mutual fund market's growth rate was an average of 11.9% per annum, thereby tripling in NAV during 14 years since 2001. The stable growth in the Korean market can be attributed to the fact that the regulatory initiatives by the Korean government helped incubate an investor friendly market with high levels of quality disclosures but relatively low levels of fees and taxations. In the 2015 Global Fund Investor Experience report by Morningstar[8] which discusses the best practices for mutual funds from the perspective of fund investors, Korea was graded as one of the only two A-ranked countries where the other country was the US.[9] Samsung Asset

[8] Source: http://corporate.morningstar.com/US/documents/2015%20Global%20Fund%20Investor%20Experience.pdf?INV=82e08cea-55

[9] The other competing Asian countries which have larger NAV values than Korea in 2015 were given C- (Japan) and D+ (China).

Management Co. Ltd. is the largest mutual fund firm in Korea, which is a subsidiary of the Samsung chaebol group.

Mutual fund families in the US are a group of legally independent entities that are marketed by the same sponsoring management company and that also share distribution channels for their funds. The top 50 US fund families have over 80% of all the equity assets under management (Gaspar et al., 2006). Due to the influence of large mutual fund families, mutual fund managers have been suspected to pursue interest of their family groups rather than that of their clients. The main advantage of forming a family is cost saving from economy of scale in finding clients and selling funds. The member firms may also share valuable information about the stocks covered, which can lead to an increase in research quality. However, the fund families might coordinate investment strategies across the mutual funds to maximize the total group profit at the expense of clients' profits of individual funds. Gaspar et al. (2006) find evidence of a "performance transfer" from less valuable funds of the group (i.e., low fee, low past performing or old funds) to more valuable funds of the group (i.e., high fee, high past performing or young funds). They argue that the families engage in a "cross-fund subsidization" to enjoy a spillover effect on the overall group funds by creating a highly performing star fund (Nanda, Wang, & Zheng, 2004). Creating a brand name for the family is also important as investors tend to select a fund family first rather than focusing on individual funds (Massa, 2003). Gaspar et al. (2006) further identify potential channels of such subsidization, which include allocating underpriced initial public offering (IPO) stocks to high value funds and taking opposite trades between the affiliated mutual funds in favor of high value funds.

In our research setting, a similar type of cross-subsidization among firms may exist

through group affiliation. Especially, when a business group owns both an asset management firm and a brokerage firm, the controlling family may pressure affiliated analysts to provide favorable opinions for affiliated stocks to maximize the group profits. In addition, chaebol member firms tend to engage in various internal transactions by sharing financial resources and marketing channels with other member firms (Chang & Hong, 2000). The affiliated asset fund managers are important clients for fellow member brokerage firms as they generate trades to the brokerage firm and also provide marketing channels for analysts' reports. If chaebol-affiliated analysts are influenced by the controlling family of the group and the close business ties between the brokerage house and the asset management firm, they will have incentives to produce biased reports in favor of the affiliated mutual fund managers. Accordingly, we propose our first hypothesis as follows:

H1a: Affiliated analysts in a business group will provide more optimistic reports for stocks invested by affiliated asset management firms in the same business group than other stocks (analyst optimism hypothesis).

Alternatively, affiliated analysts may be able to provide more accurate forecasts about affiliated stocks (Jacob, Rock, & Weber, 2008; Xue, 2017). Employees in the same business group can communicate more frequently through the internal media (Y. Lim & Jung, 2012). Shin and Park (1999) document that there is an internal capital market within a chaebol group, which helps reducing the financing difficulties of the chaebol member firms. As securities firms often play an important role in the internal capital market, they are likely to engage in various mutual business ties and personnel exchanges among the chaebol member firms (Song,

Mantecon, & Altintig, 2012)[10]. By sharing information and research pools of the group, affiliated analysts and affiliated mutual fund managers can achieve more precise evaluation of covered stocks. They may share exclusive tips about the performance and the prospects of covered stocks easily by using various group communication channels.

Furthermore, evidence shows as investors and regulators have become more concerned with the conflicts of interest that analysts face, forecasts of analysts become more accurate and less biased. Kadan, Madureira, Wang, and Zach (2009) examine the informativeness of analyst recommendations measured by market reactions surrounding the Global Analyst Research Settlement, the regulation to mitigate the interdependence between research and investment banking in 2002. They report after the agreement, optimistic recommendations have become less frequent and the forecasts have become more informative. Gu and Xue (2008) argue the presence of independent analysts works as a disciplinary measure for non-independent analysts. They find forecast accuracy of non-independent analysts is higher by about 20% when independent analysts are issuing a report for the same firms than when there is no other independent analyst. It has been also reported that the market discounts optimistic recommendation made by affiliated analysts. For example, the average daily abnormal return to buy recommendations made by independent analysts is higher by 3.1 basis points than that of buy recommendations announced by analysts from investment banks (Barber, Lehavy, & Trueman, 2007). To build and maintain a good reputation in the market, affiliated analysts in our research setting are likely to provide more accurate forecasts and less biased opinions on the affiliated stocks by utilizing their information advantages. In line with this argument, we

[10] According to discussions with analysts in major brokerage firms, securities firms are often considered strategically more important within chaebol groups compared to asset management firms. It is also not uncommon that employees of the securities firm who are close to retirement or not performing well move to the affiliated asset management firm.

present the competing hypothesis as follows:

H1b: Affiliated analysts in a business group will provide more accurate forecasts for stocks invested by affiliated asset management firms in the same business group than other stocks (information sharing hypothesis).

While the affiliated analysts may keep their forecasts more accurate according to the information sharing hypothesis, analysts can still choose to be optimistic on certain stocks. Providing selectively optimistic reports while taking advantage of information sharing in general can be optimal strategies to both analysts and affiliated fund management firms. Closely cooperating with fund managers allows the analysts to keep their high reputation and credibility by providing accurate recommendations. Based on their reputation, analysts can maximize the benefits to their affiliated fund management firms by releasing biased reports on certain affiliated stocks, especially, more valuable stocks to the fund management firms. If the total amount invested on a stock is not big enough, analyst recommendations on that stock would not substantially affect profits of affiliated fund management firms and thereby, total profits of the business group. However, as the funding amount increases, the affiliated analysts could be under higher pressure to release more favorable recommendations. Thereby, we propose the following hypothesis:

H2: Affiliated analysts in a business group will provide more optimistic reports for affiliated stocks if the funding amounts on those stocks allocated by affiliated asset management firms

are high.

3. Sample selection and research design

Sample selection

We combine two databases to construct stock recommendations and earnings forecasts samples. First, all stock recommendations and earnings forecasts are obtained from the DataguidePro database for companies listed on the Korean Stock Exchange (KSE) and the Korean Securities Dealers Automated Quotation (KOSDAQ) from July 1, 2000 to February 31, 2008.[11] Then, data on management fees charged to clients and monthly fund holdings of each fund offered during the sample period is provided by the Asset Management Association of Korea (AMAK).[12] For each forecast and recommendation during our research period, we identify whether the analyst who issues the recommendation or earnings forecasts belongs to a brokerage firm which is a subsidiary of a chaebol group and whether the recommended stock is included in a fund portfolio managed by an affiliated fund manager. Since we examine stock recommendations, we consider only equity funds for our analysis. Chaebol affiliations are confirmed by the list of business groups provided by the Korea Fair Trade Commission (KFTC).[13] To alleviate the effects of reiteration, we use only the most recent stock

[11] Lim and Jung (2012) and Song et al. (2012) also use analyst recommendation and forecast data from the same data provider in their studies.

[12] We exclude private equity funds from the fund holding data to focus on mutual funds only. We use the fund data up to 2008 as the financial regulations introduced in 2009 allowed financial institutions to provide both brokerage and asset management services. Although most of business groups maintain separate brokerage firms and asset management firms after the regulatory change, those firms providing consolidated financial services may contaminate our sample.

[13] The definition of a business group by KFTC is a collection of companies that function as one economic entity with a common source of control such as a single controlling shareholder, his/her relatives, and their affiliated

recommendations and earnings forecasts prior to the actual earnings reporting date for each year.[14] The actual earnings reporting dates are obtained from the TS-2000 database. To calculate relative recommendation optimism and relative forecasts accuracy, we further eliminate the stock recommendations and earnings forecasts if the recommended stock are not followed by more than one analyst.[15] Finally, we exclude the observations with missing values to generate control variables. Table 1 describes the detailed procedure of our sample selection. The final sample includes 32,154 stock recommendations and 52,579 earnings forecasts.[16]

Table 2 presents the distribution of stock recommendations in our final sample.[17] Panel A illustrates the distribution of stock recommendations by year. It shows that stock recommendations are evenly distributed across our sample period, with no apparent time-series pattern. Panel B illustrates the distribution of stock recommendations by industry. Industries are classified by Korean Standard Industrial Code (KSIC). Most recommendations are found in manufacturing industry (51.72%), followed by high-tech industry (12.37%) and information and communication industry (11.41%).

Research design

To test our hypotheses, we first estimate the Ordinary Least Square (OLS) regression

companies that own more than 30% of the total equity value of a company.

[14] We also use the sample of all stock recommendations. The regression result with the full sample is reported in Column (6) of Table 5.

[15] Alternatively, we try different cut-off points such as three, four or five analysts following the firm. However, the results with the alternative samples are not qualitatively different from our main results.

[16] The sample size for earnings forecasts is larger than that of stock recommendations as we include earnings forecasts for all future financial years following Lim and Jung (2012). We also re-run our main regression model in Equation (2) using earnings forecasts for the next financial year. The results (untabulated) are qualitatively the same.

[17] The distribution of earnings forecasts are similar to that of stock recommendations and thus is untabulated for simplicity.

model shown in equation (1) with *Relative recommendation* as the dependent variable. Following Firth et al. (2013), *Relative recommendation* is calculated as individual stock recommendation minus the median stock recommendation from all recommendations issued by existing analysts covering the same stock for the month.

$$Relative\ recommendation = \beta_0 + \beta_1 Affiliated + \beta_2 FMAT + \beta_3 Firm\ size + \beta_4 Firm\ coverage + \beta_5 Industry\ coverage + \beta_6 Broker\ size + \beta_7 Analyst\ following + \beta_8 Career\ experience + \beta_9 Firm\ specific\ experience + \beta_{10} Absolute\ forecast\ accuracy + Year\ fixed\ effects + Industry\ fixed\ effects + \varepsilon \quad (1)$$

where *Affiliated* is a dummy variable that equals 1 if the recommendation is issued by affiliated analysts for affiliated stocks and 0 otherwise. If chaebol affiliated analysts release more favorable recommendation on affiliated stocks, consistent with H1a, the coefficient on *Affiliated*, β_1, will be positive. We also include the amount of invested in an affiliated stock by creating a variable, *FAMT* to test H2. Following Firth et al. (2013), *FAMT* is measured as logged total won amounts invested by an affiliated fund management firm for affiliated stocks and zero for non-affiliated stocks. If affiliated analysts provide more optimistic recommendations for affiliated stocks as the funding amounts increase, the sign of *FAMT*, β_2, will be positive, consistent with H2.

In addition, we control for firm, brokerage firm, and analyst specific characteristics documented to affect the analyst's recommendations by the previous studies such as Lim and Jung (2012), Song et al. (2012), and Firth et al. (2013). First, we control for the recommended firm characteristics. *Firm size* is the logarithmic value of the recommended firm's market

capitalization. *Analyst following* is the number of analysts following the recommended firm at the end of the year. To control for the brokerage firm's characteristics we include *Broker size* which is the number of analysts at a brokerage firm. Finally, we control for the analyst's characteristics. *Firm coverage* is the number of companies covered by the analyst each year. *Industry coverage* is the number of industries covered by the analyst each year. *Career experience* is the number of years since the analyst was first listed in the DataguidePro database. *Firm-specific experience* is the number of years of experience related to a particular firm since the analyst's first recommendation appeared in the DataguidePro database. *Absolute forecast accuracy* is the absolute value of the difference between individual forecasted earnings and actual reported earnings, scaled by price and multiplied by -1. We also control for year and industry fixed effects. All control variables are measured at the year-end before the recommendation's issuance. Detailed definitions of the variables are also described in the Appendix.

Furthermore, we use the Heckman selection model to alleviate the sample selection bias caused from the systematic difference between stocks included in mutual funds and those not. If analysts selectively choose to recommend on stocks that are invested by mutual funds, the endogenous selection bias can induce a systematic bias in the analysts' recommendations (McNichols & O'Brien, 1997; O'Brien & Bhushan, 1990). To address this issue, we take two steps of Heckman selection model. In the first stage, we estimate a logit regression with *Funded* as the dependent variable. Following Ljungqvist, Marston, Starks, Wei, and Yan (2007) and Firth et al. (2013), *Broker industry coverage* is used as an instrumental variable. *Broker industry coverage* is the ratio of the number of all existing recommendations from the brokerage firm that cover stocks belonging to the given stock's industry to the total number of all existing recommendations issued by that brokerage firm. In the second stage, we re-estimate

our regression (1) with *Inverse Mill's ratio,* calculated from the first stage, as an additional control variable.

In addition, since analysts' stock recommendations tend to herd toward the average stock recommendation, many observations in our sample have a zero value for *Relative recommendation*. We further use a subsample without zero *Relative recommendation* and re-estimate our regression model (1). Alternatively, we calculate the dependent variable by using the average recommendation instead of the median value. Finally, we perform OLS regression including all recommendations issued during the year, allowing the reiteration of recommendations.

On the other hand, forecasts made by affiliated analysts can be more accurate for affiliated stocks according to H1b. We also employ *Relative forecast accuracy, Absolute forecast accuracy,* and *Forecast optimism* as alternative dependent variables. Following Hong and Kubik (2003), *Absolute forecast accuracy* is defined as the absolute value of the difference between individual forecasted earnings and actual reported earnings, scaled by price and multiplied by -1. Next, we rank all earnings forecasts covering the same company by using the absolute forecast accuracy. The *Relative forecast accuracy* is constructed as follows:

$$Relative\ forecast\ accuracy_{ijt} = 100 - \left[\frac{Rank_{ijt}-1}{Coverage_{jt}-1}\right] * 100 \qquad (2)$$

where $Rank_{ijt}$ is analyst i′s rank of absolute forecast accuracy for firm *j* in year *t*, and $Coverage_{jt}$ is the number of analysts who issue forecasts for firm *j* in year *t*. *Forecast optimism* is calculated as an individual earnings forecast minus the average earnings forecast for the firm in the same target year, scaled by the standard deviation of forecasts for the same firm and target year.

$$Relative\ (Absolute) forecast\ accuracy\ or\ Forecast\ optimism = \beta_0 + \beta_1 Affiliated\ + \beta_2 FAMT + \beta_3 Firm\ size + \beta_4 Firm\ coverage + \beta_5 Industry\ coverage + \beta_6 Broker\ size + \beta_7 Analyst\ followings + \beta_8 Career\ experience + \beta_9 Firm\ specific\ experience + \beta_{10} Forecast\ horizon + Year\ fixed\ effects + Industry\ fixed\ effects + \varepsilon \quad (3)$$

In this equation, if chaebol affiliated analysts release more accurate earnings forecasts on the stock invested by an affiliated mutual fund management firm, the coefficient on *Affiliated,* β_1, will be positive when accuracy measures are used as dependent variables, supporting H1b.

The same control variables used in Equation (1) are also included in Equation (2) except for *Absolute forecast accuracy* which is one of the dependent variables here. In addition, *Forecast horizon* is added, which indicates the target fiscal year for the earnings forecasts.

4. Results

Descriptive statistics

Table 3 presents the descriptive statistics of the variables used in main regression equations (1) and (3). The mean and median of *Relative recommendation* are -0.048 and 0.000, respectively. As its first and third quartile values are all zero, it seems that analysts tend to herd toward the mean recommendation levels. Also, the mean and median of *Relative forecast accuracy* are 48.002 and 50.000, consistent with its definition. *Absolute forecast accuracy* has -0.128 and -0.043 as its mean and median, respectively. *Forecast optimism* has 0.000 and 0.126 as its mean and median, respectively. The mean value of our main independent variable,

Affiliated indicates that 11.1% of recommendations are made for affiliated stocks. *FAMT* has 2.405 and 0.000 as its mean and median, respectively.[18]

Correlations

Table 4 presents the Pearson (upper-right triangle) and Spearman (lower-left triangle) correlations among our dependent variables and the independent variable of our interest, *Affiliated*. It shows that *Affiliated* is negatively correlated with *Relative recommendation*, which means that recommendations by affiliated analysts are less optimistic than others. *Affiliated* is also positively correlated with *Absolute forecast accuracy*, implying that forecasted earnings for affiliated stocks are more accurate than others, consistent with H1b. However, inconsistent with H1b, we find negative correlations between *Affiliated* and *Relative forecasts accuracy*. The correlations between *Affiliated* and *Forecast optimism* are positive but not statistically significant. Other independent variables have coefficients of the value below 0.5, except for the correlations between *Firm size* and *Analyst following* (corr.=0.57 in Pearson correlations, 0.57 in Spearman correlations), and *Career experience* and *Firm-specific experience* (corr.=0.69 in Pearson correlations, 0.65 in Spearman correlations), exhibiting a low probability of multicollinearity issues in our models.[19]

Multivariate analysis

[18] *FAMT* has 20.6762 and 20.9890 as the mean and the median, respectively, for recommendations on affiliated stocks only (i.e., *Affiliated*=1). Its first and third quintile value, in that sample is 19.3391 and 22.1834 , respectively.
[19] In addition, we also find that the high correlations among the variables do not have serious multcollinearity problems as confirmed by the tolerance scores greater than 0.31 and variation inflation factor (VIF) less than 3.18 in our main regression models.

Table 5 presents our multivariate regression results with *Relative recommendation* as a dependent variable. In column (1), with 32,154 stock recommendations-year observations, we analyze the impact of our hypothesized relationship regarding analysts' optimism in affiliated stocks. The coefficient on *Affiliated* is significantly negative (coeff.=-0.028, t-stats.=-3.41), implying that recommendations issued for affiliated stocks are less optimistic than others. This result rejects our first alternative hypothesis, H1a. Interestingly, the coefficient on *FAMT* is significantly positive (coeff.=0.005, t-stats.=1.76) while the coefficients on *Affiliated* remain significantly negative. This means for the affiliated stock with the average funding amount (20.6762), the combined coefficient on the affiliated stock turns to positive (coeff.=0.075).[20] It implies that although the recommendations on affiliated stocks are in general less optimistic than others, they become more optimistic as the funding amounts increase. This result is consistent with H2. Next, the Heckman selection model is estimated and presented in columns (2) and (3). Column (2) performs the first-stage logit regression with *Funded* as the dependent variable. *Funded* is a dummy variable which equals 1 if a recommended stock is included in any mutual funds and 0 otherwise. Column (3) reports the second stage regression result after controlling for the Inverse Mill's ratio obtained from the first stage. The coefficient on *Affiliated* in column (3) is still significantly negative (coeff.=-0.028, t-stats.=-3.36), consistent with the result in column (1). The Inverse Mill's ratio is statistically significant, confirming that our implementation of Heckman selection model is well executed.

Furthermore, we perform OLS regression with *Relative recommendation* calculated using the mean recommendation instead of median recommendation. The results in column (4) still exhibit the significantly negative coefficient on *Affiliated* (coeff.=-0.017, t-stats.=-2.36).

[20] The coefficient on the FAMT for affiliated stocks can be calculated as follows: -0.028+20.6762*0.005.

In column (5), we estimate the OLS regression for a subsample of 7,365 recommendations, which contains observations with non-zero *Relative recommendation*. The result confirms that exclusion of zero *Relative recommendation* does not alter our results. It shows that the coefficient on *Affiliated* is significantly negative (coeff.=-0.103, t-stats=-2.90), confirming the less optimistic recommendations as reported in column (1).

To eliminate the effect of the reiteration of recommendations during the year, our sample tested in columns (1) through (5) includes only the most recent recommendation before the actual earnings announcement date. However, one potential concern of this approach is that it fails to take into account the changes in the recommendations throughout the year. To address this concern, we re-estimate our regression model (1) with the full sample of 246,141 observations and present the results in column (6). The coefficient on *Affiliated* is still significantly negative (coeff.=-0.029, t-stats=-10.87). The main results in Table 5 universally reject the analyst optimism hypothesis (H1a).

To further check if the earnings forecasts issued by affiliated analysts are indeed more accurate than those made by other analysts, consistent with H1b, we conduct additional tests using analysts' earnings forecasts. Table 6 presents the regression results with *Relative* (*Absolute*) *forecast accuracy* and *Forecast optimism* as dependent variables. In column (1), the dependent variable is *Relative forecast accuracy*. The coefficient on *Affiliated* is significantly positive at the 10% significance level (coeff.=7.791, t-stats.=2.22), meaning that the forecasted earnings for affiliated stocks are more accurate than others. Similar to the results in Table 5, the coefficient on *FAMT* is significantly negative (coeff.=-0.386, t-stats.=-2.37), implying that although the earnings forecasts for the affiliated firm are in general more accurate than others, they become less accurate as the funding amounts increase. In columns (2) and (3), we also

perform the Heckman selection model by using the earnings forecasts sample. The coefficient on *Affiliated* in column (3) remains significantly positive (coeff.=7.852, t-stats.=2.24). In columns (4) and (5), we alternatively use *Absolute forecast accuracy* and *Forecast optimism* as a dependent variable, respectively. The coefficient on *Affiliated* in column (4) is significantly positive (coeff.=0.058, t-stats.=2.12), confirming the results in column (1). On the other hand, the coefficient on *Affiliated* in column (5) is significantly negative (coeff.=-0.176, t-stats.=-1.80), implying that earnings forecasts for the affiliated firms are less optimistic. Overall results in Tables 5 and 6 confirm the information sharing argument presented in H1b and also support the selective optimism discussed in H2.

Affiliated non-financial chaebol firms

Lim and Jung (2012) and Song et al. (2012) argue that there is a systematic bias in recommendations and earnings forecasts if chaebol affiliated analysts release recommendations on non-financial firms within the same chaebol group. To control for such effects, we include a dummy variable, *Chaebol firm* which equals to 1 if a chaebol affiliated analyst issues a stock recommendation on a firm belonging to the same chaebol group as the analyst's brokerage firm and 0 otherwise. The regression results are presented in Table 7. *Relative recommendation* is used as the dependent variable in columns (1) and (2) and *Relative forecast accuracy* in columns (3) and (4). The *Chaebol firm* dummy is included in columns (1) and (3) and additionally, its interaction with *Affiliated* in columns (2) and (4). The results in reveal that the coefficients on *Chaebol firm* are significantly positive in columns (1) and (2) (coeff.=0.149, t-stats.=5.40; coeff.=0.170, t-stats.=5.37, respectively) and significantly negative in columns (3) and (4) (coeff.=-6.549, t-stats.=-4.04; coeff.=-7.040, t-stats.=-3.72, respectively), consistent

with the findings by Lim and Jung (2012) and Song et al. (2012). Furthermore, the coefficients on *Affiliated* still remain significantly negative in columns (1) and (2) (coeff.=-0.029, t-stats.=-3.53; coeff.=-0.028, t-stats.=-3.33, respectively) and significantly positive in columns (3) and (4) (coeff.=7.598, t-stats.=2.17; coeff.=7.654, t-stats.=2.18, respectively), supporting our information sharing hypothesis. However, the coefficients on the interaction between *Chaebol firm* and *Affiliated* in columns (2) and (4) are not statistically significant, implying that our main results are not affected by whether the covered stock is a chaebol member firm or not.

5. Additional tests

Although our overall empirical results support the information sharing hypothesis, it is still questionable how mutual fund managers can benefit by sharing such information with their affiliated analysts. One possibility is that analysts selectively provide biased reports about stocks more valuable to mutual fund managers, consistent with H2. To extend our findings, we perform additional tests to see if a certain type of affiliated stocks indeed receive more favorable recommendations by the affiliated analysts.

Fund management fees

Mutual fund companies charge different levels of management fees to customers on their funds, which indicates various contributions of those funds toward their firm profits.[21] The results on the funding amounts (*FAMT*) signify that affiliated analysts may issue distorted

[21] Various transaction fees are imposed by fund management firms on the fund's management, sales, and consignment. Of such transaction fees, only the management fee is directly paid to mutual fund firms.

recommendations on more valuable stocks to their affiliated fund management firms. Likewise, affiliated analysts may issue more favorable recommendations to stocks included in the fund with high management fees as it can contribute more to the profits of the mutual fund firm and those of the entire business group. To examine this conjecture, we create a new variable, *Management fee*, which is an average percentage annual fee charged on the funds which include the cover stock to the clients. The regression model (1) is re-estimated with the new variable and its interaction variable, *Management fee*Affiliated*. Table 8 presents the regression results. *Relative recommendation* is a dependent variable in the first columns and *Relative forecast accuracy* in the second columns. In columns (1) and (3), we test the subsample which contains analysts' recommendations on the stocks included in any mutual funds (i.e., *Funded*=1). The coefficients on *Management fee* are not statistically significant in columns (1) and (3) (coeff.=0.015, t-stats.=0.87; coeff.=-0.223, t-stats.=-0.23, respectively), implying that the management fees in general do not affect to analysts' stock recommendations or earnings forecasts. Meanwhile, the coefficient on *Management fee*Affiliated* is significantly positive in column (1) (coeff.=0.106, t-stats.=2.05) and significantly negative in column (3) (coeff.=-6.128, t-stats.=-2.32), implying that affiliated analysts issue more favorable stock recommendations but less accurate earnings forecasts for the affiliated stocks with higher management fees. This result is also confirmed by the results in columns (2) and (4) with the sub-sample of affiliated stocks only (i.e., *Affiliated*=1). The result shows that the coefficient on *Management fee* is significantly positive in column (2) (coeff.=0.110, t-stats.=1.82) and negative in column (4) (coeff.=-5.151, t-stats.=-1.91), supporting our conjecture on the selective bias of affiliated analysts' recommendations.

New inclusion and termination in the fund

When a fund manager includes a new stock in their fund portfolio, the returns on such fund will be immediately evaluated in the market and likely to be used as an estimate proxy for the fund manager's ability. Thus, in the initial year when a new stock is included to the fund, the fund manager may ask affiliated analysts to help boost the returns of such fund. To test this conjecture, we examine the change in recommendations during the initial year of a new stock inclusion to the fund and the termination of stock coverage from the fund. Specifically, we perform OLS regression with Δ*Recommendation* as the dependent variable and logit regressions with *Upgrade* and *Downgrade*, respectively. Δ*Recommendation* is an indicator variable whose value is equal to 1 for an upgraded stock recommendation, -1 for an downgraded stock recommendation, and 0 for the same stock recommendation from the previous recommendation *Upgrade* (*Downgrade*) is a dummy variable which equals to 1 if an analyst releases upgraded (downgraded) stock recommendation comparing to the previous recommendation and 0 otherwise. The new independent variables of our interest, *Affiliation_Start* (*Affiliation_Quit*) is a dummy variable which equals to 1 if it is the initial year that the recommended stock is included in (excluded from) the affiliated funds and 0 otherwise. The regression results are shown in Table 9. The coefficients on *Affiliation_Start* are significantly positive (coeff.=0.215, t-stats.=1.97) when *Upgrade* is used as the dependent variables but significant negative (coeff.=-0.435, t-stats.=-3.31) when *Downgrade* is used as the dependent variable. Conversely, the coefficients on *Affiliation_Quit* is significantly negative (coeff.=-0.586, t-stats.=-3.79) when *Upgrade* is used as the dependent variables but not statistically significant when *Downgrade* is used as the dependent variable. The results for Δ*Recommendation* are also consistent with those regarding *Upgrade* and *Downgrade*, showing a positive coefficient on *Affiliation_Start* but a negative coefficient on *Affiliation_Quit.* Overall,

the results confirm our conjecture that affiliated analysts change their recommendations to be more optimistic on the new stock included in the fund held by affiliated mutual fund managers during the initial year of the inclusion.

Market reaction

If affiliated analysts are accurate in general but selectively biased toward affiliated stocks, how does the market react to such recommendations? To answer this question, we examine the size adjusted three days buy and hold abnormal return (*Buy–and-hold 3 day abnormal return*) calculated as the cumulative three day buy-and-hold returns for the recommended securities minus the average cumulative three-day buy-and-hold return for the relevant size decile, centered on the recommendation date. Specifically, following Lin and McNichols' (1998) return model, we estimate the OLS regression model (3) with *Buy and hold 3 day abnormal return* as the dependent variable.

$$Buy\ and\ hold\ 3\ day\ abnormal\ return = \alpha_1 Buy + \alpha_2 Sell + \alpha_3 Buy * Affiliated + \alpha_4 Sell * Affiliated + \varepsilon \quad (3)$$

where *Buy* is an indicator variable for 'Strong Buy' or 'Buy' recommendations; *Sell* is an indicator variable for 'Hold', 'Underperform', or 'Sell' recommendations;

Table 10 presents the OLS regression results for the market reaction analyses. It reveals that stock market, in general, efficiently react to analysts' recommendations. That is, the buy-and-hold 3 day abnormal returns are positive to analysts' 'Strong buy' and 'Buy' recommendations while negative to analysts' 'Hold', 'Underperform' and 'Sell' recommendations. However, the coefficients on both *Buy*Affiliated* and *Sell*Affiliated* are all

significantly negative, implying that the market discounts the affiliated analysts' recommendations for Buy recommendations due to a possible bias caused by the group affiliation. For Sell recommendations, investors react even more strongly as they would consider biased affiliated analysts are less likely to report such negative recommendations than others. The market appears to perceive Sell recommendations from affiliated to be more impactful and more informative than the same recommendation issued by other analysts.

6. Conclusion

This study examines if the group affiliation between asset management firms and brokerage firms affects sell-side analyst recommendations in business groups. We test the analyst optimism hypothesis and the information sharing hypothesis. Our main results are consistent with the information sharing hypothesis, showing that affiliated analysts report more accurate forecasts on the stock held by affiliated mutual funds. Although our overall empirical results support the information sharing hypothesis, the analyst optimism increases with the holding amount of stocks invested and fund management fees charged by affiliated mutual fund managers. Also, an increased optimistic bias in recommendations is found during the beginning year of new stock inclusion in the affiliated fund. Finally, we find the stock market discounts buy recommendations by affiliated analysts due to the possible bias caused by the group affiliation but react more strongly to sell recommendations by affiliated analysts.

Our findings have practical implications to corporate managers, investors and regulators. The increased forecast accuracy of affiliated analysts supports the notion that establishing a business cluster for companies in the finance industry can create a synergy effect. This strategy will be particularly effective for firms with long-term business relationships such

as brokerage firms (responsible for marketing and sales of funds) and asset management firms (engaged in fund management and stock trading). Furthermore, it will be more impactful when these firms belong to the same business group as subsidiaries. The family group can combine research and financial resources from multiple financial firms within the group. In Korea, chaebol groups own multiple financial institutions, for example, Samsung group has subsidiaries such as Samsung Life Insurance, Samsung Fire & Marine Insurance, Samsung Card, Samsung Securities, Samsung Asset Management, and Samsung Venture Investment, etc. These separate firms provide financial services in different areas which allows each firm to collect market-wide information through diverse channels. Since such information can be shared among family firms, the overall research efficacy of the group exceeds that of an independent brokerage firm. Such information can be utilized to identify investment opportunities both in the financial and manufacturing sectors. A unique aspect of this information sharing process is that since the fund managers and analysts are not employed or directly working in the same firm, there is no conflicts of interest, such as defined under Title V of the Sarbanes-Oxley Act in the US, and this information sharing is not regarded as an illegal activity.

However, investors need to be wary of possible adverse effects caused by close cooperation between fund managers and financial analysts. One example shown in our paper is that analysts might strategically provide optimistic opinions on the selected stocks for maximization of the total group profit or for window-dressing purposes in favor of affiliated fund managers. The problem is this type of subtle manipulation will be hard to detect, especially for individual clients of fund management firms. Furthermore, there is no requirement for fund managers to publicly disclose which individual assets are included in their portfolios while they are only required to disclose investment returns and investment ratios of

asset classes quarterly. This would allow affiliated fund managers to secretly collaborate with affiliated analysts without a strict scrutiny from their clients. Providing high commission fees on mutual fund sales to financial advisors can be also used to support such collaboration. This practice, however, has recently been made illegal in European countries. For example, the Retail Distribution Review (RDR) rules in the UK were introduced at the end of 2012 and similarly in EU Article 24 of the Markets Infrastructure Financial Instruments Directive 2 introduced in 2017 restricts fund companies from directly paying commission fees to financial advisors upon mutual fund sales. However, according to our findings fund managers still can provide non-monetary compensation to analysts by sharing exclusive information about the firms in their portfolios. Regulators would need to help individual investors make fully informed investment decisions, considering that such potential agency conflicts exist.

Appendix. Definitions of variables

Variable Names	Variable Definitions
Relative recommendation	Individual stock recommendation minus the median stock recommendation of all recommendations issued by analysts covering the same stock within the month prior to the earnings announcement date each year
Δ*Recommendation*	An indicator variable whose value is equal to 1 for an upgraded stock recommendation, -1 for an downgraded stock recommendation, and 0 for the same stock recommendation from the previous recommendation
Upgrade	A dummy variable which equals 1 if an analyst releases an upgraded stock recommendation from the previous recommendation and 0 otherwise
Downgrade	A dummy variable which equals 1 if an analyst releases a downgraded stock recommendation from the previous recommendation and 0 otherwise
Absolute forecast accuracy	Absolute value of the difference between individual forecasted earnings and actual reported earnings for the same financial year scaled by the stock price, multiplied by -1
Relative forecast accuracy	Percentage rank of absolute forecast accuracy
Forecast optimism	Size-adjusted buy-and-hold abnormal returns during three days surrounding the recommendation date. calculated as the buy-and-hold return minus the average of the buy-and-hold return for the relevant size decile
Buy and hold 3 day abnormal return	Individual forecasted earnings minus the average forecasted earnings by all analysts that report a recommendation for the same firm and target-year, scaled by the standard deviation of forecasts for the firm and target year
Affiliated	A dummy variable which equals 1 if a recommendation is issued by an analyst belonging to a chaebol-affiliated brokerage firm and simultaneously the recommended stock is also invested by a mutual fund managed by a firm within the same chaebol-group as the brokerage and 0 otherwise
Funded	A dummy variable which equals 1 if a recommended stock is included in any mutual fund and 0 otherwise
Management fee	Percentage annual fees related to the management of the fund paid by a fund holder

Appendix - *Continued*

Chaebol firm	A dummy variable which equals 1 if a chaebol affiliated analyst issues a stock recommendation on a firm belonging to the same chaebol group as the analyst's brokerage and 0 otherwise
Affiliation_Start	A dummy variable which equals 1 for the year when a recommended stock is newly included in the fund owned by an affiliated fund management firm and 0 otherwise
Affiliation_Quit	A dummy variable which equals 1 for the year when a recommended stock is firstly excluded in the fund owned by an affiliated fund management firm and 0 otherwise
Buy	A dummy variable which equals to 1 if the recommendation is 'Strong Buy' or 'Buy' and 0 otherwise
Sell	A dummy variable which equals to 1 if the recommendation is 'Hold', 'Underperform' or 'Sell' and 0 otherwise
FAMT	Logarithmic value of total won amounts invested by mutual funds if *Affiliated*=1 and 0 if *Affiliated*=0.
Firm size	Log of market capitalization
Firm coverage	Number of companies covered by an analyst for the year
Industry coverage	Number of industries covered by an analyst for the year
Broker size	Number of analysts at the brokerage firm
Analyst following	Number of analysts following the recommended firm at the end of the year
Career experience	Number of years since the analyst is included in the DataguidePro database
Firm-specific experience	Number of years of experience related to a particular firm, since the analyst's first recommendation appears in the DataguidePro database
Broker industry coverage	Ratio of the number of all recommendations from the brokerage firm that cover stocks belonging to the given stock's industry to the total number of all recommendations issued by that brokerage firm
Forecast horizon	Number of years between the earnings forecasting date and the corresponding report date of the actual earnings on the TS-2000 database

Note. This table describes the detailed definitions of all variables used in this paper.

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Table 1. Sample construction

Panel A: Stock recommendation

	# of stock recommendations		% of stock recommendations
All stock recommendations on DataguidePro from July 2001 to February 2008	276,818		
Affiliated=0		238,562	86.18%
Affiliated=1		38,256	13.82%
Less: Delete except for the most recent recommendation before the actual earnings announcement date for a year.	(243,386)		
Less: Stock recommendations for firms followed by less than two analysts	(973)		
Less: Stock recommendations with missing control variables	(305)		
Final sample	32,154		
Affiliated=0		28,576	88.87%
Affiliated=1		3,578	11.13%

Panel B: Analyst earnings forecasts

	# of earnings forecasts		% of earnings forecasts
All analysts' earnings forecasts on DataguidePro from July 2001 to February 2008	666,787		
Affiliated=0		572,096	85.80%
Affiliated =1		94,691	14.20%
Less: Delete except for the most recent forecasts before the actual earnings announcement date for a year.	(612,217)		
Less: Earnings forecasts for firms followed by less than two analysts	(1,587)		
Less: Earnings forecasts with missing control variables	(404)		
Final sample	52,579		
Affiliated=0		46,674	88.77%
Affiliated=1		5,905	11.23%

Note. Table 1 shows the sample selection process. See the Appendix for variable definitions.

Table 2. Sample distribution

Panel A: Distribution by year

Year	Frequency (#)	Percentage (%)
2001	3,382	10.52
2002	4,890	15.21
2003	4,791	14.90
2004	4,561	14.18
2005	4,583	14.25
2006	3,987	12.40
2007	3,937	12.24
2008	2,023	6.29
Total	32,154	

Panel B: Distribution by industry

Industry	Frequency (#)	Percentage (%)
Construction	1,137	3.54
Mining and quarrying	9	0.03
Education	156	0.49
Financial and insurance activities	2,755	8.57
Agriculture, forestry and fishing	19	0.06
Wholesale and retail service	1,896	5.90
Real estate, renting, and leasing	30	0.09
Business facilities and management services	302	0.94
Accommodation and food service	23	0.07
Arts, sports and leisure services	283	0.88
Transportation	580	1.80
Electricity, gas, steam and water supply	590	1.83
Professional, scientific and technical activities	3,979	12.37
Manufacturing	16,631	51.72
Information and communications	3,669	11.41
Sewerage, waste management, materials recovery and remediation activities	26	0.08
Membership organizations, repair and other personal services	69	0.21
Total	32,154	

Table 3. Descriptive statistics

Variables	N	Mean	Median	S.D.	Q1	Q3
Relative recommendation	32,154	-0.048	0.000	0.451	0.000	0.000
Relative forecast accuracy	52,579	48.002	50.000	33.340	18.182	76.923
Absolute forecast accuracy	52,579	-0.128	-0.043	0.272	-0.112	-0.012
Forecast optimism	52,494	0.000	0.126	0.927	-0.667	0.671
Affiliated	32,154	0.111	0.000	0.314	0.000	0.000
FAMT	32,154	2.405	0.000	6.819	0.000	0.000
Firm size	32,154	13.222	13.111	1.868	11.741	14.638
Firm coverage	32,154	14.916	14.000	8.318	10.000	18.000
Industry coverage	32,154	2.804	3.000	1.471	2.000	4.000
Broker size	32,154	22.729	22.000	10.161	15.000	29.000
Analyst following	32,154	18.229	18.000	9.982	10.000	25.000
Career experience	32,154	2.373	2.000	1.956	1.000	4.000
Firm-specific experience	32,154	1.289	1.000	1.634	0.000	2.000
Forecast horizon	52,579	1.185	1.000	1.000	0.000	2.000

Note. This Table presents the descriptive statistics of the variables used in main regression models. S.D. represents standard deviation. Q1 and Q3 represent the first and third quartile, respectively. N represents the number of observations. All detailed definitions of variables in this table are described in the Appendix.

Table 4. Pearson and Spearman correlation among variables of interest

#	Variables	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Δ*Relative recommendation*	32,154	1.00	-0.04	-0.03	0.04	-0.03	0.00	-0.08	-0.01	0.01	-0.02	-0.08	-0.04	-0.04	-0.01
				(0.00)	(0.00)	(0.00)	(0.00)	(1.00)	(0.00)	(0.14)	(0.21)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
2	*Relative forecast accuracy*	52,579	-0.04	1.00	0.19	-0.02	-0.01	-0.02	-0.03	0.01	0.00	-0.02	-0.05	0.05	0.06	-0.13
			(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.10)	(0.32)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
3	*Absolute forecast accuracy*	52,579	-0.05	0.54	1.00	-0.07	0.05	0.05	0.28	-0.04	-0.03	-0.04	0.17	0.08	0.10	-0.21
			(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
4	*Forecast optimism*	52,494	0.04	-0.07	0.04	1.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.08	-0.10	-0.10	0.25
			(0.00)	(0.00)	(0.00)		(0.80)	(0.79)	(0.89)	(0.00)	(0.41)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
5	*Affiliated*	32,154	-0.03	-0.01	0.05	0.00	1.00	0.18	0.14	-0.08	-0.01	0.08	0.09	0.08	0.05	0.00
			(0.00)	(0.00)	(0.00)	(0.47)		(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.36)
6	*FAMT*	32,154	-0.03	-0.02	0.05	0.00	1.00	1.00	0.08	-0.02	-0.03	0.00	0.03	0.05	0.03	0.00
			(0.00)	(0.00)	(0.00)	(0.46)	(0.00)		(0.00)	(0.00)	(0.00)	(0.70)	(0.00)	(0.00)	(0.00)	(0.31)
7	*Firm size*	32,154	-0.08	-0.03	0.31	0.01	0.14	0.15	1.00	-0.16	-0.17	-0.05	0.57	0.23	0.29	-0.10
			(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
8	*Firm coverage*	32,154	-0.01	0.04	-0.02	-0.01	-0.09	-0.09	-0.18	1.00	0.47	0.07	-0.03	-0.01	-0.07	-0.01
			(0.03)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.06)	(0.00)	(0.02)
9	*Industry coverage*	32,154	0.01	0.01	0.02	0.00	-0.02	-0.02	-0.16	0.42	1.00	0.06	-0.10	-0.12	-0.12	0.03
			(0.13)	(0.01)	(0.00)	(0.45)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
10	*Broker size*	32,154	-0.02	-0.01	-0.04	-0.04	0.05	0.05	-0.04	0.02	0.05	1.00	-0.05	-0.04	-0.02	0.03
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)
11	*Analyst following*	32,154	-0.08	-0.05	0.21	0.09	0.10	0.10	0.57	-0.05	-0.12	-0.06	1.00	-0.05	0.07	-0.11
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
12	*Career experience*	32,154	-0.04	0.06	0.09	-0.10	0.08	0.09	0.23	0.04	-0.10	0.00	-0.01	1.00	0.69	-0.09
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.59)	(0.17)		(0.00)	(0.00)
13	*Firm-specific experience*	32,154	-0.05	0.09	0.13	-0.10	0.05	0.05	0.29	-0.03	-0.10	0.01	0.13	0.65	1.00	-0.14
			(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)		(0.00)
14	*Forecast horizon*	52,579	-0.01	-0.13	-0.31	0.26	-0.01	-0.01	-0.13	-0.01	0.04	0.01	-0.12	-0.12	-0.22	1.00
			(0.19)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.09)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	

Note. Table 4 presents Pearson (Upper-right triangle) and Spearman (Lower-left triangle) correlations among the variables of interest used in main regression models. N represents the number of observations. All detailed definitions of variables in this table are described in the Appendix. Figures in parentheses are p-values.

Table 5. Relative recommendations

	Dependent variable:					
		Heckman Selection Model		*Relative recommendation based on average recommendations*	*Relative recommendation* OLS	*Relative recommendation* OLS
Independent variables	*Relative recommendation* OLS (1)	*Funded* = 1? 1st Step (2)	*Relative recommendation* 2nd Step (3)	*OLS* (4)	w/o Relative recommendation=0 (5)	Sample with all recommendations (6)
Affiliated	-0.028***		-0.028***	-0.017**	-0.103***	-0.029***
	(-3.41)		(-3.36)	(-2.36)	(-2.90)	(-10.87)
FAMT	0.005*		0.005*	0.004	0.034	0.000***
	(1.76)		(1.83)	(1.62)	(1.17)	(3.80)
Firm size	-0.007***	-0.179***	-0.017***	-0.004**	-0.037***	-0.004***
	(-3.64)	(-29.39)	(-2.91)	(-2.08)	(-4.30)	(-5.53)
Firm coverage	-0.002***	-0.003***	0.005*	-0.002***	-0.006***	-0.001***
	(-4.07)	(-3.14)	(1.82)	(-5.50)	(-3.81)	(-5.12)
Industry coverage	0.001	0.014**	-0.010**	0.004**	-0.001	-0.004***
	(0.28)	2.0057	(-2.53)	(2.02)	(-0.14)	(-4.53)
Broker size	-0.001***	0.001	-0.002***	-0.002***	-0.006***	-0.001***
	(-5.69)	0.6933	(-4.41)	(-8.62)	(-5.58)	(-10.25)
Analyst following	-0.003***	0.021***	0.001	0.000	-0.016***	-0.003***
	(-8.64)	19.0741	(0.58)	(-0.79)	(-10.41)	(-20.24)
Career experience	0.002	0.066***	-0.001***	0.002	0.018	0.004***
	(0.91)	9.4143	(-5.57)	(1.05)	(1.62)	(4.22)
Firm-specific experience	-0.004*	-0.116***	-0.002**	-0.006***	-0.011	-0.003***
	(-1.91)	(-17.51)	(-2.54)	(-3.29)	(-1.16)	(-4.53)
Absolute forecast accuracy	-0.006	0.197***	0.005	-0.008	-0.023	-0.017***
	(-0.76)	8.1618	(0.48)	(-1.13)	(-0.66)	(-5.42)
Broker industry coverage		-0.003				
		(-0.02)				
Inverse Mill's ratio			0.099*			
			(1.79)			
Intercept	0.013	4.432***	0.155	0.078	-0.311	-0.078***
	(0.21)	(15.53)	(1.54)	(1.45)	(-1.08)	(-3.35)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes

Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.012	0.258	0.012	0.006	0.068	0.008
[F-value]	[13.30]***	{6850.17}***	[13.00]***	[6.99]***	[17.25]***	[61.73]***
N	32,154	32,154	32,154	32,154	7,365	246,141

Note. Table 5 presents the regression results of examining the optimistic bias in the stock recommendations stemming from the Chaebol-affiliated mutual fund-brokerage firm business relationship. In column (1), we perform OLS regression with *Relative recommendation* as the dependent variable. In columns (2) and (3), we estimate the Heckman selection model. Column (2) performs the first-stage logit regression with *Funded* as the dependent variable. Following Firth et al. (2013), *Broker industry coverage* is used as an instrumental variable. Column (3) reports the second stage regression result, additionally controlling for the *Inverse Mill's ratio* obtained from the first stage. In column (4), we perform OLS regression in which the dependent variable is *Relative recommendation* calculated using the mean recommendation instead of median recommendation. In column (5), we re-estimate the OLS regression with *Relative recommendation* as the dependent variable on the subsample which excludes observations where *Relative recommendation* has a value of 0. In column (6), we perform OLS regression in which the dependent variable is *Relative recommendation* as the dependent variable on the full sample to allow the reiteration recommendations during a year. Numbers in parentheses are t-values. All detailed definitions of variables in this table are described in the Appendix. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Forecast accuracy and optimism

		Dependent variable:			
		Heckman Selection Model			
	Relative forecast accuracy	*Funded* = 1?	*Relative forecast accuracy*	*Absolute forecast accuracy*	*Forecast optimism*
	OLS	1st Step	2nd Step	OLS	OLS
Independent variables	(1)	(2)	(3)	(4)	(5)
Affiliated	7.791**		7.852**	0.058**	-0.170*
	(2.22)		(2.24)	(2.12)	(-1.80)
FAMT	-0.386**		-0.389**	-0.002*	0.009**
	(-2.37)		(-2.38)	(-1.86)	(1.97)
Firm size	-0.438***	-0.180***	-0.245	0.049***	-0.003
	(-3.60)	(-35.69)	(-0.65)	(52.31)	(-0.99)
Firm coverage	0.000	-0.004***	0.004	0.000	-0.009***
	(0.01)	(-4.25)	(0.19)	(-1.07)	(-16.00)
Industry coverage	0.326**	0.005	0.320**	0.002**	0.006*
	(2.49)	(0.89)	(2.44)	(2.01)	(1.80)
Broker size	-0.053***	0.001*	-0.054***	0.000***	-0.003***
	(-3.57)	(1.66)	(-3.61)	(-3.14)	(-8.10)
Analyst following	-0.242***	0.025***	-0.269***	-0.002***	0.008***
	(-11.27)	(27.91)	(-4.94)	(-10.93)	(14.20)
Career experience	-0.229*	0.052***	-0.279*	0.000	0.002
	(-1.89)	(10.30)	(-1.83)	(0.23)	(0.55)
Firm-specific experience	1.031***	-0.102***	1.135***	-0.001	-0.013***
	(8.86)	(-21.20)	(5.03)	(-1.15)	(-4.10)
Forecast horizon	-3.990***	0.009	-3.996***	-0.051***	0.245***
	(-27.11)	(1.43)	(-27.07)	(-44.66)	(61.79)
Broker industry coverage		-0.046			
		(-0.44)			
Inverse Mill's ratio			-1.929		
			(-0.54)		
Intercept	60.216***	4.353***	57.588***	-0.672***	-0.330***
	(16.67)	(19.32)	(9.47)	(-24.06)	(-3.40)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes

Adj. R^2	0.034	0.231	0.021	0.133	0.101
[F-value] or $\{\chi^2\}$	[57.72]***	{9882.75}***	[35.03]***	[246.39]***	[179.55]***
N	52,579	52,579	52,579	52,579	52,494

Note. Table 6 presents the OLS regression results of examining the accuracy and optimism in the forecasted earnings by an analyst in the Chaebol-affiliated mutual fund-brokerage firm business relationship. In column (1), we perform OLS regression with *Relative forecast accuracy* as the dependent variable. In columns (2) and (3), we estimate the Heckman selection model. Column (2) performs the first-stage logit regression with *Funded* as the dependent variable. Following Firth et al. (2013), *Broker industry coverage* is used as an instrumental variable. Column (3) reports the second stage regression result, additionally controlling for the *Inverse Mill's ratio* obtained from the first stage. In columns (4) and (5), we perform OLS regressions in which the dependent variable is *Absolute forecast accuracy* and *Forecast optimism*, respectively. Numbers in parentheses are t-values. All detailed definitions of variables in this table are described in the Appendix. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Additional tests for alternative explanations

	Dependent variable:			
	Relative recommendation		*Relative forecast accuracy*	
Independent variables	(1)	(2)	(3)	(4)
Affiliated	-0.029***	-0.028***	7.598**	7.654**
	(-3.53)	(-3.33)	(2.17)	(2.18)
Chaebol firm	0.149***	0.170***	-6.565***	-7.040***
	(5.40)	(5.37)	(-4.04)	(-3.72)
*Affiliated*Chaebol firm*		-0.086		1.816
		(-1.36)		(0.49)
FAMT	0.005*	0.005*	-0.374**	-0.378**
	(1.81)	(1.80)	(-2.30)	(-2.32)
Firm size	-0.008***	-0.008***	-0.412***	-0.412***
	(-3.94)	(-3.94)	(-3.39)	(-3.38)
Firm coverage	-0.001***	-0.001***	-0.001	-0.001
	(-4.01)	(-4.01)	(-0.04)	(-0.03)
Industry coverage	0.001	0.001	0.332**	0.332**
	(0.24)	(0.24)	(2.53)	(2.53)
Broker size	-0.002***	-0.002***	-0.048***	-0.048***
	(-6.20)	(-6.20)	(-3.21)	(-3.21)
Analyst following	-0.003***	-0.003***	-0.242***	-0.242***
	(-8.68)	(-8.70)	(-11.29)	(-11.29)
Career experience	0.002	0.002	-0.229*	-0.228*
	(0.90)	(0.89)	(-1.89)	(-1.88)
Firm-specific experience	-0.004*	-0.004*	1.023***	1.023***
	(-1.78)	(-1.77)	(8.79)	(8.79)
Absolute forecast accuracy	-0.006	-0.006		
	(-0.75)	(-0.74)		
Forecast horizon			-3.994***	-3.994***
			(-27.14)	(-27.14)
Intercept	0.024	0.024	59.768***	59.768***
	(0.39)	(0.38)	(16.54)	(16.54)
Industry fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Adj. R^2	0.013	0.013	0.035	0.035
[F-value]	[13.77]***	[13.43]***	[56.51]***	[54.90]***
N	32,154	32,154	52,579	52,579

Note. Table 7 presents the OLS regression results with *Relative recommendation* in columns (1) and (2) and *Relative forecast accuracy* in columns (3) and (4), respectively, as the dependent variable, controlling for the possible omitted variables which may cause an endogeneity problem. In columns (1) and (3), we control for the relationship between the brokerage and target firm within the same Chaebol group by including *Chaebol firm*. In columns (2) and (4), we included the interaction between *Chaebol firm* and *Affiliated*. Numbers in parentheses are t-values. All detailed definitions of variables are described in the Appendix. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 8. The effect of management fees on affiliated analyst recommendations

	Dependent variable:			
	Relative recommendation		*Relative forecast accuracy*	
	Funded only	Affiliation only	Funded only	Affiliation only
Independent variables	(1)	(2)	(3)	(4)
Management fee	0.015	0.110*	-0.223	-5.151*
	(0.87)	(1.82)	(-0.23)	(-1.91)
*Affiliated*Management fee*	0.106**		-6.128**	
	(2.05)		(-2.32)	
Affiliated	-0.050**		10.559	
	(-2.51)		(1.47)	
FAMT	0.014	0.013	-0.497	-0.105
	(0.89)	(0.70)	(-1.45)	(-0.28)
Firm size	-0.010*	0.013	-0.658**	0.655
	(-1.84)	(0.74)	(-2.04)	(0.71)
Firm coverage	-0.001**	0.005*	0.104**	0.476***
	(-2.05)	(1.84)	(2.55)	(3.19)
Industry coverage	0.004	-0.026*	0.200	-0.336
	(0.85)	(-1.82)	(0.83)	(-0.44)
Broker size	-0.002***	-0.002	-0.063**	-0.390***
	(-3.96)	(-1.25)	(-2.31)	(-4.86)
Analyst following	-0.002***	-0.004*	-0.353***	-0.277***
	(-3.46)	(-1.81)	(-9.05)	(-2.61)
Career experience	0.002	-0.018	-0.625***	-2.029***
	(0.47)	(-1.37)	(-2.87)	(-3.31)
Firm-specific experience	0.000	-0.006	2.312***	2.836***
	(0.01)	(-0.39)	(9.66)	(4.31)
Absolute forecast accuracy	-0.024*	-0.142***		
	(-1.81)	(-2.79)		
Forecast horizon			-6.419***	-3.879***
			(-22.50)	(-4.84)
Intercept	0.044	-0.393	71.498***	81.780***
	(0.37)	(-1.04)	(10.16)	(4.27)
Industry fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Adj. R^2	0.014	0.028	0.058	0.073
[F-value]	[4.51]***	[2.07]***	[26.92]***	[5.65]***
N	8,327	980	14,601	1,753

Note. Table 9 presents the regression results of examining the effect of management fee of the fund on our hypothesized relationship. The dependent variable is *Relative recommendation* in columns (1) and (2) and *Relative forecast accuracy* in columns (3) and (4), respectively. In columns (1) and (3), we use subsample to include stock recommendations and earnings forecasts on funded stocks. In columns (2) and (4), we restrict our sample to only our hypothesized relationship (*Affiliated* = 1). Numbers in parentheses are t-values. All detailed definitions of variables are described in the Appendix. *** and ** indicate significance at the 1% and 5%, respectively.

Table 9. Change in recommendations around a start and a termination of fund coverage

Independent variables	*Dependent variable:*		
	ΔRecommendation	*Upgrade*	*Downgrade*
	(1)	(2)	(2)
Affiliation_Start	0.033***	0.215**	-0.435***
	(3.35)	(1.97)	(-3.31)
Affiliation_Quit	-0.012	-0.586***	-0.170
	(-1.22)	(-3.79)	(-1.39)
Funded	0.005	0.150***	0.059
	(0.95)	(2.80)	(1.14)
Firm size	0.009***	0.079***	-0.072***
	(5.22)	(4.13)	(-3.95)
Firm coverage	0.000	0.005	0.006*
	(-0.43)	(1.54)	(1.78)
Industry coverage	0.001	-0.001	-0.016
	(0.58)	(-0.04)	(-0.77)
Broker size	0.000*	0.006**	-0.002
	(1.77)	(2.49)	(-0.74)
Analyst following	-0.001**	0.007**	0.017***
	(-2.44)	(2.21)	(5.49)
Career experience	-0.001	-0.010	0.029
	(-0.32)	(-0.35)	(1.04)
Firm-specific experience	0.004**	0.435***	0.404***
	(2.46)	(20.64)	(19.33)
Forecast accuracy	0.004	-0.046	-0.130*
	(0.54)	(-0.52)	(-1.74)
Intercept	-0.113**	-7.245***	-5.811***
	(-2.14)	(-9.06)	(-7.27)
Industry fixed effect	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Adj. R^2	[6.18]***	0.130	0.120
[F-value] or {χ2}	0.006	{1639.06}***	{1613.91}***
N	32,154	32,154	32,154

Note. Table 9 presents the regression results of examining the change in recommendations around our hypothesized affiliations' start and quit. In column (1), we perform OLS regression with Δ*Recommendation* as the dependent variable. In columns (2) and (3), we perform logit regressions with *Upgrade* and *Downgrade*, respectively. Numbers in parentheses are t-values. All detailed definitions of variables are described in the Appendix. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 10. Market returns

Independent variables	Dependent variable: *Buy and hold 3 day abnormal return*
Buy	0.008***
	(20.24)
Sell	-0.003***
	(-5.09)
*Buy*Affiliated*	-0.002*
	(-1.66)
*Sell*Affiliated*	-0.003*
	(-1.95)
Adj. R^2	0.009
[F-value]	[120.33]***
N	32,154
F-value for test1: *Buy* + *Buy*Affiliated*=0	[31.83]***
F-value for test2: *Sell* + *Sell*Affiliated*=0	[13.88]***

Note. Table 10 presents the OLS regression results of examining the stock market reaction upon the issuance of recommendations. The dependent variables in this table are *Buy and hold 3 day abnormal return*, size adjusted three days buy-and-hold abnormal returns during (-1, 1) window centered on the recommendation date. Numbers in parentheses are t-values. Numbers in parentheses in square bracket are F-values. All detailed definitions of variables are described in the Appendix. *** and ** indicate significance at the 1% and 5%, respectively.