Are all analysts created equal? Industry expertise and monitoring effectiveness of financial analysts

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Abstract

We examine whether analysts' prior industry experience influences their ability to serve as effective external firm monitors. Our analyses of firms' financial disclosure, executive compensation and CEO turnover portray a consistent picture that only analysts with related pre-analyst industry experience play an effective monitoring role. These analysts are able to reduce earnings management behavior and the probability of firms committing financial misrepresentation. Their presence also leads to lower CEO excess compensation and higher performance sensitivity of forced CEO turnovers. Our results highlight the importance of analysts' industry expertise and suggest that not all analysts are equal in providing external monitoring.

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1. Introduction

Sell-side analysts provide a valuable service to financial market participants through their ability to collect, interpret, and circulate large amounts of often complex information. The past several decades of research pertaining to financial analysts almost exclusively focuses on their earnings forecasts and stock recommendations. A nascent literature has recently emerged suggesting that analysts can also have a considerable impact on major corporate decisions. It has been shown that analyst coverage or the loss/reduction of it affects a number of corporate policies such as financial disclosure, executive compensation, investment, financing, and innovation (e.g., Yu (2008), Irani and Oesch (2013), Balakrishnan, Billings, Kelly, and Ljungqvist (2013), Chen, Harford, and Lin (2013), Derrien and Kecskés (2013), Degeorge, Derrien, Kecskés, and Michenaud (2013), He and Tian (2013)).[1]

This new line of investigation not only advances our understanding of the role of financial analysts beyond just information providers to investors, but also poses an interesting question: Are all analysts capable of exerting influence over firm decision making? This question is especially relevant when viewed against the backdrop of substantial heterogeneities among analysts and their impact on analyst performance (e.g., Clement (1999), Jacob, Lys, and Neale (1999)). In particular, there is no evidence on how analysts' industry expertise factors into their role in shaping major corporate strategies and policies. This is surprising for at least two reasons. First, industry expertise is consistently rated as the most important quality for analysts, both by analysts themselves (see the survey by Brown, Call, Clement, and Sharpe (2014)) and by buy-side investors who annually rank the top analysts for *Institutional Investor's* all-star research teams. Analysts tend to specialize in few industries to take advantage of economies of scale in information production (Boni and Womack (2006), Kadan, Madureira, Wang, and Zach (2012)). Bradley, Gokkaya, and Liu (2014) capture analysts' industry expertise by their pre-analyst work experience and show that analysts with related industry experience in the firms they cover issue more accurate earnings forecasts, generate higher market reactions by their forecast revisions, and have more favorable career outcomes, further affirming the importance of industry expertise. Second, there is a growing interest in the implications

[1] Yu (2008), Irani and Oesch (2013), and Chen, Harford, and Lin (2013) find that financial analysts can provide external monitoring of firms and reduce agency problems. Derrien and Kecskés (2013) show that less analyst coverage leads to significant reductions in investments and financing activities. He and Tian (2013) find that analyst coverage impedes firm innovation. Balakrishnan et al. (2013) show that loss of analyst coverage prompts firms to increase voluntary disclosure. Degeorge et al. (2013) find that analysts' preferences affect corporate policies.

of industry expertise for some key actors in the corporate and financial market settings, e.g., CEOs, board of directors, and financial institutions.[2]

We contribute to a more complete understanding of the effects of analysts on corporate decision making by examining whether analysts' industry expertise affects their effectiveness in providing external monitoring and improving the corporate governance of firms.[3] The notion of analyst monitoring goes at least as far back as Jensen and Meckling (1976, p. 354-355), who suggest that security analysts possess comparative advantages in monitoring firm management and thus can play a large role in reducing agency costs. Monitoring by analysts can take the form of scrutinizing and, if necessary, questioning firms' financial results, performance, and specific policies. Analysts can raise concerns and bring issues to light when they directly interact with firm managers on earnings conference calls (Cohen, Lou, and Malloy (2014)),[4] express their views in the media and in their research reports (Degeorge et al. (2013)), or voice their opinions more discreetly through private communications with corporate executives (Brown et al. (2014) and Soltes (2014)). Analysts can also provide external monitoring as an information intermediary by gathering, analyzing, and disseminating more firm-related information to enhance corporate transparency and help expose managerial misbehavior (Healy and Palepu (2001)). A better information environment also facilitates direct intervention by other monitors such as corporate boards and individual or institutional investors. Consistent with their monitoring role, analysts are directly involved in the unraveling of several financial frauds (Dyck, Morse, and Zingales (2010), Martin, Wang, and Xin (2014)), whereas systematic evidence from Yu (2008), Irani and Oesch (2013), and Chen, Harford, and Lin (2013) suggests that analyst coverage indeed improves the quality of corporate decision making.

As elaborated below, despite its positive effect on traditional metrics of analyst performance, the ramifications of industry expertise for the monitoring and corporate governance role of analysts are more complex and difficult to determine ex ante. On the one hand, it is possible that analysts with related industry experience in the firms they cover can provide more effective external monitoring because their prior industry experience may allow them to develop a better

[2] For example, Custodio and Metzger (2013) and Custodio, Ferreira, and Matos (2013) examine CEO industry expertise. Independent director industry expertise is the subject of investigation by Dass, Kini, Nanda, Onal, and Wang (2013), Fernandes and Fich (2013), Wang, Xie, and Zhu (2013), Minton, Taillard, and Williamson (2013), and Masulis, Ruzzier, Xiao, and Zhao (2014). The industry expertise of M&A advisors is the focus of Wang, Xie, and Zhang (2014).

[3] We use the industry expertise measure developed by Bradley, Gokkaya, and Liu (2014) in our investigation.

[4] Consistent with active monitoring by at least some analysts, Cohen, Lou, and Malloy find that firms with managed earnings and negative information are more likely to choreograph their earnings conference calls by calling on more favorable analysts, who tend to ask more positive questions.

understanding of the firm's industry. Richer and more in-depth industry knowledge can enhance analysts' ability to analyze firms' financial information and evaluate the strategies and decisions proposed or implemented by firm management. Therefore, analysts with related industry expertise, i.e., industry expert analysts, are better equipped and thus more likely to identify and bring attention to firm policies that do not serve shareholders' best interests. In addition, these analysts also contribute to a more transparent information environment through their more efficient information production and more accurate earnings forecasts (Bradley, Gokkaya, and Liu (2014)). As a result, firms followed by more industry expert analysts are subject to not only more intense but also more informed scrutiny, which can have the dual effects of reducing managers' latitude and incentives to engage in self-serving behavior as well as providing an impetus for boards of directors to demand higher accountability of managers for their actions. We term this view the *effective monitor hypothesis*.

On the other hand, prior work experience in a firm's related industry may reduce analysts' incentive to monitor firm management in subtle, but potentially important ways. For example, having worked in the firm's related industry increases the likelihood that the analysts and the firm's managers know each other if their career paths have crossed or they have met at work functions such as industry trade shows or conventions. Likewise, related industry work experience also increases the chance of social connections being developed between the analysts and firm management through common friends or acquaintances from within the industry. These social ties can potentially cloud analysts' views, causing them to be more likely to agree with rather than disapprove of the decisions made by managers. Together, these different channels imply that related industry experience can impair the incentives of analysts to monitor firm management, allowing corporate insiders to indulge more in activities that benefit themselves at shareholders' expense. We term this view the *impaired monitor hypothesis*.

We test these hypotheses by examining the effects of industry expert analyst coverage on several major corporate policies including financial disclosure, CEO compensation, and CEO turnover. A large part of an analyst's job entails the perusal and analysis of financial information disclosed by firms to the capital markets and the use of such disclosure as a basis to evaluate managerial decision making and forecast future performance. Therefore, we start our analysis by relating analyst industry expertise to a number of observable outcomes of the choices made by managers in firms' financial disclosure. This is also in keeping with earlier studies by Yu (2008) and Irani and Oesch (2013) that examine the effect of analyst monitoring on corporate financial reporting quality.

We first examine the impact of analyst industry expertise on earnings management through discretionary accruals. Earnings management is considered as a manifestation of the agency problems between managers and shareholders, because managers are able to extract various forms of private benefits and personal gains by manipulating reported financial results (e.g., Perry and Williams (1994) and Bergstresser and Philippon (2006)). Shareholders, on the other hand, bear significant costs when aggressive earnings management leads to financial misreporting that results in earnings restatements, shareholder lawsuits, and regulatory/legal sanctions against the firm (e.g., Dechow, Sloan, and Sweeney (1996) and Karpoff, Lee, and Martin (2008)). Analysts have incentives to be vigilant about aggressive earnings management as Dyck, Morse, and Zingales (2010) find that failure to detect accounting fraud at covered firms increases an analyst's probability of being demoted.

As Dichev, Graham, Harvey, and Rajgopal (2013) point out, it is difficult for outsiders to detect earnings manipulation, but large deviations from industry and peer norms can serve as a red flag for potential financial misreporting because a substantial portion of a firm's financial reporting choices is driven by operations and economic conditions specific to its industry. Therefore, relevant industry expertise and knowledge are essential for the evaluation of many aspects of corporate financial reporting. Consistent with this notion, we find that coverage by more analysts with expertise in a firm's related industry significantly reduces the firm's earnings management. In contrast, coverage by other analysts is not related to earnings management behavior. These results are robust to controlling for a wide range of analyst and firm-specific attributes. Our evidence lends support to the *effective monitor hypothesis* and suggests that related industry expertise obtained by analysts from their pre-analyst employment is crucial for them to assess and monitor firms' financial disclosure.

We also examine whether the effect of industry expert analyst coverage on earnings management exhibits any cross-sectional variation. An important benefit of this analysis is that it can depict a more nuanced picture of the effect of analyst industry expertise by highlighting the settings in which it is especially valuable. We find that the negative effect of industry expert analyst coverage on firms' earnings management is more pronounced in firms with higher information asymmetry. This is consistent with the interpretation that external monitoring is more difficult for firms with an opaque information environment and related industry expertise can help analysts overcome this information problem and facilitate their monitoring of these firms. The effect of industry expert analysts is also more important in firms with weaker corporate governance, which supports the view

that monitoring by these analysts serves as a substitute for other corporate governance mechanisms. We also uncover evidence that industry expert analysts have a larger effect in reducing earnings management in firms covered by analysts with less general and firm-specific forecasting experience, suggesting that related industry expertise is more valuable when analysts are less experienced in their profession and about the firms they cover. Finally, our results show that the effect of industry expertise is stronger if analysts obtained such expertise from working for a publicly-traded company and from more recent employment, consistent with a higher relevance of these types of industry expertise for monitoring corporate financial reporting.

Next we extend prior research on analysts' monitoring of corporate financial reporting beyond accruals policy by investigating the effect of analyst industry expertise on the probability of firms committing intentional material financial misreporting. If analysts with industry expertise play a more effective monitoring role and increase the probability of detection of financial manipulation, then managers may be less likely to engage in these egregious activities. We use the F-score developed by Dechow, Ge, Larson, and Sloan (2011) to capture the ex-ante probability of firms engaging in financial misreporting and earnings restatements as an ex-post measure of financial misreporting. We find that both measures are significantly lower when firms are followed by more analysts with related industry expertise. As is the case with our earnings management results, coverage by other analysts is not related to the probability of financial misreporting.

In further analysis, we examine firms' CEO compensation and CEO turnover decisions and provide more evidence in support of the *effective monitor hypothesis*. Specifically, we find that coverage by industry expert analysts significantly reduces the level of CEO total and excess compensation and increases the responsiveness of firms in replacing poorly performing CEOs. Closely echoing the results from our financial disclosure analysis, we find that coverage by other analysts is not related to either CEO compensation or CEO turnover decisions.

A potentially serious econometric concern with respect to our analyses is identification. Since analyst coverage in general, and coverage by industry expert analysts in particular, are not random and most likely endogenously determined, it is difficult to make any causal statement about the relations between industry expert analyst coverage and various aspects of corporate decision making that emerge from our baseline OLS regressions. For example, rather than industry expert analysts causally reducing earnings management, financial misrepresentation, and CEO total or excess compensation, it could be that industry expert analysts utilize their superior industry knowledge to identify and provide coverage for firms with fewer agency problems. To overcome the

identification challenge, we conduct additional analysis whenever possible in which we focus on exogenous disappearances of analysts caused by brokerage house mergers or closures following Kelly and Ljungqvist (2012). We observe a significant increase in firms' earnings management, ex-ante probability of committing material financial misstatement (F-score), and CEO total or excess compensation after they lose analyst coverage due to a brokerage merger or closure. However, consistent with the baseline OLS results, this pattern only holds for the loss of coverage by analysts with related industry expertise.[5] This evidence points to a causal effect of industry expert analyst coverage on corporate policies.

Overall, our findings clearly indicate that industry expert analysts provide external monitoring of firm managers and improve corporate governance. One interesting question related to the literature on analyst monitoring in general and our paper in particular is whether there are any costs to analysts in monitoring corporate managers that reduce their incentive to monitor in the first place. To shed some light on this issue, we postulate that analysts employed by brokerage houses or investment banks with investment banking relationship with a firm are less likely to be effective monitors because doing so may potentially strain the relationship between firm managers and analysts' employers and lead to a reduction or loss of investment banking businesses from the firm. Results from our analysis are consistent with this conjecture. Specifically, we find that the hitherto reported effects of industry expert analysts on firms' financial disclosure, CEO compensation, and CEO turnover polies are largely driven by "unaffiliated" industry expert analysts, whose employers have no investment banking relationship with the firms.

Our study makes two primary contributions to the literature. First, by examining the heterogeneity among analysts in the dimension of their prior work experience and resultant industry expertise, we contribute to building a more complete and accurate understanding of the potential influence of financial analysts over firm decision making. Our investigation into multiple major corporate policies conveys a consistent message that industry expertise is a critical element in enabling financial analysts to perform their purported external monitoring function in followed firms. Our evidence complements the finding by Yu (2008) that analysts working for top brokers and with more forecasting experience have a larger effect on firms' earnings management. These

[5] For the probability of intentional financial misreporting that triggers restatements and the sensitivity of forced CEO turnover to firm performance, we are unable to perform the analysis based on exogenous shocks to a firm's analyst coverage because there are only two firms that announced earnings restatements after losing coverage by industry expert analysts and only one firm that experienced a forced CEO turnover after losing coverage by industry expert analysts.

results together highlight the importance of exploring analyst heterogeneities. It is worth noting that the effect of analyst industry expertise we document is incremental to those of an analyst's general, industry-specific, and firm-specific forecasting experience and thus represents a new and distinct attribute that impacts analysts' ability to fulfill their monitoring roles.

Second, we add to the aforementioned emerging literature that investigates the implications of industry expertise for a variety of agents in corporate and financial market settings, such as CEOs, corporate directors, and investment banks. Our paper is the first to demonstrate the importance of industry expertise for the monitoring and corporate governance role of financial analysts. As such, our findings complement the evidence in Bradley, Gokkaya, and Liu (2014) that industry expertise enables analysts to make more accurate earnings forecasts as well as the evidence in Dass et al. (2013), Masulis et al. (2014), and Wang, Xie, and Zhu (2013) that industry expertise facilitates the corporate governance functions of corporate boards.

The rest of our paper proceeds as follows. Section 2 describes the data and presents descriptive statistics. Section 3 reports our empirical findings from investigations of firms' financial disclosure, CEO compensation, and CEO turnover decisions, as well as additional robustness tests. Section 4 concludes.

2. Data and descriptive statistics

The primary data employed in this study are constructed from a number of sources. We first merge Institutional Broker Estimate System (I/B/E/S) with CRSP/Compustat to obtain firm financial statement and stock price and return information. We next identify sell-side analysts who provided at least one annual earnings forecast and merge this sample with the I/B/E/S recommendation file to retrieve analyst last names, first name initials and brokerage house information. We eliminate analysts with missing information on first name initials and last names and also discard analyst research teams since only the last names of analyst team members can be obtained from I/B/E/S. This initial screening results in 9,305 unique analysts following 6,793 firms from 1983 to 2011.

We next conduct a thorough search on Zoominfo.com, an employment background indexing website, to capture the surviving analysts' full first names. We follow a very conservative approach in our web search and require that analyst last names, first name initials, and brokerage houses match the information gathered from I/B/E/S. This leaves us with 6,461 analysts. For each remaining analyst in our sample, we manually collect information on employment backgrounds from

LinkedIn.com, the world's largest professional network.[6] We search for the analyst's full name along with the corresponding brokerage house's name and collect detailed information on the names of the analyst's pre-analyst employers and years of employment. The analysts in our sample have 6,211 prior employers, 450 of which are publicly-traded. We next break down the analysts' employment experience into "related" and "unrelated" at the firm-level within their coverage portfolio. An analyst is coded as having "related industry experience" in a covered firm if the firm and the analyst's prior employer(s) share the same Fama-French (FF) 5-industry classification. Pre-analyst work experience is defined as "unrelated experience" if the FF 5-industry classifications of the followed firm and the analyst's prior employer(s) do not match.[7, 8] Analysts without pre-analyst industry work experience are classified as "inexperienced."

Insert Table 1 here

Table 1 presents the summary statistics of key variables, with Panel A for dependent variables of our analyses, Panel B for firm financial characteristics, and Panel C for analyst characteristics. Appendix 1 provides detailed explanations for the construction of these variables. All variables are winsorized at the 0.5% and 99.5% tails to reduce the impact of outliers. We note that in Panel A, the number of firm-year observations associated with each dependent variable is different, because sample construction, period, and size vary across the different analyses conducted in this paper. For expositional convenience, Panel B and C are based on the sample used for the accrual-based earnings management analysis, which consists of 28,466 firm-year observations from 1983 to 2011.

As reported in Panel A, the average (median) firm has a ratio of absolute discretionary accruals to total assets of 0.062 (0.039), an F-score of 1.215 (0.927), and a total CEO compensation of $3.9 ($2.5) million. About 2% of firm-year observations witness intentional financial misreporting

[6] Since having a *LinkedIn* profile is voluntary, we examine whether there are any observable differences in ability or quality between analysts with and without a *LinkedIn* profile. We compare the life-time earnings forecast accuracy between the two groups of analysts and find no significant difference.

[7] To classify private firms' industries in analyst employment data, we conduct thorough web searches and assign each firm manually to one of the 5 Fama French industry classifications based on the business descriptions obtained from the Securities and Exchange Commission's (SEC) website, business news websites (e.g., Bloomberg and BusinessWeek) or company official websites.

[8] A reasonable concern with our analysis is that related experience is defined by the broad Fama-French 5-industry classification. This is due to the fact that private firms significantly outnumber publicly-traded firms and it is difficult to assign private firms into finer industries. It should be noted that any misclassification would introduce noise and bias against finding any significant differences between related and unrelated industry experience. Nevertheless, we use a subsample of analysts who were employed at public firms and repeat our analyses with industries defined by the finer Global Industry Classification Standard (GICS). Our results remain intact (see Section 3.5.2).

that leads to earnings restatements, and about 3% of firm-year observations experience forced CEO turnovers.

According to Panel B, the average (median) firm has a market value of equity *(Market cap)* of $4.75 ($0.93) billion, a market-to-book ratio *(Market-to-book)* of 3.14 (2.29), a return on assets (*ROA*) of 3.1% (4.8%), a growth rate in the book value of total assets (*Total assets growth*) of 22.4% (9.5%), a standard deviation of cash flows divided by total assets (*Cash flow volatility*) of 23.1% (10.2%), and a ratio of external financing to total assets (*External financing)* of 2.3% (-0.1%), where external financing is constructed as the sum of net proceeds from equity and debt financing activities. These values are of similar magnitude to those reported in other studies (e.g., Bergstresser and Philippon (2006), Yu (2008)).

Panel C shows that the median firm is covered by 3 sell-side analysts, with one having related pre-analyst industry experience (*Related analysts*), one having unrelated pre-analyst industry experience (*Unrelated analysts*), and one having no pre-analyst industry experience (*Inexperienced analysts*). We separately calculate an analyst's general and firm-specific forecasting experience as the number of years since the analyst initially appeared in I/B/E/S (*Experience as analyst*) and the number of years in which the analyst provided coverage for a particular firm (*Experience with firm*). For the median firm in our sample, the median analyst covering the firm has 6 years of general experience, 2 years of firm-specific experience, a research portfolio consisting of 12 unique firms (*Portfolio size*), and 60% of analysts work at a top brokerage house (*Analysts from top brokers*).

3. Empirical results

In this section, we present the results from our examination of the *effective monitor hypothesis* versus the *impaired monitor hypothesis*. Sections 3.1 and 3.2 evaluate the quality of a firm's financial disclosure policy in relation to coverage by financial analysts with related industry experience, with Section 3.1 on accruals-based earnings management and Section 3.2 on measures of financial misreporting. Section 3.3 investigates the effect of financial analyst industry experience on CEO compensation policies. Section 3.4 examines whether the presence of financial analysts with related industry experience affects the sensitivity of forced CEO turnovers to firm performance. Section 3.5 reports a number of robustness checks and additional analyses.

3.1. The effect of analyst industry expertise on earnings management

We examine whether the presence of industry expert analysts (*Related analysts*) is related to firms' earnings management, which we measure using the absolute value of discretionary accruals (*Abs_DA*). Discretionary accruals are estimated based on a modified Jones (1991) model (Dechow, Sloan, and Sweeney (1996), Warfield, Wild, and Wild (1995)).[9] Managers have incentives to manage earnings upward (e.g., to meet or beat earnings forecasts, to inflate the stock price prior to their stock sales, or to hit performance targets for bonuses) as well as downward (e.g., prior to option repricing or management buyouts or as an attempt to smooth earnings). Because our hypotheses are related to the magnitude rather than the direction of earnings management, we follow prior studies, such as Bergstresser and Philippon (2006) and Yu (2008), and use the absolute value of discretionary accruals scaled by total assets as our dependent variable of interest.

The *effective monitor hypothesis* argues that by virtue of their more in-depth knowledge and understanding of a firm's industry, industry expert analysts are better able to identify abnormalities in the firm's financial reporting that represent large deviations from industry norms. Therefore, they are more likely to discover deliberate attempts by managers to distort the firm's financial condition and obfuscate the firm's true performance. Anticipating the scrutiny from industry expert analysts and faced with the prospect of being questioned and challenged by these analysts on their financial disclosure choices, managers are likely to refrain from engaging in excessive earnings management. Therefore, we expect coverage by industry expert analysts to reduce the extent of a firm's earnings management behavior. The *impaired monitor hypothesis*, however, contends that financial analysts with related industry expertise have weakened incentives to critically evaluate a firm's financial disclosure and if necessary, to voice their concerns about the choices made by firms in the financial reporting process. The more tacit stance taken by these analysts can weaken the overall monitoring of firms and allow managers to engage in more earnings management.

3.1.1. Baseline OLS regressions

To empirically test these predictions, we first estimate OLS regressions of earnings management against analyst coverage while explicitly controlling for a battery of firm and analyst-

[9] We obtain qualitatively similar results with higher statistical significance when we adjust the discretionary accruals for firm performance as suggested by Kothari, Leone, and Wasley (2005). Specifically, we follow Gong, Louis, and Sun (2008) to first sort all firms into quintile portfolios based on their lagged ROAs for each 2-digit SIC industry in each fiscal year. For each firm, the performance-adjusted discretionary accruals is equal to the difference between the firm's discretionary accruals estimated from the modified Jones model and the average discretionary accruals from the modified Jones model for the firm's industry and performance matched portfolio.

level characteristics as discussed in Section 2. We include firm and year-fixed effects in the regressions to mitigate potential concerns about time-invariant unobservable firm characteristics being correlated with both earnings management and analyst coverage (Fich and Shivdasani (2006)). Our formal model is specified in equation (1). To mitigate reverse causality concerns, all firm financial characteristics included as control variables are lagged by one year.

$$\begin{aligned} Abs\_DA_{i,t} = {} & \beta_0 + \beta_1 \text{Total analysts (Residual)}[\text{or } \beta_2 \text{Related analysts (Residual)} + \beta_3 \text{Unrelated analysts} \\ & \text{(Residual)} + \beta_4 \text{Inexperienced analysts (Residual)}] + \beta_5 \text{Market cap} + \beta_6 \text{Market-to-book} \\ & + \beta_7 \text{ROA} + \beta_8 \text{Total assets growth} + \beta_9 \text{Cash flow volatility} + \beta_{10} \text{External financing} \\ & + \beta_{11} \text{Experience as analyst} + \beta_{12} \text{Experience with firm} + \beta_{13} \text{Analysts from top brokers} \\ & + \beta_{14} \text{Portfolio size} + \text{Firm and year fixed effects} + \varepsilon \end{aligned} \quad (1)$$

Insert Table 2 here

Table 2 reports the regressions results. As in the rest of the tables, in parentheses below coefficient estimates are robust *t*-statistics based on standard errors adjusted for heteroskedasticity and firm-level clustering. As a starting point of our analysis, we replicate the finding by Yu (2008) and Irani and Oesch (2013) that analyst coverage reduces firms' earnings management. Specifically, in model 1, we regress a firm's absolute value of discretionary accruals (*Abs_DA*) against the total number of analysts following the firm. Consistent with analysts playing an external monitoring role, we find that total analyst coverage is significantly and negatively associated with *Abs_DA*.

Next we decompose the total number of analysts following a firm into the numbers of analysts with related industry expertise (*Related analysts*), analysts with unrelated industry expertise (*Unrelated analysts*), and analysts without any pre-analyst industry work experience *(Inexperienced analysts)*. We reestimate the abnormal accruals regression and present the results under model 2. We find that only coverage by financial analysts with related industry experience is significantly and negatively related to a firm's abnormal accruals. While the coefficients on the other two types of analyst coverage are also negative, they are not statistically significant. These findings suggest that the negative association between analyst coverage and earnings management documented by prior studies (Yu (2008), Irani and Oesch (2013), and Chen, Harford, and Lin (2013)) is largely driven by analysts with related industry experience. As such, they support the *effective monitor hypothesis* that financial analysts with related industry experience provide more effective monitoring of firms' financial disclosure.

Since industry expertise obtained from pre-analyst employment is only one attribute of analysts, it is important for us to ensure that industry experience is not capturing other analyst characteristics that could also affect analysts' ability to limit firms' earnings management. For instance, Yu (2008) provides empirical evidence that analysts with longer forecasting experience might be more effective in curbing earnings management behavior. Therefore, we include a wide array of analyst-specific controls in Model 3. Nonetheless, the inclusion of other analyst characteristics such as forecasting experience (either general or firm-specific), employment at top brokerage houses, and portfolio size, has little effect on the relation between industry expert analyst coverage and earnings management.[10]

An empirical challenge in investigating the question of how analyst coverage affects corporate financial disclosure is the possibility that an analyst's decision to cover a firm is associated with observable factors that could also affect firms' earnings management (Healy, Hutton, and Palepu (1999)). Therefore, we follow Yu (2008) and construct residual analyst coverage to mitigate this endogeneity concern. Residual coverage is defined as the component of analyst coverage uncorrelated with firm-specific control variables and the main determinants of earnings management as listed in Panel B of Table 1.[11] We then use residual coverage as our main proxy for analyst coverage in the remaining analysis.[12] Results from regressions of abnormal accruals against residual analyst coverage measures in models 4 through 6 are very similar to those from models 1 through 3.

3.1.2. Cross-sectional variations in the effect of analyst industry expertise

In this section, we explore whether the effect of analyst industry expertise on earnings management varies across characteristics of firms, attributes of analysts, and nature of the industry expertise.

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[10] Our results are also robust to controlling for a host of other analyst characteristics such as the analyst's all-star status, affiliation with a brokerage house that also has an investment banking relationship with the covered firm, and the number of industries followed by the analyst.

[11] We estimate a series of analyst coverage regressions, where the dependent variables are the number of 1) all analysts 2) analysts with related industry experience, 3) analysts with unrelated industry experience, and 4) analysts without any prior industry experience. The residuals from these regressions are then labeled as "residual coverage" for the corresponding type of analysts. Untabulated results indicate that the determinants of analyst coverage are quantitatively and qualitatively similar across these three types of analysts. For instance, analyst coverage is positively related to firm size and growth rate of assets, but negatively related to external financing activities.

[12] Results from all other remaining analyses are qualitatively similar if we use raw analyst coverage in lieu of residual coverage.

3.1.2.1. Firm information asymmetry

If related industry expertise indeed enhances analysts' monitoring effectiveness, its effect should be more pronounced when monitoring of firm management would be more difficult without a good understanding of the firm's industry. We use a firm's information environment to capture monitoring difficulty, in that greater information asymmetry creates more obstacles for outsiders to understand and evaluate managerial decision making. A more opaque information environment also provides more opportunities for managerial opportunism. To test our conjecture, we use three proxies to measure a firm's information asymmetry, namely, firm size, the idiosyncratic volatility of stock returns, and the number of analysts following the firm. Based on each of these measures, we partition our sample into two subsamples at the median, and estimate the abnormal accruals regressions in these subsamples. Panel A of Table 3 presents the coefficient estimates for the variables of interest. Consistent with our conjecture, the effect of industry expert analysts is more pronounced in firms with greater information asymmetry, i.e., smaller firms, firms with higher idiosyncratic volatility, and firms with low analyst coverage.[13]

Insert Table 3 here

3.1.2.2. Firm corporate governance

We next investigate whether the monitoring role of industry expert analysts is more important in the absence of other strong corporate governance mechanisms limiting firms' earnings management. We draw upon prior literature and use three measures to capture the strength of a firm's corporate governance. Two of the measures relate to the independence of directors on corporate boards and the external reputation of inside directors on boards. Klein (2002) and Xie, Wallace, and DaDalt (2003) provide empirical evidence that boards with more independent outside directors are negatively associated with earnings management behavior.[14] Masulis and Mobbs (2011) show that firms whose boards have inside directors with outside directorships, i.e. certified insider directors or CIDs, are less likely to misreport their earnings, consistent with CIDs improving internal governance. We, therefore, partition our sample based on the fraction of independent

[13] An alternative interpretation for the stronger effect of industry expert analysts in the low-analyst-coverage subsample is that holding the number of industry expert analysts constant, when firms are covered by fewer analysts in total, industry expert analysts play a larger role. Similarly, Irani and Oesch (2013) and Chen, Harford, and Lin (2013) also report stronger findings for their respective hypotheses in firms with low analyst coverage.

[14] Consistent with prior research, we define independent directors as unaffiliated directors who have no ties to the firm beyond being a board member (Weisbach (1988), Brickley, Coles and Terry (1994)).

outside directors on a firm's board and the presence of CIDs on the board, respectively, and perform subsample regressions of abnormal accruals. The results presented in the first four columns of Panel B in Table 3 show that the negative effect of industry expert analyst coverage on earnings management is significant only in the subsamples of firms with weaker governance reflected by the lower presence of independent outside directors and certified inside directors on the board.[15]

Our third measure of corporate governance aims to capture the monitoring by institutional investors. Prior research finds that long-term, independent institutional investors are more likely to monitor managers compared to other types of institutional investors (Chen, Harford and Li, 2007).[16] Therefore, we partition our sample based on whether a firm has any long-term, independent institutional investors. Subsample regression results presented in columns (5) and (6) of Panel B indicate that the negative effect of industry expert analysts on earnings management is primarily concentrated in firms without long-term, independent institutional investors. Overall, the evidence in Panel B paints a clear and consistent picture that monitoring by industry expert analysts is more important in firms with otherwise weaker governance, suggesting a substitutive relation between industry expert analyst coverage and other governance mechanisms.

3.1.2.3. Attributes of analysts

We also examine whether related industry expertise is more important to some analysts than others in helping them fulfill their external monitoring role. Conceivably, analysts who have been in the profession or have covered a particular firm for an extended period of time may have had the chance to develop a good understanding about certain industries and firms. Therefore, to them, industry expertise developed from their pre-analyst employments may not be as valuable. To put this notion to test, we partition our sample based on the average analyst's general and firm-specific forecasting experience and estimate subsample regressions of earnings management. Results presented in the first four columns of Panel C in Table 3 indicate that the effect of industry expertise on analysts' monitoring effectiveness is accentuated when analysts following a firm are less experienced in the analyst profession or about the firm.

[15] We have also explored partitioning our sample based on the independence of audit committees. However, there is little variation in audit committee independence during the period for which we have data. For example, over 90% of firm-year observations in our sample with data available have fully independent audit committees.

[16] Independent long-term institutions are defined as investment companies, independent investment advisors and pension funds that have maintained stakes in a firm for at least one year (Chen, Harford, and Li (2007)).

3.1.2.4. Attributes of related industry expertise

Finally, we delve into the nature and source of analyst industry experience and investigate whether certain types of pre-analyst industry experience are more relevant and important than others. We first consider the source of industry expertise and distinguish between industry experience obtained at public and private firms. Public firms are different from private firms in a number of dimensions, such as scale and complexity of operations, ownership and governance structures, access and exposure to capital markets, and compliance with rules and regulations imposed by stock exchanges and regulatory agencies. As a result, the financial reporting process itself and the myriad of considerations that factor into the process are likely to be drastically different between public and private firms. Given the context of our investigation, we hypothesize that industry experience obtained from working for a public company will be more pertinent in helping analysts understand, analyze and evaluate a firm's financial reporting practice and curb managerial attempt to manipulate earnings. We also consider the recentness of analyst industry experience. Since an industry's environment and characteristics may change over time, sometimes quite rapidly due to technological advancement, firm entry and exits, and (de)regulations, we hypothesize that industry experiences obtained more recently are more applicable to current situations and thus more effective in helping analysts evaluate firms' financial reporting practice and limit earnings manipulation.

We test these two ideas by re-estimating the abnormal accruals regressions in subsamples where analyst industry expertise was obtained from prior employment at a public company or from privately held companies only, as well as in subsamples created based on whether analyst industry experience is recent or stale.[17] The results are presented in the last four columns of Panel C in Table 3. Consistent with our intuition, we find that industry expertise obtained from working for public companies and more recent industry experience are more valuable in enhancing analyst's ability to monitor firms' financial reporting behavior.

3.1.3. Brokerage mergers and closures as quasi-natural experiments

As an alternative and more rigorous approach to alleviating endogeneity concerns, we exploit a unique setting where there is an unexpected exogenous shock to a firm's analyst coverage *independent* of the firm's characteristics or earnings management behavior. Specifically, our identification strategy relies on two plausibly exogenous quasi-natural experiments, namely,

[17] An analyst's industry experience is defined as recent (stale) if the number of years that has passed since the end of her industry experience is below (above) the sample median.

brokerage closures (Kelly and Ljungqvist (2012)) and brokerage mergers (Hong and Kacpercyzk (2010)). These brokerage-related events are used by a growing body of research to study the impact of financial analyst coverage on a wide array of firm policies.[18]

Kelly and Ljungqvist (2012) argue that following a merger, termination of coverage by the surviving broker could be endogenous because it *chose* to no longer cover the stock. Thus, we follow their lead and only focus on losses of coverage resulting from a merger where a stock was covered by analysts from *both* brokers before the merger and by only one of the analysts after the merger. We identify 17 brokerage house closures and 37 brokerage house mergers over the period of 1988 to 2008 and construct a sample of 600 unique treatment firms that were covered by the closed or merged brokers prior to these events.[19] Following prior studies such as Irani and Oesch (2013) and Chen, Harford, and Lin (2013), we employ a two-year event window around brokerage closures or mergers and examine the change in the financial reporting quality of treatment firms from the pre-event (t-1) year to the post-event (t+1) year. As key independent variables of this analysis, we create four indicator variables capturing whether a firm loses 1) any analysts; 2) analysts with related industry experience; 3) analysts with unrelated industry experience; and 4) analysts without industry experience. The control variables are changes in firm characteristics and other analyst characteristics from year t-1 to year t+1, thus eliminating the need for firm fixed effects. The regression model is specified in equation (2).

$$\Delta \text{Abs\_DA}_{i,t} = \beta_0 + \beta_1 \text{Lost analyst [or } \beta_2 \text{Lost related analyst} + \beta_3 \text{Lost unrelated analyst} + \beta_4 \text{Lost inexperienced analyst]} + \beta_5 \Delta \text{ Market cap} + \beta_6 \Delta \text{ Market-to-book} + \beta_7 \Delta \text{ ROA} + \beta_8 \text{Total assets growth} + \beta_9 \Delta \text{ Cash flow Volatility} + \beta_{10} \Delta \text{ External financing} + \beta_{11} \Delta \text{ Experience as analyst} + \beta_{12} \Delta \text{ Experience with firm} + \beta_{13} \Delta \text{ Analysts from top brokers} + \beta_{14} \Delta \text{ Portfolio size} + \text{Year fixed effects} + \varepsilon \quad (2)$$

Insert Table 4 here

Table 4 presents the results. Consistent with Irani and Oesch (2013), Model 1 reveals a significant positive coefficient on *Lost Analyst* (coefficient=0.84, *t*-stat=2.31), suggesting that firms losing analyst coverage due to brokerage mergers or closures engage in more earnings management in the post-event year compared to the pre-event year. More important for our purpose, model 2

[18] See, e.g., Fong et al. (2012), Derrien, Kecskes and Mansi (2012), Irani and Oesch (2013), Balakrishnan et al. (2013), Chen, Harford, and Lin (2013), Degeorge et al. (2013), and He and Tian (2013).

[19] Brokerage closure data is from Kelly and Ljungqvist (2012) and He and Tian (2013) over 1993 and 2008. Brokerage house merger information comes from a list of M&A activities in the investment banking industry compiled by Wang, Xie, and Zhang (2014) from various sources.

differentiates among the types of analysts lost by firms and shows that only the loss of coverage by analysts with related industry expertise precipitates a significant increase in earnings management. Specifically, all else being equal, we find that the average absolute value of discretionary accruals of firms losing industry expert analysts is 1.16% higher in the post-event year compared to the pre-event year. This is a sizable increase given the mean and median values of *Abs_DA* in our sample being 6.2% and 3.9%. Overall, these results provide causal support for the *effective monitor hypothesis* and suggest that related industry expertise is critical for financial analysts to perform their monitoring function.

3.2. Industry expert analyst coverage and financial misreporting by firms

So far we have shown that coverage by industry expert analysts lowers earnings management by followed firms. In this section, we examine a more egregious type of behavior by managers and consider whether these analysts also reduce the likelihood of firms committing financial misreporting. We follow Wang, Xie, and Zhu (2013) and employ both ex-ante and ex-post measures of financial misreporting. We use the F-score developed by Dechow, Ge, Larson, and Sloan (2011) to measure the ex-ante probability of a firm committing financial misrepresentation. Our ex-post indicator of financial misreporting is earnings restatements by firms.

3.2.1. Analyst industry expertise and F-score

Dechow et al. (2011) construct a comprehensive database through careful examination of firms subject to U.S. Securities and Exchange Commission (SEC) enforcement actions as indicated in Accounting and Auditing Enforcement Releases (AAERs). They then identify a sample of firms that have misstated at least one of their quarterly or annual financial statements with the intent of misleading investors. They create the F-score from a model that analyzes the financial characteristics of these misstating firms.

We employ a multivariate OLS regression to examine the importance of industry expert analysts in lowering the ex-ante probability of financial fraud as proxied by the F-score. Other than the dependent variable, the model specification is exactly the same as equation (1). Panel A of Table 5 presents the regression results.

Insert Table 5 here

Perhaps the most immediate takeaway from Model 1 of Panel A is that the intensity of analyst following is significantly and negatively related to a firm's F-score, suggesting that analyst

coverage reduces firms' ex-ante likelihood of earnings manipulation via external monitoring. However, once we distinguish between analysts based on their industry expertise, we find that this result is driven by coverage by analysts with related industry experience (Model 2). For example, a one-standard deviation increase in the coverage by industry expert analysts reduces the F-score by 0.086, representing a 7.1% reduction in the ex-ante likelihood of financial fraud given that the average F-score in our sample is about 1.215. Conversely, coverage by analysts with unrelated industry experience or no industry experience does not result in a lower ex-ante probability of intentional financial misrepresentation.

We next reexamine the relation between industry expert analyst coverage and the F-score using exogenous shocks to a firm's analyst coverage due to brokerage closures or mergers. As in the earnings management analysis in Section 3.1.2, we employ a two-year event window around brokerage closures or mergers and examine the change in a firm's F-score from year t-1 to year t+1, with year t representing the year in which the firm loses analyst coverage due to a brokerage closure or merger. The key independent variables include four indicator variables capturing whether a firm loses 1) any analysts; 2) analysts with related industry experience; 3) analysts with unrelated industry experience; and 4) analysts without any industry experience. The control variables are changes in firm characteristics and other analyst characteristics from year t-1 to year t+1, thus eliminating the need for firm fixed effects. Panel B of Table 5 presents the regression results.

In model 1, we find that firms experience a significant increase in the F-score when they experience a loss of analyst coverage, consistent with monitoring by analysts reducing firms' ex ante probability of committing serious financial misreporting. In model 2, when we differentiate between the types of analyst coverage lost by firms, we find that only the loss of coverage by industry expert analysts leads to a significant increase in a firm's F-score. This result reaffirms our finding from Panel A about the importance of related industry experience in facilitating the monitoring role of analysts, thereby lending further support to the *effective monitor hypothesis*.

3.2.2. Analyst industry expertise and earnings restatements

Our sample of earnings restatements is obtained from the U.S. General Accounting Office's (GAO) Financial Statement Restatement Database as published in 2003 and 2007. The GAO dataset is manually constructed using a Lexis-Nexis text-based search for the variants of the word "restate", and contains restatements announced between January 1, 1997 and June 30, 2006. Hennes, Leone, and Miller (2008) develop a methodology that classifies a restatement as an irregularity if it satisfies

at least one of the three criteria: (i) variants of the words "irregularity" or "fraud" were explicitly used in restatement announcements or relevant filings in the four years around the restatement; (ii) the misstatements came under SEC or DOJ investigations; and (iii) independent investigations were launched by boards of directors of restatement firms. In a sample of restatements between 2002 and 2005, they demonstrate the importance and effectiveness of their classification scheme by showing that compared to error restatements, irregularity restatements are met with significantly more negative announcement returns (on average: -14% vs. -2%), are followed by shareholder class action lawsuits at a significantly higher rate, and lead to significantly more CEO/CFO turnovers. Therefore, we focus on irregularity restatements because they represent clear instances of deliberate and material earnings manipulation by managers. For each irregularity restatement, we obtain information on the specific years for which financial results were restated due to earnings manipulation.

We merge the restated year information with our comprehensive CRSP-Compustat-I/B/E/S sample and obtain a sample of 14,072 firm-year observations from 1997 to 2006. In about 2% (281) firm-years, earnings were restated due to accounting irregularities.[20] We estimate probit regressions to examine whether coverage by industry expert analysts affects the probability of a firm committing intentional financial misreporting in a given year. The dependent variable is equal to one for restated firm-years and zero otherwise. Table 6 reports the results. The coefficient estimates presented under Model 1 suggest that the probability of intentional financial misreporting is negatively and significantly associated with the total number of analysts following. However, as model 2 indicates, this significant and negative relation is mostly attributable to coverage by industry expert analysts, and there is no evidence that coverage by other analysts is related to the probability of financial misreporting. Economically, the coefficient estimates in model 2 imply that the likelihood of intentionally misreporting financial restatements is reduced by 13.4% when the coverage by analysts with related experience increases by one standard deviation.[21]

Insert Table 6 here

Overall, the evidence in Sections 3.1 and 3.2 lends strong support to the *effective monitor hypothesi*s that industry expertise improves the effectiveness of analysts' external monitoring of

[20] There are 428 firm-years in which earnings were restated due to accounting errors. Our results are nearly identical if we exclude these observations from our analysis.

[21] As we point out in footnote 3, we are not able to use brokerage closures/mergers as a quasi-natural experiment to reexamine the relation between industry expert analyst coverage and the probability of intentional financial misreporting that leads to earnings restatements because only two firms announced irregularity restatements after losing research coverage by industry expert analysts.

managers and reduces coverage firms' earnings manipulation activities as reflected in abnormal accruals, F-score, and irregularity-driven financial restatements.[22]

3.3. Analyst industry expertise and CEO compensation

Our investigation up to this point has focused on the influence of analyst industry expertise on corporate financial disclosure. In ensuing analyses, we explore implications of analyst industry expertise for some other major corporate policies such as CEO compensation (this section) and CEO turnover (next section) decisions.

In the context of firms' executive compensation policy, Chen, Harford, and Lin (2013) show that analyst coverage can serve an additional layer of market discipline to reduce excess compensation received by top executives. We argue that analysts' industry expertise can provide them with a comparative advantage in understanding industry and firm-specific factors that have economic impacts on the competitive level of executive compensation. As a result, they are more likely to recognize large discrepancies between a CEO's actual pay and her fair and competitive level of pay, and when they do, they can voice their concern to cast unfavorable light on firms. Their opinions are also likely to be taken seriously by managers and boards because of analysts' unique position to influence the stock price.[23] As such, the *effective monitor hypothesis* predicts that firms followed by more industry expert analysts are less likely to award exorbitant compensation packages to their top executives. The *impaired monitor hypothesis*, however, argues that analysts with related industry experience may be connected to the managers of the firms they follow and thus have less incentive to be concerned with overly generous CEO pay.

To test these predictions, we obtain CEO compensation information including salary, bonus, stock and option grants, and long-term incentive plans from Standard & Poor's ExecuComp database for our sample. This yields information on CEOs of 2,161 unique firms covered by an average (median) number of 1.66 (1) analysts with related industry expertise. Similar to Chen, Harford, and Lin (2013), we assess the impact of analyst industry expertise on both CEO total

[22] In untabulated results, we use a firm being the target of a securities class-action lawsuit as an alternative ex-post measure of financial misreporting, to the extent that earnings manipulation with an intention to mislead investors can lead to class-action lawsuits (DuCharme, Malatesta, and Sefcik (2004)). We obtain a comprehensive sample of 3,566 securities class action lawsuits on 2,152 unique firms from 1996 to 2011 from the Securities Class Action Clearinghouse website (http://securities.stanford.edu/). We find that coverage by industry expert analysts significantly reduces the probability of a firm being targeted by a class-action lawsuit, whereas coverage by other analysts is not significantly related to the probability of being sued.

[23] According to the CFO survey by Graham, Harvey, and Rajgopal (2005), about 54.6% of respondents rank analysts among the two most important stock price setters for their companies.

compensation and excess compensation. To estimate CEO excess compensation, we regress the logarithmic transformation of CEO total compensation against a firm's market capitalization, buy-and-hold abnormal returns over CRSP value-weighted returns, stock return volatility, as well as industry (based on two-digit SIC codes) and year fixed effects. The residuals from this estimation is our measure of CEO excess compensation (e.g., Hartzell, Ofek, and Yermack (2004), Cai, Garner, and Walkling (2009)). We estimate OLS regressions of CEO pay against analyst coverage while controlling for firm financial and governance characteristics as well as firm and year-fixed effects. The regression model is specified as follows.

$$\text{CEO Total (Excess) compensation}_{i,t} = \beta_0 + \beta_1\text{Total analysts (Residual) [or } \beta_2\text{Related analysts (Residual)} + \beta_3\text{Unrelated analysts (Residual)} + \beta_4\text{Inexperienced analysts (Residual)]} + \beta_5\text{Market cap} + \beta_6\text{Tobins Q} + \beta_7\text{Leverage} + \beta_8\text{R\&D/sale} + \beta_9\text{Capx/sale} + \beta_{10}\text{Xad/sale} + \beta_{11}\text{Abnormal ROA} + \beta_{12}\text{Abnormal stock return} + \beta_{13}\text{CEO tenure} + \beta_{14}\text{Firm age} + \beta_{15}\text{Experience as analyst} + \beta_{16}\text{Experience with firm} + \beta_{17}\text{Analysts from top brokers} + \beta_{18}\text{Portfolio size} + \text{Firm and year fixed effects} + \varepsilon \quad (3)$$

Insert Table 7 here

Panel A of Table 7 presents the regression results. The dependent variable is the natural logarithm of CEO total compensation in models 1-2 and CEO excess compensation in models 3-4. Consistent with the *effective monitor hypothesis*, we find that analyst coverage significantly reduces the level of both CEO total and excess compensation (Chen, Harford, and Lin (2013)) (models 1 and 3), but the relation is again driven by analysts with related industry expertise in their followed firms (models 2 and 4). In terms of economic significance, the coefficient on the coverage by analysts with related industry experience in Column 2 implies that for a one-standard deviation increase in the number of industry expert analysts, CEO compensation is lower by 3.51%, representing roughly a reduction of $136,890 in CEO compensation given that the average CEO pay is $3.9 million in our sample. Consistent with earlier results, coverage by analysts without related industry experience does not have a significant impact on CEO pay. Coefficient estimates on control variables mostly have expected signs that conform to prior literature. For example, CEO compensation is higher at larger (*Market cap*) and older (*Firm age*) firms with more valuable investment opportunities (*Tobin's Q*), higher profitability (*Abnormal ROA*), and lower leverage (*Leverage*).

In further analysis, we exploit the exogenous shocks to a firm's analyst coverage created by brokerage house closures and mergers to speak directly to the causal nature of the relation between

industry expert analyst coverage and CEO compensation. Specifically, we focus on the change in a firm's CEO total or excess compensation from year t-1 to year t+1, with year t being the year in which the firm loses analyst coverage due to a brokerage closure or merger. We examine how the compensation change is related to a firm's loss of analyst coverage while controlling for changes in firm and other analyst characteristics. Panel B of Table 7 presents the regression results. The dependent variable is the change in CEO total compensation for models 1 and 2 and the change in CEO excess compensation for models 3 and 4. We find that both total and excess compensation for a firm's CEO experience a significant increase following the loss of analyst coverage (models 1 and 3). When we break down the loss of analyst coverage based on the types of analysts, we find that only the loss of coverage by industry expert analysts leads to a significant increase in CEO compensation (models 2 and 4). These results suggest that coverage by industry expert analysts indeed has a causal effect on a firm's CEO compensation policy and are consistent with the *effective monitor hypothesis* that the external monitoring by industry expert analysts reduces the level of CEO total and excess compensation.

3.4. Industry expert analyst coverage and CEO turnover-performance sensitivity

In this section we investigate whether coverage by industry expert analysts affects the responsiveness of boards in removing poorly performing CEOs. Analysts with expertise in a firm's related industries are likely to have a more thorough understanding of the firm's operating environment, and the opportunities and challenges it faces. Therefore, they are likely to be able to better analyze and evaluate major corporate strategies and decision making. When firm performance disappoints, they can put more pressure on the firm to change its strategic direction and, if necessary, change its leadership. As a result, under the *effective monitor hypothesis*, we expect a firm's board to replace its CEO in a more timely manner in response to poor performance when it is covered by more analysts with related industry expertise. However, under the *impaired monitor hypothesis*, we expect analysts with related industry experience to take a more passive stance in the face of subpar firm performance, thus contributing to a slower response by boards to replace poorly performing managers.

To examine these conjectures, we follow Kanaan and Jenter (2013) and construct our primary dataset of CEO forced turnovers from Standard & Poor's ExecuComp database. We then use news reports collected from Lexis-Nexis to ascertain that CEO turnover is forced, not due to any of the following reasons such as death, health problems, retirement, or promotion to a

higher/comparable position at another firm (e.g., Parrino (1997), Huson, Malatesta, and Parrino (2004), among others).

We estimate a probit model to assess the marginal impact of industry expert analysts on the CEO turnover-performance sensitivity. The dependent variable equals one for years in which a forced CEO turnover event occurs, and zero otherwise. The key independent variables include abnormal firm performance, measured by the firm's industry-adjusted abnormal stock return over the previous year, and its interaction terms with the three types of analyst coverage.[24] This model specification allows the CEO turnover-performance sensitivity to vary with the coverage of different types of analysts.

Insert Table 8 here

Table 8 reports the probit regression results. We find a significantly negative coefficient on the abnormal stock return, affirming the well documented negative relation between the probability of forced CEO turnover and firm performance (see, e.g., Coughlan and Schmidt (1985), Weisbach, (1988), Fich and Shivdasani (2006)). More importantly, the interaction term between abnormal stock return and coverage by industry expert analysts has significantly negative coefficient, while the coefficients on the other two interaction terms are insignificant. This evidence is consistent with the notion that the external monitoring by industry expert analysts makes corporate boards more responsive to poor firm performance in disciplining poorly performing CEOs. Conversely, coverage by analysts without related industry expertise is not related to the CEO turnover-performance sensitivity.[25]

3.5. Robustness tests and discussion

3.5.1. Additional controls

Our results are consistent with the view that analysts' prior employment provides them with related industry expertise in firms they cover, thereby enhancing their effectiveness as external monitors of firm management. Pre-analyst employment positions, however, are not the only source of industry expertise. For example, since analysts specialize in specific industries (Kadan, Madureira, Wang, and Zach (2012)), they can develop industry expertise through covering firms in these

[24] We obtain similar results when we measure firm performance by the industry-adjusted ROA over the previous year.

[25] There is only one firm that experienced forced CEO turnover following the loss of industry expert analyst coverage, making it econometrically unreliable to analyze the CEO turnover-performance sensitivity using exogenous shocks to a firm's analyst coverage created by brokerage closures and mergers.

industries over an extended period of time. To ensure that our results are not just an artifact of the effect of analyst experience in covering a particular industry, we explicitly control for the number of years over which an analyst has been issuing forecasts in the coverage firm's 2-digit SIC industry. Results presented in model 1 of Table 9 show that analyst experience in covering a firm's industry has a negative effect on earnings management, and the effect is marginally significant at the 10% level (p-value: 0.103). More importantly, pre-analyst related industry experience continues to have a significantly negative effect on earnings management.

Insert Table 9 here

In a recent paper, Dass et al. (2013) focus on directors from related industries defined as executives or directors of firms from related upstream and downstream industries (i.e. DRIs) and provide empirical evidence that DRIs improve the effectiveness of their board's monitoring. Similarly, Guan, Wong, and Zhang (2013) show that analysts simultaneously following a covered firm's customers issue more accurate earnings forecasts for the suppliers than analysts who do not. Therefore, to mitigate the potential concern that pre-analysts industry expertise may simply proxy for analyst experience from covering firms in related industries, we include indicators for analysts following firms in related industries as well as analysts following the customers of covered firms. The results presented in models 2 and 3 suggest that the effect of pre-analyst industry experience on earnings management remains significantly negative. Interestingly, we find that experience in covering a firm's customers can also help analysts reduce the firm's earnings management behavior (see model 3).

We also control for analysts' accounting experience, which may enhance their capability to identify earnings manipulations and thus deter firms from engaging in such practice. Specifically, we capture an analyst's accounting experience by whether the analyst has a CPA or worked for a Big-N accounting firm. We then compute the number of analysts with accounting experience covering each firm. Model 4 presents the results of this analysis. The coefficient on the number of analysts with accounting experience is negative, but not significantly different from zero. Including this variable does not materially impact the coefficient of our main variable of interest.

Finally, Wang, Xie, and Zhu (2013) find that audit committees with more independent directors with industry expertise, which they term as industry expert directors (IEDs), reduce firms' earnings management behavior and probability to engage in fraud. To ensure that industry expert analysts are not simply more likely to follow firms with more IEDs on their audit committees, we control for the percentage of IEDs on a firm's audit committee (*AC_IED_Pct*) in the earnings

management regression. Consistent with Wang et al. (2014), we find that a greater presence of IEDs on the audit committee indeed reduces firms' earnings management. More importantly, the coefficient on industry expert analyst coverage remains negative and highly significant (see model 5).

3.5.2. Industry expertise defined using finer industry classifications

A reasonable concern with our analysis is that related industry experience is defined based on the broad Fama-French 5-industry classifications due to the majority (72.5%) of pre-analyst employer firms being private. However, any misclassification should bias against finding any significant results for our main research questions as a result of introducing noise. Nevertheless, we repeat our main analyses using a subset of analysts that worked only for publicly-traded employers in pre-analyst years, because we can classify these employers into finer industries. For this subsample of 1,158 analysts, we redefine related and unrelated experience using Global Industry Classification Standard (GICS) as suggested by Boni and Womack (2006) and Kadan, Madureira, Wang, and Zach (2012).[26] Table 10 presents the results from re-estimating regressions of abnormal accruals, the ex-ante and ex-post probabilities of material financial misreporting, CEO total and excess compensation, and the probability of forced CEO turnovers. We find that coverage by industry expert analysts continues to significantly reduce earnings management and the likelihood of material financial misrepresentation, rein in CEO total and excess compensation, and increase the sensitivity of forced CEO turnovers to firm performance. These results provide confirmation in support of the *effective monitor hypothesis* that analysts' related industry experience improves the effectiveness of their external monitoring functions and enhances the corporate governance of covered firms.

Insert Table 10 here

3.5.3. Discussion on analysts' monitoring costs

Our paper provides pervasive evidence in support of the *effective monitoring hypothesis* that industry expertise aids in analysts' monitoring of firm management. We help advance the extant literature on analyst monitoring by highlighting the importance of industry expertise. One question related to this literature in general is whether analysts bear any costs in monitoring firm management and if so, whether such costs can be severe enough to reduce analysts' incentive to monitor in the first place. It is entirely conceivable that certain situations could arise that weaken analysts'

[26] Bradley, Gokkaya, and Liu (2014) also provide a similar analysis for the subset of analysts with experience at publicly-traded firms. Their results are robust to using this smaller sample.

monitoring incentive. For instance, a voluminous literature suggests that analysts affiliated with banks that have an underwriting relationship with the firm provide overly optimistic recommendations (e.g., Lin and McNichols (1998), Michaely and Womack (1999)). Such a relationship could compromise analysts' willingness to be effective monitors if their monitoring may potentially alienate or even antagonize firm managers and jeopardize existing investment banking relationships. This view is confirmed by Brown et al. (2014), who survey sell-side analysts about the incentives they face. Citing one of the respondent's answers, "Equity analysts… are very, very reluctant—even after the Spitzer rules—to upset the investment bankers, because the investment bankers bring in so much more profitability…They certainly realize that the success of their company is tied to the performance of this much higher-margin business than the business that they're part of."

While it is beyond the scope of this paper to fully investigate the costs or adverse consequences to analysts related to their monitoring role, we try to shed some light on this issue by examining if investment banking pressures reduce the monitoring incentives of industry expert analysts. We classify industry expert analysts as affiliated with firm management if their employers provided equity underwriting or M&A advisory services for the firm within the past 3 years, and unaffiliated otherwise. About 15% of the industry expert analysts are classified as affiliated while the rest unaffiliated. We treat affiliated and unaffiliated industry expert analyst coverage as separate variables and include them simultaneously in the reexamination of financial reporting, CEO compensation, and CEO turnover policies. We estimate both baseline regressions and regressions based on exogenous shocks to analyst coverage. Unfortunately, depending on the corporate policy under examination, we only observe between 2 and 13 cases of exogenous losses of affiliated industry expert analysts from brokerage closures. This potentially reduces the power of our tests and limits our ability to provide meaningful evidence using exogenous shocks. With this caveat in mind, the results from our analyses indicate that the disciplining effects of industry expert analyst coverage on the corporate policies of interest are driven by unaffiliated industry expert analysts (see Appendix 2). These findings are consistent with our conjecture that analysts whose employers have existing investment banking relationships with the covered firm face higher costs and pressure in monitoring firm managers and thus have weaker incentives to do so.

4. Conclusion

Jensen and Meckling (1976) first broached the idea of analysts being capable of playing a monitoring role to reduce agency problems. Consistent with their supposition, recent research (e.g., Yu (2008), Irani and Oesch (2013), Chen, Harford, and Lin (2013)) has produced a growing body of evidence suggesting that analyst coverage can improve corporate governance, managerial incentives, and firm decision making. In this paper we examine whether analysts' industry experience obtained from pre-analyst employment affects their effectiveness as external monitors of followed firms. Our analyses of firms' financial disclosure, executive compensation, and CEO turnover decisions indicate that only financial analysts with related industry experience in their followed firms can play an effective monitoring role. More specifically, we find that coverage by industry expert financial analysts is able to rein in firms' earnings management behavior and reduce both the ex-ante probability and ex-post occurrence of firms committing financial misrepresentation. The presence of these analysts also reduces CEO excess compensation and increases the sensitivity of forced CEO turnovers to firm performance. In stark contrast, coverage by other analysts is not significantly related to these corporate policies. Our results highlight the importance of analysts' pre-analyst industry work experience and resultant industry expertise, and suggest that not all analysts are equal in providing external monitoring of firms.

In light of the evidence in this paper, a potentially fruitful direction for future research is to further explore heterogeneities among analysts and the implications for their monitoring efficacy. Additional work in this area can help deliver a more complete understanding of the roles and impact of financial analysts in the capital markets and corporate decision making.

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Table 1. Descriptive Statistics

This table reports summary statistics of our sample, with Panel A for the dependent variables of our analyses, Panel B for firm characteristics, and Panel C for analyst characteristics. The number of observations used in different analyses varies. Panels B and C are based on the sample for our earnings management analysis, which consists of 28,466 firm-year observations from 1983 to 2011. See Appendix 1 for a detailed description of these variables.

Variables	N	Mean	1st quartile	Median	3rd quartile	Std Dev
Panel A: Dependent Variables						
Absolute value of discretionary accruals (Abs_DA)	28,466	0.062	0.017	0.039	0.077	0.075
F-score	26,607	1.215	0.597	0.927	1.379	4.789
Restated due to irregularity	14,072	0.020	0.000	0.000	0.000	0.140
CEO compensation ($ mil)	11,177	3.902	1.275	2.516	5.030	3.990
Forced CEO turnover	8,045	0.030	0.000	0.000	0.000	0.171
Panel B: Firm Characteristics						
Market cap ($ bil)	28,466	4.749	0.347	0.929	2.910	16.977
Market-to-book	28,466	3.143	1.481	2.292	3.716	3.677
ROA	28,466	0.031	0.015	0.048	0.087	0.139
Total assets growth	28,466	0.224	0.008	0.095	0.242	0.646
Cash flow volatility	28,466	0.231	0.060	0.102	0.198	1.426
External financing	28,466	0.023	-0.047	-0.001	0.048	0.166
Panel C: Analyst characteristics						
Total analysts	28,466	3.950	1.000	3.000	5.000	3.478
Related analysts	28,466	1.229	0.000	1.000	2.000	1.782
Unrelated analysts	28,466	1.259	0.000	1.000	2.000	1.532
Inexperienced analysts	28,466	1.378	0.000	1.000	2.000	1.390
Experience as analyst	28,466	6.312	4.000	6.000	8.286	3.392
Experience with firm	28,466	2.422	1.000	2.000	3.500	2.136
Portfolio size	28,466	12.521	9.333	12.000	14.556	5.670
Analysts from top brokers	28,466	0.568	0.333	0.600	1.000	0.350

Table 2. Industry Expert Analyst Coverage and Earnings Management

This table presents the results of baseline regressions of earnings management. The sample consists of 28,466 firm-year observations from 1983 to 2011. The dependent variable is the absolute value of discretionary accruals (Abs_DA). See Appendix 1 for a detailed description of variables. Firm and year-fixed effects are included, but their coefficient estimates are suppressed for brevity. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Total analysts	-0.093***					
	(-4.101)					
Related analysts		-0.163***	-0.150***			
		(-3.801)	(-3.499)			
Unrelated analysts		-0.045	-0.042			
		(-1.059)	(-0.983)			
Inexperienced analysts		-0.058	-0.062			
		(-1.232)	(-1.281)			
Total analysts (Residual)				-0.068**		
				(-2.519)		
Related analysts (Residual)					-0.116**	-0.133***
					(-2.518)	(-2.895)
Unrelated analysts (Residual)					-0.039	-0.050
					(-0.953)	(-1.229)
Inexperienced analysts (Residual)					-0.053	-0.065
					(-1.069)	(-1.297)
Market cap	-0.142	-0.150*	-0.077	-0.317***	-0.320***	-0.227***
	(-1.581)	(-1.664)	(-0.829)	(-3.942)	(-3.970)	(-2.706)
Market-to-book	0.126***	0.127***	0.121***	0.135***	0.135***	0.126***
	(5.525)	(5.590)	(5.316)	(5.943)	(5.962)	(5.581)
ROA	-20.010***	-20.008***	-20.283***	-19.765***	-19.776***	-20.084***
	(-15.463)	(-15.446)	(-15.568)	(-15.334)	(-15.353)	(-15.504)
Total assets growth	3.091***	3.094***	3.070***	3.107***	3.106***	3.074***
	(8.222)	(8.231)	(8.214)	(8.246)	(8.241)	(8.213)
Cash flow volatility	-0.063***	-0.061**	-0.063***	-0.063***	-0.063***	-0.066***

	(-2.652)	(-2.557)	(-2.716)	(-2.652)	(-2.635)	(-2.866)
External financing	-0.924	-0.925	-1.048	-0.778	-0.774	-0.920
	(-1.007)	(-1.008)	(-1.151)	(-0.848)	(-0.843)	(-1.011)
Experience as analyst			0.012			0.011
			(0.555)			(0.545)
Experience with firm			-0.127***			-0.140***
			(-4.026)			(-4.428)
Analysts from top brokers			-0.224			-0.223
			(-1.399)			(-1.391)
Portfolio size			0.023**			0.028**
			(2.104)			(2.498)
R^2	15.17%	15.16%	15.26%	15.60%	15.57%	15.55%
N	28,466	28,466	28,466	28,466	28,466	28,466
Fixed Effects	Y	Y	Y	Y	Y	Y

Table 3. Cross-Sectional Variations in the Effect of Analyst Industry Expertise: Firm and Analyst Characteristics

This table reports results from subsample regressions of earnings management. Panels A/B/C are for subsamples created by partitioning our full sample based on various firm/governance/analyst characteristics. For brevity, only the coefficient estimates on different types of analyst coverage are presented. The full sample consists of 28,466 firm-year observations from 1983 to 2011. The dependent variable is the absolute value of discretionary accruals (Abs_DA). See Appendix 1 for a detailed description of variables. Firm and year-fixed effects are included, but their coefficient estimates are suppressed for brevity. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Panel A. Firm Characteristics	Large Firm	Small Firm	High IdioVol	Low IdioVol	High Analyst Coverage	Low Analyst Coverage
Related analyst (residual)	-0.107**	-0.317***	-0.308***	-0.033	-0.104**	-0.330***
	(-2.022)	(-2.843)	(-3.603)	(-0.722)	(-1.986)	(-2.729)
Unrelated analyst (residual)	-0.071	-0.023	-0.010	-0.055	-0.039	0.007
	(-1.494)	(-0.217)	(-0.109)	(-1.189)	(-0.790)	(0.064)
Inexperienced analyst (residual)	0.026	-0.207	-0.161	-0.032	0.031	-0.181
	(0.489)	(-1.591)	(-1.563)	(-0.659)	(0.572)	(-1.330)

Panel B. Governance Characteristics	High Board Independence	Low Board Independence	High certified insider directors	Low certified insider directors	Long term independent Institutions	No Long term independent Institutions
Related analyst (residual)	-0.007	-0.156**	-0.006	-0.223**	0.039	-0.169***
	(-0.116)	(-2.523)	(-0.045)	(-2.211)	(0.304)	(-3.213)
Unrelated analyst (residual)	-0.080	-0.002	0.109	-0.068	0.117	-0.079
	(-1.386)	(-0.030)	(1.060)	(-0.751)	(1.068)	(-1.561)
Inexperienced analyst (residual)	-0.064	-0.009	-0.111	-0.128	-0.022	-0.017
	(-1.057)	(-0.105)	(-1.105)	(-1.099)	(-0.195)	(-0.289)

Panel C. Analyst Characteristics.	High Experience as analyst	Low Experience as analyst	High Experience with firm	Low Experience with firm	Public Experience	No Public Experience	Recent Experience	Stale Experience
Related analyst (residual)	-0.109*	-0.253***	-0.114**	-0.242***	-0.266***	-0.166***	-0.259***	-0.151**
	(-1.667)	(-3.235)	(-2.174)	(-2.936)	(-4.483)	(-2.610)	(-3.146)	(-1.975)
Unrelated analyst (residual)	-0.054	-0.030	0.019	0.047	-0.091	0.058	-0.070	-0.149
	(-0.822)	(-0.429)	(0.362)	(0.640)	(-1.337)	(1.010)	(-0.852)	(-1.583)
Inexperienced analyst (residual)	0.046	-0.162	-0.079	-0.079	-0.101*	-0.079*	-0.092	-0.046
	(0.468)	(-1.553)	(-1.069)	(-0.625)	(-1.667)	(-1.701)	(-1.338)	(-0.735)

Table 4. Exogenous Shocks from Brokerage Mergers/Closures and Earnings Management

This table presents earnings management OLS regression results for the loss of analyst coverage due to exogenous shocks stemming from brokerage mergers/closures. The dependent variable is the change in absolute value of discretionary accruals (Abs_DA) from before to after the exogenous brokerage event. Four key independent variables are created to capture whether a firm loses 1) any analysts; 2) analysts with related industry experience; 3) analysts with unrelated industry experience, and 4) analysts without any industry experience. The control variables are also changes in firm characteristics and other analyst characteristics from year t-1 to year t+1. See Appendix 1 for a detailed description of variables. Firm and year-fixed effects are included, but their coefficient estimates are suppressed for brevity. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Model 1	Model 2
Lost analyst	0.842**	
	(2.308)	
Lost related analyst		1.162***
		(2.715)
Lost unrelated analyst		0.986
		(1.367)
Lost inexperienced analyst		0.660
		(1.003)
Δ Market cap	0.695***	0.693***
	(4.178)	(4.164)
Δ Market-to-book	0.000	0.000
	(0.097)	(0.101)
Δ ROA	-19.267***	-19.272***
	(-9.187)	(-9.187)
Δ Total assets growth	3.904***	3.906***
	(5.976)	(5.978)
Δ Cash flow volatility	9.529***	9.539***
	(8.921)	(8.932)
Δ External financing	-4.870***	-4.879***
	(-3.824)	(-3.828)
Δ Experience as analyst	0.029	0.030
	(1.241)	(1.272)
Δ Experience with firm	-0.006	-0.006
	(-0.150)	(-0.164)
Δ Analysts from top brokers	-0.314	-0.319
	(-1.494)	(-1.518)
Δ Portfolio size	-0.003	-0.003
	(-0.200)	(-0.201)
R^2	8.36%	8.38%
N	12,555	12,555
Fixed Effects	Y	Y

Table 5. Industry Expert Analyst Coverage and Ex-ante Measure of Financial Misreporting

This table presents OLS regression results for an ex-ante measure of financial misreporting (F-score) in panel A and change in F-score around the loss of analyst coverage due to exogenous shocks stemming from brokerage mergers/closures in panel B. See Appendix 1 for a detailed description of variables. Firm and year-fixed effects are included, but their coefficient estimates are suppressed for brevity. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Panel. A. F-score	Model 1	Model 2
Total analysts (Residual)	-2.412**	
	(-2.282)	
Related analysts (Residual)		-5.454**
		(-2.141)
Unrelated analysts (Residual)		0.114
		(0.059)
Inexperienced analysts (Residual)		-2.656
		(-1.377)
Market cap	6.062	5.737
	(0.994)	(0.943)
Market-to-book	-0.182	-0.173
	(-0.354)	(-0.340)
ROA	-192.081	-192.792
	(-1.585)	(-1.591)
Total assets growth	29.513	29.571
	(1.176)	(1.175)
Cash flow volatility	4.661	4.018
	(0.174)	(0.149)
External financing	-14.306	-13.614
	(-0.163)	(-0.155)
Experience as analyst	1.668	1.652
	(0.962)	(0.961)
Experience with firm	-6.675***	-6.537***
	(-3.156)	(-3.197)
Analysts from top brokers	-13.276	-13.813
	(-1.021)	(-1.063)
Portfolio size	-0.781	-0.781
	(-1.269)	(-1.274)
R^2	0.53%	0.49%
N	26,607	26,607
Fixed Effects	Y	Y

Panel B. Change in F-score	Model 1	Model 2
Lost analyst	6.133*	
	(1.817)	
Lost related analyst		10.631***
		(2.786)
Lost unrelated analyst		2.198
		(0.423)
Lost inexperienced Analyst		4.371
		(0.743)
Δ Market cap	13.850	13.832
	(1.473)	(1.471)
Δ Market-to-book	-0.018	-0.018
	(-0.510)	(-0.510)
Δ ROA	-65.890	-66.024
	(-1.592)	(-1.595)
Δ Total assets growth	7.681	7.700
	(0.177)	(0.177)
Δ Cash flow volatility	198.194	198.190
	(1.331)	(1.330)
Δ External financing	-35.322	-35.353
	(-1.384)	(-1.384)
Δ Experience as analyst	-0.439	-0.438
	(-0.175)	(-0.175)
Δ Experience with firm	-0.307	-0.308
	(-0.129)	(-0.129)
Δ Analysts from top brokers	16.642	16.615
	(0.841)	(0.840)
Δ Portfolio size	1.669	1.671
	(1.273)	(1.274)
R^2	0.28%	0.28%
N	11,972	11,972
Fixed Effects	Y	Y

Table 6. Industry Expert Analyst Coverage and Ex-post Measure of Financial Misreporting

This table presents the results from probit regressions of the probability of firms committing intentional financial misreporting that leads to earnings restatements. The dependent variable is equal to one for firm-years whose earnings are restated due to accounting irregularities and zero otherwise. See Appendix 1 for a detailed description of variables. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Model 1	Model 2
Total analysts (Residual)	-2.300**	
	(-2.556)	
Related analysts (Residual)		-4.200***
		(-3.043)
Unrelated analysts (Residual)		-1.660
		(-1.194)
Inexperienced analysts (Residual)		-1.330
		(-0.613)
Market cap	2.870*	2.830*
	(1.719)	(1.685)
Market-to-book	-0.517	-0.521
	(-0.907)	(-0.916)
ROA	-10.630	-10.590
	(-1.339)	(-1.337)
Total assets growth	8.900***	8.880***
	(2.602)	(2.596)
Cash flow volatility	-43.700**	-43.540**
	(-2.185)	(-2.173)
External financing	39.050**	39.130**
	(2.481)	(2.477)
Experience as analyst	1.090	1.100
	(1.326)	(1.333)
Experience with firm	-1.410	-1.410
	(-1.022)	(-1.022)
Analysts from top brokers	9.740	9.820
	(1.366)	(1.377)
Portfolio size	0.344	0.335
	(0.602)	(0.584)
R^2	0.24%	0.23%
N	14,072	14,072
Fixed Effects	Y	Y

Table 7. Industry Expert Analyst Coverage and CEO Compensation

This table presents OLS regression results for CEO compensation (Panel A) and the change in CEO compensation around the loss of analyst coverage due to exogenous shocks stemming from brokerage mergers/closures (Panel B). The dependent variable is the (change in) logarithmic transformation of total CEO compensation in models 1-2 from panel A (panel B), and (change in) excess CEO compensation in models 3-4 from panel A (panel B). See Appendix 1 for a detailed description of variables. Firm and year-fixed effects are included, but their coefficient estimates are suppressed for brevity. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Panel A. CEO compensation

	Model 1	Model 2	Model 3	Model 4
Total analysts (Residual)	-0.682*		-0.705*	
	(-1.687)		(-1.780)	
Related analysts (Residual)		-1.682**		-1.474*
		(-2.179)		(-1.896)
Unrelated analysts (Residual)		-0.543		-0.638
		(-0.869)		(-0.969)
Inexperienced analysts (Residual)		0.215		0.051
		(0.280)		(0.068)
Market cap	34.990***	34.994***	25.491***	25.515***
	(13.136)	(13.142)	(9.443)	(9.462)
Tobin's Q	7.168***	7.188***	5.170***	5.202***
	(7.059)	(7.099)	(4.997)	(5.049)
Leverage	-75.016***	-74.667***	-53.357***	-53.077***
	(-6.467)	(-6.412)	(-4.675)	(-4.635)
R&D/sale	-0.733	-0.722	-0.591	-0.581
	(-0.811)	(-0.807)	(-0.778)	(-0.770)
Capx/sale	12.991***	12.982***	10.669**	10.661**
	(2.834)	(2.833)	(2.429)	(2.425)
Xad/sale	51.664	55.049	96.847	99.723
	(0.671)	(0.709)	(1.308)	(1.335)
Abnormal ROA	97.822***	98.201***	82.018***	82.360***
	(7.470)	(7.502)	(6.263)	(6.298)
Abnormal stk ret	4.451**	4.404**	-3.510*	-3.553*
	(2.389)	(2.362)	(-1.843)	(-1.866)
CEO tenure	-3.400***	-3.392***	-3.442***	-3.439***
	(-9.419)	(-9.421)	(-9.682)	(-9.691)
Firm age	8.970***	8.964***	3.499***	3.494***
	(21.520)	(21.586)	(8.446)	(8.452)
Experience as analyst	0.577*	0.463	0.410	0.314
	(1.666)	(1.317)	(1.177)	(0.884)
Experience with firm	-0.175	-0.095	-0.211	-0.149
	(-0.314)	(-0.170)	(-0.380)	(-0.267)
Analysts from top brokers	1.517	1.716	-1.907	-1.740
	(0.533)	(0.598)	(-0.672)	(-0.610)
Portfolio size	-0.028	-0.034	0.154	0.150
	(-0.133)	(-0.157)	(0.742)	(0.723)
R^2	10.05%	10.04%	7.21%	7.22%
N	11,177	11,177	11,177	11,177
Fixed Effects	Y	Y	Y	Y

Panel B. Change in CEO compensation around the loss of analyst coverage due to exogenous shocks

	Model 1	Model 2	Model 3	Model 4
Lost analyst	4.850		10.394**	
	(0.978)		(2.128)	
Lost related analyst		13.029**		11.554**
		(2.185)		(2.453)
Lost unrelated analyst		0.268		10.500
		(0.024)		(0.910)
Lost inexperienced analyst		0.596		9.438
		(0.069)		(1.115)
Δ Market cap	47.176***	47.185***	33.244***	33.244***
	(13.892)	(13.893)	(9.789)	(9.786)
Δ Tobin's Q	7.726***	7.724***	4.548***	4.549***
	(6.062)	(6.060)	(3.563)	(3.562)
Δ Leverage	-89.725***	-89.847***	-49.650***	-49.666***
	(-7.331)	(-7.339)	(-4.060)	(-4.060)
Δ R&D/sale	0.462	1.375	-25.849	-25.707
	(0.011)	(0.033)	(-0.625)	(-0.621)
Δ Capx/sale	47.792***	47.698***	43.141***	43.138***
	(3.851)	(3.845)	(3.494)	(3.493)
Δ Xad/sale	214.931	218.441	310.128**	310.334**
	(1.373)	(1.395)	(1.979)	(1.978)
Δ Abnormal ROA	128.814***	128.717***	118.687***	118.665***
	(8.643)	(8.637)	(8.003)	(8.002)
Δ Abnormal stk ret	6.482***	6.494***	-2.238	-2.234
	(3.328)	(3.333)	(-1.163)	(-1.160)
Δ Experience as analyst	0.259	0.255	0.408	0.407
	(0.683)	(0.671)	(1.071)	(1.066)
Δ Experience with firm	0.519	0.515	-0.012	-0.013
	(0.789)	(0.783)	(-0.019)	(-0.020)
Δ Analysts from top brokers	0.693	0.741	-2.678	-2.669
	(0.225)	(0.241)	(-0.861)	(-0.858)
Δ Portfolio size	-0.174	-0.177	-0.257	-0.257
	(-0.691)	(-0.703)	(-1.020)	(-1.019)
R^2	10.49%	10.51%	5.95%	5.95%
N	6,143	6,143	6,143	6,143
Fixed Effects	Y	Y	Y	Y

Table 8. Industry Expert Analyst Coverage and CEO Turnover-Performance Sensitivity

This table presents probit regression results for forced CEO turnovers. The dependent variable is an indicator that equals 1 if there is a forced CEO turnover in year t and 0 otherwise. See Appendix 1 for a detailed description of variables. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Model 1	Model 2
Abnormal stk ret * Related analysts (Residual)	-11.980*	-12.080*
	(-1.704)	(-1.713)
Abnormal stk ret * Unrelated analysts (Residual)	2.200	2.160
	(0.467)	(0.458)
Abnormal stk ret * Inexperienced analysts (Residual)	7.830	7.660
	(1.174)	(1.142)
Abnormal stk ret	-41.080***	-41.550***
	(-4.179)	(-4.189)
Related analysts (Residual)	2.080	2.180
	(0.981)	(1.023)
Unrelated analysts (Residual)	2.180	2.680
	(1.160)	(1.411)
Inexperienced analysts (Residual)	3.080	2.560
	(1.474)	(1.180)
Market cap	0.851	-0.580
	(0.332)	(-0.217)
Firm age	0.005	-0.047
	(0.026)	(-0.219)
Leverage	51.200*	56.030*
	(1.755)	(1.874)
Tobin's Q	-6.980**	-6.830**
	(-2.209)	(-2.134)
Sales volatility	20.660***	21.070***
	(4.396)	(4.300)
CEO/Chairman	-4.490	-4.490
	(-0.681)	(-0.677)
Experience as analyst		0.952
		(0.787)
Experience with firm		3.180*
		(1.747)
Analysts from top brokers		-0.278
		(-0.025)
Portfolio size		-0.113
		(-0.140)
R^2	2.17%	2.26%
N	7,492	7,492
Fixed Effects	Y	Y

Table 9. Robustness Analysis

This table presents earnings management regressions with additional controls. The baseline sample consists of 28,466 firm-year observations from 1983 to 2011. The dependent variable is the absolute value of discretionary accruals (Abs_DA). See Appendix 1 for a detailed description of variables. Firm and year-fixed effects are included, but their coefficient estimates are suppressed for brevity. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
Dependent Variable	Abs_DA	Abs_DA	Abs_DA	Abs_DA	Abs_DA
Related analysts (Residual)	-0.136***	-0.137***	-0.137***	-0.124***	-0.173***
	(-2.977)	(-2.982)	(-2.988)	(-2.671)	(-3.094)
Unrelated analysts (Residual)	-0.054	-0.055	-0.053	-0.044	-0.015
	(-1.316)	(-1.325)	(-1.273)	(-1.047)	(-0.286)
Inexperienced analysts (Residual)	-0.069	-0.069	-0.067	-0.065	-0.068
	(-1.371)	(-1.382)	(-1.347)	(-1.303)	(-0.980)
Market cap	-0.207**	-0.216**	-0.210**	-0.211**	-0.266
	(-2.429)	(-2.544)	(-2.491)	(-2.461)	(-1.464)
Market-to-book	0.123***	0.123***	0.123***	0.124***	0.049
	(5.465)	(5.482)	(5.481)	(5.525)	(1.391)
ROA	-20.265***	-20.256***	-20.264***	-20.098***	-22.244***
	(-15.425)	(-15.424)	(-15.432)	(-15.508)	(-8.611)
Total assets growth	3.138***	3.138***	3.138***	3.073***	3.138***
	(7.207)	(7.206)	(7.206)	(8.210)	(5.617)
Cash flow volatility	-0.068***	-0.068***	-0.069***	-0.065***	-0.608
	(-2.651)	(-2.656)	(-2.686)	(-2.847)	(-0.684)
External financing	-1.137	-1.125	-1.131	-0.935	-3.563***
	(-1.127)	(-1.115)	(-1.121)	(-1.028)	(-3.052)
Experience as analyst	0.045	0.012	0.012	0.011	-0.010
	(1.545)	(0.581)	(0.571)	(0.506)	(-0.289)
Experience with firm	-0.137***	-0.143***	-0.143***	-0.139***	-0.143**
	(-4.284)	(-4.463)	(-4.452)	(-4.385)	(-2.566)
Analysts from top brokers	-0.249	-0.250	-0.251	-0.224	-0.199
	(-1.551)	(-1.561)	(-1.566)	(-1.397)	(-0.737)
Portfolio size	0.028**	0.028**	0.028**	0.027**	0.037*
	(2.539)	(2.519)	(2.548)	(2.455)	(1.832)
Industry covering experience	-0.043				
	(-1.631)				
Covering related industry		0.025			
		(0.196)			

Covering customer/supplier			-0.679*		
			(-1.886)		
# of analysts with accounting experience				-0.215	
				(-1.292)	
AC_IED_Pct					-1.128**
					(-2.516)
R^2	15.61%	15.61%	15.59%	15.50%	13.14%
N	28,466	28,466	28,466	28,466	10,071
Fixed Effects	Y	Y	Y	Y	Y

Table 10. Analyst Related Industry Experience Obtained from Public Firm Employments

This table presents multiple regression results for analyst experience classification based only on pre-analyst public firm experience. See Appendix 1 for a detailed description of variables. Firm and year-fixed effects are included, but their coefficient estimates are suppressed for brevity. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Abs_DA	F-score	Restatements	CEO Comp (Raw)	CEO Comp (Excess)	CEO Turnover
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Public related analyst (Residual)	-0.229***	-8.055**	-10.980**	-2.321**	-2.382*	-4.870
	(-3.851)	(-2.286)	(-1.986)	(-2.018)	(-1.918)	(-1.338)
Public unelated analyst (Residual)						0.730
						(0.243)
Abnormal stk ret * Public related analysts(Residual)						-14.720*
						(-1.942)
Abnormal stk ret * Public unrelated analysts(Residual)						-3.050
						(-0.459)
Abnormal stk ret						-34.750***
						(-3.635)
Market cap	-0.242**	12.642	-0.150	31.615***	20.525***	2.630
	(-2.029)	(1.145)	(-0.040)	(8.834)	(5.706)	(0.889)
Market-to-book	0.113***	-0.999	-0.629			
	(4.474)	(-1.477)	(-0.386)			
ROA	-20.353***	-93.311	-82.670**			
	(-12.906)	(-1.235)	(-2.112)			
Total assets growth	3.294***	41.436**	9.660			
	(10.859)	(2.042)	(0.464)			
Cash flow volatility	-0.056	17.349	-88.670***			
	(-0.778)	(0.485)	(-2.860)			
External financing	-2.759***	-38.306	69.620			
	(-3.588)	(-0.393)	(1.172)			
Experience as analyst	0.013	1.338	-2.610	0.345	0.237	1.420
	(0.420)	(0.505)	(-0.942)	(0.698)	(0.489)	(0.904)

Experience with firm	-0.158***	-5.953**	3.650	-0.121	-0.496	2.020
	(-3.466)	(-2.111)	(0.958)	(-0.153)	(-0.622)	(0.898)
Analysts from top brokers	0.063	-29.757	-14.990	5.584	2.821	-1.460
	(0.248)	(-1.283)	(-0.744)	(1.252)	(0.653)	(-0.101)
Portfolio size	0.013	-0.092	-0.245	0.384	0.527*	1.310
	(0.699)	(-0.115)	(-0.147)	(1.293)	(1.837)	(1.260)
Tobins Q				6.137***	3.872***	-8.760**
				(4.548)	(2.906)	(-2.330)
Leverage				-57.626***	-29.435**	50.210
				(-4.204)	(-2.143)	(1.377)
R&D/sale				2.123***	1.475**	
				(3.960)	(2.480)	
Capx/sale				12.245**	10.593*	
				(2.145)	(1.919)	
Xad/sale				43.056	98.505	
				(0.372)	(0.865)	
Abnormal ROA				126.125***	110.447***	
				(7.672)	(6.397)	
Abnormal stk ret				4.438**	-4.199*	
				(2.008)	(-1.956)	
CEO tenure				-3.330***	-3.383***	
				(-7.244)	(-7.360)	
Firm age				9.075***	3.894***	-0.130
				(16.688)	(7.037)	(-0.464)
Sales volatility						26.330
						(1.302)
CEO/Chairman						-1.890
						(-0.240)
R^2	16.39%	0.31%	0.76%	10.41%	6.58%	2.43%
N	17,222	16,659	1,790	7,741	7,705	5,102
Fixed Effects	Y	Y	N	Y	Y	Y

Appendix 1. Variable Definitions

Variable	Definition
Total analysts	Number of analysts covering subject firm *j*
Related analysts	Number of analysts with related industry experience covering subject firm *j*
Unrelated analysts	Number of analysts with unrelated pre-analyst industry work experience covering subject firm *j*
Inexperienced analysts	Number of analysts without prior industry work experience covering subject firm *j*
Discretionary accruals (DA)	Discretionary accruals are estimated based on a modified Jones (1991) model (Dechow, Sloan, and Sweeney (1996), Warfield, Wild, and Wild (1995))
Market cap	The natural log of market capitalization of the covered firm (in $thousands) by the end of the fiscal year
Market-to-book	Current market value of equity divided by the book value of equity in the fiscal year prior to the earnings forecast
ROA	Return on Assets, calculated as earnings divided by total assets (#18/#6)
Total assets growth	Growth rate of assets is calculated by the change of assets scaled by lagged total assets
Cash flow volatility	The standard deviations of cash flows of a firm in the entire sample period, scaled by lagged total assets
External financing	The sum of net cash received from equity and debt issuance scaled by lagged total assets
Experience as analyst	Average number of years that analyst's *i* appeared in *I/B/E/S*
Experience with firm	Average number of years since analyst's *i* first earnings forecast for the covered firm *j*
Analysts from top brokers	Number of analysts working at a top decile brokerage house
Portfolio size	Average number of firms followed by analysts that cover the subject firm
Volatility	Excess stock return volatility calculated as the standard deviation of daily CRSP VW index-adjusted excess stock returns over prior 250 trading days
Tobin's Q	Market-to-book ratio of assets, where market value of assets is computed as is book value of assets plus market value of equity,

	minus book value of equity ((#6+#199×#25-#60-#74)/#6)
Leverage	Long-term plus short-term debt, scaled by total assets ((#9+#34)/#6)
R&D/sale	R&D expenditures scaled by total sales (#46/#12)
Capx/sale	Capital expenditures scaled by total sales (#128/#12)
Xad/sale	Advertising expenditures scaled by total sales (#45/#12)
Abnormal ROA	Industry adjusted ROA
Abnormal stk ret	Industry adjusted annual stock return
CEO tenure	Number of years since the CEO has been employed with the company
Firm age	Number of years since the firm's first appearance in CRSP
Sales volatility	Standard deviation of sales of a firm in the entire sample period, scaled by lagged assets
CEO/Chairman	Indicator for whether CEO is also chairman of the board
Recent (stale) experience	An analyst's industry experience is considered recent (stale) if the number of years that has passed since the end of her pre-analyst industry experience is below (above) the sample median
Public related analyst	Number of analysts with related pre-analyst public firm industry work experience covering subject firm *j*
Public unrelated analyst	Number of analysts with unrelated pre-analyst public firm industry work experience covering subject firm *j*
Industry covering experience	Average number of years that covering analysts has issued forecasts in the coverage firm's 2-digit industry
Covering related industry	Indicator variable=1 if at least one of analysts also covers the coverage firm's related industry, 0 otherwise
Covering customer/supplier	Indicator variable=1 if at least one of analysts also covers the coverage firm's supplier or customer, 0 otherwise
# of analysts with accounting experience	Number of covering analysts with accounting experience in year *t*
AC_IED_Pct	The number of independent directors on the audit committee with industry expertise divided by the total number of independent directors on the audit committee
Affiliated analyst	Analyst whose employer has an investment banking relationship

	with the covered firm during the past 3 years
Unaffiliated analyst	Analyst whose employer does not have an investment banking relationship with the covered firm during the past 3 years

Appendix 2. Investment Banking Relationships and Analyst Monitoring Incentive

This table presents an excerpt of the results from regression analyses of firms' financial disclosure (models 1-3), CEO compensation (models 4 and 5), and CEO turnover (model 6) policies. In these regressions, we separate analysts who are affiliated and unaffiliated with the followed firm, with analysts classified as affiliated if their employers have an investment banking relationship with the firm and unaffiliated otherwise. See Appendix 1 for a detailed description of variables. Coefficients on control variables and firm and year-fixed effects are suppressed for brevity. All coefficients have been inflated by 100 for ease of presentation. In parentheses below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm clustering (Petersen (2009)). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Abs_DA	F-score	Restatements	CEO Comp (Raw)	CEO Comp (Excess)	CEO Turnover
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Affiliated related analysts (Residual)	-0.013	8.457	-1.510	0.033	1.085	
	(-0.083)	(0.722)	(-0.297)	(0.015)	(0.490)	
Unaffiliated related analysts (Residual)	-0.138***	-6.085**	-4.440***	-1.746**	-1.570**	
	(-2.992)	(-2.181)	(-3.105)	(-2.232)	(-1.992)	
Unrelated analysts (Residual)	-0.049	0.276	-1.620	-0.523	-0.609	
	(-1.195)	(0.139)	(-1.165)	(-0.837)	(-0.924)	
Inexperienced analysts (Residual)	-0.064	-2.577	-1.300	0.225	0.069	
	(-1.284)	(-1.349)	(-0.599)	(0.293)	(0.094)	
Abnormal stk ret * Affiliated related analysts (Residual)						-24.450
						(-1.174)
Abnormal stk ret * Unaffiliated related analysts (Residual)						-13.200**
						(-1.985)
Abnormal stk ret * Unrelated analysts (Residual)						2.260
						(0.524)
Abnormal stk ret * Inexperienced analysts (Residual)						1.630
						(0.248)
R^2	15.57%	0.31%	0.23%	10.04%	6.58%	2.30%
N	28,466	16,659	14,072	11,177	7,705	7,620
Fixed Effects	Y	Y	N	Y	Y	Y