Do corporate governance analysts matter?

Evidence from a quasi-natural experiment*

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ABSTRACT

This paper examines potential consequences of governance analyst coverage. Based on a quasi-natural experiment, I find that an exogenous increase in governance analyst coverage results in increasing analyst following, to some extent in increasing free float, in improvements in firm-level corporate governance, and at least partly in decreasing accruals manipulations. These findings are robust to endogeneity concerns. They suggest that the financial analysts' marginal costs to cover a firm decrease after the exogenous increase in governance analyst coverage. They further imply that executives and board members feel potentially pressured by the presence of governance analysts to improve firm-level governance quality. Overall, my findings suggest that governance analysts serve as information intermediaries by enhancing the firm's information environment and by promoting external monitoring to managers.

EFM Classification: 150, 180
Keywords: Information intermediaries, corporate governance analysts, earnings management

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ABSTRACT

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1. INTRODUCTION

Using a quasi-natural experiment that exploits an exogenous shock in the UK governance analyst coverage, this paper investigates the relevance of non-financial governance analysts. Similar to financial (sell-side) analysts or business press, governance analysts represent information intermediaries on capital markets. Their core business consists of governance consultancy and risk assessments via, e.g., commercial corporate governance ratings and / or proxy voting recommendations to institutional shareholders or other capital market participants.

Prior literature on financial analysts has primarily focused on the role of sell-side equity analysts examining, among others, the determinants and consequences of financial analyst coverage (e.g., Yu, 2008; Jiraporn et al., 2012; Degeorge et al., 2013; Irani and Oesch, 2013; Chen et al., 2013). Although this has contributed much to our understanding of financial analysts, so far only little attention has been paid to the role of 'other' types of analysts and their interaction with, for example, sell-side equity analysts. In a recent related literature survey, Beyer et al. (2010, p. 336) propose that – despite focusing on sell-side equity analysts – "other information intermediaries [like, e.g., rating agencies and debt analysts] are important in understanding the development of the overall corporate information environment" and that "more research in this area is warranted".

Besides having first empirical evidence on buy-side analysts and bond analysts (Cheng et al., 2006; De Franco et al., 2009), as well as on the (non-financial) information processing of financial analysts (Orens and Lybaert, 2010, Bhat et al., 2006; Byard et al., 2006; Asare et al., 2011), previous literature has been silent on the actual role of governance analysts as information intermediaries and their potential interaction with financial analysts, investors or managers. This is even more surprising given the increasing importance and popularity of proxy voting advisory and

commercial corporate governance ratings among capital market participants (Larcker et al., 2013; Daines et al., 2010). Accordingly, the main purpose of this study is to fill this research gap and to investigate the relevance of non-financial governance analysts. In doing so, I examine potential consequences of governance analyst coverage by focusing on two different groups as well as on two firm-level mechanisms which are potentially affected by the presence of governance analysts: (1) financial analysts, (2) investors, (3) corporate governance quality, and (4) earnings management.

Based on UK data from the Institutional Shareholder Services (ISS), I measure the coverage by governance analysts on the dimension of whether or not ISS provides governance reports and commercial corporate governance ratings (CGQ ratings) for UK firms. Similar to financial analysts, the decision of ISS analysts to cover a firm (i.e., to provide the CGQ rating) depends on firm characteristics (i.e., index membership and institutional ownership) and thus is endogenous in nature (e.g., Irani and Oesch, 2013, p. 399). As these firm characteristics are in turn most likely related to my outcome variables (i.e., analyst following, free float, governance quality, and accounting quality), ordinary OLS results are potentially biased.

To address those concerns, I exploit an exogenous shock to the coverage by ISS corporate governance analysts. From 2004 to 2005, ISS coverage in the UK exhibited an unusual and strong increase of almost 154 percent. A similar shock is not observable in any of the other countries ISS operated in at that time. In 2005, ISS developed different corporate governance indices together with FTSE, with one of them explicitly focusing on UK firms. To construct the UK specific index with a sufficient firm base, ISS decided to enlarge the UK coverage in 2005 from 209 to 530 firms. From an econometrician's perspective, the observed increase in UK ISS coverage is exogenously caused by the joint indices project, and not endogenously determined by a change in certain firm characteristics like institutional ownership structure or index membership.

Thus, by exploiting the exogenous shock setting as a quasi-natural experiment, the UK sample provides a unique setting in investigating the effects of ISS governance analyst coverage as well as in drawing causal inferences.

Employing a two-fold difference-and-difference research design (with one treatment and two natural control groups), I find that the exogenous increase in ISS analyst coverage results in increasing analyst following, to some extent in increasing free float, in improvements in firm-level corporate governance, and at least partly in decreasing accruals manipulations. These findings are robust to endogeneity concerns. They are further consistent with the notion that the financial analysts' marginal costs to cover a firm decrease after the exogenous increase in ISS coverage. Moreover, they imply that executives and board members feel potentially pressured by the presence of governance analysts to improve firm-level governance quality, if necessary. Overall, my results suggest that governance analysts serve as information intermediaries by materially enhancing the firm's information environment and by promoting external monitoring to managers.

Taken together, the findings of this paper contribute to the extant literature in several ways. First, this is to my knowledge the first paper to provide evidence on the coverage effect of corporate governance analysts. In doing so, it extends research on financial analysts by introducing 'another' type of analysts, i.e., non-financial corporate governance analysts, and by providing evidence on the interrelations between governance and financial analysts.

By investigating the role of governance analysts as information intermediaries, my paper contributes additionally to at least two related streams of literature: the literature on commercial corporate governance ratings and proxy voting advisory, and the literature on the governance role of institutional investors. The former stream of literature addresses issues like the growth and impact of commercial corporate

governance rating vendors (e.g., Rose, 2007), the role and regulation as well as the usefulness of proxy advisors (e.g., Larcker et al., 2011; Larcker et al., 2013), or the (incremental) usefulness of commercial governance ratings to investors (e.g., Daines et al., 2010; Hitz and Lehmann, 2013). The majority of prior findings on the question of whether proxy advisors or governance rating vendors are valuable for investors, however, do not provide evidence in favor of the governance industry (e.g., Daines et al., 2010). Thus, the economic vindication of these information intermediaries is still a question of debate. Extending this stream of literature, evidence on the role of governance analysts provides additional insights into the usefulness of governance advisory on capital markets.

Prior research on the governance role of institutional investors, for example, investigates whether those investors shape the firm's reporting behavior (e.g., Chung et al., 2002) or whether they enhance the firm's overall corporate governance structure (e.g., Aggarwal et al., 2011). Since governance agencies are primarily paid by institutional investors (e.g., mutual funds or public pension funds) in order to enhance the firm's informational environment with respect to governance issues, my paper adds to this research by providing evidence on a potential channel in which the presence of such investors might affect the firm's information environment.

The remainder of the paper is organized as follows: The second chapter provides some background information with respect to the corporate governance business. Chapter three introduces sample and identification. Chapter four presents the paper's empirical predictions. Chapter five describes the empirical setup. Chapter six provides results, implications and additional tests. The last chapter concludes.

2. BACKGROUND

Internationally, three prominent governance rating agencies exist: Institutional

Shareholder Services (ISS), Governance Metrics International (GMI), and the Corporate Library (TCL) (e.g., Larcker and Tayan, 2011, 437).[1] In terms of worldwide coverage, ISS is "the most visible governance rating" vendor (Daines et al., 2010, p. 440). It markets commercial corporate governance ratings for more than 8,000 firms across 31 countries since 2002.[2] These commercial corporate governance ratings – based on over 60 single governance provisions – are commonly available to institutional shareholders or other capital market participants via subscription packages which can result in fees of up to $ 100,000 per year (Coffin and Collinson, 2005, p. 3). In addition, ISS provides proxy voting services (i.e., governance-related advisory on how to vote on annual general meetings) for over 1,700 institutional investors managing $ 26 trillion in assets, including 24 of the top 25 mutual funds, 25 of the top 25 assets managers, and 17 of the top 25 public pension funds (Daines et al., 2010, p. 439). However, the fact that governance advisors like ISS also provide governance advisory directly to firms raises concerns about their independency (e.g., Koeng and Ueng, 2007, p. 61; Rose, 2007, pp. 891, 906; Vo, 2008, p. 17). In a current green paper, the European Commission (2011, p. 15) shares these concerns by stating that "when proxy advisors also act as corporate governance consultants to investee companies, this may give rise to conflicts of interest".

Overall, governance analysts working for governance rating vendors and proxy voting advisors are different from sell-side equity analysts on several dimensions. They sell different products (i.e., produce different information), deal with a different market structure (only few global governance ratings vendors operating on an effectively unregulated playing field), have different conflicts of interests (e.g., institutional

[1] The corporate governance business has been vastly growing throughout the last decade. Rose (2007, p. 887), for example, stresses this point by stating that "[…] corporate governance industry influences the votes of trillions of dollars of equity, and affects the governance policies and fortunes of thousands of companies through proxy voting recommendations and governance ratings."

[2] ISS revised its corporate governance rating (the CGQ) in 2010 and introduced the Governance Risk Indicator (GRId). However, in most points the CGQ is not materially different to its successor the GRId rating (Larcker and Tayan, 2011, p. 440).

investors or other capital market participants hire and pay those analysts but firms are directly consulted by those advisors as well), and are rather less involved in direct dealing with firms' management (e.g., at analyst conferences or during conference calls).

3. SAMPLE AND IDENTIFICATION

3.1 Sample Selection

The sample covers - with the UK market - the largest European and worldwide the third largest (after the U.S. and Japan) country in which ISS offers commercial corporate governance ratings and proxy voting advisory. Therefore, the initial sample is based on all listed firms available in the UK Worldscope database. The sample period covers the years between 2004 and 2006.[3] After applying certain selection criteria (e.g., dropping firms with missing accounting data, or firms from financial industry, or firms with no financial analyst following), the final (initial) sample consists of 1,397 firm-year observations with an ISS coverage quote of 41.37 percent. Table 1 summarizes the sample selection procedure and provides further details on the sample composition.

[Table 1 about here]

3.2 Identification Strategy

It is plausible to assume that ISS' decision to cover a firm (i.e., to provide the CGQ rating) depends on firm characteristics (like institutional ownership or index membership) and thus is endogenous in nature. ISS states that in particular index membership (MSCI EAFE for non-US companies as well as FTSE All Share Index for UK firms) is an important criterion of coverage (RiskMetrics, 2007, p. 4; RiskMetrics, 2009, p. 1; Aggarwal et al., 2009, pp. 3140-3141). As these firm characteristics (i.e.

[3] Using alternative sample periods, e.g., without the exogenous shock year (sample is based on 2004 and 2006 only), or without the year after the exogenous shock (sample is based on 2004 and 2005 only) do not alter my main inferences.

index membership or institutional ownership) are in turn most likely related to my outcome variables (i.e., analyst following, free float, governance quality, and accounting quality), ordinary OLS results are potentially biased.

To address that problem and to provide inferences beyond mere descriptions[4], I exploit the unique data structure of ISS coverage in the UK. From 2004 to 2005, the ISS coverage in the UK exhibits an unusual and strong increase of almost 154 percent. In comparison, the average absolute change of the remaining top five "ISS coverage countries" was around 20 percent between these two years whereas the average absolute change of all remaining 15 European "ISS coverage countries" was even lower with around 13 percent. At the end of 2004, ISS developed different corporate governance indices together with FTSE. This engagement in a "joint global corporate governance ratings and index project" with the explicit focus on the UK market – as one of the three initial single countries the FTSE ISS joint project is covering (besides Japan and the US[5]) – was the primary catalyst for the increasing coverage in the UK (FTSE ISS CGI, 2005, p. 4, 21; Beckley et al., 2005, p. 15).[6]

From an econometrician's perspective, this in turn implies that the increase of ISS coverage in the UK between the years 2004 and 2005 is exogenously caused by the joint indices project between ISS and FTSE, and not endogenously determined by a change in certain firm characteristics like index membership or institutional ownership structure. Thus, by exploiting the exogenous shock to the UK governance industry, the UK sample provides a unique setting in investigating the effects of ISS governance

[4] In a recent survey paper on "Causal Inference in Empirical Archival Financial Accounting Research", Gassen (2013, p. 3) states that "positivistic empirical studies that aim beyond description should allow the reader to conclude whether the observed effect is likely to be caused by the mechanism proposed by the study, or, in short: they should allow for causal inference […]".

[5] On the aggregated level, the joint project considered the FTSE ISS Developed CGI, the FTSE ISS Europe CGI, and the FTSE ISS Euro CGI (FTSE ISS CGI, 2005, p. 21).

[6] I am grateful to Paul Wanner (former Director of Corporate Governance Ratings at RiskMetrics / ISS) and Mark Brockway (Director of ISS Corporate Services at MSCI / ISS) for comments on the ISS coverage and the final clarification of the respective increase in UK coverage between 2004 and 2005.

analyst coverage.[7] Table 2 provides an overview about the ISS coverage among the Top Five countries ISS is covering (Panel A and B) and detailed information on the paper's identification strategy (Panel C and D).

[Table 2 about here]

To exploit the exogenous shock setting, I employ a two-fold difference-and-difference (DiD) design based on different sample compositions. First, I use all sample firms over the whole sample period which are not followed by ISS analysts as my *control* sample (701 firm-year observations). Additionally, I use all firm-year observations which were constantly covered after the exogenous shock event in 2005, but not in the year before as my *treatment* sample (366 firm-year observations). My indicator variable measuring ISS coverage (POST×TREATED) takes the value of one if the firm belongs to the treatment group in the period between 2005 and 2006 (248 firm-year observations), and zero otherwise (819 firm-year observations). Empirically implemented in a regression model, the DiD design underlying my indicator variable (POST×TREATED) combined with a comprehensive set of fixed-effects efficiently addresses the endogeneity concerns.

Second, corresponding to the approach described above, I use all firm-year observations which were constantly covered after 2005, but not in the year before as my *treatment* sample (366 firm-year observations). In contrast to the previous approach, my indicator variable measuring ISS coverage (ANTE×TREATED) takes the value of one if the firm belongs to the treatment group in the year 2004 (118 firm observations), and zero otherwise (440 firm-year observations). Consequently, my control group differs to the previous approach as well. I use all sample firms over the whole sample period which were constantly covered by ISS analysts as my *control* sample (192 firm-year ob-

[7] In terms of treatment assignments, this setting constitutes a quasi-natural experiment rather than a pure natural experiment. In particular, it is most likely that the treatment assignments are not random. However, similar concerns apply to recent financial analyst studies based on brokerage house mergers or closures as natural experimental settings as well (Irani and Oesch, 2013; Chen et al., 2013; Degeorge et al., 2013).

servations). Therefore, ANTE×TREATED indicates – in contrast to the previously defined indicator variable – the *non-coverage* by governance analysts. Similar to the first approach, the DiD design underlying my second indicator variable (ANTE×TREATED) addresses endogeneity concerns in a regression framework as well.

4. EMPIRICAL PREDICTIONS

To glean insights into the informational role of non-financial governance analysts and their relevance to the capital market, I investigate potential consequences of governance analyst coverage. In particular, I focus on two different groups as well as on two firm-level mechanisms which are potentially affected by the presence of governance analysts: (1) financial analysts, (2) investors, (3) corporate governance quality, and (4) earnings management.

Governance Analysts and Financial Analysts

Prior literature documents that the extent of financial analysts following a firm is increasing with the quality of the firm's information environment (e.g., Bushman et al., 2004, p. 244; Lang et al., 2004, p. 589; Baik et al., 2010, p. 170). Jiraporn et al. (2012, p. 3091-3092), for example, predict and find evidence that "more transparent information environment facilitates the analyst's job" and in turn attracts larger analyst following. However, the relation between analyst following and transparency depends substantially upon the role of financial analysts: information intermediary vs. information provider (Lobo et al., 2012, p. 498, 499). The former role is consistent with a positive relationship between analyst following and the quality of firms' information environment whereas the latter role implies the opposite. Based on different settings, prior finance and accounting literature provides evidence for both (e.g., Lobo et al., 2012, p. 499; Barth et al., 2001, p. 4; Lang et al., 2004, p. 589).

As my setting is characterized by an exogenous shock in the information environment (i.e., an exogenous increase in governance information), I rather expect a positive relationship between financial analyst following and transparency. Assuming that financial analysts directly process information produced by governance analysts, the exogenous shock in ISS governance coverage potentially affects the financial analysts' costs to cover a firm, holding everything else constant (e.g., market size, firm disclosure, etc.). In particular, it is plausible to assume that the marginal costs to cover a firm are decreasing with the financial analysts' ability to efficiently allocate monitoring resources based on information which is indicative of firms' governance deficiencies. In a similar vein, Bhat et al. (2006, p. 719) argue that "analysts who are aware of the effects of the weak governance on reporting quality might rely less on the reported financial figures and instead use other sources of information" to generate analyst reports and forecasts for weakly governed firms. Evidence from a recent experiment based on 19 buy-side analysts from the U.S. and 17 from the UK underscores the potential effect of governance information on financial analysts. [8] Asare et al. (2011, p. 1) show, among others, that "analysts exhibit more certainty in their range forecast when the corporate governance rating is above average, relative to below average".

Consequently, evidence on whether or not governance analysts serve as information intermediaries as well as whether those analysts contribute to the quality of firms' information environment is reflected in changes in financial analyst following due to the exogenous increase in ISS coverage. *Assuming an informational role of governance analysts, I predict that the exogenous increase in ISS coverage causes an increase in analyst following (Prediction I).*

[8] Consistent with prior literature, these findings suggest that financial analysts potentially consider governance information when preparing analyst reports or forecasts (e.g., Bhat et al., 2006; Byard et al., 2006; Asare et al., 2011). However, it is still unclear whether financial analysts produce such governance information 'in-house' based on firm disclosure or whether they actually rely on other information intermediaries like governance analysts.

Governance Analysts and Investors

Assuming that institutional investors base (at least partly) investment decisions on third-party governance evaluations (e.g., Rose, 2007, p. 898), an exogenous increase in governance analyst coverage should affect the ownership structure of the respective firms. For one reason, institutional investors are potentially more willing to invest in those firms due to an increase in the firm's information environment. In terms of monitoring, investors might find it less costly to monitor firms due to a more efficient allocation of monitoring resources based on information which is indicative of firms' governance deficiencies.

Consequently, holding smaller investments and owning less control rights might become less expensive due to decreasing marginal monitoring costs which in turn potentially promote investments by institutional shareholders and other investors. Therefore, more favorable investment opportunities together with an increasing coverage by financial analysts should result in increasing free float (respectively in decreasing shares of block holders). *I thus conjecture that the exogenous increase in ISS coverage leads to an increase in firms' free float (Prediction II).*

Governance Analysts and Governance Quality

Within the data collection process ISS provides all covered firms with a unique account number and password to check and review the collected ISS governance data. This in turn allows these firms to comment on the coding of the single governance provisions. ISS "will [then] review the comments, fact check each requested data point change [and] correct/update the profile as necessary" (RiskMetrics, 2007, p. 3). In addition, ISS offers all covered firms access to a fee-based governance service (e.g., Rose, 2007, p. 902). This service provides tools to illustrate how changes in the firm's governance structure affect the respective CGQ rating. Moreover, it enables firms to perform

benchmark and peer-group analyses. Thus, in the course of ISS coverage, firms are most likely aware of the presence of such governance analysts.

In addition, board members are potentially responsive to third-party governance evaluation. Evidence from a recent survey based on more than 1,000 directors serving on U.S. boards conducted by *Corporate Board Member* and *PricewaterhouseCoopers* in 2008 underscores this. The survey participants perceive governance advisors like ISS as the third most important group influencing their boards, after (1) institutional investors and (2) financial analysts, and followed by (4) plaintiff's bar, (5) media, and (6) activist hedge funds (CBM PwC, 2008, p. 11). In a supplement study conducted in 2009, 62% of the interviewed directors state that "published governance ratings will increase a board member's focus and 45% say [that] positive governance ratings help [to] attract investors" (CBM PwC, 2009, p. 7). In a similar vein, Larcker and Tayan (2011, p. 433) note that "interviews with firms suggest that both executives and board members feel pressured to change their policies to increase their governance ratings". Even though these findings are based on U.S. executives and directors, it is plausible to assume that the coverage by ISS governance analysts might induce pressure on UK executives as well to improve the firm's governance quality, if necessary. *I thus conjecture that the exogenous increase in ISS coverage leads, on average, to improvements in firms' governance structures (Prediction III).*

Governance Analysts and Earnings Management

Finally, I investigate whether improvements in outside monitoring (as potentially reflected in increasing analyst following) and firm-level governance structures due to the coverage by governance analysts are *ultimately* reflected in increasing accounting quality, and decreasing earnings management, respectively.

Prior literature on corporate governance and earnings management believes

almost unanimously in a constraining role of corporate governance. Following Dechow et al. (1996, p. 4), the rationale behind this is that "[i]nternal governance processes are established to maintain the credibility of firms' financial statements and safeguard against such behavior as earnings manipulation". However, the empirical findings are rather mixed (e.g., Klein, 2002; Brown et al., 2011, p. 151; Dechow et al., 2010, p. 382; Larcker et al., 2007, p. 985). In contrast, prior studies on financial analysts suggest that external monitors – like financial analysts – are potentially more effective in constraining earnings management than internal governance mechanisms (Yu, 2008, p. 248; Bolton et al., 2005, p. 7). These studies argue that in most cases earnings management is rather driven by an agency conflict between current and future shareholders and not between managers and shareholders.[9] Empirical evidence appears to be consistent with that. Prior literature documents a negative relationship between the number of financial analysts following as well as the coverage by those analysts and earnings management (e.g., Yu, 2008; Degeorge et al., 2013). Recent studies employing natural experiments based on brokerage house mergers and closures provide evidence for a causal relationship between financial analyst coverage and the firm's extent of earnings management (e.g., Irani and Oesch, 2013; Chen et al., 2013).

Since governance analysts presumably affect both financial analysts and governance quality (prediction I & III), I expect that the exogenous increase in ISS coverage leads, on average, to less earnings management (Prediction IV).

5. EMPIRICAL SETUP

5.1 Regression Models

To empirically implement the two-fold DiD approach as outlined in section 3, I use the following regression design:

[9] Yu (2008, p. 248), for example, notes that "current shareholders could choose to incentivize management for short-term stock performance, even with the understanding that this creates incentives for management to manipulate earnings".

$$VI_{it} = \gamma_1 + \gamma_2 TREATED_{it} + \gamma_3 POST \times TREATED_{it} + \sum \gamma_4 FIRM\_CONTROL_{it} + \sum \gamma_5 YEAR_{it} + \sum \gamma_6 INDUSTRY_{it} + \varepsilon \quad (1)$$

$$VI_{it} = \gamma_1 + \gamma_2 TREATED_{it} + \gamma_3 ANTE \times TREATED_{it} + \sum \gamma_4 FIRM\_CONTROL_{it} + \sum \gamma_5 YEAR_{it} + \sum \gamma_6 INDUSTRY_{it} + \varepsilon \quad (2)$$

The idea behind both regression models is to compare for a given variable of interest (VI) the changes in the treatment group around the exogenous event to the corresponding changes in the non-treated control group (e.g., Irani and Oesch, 2013, p. 402). As described in section 3, both regression models are based on the same *treatment group* (i.e., all firm-year observations which were constantly covered after 2005, but not in the year before), but differ in the underlying *control group*. Regression model (1) uses all sample firms which are not followed by ISS analysts as the underlying control group, whereas model (2) uses constantly ISS covered firms as control firms. Evidence on whether or not the exogenous shock in ISS coverage results in certain differences (similarities) between the treatment firms and the constantly non-covered (constantly covered) firms, is reflected in the variable POST×TREATED (ANTE×TREATED), which indicates all firms in the treatment group after (before) 2005. This two-fold DiD design combined with firm controls and fixed-effect structures addresses efficiently endogeneity concerns and allows for causal inferences.

Analogous to the stated predictions, I use the following variables of interest (VI) as my left-hand side variables: number of analysts following a firm (AF), free float of a firm (FF), corporate governance quality score (GOV) provided by ASSET4[10], and absolute discretionary accruals (ADAC) measuring earnings management (respectively accounting quality). In each regression model, TREATED is a dummy variable

[10] I use the ASSET4 governance score to evaluate the governance quality of the treatment group before and after the coverage by ISS analysts (for more information on ASSET4, see, e.g., Mackenzie et al., 2013, p. 502; Lys et al., 2012, p. 9). However, due to data restrictions in the ASSET4 database I run the governance regression only on a subsample (w.r.t. treatment and control group) and only on the second difference-in-difference model (with ANTE×TREATED as the main interest variable).

indicating the treatment group. Depending on the underlying control group, the coefficient estimates on the variables POST×TREATED and ANTE×TREATED capture the DiD effect. Consistent with the first, second, and third prediction, I expect that the coefficient estimate on POST×TREATED (ANTE×TREATED) obtains a positive (negative) sign and becomes significant at conventional levels in the respective regression model. In line with the fourth prediction, I expect a significantly negative (positive) coefficient estimate on POST×TREATED (ANTE×TREATED) in the earnings management regressions. FIRM_CONTROL is a model specific vector of firm characteristics which potentially affect the respective left-hand side variable. To control for year- and industry-fixed effects, I include two dummies for the years 2005 and 2006 and several dummies for different first-digit SIC industry sectors. Alternatively to industry-fixed effects and the inclusion of TREATED, I additionally estimate the regressions with firm-fixed effects (e.g., Irani and Oesch, 2013, p. 402). In all regression models, the standard errors are heteroskedasticity robust (White, 1980) and one-way clustered at firm level (Gow et al., 2010; Petersen 2009).

5.2 Firm Control Variables

In line with prior literature (e.g., Bhushan, 1989, p. 268; O'Brian and Bhushan, 1990, pp. 59 ff; Lang et al., 2004, pp. 605-606; Jiraporn et al., 2012, p. 3095), I consider a variety of firm control variables in the financial analyst following (AF) regression: blue chip index membership (FTSE100), availability of alternative governance information (asset4 coverage), capital intensity (PPE to total assets), volatility of business (StD of cash from operations), stock price volatility (StD of monthly stock returns), brokerage commission (inverse stock price), accounting performance (ROA), growth (book-to-market ratio), institutional investors (pension funds holdings), ownership concentration (closely held shares), size (log of total assets), and leverage (total debt to total assets).

In the free float (FF) regression model, I follow the first (AF) regression specification, but replace closely held shares, pension funds holding, book-to-market ratio, capital intensity, StD of cash from operations, and brokerage commission with analyst following and dividends per share (e.g., Van der Elst, 2004, pp. 427, 438; Richter and Weiss, 2013, pp. 6-7).

To specify the governance (GOV) regression model, I follow Beiner et al. (2006, pp. 253-254) and control for size (log of total assets), growth (on-year change in net sales), accounting performance (ROA), blue chip index membership (FTSE100), and firm valuation (Tobin's Q). In addition, I consider analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), and leverage (total debt to total assets).

In line with prior earnings management studies (e.g., Klein, 2002, p. 388; Koh et al., 2007, pp. 318-319; Bowen et al., 2009, pp. 367-371), I include the following control variables in the discretionary accrual (ADAC) regression: size (log of total assets), blue chip index membership (FTSE100), analyst following, availability of alternative governance information (asset4 coverage), institutional investments (pension funds holdings), ownership concentration (closely held shares), loss reporting, cash from operations, and leverage (total debt to total assets).[11]

5.3 Discretionary Accruals

Discretionary accruals are estimated on an extended cross-sectional modified Jones model based on the cash flow approach and total accruals (e.g., Garcia Lara et al., 2012, p. 12; Botsari and Meeks, 2008; Hribar and Collins, 2002). To control for growth characteristics (Collins et al., 2012) and firm performance (Kothari et al., 2005), I

[11] Consistent with Larcker et al. (2007, p. 987), I do not control for growth opportunities and performance within the ADAC regression model since my ADACs are orthogonal to growth and performance due to the applied estimation model. However, when considering additionally ROA and growth in the basic regression model the main inferences remain unaffected. For detailed information and definitions of all variables used in this study, see Appendix 1.

include growth and one-year lagged ROA as additional explanatory variables in the model. Overall, I estimate discretionary accruals for each two-digit SIC industry group and year by the following regression model based on all available non-financial UK Worldscope firms (with at least 15 observations per industry-year group):

$$\begin{aligned} TAC_{it}/TA_{it-1} = {} & \beta_1 + \beta_2(1/TA_{it-1}) + \beta_3[(\Delta REV_{it}/TA_{it-1}) - (\Delta REC_{it}/TA_{it-1})] \\ & + \beta_4(PPE_{it}/TA_{it-1}) + \beta_4(GROWTH_{it}) + \beta_5(ROA_{it-1}) + \varepsilon_i \end{aligned} \quad (3)$$

The dependent variable TAC stands for total accruals and is obtained directly from the cash flow statement (total accruals as net income minus cash from operations). ΔREV stands for changes in revenues, ΔREC represents changes in receivables, PPE is property, plant and equipment, GROWTH measures current one-year growth in sales, ROA stands for return-on-assets. The residuals of regression model (3) are the discretionary accruals (DAC).

6. RESULTS

6.1 Descriptive Statistics

Table 3 presents descriptive statistics of all variables used in this study based on different subsamples. Panel A (Panel B) of Table 3 covers separately the samples of the treatment group and both control groups before (after) the exogenous shock in ISS coverage in 2005. Consistent with the paper's identification strategy, firms in both groups – the treatment and the first control group – are not covered by ISS analysts before 2005. In addition, firms belonging to the second control group are constantly covered by ISS analysts over the whole sample period from 2004 to 2006. Reflecting the exogenous shock in ISS coverage, firms in the treatment group are not covered before 2005 but constantly afterwards. Overall, firms across all three subsamples (treatment, control 1, and control 2) differ on various dimensions. In contrast to the first (second) control group, firms in the treatment sample, for example, have, on average, higher (lower) analyst following, higher free float, higher absolute discretionary

accruals, higher (lower) pension funds holdings, lower (higher) ownership concentration, and higher (lower) total assets in the year prior to the exogenous shock (Panel A of Table 3).

Comparisons of the differences in the differences across the treatment and both control groups before and after the exogenous shock event allow for first descriptive evidence on the role of governance analysts. In particular, for firms in the treatment group, mean values for analyst following (+1.41 analyst), for free float (+4.69 percent points), and for governance quality (+4.66 percent points), are increasing after the exogenous shock, whereas the average absolute discretionary accruals (-1.47 percent points) are decreasing.[12] In line with the paper's first three predictions, firms in both control groups do not experience, on average, a similar increase in analyst following, free float and governance quality.[13] Changes in absolute discretionary accruals across both control groups, however, reveal a mixed picture. Firms in the first control group exhibit an increase in absolute discretionary accruals (+2.84 percent points), whereas firms in the second control group experience a similar decrease in absolute discretionary accruals (-1.52 percent points) as the treated firms after the exogenous shock. However, since the descriptive results do not consider the DiD design in a framework with fixed-effects and firm control variables, the above stated inferences are only tentative.

[Table 3 about here]

Complementing the descriptive statistics, Table 4 provides non-parametric Spearman correlation coefficients based on the initial sample of 1,397 firm-year observations. In the absence of any subsample and DiD analyses, I observe that the coverage by ISS governance analysts (ISS_COV) is significantly and positively

[12] Control Group 1: analyst following (-0.71 analyst), for free float (+0.52 percent points), and discretionary accruals (+2.84 percent points). Control Group 2: analyst following (-0.01 analyst), for free float (+0.90 percent points), for governance quality (-4.81 percent points), and absolute discretionary accruals (-1.52 percent points).

[13] Owing to data restrictions in the ASSET4 governance database, differences in differences on the governance dimension is only observable between the treatment group and the second control group (i.e., constantly covered firms).

(negatively) correlated with analyst following, and free float, governance quality (absolute discretionary accruals). In addition, analyst following, free float, and governance quality are likewise negatively correlated with absolute discretionary accruals, yet, not in all cases on a statistically meaningful level.[14]

[Table 4 about here]

6.2 Regression Results

Table 5 presents the main regression results along the paper's predictions.[15] Consistent with the first prediction that the exogenous shock in ISS coverage causes an increase in analyst following, the coefficient estimates on POST×TREATED (ANTE×TREATED) obtain a positive (negative) sign and become significant at conventional levels in both specifications, with and without firm fixed effects (Panel A, Table 5). Prediction 2, in contrast, is supported only by the first DiD regression model ('Treatment & Control 1'). Although both coefficient estimates reflecting the DiD effect, POST×TREATED and ANTE×TREATED, obtain the expected sign in the free float regression, only the former becomes significant at conventional levels (Panel B, Table 5). Since the coverage of ASSET4 governance data is limited, Prediction 3 is only tested on the second DiD regression model ('Treatment & Control 2') with a restricted sample size. In line with the third prediction that the exogenous shock in ISS coverage causes improvements in firm-level governance quality, the coefficient estimates on ANTE×TREATED obtain a negative sign and become significant at conventional levels in both specifications, with and without firm fixed effects (Panel C, Table 5). Finally, Panel D presents the corresponding results for the earnings management DiD

[14] In response to some high correlation coefficients (e.g., between SIZE and AF), I perform multicollinearity tests for all explanatory variables used in the regression models. In particular, the Variance Inflation Factors (VIF) do not exceed 3.27 in the difference-in-difference regressions implying that my inferences are not affected by multicollinearity concerns (e.g., Gujarati, 2003, p. 362).

[15] In particular, the Panels of Table 5 address the respective predictions as follows: Panel A = prediction 1, Panel B = prediction 2, Panel C = prediction 3, and Panel D = prediction 4.

regressions. Similar to the free float findings, Prediction 4 is only supported by the first DiD regression model ('Treatment & Control 1'). Again, both coefficient estimates reflecting the DiD effect obtain the expected sign in the earnings management regression. However, only the coefficient estimates on POST×TREATED become significant at conventional levels (Panel B, Table 5).

Overall, the results so far suggest that the exogenous shock in ISS analyst coverage results in increasing analyst following (on average by 1 analyst), to some extent in increasing free float (on average by 4.2 percent points), in improvements in firm-level corporate governance (on average by 7.4 percent points), and at least partly in decreasing accruals manipulations (on average by 1.8 percent points).

[Table 5 about here]

6.3 Additional Analyses

Spillover Effects

Table 5 provides additionally auxiliary regressions on both control groups ('Control 1 & Control 2'). The rationale behind is to examine any spillover effects on the second control group (i.e., constantly covered firms) due to the exogenous increase in ISS coverage. Analogous to possible spillover effects for voluntary IFRS adopters after mandatory IFRS adoption due to increased comparability (e.g., Daske et al., 2008, pp. 1088-1089), constantly covered firms might be likewise affected by an increase in ISS coverage. An extended ISS coverage, for example, might be beneficial for any governance-related benchmark and peer-group analysis due to increased sample size power. Thus, the coefficient estimate on SPILLOVER captures any spillover effects on the second original control group (i.e., constantly covered firms) due to the exogenous shock in the original treatment group. Although insignificant in the analyst following and free float regressions (Panel A and B, Table 5), the coefficient estimates on

SPILLOVER in the earnings management regression become significant at conventional levels and obtain negative signs (Panel D, Table 5). These findings might indicate some spillover effects with respect to changes in earnings management and potentially explain the insignificant findings of the second DiD regression model in the earnings management specification ('Treatment & Control 2', Panel D, Table 5).

Validity of Exogenous Shock Event

Following Irani and Oesch (2013), I challenge the validity of the quasi-natural experiment by re-estimating the main DiD regressions (Table 5) based on a restricted sample covering only the two years prior to the original exogenous shock in 2005 (restricted sample from 2003 to 2004). Depending on the underlying control group, the variables POST×TREATED and ANTE×TREATED in the re-estimated DiD regressions simulate an exogenous shock in *2004*. Given that *parallel trend* assumptions hold between treatment and control group for the period *prior* to the original exogenous shock in 2005, I do not expect the coefficient estimates on POST×TREATED and ANTE×TREATED to become significant in the re-estimated DiD regressions.

Consistent with the validity of the exogenous shock event, untabulated results reveal that in the re-estimated analyst following (AF), governance (GOV), and earnings management (ADAC) DiD regressions, the respective coefficient estimates remain insignificant. However, the findings for the free float (FF) regressions are mixed (POST×TREATED becomes significant at a 5 percent level). I therefore caution to some extent the inferences with respect to free float based on the main DiD regressions (Table 5, Panel B).[16]

[16] See Appendix 2.

Real Earnings Management

To extend the scope of my earnings management proxy, I re-estimate the earnings management DiD regressions (Table 5, Panel D) based on a measure of real earnings management. Alternatively to the employed discretionary accrual proxy (ADAC), I use a summary measure based on abnormal production costs and abnormal discretionary expenses to assess real earnings management activities (Roychowdhury, 2006; Garcia Lara et al., 2012).[17]

Whether the coverage by governance analysts ultimately affects both accrual-based and real earnings management is a priori unclear. Prior earnings management studies, for example, document that managers have started to substitute accruals manipulation by real earnings management activities after the introduction of Sarbanes Oxley Act (Cohen et al., 2008; Roychowdhury, 2006). In a recent study, Garcia Lara et al. (2012) show that – given constant incentives to engage in earnings management – firms shift from accrual-based to (potentially more costly) real earnings management if accounting conservatism constrains the extent of accruals manipulation. Consistent with that, Zang (2012) documents that firms choose the level of accruals manipulation in accordance to the realized manipulation of real activities.

Untabulated results reveal that across all model specifications ('Treatment & Control 1', 'Treatment & Control 2', with and without firm-fixed effects) the coefficient estimates capturing the DiD effect (POST×TREATED and ANTE×TREATED) remain insignificant. Thus, these findings do *not* suggest that real earnings management – compared to accrual-based earnings management – is likewise affected by the exogenous increase in governance analyst coverage.[18]

[17] See Appendix 3, Panel A for details on the estimation process of real earnings management.
[18] See Appendix 3.

OLS Regression and Two-Stage Heckman Modeling

Finally, I estimate ordinary OLS regressions for comparability reasons. To address the self-selection (endogeneity) bias in the OLS regression model, I follow the two-stage Heckman procedure (e.g., Lennox et al., 2012, p. 591-592) and include the inverse Mills (MILLS) ratio from a first-stage probit regression into the main OLS regression model as an additional explanatory variable.[19] Thus, I estimate the following model:

$$\mathrm{VI}_{it} = \alpha + \gamma_1 \mathrm{ISS\_COV}_{it} + \gamma_2 \mathrm{MILLS}_{it} + \sum \gamma_2 \mathrm{FIRM\_CONTROL}_{it} + \sum \gamma_3 \mathrm{YEAR}_{it} + \varepsilon \qquad (4)$$

The OLS regressions employ the same set of dependent variables (the same variables of interests - VI) as well as firm control variables as the original DiD models (Table 5). They further contain fixed effects (year and firm) as well as heteroskedasticity-robust and firm-level clustered standard errors. ISS_COV is the model's main interest variable and indicates whether or not a firm is covered by ISS governance analysts (CGQ ratings). Following the first three (the last) predictions and employing the respective dependent variable in the OLS model, I expect positive (negative) and significant coefficient estimates on ISS_COV.

Untabulated results appear to be in line with my original DiD findings. In particular, the coverage by ISS analysts is significantly and positively (negatively) associated with analyst following, free float, and governance quality (earnings management).[20] Likewise, OLS results do not suggest that ISS coverage is correlated with real earnings management. Compared to the DiD findings, the OLS results, however, overestimate (underestimate) the governance analyst coverage effect on accrual-based earnings management (analyst following and governance quality).

Nevertheless, as outlined in section 3, these OLS results are difficult to interpret

[19] I use index membership (FTSE All Share Index) and dividend yield (DIV_YIELD) as exclusion restrictions, and expect that these variables have no first-order effect on my dependent variables, but rather serve as good predictors of ISS coverage. See Appendix 4, Panel A for details on the two-stage Heckman procedure.

[20] However, the coefficient estimate on ISS_COV in the governance regression remains insignificant when including the MILLS ratio from the first-stage Heckman Model. See Appendix 4.

due to the potential endogenous relationship between governance analyst coverage and various firm characteristics (e.g., index membership and institutional investments). As these firm characteristics are in turn most likely related to my dependent variables (i.e., analyst following, free float, governance quality, and accounting quality), OLS results are prone to endogeneity concerns. IV methods (e.g., two-stage Heckman modeling with exclusion restrictions as instruments in the first stage) are potentially able to address those concerns. However, in most empirical setups it is difficult to find appropriate instruments (e.g., Larcker and Rusticus, 2010, pp. 187, 196, 201; Ertugrul and Hegde, 2009, pp. 157-158; Boersch-Supan and Koeke, 2002, p. 321). In a recent literature survey, Lennox et al. (2012, p. 590) critique the inflationary use of IV models in empirical accounting research by stating that "[a] surprising number of studies (14 of 75) fail to have any exclusions, and other studies (7 out of 75) do not report the first stage model, making it impossible to determine if they imposed exclusion restrictions. Moreover, very few studies provide any theoretical or economic justification for their chosen restrictions."

7. CONCLUSION

Using a quasi-natural experiment that exploits an exogenous shock in the UK ISS governance analyst coverage, I provide evidence on the informational role of non-financial governance analysts and their relevance to the capital market. Specifically, I examine potential consequences of governance analyst coverage by focusing on two different groups (financial analysts and investors) as well as on two firm-level mechanisms (corporate governance quality and earnings management) which are potentially affected by the presence of governance analysts.

Overall, my results – based on a two-fold difference-in-difference design – suggest that the exogenous increase in ISS analyst coverage results in increasing analyst

following, to some extent in increasing free float, in improvements in firm-level corporate governance, and at least partly in decreasing accruals manipulations. These findings are robust to endogeneity concerns. They are consistent with the notion that the financial analysts' marginal costs to cover a firm decrease after the exogenous increase in ISS coverage. They imply further that executives and board members feel potentially pressured by the presence of governance analysts to improve firm-level governance quality, if necessary. Overall, my results suggest that governance analysts serve as information intermediaries by materially enhancing firm's information environment and by promoting external monitoring to managers.

The paper's findings contribute to the extant literature in several ways. First, this is to my knowledge the first paper providing evidence on the coverage effect of governance analysts. In doing so, it extends research on financial analysts by introducing 'another' type of analysts, i.e., non-financial corporate governance analysts, and by providing evidence on potential consequences of governance analyst coverage (including interrelations between governance and financial analysts). These insights are potentially important as prior research on financial analysts has primarily focused on the role of sell-side equity analysts. By examining the informational role of governance analysts, my paper additionally contributes to the limited but growing research addressing issues like the growth and impact of commercial corporate governance rating vendors, the role and regulation as well as the usefulness of proxy advisors, or the usefulness of commercial governance ratings to investors. Since these studies particularly argue about the economic vindication (or usefulness) of proxy advisors and governance rating vendors (and their ratings), empirical evidence on potential consequences of governance analyst coverage provides additional insights into the usefulness of governance advisory on capital markets. Finally, my findings potentially contribute to the literature on the governance role of institutional investors. Since

governance agencies are primarily paid by institutional investors in order to enhance the firm's information environment with respect to governance issues, my paper adds to this research by providing evidence on a potential channel in which the presence of such investors might affect the firm's information environment.

My findings, however, are subject to several limitations. Owing to the exogenous shock setting, I only investigate the coverage effects of one particular governance agency (namely ISS), for one particular market (namely UK), and for a specific time period (2004 to 2006). With the paper's quasi-natural experiment, internal validity increases at the expenses of external validity. Thus, my findings create various research opportunities. Future work may consider governance analysts from different agencies, for different markets, and different time periods. In the absence of any natural experiment (i.e., exogenous shock in coverage), it might be worth to study first-time coverage effects for firms in a particular market. Likewise, evidence from a cross-country setting might provide additional insights. It is plausible to assume that institutional features, like enforcement strength or investor protection standards, affect the information role of governance analysts.

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Table 1: Sample Selection

Panel A. Selection Criteria

Selection Criteria		**Observations**
Start (Worldscope UK Universe from 2004-2006)		7,413
Firms in financial industry (SIC 60-69)	*-2,235*	5,178
Datastream / Worldscope data unavailable (to estimate DAC)	*-1,058*	4,120
Two-digit SIC-year-country min. requirement: >15 obs. (to estimate DAC)	*-951*	3,169
Datastream / Worldscope / IBES data unavailable (to specify control VAR)	*-1,138*	2,031
Firms without at least one financial analyst following	*-634*	1,397
Final Sample (firm-year observations between 2004-2006):		**1,397**

Table 2: Identification Strategy and Regression Samples

Panel A. Exogenous Shock to the UK Governance Industry

ISS Firm coverage per year	**Rank**	**2004**	**2005**	**2006**	**2007**	**2008**	**Sum (p.c.)**	**wscope sample**	**2008 / wscope**
US[21]	1	4,776	5,202	5,152	4,853	4,624	24,607	9,175	50.40%
Delta (|%|)			8.92%	0.96%	5.80%	4.72%	**20.40%**		
ISS Firm coverage per year	**Rank**	**2003**	**2004**	**2005**	**2006**	**2007**	**Sum (p.c.)**	**wscope sample**	**2007 / wscope**
Japan	2	501	510	589	600	600	2,800	3,668	16.36%
Delta (|%|)			1.80%	15.49%	1.87%	0.00%	**19.15%**		
UK	3	205	209	**530**	525	526	1,995	1,890	27.83%
Delta (|%|)			1.95%	**153.59%**	0.94%	0.19%	**156.67%**		
Canada	4	199	186	168	194	196	943	3,364	5.83%
Delta (|%|)			6.53%	9.68%	15.48%	1.03%	**32.72%**		
Australia	5	86	83	119	120	119	527	1,957	6.08%
Delta (|%|)			3.49%	43.37%	0.84%	0.83%	**48.54%**		

Panel B. Sample Distribution & ISS Coverage (based on sample selection criteria as outlined in Table 1)

	2003	**2004**	**2005**	**2006**	2007	**∑ ('04-'06)**
Sample	418	441	470	486	488	**1,397**
ISS Coverage (abs)	93	90	251	237	220	578
ISS Coverage (%)	22.25	20.41	53.40	48.77	45.08	41.37
Delta in ISS Coverage (|%|)		3.22	**178.89**	**5.58**	7.17	

Panel C. Sample Partitioning to Separate the ISS Coverage Effect

			Sample Period between 2004 and 2006		
			2004	***2005***	***2006***
ISS Coverage	***No***	-	***Sub-Sample IV*** *(CONTROL 1):* Benchmark firms which are not covered by ISS during the sample period (firm-year N=701)		
	Yes	*Partly (only through 2005 and 2007)*	***Sub-Sample IIIa*** *(ANTE×TREATED):* Firms from sub-sample IIIb as firm obs. for the years 2004 (firm N=118)	***Sub-Sample IIIb*** *(POST×TREATED):* Firms are not covered by ISS in 2004 but in 2005 and 2006 constantly (firm-year N=248)	
	Yes	*Non-constantly & non-systematically*	*Sub-Sample II:* Firms are not constantly covered by ISS between 2004 and 2006 *(these firms often have only 1 or 2 firm-year obs. in the dataset)* (firm year N=138)		
	Yes	*Constantly*	***Sub-Sample I*** *(CONTROL 2):* Firms are constantly covered by ISS between 2004 and 2006 (firm-year N=192)		

Panel D. Identification Strategy: two-fold difference-in-difference design based on different samples

Identification Strategy (1): *(Sample 1)*	• Sample (1) is based on three sub-samples (IIIa, IIIb, & IV) and uses an indicator variable (POST×TREATED) taking the value of one if the firm belongs to sub-sample IIIb, and zero otherwise (sub-samples IIIa & IV) • The difference-in-difference design uses the subsamples IIIa & IIIb as the *treatment* group and subsample IV as the *control* group • The sample period covers all three years (from 2004 to 2006)
Identification Strategy (2): *(Sample 2)*	• Sample (2) is based on three sub-samples (I, IIIa, & IIIb) and uses an indicator variable (ANTE×TREATED) taking the value of one if the firm belongs to sub-sample IIIa, and zero otherwise (sub-samples I & IIIb) • The difference-in-difference design uses the subsamples IIIa & IIIb as the *treatment* group and subsample I as the *control* group • The sample period covers all three years (from 2004 to 2006)

Notes: The "wscope sample" numbers are based on the "Worldscope Coverage" Guide as of February 2013 (available online from the Datastream Extranet) and represent the total number of active firms in the respective country Worldscope Universe.

[21] US CGQ coverage data are inferred from the CGQ data provided by Aggarwal et al. (2011).

Table 3: Descriptive Analysis

Panel A: Sample Period: 2004 (prior to the exogenous shock in ISS coverage)

Variables	Treatment Group (N=118)		Control Group 1 (N=233)		Control Group 2 (N=64)	
	Mean	Min (Max)	Mean	Min (Max)	Mean	Min (Max)
ISS Coverage	0	0 (0)	0	0 (0)	1	1 (1)
Dependent Variables						
Analyst Following (AF)	4.06	1 (12)	2.53	1 (19)	11.75	1 (34)
Free Float (FF)	54.09	7 (97)	54.96	8 (100)	60.76	30 (90)
ASSET4 GOV Score (GOV)*	54.20	18 (91)	-	-	75.12	31 (96)
Disc. Accruals (ADAC)	.0703	0 (.25)	.0668	0 (.54)	.0666	0 (.27)
Independent Variables						
Index Membership (FTSE100)	.0254	0 (1)	.0042	0 (1)	.3906	0 (1)
ASSET4_COV	.4406	0 (1)	.0386	0 (1)	.6250	0 (1)
Pension Funds (PF)	2.88	0 (15)	1.71	0 (19)	3.32	1 (9)
Ownership (OWNER)	22.36	.08 (79)	32.73	.06 (88)	11.51	.02 (56)
Log Total Assets (SIZE)	12.44	9.27 (14.9)	11.11	7.49 (15)	14.60	11.3 (19.2)
Delta Sales (GROWTH)	.1306	-.55 (.88)	.1416	-1 (8.67)	.0565	-.39 (.54)
Leverage (LEV)	.1506	0 (.47)	.1608	0 (.81)	.2515	0 (.58)
Cash from Operations (CFO)	.0884	-.77 (.37)	.0354	-1.35 (.95)	.0967	-.12 (.32)
Capital Intensity (PPE_TA)	.2621	.01 (.94)	.2433	0 (2.55)	.2834	.01 (.85)
Return-on-Assets (ROA)	.0670	-.89 (.38)	.0019	-1.32 (.35)	.0684	-.30 (.32)
Book-to-Market (BTM)	.6457	-1.2 (5.6)	.5515	-4.6 (3.4)	.4387	-.35 (2.8)
Log Tobin's Q (Q)	.5684	-.29 (2.4)	.4589	-.57 (2.4)	.5186	-.28 (1.9)
Volatility of CFO (SD_CFO)	.0629	.01 (.28)	.0938	0 (.77)	.0384	.01 (.14)
Volatility of SR (SD_STOCK)	.1092	.02 (.31)	.1354	.03 (.54)	.1203	.03 (.62)
Inverse Stock Price (BC)	-11.55	-1005 (-.14)	-2.20	-96 (-.02)	-4.12	-18 (-.52)
Dividend per Shares (DPS)	.3199	0 (29)	.0617	0 (4.3)	.1224	0 (.71)
Loss reporting (LOSS)	.2033	0 (1)	.4077	0 (1)	.3281	0 (1)

Panel B: Sample Period: 2005-2006 (after the exogenous shock in ISS coverage)

Variables	Treatment Group (N=248)		Control Group 1 (N=468)		Control Group 2 (N=128)	
	Mean	Min (Max)	Mean	Min (Max)	Mean	Min (Max)
ISS Coverage	1	1 (1)	0	0 (0)	1	1 (1)
Dependent Variables						
Analyst Following (AF)	5.47	1 (24)	1.82	1 (16)	11.74	1 (42)
Free Float (FF)	58.78	12 (100)	55.48	6 (100)	61.66	21 (100)
ASSET4 GOV Score (GOV)*	58.86	10 (92)	-	-	70.31	26 (96)
Disc. Accruals (ADAC)	.0556	0 (.51)	.0952	0 (.55)	.0514	0 (.19)
Independent Variables						
Index Membership (FTSE100)	.0403	0 (1)	.0064	0 (1)	.3828	0 (1)
ASSET4_COV	.4556	0 (1)	.0235	0 (1)	.7812	0 (1)
Pension Funds (PF)	1.55	0 (71)	.5662	0 (20)	1.32	0 (6)
Ownership (OWNER)	21.20	1 (89)	35.52	.02 (98)	14.42	.01 (56)
Log Total Assets (SIZE)	12.57	9.2 (19)	10.44	6.7 (15.3)	14.58	10.9 (19.1)
Delta Sales (GROWTH)	.1703	-.74 (5.8)	.2413	-.78 (12.1)	.0460	-.91 (1.51)
Leverage (LEV)	.1759	0 (1.33)	.1429	0 (1.60)	.2516	0 (1.17)
Cash from Operations (CFO)	.0901	-.66 (.37)	.0146	-1.8 (.34)	.0849	-.35 (.29)
Capital Intensity (PPE_TA)	.2401	0 (.94)	.1803	0 (.96)	.2586	0 (.92)
Return-on-Assets (ROA)	.0792	-1.09 (.48)	-.0280	-2.5 (.71)	.0834	-.42 (.38)
Book-to-Market (BTM)	.4932	-4.5 (4.9)	.6181	-1.2 (11.7)	.3775	-.42 (2.1)
Log Tobin's Q (Q)	.6572	-.32 (2.41)	.5623	-.59 (2.41)	.5754	-.36 (1.55)
Volatility of CFO (SD_CFO)	.0629	.01 (.29)	.1514	0 (9.6)	.0390	0 (.14)
Volatility of SR (SD_STOCK)	.0857	.03 (.32)	.1239	.02 (1.0)	.0738	.02 (.19)
Inverse Stock Price (BC)	-16.86	-1777 (-.06)	-2.73	-445 (-.01)	-4.93	-28.2 (-.28)
Dividend per Shares (DPS)	.3621	0 (36)	.0251	0 (.46)	.1405	0 (.9)
Loss reporting (LOSS)	.1814	0 (1)	.3846	0 (1)	.1953	0 (1)

Notes: *The sample size w.r.t. ASSET4 GOV score is restricted (Panel A: Treatment sample N = 40 & Control Group 2 sample N = 52; Panel B: Treatment sample N = 113 & Control Group 2 sample N = 100). This table displays the descriptive statistics of all variables used on this study. For details on the sample selection process, see Table 1. For detailed information and definitions of the variables, see Appendix 1.

Table 4: Correlation Analysis

Sample (N=1,397)		Nonparametric Spearman Correlations										
		1	2	3	4	5	6	7	8	9	10	11
ISS_COV	1	1										
AF	2	**0.619**	1									
		(0.00)										
FF	3	**0.083**	0.035	1								
		(0.00)	(0.19)									
GOV*	4	**0.239**	0.358	0.031								
		(0.00)	(0.00)	(0.54)								
ADAC	5	**-0.151**	**-0.197**	**-0.036**	**-0.035**	1						
		(0.00)	**(0.00)**	**(0.17)**	**(0.50)**							
FSTE100	6	0.314	0.421	0.069	0.313	-0.125	1					
		(0.00)	(0.00)	(0.01)	(0.00)	(0.00)						
ASSET4_COV	7	0.503	0.627	0.112	-	-0.160	0.424	1				
		(0.00)	(0.00)	(0.00)	-	(0.00)	(0.00)					
PF	8	0.132	0.348	-0.289	0.116	-0.057	0.122	0.190	1			
		(0.00)	(0.00)	(0.00)	(0.02)	(0.03)	(0.00)	(0.00)				
OWNER	9	-0.367	-0.442	-0.363	-0.195	0.104	-0.239	-0.409	-0.274	1		
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
SIZE	10	0.641	0.813	0.107	0.442	-0.212	0.443	0.658	0.365	-0.462	1	
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
LEV	11	0.226	0.304	0.031	0.066	-0.143	0.193	0.238	0.130	-0.170	0.430	1
		(0.00)	(0.00)	(0.25)	(0.20)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
ROA	12	0.226	0.295	-0.019	-0.011	-0.171	0.164	0.288	0.060	-0.076	0.246	-0.018
		(0.00)	(0.00)	(0.47)	(0.83)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.51)

Notes: *The sample size w.r.t. ASSET4 GOV score is restricted (N = 387). This table reports non-parametric Spearman correlation coefficients. For detailed information and definitions of the variables, see Appendix 1. Reported values: coefficients (p-values).

Table 5: DiD Regression Analyses

Panel A. Prediction 1: Governance Analysts and Financial Analysts

	Pred. Sign	Dependent variable: *Analyst Following*					
		Treatment & Control 1		**Treatment & Control 2**		Control 1 & Control 2	
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
POST_TREATED	+	**1.1508*** **	**.8814*** **				
		(5.10)	**(3.23)**				
ANTE_TREATED	-			**-.9619** **	**-.9789***		
				(-2.04)	**(-1.73)**		
SPILLOVER						-.6826	-.4693
						(-1.55)	(-0.82)
FIRM CONTROL VARs		Yes	Yes	Yes	Yes	Yes	Yes
YEAR fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
IND fixed effect		Yes	No	Yes	No	Yes	No
FIRM fixed effect		No	Yes	No	Yes	No	Yes
Sample Size		1067	1067	558	558	1031	1031
Adj. R^2		.5496	.8400	.6987	.9013	.7089	.9085

Panel B. Prediction 2: Governance Analysts and Investors

	Pred. Sign	Dependent variable: *Free Float*					
		Treatment & Control 1		**Treatment & Control 2**		Control 1 & Control 2	
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
POST_TREATED	+	**4.7748** **	**5.2970***				
		(2.22)	**(1.72)**				
ANTE_TREATED	-			**-3.7783**	**-3.2452**		
				(-1.48)	**(-1.01)**		
SPILLOVER						.6500	-.1377
						(0.29)	(-0.04)
FIRM CONTROL VARs		Yes	Yes	Yes	Yes	Yes	Yes
YEAR fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
IND fixed effect		Yes	No	Yes	No	Yes	No
FIRM fixed effect		No	Yes	No	Yes	No	Yes
Sample Size		1067	1067	558	558	1031	1031
Adj. R^2		.2472	.5790	.4962	.6676	.2707	.5878

Panel C. Prediction 3: Governance Analysts and Corporate Governance

	Pred. Sign	Dependent variable: *Corporate Governance Quality (ASSET4)*					
		Treatment & Control 1		**Treatment & Control 2**		Control 1 & Control 2	
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
POST_TREATED	+						
ANTE_TREATED	-			**-9.0381*** **	**-5.9503***		
				(-3.17)	**(-1.82)**		
SPILLOVER							
FIRM CONTROL VARs				Yes	Yes		
YEAR fixed effect				Yes	Yes		
IND fixed effect				Yes	No		
FIRM fixed effect				No	Yes		
Sample Size				305	305		
Adj. R^2				.2791	.6936		

Panel D. Prediction 4: Governance Analysts and Earnings Management

	Pred. Sign	Dependent variable: *Absolute Discretionary Accruals*					
		Treatment & Control 1		**Treatment & Control 2**		Control 1 & Control 2	
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
POST_TREATED	-	**-.0361*** **	**-.0344*** **				
		(-3.83)	**(-2.61)**				
ANTE_TREATED	+			**.0009**	**.0020**		
				(0.09)	**(0.15)**		
SPILLOVER						-.0271***	-.0291**
						(-2.88)	(-2.12)
FIRM CONTROL VARs		Yes	Yes	Yes	Yes	Yes	Yes
YEAR fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
IND fixed effect		Yes	No	Yes	No	Yes	No
FIRM fixed effect		No	Yes	No	Yes	No	Yes
Sample Size		1067	1067	558	558	1031	1031
Adj. R^2		.1183	.4082	.0719	.1804	.1432	.4530

The underlying basic regression model is:

$$VI_{it} = \alpha + \gamma_1 TREATED_{it} + \gamma_2 POST \times TREATED_{it}[\gamma_2 ANTE \times TREATED_{it}] + \sum \gamma_2 FIRM\_CONTROL_{it} + \sum \gamma_3 YEAR_{it} + \sum \gamma_4 INDUSTRY_{it} + \varepsilon$$

TREATED is a dummy variable indicating the treatment group. Depending on the underlying control group, the coefficient estimates on the variables POST×TREATED and ANTE×TREATED capture the difference-in-difference effect (for definitions of treatment and control group, see Table 2). Firm control for analyst following (AF) regression (Panel A): blue chip index membership (FTSE100), alternative governance information (asset4 coverage), capital intensity (PPE to total assets), volatility of

business (StD of cash from operations), stock price volatility (StD of monthly stock returns), brokerage commission (inverse stock price), accounting performance (ROA), growth (book-to-market ratio), institutional investors (pension funds holdings), ownership concentration (closely held shares), size (log of total assets), and leverage (total debt to total assets). Firm control for free float (FF) regression (Panel B): blue chip index membership (FTSE100), alternative governance information (asset4 coverage), stock price volatility (StD of monthly stock returns), accounting performance (ROA), size (log of total assets), leverage (total debt to total assets), analyst following, and dividends per share. Firm control for governance (GOV) regression (Panel C): size (log of total assets), growth (on-year change in net sales), accounting performance (ROA), blue chip index membership (FTSE100), firm valuation (Tobin's Q), analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), and leverage (total debt to total assets). Firm control for absolute Discretionary Accruals (ADAC) regression (Panel D): size (log of total assets), blue chip index membership (FTSE100), analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), loss reporting, cash from operations, and leverage (total debt to total assets). For detailed information and definitions of the variables, see Appendix 1. In each Panel, Model 5 and 6 simulate the exogenous shock design based on a sample without the treatment group but including both control groups. In these models, SPILLOVER is identical to POST×TREATED in terms of construction (with Control Group 2 as simulated Treatment Group and Control Group 1 as the simulated Control Group). Thus, the coefficient estimate on SPILLOVER captures any spillover effects on the second original control group (constantly covered firms) due to the exogenous shock in the original treatment group. The regression models contain industry- and year-fixed effects, and have standard errors which are heteroskedasticity robust and one-way clustered at firm level. Alternatively to industry-fixed effects and the inclusion of TREATED, I additionally estimate the regression with firm-fixed (as indicate in Table 5). Detailed results of the estimated regressions are provided in Appendix 5. Reported values: coefficient (t-value) *** (**) (*) indicates significance levels at 1% (5%) (10%), two-tailed.

APPENDIX

Appendix 1: Definition of Variables

SHORT CUT	VARIABLE	DEFINITION
Earnings Management Proxy		
ADAC*	Absolute discretionary accruals	*ADAC* are the absolute residuals from an extended (performance & growth adj.) cross-sectional modified Jones model (CMJM) based on the cash flow approach and total accruals
TAC*	Total accruals	*TAC* is total accruals = net income (wc01751) – cash from operations (wc04860)
REV*	Revenues	*REV* is net sales of revenues (wc01001)
REC*	Receivables	*REC* is receivables (wc02051)
PPE	Property, plant & equipment	*PPE* is property, plant & equipment (wc02301)
ROA*	Return-on-assets	*ROA* is return-on-assets as EBIT (wc18191) scaled by total assets (wc02999)
GROWTH	Growth in net sales	*GROWTH* is change in net sales (($wc01001_t$-$wc01001_{t-1}$)/$wc01001_{t-1}$)
TA	Total Assets	*TA* is total assets (wc02999)
Coverage by Governance Analysts		
ISS_COV	Coverage by Governance Rating Agency	*ISS_COV* is a dummy variable indicating whether a firm is covered by ISS, or not.
Dependent Variables (excluding DAC)		
AF	Analyst following	*AF* is the number of analyst following (f1ne)
FF	Free float	*FF* measures free float of outstanding shares (noshff).
GOV	Governance Score	*GOV* is a corporate governance score provided by ASSET4 (cgvscore)
Firm Control Variables		
PENSION	Pension funds holdings	*Pension* is number of shares hold by pension funds (noshpf)
LOSS	Loss reporting	*LOSS* stands for loss reporting and indicates as a dummy variable with 1 if the firm reports a loss in year t-1 ($wc01751_{t-1}$<0)
SIZE	Log of market value of equity	*SIZE* if the natural logarithm of market value of equity (EURO) (xmve)
LEV	Leverage	*LEV* is the accounting leverage as total liability (wc03351) to fiscal years average total assets (dwta)
CFO	Cash from $operations_1$	CFO_1 = net cash flow – operating activities (wc04860) deflated by total assets (wc02999)
OWNER	Ownership	*Owner* as ownership – closely held shares (wc08021)
SD_CFO	Volatility of business	*SD_CFO* is volatility of business as the standard deviation of cash from operations (wc04860) over the sample period (2003 to 2007)
FTSE100	Index membership	*FTSE100* indicates FTSE100 index membership (wc05661)
Q	Tobin's Q	*Q* measures firm value and equals the book value of total assets (dwta) + market value of common shares (mv) - book value of common shares (dwse) divided by book value of total assets (dwta).
CAP_INT	PPE to total assets	*CAP_INT* (capital intensity) is property, plant & equipment (wc02501) to total assets (wc02999).
ASSET4_COV	ASSET4 coverage	*ASSET4_COV* is a dummy variable indicating with 1 and 0 whether a firm is covered by ASSET4 governance score
GROWTH	Change in net sales	*GROWTH* is one-year change in net sales (wc01001)
ROA	Return on Assets	*ROA* is defined as EBIT (wc18191) deflated by total assets (wc02999)
BTM	Book-to-Market ratio	*BTM* is defined as common equity (wc03501) deflated by market capitalization (wc05001*nosh)
SD_STOCK	Stock Volatility	*SD_STOCK* is the yearly average standard deviation of monthly stock returns (based on wc05015 – wc05070)
BC	Brokerage Commission	*BC* stands for brokerage commission and is defined as the firm's inverse stock price (-1*wc05001)
DPS	Dividend per share	*DPS* is dividends per share (wc05101)

* Winsorized by extreme percentiles (1 percent level) to control for outliers (yearly based).

Appendix 2: Validity of Natural Experiment

	Sample: 2003 to 2004 (without an exogenous shock)						
	Analyst Following		Free Float		GOV	ADAC	
	Treatment & Control 1	*Treatment & Control 2*	*Treatment & Control 1*	*Treatment & Control 2*	*Treatment & Control 2*	*Treatment & Control 1*	*Treatment & Control 2*
P_TREATED	**-.2091**		**11.45****			**.0006**	
	(-0.62)		**(2.05)**			**(0.03)**	
A_TREATED		**.6067**		**7.49**	**6.65**		**.0057**
		(0.79)		**(1.56)**	**(0.61)**		**(0.29)**
F. CONTROL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR fe	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IND fe	No	No	No	No	No	No	No
FIRM fe	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	677	349	702	351	127	763	354
Adj. R^2	.8301	.8991	.2876	.3935	.7117	.5002	.3215

The sample period is between 2003 and 2004 (without exogenous shock). The underlying basic regression model is:

$$VI_{it} = \alpha + \gamma_1 TREATED_{it} + \gamma_2 POST \times TREATED_{it}[\gamma_2 ANTE \times TREATED_{it}] + \sum \gamma_2 FIRM\_CONTROL_{it} + \sum \gamma_3 YEAR_{it} + \sum \gamma_4 INDUSTRY_{it} + \varepsilon$$

TREATED is a dummy variable indicating the treatment group. Depending on the underlying control group, the coefficient estimates on the variables POST×TREATED and ANTE×TREATED capture the difference-in-difference effect (for definitions of treatment and control group, see Table 2). Firm control for analyst following (AF) regression: blue chip index membership (FTSE100), alternative governance information (asset4 coverage), capital intensity (PPE to total assets), volatility of business (StD of cash from operations), stock price volatility (StD of monthly stock returns), brokerage commission (inverse stock price), accounting performance (ROA), growth (book-to-market ratio), institutional investors (pension funds holdings), ownership concentration (closely held shares), size (log of total assets), and leverage (total debt to total assets). Firm control for free float (FF) regression: blue chip index membership (FTSE100), alternative governance information (asset4 coverage), stock price volatility (StD of monthly stock returns), accounting performance (ROA), size (log of total assets), leverage (total debt to total assets), analyst following, and dividends per share. Firm control for governance (GOV) regression: size (log of total assets), growth (on-year change in net sales), accounting performance (ROA), blue chip index membership (FTSE100), firm valuation (Tobin's Q), analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), and leverage (total debt to total assets). Firm control for absolute Discretionary Accruals (ADAC) regression: size (log of total assets), blue chip index membership (FTSE100), analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), loss reporting, cash from operations, and leverage (total debt to total assets). For detailed information and definitions of the variables, see Appendix 1. The regression models contain industry- and year-fixed effects, and have standard errors which are heteroskedasticity robust and one-way clustered at firm level. Alternatively to industry-fixed effects and the inclusion of TREATED, I additionally estimate the regression with firm-fixed (as indicate in Table 5). Reported values: coefficient (t-value) *** (**) (*) indicates significance levels at 1% (5%) (10%), two-tailed.

Appendix 3: Real Earnings Management

Panel A. Estimation of Real Earnings Management

Following Roychowdhury (2006) and Garcia Lara et al. (2012), I use a summary measure based on abnormal production costs and abnormal discretionary expenses to assess real earnings management activities. Both measures are adjusted by one-year lagged ROA and sales growth in the estimation process to control for firm performance and growth (Garcia Lara et al., 2012, p. 13-14). To estimate abnormal production costs, I use the following regression model for each two-digit SIC industry group and year (with at least 15 observations):

$$\begin{aligned}\mathrm{PROD_{it}}/\mathrm{TA_{it-1}} = {} & \delta_1 + \delta_2(1/\mathrm{TA_{it-1}}) + \delta_3(\mathrm{SALES_{it}}/\mathrm{TA_{it-1}}) + \delta_4(\Delta\,\mathrm{SALES_{it}}/\mathrm{TA_{it-1}}) \\ & + \delta_5(\Delta\,\mathrm{SALES_{it-1}}/\mathrm{TA_{it-1}}) + \delta_6(\mathrm{ROA_{it-1}}) + \delta_7(\mathrm{GROWTH}) + \varepsilon_i\end{aligned} \quad \text{(i)}$$

The dependent variable PROD stands for production costs and is measured as the sum of costs of goods sold and the change in inventory during the respective year. SALES stands for firm's net sales, GROWTH measures current one-year growth in sales, and ROA is return-on-assets. The residuals of regression model (i) are the abnormal production costs (APROD) with higher values indicating more real earnings management.

To estimate abnormal discretionary expenses, I use the following regression model for each two-digit SIC industry group and year (with at least 15 observations):

$$\begin{aligned}\mathrm{DEXP_{it}}/\mathrm{TA_{it-1}} = {} & \varphi_1 + \varphi_2(1/\mathrm{TA_{it-1}}) + \varphi_3(\mathrm{SALES_{it-1}}/\mathrm{TA_{it-1}}) + \varphi_6(\mathrm{ROA_{it-1}}) \\ & + \varphi_7(\mathrm{GROWTH}) + \varepsilon_i\end{aligned} \quad \text{(ii)}$$

The dependent variable DEXP represents discretionary expenses and is defined as the sum of selling, general & administrative (SG&A) expenses, R&D expenses, and advertising expenses. SALES, ROA, and GROWTH are defined as for model (4). The residuals of regression model (ii) are the abnormal discretionary expenses (ADEXP) with lower values indicating more income increasing real earnings management. Following prior literature, I aggregate the two variables into one proxy (REM) to measure real earnings management activities (e.g., Garcia Lara et al., 2012, p. 14; Cohen and Zarowin, 2010, p. 9). In doing so, I define REM as the sum of APROD and (-1*ADEXP). Thus, higher values of REM indicate more real earnings management.

Panel B. DiD Regression Results

	Pred. Sign	Dependent variable: *Real Earnings Management*					
		Treatment & Control 1		**Treatment & Control 2**		**Control 1 & Control 2**	
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
POST_TREATED	-	-.0742	.0006				
		(-1.42)	(0.01)				
ANTE_TREATED	+			.0022	-.0008		
				(0.05)	(-0.02)		
SPILLOVER						-.0230	.0105
						(-0.49)	(0.19)
FIRM CONTROL VARs		Yes	Yes	Yes	Yes	Yes	Yes
YEAR fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
IND fixed effect		Yes	No	Yes	No	Yes	No
FIRM fixed effect		No	Yes	No	Yes	No	Yes
Sample Size		870	870	451	451	781	781
Adj. R^2		.1056	.8127	.1745	.8547	.0671	.7923

The underlying basic regression model is:

$$\mathrm{REM_{it}} = \alpha + \gamma_1\mathrm{TREATED_{it}} + \gamma_2\mathrm{POST} \times \mathrm{TREATED_{it}}[\gamma_2\mathrm{ANTE} \times \mathrm{TREATED_{it}}] + \sum \gamma_2\mathrm{FIRM\_CONTROL_{it}} + \sum \gamma_3\mathrm{YEAR_{it}} + \sum \gamma_4\mathrm{INDUSTRY_{it}} + \varepsilon$$

TREATED is a dummy variable indicating the treatment group. Depending on the underlying control group, the coefficient estimates on the variables POST×TREATED and ANTE×TREATED capture the difference-in-difference effect (for definitions of treatment and control group, see Table 2). REM (real earnings management) is a proxy based on abnormal production costs and abnormal discretionary expenses (Garcia Lara et al., 2012; Roychowdhury, 2006). Firm control includes: size (log of total assets), blue chip index membership (FTSE100), analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), loss reporting, cash from operations, and leverage (total debt to total assets). For detailed information and definitions of the variables, see Appendix 1. Model 5 and 6 simulate the exogenous shock design based on a sample without the treatment group but including both control groups. In these models, SPILLOVER is identical to POST×TREATED in terms of construction (with Control Group 2 as simulated Treatment Group and Control Group 1 as the simulated Control Group). Thus, the coefficient estimate on SPILLOVER captures any spillover effects on the second original control group (constantly covered firms) due to the exogenous shock in the original treatment group. The regression models contain industry- and year-fixed effects, and have standard errors which are heteroskedasticity robust and one-way clustered at firm level. Alternatively to industry-fixed effects and the inclusion of TREATED, I additionally estimate the regression with firm-fixed (as indicate). Reported values: coefficient (t-value) *** (**) (*) indicates significance levels at 1% (5%) (10%), two-tailed.

Appendix 4: Naïve OLS Regressions (with and without Heckman Modeling)

Panel A. Two-Stage Heckman Modeling

To address a potential self-selection (endogeneity) bias in the basic OLS regression model, I follow the two-stage Heckman procedure (e.g., Lennox et al., 2012, p. 591-592) and include the inverse Mills ratio from a first-stage probit regression into the main OLS regression model as an additional explanatory variable. In doing so, I use the following first-stage probit regression model:

$$\text{Probit}(\text{ISS\_COVERAGE})_{it} = \alpha_1 + \sum \alpha_2 \text{EXCLUSION}_{it} + \sum \alpha_3 \text{FIRM\_CONTROL}_{it} + \sum \alpha_4 \text{YEAR}_{it} + \sum \alpha_5 \text{INDUSTRY}_{it} + \varepsilon \quad \text{(iii)}$$

ISS_COVERAGE a dummy variable indicating whether or not a firm is covered by ISS (CGQ rating). The vector of firm characteristics, the year and industry-fixed effects, and the standard errors are defined as for regression models 3 to 6. EXCLUSION represents a vector of exclusion restrictions to specify the first-stage probit regression. Lennox et al. (2012, p. 592) state that "the choice of exclusion restriction is vital for implementing the selection model in a way that convincingly controls for endogeneity" in the second stage of the Heckman procedure. I use index membership (FTSE All Share Index) and dividend yield (DIV_YIELD) as my exclusion restrictions, and expect that these variables criteria have no first-order effect on my dependent variables, but rather serve as good predictors of ISS coverage. However, I acknowledge that the quality (respectively the fully exogenous nature) of my selected exclusion restrictions is potentially weak. Partially (or even fully) endogenous exclusion restrictions are an issue that plagues virtually all empirical accounting studies employing selection models. In a recent survey of prior empirical accounting studies using selection models, Lennox et al. (2012, p. 590) note that "[a] surprising number of studies (14 of 75) fail to have any exclusions, and other studies (7 out of 75) do not report the first stage model, making it impossible to determine if they imposed exclusion restrictions. Moreover, very few studies provide any theoretical or economic justification for their chosen restrictions."

Panel B. Analyst Following, Free Float, and Governance Quality

	Sample: 2004 to 2006 (with an exogenous shock)					
	Analyst Following		**Free Float**		**ASSET4 GOV**	
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
ISS_COV	**.6915****	**.7063****	**4.4390***	**4.4927***	**4.6403***	**1.6259**
	(2.42)	**(2.51)**	**(1.88)**	**(1.90)**	**(1.69)**	**(0.56)**
MILLS		.0552		1.6107		-5.035
		(0.18)		(0.87)		(-1.62)
FIRM CONTROL VARs	Yes	Yes	Yes	Yes	Yes	Yes
YEAR fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
IND fixed effect	No	No	No	No	No	No
FIRM fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Sample Size	1397	1395	1397	1395	378	378
Adj. R^2	.9002	.9002	.5972	.5967	.6784	.6811

Panel C. Accrual-based and real earnings management

	Sample: 2004 to 2006 (with an exogenous shock)			
	Accrual-based EM		**Real EM**	
	Model 7	*Model 8*	*Model 9*	*Model 10*
ISS COVERAGE	**-.0205****	**-.0197****	**-.0137**	**-.0170**
	(-2.14)	**(-2.13)**	**(-0.34)**	**(-0.42)**
MILLS		-.0205**		-.0239
		(-2.58)		(-0.62)
FIRM CONTROL VARs	Yes	Yes	Yes	Yes
YEAR fixed effect	Yes	Yes	Yes	Yes
IND fixed effect	No	No	No	No
FIRM fixed effect	Yes	Yes	Yes	Yes
Sample Size	1397	1395	1103	1101
Adj. R^2	.4069	.4071	.8152	.8153

The underlying basic regression model is:

$$\text{VI}_{it} = \alpha + \gamma_1 \text{ISS COVERAGE}_{it} + \gamma_2 \text{MILLS}_{it} + \sum \gamma_2 \text{FIRM\_CONTROL}_{it} + \sum \gamma_3 \text{YEAR}_{it} + \sum \gamma_4 \text{INDUSTRY}_{it} + \varepsilon$$

ISS_COV is a dummy variable indicating whether or not a firm is covered by ISS (CGQ rating). MILLS is the inverse mills ratio from a first stage Heckman regression with the following two exclusion restrictions: dividend yield and FTSE ALL Share Index Membership. Firm control for analyst following (AF) regression : blue chip index membership (FTSE100), alternative governance information (asset4 coverage), capital intensity (PPE to total assets), volatility of business (StD of cash from operations), stock price volatility (StD of monthly stock returns), brokerage commission (inverse stock price), accounting performance (ROA), growth (book-to-market ratio), institutional investors (pension funds holdings), ownership concentration (closely held shares), size (log of total assets), and leverage (total debt to total assets). Firm control for free float (FF) regression: blue chip index membership (FTSE100), alternative governance information (asset4 coverage), stock price volatility (StD of monthly stock returns), accounting performance (ROA), size (log of total assets), leverage (total debt to total assets), analyst following, and dividends per share. Firm control for governance (GOV) regression : size (log of total assets), growth (on-year change in net sales), accounting performance (ROA), blue chip index membership (FTSE100), firm valuation (Tobin's Q), analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), and leverage (total debt to total assets). Firm control for absolute Discretionary Accruals (ADAC) regression: size (log of total assets), blue chip index membership (FTSE100), analyst following,

institutional investments (pension funds holdings), ownership concentration (closely held shares), loss reporting, cash from operations, and leverage (total debt to total assets). For detailed information and definitions of the variables, see Appendix 1. The regression models contain year- and firm-fixed effects, and have standard errors which are heteroskedasticity robust and one-way clustered at firm level. Reported values: coefficient (t-value) *** (**) (*) indicates significance levels at 1% (5%) (10%), two-tailed.

Appendix 5: Detailed DiD Regression Analyses (w.r.t. Table 5)

Panel A. Prediction 1: Governance Analysts and Financial Analysts

	Pred. Sign	Dependent variable: *Analyst Following*							
		Treatment Group & Control Group 1				**Treatment Group & Control Group 2**			
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*	*Model 8*
Intercept		2.532***	2.629***	-8.829***	-9.358	11.742***	7.607***	-33.023***	-11.775
		(13.97)	(31.45)	(-6.65)	(-1.20)	(13.34)	(109.89)	(-7.26)	(-0.76)
POST		-0.707***	0.363**	(omitted)	(omitted)				
		(-3.82)	(2.51)						
ANTE						0.008	-0.110	(omitted)	(omitted)
						(0.02)	(-0.24)		
TREATED		1.536***	(omitted)	-0.701**	(omitted)	-6.270***	(omitted)	-0.540	(omitted)
		(4.82)		(-2.40)		(-6.68)		(-0.90)	
POST_TREATED	+	**2.111*** **	**0.872*** **	**1.151*** **	**0.881*** **				
		(7.47)	**(3.17)**	**(5.10)**	**(3.23)**				
ANTE_TREATED	-					**-1.412*** **	**-1.125** **	**-0.962** **	**-0.979***
						(-2.99)	**(-2.20)**	**(-2.04)**	**(-1.73)**
FTSE100				3.148**	(omitted)			1.448*	(omitted)
				(2.61)				(1.73)	
ASSET4_COV				2.282***	(omitted)			0.739	-0.290
				(5.27)				(1.35)	(-0.27)
PPE_TA				0.216	-1.395			0.208	-2.608
				(0.44)	(-0.52)			(0.20)	(-0.76)
BTM				-0.148	-0.047			0.125	-0.243
				(-0.82)	(-0.35)			(0.32)	(-0.63)
PF				-0.007	0.001			0.022	-0.002
				(-0.43)	(0.06)			(1.30)	(-0.13)
SD_STOCK				0.388	1.162			3.063	2.213
				(0.34)	(0.82)			(1.01)	(0.66)
BC				0.000	0.000			-0.001*	-0.001
				(-0.53)	(-0.16)			(-1.91)	(-0.80)
OWNER				-0.009*	-0.007			-0.029***	0.006
				(-1.90)	(-1.03)			(-2.97)	(0.48)
SIZE				0.964***	1.100			2.779***	1.451
				(8.99)	(1.59)			(8.96)	(1.27)
LEV				-0.344	0.158			-0.357	0.067
				(-0.66)	(0.21)			(-0.22)	(0.04)
SD_CFO				0.260	(omitted)			16.922***	(omitted)
				(1.19)				(3.42)	
ROA				-0.155	0.288			3.529*	-0.843
				(-0.48)	(0.46)			(1.86)	(-0.54)
YEAR fixed effect		No	No	Yes	Yes	No	No	Yes	Yes
IND fixed effect		No	No	Yes	No	No	No	Yes	No
FIRM fixed effect		No	Yes	No	Yes	No	Yes	No	Yes
Sample Size		1067	1067	1067	1067	558	558	558	558
Adj. R^2		0.223	0.832	0.550	0.840	0.280	0.889	0.699	0.901

Panel B. Prediction 2: Governance Analysts and Investors

	Pred. Sign	Dependent variable: *Free Float*							
		Treatment Group & Control Group 1				**Treatment Group & Control Group 2**			
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*	*Model 8*
Intercept		54.97***	55.94***	44.07***	1.829	61.66***	59.66***	60.18***	68.229
		(45.61)	(55.11)	(5.02)	(0.03)	(42.19)	(119.72)	(4.48)	(0.63)
POST		0.513	-2.218	(omitted)	(omitted)			(omitted)	(omitted)
		(0.37)	(-1.12)						
ANTE						-0.898	-0.602		
						(-0.48)	(-0.26)		
TREATED		-0.877	(omitted)	-3.354	(omitted)	-2.882	(omitted)	0.496	(omitted)
		(-0.44)		(-1.45)		(-1.51)		(0.22)	
POST_TREATED	+	**4.176** **	**6.555** **	**4.775** **	**5.297***				
		(1.98)	**(2.18)**	**(2.22)**	**(1.72)**				
ANTE_TREATED	-					**-3.791**	**-3.735**	**-3.778**	**-3.245**
						(-1.54)	**(-1.23)**	**(-1.48)**	**(-1.01)**
AF				-0.195	-0.482			0.356*	0.311
				(-0.69)	(-0.67)			(1.70)	(0.81)
FTSE100				-0.923	(omitted)			-1.867	(omitted)
				(-0.21)				(-0.77)	
ASSET4_COV				3.103	(omitted)			0.971	-1.127
				(1.30)				(0.46)	(-0.19)
SIZE				1.299*	4.742			0.297	-2.074
				(1.88)	(0.90)			(0.31)	(-0.25)
LEV				-1.837	1.940			-5.541	-3.027
				(-0.45)	(0.29)			(-1.34)	(-0.46)
ROA				-6.948**	-4.006			-9.154	-3.896
				(-2.58)	(-0.45)			(-1.42)	(-0.34)
SD_STOCK				6.007	3.619			-21.536	6.837
				(0.66)	(0.21)			(-1.63)	(0.30)
DPS				0.550***	0.289			0.450***	-0.756
				(5.50)	(0.17)			(4.54)	(-0.53)
YEAR fixed effect		No	No	Yes	Yes	No	No	Yes	Yes
IND fixed effect		No	No	Yes	No	No	No	Yes	No
FIRM fixed effect		No	Yes	No	Yes	No	Yes	No	Yes
Sample Size		1067	1067	1067	1067	558	558	558	558
Adj. R^2		0.003	0.219	0.247	0.579	0.010	-0.038	0.496	0.668

Appendix 5: Detailed DiD Regression Analyses (w.r.t. Table 5)

Panel C. Prediction 3: Governance Analysts and Corporate Governance

	Pred. Sign	Dependent variable: *Corporate Governance Quality (ASSET4)*							
		Treatment Group & Control Group 1				**Treatment Group & Control Group 2**			
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*	*Model 8*
Intercept						70.31***	63.99***	-13.500	-157.905
						(36.47)	(136.11)	(-0.46)	(-1.41)
POST									
ANTE						4.814**	4.118	(omitted)	(omitted)
						(2.17)	(1.61)		
TREATED						-11.442***	(omitted)	-2.779	(omitted)
						(-3.89)		(-0.81)	
POST_TREATED	+								
ANTE_TREATED	-					**-9.480*** **	**-7.506** **	**-9.038*** **	**-5.950* **
						(-3.39)	**(-2.34)**	**(-3.17)**	**(-1.82)**
AF								-0.477	0.746
								(-1.46)	(1.48)
FTSE100								0.475	(omitted)
								(0.11)	
PF								-0.284***	-0.033
								(-2.79)	(-0.35)
Q								-0.015	-3.407
								(0.00)	(-0.42)
OWNER								-0.125	-0.021
								(-1.46)	(-0.20)
SIZE								6.554***	15.859**
								(3.22)	(1.97)
ROA								12.983	14.110
								(1.26)	(1.39)
LEV								-12.585**	-12.849
								(-1.96)	(-1.52)
GROWTH								-3.237	-5.551
								(-0.83)	(-1.33)
YEAR fixed effect						No	No	Yes	Yes
IND fixed effect						No	No	Yes	No
FIRM fixed effect						No	Yes	No	Yes
Sample Size						305	305	305	305
Adj. R^2						0.150	0.667	0.279	0.694

Panel D. Prediction 4: Governance Analysts and Earnings Management

	Pred. Sign	Dependent variable: *Absolute Discretionary Accruals*							
		Treatment Group & Control Group 1				**Treatment Group & Control Group 2**			
		Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*	*Model 8*
Intercept		0.06***	0.07***	0.17***	0.53*	0.05***	0.05***	0.19***	-0.060
		(13.33)	(15.12)	(4.62)	(1.69)	(12.18)	(26.74)	(4.62)	(-0.16)
POST		0.028***	0.020**	(omitted)	(omitted)			(omitted)	(omitted)
		(4.36)	(2.02)						
ANTE						0.015*	0.017*		
						(1.90)	(1.78)		
TREATED		0.003	(omitted)	0.023***	(omitted)	0.004	(omitted)	-0.012	(omitted)
		(0.47)		(2.84)		(0.70)		(-1.56)	
POST_TREATED	+	**-0.043*** **	**-0.034** **	**-0.036*** **	**-0.034** **				
		(-4.68)	**(-2.53)**	**(-3.83)**	**(-2.61)**				
ANTE_TREATED	-					**-0.001**	**-0.003**	**0.001**	**0.002**
						(-0.05)	**(-0.26)**	**(0.09)**	**(0.15)**
AF				0.001	-0.001			0.000	0.000
				(0.90)	(-0.46)			(-0.24)	(0.08)
LOSS				0.016**	0.017			0.022**	0.020
				(2.07)	(1.26)			(2.49)	(1.33)
FTSE100				-0.010	(omitted)			0.005	(omitted)
				(-0.68)				(0.56)	
ASSET4_COV				0.000	(omitted)			-0.004	-0.012
				(0.06)				(-0.66)	(-0.60)
PF				0.000	0.000			-0.001***	-0.001**
				(-0.03)	(0.03)			(-2.73)	(-2.27)
OWNER				0.000	0.000			0.000	0.000
				(0.34)	(0.28)			(0.70)	(-0.69)
SIZE				-0.009***	-0.043			-0.008**	0.009
				(-2.90)	(-1.52)			(-2.48)	(0.34)
LEV				0.052**	0.058			0.014	0.004
				(2.13)	(0.82)			(0.66)	(0.07)
CFO				-0.069**	-0.027			0.025	-0.009
				(-2.41)	(-0.36)			(0.69)	(-0.08)
YEAR fixed effect		No	No	Yes	Yes	No	No	Yes	Yes
IND fixed effect		No	No	Yes	No	No	No	Yes	No
FIRM fixed effect		No	Yes	No	Yes	No	Yes	No	Yes
Sample Size		1067	1067	1067	1067	558	558	558	558
Adj. R^2		0.035	0.393	0.118	0.408	0.010	0.185	0.072	0.180

The underlying basic regression model is:

$$VI_{it} = \alpha + \gamma_1 TREATED_{it} + \gamma_2 POST \times TREATED_{it}[\gamma_2 ANTE \times TREATED_{it}] + \sum \gamma_2 FIRM\_CONTROL_{it} + \sum \gamma_3 YEAR_{it} + \sum \gamma_4 INDUSTRY_{it} + \varepsilon$$

TREATED is a dummy variable indicating the treatment group. Depending on the underlying control group, the coefficient estimates on the variables POST×TREATED and ANTE×TREATED capture the difference-in-difference effect (for definitions of treatment and control group, see Table 2). Firm control for analyst following (AF) regression (Panel A): blue chip index membership (FTSE100), alternative governance information (asset4 coverage), capital intensity (PPE to total assets), volatility of business (StD of cash from operations), stock price volatility (StD of monthly stock returns), brokerage commission (inverse stock price), accounting performance (ROA), growth (book-to-market ratio), institutional investors (pension funds holdings), ownership concentration (closely held shares), size (log of total assets), and leverage (total debt to total assets). Firm control for free float (FF) regression (Panel B): blue chip index membership (FTSE100), alternative governance information (asset4 coverage), stock price volatility (StD of monthly stock returns), accounting performance (ROA), size (log of total assets), leverage (total debt to total assets), analyst following, and dividends per share. Firm control for governance (GOV) regression (Panel C): size (log of total assets), growth (on-year change in net sales), accounting performance (ROA), blue chip index membership (FTSE100), firm valuation (Tobin's Q), analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), and leverage (total debt to total assets). Firm control for absolute Discretionary Accruals (ADAC) regression (Panel D): size (log of total assets), blue chip index membership (FTSE100), analyst following, institutional investments (pension funds holdings), ownership concentration (closely held shares), loss reporting, cash from operations, and leverage (total debt to total assets). For detailed information and definitions of the variables, see Appendix 1. In each Panel, Model 5 and 6 simulate the exogenous shock design based on a sample without the treatment group but including both control groups. In these models, SPILLOVER is identical to POST×TREATED in terms of construction (with Control Group 2 as simulated Treatment Group and Control Group 1 as the simulated Control Group). Thus, the coefficient estimate on SPILLOVER captures any spillover effects on the second original control group (constantly covered firms) due to the exogenous shock in the original treatment group. The regression models contain industry- and year-fixed effects, and have standard errors which are heteroskedasticity robust and one-way clustered at firm level. Alternatively to industry-fixed effects and the inclusion of TREATED, I additionally estimate the regression with firm-fixed (as indicate in Table 5). Reported values: coefficient (t-value) *** (**) (*) indicates significance levels at 1% (5%) (10%), two-tailed.