Star analyst activities, stock price synchronicity, and equity market reforms*

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Abstract

This study examines whether analysts' informativeness and activities change following regulatory reforms that strengthen market surveillance in an emerging market. We find that star (non-star) analysts provide firm-specific (market-wide) information, particularly for firms with characteristics favored by fund managers. However, such information provision is only significant before the reforms. We find that, after the reforms, star analysts tend to cover firms with larger sizes, higher earnings, higher stock liquidity, and lower leverage ratios. Overall results imply that star analysts prefer to focus on financially stable and relatively predictable firms after the reforms. We further provide policy implications regarding market surveillance and information efficiency in emerging markets.

Keywords: Analyst coverage; Firm-specific information; Insider tipping; Star analyst; Stock price synchronicity

JEL Classification: G12; G14; G38

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1. Introduction

Financial analysts' activities reduce information asymmetry among investors (Amiram, Owens, and Rozenbaum, 2016; Kim, Ryu, and Yang, 2019), and yet, not all analyst reports convey the same signal. Analysts collect and analyze information about financial markets, industries, and firms, and they forecast firm-specific variables, including earnings and stock prices (Lawrence, 2013; Lehavy, Li, and Merkley, 2011; Walker and Hatfield, 1996). Their reports are especially influential because investors' trading decisions and strategies depend on them. However, analyst reports' informational role may vary with their characteristics, such as being nominated as a star or best analyst. Many studies reveal that publications of reports by star analysts impact stock prices and trading volumes more strongly than their non-star counterparts (Gleason and Lee, 2003; Loh and Stulz, 2011; Zhou, Lin, and An, 2017).

Star analysts may outperform other analysts through three different mechanisms. First, star analysts may have advantages in acquiring private information about firms over the rest. Analysts can obtain firm-specific, private information through corporate investor relations or conference calls, which is also known as insider tipping (Hilary and Hsu, 2013). Star analysts may have better networks with firm directors than other analysts. Second, some studies claim that star analysts' information superiority derives from their information-processing or analytical skills (Meng, Li, Jiang, and Chan, 2017). These studies suggest that star analysts interpret firm news more accurately than others, even when all analysts receive the same information. Third, star analysts' reputations may contribute to their influence. Some studies show that more popular and recognizable analysts are more likely to be nominated as star analysts (Emery and Li, 2009). Thus, their fame may increase their recommendations' influence.

Using financial data from firms listed on the Korea Composite Stock Price Index (KOSPI) covering from 2010 to 2020, this study investigates the reactions of star and non-star analysts to regulatory changes that potentially deter their information-collecting and information-producing activities. We use analyst coverage, calculated as the logarithm of the number of analyst reports published about each firm, as a measure of analyst activities. Star and non-star analyst coverages are

separately calculated by identifying whether the publisher of each report is nominated as the annual best analyst. For regulatory changes, this study considers the adoption of the guidelines on investor relations, research, and analysis activities presented by the Korea Financial Investment Association (KOFIA)[1] and the 2016 Prohibition on Market Disturbances[2]. We employ a two-way fixed-effects panel data regression method throughout the study and examine analysts' informativeness by estimating the relationship between analyst coverage and stock price synchronicity.

Our findings are as follows. First, the relationship between star analyst coverage and stock price synchronicity is significantly negative, whereas that between the coverage by non-star analysts and synchronicity is insignificant throughout the sample period. This finding indicates that only reports by star analysts contain firm-specific information. Second, star analysts provide firm-specific information within reports on firms with large market capitalizations, high earnings, high net incomes, high leverage ratios, and high book-to-market ratios. Firms with these characteristics are generally favored by fund managers, potentially implying evidence of *analyst tipping*. Third, star analysts' reports are no longer significantly informative after adopting the regulations, indicating that these regulations hinder analyst activities to collect information as well as implying the existence of *insider tipping* before the reform. Finally, star analysts' coverage preferences change following the adoption of the regulations. After the reforms, they tend to cover firms with characteristics associated with financial stability, such as larger market capitalizations, lower leverage ratios, and lower book-to-market ratios. Overall, our results suggest that corporate insiders, analysts, and fund managers shared a cozy relationship prior to the reforms (Barker, 1998).

This study contributes to the existing literature by analyzing analysts' activities in emerging markets. Although analysts play particularly pivotal informational roles in emerging markets (Chan and Hameed, 2006; Moshirian, Ng, and Wu, 2009; Zhu, Chen, Yang, and Yi, 2021), most studies neglect to highlight how they acquire and produce information. By investigating financial data from Korea, which has a leading emerging economy and influential financial market, we describe analysts'

[1] Refer to KOFIA regulations (https://law.kofia.or.kr/service/main/main.do).
[2] Refer to Article 178-2, Financial Investment Services and Capital Markets Act.

informativeness and activities in detail. Furthermore, this study provides important policy implications. To the best of our knowledge, our study is the first to investigate changes in star analysts' behavior following the adoption of regulations. Although the primary purposes of the regulations are to enhance market discipline and deter unfair trading by corporate insiders, they may also restrict analysts' information production activities. We investigate the impacts of the regulations on analysts' informativeness and examine the effectiveness of the regulation.

The rest of the paper is organized as follows. We review relevant previous studies in Section 2 and explain the sample data and methodology in Section 3. We interpret the empirical findings in Section 4. Section 5 concludes the paper.

2. Literature review

Analyst reports provide useful information that affects investors' trading behavior and investment decisions (Berkman and Yang, 2019; Kecskés, Michaely, and Womack, 2016). These reports reduce information asymmetry among equity market investors by providing information about individual firms in this market (Frankel and Li, 2004; Kim, Ryu, and Yang, 2021). Hameed, Morck, Shen, and Yeung (2015) find that analyst coverage for the firms whose stocks are covered by relatively large numbers of analysts affects peer firms' fundamental values. This result implies that analyst reports convey industry-wide and market-wide information. They also suggest that many analysts attempt to improve their reputations by analyzing large and leading firms in each industry. Amiram, Owens, and Rozenbaum (2016) find that analyst reports offer new information to unsophisticated investors, while their information is already common to sophisticated investors. They suggest that analysts play the role of information intermediaries in financial markets by alleviating information asymmetry among these investors. Kim, Ryu, and Yu (2021) examine whether analyst reports affect investors differently by investor type. They find that, among all investor types, local individuals utilize the information obtained from analyst reports the most when making trading decisions.

Studies also reveal that the informativeness of analyst reports depends on the general

characteristics of the analysts. Clement and Tse (2005) show that analyst reports issued by larger brokerage firms are more informative. Bae, Stulz, and Tan (2008) discover that local analysts forecast local firms' earnings more accurately than foreign analysts. They attribute this difference to local analysts' access to interested parties, such as domestic firms' employees and customers. Kumar (2010) and Brown, Call, Clement, and Sharp (2015) show that female analysts outperform their male counterparts in terms of the accuracy of earnings forecasts. Green, Jame, Markov, and Subasi (2014) and Pacelli (2019) reveal that analysts who host investor conferences for a firm provide superior and more accurate information specific to that firm, compared to analysts who do not host such conferences. These studies, overall, suggest that analysts' informativeness and performance vary with not only their skills but also other analyst characteristics, such as the size of the affiliated brokerage, nationality, and gender.

The star nomination, based on the past performance of analyst recommendations, particularly highlights the informativeness of analyst reports among other features. Previous studies often identify star and non-star analysts according to the *All-Star* analysts nominated by the Wall Street Journal. The newspaper specifically selects the analysts who recommended the most profitable stocks during the most recent calendar year. Desai, Liang, and Singh (2000) find that the stocks recommended by star analysts outperform a market portfolio. Gleason and Lee (2003) show that star analysts make more accurate forecasts than non-star analysts and find that revisions to the former's forecasts significantly enhance the price discovery process in the equity market. Fang and Yasuda (2014) provide evidence of a nomination effect, indicating that star analysts are more informative because they are nominated as such. Merkley, Michaely, and Pacelli (2017) reveal that star analysts have greater incentives to offer firm-specific information under higher competition among analysts. Guan, Li, Lu, and Wong (2019) show that star analysts have superior capabilities such as the acquisition of information and research analysis compared to non-star analysts. Using a similar approach, this study examines whether the informativeness of analyst reports differs between star and non-star analysts in an emerging market.

Analyst informativeness refers to whether an analyst's report provides market participants with

previously undisclosed information or news. Existing studies use various proxies to measure the informativeness of analysts' recommendations. One strand of research uses forecast accuracy (e.g., Brown, 2001; Clement, 1999; Muslu, Mutlu, Radhakrishnan, and Tsang, 2019). As Clement and Tse (2003) explain, these studies assume that analyst reports are more informative when they forecast individual firms' future earnings in a more accurate manner. Another strand uses the price impact of analyst recommendations as a proxy for analyst informativeness (e.g., Green, Jame, Markov, and Subasi, 2014). Frankel, Kothari, and Weber (2006) investigate size-adjusted stock returns around analyst report announcements and claim that analyst reports are informative when the absolute values of these returns are high.

However, although these measures indicate the general informativeness of analyst reports, they do not distinguish between the types of information conveyed by the reports. Because this study aims to distinguish between the informativeness of star and non-star analysts' reports, it is crucial to identify the types of information conveyed by each of them. Thus, we estimate the informativeness of analysts' reports by examining the relationship between analyst coverage and stock price synchronicity. First, stock price synchronicity is defined as the co-movement between an individual stock price and the market price. Chan and Hameed (2006) suggest that analyst reports include market-wide (firm-specific) information if analyst coverage and stock price synchronicity have a positive (negative) relationship. Fernandes and Ferreira (2009) interpret stock price synchronicity as the amount of market-wide information reflected in stock prices. Higher stock price synchronicity indicates that stock prices are more reflective of market-wide information and more sufficiently explained by market returns.

3. Sample data and methodology

3.1. Sample data

We use stock trading data from the KOSPI market, the corporate financial ratios of KOSPI-listed firms, and the recommendation records of analyst reports about these firms. The sample period extends from 2010 to 2020, and all the data are collected from the FnGuide database. For the data on

financial ratios, we remove all firms with missing financial statements, and the final dataset comprises 7,128 observations of 648 firms that survived the sample period. This sample corresponds to about 78% of the firms listed on the KOSPI market, indicating that our sample sufficiently represents the entire market. In addition, for analyst report records, we exclude those without target prices, sales forecasts, earnings forecasts, and net income forecasts from the sample, leaving 61,461 analyst reports. The excluded reports are not concerned when evaluating analyst performances.

This study investigates financial data from the Korean market[3], which is an emerging market that features high information uncertainty, active trading by individual investors, and severe information asymmetry among its participants (Chung, Kim, and Ryu, 2017; Ciner and Karagozoglu, 2008; Hu, Kirilova, Park, and Ryu, *forthcoming*; Kim, Ryu, and Yu, 2022; Seok, Cho, and Ryu, 2022). We specifically investigate the KOSPI market, as it is the largest among Korea's equity markets, which include the KOSPI, the Korean Securities Dealers Automated Quotation (KOSDAQ), and the Korea New Exchange (KONEX) markets. Among them, the KOSPI market is the most representative of the Korean market since it accounts for 83.5% of the entire equity market with a total market capitalization of USD 1,823 billion in 2020.[4]

Panel A of Table 1 presents the summary statistics of variables used in this study. *Synch* is the firm-specific stock price synchronicity, calculated on a yearly basis. *Analyst coverage*, *Star coverage*, and *Nonstar coverage* denote the numbers of reports published by all, star, and non-star analysts, respectively. . *Analyst*, *Star*, and *Nonstar* denote the logarithm of the total, star, and non-star analyst coverages, respectively. Our analysis also includes the market capitalization (*SIZE*), the logarithm of the stock trading volume (*LIQ*), the stock price volatility (*VOLAT*), foreign ownership (*FOWN*), the return on assets (*ROA*), the debt-to-assets ratio (*LEV*), and the book-to-market ratio (*BM*) for each firm and year. The mean of *Synch* is negative, indicating that the prices of KOSPI-listed stocks are generally explained more by idiosyncratic features than by market dynamics. Panel B reports the

[3] The following recent studies, among others, describe the characteristics and importance of the Korean financial market: Chun, Cho, and Ryu (2020), Kim, Cho, and Ryu (2018), Lee, Ryu, and Yang (2021), Ryu, Webb, and Yu (2022), Ryu and Yu (2020, 2021), and Yang, Kutan, and Ryu (2019).
[4] The total capitalization of the KOSPI market was KRW 1,980 trillion at the end of 2020, and the corresponding exchange rate between dollars and won was 1,086.30.

correlations among the variables. *Synch* and *Analyst* have a significantly positive correlation of 0.2493, implying that stock price synchronicity increases with analyst coverage.

[Table 1 here]

3.2. Regulatory reforms

This study considers the effects of regulatory reforms that are expected to impact analysts' activities to collect or provide information. In particular, financial analysts may mediate private information flows among market participants through their relationships with corporate insiders and fund managers (Barker, 1998). Here, we assume that an analyst may facilitate unfair trading through two channels. First, analysts may provide fund managers with private information that they acquired, which is also known as *analyst tipping* (Irvine, Lipson, and Puckett, 2007; Lin and Lu, 2015; Mao, Segara, and Westerholm, 2019). Before 2016, Korean financial authorities did not have the means to regulate or punish those who indirectly acquired private information from corporate outsiders, such as analysts. Second, analysts may unfairly acquire information from corporate insiders, known as *insider tipping*. Although these activities are strictly prohibited, many studies report that analysts still have incentives to build friendly relationships with managers or corporate insiders to gain access to private information (Bowen, Davis, and Matsumoto, 2002; Das, Levine, and Sivaramakrishnan, 1998; Ke and Yu, 2006; Lim, 2001). Additionally, studies also show that corporate managers prefer analysts who are favorable to their firms (Mayew, 2008).

The financial authorities in Korea have introduced several regulations to deter these unfair activities. First, the Financial Supervisory Service (FSS) has strengthened its supervision of the unfair acquisition of private information, aiming to restrict the cases that are relevant to the first channel. Specifically, Article 178-2 (Prohibition on Market Disturbances) of the Financial Investment Services and Capital Markets Act prohibits the use of undisclosed firm-specific information by market participants, even when the information is obtained from sources other than corporate insiders. Under

this revised act, whoever trades on private information and manipulates asset prices is subject to punishment even when they are not explicitly related to the corresponding firms.

In addition to the aforementioned regulation, the financial authorities introduced guidelines on investor relations, research, and analysis activities. The new FSS guidelines aim to improve the quality of analyst reports and guarantee analysts' independence by strictly prohibiting analysts, brokerages, and corporate managers from forming cozy relationships. The restrictive clauses within these guidelines require analysts to report the ratios of their recommendations and earnings forecast errors. This regulatory change particularly restricts the second channel through which analysts obtain private information from corporate insiders.

[Table 2 here]

3.3. Model specification

The construction of *stock price synchronicity* follows that suggested by Chan and Hameed (2006) and Morck, Yeung, and Yu (2000). We regress the daily stock returns of individual firm *i* on day *t* in year *y* ($Ret_{i,t}^{y}$) on the market index returns ($Ret_{m,t}^{y}$), as shown in Equation (1), and obtain an *R*-squared value for each firm and year (${R_{i,y}}^2$). We use the KOSPI return to proxy for the market index return. Here, ${R_{i,y}}^2$ indicates the proportion of firm *i*'s stock return dynamics that is explained by market fluctuations in year *y*, and $1 - {R_{i,y}}^2$ indicates the idiosyncratic proportion. Then, we calculate the stock price synchronicity for firm *i* in year *y* ($Synch_{i,y}$) using Equation (2). Here, a higher (lower) value of $Synch_{i,y}$ indicates that the given stock's price reflects relatively more market-wide (firm-specific) information.

$$Ret_{i,t}^{y} = \alpha_{0,y} + \alpha_{1,y} \cdot Ret_{m,t}^{y} + \epsilon_{i,y,t}, \quad (1)$$

$$Synch_{i,y} = \log\left(\frac{{R_{i,y}}^2}{1-{R_{i,y}}^2}\right). \quad (2)$$

Second, we construct *analyst coverage* as a proxy for analysts' activities. Analyst coverage ($Analyst_{i,y}$) is defined as the logarithm of the number of analyst reports about individual firm i in year y ($Analyst\ Coverage_{i,y}$), as shown in Equation (3). In this study, we consider only analyst reports that include earnings forecasts; those without earnings forecasts are excluded from the sample.

$$Analyst_{i,y} = ln(1 + Analyst\ Coverage_{i,y}). \quad (3)$$

In addition, we separately construct analyst coverage measures for star ($Star_{i,y}$) and non-star analysts ($Nonstar_{i,y}$), as shown in Equations (4) and (5), respectively, to compare these analysts' informativeness. Here, star and non-star analysts in the Korean financial market are identified based on their annual performances, which are evaluated by the Chosunilbo and FnGuide. This evaluation is similar to the selection of star analysts as Best on the Street analysts, which is published by the Wall Street Journal.[5] Star analysts are selected based on quantitative (70%) and qualitative (30%) criteria. The quantitative criteria specifically evaluate each analyst according to the performances of the portfolios recommended by the analyst (30%) and the forecasting accuracy with respect to the target firms' total sales (10%), earnings (20%), and net profits (10%). The qualitative criterion is survey assessments conducted by fund managers. $Star\ Coverage_{i,y}$ ($Nonstar\ Coverage_{i,y}$) denotes the number of star (non-star) analyst reports for firm i in year y.

$$Star_{i,y} = ln(1 + Star\ Coverage_{i,y}). \quad (4)$$

$$Nonstar_{i,y} = ln(1 + Nonstar\ Coverage_{i,y}). \quad (5)$$

[5] The Chosunilbo, the largest news media company in Korea, and FnGuide, a representative institution that provides Korean financial data, select analysts with superior performances annually; the nominated analysts are referred to as the *best analysts*. In this study, we identify these analysts as *star* analysts and the remaining analysts as *non-star* analysts, following conventional terminologies (e.g., Li, Luo, and Soderstrom, 2020; Zhou, Lin, and An, 2017).

We also construct star and non-star analyst coverage proxies that are orthogonal to general firm-specific characteristics to account for the potential multicollinearity among variables (Yu, 2008) by extracting the residual terms from Equation (6). *SIZE*, *VOLAT*, *ROA*, *GROWTH*, and *LEV* denote the market capitalization, stock price volatility, return on assets, growth rate of assets, and leverage ratio, respectively.

$$Cov_{i,y} = \delta_0 + \delta_1 SIZE_{i,y} + \delta_2 VOLAT_{i,y} + \delta_3 ROA_{i,y-1} + \delta_4 GROWTH_{i,y} + \delta_5 LEV_{i,y} + RCov_{i,y}, \text{ where } Cov = \{Analyst,\ Star,\ Nonstar\}. \quad (6)$$

We employ the panel data regression shown in Equation (7) to estimate the relationship between analyst coverage and stock price synchronicity. Using this model, we examine whether analyst reports reveal firm-specific or market-wide information. *LIQ*, *FOWN*, and *BM* denote the logarithm of trading volume, ratio of foreign ownership, and book-to-market ratio, respectively. $INDDUM_{i,s}$ denotes the dummy variable for the industry to which firm i belongs. In our sample, 16 distinct industries are considered.[6] α_i and δ_y indicate fixed effects among firms and years, respectively[7]. $\epsilon_{i,y}$ denotes the error term.

[6] The firms in our sample are grouped into 16 industry categories: agriculture, forestry, and fishing; mining and quarrying; manufacturing; electricity, gas, steam, and air conditioning supply; construction; wholesale and retail trade; transportation and storage; accommodation and food service activities; information and communication; financial and insurance activities; real estate activities; professional, scientific, and technical activities; business facilities management and business support services, rental and leasing activities; education; arts, sports, and recreation-related services; and membership organizations, repair, and other personal services. We refer to the Korean Standard Industrial Classification (http://kssc.kostat.go.kr/ksscNew_web/ekssc/main/main.do), which is based on the International Standard Industrial Classification adopted by the United Nations.

[7] Our model does not consider analyst-specific local effects because more than 95% of brokerages in our sample are located in one area, the Seoul metropolitan area. We confirm that our results remain qualitatively unchanged after excluding non-Seoul brokerages from the sample. Previous studies (e.g., Gerken and Painter, *forthcoming*) identify local effects based on analysts' birthplaces and former workplaces; however, we identify them only according to analysts' current workplaces because their personal information is not publicly available in Korea.

$$Synch_{i,y} = \beta_0 + \beta_1 \cdot Analyst_{i,y} + \beta_2 \cdot SIZE_{i,y} + \beta_3 \cdot LIQ_{i,y} + \beta_4 \cdot VOLAT_{i,y} + \beta_5 \cdot FOWN_{i,y} + \beta_6 \cdot ROA_{i,y} + \beta_7 \cdot LEV_{i,y} + \beta_8 \cdot BM_{i,y} + \sum_{s=1}^{15} INDDUM_{i,s} + \alpha_i + \delta_y + \epsilon_{i,y}. \quad (7)$$

Here, if the coefficient of $Analyst_{i,y}$ is significantly positive (negative), this suggests that a greater (smaller) proportion of a stock price is explained by market return fluctuations as analyst coverage increases; in other words, analyst reports reveal market-wide (firm-specific) information.

Furthermore, we examine whether star analysts' reports convey different information from their non-star counterparts' by considering star and non-star analyst coverage separately, as in Equation (8). The estimated coefficient γ_1 (γ_2) indicates the informativeness of analyst reports produced by star (non-star) analysts.

$$Synch_{i,y} = \gamma_0 + \gamma_1 \cdot Star_{i,y} + \gamma_2 \cdot Nonstar_{i,y} + \gamma_3 \cdot SIZE_{i,y} + \gamma_4 \cdot LIQ_{i,y} + \gamma_5 \cdot VOLAT_{i,y} + \gamma_6 \cdot FOWN_{i,y} + \gamma_7 \cdot ROA_{i,y} + \gamma_8 \cdot LEV_{i,y} + \gamma_9 \cdot BM_{i,y} + \sum_{s=1}^{15} INDDUM_{i,s} + \alpha_i + \delta_y + \epsilon_{i,y}. \quad (8)$$

As aforementioned, adopting more restrictive regulations may hinder analysts' ability to collect firm-specific information. Using the above estimation model, we conduct subsample analyses to examine whether the informativeness of analyst reports depends on regulatory changes. The pre-reform period extends from 2010 to 2015, and the post-reform period is from 2017 to 2020. Observations in 2016 are excluded from the sample as the regulatory changes were gradually applied during this period, as shown in Table 2.

4. Empirical results

4.1. Informativeness of analyst coverage

Table 3 presents the relationship between analyst coverage and stock price synchronicity, representing the informativeness of analyst reports. Models *M1*, *M2*, and *M3* show the pooled ordinary least squares (OLS) regression results; Models *M4*, *M5*, and *M6* present the fixed-effects panel data regression results; *M7* shows the results using the orthogonal analyst coverage proxies as

the independent variables.[8] The rows labeled *Firm*, *Industry*, and *Year* indicate whether the given model considers the fixed effects among firms, industries, and years, respectively. The row labeled *Robust* indicates whether the given model uses robust standard errors. *Obs.* shows the number of observations in each regression. R^2 is the *R*-squared value.

[Table 3 here]

In Table 3, we find that the coefficients of *Analyst* are all statistically insignificant. Unlike previous studies that only control for industry categories (e.g., Chan and Hameed, 2006), our results, using both pooled OLS and fixed-effects panel data regressions, indicate that analyst coverage does not generally provide any information that impacts the return movements of individual stocks after controlling for idiosyncratic, firm-specific effects along with industry and time fixed effects. The regression results are consistent with previous findings that analyst reports, or their revisions, do not convey novel information to general stock market participants (Altınkılıç and Hansen, 2009).

We employ the regression model shown in column *M6* hereafter for further subsample analyses as it reports the highest *R*-squared values.

4.2. Differences between star and non-star analysts' informativeness

Next, we investigate whether reports by star analysts convey different information from those by non-star analysts. Fig. 1 illustrates the average number of analyst reports produced annually for each firm. The black (gray) bars show the annual average number of analyst reports, including (excluding) reports by star analysts. Overall, the average analyst coverage that includes star analysts' is evidently greater than that of non-star analysts alone. This pattern may suggest that non-star analysts exhibit herding behavior by following star analysts (Desai, Liang, and Singh, 2000). If non-star analysts' recommendations somewhat mimic those of their star counterparts, then the informativeness of their

[8] We also examine the relationship between analyst coverage and stock price synchronicity using the dynamic GMM models to account for potential endogeneity and confirm that the results remain qualitatively the same.

reports is likely to differ from that of star analysts' reports.

[Fig. 1 here]

Table 4 statistically examines the difference between the informativeness of star and non-star analysts' reports. We find that the informativeness of an analyst's reports depends on whether or not the analyst is nominated as a star analyst or not. In Models *M1* and *M3*, the coefficients of star analyst coverage, *Star*, are significantly negative, and this implies that market fluctuations explain target firms' returns to a lesser degree as star analyst coverage increases. In other words, star analysts' reports reveal firm-specific information. In contrast, the coefficients of *Nonstar* are positive but insignificant in models *M2* and *M3*, implying that non-star analysts' reports do not significantly convey information. Models *M7*, *M8*, and *M9* further confirm that our results remain qualitatively the same when the orthogonal analyst coverage proxies (i.e., *RStar* and *RNonstar*) are used. As proposed by Xu, Chan, Jiang, and Yi (2013), star analysts may be more effective at collecting and producing firm-specific news because of their richer experience. This result emphasizes the importance of considering analyst-specific features, that is, star status, when investigating the informational effects of analyst reports. Additionally, it implies that star analysts may play a role in mitigating information asymmetry among investors, particularly in emerging markets, as their reports reveal firm-specific information (Zhou, Lin, and An, 2017).

[Table 4 here]

In addition, the negative and positive coefficients of *Star* and *Nonstar*, respectively, imply that the insignificant relationship between total analyst coverage and stock price synchronicity, shown in Table 3, may arise because star and non-star analysts provide different types of information. Specifically, the general analysis may fail to identify a significant relationship because star analyst coverage decreases stock price synchronicity, whereas non-star analyst coverage increases it.

Furthermore, analyst coverage may be biased toward some firms because analysts prefer certain firms to others (Gerken and Painter, *forthcoming*). To control for this bias, we construct adjusted analyst coverage measures by dividing the analyst coverage for firm *i* in year *y* by the average value of analyst coverage for that firm. In Table 4, *AStar* and *ANonstar* denote the adjusted coverage measures for *Star* and *Nonstar*, respectively. In columns labeled *M4* and *M6*, the coefficients of *AStar* are significantly negative, consistent with the results in columns *M1* and *M3*. This shows that our findings are robust in controlling for the preferences of star and non-star analysts.

Next, to check for analyst tipping, we examine whether star analysts' informativeness differs across firms favored and disfavored by fund managers. Table 5 presents the results. The most (least) favored two deciles of stocks are classified as *Favored* (*Disfavored*) for each firm characteristic, and the rest are classified as *Moderate*. Note that our results are robust to changes in the classification thresholds (i.e., the 25th, 30th, and 33rd percentiles). The *Favored* group includes firms with high market capitalizations, high earnings, high return on assets, high debt-to-asset ratios, high book-to-market ratios, or high trading liquidity (Covrig, Lau, and Ng, 2006; Pinnuck, 2004).

[Table 5 here]

In Table 5, the coefficients of *Star* are significantly negative, particularly for firms categorized as *Favored*, except in the case of *LIQ*. The results indicate that star analysts tend to provide firm-specific information for stocks favored by fund managers. The relationships between *Star* and stock price synchronicity are generally negative, though not significant, except for the *Disfavored SIZE*, *Disfavored EARN*, *Moderate SIZE*, and *Moderate EARN* groups. This finding is consistent with our finding that star analysts deliver firm-specific rather than market-wide information. On the other hand, non-star analyst coverage does not significantly affect the synchronicity of *Disfavored* stocks, whereas it is significantly positively associated with firms that have high values of *LEV*, or *BM*. Overall, the results imply that analysts are particularly informative about the stocks that fund managers favor (Harford, Jiang, Wang, and Xie, 2019).

4.3 Effects of the regulatory changes

In this section, we investigate whether the informativeness of star and non-star analysts changes after the regulatory reforms that are described in Section 3.2. Panel A (Panel B) of Table 6 shows the analysts' informativeness before (after) the regulatory reforms. In Panel A, the coefficients of *Analyst* and *Nonstar* are insignificant, whereas those of *Star* are significantly negative. This finding is consistent with Tables 3 and 4. The effects of regulatory changes are suggested by the results in Panel B. We find that analyst coverage measures, including *Star*, are generally insignificantly associated with stock price synchronicity. The adoption of these regulations aims to strengthen market surveillance regarding unfair trading activities. These results suggest that the informativeness of star analysts' reports during the pre-reform period may be attributed to insider tipping.

[Table 6 here]

4.4. Changes in star analysts' behavior

We further investigate how star analysts' behavior changes after market surveillance strengthens. To do so, we analyze the characteristics of firms covered by analysts each year. Panel A of Table 7 shows the average values of firm characteristics for those covered by star analysts; Panel B shows the values of firm characteristics for firms covered by star analysts relative to those for firms covered by non-star analysts. *CAP*, *EARN*, *ROA*, *LEV*, *BM*, and *LIQ* denote the annual averages of market capitalization divided by one trillion, earnings divided by one trillion, return on assets, leverage ratio, book-to-market ratio, and logarithm of the trading volume for the firms covered by analysts. In Panel A, comparing pre-reform and post-reform average values, we observe that *CAP*, *EARN*, and *LIQ* of firms covered by star analysts increase by more than one pre-reform standard deviation after the reforms. Conversely, the average leverage ratio of firms that star analysts cover falls following the reforms. Overall, these results indicate that star analysts tend to cover more financially stable firms, that is, those with greater sizes, higher earnings, higher trading volumes, and lower leverage ratios, as market surveillance strengthens. The *ROA* and *BM* values of the covered firms remain relatively

unchanged. Panel B shows that the ratios of *CAP*, *EARN*, *LIQ*, and *LEV* are closer to one from around 2017, indicating that star and non-star analysts tend to cover firms with more similar characteristics following the reforms.

[Table 7 here]

Fig. 2 illustrates changes in star analysts' behavior before and after the reforms by showing the dependence of star analyst coverage on firm characteristics in each year. The black (gray) bars indicate the average numbers of star analyst reports of firms in the top (bottom) two deciles for each firm characteristic. The dotted line in each graph shows the market-adjusted average of the given characteristic among firms covered by star analysts.

[Fig. 2 here]

Observing the bar graphs in Fig. 2, we primarily note that the decline in absolute analyst coverage starts in 2017 in all graphs, implying that star analyst activities generally reduce after the regulatory changes. These graphs imply that star analysts tend to focus more on financially stable firms after the reform. Specifically, the average numbers of reports decline for both the firms with high and low earnings; however, the decrement is pronounced for low-earnings firms. Star analysts gradually cover less firms with low earnings from 2017 and do not cover them at all in 2019. A similar change in star analysts' coverage is observed for firms with low returns on assets. In addition, in Panel D, while star analysts exhibit a clear preference for high-leverage firms before 2017, they publish a similar number of reports about firms with high and low leverage ratios after 2017. The change is clearer when we observe star analyst coverage according to the book-to-market ratio, shown in Panel E. Star analyst coverage of firms with high *BM* values dropped drastically starting in 2017; moreover, their coverage of firms with low *BM* exceeds that of firms with high *BM*.

The notable findings for the market-adjusted averages of the firm characteristics (i.e., the dotted

lines) generally confirm the interpretations of the bar graphs. The market-adjusted means of *SIZE*, *EARN*, and *LIQ* for firms covered by star analysts substantially increase around 2017. Contrarily, those of *LEV* and *BM* drastically fall, at least temporarily, in 2017. As conjectured, analysts' incentives to tip fund managers are likely to decrease as the regulatory reforms reinforce market surveillance. In addition, analysts become obliged to explicitly state their earnings forecasting errors when publishing reports. Such changes in star analyst activities confirm our conjecture that these analysts typically prefer to cover financially stable firms with more predictable earnings, potentially in an attempt to uphold their reputations.

5. Conclusion

This study investigates changes in analysts' informativeness and activities following the adoption of regulations that strengthen market surveillance. We find that star analyst coverage is negatively related to stock price synchronicity, implying that these analysts' reports convey firm-specific information. Such informativeness is pronounced for firms with characteristics favored by fund managers. However, this negative relationship becomes insignificant following Korea's regulatory changes. Moreover, after the reform, star analysts tend to cover firms with more financially stable features, including larger sizes, higher earnings, higher stock liquidity, and lower leverage ratios. Overall, our findings indicate that tighter market surveillance following regulatory changes reduces analysts' activities to acquire and produce information. Given financial analysts' pivotal roles as information intermediaries in emerging markets, this study provides important policy implications by identifying a potential tradeoff between market surveillance and information efficiency in an emerging market.

References

Altınkılıç, O., & Hansen, R.S. (2009). On the information role of stock recommendation revisions. *Journal of Accounting and Economics*, 48(1), 17-36.

Amiram, D., Owens, E., & Rozenbaum, O. (2016). Do information releases increase or decrease information asymmetry? New evidence from analyst forecast announcements. *Journal of Accounting and Economics*, 62(1), 121-138.

Bae, K.-H., Stulz, R.M., & Tan, H. (2008). Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts. *Journal of Financial Economics*, 88(3), 581-606.

Barker, R.G. (1998). The market for information: Evidence from finance directors, analysts and fund managers. *Accounting and Business Research*, 29(1), 3-20.

Berkman, H., & Yang, W. (2019). Country-level analyst recommendations and international stock market returns. *Journal of Banking & Finance*, 103, 1-17.

Bowen, R.M., Davis, A.K., & Matsumoto, D.A. (2002). Do conference calls affect analysts' forecasts? *Accounting Review*, 77(2), 285-316.

Brown, L.D. (2001). How important is past analyst forecast accuracy? *Financial Analysts Journal*, 57(6), 44-49.

Brown, L.D., Call, A.C., Clement, M.B., & Sharp, N.Y. (2015). Inside the "black box" of sell-side financial analysts. *Journal of Accounting Research*, 53(1), 1-47.

Chan, K., & Hameed, A. (2006). Stock price synchronicity and analyst coverage in emerging markets. *Journal of Financial Economics*, 80(1), 115-147.

Chun, D., Cho, H., & Ryu, D. (2020). Economic indicators and stock market volatility in an emerging economy. *Economic Systems*, 44(2), 100788.

Chung, C.Y., Kim, H., & Ryu, D. (2017). Foreign investor trading and information asymmetry: Evidence from a leading emerging market. *Applied Economics Letters*, 24(8), 540-544.

Ciner, C., & Karagozoglu, A.K. (2008). Information asymmetry, speculation, and foreign trading activity: Emerging market evidence. *International Review of Financial Analysis*, 17(4), 664-680.

Clement, M. B. (1999). Analyst forecast accuracy: Do ability, resources, and portfolio complexity matter? *Journal of Accounting and Economics*, 27(3), 285-303.

Clement, M.B., & Tse, S.Y. (2003). Do investors respond to analysts' forecast revisions as if forecast accuracy is all that matters? *Accounting Review*, 78(1), 227-249.

Clement, M.B., & Tse, S.Y. (2005). Financial analyst characteristics and herding behavior in forecasting. *Journal of Finance*, 60(1), 307-341.

Covrig, V., Lau, S.T., & Ng, L. (2006). Do domestic and foreign fund managers have similar preferences for stock characteristics? A cross-country analysis. *Journal of International Business Studies*, 37(3), 407-429.

Das, S., Levine, C.B., & Sivaramakrishnan, K. (1998). Earnings predictability and bias in analysts' earnings forecasts. *Accounting Review*, 73(2), 277-294.

Desai, H., Liang, B., & Singh, A.K. (2000). Do all-stars shine? Evaluation of analyst

recommendations. *Financial Analysts Journal*, 56(3), 20-29.

Emery, D.R., & Li, X. (2009). Are the Wall Street analyst rankings popularity contests? *Journal of Financial and Quantitative Analysis*, 44(2), 411-437.

Fang, L.H., & Yasuda, A. (2014). Are stars' opinions worth more? The relation between analyst reputation and recommendation values. *Journal of Financial Services Research*, 46(3), 235-269.

Fernandes, N., & Ferreira, M.A. (2009). Insider trading laws and stock price informativeness. *Review of Financial Studies*, 22(5), 1845-1887.

Frankel, R., Kothari, S.P., & Weber, J. (2006). Determinants of the informativeness of analyst research. *Journal of Accounting and Economics*, 41(1-2), 29-54.

Frankel, R., & Li, X. (2004). Characteristics of a firm's information environment and the information asymmetry between insiders and outsiders. *Journal of Accounting and Economics*, 37(2), 229-259.

Gerken, W.C., & Painter, M.O. (Forthcoming). The value of differing points of view: Evidence from financial analysts' geographic diversity. *Review of Financial Studies*.

Gleason, C.A., & Lee, C.M.C. (2003). Analyst forecast revisions and market price discovery. *Accounting Review*, 78(1), 193-225.

Green, T.C., Jame, R., Markov, S., & Subasi, M. (2014). Access to management and the informativeness of analyst research. *Journal of Financial Economics*, 114(2), 239-255.

Guan, Y., Li, C., Lu, H., & Wong, M.F. (2019). Regulations and brain drain: Evidence from Wall Street star analysts' career choices. *Management Science*, 65(12), 5766-5784.

Hameed, A., Morck, R., Shen, J., & Yeung, B. (2015). Information, analysts, and stock return comovement. *Review of Financial Studies*, 28(11), 3153-3187.

Harford, J., Jiang, F., Wang, R., & Xie, F. (2019). Analyst career concerns, effort allocation, and firms' information environment. *Review of Financial Studies*, 32(6), 2179-2224.

Hilary, G., & Hsu, C. (2013). Analyst forecast consistency. *Journal of Finance*, 68(1), 271-297.

Hu, J., Kirilova, A., Park, S.G., & Ryu, D. (Forthcoming). Who profits from trading options? *Management Science*.

Irvine, P., Lipson, M., & Puckett, A. (2007). Tipping. *Review of Financial Studies*, 20(3), 741-768.

Ke, B., & Yu, Y. (2006). The effect of issuing biased earnings forecasts on analysts' access to management and survival. *Journal of Accounting Research*, 44(5), 965-999.

Kecskés, A., Michaely, R., & Womack, K.L. (2016). Do earnings estimates add value to sell-side analysts' investment recommendations? *Management Science*, 63(6), 1855-1871.

Kim, H., Cho, H., & Ryu, D. (2018). Characteristics of mortgage terminations: An analysis of a loan-level dataset. *Journal of Real Estate Finance and Economics*, 57(4), 647–676.

Kim, K., Ryu, D., & Yang, H. (2019). Investor sentiment, stock returns, and analyst recommendation changes: The KOSPI stock market. *Investment Analysts Journal*, 48(2), 89-101.

Kim, K., Ryu, D., & Yang, H. (2021). Information uncertainty, investor sentiment, and analyst reports. *International Review of Financial Analysis*, 77, 101835.

Kim, K., Ryu, D., & Yu, J. (2021). Do sentiment trades explain investor overconfidence around analyst recommendation revisions? *Research in International Business and Finance*, 56, 101376.

Kim, K., Ryu, D., & Yu, J. (2022). Is a sentiment-based trading strategy profitable? *Investment Analysts Journal*, 51(2), 94-107.

Kumar, A. (2010). Self-selection and the forecasting abilities of female equity analysts. *Journal of Accounting Research*, 48(2), 393-435.

Lawrence, A. (2013). Individual investors and financial disclosure. *Journal of Accounting and Economics*, 56(1), 130-147.

Lee, J., Ryu, D., & Yang, H. (2021). Does vega-neutral options trading contain information? *Journal of Empirical Finance*, 62, 294-314.

Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *Accounting Review*, 86(3), 1087-1115.

Li, C.K., Luo, J.-H., & Soderstrom, N.S. (2020). Air pollution and analyst information production. *Journal of Corporate Finance*, 60, 101536.

Lim, T. (2001). Rationality and analysts' forecast bias. *Journal of Finance*, 56(1), 369-385.

Lin, T.-C., & Lu, X. (2015). Why do options prices predict stock returns? Evidence from analyst tipping. *Journal of Banking & Finance*, 52, 17-28.

Loh, R.K., & Stulz, R. M. (2011). When are analyst recommendation changes influential? *Review of Financial Studies*, 24(2), 593-627.

Mao, R., Segara, R., & Westerholm, J. (2019). Analyst tipping: Evidence on Finnish stocks. *International Review of Financial Analysis*, 66, 101350.

Mayew, W.J. (2008). Evidence of management discrimination among analysts during earnings conference calls. *Journal of Accounting Research*, 46(3), 627-659.

Meng, Q., Li, Y., Jiang, X., & Chan, K.C. (2017). Informed or speculative trading? Evidence from short selling before star and non-star analysts' downgrade announcements in an emerging market. *Journal of Empirical Finance*, 42, 240-255.

Merkley, K., Michaely, R., & Pacelli, J. (2017). Does the scope of the sell-side analyst industry matter? An examination of bias, accuracy, and information content of analyst reports. *Journal of Finance*, 72(3), 1285-1334.

Morck, R., Yeung, B., & Yu, W. (2000). The information content of stock markets: why do emerging markets have synchronous stock price movements? *Journal of Financial Economics*, 58(1-2), 215-260.

Moshirian, F., Ng, D., & Wu, E. (2009). The value of stock analysts' recommendations: Evidence from emerging markets. *International Review of Financial Analysis*, 18(1-2), 74-83.

Muslu, V., Mutlu, S., Radhakrishnan, S., & Tsang, A. (2019). Corporate social responsibility report narratives and analyst forecast accuracy. *Journal of Business Ethics*, 154(4), 1119-1142.

Pacelli, J. (2019). Corporate culture and analyst catering. *Journal of Accounting and Economics*, 67(1), 120-143.

Pinnuck, M. (2004). Stock preferences and derivative activities of Australian fund managers.

Accounting & Finance, 44(1), 97-120.

Ryu, D., Webb, R., & Yu, J. (2022). Liquidity-adjusted value-at-risk: A comprehensive extension with microstructural liquidity components. *European Journal of Finance*, 28(9), 871-888.

Ryu, D., & Yu, J. (2020). Hybrid bond issuances by insurance firms. *Emerging Markets Review*, 45, 100722.

Ryu, D., & Yu, J. (2021). Informed options trading around holidays. *Journal of Futures Markets*, 41(5), 658-685.

Seok, S., Cho, H., & Ryu, D. (2022). Scheduled macroeconomic news announcements and intraday market sentiment. *North American Journal of Economics and Finance*, 62, 101739.

Walker, M.M., & Hatfield, G.B. (1996). Professional stock analysts' recommendations: Implications for individual investors. *Financial Services Review*, 5(1), 13-29.

Xu, N., Chan, K.C., Jiang, X., & Yi, Z. (2013). Do star analysts know more firm-specific information? Evidence from China. *Journal of Banking & Finance*, 37(1), 89-102.

Yang, H., Kutan, A.M., & Ryu, D. (2019). Volatility information trading in the index options market: An intraday analysis. *International Review of Economics and Finance*, 64, 412-426.

Yu, F. F. (2008). Analyst coverage and earnings management. *Journal of Financial Economics*, 88(2), 245-271.

Zhou, M., Lin, J., & An, Y. (2017). Star analysts, overreaction, and synchronicity: Evidence from China and the United States. *Financial Management*, 46(3), 797-832.

Zhu, L., Chen, Q., Yang, S., & Yi, Z. (2021). The role of analysts in negative information production and disclosure: Evidence from short selling deregulation in an emerging market. *International Review of Economics & Finance*, 73, 391-406.

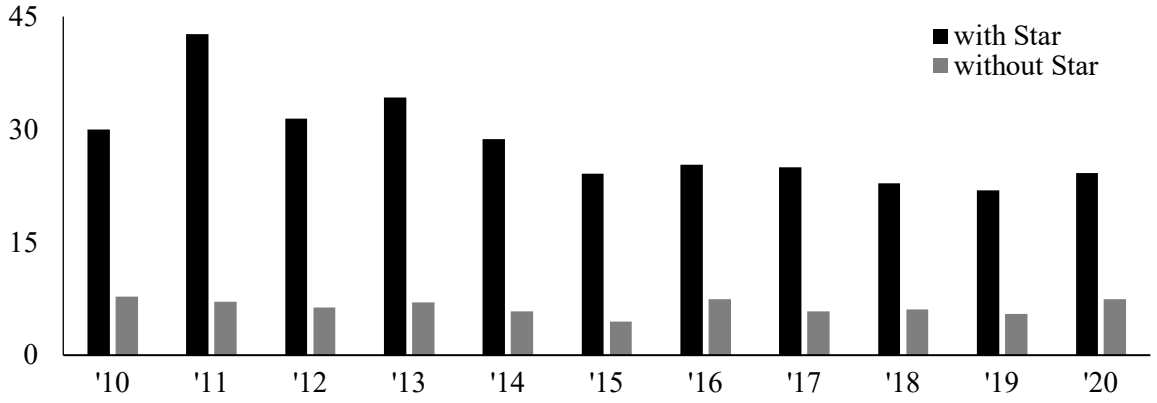

Fig. 1. Annual average analyst coverage for individual firms with and without star analysts.

Notes. The black (gray) bars indicate the annual average analyst coverage for individual firms, including (excluding) star analysts. The vertical axis denotes the number of analysts; the horizontal axis denotes the year.

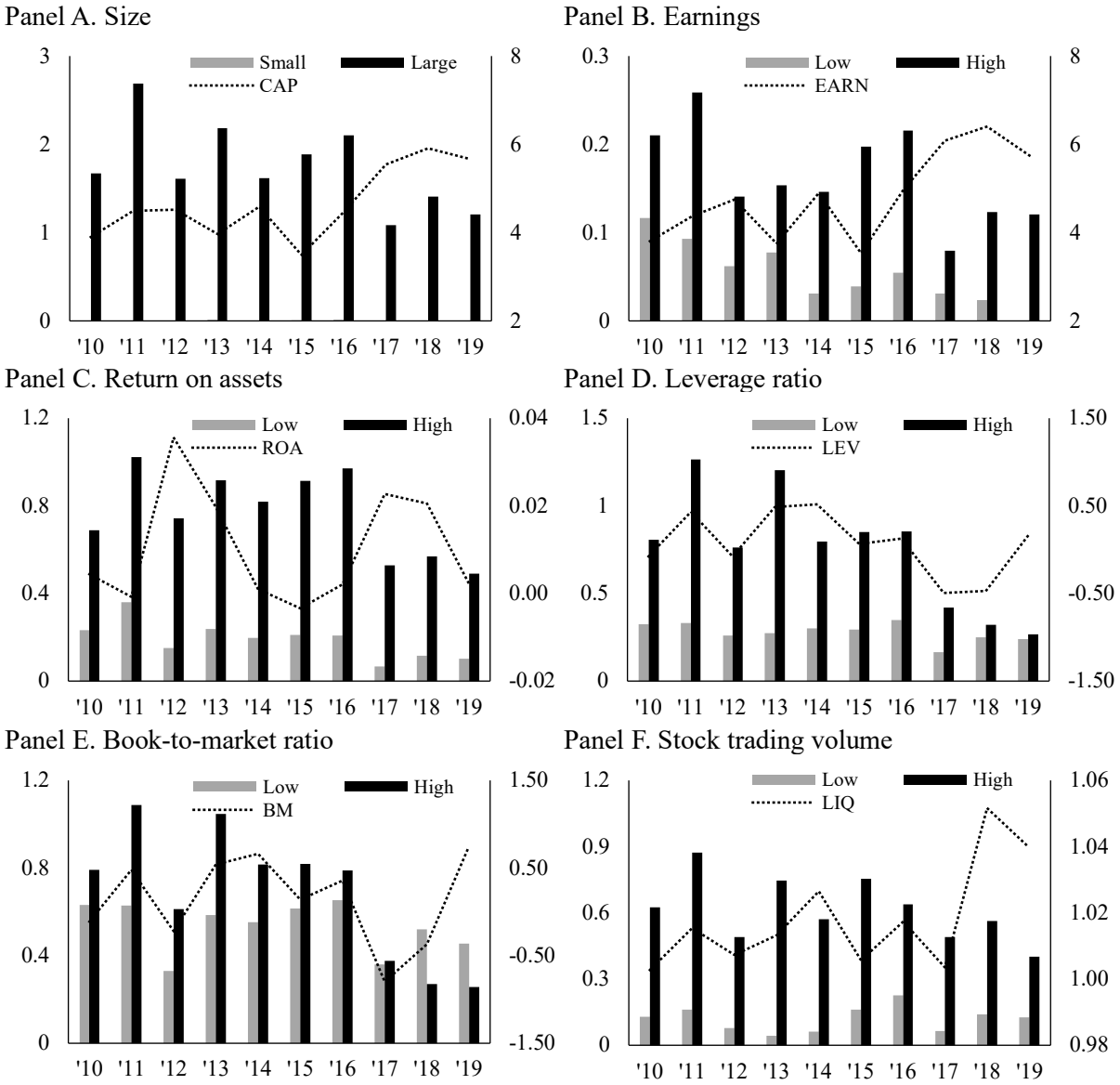

Fig. 2. Annual star analyst coverage for firms with certain characteristics.

Notes. These figures show the average numbers of star analyst reports for firms with certain characteristics. *SIZE*, *EARN*, *ROA*, *LEV*, *BM*, and *LIQ* indicate the logarithm of the market capitalization divided by one trillion, earnings divided by one trillion, return on assets, debt-to-asset ratio, book-to-market ratio, and logarithm of the stock trading volume, respectively. The vertical axes on the left-hand side indicate analyst coverage, and those on the right-hand side indicate the levels of the given firm characteristics. The horizontal axes indicate the year, which extends from 2010 to 2019. The black (gray) bars in each panel show the average numbers of star analyst reports published about firms in the top (bottom) two deciles of the given firm characteristic in the given year.

Table 1
Sample statistics.

Panel A: Summary statistics

	Mean	Std.	Min.	Q1	Q2	Q3	Max.
Synch	-1.2009	0.7220	-6.6135	-1.5206	-1.1047	-0.7425	0.4470
Analyst coverage	7.1674	13.0913	0.0000	0.0000	0.0000	7.0000	85.0000
Star coverage	0.4223	1.1022	0.0000	0.0000	0.0000	0.0000	12.0000
Nonstar coverage	6.7451	12.3387	0.0000	0.0000	0.0000	7.0000	82.0000
Analyst	0.4660	0.5842	0.0000	0.0000	0.0000	0.9031	1.9345
Star	0.0879	0.2015	0.0000	0.0000	0.0000	0.0000	1.1139
Nonstar	0.4565	0.5735	0.0000	0.0000	0.0000	0.9031	1.9191
SIZE	11.4214	0.7199	9.7990	10.9096	11.2681	11.8133	14.5330
EARN	0.1995	1.5005	-3.2740	0.0029	0.0164	0.0677	58.8867
LIQ	5.0362	0.9016	2.0371	4.4747	5.1246	5.6661	7.8173
VOLAT	0.0264	0.0104	0.0033	0.0190	0.0246	0.0318	0.0816
FOWN	10.6408	14.0414	0.0000	1.3635	4.7201	14.5079	89.2970
ROA	-0.0280	1.7215	-88.0028	0.0033	0.0492	0.0957	56.2728
LEV	1.9646	14.3524	-665.9569	0.4597	0.9649	1.8080	845.1024
BM	4.3306	6.0222	0.0423	1.4723	2.6283	4.7106	110.1629

Panel B: Correlations among research variables

	Synch	Analyst	SIZE	EARN	LIQ	VOLAT	FOWN	ROA	LEV
Analyst	0.2493***								
SIZE	0.2974***	0.8221***							
EARN	0.1187***	0.2282**	0.3373***						
LIQ	0.1900***	0.1754***	0.1704***	0.0890***					
VOLAT	-0.0462***	-0.2130***	-0.2539***	-0.0837***	0.5330***				
FOWN	0.1653***	0.5440***	0.5954***	0.2708***	0.0264**	-0.2560***			
ROA	0.0165	0.0444***	0.0552***	0.0138***	-0.0235**	-0.0555***	0.0370***		
LEV	0.0245**	0.0078	0.0127	0.0033	0.0327***	0.0175	0.0030	-0.5143***	
BM	0.1589***	-0.0053	0.0240**	0.0298**	-0.0050	-0.1347***	0.0379***	-0.0237**	0.1579***

Notes. This table presents summary statistics for the sample data. Panel A shows the distributions of the variables; Panel B presents the correlation matrix. *Mean*, *Std*, *Q1*, *Q2*, and *Q3* denote the mean, standard deviation, first quartile value, second quartile value, and third quartile value, respectively. *Synch* denotes stock price synchronicity. *Analyst coverage*, *Star coverage*, and *Nonstar coverage* denote the analyst coverage, star analyst coverage, and non-star analyst coverage, respectively. *Synch* denotes stock price synchronicity. *Analyst coverage*, *Star coverage*, and *Nonstar coverage* denote coverage by all, star, and non-star analysts, respectively, and *Analyst*, *Star*, and *Nonstar* are their respective logarithms. *SIZE*, *EARN*, *LIQ*, *VOLAT*, *FOWN*, *ROA*, *LEV*, and *BM* indicate the logarithm of individual firms' market capitalization, one-trillionth of earnings, logarithm of stock trading volume, stock price volatility, foreign ownership, return on assets, debt-to-assets ratio, and book-to-market ratio, respectively. *** and ** indicate statistical significance at the 1% and 5% levels, respectively.

Table 2
Background of the regulations.

Date	Event
Dec. 2014	Enactment of the Prohibition on Market Disturbances
July 2015	Enforcement of the Prohibition on Market Disturbances
Mar. 2016	Announcement of guidelines on the Prohibition on Market Disturbances by the FSS
Aug. 2016	Enactment of guidelines on investor relations, research, and analysis activities
Sep. 2016	Unfair trading of Hanmi Pharmaceutical shares
Oct. 2016	FSS investigation of Hanmi Pharmaceutical case
Dec. 2016	Court decision on the Hanmi Pharmaceutical case (i.e., the first case to which the Prohibition on Market Disturbances was applied)

Notes. This table shows events related to the adoption of the regulations, listed in chronological order. The *Event* column includes the contents of the regulatory changes, and the *Date* column lists the time of each event.

Table 3
Informativeness of analyst coverage in the equity market.

	M1	M2	M3	M4	M5	M6	M7
Intercept	-4.7246***	-3.4774***	-4.9271***	-4.9330***	-4.2820***	-4.6109***	-4.7526***
	(-14.96)	(-11.05)	(-15.21)	(-7.92)	(-6.93)	(-6.68)	(-6.42)
Analyst	**0.0121**	**0.0410**	**0.0333**	**-0.0589**	**0.0483**	**0.0483**	
	(0.37)	**(1.23)**	**(1.04)**	**(-1.33)**	**(1.19)**	**(1.19)**	
RAnalyst							0.0299
							(0.67)
SIZE	0.2482***	0.2128***	0.2411***	0.2345***	0.3652***	0.3652***	0.3935***
	(8.69)	(7.58)	(8.44)	(4.04)	(6.41)	(6.41)	(6.66)
LIQ	0.1455***	0.1564***	0.1453***	0.0869***	-0.0602**	-0.0602**	-0.0959***
	(9.19)	(10.08)	(9.30)	(3.02)	(-2.08)	(-2.08)	(-3.14)
VOLAT	-4.3552***	-12.6553***	-4.1119***	5.6610***	-5.6595***	-5.6595***	-4.2668***
	(-3.00)	(-9.79)	(-2.92)	(3.20)	(-3.73)	(-3.73)	(-2.64)
FOWN	-0.0008	-0.0017*	-0.0010	0.0001	-0.0020	-0.0020	-0.0024
	(-0.88)	(-1.95)	(-1.09)	(0.04)	(-1.23)	(-1.23)	(-1.29)
ROA	0.0023	0.0039	0.0011	-0.0050	-0.0031	-0.0031	-0.0035
	(0.47)	(1.05)	(0.23)	(-1.21)	(-1.18)	(-1.18)	(-1.23)
LEV	-0.0002	0.0002	-0.0003	0.0000	0.0003	0.0003	0.0003**
	(-0.26)	(0.46)	(-0.40)	(-0.06)	(1.36)	(1.36)	(2.04)
BM	0.0175***	0.0124***	0.0160***	0.0152***	0.0031	0.0031	0.0031
	(6.64)	(5.60)	(5.55)	(3.92)	(1.27)	(1.27)	(1.17)
Firm	No	No	No	Yes	Yes	Yes	Yes
Industry	No	No	Yes	No	No	Yes	Yes
Year	No	Yes	No	No	Yes	Yes	Yes
Robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	7,128	7,128	7,128	7,128	7,128	7,128	6,480
R^2	0.1347	0.3879	0.1471	0.3133	0.5621	0.5621	0.5769

Notes. This table shows the estimated relationship between analyst coverage and stock price synchronicity. *Intercept* is the intercept term. *Analyst* denotes the logarithm of analyst coverage. *RAnalyst* indicates the residual analyst coverage. *SIZE*, *LIQ*, *VOLAT*, *FOWN*, *ROA*, *LEV*, and *BM* indicate the logarithm of individual firms' market capitalization, logarithm of the stock trading volume, stock price volatility, foreign ownership, return on assets, debt-to-assets ratio, and book-to-market ratio, respectively. *Firm*, *Industry*, and *Year* indicate whether the given model considers fixed effects among firms, industries, and years, respectively. *Robust* indicates whether the given model includes robust standard errors. *Obs* denotes the number of observations. R^2 is the *R*-squared value. The figures in parentheses are *t*-statistics. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4
Informativeness of star and non-star analyst coverages.

	M1	M2	M3	M4	M5	M6	M7	M8	M9
Intercept	-4.9538***	-4.5509***	-4.5719***	-4.9436***	-4.7251***	-4.7819***	-4.5178***	-4.7747***	-4.5993***
	(-7.60)	(-6.58)	(-6.61)	(-7.57)	(-7.16)	(-7.24)	(-6.10)	(-6.44)	(-6.16)
Star	**-0.1133****		**-0.1258****						
	(-2.32)		**(-2.56)**						
Nonstar		**0.0591**	**0.0690**						
		(1.40)	**(1.63)**						
AStar				**-0.0097***		**-0.0101***			
				(-1.79)		**(-1.84)**			
ANonstar					**0.0082***	**0.0084***			
					(1.75)	**(1.80)**			
RStar							-0.1313**		-0.1402***
							(-2.50)		(-2.67)
RNonstar								0.0450	0.0554
								(0.98)	(1.21)
SIZE	0.3969***	0.3599***	0.3629***	0.3946***	0.3771***	0.3819***	0.3734***	0.3957***	0.3817***
	(7.57)	(6.30)	(6.36)	(7.52)	(7.07)	(7.14)	(6.31)	(6.69)	(6.41)
LIQ	-0.0558*	-0.0608**	-0.0602**	-0.0565*	-0.0581**	-0.057**	-0.0926***	-0.0968***	-0.0960***
	(-1.91)	(-2.10)	(-2.08)	(-1.94)	(-2.00)	(-1.99)	(-3.02)	(-3.17)	(-3.14)
VOLAT	-5.9540***	-5.6210***	-5.6846***	-5.8923***	-5.7821***	-5.8128***	-4.5244***	-4.2068***	-4.2991***
	(-3.95)	(-3.70)	(-3.74)	(-3.91)	(-3.84)	(-3.87)	(-2.82)	(-2.60)	(-2.66)
FOWN	-0.0018	-0.0020	-0.0019	-0.0018	-0.0019	-0.0018	-0.0022	-0.0024	-0.0023
	(-1.18)	(-1.24)	(-1.23)	(-1.19)	(-1.20)	(-1.19)	(-1.27)	(-1.30)	(-1.31)
ROA	-0.0030	-0.0031	-0.0032	-0.0030	-0.0030	-0.0031	-0.0035	-0.0036	-0.0037
	(-1.12)	(-1.20)	(-1.23)	(-1.12)	(-1.15)	(-1.16)	(-1.19)	(-1.26)	(-1.29)
LEV	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003**	0.0003**	0.0003**
	(1.47)	(1.34)	(1.34)	(1.46)	(1.47)	(1.49)	(2.11)	(2.00)	(1.98)
BM	0.0031	0.0031	0.0030	0.0032	0.0032	0.0032	0.0030	0.0030	0.0029
	(1.28)	(1.26)	(1.21)	(1.32)	(1.28)	(1.28)	(1.14)	(1.15)	(1.10)
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	7,128	7,128	7,128	7,128	7,128	7,128	6,480	6,480	6,480
R^2	0.5623	0.5622	0.5626	0.5621	0.5622	0.5623	0.5773	0.5770	0.5775

Notes. This table shows the informativeness of star and non-star analyst coverages. *Intercept* is the intercept term. *Star* (*Nonstar*) denotes the logarithm of star (non-star) analyst coverage, and *AStar* (*ANonstar*) is the adjusted star (non-star) analyst coverage. *RStar* (*RNonstar*) is the residual star (non-star) analyst coverage. *SIZE*, *LIQ*, *VOLAT*, *FOWN*, *ROA*, *LEV*, and *BM* indicate the logarithm of individual firms' market capitalization, logarithm of the stock trading volume, stock price volatility, foreign ownership, return on assets, debt-to-assets ratio, and book-to-market ratio, respectively. *Firm*, *Industry*, and *Year* indicate whether the given model considers fixed effects among firms, industries, and years, respectively. *Robust* indicates whether the given model includes robust standard errors. *Obs* denotes the number of observations. R^2 is the *R*-squared value. The figures in parentheses are *t*-statistics. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5
Star and non-star analysts' informativeness depending on firm characteristics.

	Disfavored				Moderate				Favored			
	Star	Nonstar	Obs.	R^2	Star	Nonstar	Obs.	R^2	Star	Nonstar	Obs.	R^2
SIZE	0.4119***	0.0231	1,419	0.4892	0.0544	0.0784*	4,290	0.5292	-0.2404***	0.1117	1,419	0.6459
	(2.66)	(0.20)			(0.68)	(1.69)			(-3.77)	(0.80)		
EARN	0.0528	0.1012	1,419	0.4951	0.0414	0.0634	4,290	0.5261	-0.2328***	0.1793	1,419	0.6495
	(0.27)	(0.76)			(0.48)	(1.42)			(-3.65)	(1.30)		
ROA	-0.0115	0.1860	1,419	0.5228	-0.0863*	0.0678	4,290	0.5779	-0.2123**	0.0416	1,419	0.5574
	(-0.06)	(1.69)			(-1.65)	(1.43)			(-2.18)	(0.45)		
LEV	-0.0220	-0.0346	1,419	0.5475	-0.1271*	0.0628	4,290	0.5385	-0.2044***	0.2513***	1,419	0.6466
	(-0.18)	(-0.43)			(-1.73)	(1.13)			(-2.89)	(2.64)		
BM	-0.1649	0.0012	1,419	0.5233	-0.1013	0.0666	4,290	0.5445	-0.1511**	0.1865**	1,419	0.6450
	(-1.31)	(0.01)			(-1.53)	(1.21)			(-2.08)	(2.31)		
LIQ	-0.0478	0.0635	1,419	0.5172	-0.1326**	0.0267	4,290	0.5686	-0.1874	0.1293	1,419	0.5963
	(-0.29)	(0.57)			(-2.39)	(0.56)			(-1.38)	(1.01)		

Notes. This table shows the informativeness of star and non-star analyst coverages depending on firm characteristics. For brevity, the estimated coefficients of the control variables are omitted. *Star* (*Nonstar*) denotes the logarithm of star (non-star) analyst coverage. The rows labeled *SIZE*, *EARN*, *ROA*, *LEV*, *BM*, and *LIQ* show the results from analyzing subsamples based on firms; market capitalizations, earnings, return on assets, debt-to-assets ratio, book-to-market ratio, and stock trading volume, respectively. We classify firms into three subgroups according to fund managers' preferences. The most (least) favored two deciles of stocks are classified as *Favored* (*Disfavored*), and the rest are classified as *Moderate*. The *Favored* group includes firms with high market capitalizations, earnings, returns on assets, debt-to-asset ratios, book-to-market ratios, or trading volumes. *Obs* denotes the number of observations. R^2 is the *R*-squared value. The figures in parentheses are *t*-statistics. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6
Analysts' informativeness before and after regulatory reforms.

Panel A: Before

	M1	M2	M3	M4	M5	M6
Intercept	-6.5134***	-6.5598***	-6.5070***	-5.3373***	-5.0039***	-4.9538***
	(-7.17)	(-7.44)	(-7.13)	(-5.14)	(-4.82)	(-4.76)
Analyst	**-0.0213**					
	(-0.44)					
Star		**-0.2688*** **	**-0.2703*** **			
		(-3.38)	**(-3.31)**			
Nonstar			**0.0093**			
			(0.18)			
RAnalyst				-0.0802		
				(-1.44)		
RStar					-0.3735***	-0.3692***
					(-3.98)	(-3.88)
RNonstar						-0.0361
						(-0.62)
SIZE	0.4420***	0.4472***	0.4425***	0.4142***	0.3878***	0.3822***
	(5.96)	(6.23)	(5.94)	(4.81)	(4.53)	(4.43)
LIQ	-0.0946*	-0.0949**	-0.0958**	-0.1654***	-0.1704***	-0.1667***
	(-1.95)	(-1.97)	(-1.97)	(-3.17)	(-3.28)	(-3.20)
VOLAT	-4.6070*	-4.7545**	-4.7206**	-0.3485	-0.4303	-0.5791
	(-1.95)	(-2.02)	(-2.00)	(-0.14)	(-0.17)	(-0.23)
FOWN	-0.0039**	-0.0038*	-0.0038*	-0.0049**	-0.0048**	-0.0047**
	(-1.97)	(-1.92)	(-1.91)	(-1.96)	(-1.98)	(-1.97)
ROA	-0.0094***	-0.0095***	-0.0095***	-0.0108***	-0.0112***	-0.0111***
	(-3.24)	(-3.32)	(-3.34)	(-3.03)	(-3.19)	(-3.17)
LEV	-0.0003	-0.0003	-0.0003	-0.0004	-0.0004	-0.0004
	(-1.03)	(-1.08)	(-1.09)	(-1.50)	(-1.61)	(-1.60)
BM	0.0059	0.0060	0.0060	0.0089*	0.0091*	0.0091*
	(1.42)	(1.44)	(1.44)	(1.82)	(1.83)	(1.84)
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Obs	3,888	3,888	3,888	3,240	3,240	3,240
R^2	0.6057	0.6071	0.6071	0.6384	0.6406	0.6407

Panel B: After

	M1	M2	M3	M4	M5	M6
Intercept	4.1084*	3.8204*	4.1182*	16.1808***	16.2613***	16.2348***
	(1.71)	(1.64)	(1.71)	(5.49)	(5.54)	(5.53)
Analyst	**0.0634**					
	(0.58)					
Star		**-0.0047**	**-0.0099**			
		(-0.05)	**(-0.10)**			
Nonstar			**0.0672**			
			(0.60)			
RAnalyst				0.0007		
				(0.01)		
RStar					-0.0496	-0.0504
					(-0.35)	(-0.35)
RNonstar						0.0101
						(0.07)

SIZE	-0.1946	-0.1677	-0.1950	-1.4178***	-1.4237***	-1.4213***
	(-0.99)	(-0.87)	(-0.99)	(-5.95)	(-6.04)	(-5.98)
LIQ	-0.4167***	-0.4143***	-0.4170***	0.0120	0.0113	0.0109
	(-7.04)	(-7.02)	(-7.03)	(0.17)	(0.16)	(0.15)
VOLAT	5.5141**	5.2840*	5.5248*	30.2147***	30.2080***	30.2459***
	(1.84)	(1.79)	(1.84)	(7.59)	(7.70)	(7.60)
FOWN	0.0002	0.0003	0.0002	0.0014	0.0014	0.0014
	(0.02)	(0.05)	(0.02)	(0.15)	(0.16)	(0.16)
ROA	-0.0124	-0.0122	-0.0124	-0.0285	-0.0285	-0.0286
	(-0.97)	(-0.95)	(-0.97)	(-1.05)	(-1.05)	(-1.06)
LEV	-0.0001	-0.0001	-0.0001	-0.0039**	-0.0039**	-0.0039**
	(-0.16)	(-0.11)	(-0.16)	(-2.36)	(-2.37)	(-2.36)
BM	-0.0058*	-0.0056***	-0.0058*	0.0169**	0.0170**	0.0170**
	(-1.77)	(-1.71)	(-1.76)	(2.20)	(2.22)	(2.21)
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Obs	2,592	2,592	2,592	2,592	2,592	2,592
R^2	0.6972	0.6926	0.6972	0.4253	0.4253	0.4253

Notes. This table shows the informativeness of analyst coverages before and after the regulatory changes in the Korean market. *Before* and *After* indicate the pre- and post-reform periods, respectively. *Intercept* is the intercept term. *Analyst* denotes the logarithm of total analyst coverage, and *Star* (*Nonstar*) denotes the logarithm of star (non-star) analyst coverage. *RAnalayst*, *RStar*, and *RNonstar* denote general, star, and non-star analyst coverage proxies, respectively, that are orthogonal to firm-specific characteristics. *SIZE*, *LIQ*, *VOLAT*, *FOWN*, *ROA*, *LEV*, and *BM* indicate the logarithm of individual firms' market capitalization, logarithm of the stock trading volume, stock price volatility, foreign ownership, return on assets, debt-to-assets ratio, and book-to-market ratio, respectively. *Firm*, *Industry*, and *Year* indicate whether the given model considers fixed effects among firms, industries, and years, respectively. *Robust* indicates whether the given model includes robust standard errors. *Obs* denotes the number of observations. R^2 is the *R*-squared value. The figures in parentheses are *t*-statistics. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7
Characteristics of firms covered by analysts.

Panel A: Star

	CAP	EARN	ROA	LEV	BM	LIQ
2010	5.3890	0.6967	0.1511	2.2081	3.1027	5.6370
2011	7.0575	0.7492	0.1267	2.6120	3.5624	5.7156
2012	7.0033	0.8060	0.1290	2.0280	3.3616	5.5226
2013	6.2677	0.6268	0.1272	2.5415	4.1990	5.4725
2014	7.4759	0.7796	0.0958	2.4683	4.4683	5.5148
2015	5.9072	0.6454	0.0778	2.1489	4.1058	5.4375
2016	7.6349	1.0468	0.0920	2.0206	4.5803	5.4525
2017	11.0927	1.7019	0.1487	1.4522	3.0748	5.4452
2018	11.8787	1.8038	0.1250	1.5037	3.7425	6.1151
2019	10.3039	1.0739	0.0569	2.0382	5.6855	6.0405
2020	11.8428	0.9745	0.0655	1.3309	3.8305	6.2215
Pre-reform mean	6.5168	0.7173	0.1179	2.3345	3.8000	5.5500
Pre-reform STD	0.7943	0.0729	0.0264	0.2376	0.5356	0.1055
Post-reform mean	11.2795	1.3885	0.0990	1.5813	4.0833	5.9556

Panel B: Star to non-star

	CAP	EARN	ROA	LEV	BM	LIQ
2010	0.6133	0.5940	0.8917	1.1948	1.1946	0.9930
2011	0.7083	0.6440	0.8389	1.2489	1.2478	0.9923
2012	0.6700	0.6498	0.9598	1.0580	1.0237	0.9829
2013	0.5803	0.4867	0.9148	1.3398	1.2610	0.9884
2014	0.7539	0.7508	0.9745	1.2575	1.2328	0.9992
2015	0.6456	0.5908	0.8209	1.1554	1.0725	0.9871
2016	0.7607	0.7817	0.9341	1.1440	1.1193	0.9988
2017	0.9255	0.9798	1.0531	0.9247	0.9629	0.9917
2018	0.9486	0.9463	0.9630	1.0213	1.0930	1.0142
2019	0.9241	0.9637	0.9485	1.1112	1.2041	1.0054
2020	0.7463	0.7109	0.9001	1.2209	1.2274	0.9627
Pre-reform mean	0.6619	0.6193	0.9001	1.2091	1.1721	0.9905
Pre-reform STD	0.0632	0.0870	0.0623	0.0969	0.0998	0.0057
Post-reform mean	**0.8862**	**0.9001**	**0.9662**	**1.0695**	1.1218	0.9935

Notes. Panel A shows the average values of characteristics for firms covered by star analysts in each year. Panel B shows the values of characteristics for star-covered firms relative to those for non-star-covered firms. The columns labeled *CAP*, *EARN*, *ROA*, *LEV*, *BM*, and *LIQ* show the average values of market capitalization divided by one trillion, earnings divided by one trillion, return on assets, debt-to-asset ratio, book-to-market ratio, and logarithm of the stock trading volume, respectively, for the firms covered by star analysts in each year. *Pre-reform mean* (*Post-reform mean*) shows the average values of the firm characteristics during the pre-reform (post-reform) period. *Pre-reform STD* shows the standard deviations of the firm characteristics during the pre-reform period.