Essays on Textual Information in Corporate Disclosure

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Abstract

Textual information in various corporate disclosures, despite its unstructured feature, provides useful information beyond numeric information contained in financial statements such as earnings and cash flows. Using textual analysis methods, I examine how firms convey their textual information to users and how their communication impacts capital market and business decisions. This dissertation consists of two self-contained studies. Chapter 2 examines the real effects of a UK disclosure mandate that, with the aim of enhancing performance reporting, requires a subset of London Stock Exchange firms to describe their strategic aspects of value creation, such as business models and strategies, in their annual reports. Using an instrumented difference-in-differences design, I find that compliance with this initiative, evidenced by more disclosures of performance measures and commentaries relating to business operations and strategies, promotes intangible investments. My analysis of external and internal control systems suggests that enhanced performance reporting promotes investments because it attracts long-term investors and reduces CEO pay sensitivity to earnings performance. Chapter 3 examines management discussion of accruals and cash flows in earnings call. Using earnings call transcripts of S&P 500 firms, I extract cash flows and earnings measures within management presentation and calculate the weighted average of accruals attention. I find that relative emphasis on accruals varies with the ability of accruals addressing the mismatching problem of cash flows and the limitation of accruals. However, I also find that relative emphasis on accruals also reflects managerial incentives to downplay unfavorable information and that such abnormal emphasis on accruals predicts one year ahead poor

performance. The return analysis shows that the negative signal of abnormal emphasis on accruals is not incorporated into stock prices immediately. The evidence suggests that abnormal emphasis on accruals may obscure true picture of periodic performance and influence investors' decision-making. Combined together, the two studies contribute to the accounting literature by deepening our understanding of business communication reflected in financial texts and the incentives and behaviours of managers and investors.

Acknowledgements

Declaration of Authorship

I hereby declare that, except where specific reference is made to the work of others, the content of this thesis titled "Essays on Textual Information in Corporate Disclosure" is original and has not been submitted in whole or in part for the award of any other degree.

I further declare that Chapter 2 is my solo-authored work and Chapter 3 is co-authored with Professor Steven Young. I finally declare that Chapter 2 is currently Revise and Resubmit at the Accounting Review.

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Chapter 1: Introduction

Accounting researchers have extensively examined the role of corporate disclosure in the capital market such as mitigating information asymmetry and agency problems, and facilitating efficient allocation of resources (Jensen and Meckling 1976; Healy and Palepu 2001). Early research focuses on the relevance of financial information in corporate disclosures (Beaver 1968; Ou and Penman 1989; DeAngelo 1986; Ohlson 1995) due to the challenge of objectively quantifying qualitative information (Li 2010; Feldman et al. 2010). However, researchers point out that financial data alone conveys insufficient information (Amir and Lev 1996; Tasker 1998; Shirata et al., 2011; Lev and Gu 2016). Consistent with this argument, research concludes that both quantitative and qualitative data are value relevant (Tennyson et al. 1990; Lev and Thiagarajan 1993; Amir and Lev 1996; Bryan 1997; Back, Toivonen, Vanharanta, and Visa 2001; Cole and Jones 2004; Sun 2010; Brown and Tucker 2011).

Using manual coding of information content, an established stream of research focuses on textual data in corporate disclosure and shows that text provides useful information beyond financial data. For instance, discussions of inventory, operations, and capital allocation are associated with future performances and investments (Bryan 1997; Cole and Jones 2004; Sun 2010), and analysts use non-financial information in the MD&A section of annual report (Previts, Bricker, Robinson, and Young 1994). Tennyson et al. (2000) also find that president's letter section of annual reports provides incrementally useful information in predicting bankruptcy.

Accounting researchers are increasingly using natural language processing and machine learning methods (Li 2010; El-Haj et al. 2019) to study the properties and effects of textual information in corporate disclosures. Leveraging these techniques to measure textual information and latent linguistic features in disclosure, research confirms the incremental usefulness of textual information in various contexts. For instance, Brown and Tucker (2011) find that firms with larger economic changes modify their MD&A to a greater extent, providing useful information on their future operations. Additionally, Frankel et al. (2016) demonstrate that keywords in MD&A improves the prediction of accruals. Studies also show that causal language in corporate disclosure helps investors understand the relation between financial results and causes, thereby improving analysts' information processing and forecast accuracy (Zhang et al. 2019). Lang and Stice-Lawrence (2015) and Hope et al. (2016) document that more specific disclosure, as evidenced by less boilerplate statements and more named entities, reduces information asymmetry, and enhances analysts' ability to assess fundamental risks.

A significant body of research examines the polarity of textual information. Studies show that tone in various sources of management commentaries, such as annual report, earnings release, and earnings conference call, reflects an optimistic or pessimistic view on current and future performance and therefore explains current and future firm performance and returns even after controlling for financial information (Tetlock et al. 2008; Price et al. 2012; Davis et al. 2012; Feldman et al. 2010; Merkley 2014). The incremental information in disclosure tone helps to reduce information asymmetry and explains market anomalies (Kothari et al. 2009; Li 2010).

Other studies employ textual analysis to detect and predict managerial opportunism, fraud, and business failure. For instance, managers strategically manipulate the tone of their commentaries to manage investor perceptions by using optimistic language and avoiding negative keywords when describing firm performance (Cho et al. 2010; Davis and Tama-Sweet 2012; Schleicher and Walker 2010; Huang et al. 2014; Chou et al. 2018). Managers often blame external factors for poor results while praising themselves for good performance (Clatworthy and Jones 2003; Aerts 2005; Keusch et al. 2012). Another stream of research finds that managers attempt to hide unfavorable information by providing less readable and more complex disclosure (Li 2008; Bonsall et al. 2011; Lehavy et al. 2011; Hsieh et al. 2015; Asay et al. 2018; Bushee et al. 2018), and by adhering to prepared scripts during conference calls (Lee 2016). Research also finds that textual information in corporate disclosure is useful in predicting fraud and misreporting (Goel et al. 2010; Larcker and Zakolyukina 2012; Purda and Skillicorn 2015), and bankruptcy (Smith and Taffler 2000; Shirata et al 2011; Nguyen and Huynh 2022).

This dissertation consists of two studies that seek to contribute to our understanding of causes and effects of corporate narrative disclosure in the context of performance reporting and value creation. Despite extensive research on the relevance of textual information content in corporate disclosure, the extant literature lacks evidence on how management discuss financial and non-financial value creation. My thesis fills this gap by examining (1) what and how much managers talk about their non-financial value creation relative to financial results and (2) how managers emphasize their earnings performance relative to cash flows.

Chapter 2 examines the effects of textual information on business operations and strategies. Criticizing traditional performance reporting for placing excessive focus on backward-looking information and encouraging myopia among managers and investors (Stein 1989; Krehmeyer et al. 2006; Fuller and Jensen 2010; Kay 2012; Lev and Gu 2016; Gigler, et al. 2014), reporting practitioners and regulators are increasingly asking firms to describe their business operations and strategies including innovation activities, supply chain relationships, human resources, production processes, and marketing. Regulators believe that these descriptions help investors better understand and monitor firm activities and encourages managers to look beyond earnings and make decisions for the long-term (Lev 2001; Athanasakou et al. 2021; Krehmeyer et al. 2006; FRC 2010; European Commission 2017; IIRC 2013; SEC 2016). I exploit a UK disclosure mandate that requires London Stock Exchange Main Market firms to describe their business operations and strategies for value creation in their annual reports. To measure the amount of information on operations and strategies in disclosure, I construct two empirical measures. I manually collect all performance measures appearing in each annual report and calculate the proportion of performance measures relating to operations and strategies. I also use Latent Dirichlet Allocation (LDA) (Blei et al. 2003) to generate topic profile of annual reports and estimate the proportion of topics related to operations and strategies. Using two approaches, I find that the reporting mandate encourages Main Market firms to disclose more performance metrics and commentaries relating to business operations and strategies relative to a control group of non-treated firms, and that increasing such commentary promotes intangible investments. I explore internal and external channels to understand this effect. My analysis of external control systems suggests that enhanced performance

reporting promotes investment spending because it attracts long-term investors who place less pressure on management to boost short-term earnings performance (Bushee 1998) and therefore lowers managers' incentives to behave myopically by forgoing long-term investments. My analysis of internal control system design shows that firms, in the expectation of increased investors' monitoring after the reporting mandate, align executive compensation more closely with long-term value creation by reducing the relative reliance on short-term earnings in determining CEO pay to promote corporate investments. Collectively, my results reveal that exogenous pressure to describe value creation leads to more informative reporting that in turn promotes greater focus on the long-term through changes in ownership structure and adjustment of executive compensation arrangements.

In Chapter 3, I examine managers' relative emphasis on cash flows and accruals-based (earnings) performance measures in their presentations during earnings conference call, and the consequences of this relative emphasis for capital market outcomes. Theory and evidence highlight the importance of accruals and cash flows, and their differential roles in performance measurement and valuation (Dechow 1994; Dechow et al. 1998; Bushman et al 2016; Nallareddy et al. 2020; Bushman et al. 2016; Beaver 1966; Gombola et al. 1987). However, extant research in this area focuses exclusively on financial statement numbers, leaving the question of how managers discuss accruals and cash flows, and the impact of such discussions unexplored. To examine how cash flow and accrual-based measures feature in performance commentary, I construct a measure of managers' relative emphasis on accruals (*REA*) in conference call discourse. Using a self-curated dictionary of performance measures, I count the incidence of cash flow and earnings (accrual-based) metrics in conference call and then calculate the proportion of accruals-

based metrics. I use this measure to examine whether management commentary on accruals and cash flows provides useful information on periodic performance or obscures economic reality. I find that *REA* associates positively with operating cycle and the change in non-cash working capital, and associates negatively with intangible intensity and short-term liabilities. These findings support the informative reporting hypothesis. Nevertheless, I also find that *REA* reflects managerial obfuscation incentives in conference call presentations as managers emphasize metrics that indicate favorable performance and deemphasize metrics that reveal less favorable results. With evidence that REA consists of both information and obfuscation component, I estimate and examine the effects of the obfuscation component of REA. I find that the obfuscation component is associated with weaker future earnings and cash flow performance. While the abnormal REA component is therefore a negative signal, I find that capital market participants do not appear to incorporate the obfuscation component of REA in a timely manner, as evidenced by insignificant three-day abnormal returns as well as quarterly returns through Q4. In contrast, I find significant abnormal returns through quarters five to eight. I show that this post earnings announcement drift that associates with the relative emphasis on accruals in management commentary is significant even after controlling for the earnings surprise and other financial factors. Collectively, my research finds that management commentaries on accrual-based and cash flow measures are informative in general. However, managers use their commentaries to steer investor attention away from unfavorable performance outcomes, and this strategy is partially effective.

I organize the remainder of this thesis as follows. Chapter 2 studies the effects of corporate disclosure emphasizing operational and strategic aspects of value creation.

Chapter 3 examines the information and obfuscation role of management commentaries on accruals and cash flow information, and their effects on future performance and market pricing. Chapter 4 presents the conclusion of this dissertation.

Chapter 2: The Impact of Performance Reporting on Investment Behavior: Evidence from Disclosure Reform in the UK

2.1 Introduction

Researchers and practitioners have criticized traditional earnings-focused performance reporting for placing insufficient emphasis on long-term value creation and fueling myopia among managers and investors (Stein 1989; Krehmeyer, Orsagh, and Schacht 2006; Fuller and Jensen 2010; Kay 2012; Lev and Gu 2016; Gigler, Kanodia, Sapra, and Venugopalan 2014). In response, accounting standard setters and practitioner groups are increasingly asking management to supplement current earnings results with information on business activities and strategies, such as innovation activities, supply chain relation, human resource management, operations, and marketing, because such information helps investors to understand the process of value creation and better predict future performance, and because disclosure can encourage managers to look beyond earnings and make decisions for long-term (Lev 2001; Athanasakou, El-Haj, Rayson, Walker, and Young 2019; Krehmeyer et al. 2006; Financial Reporting Council 2010a; European Commission 2017; International Integrated Reporting Council 2013; Securities and Exchange Commission 2016). For instance, the Financial Accounting Standards Board's (2001) guideline recommends that management describe their business environment and the metrics they use to achieve operational and strategic success. Chartered Financial Analyst Institute (CFA) (2006) also emphasizes the need for firms to complement financial measures with information on business models and strategies. The

Securities Exchange Commission (SEC) (2016) questions whether the management discussion and analysis (MD&A) section of Regulation S-K should be amended to require firms to provide detailed information on their business strategies. In Europe, the International Accounting Standards Board (IASB) (2010) has issued a Practice Statement Management Commentary, a non-binding framework that encourages firms to describe long-term managerial objectives and strategies. The International Integrated Reporting Council (IIRC) (2013) has developed an Integrated Reporting Framework that requires firms to explain how their strategies, governance, and other aspects of management generate value over time. The European Commission (2017) also provides guidelines on corporate reporting and recommends that firms disclose key performance indicators for evaluating strategic success.

While regulators and practitioners are increasingly encouraging firms to describe their business operations and strategies, in the belief that such disclosures promote long-term decisions by management (FRC 2010; European Commission 2017; PwC 2006), little is known about the real effects of these disclosures. Instead, previous research focuses mainly on the capital-market effects of such disclosures, such as the market response to the disclosure of business strategies and improved forecast quality (Whittington, Yakis-Douglas, and Ahn 2016; Athanasakou, El-Haj, Rayson, Walker, and Young 2019). Thus, Barth, Cahan, Chen, and Venter (2020) point out the dearth of evidence showing the real effects of reporting mandates requiring firms to describe the long-term aspects of value creation. A notable exception is Barth et al.'s (2017) study, which exploits the Johannesburg Stock Exchange's requirement for integrated reports to produce preliminary evidence of a negative association between integrated reporting quality and investment

inefficiency. However, causality is difficult to establish in their setting, as their observations are limited to the post-mandate period with no counterfactual.

My study addresses this limitation by exploiting a UK regulatory development that mandates commentary on strategy and value creation in the annual reports of a subset of firms listed on the London Stock Exchange (LSE). In response to concerns about excessive emphasis on earnings results and insufficient discussion of the process of long-term value creation, in 2010 the Financial Reporting Council (FRC) revised the UK Corporate Governance Code (FRC 2010a 2010b) and required managers to explain in their annual reports how their business operations and strategies deliver value over the longer term. Examples include descriptions of strategies and objectives in the context of business operations such as main products, services, markets, customers, employees, suppliers, production, distribution, and tangible and intangible resources. This reporting mandate applies to LSE Main Market (MM) firms and took effect for fiscal years beginning on or after June 29, 2010. My tests examine changes in the performance reporting and investment behavior of LSE MM firms in response to this reporting requirement, with LSE Alternative Investment Market (AIM) firms forming a control group.

To examine the effects of the UK Corporate Governance Code (2010), I first define the term "enhanced performance reporting" (EPR). This refers to quantitative and qualitative information describing the *process* of value creation, as opposed to information centering on the *result* of value creation such as earnings and its variants. Examples of EPR include disclosures relating to customers (e.g., customer satisfaction, customer base), human resources (e.g., employee training, employee retention), production (e.g., product quality, volume), innovation (e.g., R&D, exploration), product markets (e.g., market share,

competition), strategic partnerships (e.g., joint ventures, affiliate agreements), and other information describing the value-creation process.

I construct two empirical measures of EPR in annual report performance commentaries. The first captures the incidence of performance metrics evaluating operational and strategic aspects of value creation. I manually collect performance measures presented in key performance-focused sections of the annual report and then calculate the ratio of EPR metrics to total metrics disclosed. EPR metrics include indicators of business activities and strategies for value creation such as customer satisfaction, market share, number of shops, employee retention, product quality, and number of patents, as opposed to traditional short-term results such as operating profit, profit before tax, earnings per share, and operating cash flow. My second proxy captures qualitative aspects of EPR. Having identified latent themes in the UK annual report corpus through topic modeling (Blei, Ng, and Jordan 2003), I use the proportion of topics relating to business operations and strategies as my second proxy for the strength of EPR.

I examine the impact of the UK Corporate Governance Code 2010 on investment decisions using an instrumented difference-in-differences (DiD) method (Hudson, Hull, and Liebersohn 2017), which takes an IV estimation approach to estimate the effects on investments of increasing EPR by one percentage point. I find a 10.1 (4.0) percentage point increase in metric-based (topic-based) EPR among MM firms relative to AIM firms following the introduction of the reporting mandate. The second-stage result indicates that a one percentage point increase in metric-based (topic-based) EPR promotes total investment as a proportion of assets by 0.6 (1.5) percent.

Next, I explore mechanisms through which EPR promotes investment. I propose

two non-mutually exclusive channels: an external investor-related channel and an internal compensation-related channel. The external channel reflects the potential benefits of more long-term dialogue between management and investors. Serafeim (2015) documents that long-term-oriented reporting is positively associated with the proportion of long-term investors, while Bushee (1998) finds that managers exhibit a lower tendency for investment myopia in the presence of long-term institutional investors. Calculating long-term institutional ownership following Bushee and Noe (2000), I find that growth in EPR leads to an increase in the proportion of long-term investors, and that this growth promotes investment spending among MM firms relative to AIM firms. My results support the view that EPR promotes investment spending by attracting investors who prioritize and encourage a longer-term focus.

The internal control channel reflects the enhanced monitoring effects of EPR. As firms expect and experience increased monitoring of long-term value creation by investors following the introduction of the reporting mandate, I predict they align internal control system features such as executive compensation with EPR. For example, an increase in EPR for financial reporting purposes may lead firms to replace some short-run earnings-focused metrics with EPR-related measures in their executive compensation plans. Consistent with this view, I document that a growth in EPR precedes a decrease in the sensitivity of CEO pay to earnings, which in turn promotes investment.

I implement a series of additional tests to evaluate the robustness of my results and conclusions. First, while my results suggest that the regulatory push for EPR encourages managers to make longer-term decisions, the resulting increase in investment may represent overinvestment. I explore this possibility by examining a subsample of firms with

a high probability of overinvestment. I find that the treatment effects are insignificant among this subsample, suggesting that the rise in investment spending in the main analysis is unlikely to represent overinvestment. Second, I address the concern that the financial crisis may have had differential effects on the financial constraints of MM and AIM firms. My results and conclusions are robust to controlling for financial constraints. Third, I test for confounding effects from other provisions of the UK Corporate Governance Code 2010, such as annual re-election of executive directors and triennial evaluation of board effectiveness, which apply to a subset of large MM firms and may affect investment decisions. Excluding these firms does not change my inferences or conclusions concerning the effects of the reporting mandate on investment.

One critical assumption of my identification strategy is parallel trends in investments by the two groups in the pre-treatment period. I examine the validity of this assumption by analyzing counterfactual treatment effects in the pre-treatment period. I also adopt various approaches to address concerns about heterogeneity between MM and AIM firms, including DiD using an alternative control group and a matched-sample DiD. The results and conclusions are robust to these tests.

My study contributes to extant research in several ways. First, my paper answers Leuz and Wysocki's (2016) call for research on the real effects of disclosure mandates, particularly in novel settings outside the U.S. The real effect evidence in my study also contributes to the literature on non-traditional disclosure emphasizing long-term value and strategies to address managerial myopia (Athanasakou et al. 2019; CFA 2006; FRC 2010a; European Commission 2017; IIRC 2013; SEC 2016). While some studies examine the effects of disclosing information on long-term value creation, they focus mainly on capital-

market effects, leaving the real effects of such disclosures largely unexplored (Barth et al. 2020). Real-effects evidence is important, as regulators and reporting practitioners introduce such mandates in the belief that disclosures emphasizing long-term aspects of value creation help firms make long-term decisions (FRC 2010a; European Commission 2017; PwC 2006). To the best of my knowledge, only Barth et al. (2017) provide preliminary evidence of real effects, using the integrated reporting requirement in South Africa. However, causality is difficult to establish in their setting, as their observations are limited to the post-mandate period with no counterfactual. By exploring the UK institutional setting, my paper provides real-effects evidence to the literature on non-traditional disclosure that attempts to encourage managers to look beyond short-term results, such as strategy reporting and integrated reporting.

Second, my study speaks to the issue of the myopic effects of financial reporting. Frequent performance reporting is often considered to cause managerial myopia (Fuller and Jensen 2010; Kraft, Vashishtha, and Venkatachalam 2018). This issue is subject to ongoing debate, with the SEC (2016) seeking public comments on the idea of reducing the burden of quarterly reporting, and recent research providing mixed results on the effects of reporting frequency (Agarwal, Vashishtha, and Venkatachalam 2018; Nallareddy, Pozen, and Rajgopal 2017; Kajüter, Klassmann, and Nienhaus 2019; Fu, Kraft, Tian, Zhang, and Zuo 2020; Arif and De George 2020). While my study does not directly address the issue of reporting frequency, it offers the new perspective that disclosures focusing on process aspects of value creation may curb myopic behaviors and catalyze firm-level discussion of sustainable value creation.

I also provide empirical evidence that mandatory disclosure of long-term value

creation mitigates the market friction documented by Gigler et al. (2014). They identify the adverse selection faced by future shareholders when managerial interests are aligned with those of myopic current shareholders who encourage managers to make myopic decisions to achieve quick returns at the expense of future shareholders' value. Gigler et al. (2014) highlight the difficulty of a market solution, as contracting between current and future shareholders requires the latter to be identifiable. Moreover, short-term-oriented managerial incentives deter voluntary disclosure of long-term value creation. Thus, mandatory disclosure of information on long-term value creation may play a role in addressing this friction. My paper suggests that mandating disclosure of information on long-term value, when followed by enhanced monitoring and management control, helps to promote long-term behavior particularly for firms suffering from the friction documented by Gigler et al. (2014).

Lastly, I extend current understanding of interactions between external and internal reporting. Value-based management theory stresses the importance of aligning external reporting with internal control to deliver value and achieve long-term goals; yet Ittner and Larcker (2001) highlight lack of research on this interaction. My internal channel analysis speaks directly to this issue. My results indicate that as the balance shifts from earnings-centered reporting towards greater emphasis on long-term indicators of value creation, control systems place less weight on earnings performance for CEO compensation, and this rebalancing promotes longer-term investment spending.

2.2 Related Literature

Although periodic performance reporting centers on measures of financial

performance in general, and accounting earnings in particular, theory and evidence highlight the limitations of devoting excessive attention to earnings in performance measurement and business valuation (Tasker 1998; Lev and Zarowin 1999; Graham, Harvey, and Rajgopal 2005; Lev and Gu 2016). Research demonstrates that earnings alone convey insufficient information about value creation in the long term (Amir and Lev 1996; Lev and Gu 2016). Valuation theory highlights the importance of information other than earnings in forecasting future performance and estimating value (Ohlson 1995). Ball and Shivakumar (2008) show that earnings has relatively low surprise content because the construct is primarily backward-looking, while others argue that reported earnings blurs value creation in R&D-intensive firms (Tasker 1998; Lev and Zarowin 1999; Merkley 2014).

Given the limitations of earnings, and backward-looking accounting measures more generally, Kaplan and Norton (1996) argue that management control systems should supplement financial performance measures with leading indicators that evaluate operational and strategic success. For example, information on customers, operations, employees, and innovation provides useful insights into long-term value creation (Behn and Riley 1999; Nagar and Rajan 2001; Merkley 2014). Accordingly, regulators and policymakers encourage firms to discuss their business operations and strategies for delivering value over the long term, in the belief that such disclosures not only provide useful information to investors, but also encourage managers to take a longer-term view (FRC 2010a; European Commission 2017; PwC 2006; Krehmeyer et al. 2006; IIRC 2013). Consistent with this view, the disclosure literature shows that operational and strategic information disclosures are useful for capital markets (Athanasakou et al. 2019;

Gu and Li 2007; Whittington et al. 2016). However, extant research focuses mainly on the effects of capital markets rather than managerial decision making. A notable exception is Barth et al. (2017), who produce preliminary evidence on this issue by exploiting the requirement of the Johannesburg Stock Exchange (JSE) for integrated reports. Using a proprietary measure of JSE firms' integrated reporting quality (IRQ), Barth et al. (2017) report a negative association between IRQ and investment inefficiency. Nevertheless, causality is difficult to establish in their setting, as their observations are limited to the post-mandate period, with no counterfactual.

2.3 Institutional Background

2.3.1 UK Corporate Governance Code

The Financial Reporting Council (FRC) and the House of Commons Treasury Committee (the UK parliament's legislative committee) identified a significant gap in UK performance reporting, in that most firms did not describe how they deliver value over the long term (FRC 2010b, para. 30). Accordingly, in the 2010 revision of the UK Corporate Governance Code, the FRC added a provision requiring firms to describe their strategy for generating long-term value in their annual reports. Specifically, paragraph C.1.2. states that directors should explain the basis on which the company generates or preserves value over the longer term (the business model) and their strategy for delivering the company's objectives.[1] The revision also added the phrase "long-term" to the first principle describing

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[1] Appendix 3.2 details major changes in the Corporate Governance Code (2010). The code requires FTSE 350 firms, a subset of large MM firms, to re-elect directors annually and evaluate board performance triennially. In a robustness test, I exclude FTSE 350 firms from my sample to control for the effects of these additional requirements.

the board's responsibility for "ensuring the (long-term) success of the company" (para. A.1). The FRC suggested that firms should follow a best-practice reporting framework to help investors assess long-term value creation by describing strategies and objectives in the context of business operations, such as main products, services, markets, customers, employees, suppliers, production, distribution, and tangible and intangible resources (Accounting Standards Board 2006). [2]

The new reporting mandate took effect for reporting periods beginning on or after June 29, 2010, and applied to LSE MM firms on a "comply or explain" basis. [3] Although non-compliance is an available option, several factors make this mandate a de facto regulation. First, the UK Disclosure and Transparency Rule requires firms to identify explicitly in their governance statements which provision(s) of the UK Corporate Governance Code they depart from and the reasons for doing so (DTR 7.2.3). [4] Second, under the new reporting mandate, regulatory bodies and reporting practitioners monitor disclosures of business operations and strategies. The Financial Reporting Review Panel, a subsidiary group of the FRC charged with investigating non-compliance with financial reporting requirements and enforcing the regulatory framework, has conducted inquiries into strategy reporting (FRC 2011, 2012). The FRC also established a Financial Reporting Lab in 2011, with the priority of helping firms to provide relevant information on their

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[2] Owing to the early announcement of the reporting mandate and increasing awareness of non-financial reporting in the late 2000s (Stolowy and Paugam 2018), the Corporate Governance Code 2010 may not have been an unpredictable shock. This may have created a bias against significant results, as early adoption of EPR would leave little room for improvements in performance reporting following the introduction of the reporting mandate.

[3] Note that a sharp treatment (i.e., 100 percent compliance) is not a necessary condition for estimation of treatment effects. In order to examine the treatment effects for compliers, I estimate Local Average Treatment Effect (LATE) using an IV estimation method (Imbens and Angrist 1994).

[4] In a manual check of my sample firms' governance statements, I find no case of non-compliance with provision C.1.2. Consistent with this manual check, my empirical test confirms a sharp increase in EPR following the reporting mandate.

business models and strategy (FRC 2011). Finally, financial services firms have reviewed annual reports and evaluated the quality of disclosures relating to strategic goals and long-term success (PwC 2012; Deloitte 2013).

Appendix 2.3 provides an example of a strategy disclosure in the 2011 annual report of Berkeley, a UK housebuilder. The firm has inserted a new section into its annual report and describes a long-term vision and four key objectives, with descriptions of why these are important and how they are achieved. It also provides performance indicators for measuring operational and strategic success. Overall, the narrative adopts a balanced approach to describing value creation, with information on the results of value creation (i.e., earnings) as well as its process, such as securing property and land for business, managing human capital, improving customer satisfaction, and meeting social and environmental standards.

Although Berkeley discusses its strategies and long-term value creation in a standalone section, the Corporate Governance Code (2010) does not specify a format for EPR disclosures. Rather than adding separate sections, firms may describe their strategies within existing sections of their annual reports, such as the chairman's letter, the CEO's review, and the financial review, in order to make strategic information the backbone of the annual report.

2.3.2 Expected Impact of Enhanced Performance Reporting

Although regulators and practitioners believe that explicit discussion of long-term value creation helps managers look beyond earnings and deliver value over the long term, skeptics cite cheap talk (Forsythe et al. 1999) and decoupling (Abraham and Shrives 2014) among reasons why EPR may not affect decision-making behavior. Management may

exploit cheap talk (Forsythe et al. 1999) because information on long-term value creation is inherently vague and difficult to verify. Meanwhile, decoupling theory argues that firms may already make optimal investment decisions but may choose not to disclose details because the costs of disclosing proprietary information are higher than the benefits (Abraham and Shrives 2014).

While cheap talk and decoupling predict limited effects of the reporting mandate, I propose two non-mutually exclusive channels through which EPR may influence investment decisions. The external channel reflects the potential benefits of enhanced interaction between management and investors. Serafeim (2015) reports a positive association between integrated reporting and the proportion of long-term investors. If this effect extends to performance reporting, EPR may also help to attract long-term investors. Since long-term investors place less pressure on management to boost short-term earnings performance (Bushee 1998), attracting long-term investors may lower managers' incentives to forgo long-term investments and promote investment spending. The internal control channel reflects the effects of enhanced monitoring following the EPR mandate. As firms predict and experience increased investor interest in and monitoring of long-term value creation, they seek to align executive compensation with EPR disclosures. [5] Specifically, EPR for external stakeholders promotes adoption of more long-term measures and reduces reliance on short-term earnings in determining CEO pay. Lower pay sensitivity

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[5] While the Corporate Governance Code (2010) has no provision requiring links between strategy and executive compensation, the FRC's consultation on its draft discusses the idea of asking firms to explicitly describe links between remuneration and the company's long-term success (paragraph 38, report on code consultation). Given the FRC's interest in aligning strategy and executive compensation, MM firms may have adopted more EPR items for executive compensation after 2010.

to earnings can promote corporate investments. [6]

2.3.3 Limitations of the UK Corporate Governance Code (2010) as a Research Setting

The UK Corporate Governance Code (2010) has several limitations as a research setting. First, the 2007–2008 financial crisis pre-dated the reporting mandate. The crisis may have influenced how firms discuss their performance, as poorly performing firms may place more emphasis on a positive outlook and forward-looking information to distract attention from their poor results (Schleicher and Walker 2010). If the crisis promoted discussion of strategy and long-term value during the pre-treatment years (2008–2010), there will have been less room for improvements to strategy disclosures, reducing the power of the test. The crisis may also have restricted financing opportunities and triggered a decline in corporate investments, creating a bias that blurs the investment-promoting effects of the reporting mandate.[7] However, my research mitigates these concerns in the following ways. First, my sample excludes financial firms, which were severely impacted by the crisis. Second, the DiD research design mitigates the confounding effects of macro factors, such as the financial crisis because the financial crisis affected both MM and AIM firms whereas the Corporate Governance Code (2010) applied to MM firms only.

Nevertheless, systematic differences between MM and AIM may generate time-varying confounding factors, such as time-varying opportunities for financing and investment. The LSE established AIM to help firms needing public capital but not meeting

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[6] The two channels may impact on each other. However, I do not test for dynamic interactions between them, as disentangling their effects is beyond my analytical focus on explaining how EPR catalyzes sustainable investments.

[7] The IMF (2018) documents the long-lasting negative effects of the 2008 financial crisis on investment.

the MM requirements to access capital at reduced cost by easing the listing and reporting requirements. For example, AIM does not require a prior trading record or minimum market capitalization for listing. AIM firms are subject to light-touch regulations under the LSE's "AIM rules for companies." They are also exempt from the UK authorities' stringent listing and disclosure rules: instead, nominated advisors registered with the LSE apply relaxed disclosure and governance requirements (Gerakos, Lang, and Maffett 2013).[8] As the heterogeneity in the two groups may confound my results and inferences, it is essential to examine parallel trends and control for different characteristics of the two groups. Section 2.5 addresses these concerns through tests of counterfactual treatment effects, a more stringent set of fixed effects, a matched sample DiD, and an alternative control group within the MM.

2.4 Research Design and Results

2.4.1 Measurement of Enhanced Performance Reporting

The primary variable of interest in my empirical tests is the extent of EPR. I use two approaches to measure EPR: performance metric-based EPR (*MEPR*) and topic-based EPR (*TEPR*). These capture the proportion of quantitative and qualitative information, respectively, relating to EPR in annual reports. I construct these two measures because firms use both quantitative metrics and qualitative commentaries to provide information on their process of value creation.

To capture quantitative aspects of EPR, I manually collect all performance

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[8] See Gerakos et al. (2013, Appendix A) for details of the regulatory structure of the AIM.

measures appearing in the highlights and chair's letter sections of annual reports, which contain the most prominent discussions of periodic performance. [9] I then split the collected measures into EPR and Other categories, and calculate the proportion of EPR measures reflecting operational and strategic aspects of value creation (i.e., the process of value creation). [10]

For the classification of performance measures, I adjust the standard dichotomy between financial and non-financial measures. Although non-financial measures, such as customer satisfaction scores, product quality, and new patents align naturally with the idea of EPR, some financial measures also align with EPR. For example, R&D expenditure, employee training costs, sales from new brands, and sales per employee also describe what firms do to generate value (i.e., the process of value creation). Therefore, I first split the measures into financial and non-financial categories, and then, alongside non-financial measures, reclassify the following financial measures into EPR: financial ratios (e.g., sales per employee, manufacturing costs per ounce), investment and expenditure on future value creation (e.g., R&D, marketing costs, employee training costs) and granular financial

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[9] I do not use a top-down approach, such as curating a list of performance measures and then searching for these in text. Rather, because EPR measures tend to be firm-specific, I use the bottom-up approach of reading each annual report and collecting every performance measure. I find more than 1,000 unique performance measures in my sample.

[10] UK annual reports broadly consist of a narrative element at the front, followed by financial statements and other statutory information. The narrative element is not standardized, but typically relates to topics such as highlights, chairman's letter, financial review, risk management, and corporate social responsibility. I focus on the highlights and chairman's letter sections to develop metric-based EPR because these provide the highest-profile discussions of periodic performance, and therefore reflect managerial perspectives and horizons on value creation. Firms may provide performance measures in other parts of their annual reports, such as the financial review section. However, a financial review, by its nature, devotes attention to earnings information, regardless of whether management focuses excessively on earnings performance. Therefore, measures appearing in the highlights and chairman's letters serve as an intuitive proxy for the overall focus of firms' performance commentaries.

measures (e.g., key product sales, top 10 clients' contract value).[11] Using this classification, I get metric-based EPR (*MEPR*), which is calculated as the ratio of the number of EPR measures to the number of all measures. Appendix 2.4 illustrates the framework for categorizing performance metrics with an example of data collection from an annual report.

To measure the relative weight attached to EPR information in performance narratives, I use Latent Dirichlet Allocation (LDA), which is a computational linguistic method to identify lists of words that frequently co-occur in a large corpus (Blei et al. 2003). As co-occurring words contain semantically coherent words, I assign a label (topic name) to each word group. I then split identified topics into two broad categories: EPR and Other. The EPR category contains topics covering business operations and strategic aspects (e.g., customers, production, marketing, business model, strategy). The Other category includes topics centering on earnings performance and financial statement items (e.g., balance sheet items, earnings performance) and topics not closely related to value creation (e.g., directors' biographies, annual general meeting). Appendix 2.5 provides a list of identified topics and frequent words in each topic. For each annual report, I calculate topic-based EPR (*TEPR*), defined as the proportion of EPR-related topics as my second proxy of EPR.[12]

For the textual analysis, I create a corpus by aggregating the front part of annual reports (text prior to financial statements) of all firms listed on the LSE in the sample period

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[11] Note that the criterion for EPR classification is not whether the measure is related to current earnings. I attempt to consider whether the measure describes specific business activities and strategies for value creation (i.e., process of value creation), because information on process, relative to information on results, helps investors to understand what firms do to generate value and monitor firm behaviors. While key product sales, inventory turnover, and training costs are related to current earnings, they describe business activities and management's approach to value creation. As this classification rule may appear arbitrary, in Section 2.6, I discuss a few alternative classifications based on independent readers' reviews, and conduct robustness tests.

[12] An alternative approach to measuring EPR in performance commentaries is a dictionary-based keyword search. However, developing a comprehensive dictionary (or taxonomy) of business models and strategy is far from easy, and risks overlooking important keywords.

2008–2013, to ensure sufficient data for machine learning. The corpus includes 9,333 annual reports from 1,848 unique firms. I take steps to pre-process texts following the linguistics literature, such as removing stop words, punctuation, numbers, non-alphabet characters, and sparse words. To conduct topic model analysis, it is necessary to choose the number of topics for the model to generate. I use 20 topics, based on the results of a word intrusion task (Chang, Gerrish, Wang, Boyd-Graber, and Blei 2009) and coherence scores (Röder, Both, and Hinneburg 2015). Appendix 2.6 provides details of the text pre-processing and LDA parameters.

2.4.2 Sample and Data

As shown in Panel A of Table 2.1, the sample period is 2008–2013 for comparison of disclosures and investments before and after the revision of the Corporate Governance Code.[13] I exclude firms in the financial and utility sectors because of their idiosyncratic reporting environments. I also exclude firms with missing data in the sample period to generate a balanced panel to support symmetric DiD. The symmetric approach mitigates biases generated when the treatment is not randomly assigned (Chabé-Ferret 2015). It also corrects biases arising from non-random sample attrition.[14] I randomly select 100 LSE MM firms from the available sample, with the balance drawn from AIM-listed firms.

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[13] I convert the calendar year-end to the fiscal year-end and incorporate fixed effects based on the fiscal year. If the calendar year-end is before June 30th, I subtract one to align it with the fiscal year-end. This conversion proves to be beneficial. While the reporting mandate was applied to some firms based on their calendar year 2011, and others from calendar year 2012, it applies to all firms starting from their fiscal year-end of 2011. For instance, a firm-year starting on June 1st, 2010, and ending on May 31st, 2011 predates the reporting mandate. In this case, the firm's fiscal year-end would be 2010. However, this firm is subject to the reporting mandate in the accounting period commencing from June 1st, 2011, and ending on May 31st, 2012, with a fiscal year-end of 2011.

[14] For example, if poorly performing firms cut investment spending and are delisted, the mean of investment spending in the post-treatment period increases without any treatment. Similarly, the incidence of IPOs during the sample period creates bias in investment spending in the post-treatment period.

Financial variables are collected from Thomson Reuters Datastream. I construct EPR metrics using annual reports sourced from Perfect Information, converted to text using El-Haj, Alves, Rayson, Walker, and Young's (2020) method. I analyze the external channel of long-term investors using Bushee and Noe's (2000) classification of institutions' investment styles.[15] Institutional investors' quarterly investment portfolio data are obtained from Thomson Reuters Eikon. For the internal channel test, I obtain CEO compensation data from BoardEx. Panel B and C of Table 2.1 provide descriptive statistics for the dependent, test, and control variables for All firms, MM firm and AIM firms (see Appendix 2.1 for definitions). The table shows that MM and AIM firms differ particularly in *SIZE* and *AGE*. This systematic difference raises a concern about the previously mentioned critical assumption of parallel trends. Section V addresses this concern.

[Insert Table 2.1 about here]

2.4.3 Validation of EPR measurement

To validate the measures of EPR (*MEPR* and *TEPR*), I examine whether the determinants of EPR and the association between EPR and one-year ahead earnings (*EBIT$_{t+1}$*) make economic sense. Panel A of Table 2.2 shows that younger firms and loss-making firms are more likely to discuss EPR because they are yet to make profits or seek to distract attention from poor performance. EPR is lower among highly leveraged firms, as they must focus on their ability to make payments in the near term. In column 2, a positive association between *Q* and *TEPR* implies that firms with more investment

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[15] Based on Bushee and Noe's (2000) eight measures of institutions' investment behavior, I generate two factors: portfolio turnover and block holding. I use these in conducting three-mean cluster analysis to split investor-years into three categories: dedicated investors, quasi-indexers, and transient investors. I calculate ownership by dedicated investors and quasi-indexers, as these are long-term investors, evidenced by low portfolio turnover.

opportunities emphasize long-term aspects using qualitative EPR information. The positive (negative) coefficient of *SIZE* for *MEPR (TEPR)* implies that large firms use performance metrics to evaluate their long-term success, while small firms are more likely to use qualitative descriptions of the long term. I also test the association between EPR and near-term earnings performance. Panel B shows that EPR has a weakly negative association with one-year ahead *EBIT*, consistent with the notion that EPR indicates long-term value creation and may reduce short-term performance due to investments for the future.

[Insert Table 2.2 about here]

2.4.4 Standard Difference-in-Differences

I use a standard DiD design to obtain preliminary evidence. My research exploits the institutional setting of the Corporate Governance Code (2010), which applies to MM firms but not to their AIM counterparts.

$$INV_{it} = \alpha_1\, POSTMAIN_{it-1} + \omega' X_{it-1} + FIRM\_FE + YEAR\_FE + c + \varepsilon_{it} \qquad (2.1)$$

I use tangible investments (*TGBLINV*), intangible investments (*INTGBLINV*), and the sum of the two (*TOTALINV*) to measure investment activities. *TGBLINV* includes investments in property, plant, and equipment, and *INTGBLINV* is the sum of R&D expenditure and changes in net intangible assets, which include capitalized R&D, patents and brands, licenses, computer software, and other intangible assets. Following Edmans, Fang, and Lewellen (2013), I set missing R&D values to zero. The variable of interest is an indicator of the post-treatment period for MM firms (*POSTMAIN*). Combined with firm fixed effects and year fixed effects, the post-treatment indicator allows standard DiD identification. As firms in my sample do not change industry over time, firm fixed effects also control for industry fixed effects. I also include fiscal-year fixed effects to control for

year-level factors common to all firms. The control variables (*X*) include lagged variables for firm size (*SIZE*), investment opportunity proxied by Tobin's Q (*Q*), cash (*CASH*), leverage (*LEV*), loss (*LOSS*), firm age (*AGE*), profitability (*ROA*), and capital raise (*RAISE*).

Table 2.3 reports the results of the standard DiD estimating equation (2.1) based on OLS regression. To address heteroskedasticity, I use robust standard errors clustered at the firm level. In columns (1) and (3), the coefficient of *POSTMAIN* is positive and significant. This implies a significant increase in intangible investments (*INTGBLINV*) and aggregate investments (*TOTALINV*) among MM firms compared with AIM firms. The estimated treatment effect on intangible investments is 0.056, which is 33 percent of one standard deviation of *INTGBLINV*. On the other hand, the estimated treatment effect of the reporting mandate on tangible investments is not significant. This is unsurprising. Managerial myopia manifests in underinvestment in intangible capital because capital expenditure has less impact than R&D on earnings (Wahal and McConnell 2000; Lundstrum 2002). In addition, cuts in tangible investments are more clearly visible to investors (Stein 1989). Consistent with this view, some research on managers' opportunistic choices reports relatively weak effects on capital expenditure (Edmans et al. 2013), and most of the literature focuses on intangible investments as a proxy for myopia (Lundstrum 2002).

[Insert Table 2.3 about here]

2.4.5 Instrumented Difference-in-Differences

The standard DiD analysis shows a significant association between the reporting mandate and investment spending but does not examine whether the effects involve a significant increase in EPR. I employ instrumented DiD to demonstrate the effects through

changes in disclosures (Hudson et al. 2017). This method estimates the effects on investments of increasing EPR by one percentage point. Similar to Local Average Treatment Effects (Imbens and Angrist 1994) for the estimation of treatment effects for compliers, this method estimates treatment effects for compliers while allowing different levels of compliance with the reporting mandate. This is useful in my research setting, as some MM firms may substantially enhance their performance reporting while others barely change. To implement this approach, I estimate the following equations.

$$EPR_{it-1} = \beta_1\,POSTMAIN_{it-1} + \omega'X_{it-1} + FIRM\_FE + YEAR\_FE + c + \varepsilon \qquad (2.2)$$

$$INV_t = \beta_2\,EPR_{it-1} + \omega'X_{it-1} + FIRM\_FE + YEAR\_FE + c + \varepsilon \qquad (2.3)$$

Equation (2.2) tests whether the reporting mandate promotes EPR (*MEPR, TEPR*). Equation (2.3) tests whether the EPR explained by the reporting mandate in the first-stage regression is associated with future investment spending (*INTNGBLINV, TNGBLINV, TOTALINV*). Instrumented DiD rescales the average treatment effects of standard DiD by the level of compliance, measured by the incremental increase in EPR among MM firms relative to AIM firms.[16] Following rescaling, the coefficient of the second-stage regression (β_2) is the treatment effect of the reporting mandate on investment when the incremental increase in EPR is 100 percent. Therefore, β_2 multiplied by 0.01 is the estimated treatment effect of the reporting mandate on investment spending when EPR increases by one percentage point.

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[16] $\beta_2 = \dfrac{E[INV_{post} - INV_{pre} \mid MAIN=1] - E[INV_{post} - INV_{pre} \mid MAIN=0]}{E[EPR_{post} - EPR_{pre} \mid MAIN=1] - E[EPR_{post} - EPR_{pre} \mid MAIN=0]}$. The numerator (denominator) is the average treatment effect of standard DiD showing an incremental increase in investments (EPR). This estimator is a generalized version of Local Average Treatment Effect (LATE). While LATE estimator uses a compliance indicator for its denominator, the denominator in my estimator uses a continuous variable of compliance measured as growth in EPR.

Column 1 of Panels A (*MEPR*) and B (*TEPR*) of Table 2.4 report a significant and positive coefficient for *POSTMAIN*. The estimated effects are increases of 10.1 and 4.0 percent in *MEPR* and *TEPR*, respectively.[17] This implies that since the introduction of the reporting mandate, compared with AIM firms, MM firms provide more quantitative (performance indicators) and qualitative (management commentaries) information that reflects operational and strategic aspects of value creation. The second-stage regressions in columns (2) to (4) of Panels A and B show positive and significant treatment effects of an increase in EPR on *INTNGBLINV* and *TOTALINV*. As β_2 in equation (2.3) is the estimated treatment effect of the reporting mandate on investment for a 100 percent increase in EPR, the estimated effects of a one percentage point increase in *MEPR* (*TEPR*) on *INTGBLINV*, *TGBLINV*, and *TOTALINV* are 0.6 (1.4), 0.03 (0.07), and 0.6 (1.5) percent, respectively. The results imply that the effects on investment spending are stronger among firms with higher increases in EPR.[18]

[Insert Table 2.4 about here]

2.4.6 External Monitoring Channel

In this section, I examine mechanisms underlying the relation between EPR and investment. The first is an external control channel. Previous research suggests that long-term-oriented reporting attracts long-term investors, and thus makes managers less likely

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[17] Although the dependent variables vary between zero and one, I do not use a fractional logit model for two reasons. First, a non-linear first-stage model increases the risk of misspecification and inconsistent estimation, whereas a linear first-stage model generates consistent results (Angrist and Krueger 2001). Second, as I use fixed effects with a short sample period, a non-linear specification causes inconsistent estimation, known as the incidental parameter problem (Greene 2002).

[18] In an untabulated analysis, I calculate the mean of EPR in the pre- and post-treatment periods, split MM firms into two groups based on the median of the increase in EPR, and compare each MM group to AIM firms using standard DiD. I find that the effects on investment spending are stronger among MM firms with higher increases in EPR.

to take myopic decisions (Bushee 1998; Serafeim 2015). I operationalize this notion to examine whether EPR attracts long-term investors, and whether an increase in long-term investors promotes investment. For this test, I follow Bushee and Noe's (2000) method for calculating the proportion of long-term investors. Based on factor analysis and cluster analysis, I split institutional investors into three groups: dedicated investors, quasi-indexers, and transient investors. Dedicated investors and quasi-indexers are characterized by long-term holdings; therefore, I use the proportion of shares owned by these two groups to measure long-term investors (*LTINV*). Equations (2.4) to (2.6) test the effects of the reporting mandate on investment decisions through the external investor-related channel.[19]

$$EPR_{it-1} = \gamma_1 POSTMAIN_{it-1} + \omega'X_{it-1} + FIRM\_FE + YEAR\_FE + c \qquad (2.4)$$

$$LTINV_{it-1} = \gamma_2 EPR_{it-1} + \omega'X_{it-1} + FIRM\_FE + YEAR\_FE + c \qquad (2.5)$$

$$INV_{it} = \gamma_3 LTINV_{it-1} + \omega'X_{it-1} + FIRM\_FE + YEAR\_FE + c \qquad (2.6)$$

Panels A and B of Table 2.5 report the results of the external channel analysis using *MEPR* and *TEPR*, respectively. Both panels show positive and significant associations between *POSTMAIN* and *EPR* (column 1), *EPR* and *LTINV* (column 2), *LTINV* and *INTGBLINV* (column 3), and *LTINV* and *TOTALINV* (column 5). The average treatment effect of the Corporate Governance Code on *MEPR* is 0.101, which matches the result of the first-stage regression (Table 2.4). The estimated effect of the reporting mandate on the proportion of long-term investors among MM firms with average compliance levels is 0.072 (0.101*0.717). The estimated effect of *LTINV* on *INTGBLINV* among MM firms is 0.056 (0.101*0.717*0.775). However, the effects on *TGBLINV* are insignificant. These

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[19] Just as equations (2.2) and (2.3) produce a breakdown of treatment effects for equation (2.1), equations (2.5) and (2.6) are used to obtain a breakdown of effects for equation (2.3), revealing how disclosures impact on long-term investors, and how a change in investors affects investments.

results suggest that the reporting mandate promotes EPR among MM firms, that the increase in EPR attracts long-term investors, and that long-term investors promote intangible investments. The external channel does not have a significant effect on tangible investments.

[Insert Table 2.5 about here]

2.4.7 Internal Control Channel

My second proposed channel relates to internal incentives. As firms predict and experience enhanced investor monitoring of long-term value creation following the EPR mandate, they are more likely to align their executive compensation systems with EPR disclosures. For example, to encourage management to make longer-term decisions, I expect firms to rely less on short-term earnings performance for executive compensation. In analyzing the internal channel, I measure pay sensitivity to earnings (*PSE*). I regress total CEO compensation (*COMP*) on total shareholder return (*TSR*) and earnings performance (*EBIT*) to examine associations between compensation and market and accounting performance. I add two interaction terms (*MEPR*×*EBIT* and *MEPR*×*TSR*) to examine the effects of EPR on associations between CEO pay and accounting and market performance.

$$COMP_{it} = \beta_1\ TSR_{it} + \beta_2\ MEPR_{it}*TSR_{it} + \beta_3\ EBIT_{it} + \beta_4\ MEPR_{it}*EBIT_{it}$$
$$+\ CEO\_FE + YEAR\_FE \tag{2.7}$$

Table 2.6 reports the results. As shown in column 1, CEO pay (*COMP*) is positively associated with total shareholder return (*TSR*). In column 2, the positive coefficient on the interaction between *EPR* and *TSR* (*TSR*×*MEPR*) suggests that the positive association between *TSR* and CEO pay is stronger among firms with higher EPR. This implies that

firms with higher EPR use more forward-looking information for CEO pay. In column 3, CEO pay associated positively earnings performance. However, this association is weaker among firms with high levels of EPR ($\beta_4 < 0$). This implies that such firms rely less on short-term earnings performance in determining CEO pay. I calculate pay sensitivity to earnings (*PSE*) as $\hat{\beta}_3 + \hat{\beta}_4$ *MEPR*.

[Insert Table 2.6 about here]

For analysis of the internal channel, I test whether the reporting mandate reduces reliance on earnings to determine CEO pay (equation 2.8), and whether the reduction in pay sensitivity to earnings performance (*PSE*) promotes investments (equation 2.9). Unlike the analysis of the external monitoring channel, the equation system does not include regression of *EPR* on *POSTMAIN*, as *PSE* is a function of EPR. Equation (2.8) combines two steps: the effects of the reporting mandate on EPR, and the effects of EPR on pay sensitivity to earnings.

$$PSE_{it\text{-}1} = \delta_1 POSTMAIN_{it\text{-}1} + \omega'X_{it\text{-}1} + FIRM\_FE + YEAR\_FE + c \qquad (2.8)$$

$$INV_{it} = \delta_2 PSE_{it\text{-}1} + \omega'X_{it\text{-}1} + FIRM\_FE + YEAR\_FE + c \qquad (2.9)$$

In column 1 of Table 2.7, the reporting mandate is negatively associated with pay sensitivity to earnings performance. The estimated average treatment effect of the reporting mandate on *PSE* is -0.125. This suggests that the Corporate Governance Code encourages MM firms to rely less on short-term earnings performance in determining CEO pay, as they align their internal control systems with EPR. In column 2, the coefficients of *PSE* are negative and significant. The estimated average treatment effect of the reporting mandate on intangible investments is 0.056 (-0.125*-0.449). These results suggest that the reporting mandate reduces the sensitivity of CEO pay to earnings performance, and that this

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promotes intangible investments. However, the effects on *TGBLINV* are insignificant, consistent with the results in previous sections.

[Insert Table 2.7 about here]

2.5 Validity of Identification Strategy

Inferences from the DiD approach rely on a critical assumption that trends in the investments and EPR of MM and AIM firms would be parallel in the absence of the reporting mandate. However, this assumption may not hold owing to the systematic differences between MM and AIM mentioned in the third part of Section 2.3. These differences may give rise to time-varying opportunities for capital injections and investments, or time-varying effects of the financial crisis on the two groups. To address this concern, I test the parallel trends assumption by mapping counterfactual treatment effects, use a more stringent set of fixed effects, and implement matched-sample DiD throughout the main analysis.

2.5.1 Mapping Counterfactual Treatment Effects

To test the critical assumption of the DiD research design, I examine whether the two groups' investment and EPR trends are parallel in the pre-treatment period. Following Pischke (2005), I map counterfactual treatment effects over the sample period, using the difference between the two groups' investments in the last year of the pre-treatment period (fiscal year-end 2010) as a benchmark. I replace the single post-treatment variable (*POSTTRT*) with multiple interactions between the treatment group indicator and year indicators in the regression model. I exclude the indicator for the last year of the pre-treatment period for use as a benchmark. If the parallel trend assumption holds, treatment

effects in the pre-treatment period will be zero. In Figure 2.1, the circle points indicate the estimated counterfactual treatment effects, which reflect deviation of MM from AIM firms after controlling for the pre-existing difference in the benchmark year. The estimated counterfactual treatment effects on *TNGBLINV*, *INTNGBLINV*, *TOTALINV, TEPR*, and *MEPR* are all insignificant in the pre-treatment period. This test supports the assumption of parallel trends in investments and EPR disclosures. The estimated effects in the post-treatment period confirm significant treatment effects on each variable. The effects on investments are relatively weak in the first year of treatment, which implies delayed effects of EPR on investment spending.

[Insert Figure 2.1 about here]

2.5.2 Matched-Sample Difference-in-Differences

To further address the concern about comparability between MM and AIM, I estimate matched-sample DiD using coarsened exact matching (CEM) (Blackwell, Iacus, King, and Porro 2009).[20] This eliminates observations outside the two groups' common support of covariate distributions to ensure that observations with similar characteristics are matched. CEM then generates weightings that balance the covariates of the remaining observations. Panel A of Table 2.8 reports mean values for the covariates by group before and after matching. Although the matching procedure drops observations, the distribution of covariates is more balanced after matching. For instance, firm size in the two groups becomes similar after matching, as CEM chooses relatively large AIM firms and relatively small MM firms. Panel B reports the results of DiD regression analysis before and after

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[20] Compared with propensity score matching (PSM), CEM has the advantages that increasing balance for one covariate does not increase imbalance for another, as often occurs in PSM. CEM is also less sensitive to measurement error and is computationally efficient (Iacus, King, and Porro 2012).

applying CEM weightings. The results without CEM weightings in columns (1) to (3) are significant, consistent with the results in Table 2.3. With the CEM weightings (columns (4) to (6)), I observe a slight decrease in the estimated treatment effect on *INTGBLINV* and *TOTALINV*, but an increase in the estimated treatment effects on *TGBLINV*. This implies that potential self-selection in unobservable variables is unlikely to explain the significant results in the main analysis. I further use the matched samples consistently throughout all the tables in the main analysis, including external and internal channel analysis. Untabulated tables confirm the robustness of my results.

[Insert Table 2.8 about here]

2.5.3 Alternative Control Group

As a final step in addressing concern for heterogeneity, I create alternative treatment and control groups within MM firms, rather than using AIM firms as a control. Following Byard, Li, and Yu's (2011) approach of using voluntary adopters prior to the introduction of reporting regulations as a control group, I select MM firms with lower (higher) levels of EPR in the pre-treatment period as a treatment (control) group. I calculate the mean of EPR in the pre-treatment period and use the median value of EPR to split MM firms into two groups. Table 2.9 reports the results using the alternative treatment and control groups. The estimated treatment effects on *INTGBLINV* and *TOTALINV* are 0.024 and 0.029, respectively. Although the statistical significance is relatively low, mainly due to the reduced sample size, the magnitude of estimated treatment effects on *INTGBLINV* and *TOTALINV* is comparable to that in the main analysis. Consistent with the main analysis, the estimated effect on *TGBLINV* is insignificant.

[Insert Table 2.9 about here]

2.6 Additional Analyses

2.6.1 Overinvestment

Increased investment does not imply better decision making if it leads to overinvestment. As a robustness test, I examine whether the effects of the 2010 reporting mandate on investments are significant among firms with a higher likelihood of overinvesting. Following previous research, I identify firms with high cash and low Tobin's Q as those likely to overinvest (Cheng, Dhaliwal, and Zhang 2013; Chen, Xie, and Zhang 2017), and test the effects on this group. I generate two decile ranks of cash balance and negative Tobin's Q and take the average of the two. Firms above the top 33 (or 50) percent of this score are considered to be overinvestment candidates. Untabulated results show insignificant treatment effects on the investment spending of overinvestment-likely firms. This suggests that the effects of the reporting mandate on investments estimated in the main analysis do not represent overinvestment.

2.6.2 Cost of Capital

Extant literature documents that greater disclosure decreases the cost of capital by reducing information asymmetry (Botosan 1997; Fu, Kraft, and Zhang 2012). This suggests that an increase in EPR may promote investment by reducing the cost of capital. To examine this additional channel, I employ models by Claus and Thomas (2001), Ohlson and Juettner-Nauroth (2005), and Easton (2004) to estimate the cost of equity capital. I then examine whether the reporting mandate decreases the cost of equity capital among MM firms. Untabulated results show no effects or weakly positive effects of the reporting mandate on the cost of capital. This implies that a reduction in the cost of capital is unlikely

to explain the increase in investments.

2.6.3 Earnings Management

My primary results indicate that the disclosure mandate can promote long-term thinking and curb myopic decision making due to improvements in external monitoring and internal control. To provide further insight into changes in managerial myopia around the disclosure mandate, I examine managers' behavior related to traditional earnings-focused performance reporting, particularly earnings management around the disclosure mandate. I use three measures of earnings management: meeting or beating analyst forecasts by three percent or less (*MB*), discretionary accruals (*DA*) as implemented in Kothari, Leone, and Wasley (2005), and real-earnings management (*RM*) as implemented in Cohen and Zarowin (2010). Untabulated results show that the reporting mandate reduces accruals management and real-earnings management. This result supports regulators' belief that discussions of strategies for long-term value creation is an effective way to encourage long-term thinking and curb myopia.

2.6.4 Rationale for Reporting Mandate

As firms can benefit from voluntary disclosures of strategic information (Gu and Li 2007; Merkley 2014; Whittington et al. 2016), identification of market friction is important to justify the reporting mandate. Gigler et al. (2014) show that future shareholders risk making adverse selections when managerial incentives are aligned with those of current shareholders. Under such circumstances, current shareholders and managers prefer to generate quick returns at the expense of future shareholder value. Gigler et al. (2014) point out the difficulty of a market solution, as contracting between current

and future shareholders requires the latter to be identifiable. Moreover, short-term-oriented managerial incentives deter voluntary disclosures of long-term value creation. Therefore, mandatory corporate disclosure may help to mitigate friction.

Consistent with this prediction, the tests of external and internal channels described in Section 2.4.6 and Section 2.4.7 suggest that the effects of EPR mandate are stronger for firms with a greater decrease in market friction (i.e., a significant decrease in transient investors or pay sensitivity to current earnings). External and internal channel analyses examine the effects of reducing short-term investors and pay sensitivity to current earnings separately. I now test the joint effects of reducing PSE and short-term investors. I first calculate the pre- and post-period mean of short-term investors and obtain the difference between the two to calculate the overall change after the reporting mandate. I also calculate the change in sensitivity of CEO pay to current earnings using the same approach. I then generate decile ranks of the two changes, take the sum, and multiply by minus one. A higher value implies that the firm experiences greater decreases in short-term investors and short-term-oriented remuneration after the reporting mandate. Untabulated results show that the effects of the reporting mandate on investments are driven by firms experiencing greater reductions in market friction after the introduction of the reporting mandate.

2.6.5 Impact of the 2008 Financial Crisis

My sample period covers the period following the 2008 financial crisis. The crisis may have generated a bias that blurs the investment-promoting effects of the reporting mandate, as it restricted financing opportunities and led to a declining trend in corporate investments. The DiD research design mitigates the confounding effects of the 2008 financial crisis because the crisis affected both MM and AIM. Nevertheless, it is essential

to address a remaining concern about differing effects of the 2008 financial crisis on MM and AIM. For example, the crisis may have had more impact on the financial constraints of MM than AIM firms.

I therefore conduct a subsample analysis controlling for financial constraints. Following Rajan and Zingales (1998), I measure firm-level financial constraints as of 2008 and define firms in the top tercile of the RZ measure as financially constrained. Untabulated DiD results using the sample of unconstrained firms show similar estimated treatment effects. This analysis indicates that cross-sectional variation in the effects of the reporting mandate based on financial constraints is insignificant.

2.6.6 Other Provisions of the Corporate Governance Code

The 2008 financial crisis may have affected the governance of larger firms more significantly than other firms, as high-profile firms have greater social and economic impacts. Consistent with this notion, the Corporate Governance Code 2010 points to governance failures during the financial crisis. As well as the reporting requirement relating to business models and strategy, it includes two governance-related requirements that apply exclusively to FTSE 350 firms, which represent a subset of large MM firms. The additional requirements are annual re-election of directors (provision B.6.2) and triennial evaluation of board effectiveness (provision B.7.1). These may improve corporate governance and affect managerial decision making (Hutchinson and Gul 2004). I split MM firms into two groups (FTSE 350 and non-FTSE 350) and compare the treatment effects of the two samples. Untabulated results show that the treatment effects are greater on non-FTSE 350 firms than on FTSE 350 firms.

2.6.7 Missing R&D

The reporting mandate may induce MM firms that did not previously disclose their R&D expenditure to start doing so. As I replace missing R&D value with zero, the significant increase in intangible investments after the reporting mandate may be driven by firms starting to disclose their R&D expenditure only after the mandate rather than an actual increase in their actual R&D activities. To rule out this alternative explanation, I test the effects of the reporting mandate on investments in intangible assets as they must be disclosed. I find that the effects of the reporting mandate on intangible assets are significant. Second, I also test the effects of the reporting mandate by excluding firms that never disclosed their investments in the pre-treatment period. Untabulated results, which exclude six MM and nine AIM non-disclosing firms, confirm that the treatment effects are robust. Therefore, the results in the main analysis are unlikely to be driven by firms starting to disclose investment information only after the introduction of the reporting mandate.

2.6.8 Stringent Set of Fixed Effects

While the year fixed effect in my analysis controls for overall time trends, it assumes the same time trends for all industries. To better control for time-varying factors that may explain disclosure and investment, I include industry-year fixed effects. Untabulated results show that the additional fixed effects do not change my inference.

2.6.9 Alternative Measurement of EPR

I examine whether the test results are robust to different classifications of topics and performance metrics because EPR classification is subject to discretion. I asked three independent readers to review topics and metrics in my sample and indicate whether they

considered the item to be EPR. I use results from this review to identify ambiguous topics and metrics that reviewers believe an alternative classification is possible. To test the robustness of my results, I define two alternative *MEPR* measures and two alternative *TEPR* measures where the ambiguous items follow the alternative classifications.

For the alternative *MEPR* measures, I reclassify two sets of ambiguous performance metrics. The first set of ambiguous metrics includes specific types of financial measures such as new brand sales, sales per employee, and R&D expenditure. While I consider these metrics EPR as they naturally align with operational and strategic aspects of value creation, they are also closely related to current earnings results and as such may not reflect EPR. I therefore generate an alternative *MEPR* proxy using the standard financial versus non-financial dichotomy. The second set of debatable measures is CSR-related metrics. Although CSR is value-relevant in the long run (Clarkson, Fang, Li, and Richardson 2013; Jain, Jain, and Rezaee 2016), it is often remote from firms' main business operations and strategies. I therefore construct a second alternative *MEPR* proxy that excludes carbon emissions, water usage, employee diversity, and other CSR-related factors from EPR. Untabulated results confirm that my inference is robust to alternative definitions of *MEPR*.

I follow a similar approach to construct two alternative *TEPR* measures that exclude ambiguous topics. The first proxy excludes the "Health, Safety, Environment" topic from the main *TEPR* measure for the same reason as previously discussed. The other proxy considers the "Strategy" topic the only EPR topic among all topics. As *TEPR* in the main analysis includes industry-specific topics such as oil and gas, mining, and healthcare, the analysis is potentially subject to industry biases. On the other hand, the topic "strategy", relative to other topics, contains keywords describing strategies in general, rather than

industry-specific keywords. Therefore, I calculate the proportion of "Strategy" topic in each annual report using the trained topic model to construct an alternative *TEPR*. I then repeat the instrumented DiD test using these alternative EPR measures. Untabulated results show that the significance levels of the coefficients on the two alternative *TEPR* measures are similar to those in Table 2.4.

2.6.10 Effects of the Code on individual topics

Previous analyses examine the overall increase in EPR-related topics (*TEPR*), leaving the effects of the Code on individual topics unexplored. I therefore regress the proportion of topic k in the annual report of firm i in year t ($Topic_{k,i,t}$) on the post-treatment indicator (*POSTMAIN*) and compare the coefficients of *POSTMAIN* to examine which topics increase and decrease after the reporting mandate. Table 2.10 reports the coefficient of *POSTMAIN* in descending order and confirms the most significant increase in the strategy topic, followed by other operation-related topics. These findings support the robustness of my results to the alternative measure of *TEPR* that solely considers strategy topic. The coefficients indicate that the top 11 topics increase after the reporting mandate while the proportion of the others decrease. Nine of the 11 increased topics fall within EPR category. This result suggests that the reporting mandate is effective in encouraging firms to describe their strategies and operations.

[Insert Table 2.10 about here]

2.7 Conclusion

This study examines whether requiring firms to articulate their approach to long-

term value creation encourages management to look beyond earnings and make longer-term decisions. Using the research setting of the UK's Corporate Governance Code 2010, I document that this reporting mandate induces firms to adopt EPR, evidenced by more performance measures and narratives relating to business operations and strategies in annual report. My channel analysis suggests that greater focus on operational and strategic aspects of value creation in performance reporting promotes intangible investments, since EPR attracts long-term investors and reduces pay sensitivity to short-term earnings.

The results are subject to important limitations. First, this study relies on an assumption of parallel trends between AIM and MM. Although I test the validity of this assumption using counterfactual treatment effects, I cannot rule out all confounding effects arising from heterogeneity between the two groups. Nevertheless, my additional tests using alternative specifications such as matched sample DiD and an alternative control group test add confidence to my results and inference. Second, while I attempt to control confounding effects of other economic events such as the financial crisis and other provisions of the Corporate Governance Code, I cannot definitively rule out all confounding factors generated by unidentified events. Third, I use a relatively small sample owing to the manual data collection process and validity checking of unique words for textual analysis. Therefore, my sample may be unrepresentative of the population. However, this narrow focus offers an advantage over most other studies that directly test the economic outcomes of reporting regulations insofar as I examine the path from a regulatory change through disclosure outcomes to economic outcomes. Finally, my study does not directly address the question of whether promoting investment leads to better long-term performance. Testing long-term performance may introduce confounding events and give rise to

intractable endogeneity issues. Instead, through a subsample analysis, I show that the additional investment is unlikely to represent overinvestment.

Despite these limitations, my study extends current understanding of the effects of disclosing operational and strategic information. Regulators and practitioners promote EPR in the belief that it supports internal decisions (IIRC 2013; FRC 2010a; European Commission 2017). However, evidence supporting the real effects and the channels through which they operate is lacking in the literature (Leuz and Wysocki 2016; Barth et al. 2020). I use a disclosure innovation in the UK to produce novel evidence of the link between external reporting systems and internal incentive systems. This evidence responds to Leuz and Wysocki's (2016) appeal for further research on disclosure in countries outside the US, nontraditional disclosure, and the real effects of reporting mandates. My work also contributes to the literature on managerial myopia. In a departure from recent studies producing mixed results on the effects of reporting frequency (Agarwal et al. 2018; Nallareddy et al. 2017; Kajüter et al. 2019; Fu et al. 2020; Arif and De George 2020), my paper offers a new perspective in showing that disclosures focusing on process aspects of value creation may curb myopic behaviors and catalyze sustainable value creation. Overall, my evidence provides useful insights for practitioners and regulators.

Appendix 2.1 Definitions of Variables

Variable	Definition
Investments	
INTGBLINV	Sum of R&D expenditure and change in net intangible assets, including capitalized R&D costs, patents and brands, licenses, computer software, and other intangible assets, scaled by lagged total assets
TGBLINV	Investment in property, plant, and equipment, scaled by lagged total assets
TOTALINV	Sum of *INTGBLINV* and *TGBLINV*
Enhanced Performance Reporting	
MEPR	Measure of enhanced performance reporting, calculated as the number of non-financial measures, financial ratios, investments, and granular financial measures, divided by the number of all performance measures (see Appendix 2.4 for details)
TEPR	Measure of enhanced performance reporting, calculated as the proportion of topics relevant to business operations and strategy as opposed to earnings results (see Appendix 2.5 for topic word lists)
Treatment Variable	
POST	An indicator variable that equals one if the fiscal year begins on or after June 29, 2010
MAIN	An indicator variable that equals one if the firm is in the Main Market of the London Stock Exchange (LSE)
POSTMAIN	An interaction term between *POST* and *MAIN*
Additional Variables for External Channel Analysis	
LTINV	Institutional ownership by quasi-indexers and dedicated investors. The classification of institutional investors is based on Bushee and Noe (2000). Four measures of portfolio turnover and four measures of ownership of institutional investors are reduced to two factors (factor analysis), and institution-years are split into one of three groups (transient investor, quasi-indexer, and dedicated investor) based on the two factors (three-mean cluster analysis).
Additional Variables for Internal Channel Analysis	
COMP	Total CEO compensation from BoardEx. In the case of co-CEOs, the highest compensation is used.
TSR	One-year shareholder returns, assuming reinvestment of dividends within the window from the previous to current fiscal year-ends
EBIT	Earnings before interest and taxes
PSE	Pay sensitivity to earnings, calculated as $\beta_3 + \beta_4$ *MEPR* of regression results from column (5) of Table 2.6
Control Variables	
SIZE	Natural logarithm of total assets
Q	Tobin's Q as (market value of equity + total debt) / total assets

LEV	Ratio of total debt to total assets
CASH	Cash and cash equivalents, scaled by total assets
LOSS	An indicator of loss
AGE	Firm's age, approximated by the number of years listed on the LSE
ROA	Return on asset defined as earnings before interests and taxes scaled by total assets
RAISE	An indicator of equity issue

Appendix 2.2 Major Amendments of the Corporate Governance Code

The Combined Code on Corporate Governance 2008	The UK Corporate Governance Code 2010
New provision B.6.2	
-	Evaluation of the board of FTSE 350 companies should be externally facilitated at least every three years, with a statement on whether the external facilitator has any other connection with the company.
Provision A.7.1 → Provision B.7.1	
All directors should be subject to election by shareholders at the first annual general meeting after their appointment, and to re-election thereafter at intervals of no more than three years. The names of directors submitted for election or re-election should be accompanied by sufficient biographical details and any other relevant information to enable shareholders to take an informed decision on their election.	All directors of FTSE 350 companies should be subject to annual election by shareholders. All other directors should be subject to election by shareholders at the first annual general meeting after their appointment, and to re-election thereafter at intervals of no more than three years. Non-executive directors who have served longer than nine years should be subject to annual re-election. The names of directors submitted for election or re-election should be accompanied by sufficient biographical details and any other relevant information to enable shareholders to take an informed decision on their election.
New Provision C.1.2	
-	The directors should include in the annual report an explanation of the basis on which the company generates or preserves value over the longer term (the business model) and the strategy for delivering the objectives of the company.

Appendix 2.3 Example of EPR

The following narrative is an excerpt from the 2011 annual report of Berkeley Group, a property developer based in the UK.

VISION2020 OUR STRATEGY FOR DELIVERING VALUE

Vision2020 provides Berkeley with the framework to meet this ambition and focuses the business on four key impact areas:

- Running a Sustainable Business
- The Customer Experience
- Delivering Sustainable Communities
- Building Greener Homes

Berkeley's vision is simple

"BY 2020 BERKELEY WILL BE ONE OF THE MOST SUCCESSFUL AND SUSTAINABLE BUSINESSES IN BRITAIN"

DELIVERING THE STRATEGY - HOW AND WHY

Focused in London and the South East, Berkeley's strategy reflects the cyclical nature of property development and seeks to maximise value for shareholders over the long-term in a sustainable and safe way, for an acceptable level of risk. With a strong financial base, it is responsive to market conditions, able to invest, generate cash or protect the balance sheet as conditions dictate. Since 2009, Berkeley has been in the investment phase of the cycle. This means acquiring land in the right locations, at the right time on the right terms and investing in work in progress on existing sites to meet local demand. While continuing to invest, Berkeley is now transitioning into the delivery and execution phase which requires discipline and flair to maximise value.

In implementing its strategy, Berkeley concentrates on sites where it can add greatest value, frequently large-scale urban regeneration schemes on brownfield land, where the development solutions are highly complex and take time to create enhanced returns. The expertise required, availability of suitable land and cyclicality of property development mean that there is an optimum size at which to operate this business model.

Alongside financial strength there are many more elements that contribute to running a sustainable business. We seek to operate in a manner that touches lightly on the environment through careful management of our impacts. This reduces risk and can reduce operational costs. We are also committed to ensuring the health, safety and well-being of our staff and contractors working in our offices and construction sites. We deliver this through comprehensive health and safety management systems.

Berkeley recognises the importance of having a highly skilled, committed and passionate workforce in delivering our vision. We also recognise that we have a responsibility to give something back to the communities in which we work. Both of these elements of running a sustainable business are therefore reflected in our ongoing strategy.

Our customers are fundamental to our success. We aim to provide them with an exceptional experience throughout the purchasing process and with our aftersales service. We ensure our customers are at the heart of the decisions that we make, from the land that we buy, through development planning to the detailed design, specification and construction of homes and commercial space. Meeting and exceeding our customers' expectations helps secure our reputation and leads to repeat custom, both of which are key in maintaining our financial performance over time.

Berkeley is a mixed-use developer and it is important that we realise the sustainability expectations of our commercial customers, as well as our residential customers. We therefore expect the commercial spaces that we design and build to meet the BREEAM Very Good standard.

Berkeley's strategy for every site is to create a successful, sustainable place. We develop a specific solution, using bespoke design. We do not have standard products. We consistently use specialist architects to design each scheme, whether it consists of 10 or 4,000 homes.

Each place we create emerges through the management of a complex series of relationships and processes. Together these deliver the right mix of housing, transport, open space, retail and other facilities. We work very closely with the community to achieve this. Their needs and ideas inform the design. Ultimately, they must take pride in the place and responsibility for its long term success.

The homes we build have an environmental impact not only during the construction process but also through their occupation. Designing homes to meet environmental performance standards such as the Code for Sustainable Homes helps minimise these impacts whilst giving us the ability to clearly demonstrate their performance to our customers and other stakeholders.

However we know that environmental performance standards alone do not include all of the measures that we could take to reduce the environmental impact of the homes we build. Our strategy therefore commits us to integrating additional measures to reduce this impact where we believe these add value or meet the demands of our stakeholders. One such commitment is to maximise land-use efficiency, which Berkeley achieves through a prevalence to develop on brownfield land. This ensures that ecologically valuable greenfield sites are retained and that the value of brownfield land is realised.

(Continued on the next page)

In terms of financial performance, the vision is equally clear:

"TO MAXIMISE SHAREHOLDER VALUE OVER THE LONG-TERM IN A SUSTAINABLE AND SAFE WAY, FOR AN ACCEPTABLE LEVEL OF RISK"

vision
20**20**

Our vision
for the future

HOW WE MEASURE IT (KEY PERFORMANCE INDICATORS)

PERFORMANCE

Profit Before Tax – measures how much profit has been earned for shareholders in the period. Growth in PBT will depend upon the stage in the cycle.

£136.2 million
(2010: £110.3 million)

Return on Equity – compares profit before tax to average shareholders' funds and is a measure of the effectiveness and efficiency of how the strategy has been implemented.

15.3%
(2010: 13.3%)

Operating Margin – is a measure of the quality of profit - it compares profit to revenue and reflects both selling price performance and control of costs.

18.3%
(2010: 17.3%)

Forward Sales – is the future cash inflow secured by advance sales to customers. Maximising forward sales provides visibility for investment in new and existing sites.

£813.5 million
(2010: £648.1 million)

Land Bank – Berkeley's long-term success is dependent upon the value created in the land bank which we express as the value of estimated future gross margin to be earned from our sites.

£2.3 billion
(2010: £2.0 billion)

RIDDOR accident incident rate – an indicator of health and safety performance that measures the number of fatalities, major incidents and over three day absences per 1,000 people working on our construction sites.

3.63
(2010: 3.83)

Total direct operational carbon emissions per operative on site – is used to measure our normalised year-on-year change in our direct carbon impact. This indicates the impact of our operations on climate change.

1.81 tonnes CO_2e
(2010: 1.88 tonnes CO_2e)

Percentage of customers that would "Recommend us to a friend" – is the measure we use to indicate the level of our customers' satisfaction with our product and service.

96%
(2010: 93%)

Percentage of commercial space completed which achieved BREEAM Very Good – measures the proportion of commercial space we design and build which minimises the environmental impact for our commercial customers.

45%

Percentage of homes completed which met the Lifetime Homes standard – Lifetime Homes are designed to be adaptable to people's changing needs over their lifetime, thus preventing social exclusion. This measure therefore indicates the inclusivity of the communities we create.

29%

Number of developments achieving the Building for Life Standard – Building for Life is a national standard for well-designed homes and neighbourhoods. We use this measure to demonstrate design quality in the communities we create.

5
(One Gold and four Silver)

Percentage of homes certified using an environmental performance methodology – this demonstrates the proportion of homes we build that have been designed to minimise environmental impact.

65%
(2010: 64%)

Percentage of development on brownfield land – this measures the extent to which Berkeley use previously developed land, rather than greenfield land.

92%
(2010: 100%)

Appendix 2.4 Example of Performance Measure Collection

Annual Report

Highlights				
Revenue space	New product revenue	Operating profit	Stores	Selling
£3,802.8m	£88.3m	£38.7m	42	41,000 sqm

Financial summary
• Group revenue of £3,802.8 million (2012: £3,896.7 million), down 2.5 percent in constant currency and 1.1 percent on a like-for-like basis.
• EBITDA of £103.8 million (2012: £176.6 million) and operating profit of £38.7 million (2012: £89.8 million).
• Adjusted Group profit before tax of £26.4 million (2012: £78.7 million).
• Adjusted earnings per share of 2.5p (2012: 10.0p). Basic losses per share of 13.8p (2012: earnings per share of 3.4p).

Chairman's letter to shareholders
We have made significant progress in our priorities, namely to restore shareholder value, renew the Board, review our markets and operations…Sales per client was £47.5 (2012: £53.7)…Cash generated from operations was an inflow of £20.0 million (2012: £83.8 million), largely reflecting the lower retail profit. Net capital expenditure was £53.5 million (2012: £99.1 million)…We continue to plan prudently in what remain challenging market conditions. Nevertheless, we are confident that our new management team will deliver an improvement in earnings over the medium term.

Metric Classification

Traditional Performance Reporting	**Enhanced Performance Reporting**	
Financial measures		Non-financial measures
Traditional financial measures	Financial ratios / Investments / Granular financial measures	
Revenue Operating profit EBITDA Profit before tax Earnings per share Cash generated from operations	Sales per client Capital expenditure New product revenue	Stores Selling space

$$MEPR = \frac{5}{11}$$

Appendix 2.5 20 Topics from LDA

EPR	Broad category	Topic	Word list
0	Financial	Borrowing	net interest cash rate debt capital risk credit tax facilities assets facility currency finance rates exchange foreign
		Accounting	accordance information law accounting responsible reasonable prepare position applicable adopted auditors
		Financial Performance	profit revenue increased growth costs net increase adjusted underlying sales tax margin total earnings cash
		Financial Statement	cash tax assets costs net income loss value interest total period shares profit expenses impairment balance
	Governance	Executive	remuneration shares salary awards bonus options period pension award plan policy total non-executive scheme
		Director	chairman non-executive appointed joined finance experience member officer senior board held president managing
		Board	board chairman governance non-executive meetings shareholders independent committee meeting remuneration
		Audit	internal audit external control committee auditors risk controls effectiveness reviewed risks reporting system
		Annual General	shares ordinary capital meeting general shareholders information issued held interests set rights details resolution
		Risk	risk risks impact operations principal ensure future changes uncertainties activities products economic potential
1	Business Operations & Strategy	Safety & Environment	employees safety environmental health training local people emissions responsibility work environment waste
		Healthcare	products product clinical research sales patients pharmaceutical treatment technology healthcare drug medical
		Mining	production mining gold exploration project mine ore coal projects resource operations drilling resources copper
		Oil & Gas	oil gas production exploration drilling field reserves interest wells licence seismic area potential programme
		Marketing	sales stores retail customers brand store brands products product growth food customer distribution range total
		Production	products product sales customers production manufacturing markets demand technology supply energy global
		Progress	strong progress increase future period growth increased position trading results investment sales shareholders
		Strategy	growth strategy strategic markets focus global value people strong customers deliver opportunities businesses
		Contract	services contract contracts service construction project projects revenue sector support work division clients
		Technology	services customers revenue software products technology mobile online data customer digital media solutions

Appendix 2.6 Application of Latent Dirichlet Allocation

Creating a Corpus

For the textual analysis, I create a corpus by aggregating the annual reports of all firms listed on the London Stock Exchange in the sample period 2008–2013 to gain sufficient data for machine learning and avoid overfitting. The corpus includes 10,573 annual reports from 1,838 unique firms.

Unlike US 10-Ks, UK annual reports do not have a standardized reporting template. However, they commonly comprise two broad components: a narrative component (front part of the document) and a statutory component (rear part of the document). The former includes management commentary on periodic performance. The latter includes financial statements, footnotes, and corporate governance. I extract the narrative parts of annual reports using El-Haj et al.'s (2020) method.

Text Pre-Processing

The extracted text must be processed to allow textual analysis. First, I remove stop words such as function words and pronouns (and, as, it, be, have, do, that, etc.) as they provide little informational content. So as not to delete keywords relating to business models or strategy, I adjust the LM-stopword list (Loughran and McDonald 2011) for the words *need*, *new*, *novel*, *right*, and *value*. I exclude numbers, dates, special characters, and personal names, as they do not generate meaningful topics. However, I do not stem words, as stemming restricts the model from exploiting subtle differences in word senses generated by word inflections (e.g., market and marketing; developing and developed). As words that are too frequent or too infrequent are not useful for identifying topics (Dyer, Lang, and Stice-Lawrence 2017), I delete the 30 most frequent words and words that do

not occur in at least 100 annual reports. Next, I create a dictionary of unique words and manually check them one by one to remove invalid words such as encoding errors and to correct typos.

Implementation of LDA

I use the Mallet software to implement collapsed Gibbs sampling for LDA training, with 1,000 sampling iterations, and optimize the parameter alpha (document-topic distribution) and beta (topic-word distribution) every 10 iterations. One important choice in LDA is the number of topics to identify. Setting the number too low forces the model to combine distinct themes into a single topic, whereas setting it too high may produce topics that are too granular to interpret. Although previous accounting research applying LDA uses perplexity to decide the number, the perplexity score approach often produces less interpretable results (Chang et al. 2009). I use two alternative methods to decide the number of topics: a word intrusion task (Chang et al. 2009) and coherence scores (Newman, Noh, Talley, Karimi, and Baldwin 2010).

The word intrusion task examines whether word lists generated by topic modeling agree with human judgements. For each topic, I keep the top five words, and include an intruder word that is less likely to appear in the topic but likely to appear among the top 10 words in any of the other topics. The following is an example question.

Choose the odd one out: (a) risk (b) rate (c) cash (d) brand (e) interest (f) credit

I ask three independent readers with expertise in accounting and finance to perform the word intrusion tasks for models with 20, 30, 40, 50, and 60 topics. Table 2.11 shows the accuracy of their answers and rankings across five models. The 20- and 40-topic models

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are preferred in terms of average rank, and the 20-topic model is marginally preferred in terms of accuracy score.

[Insert Table 2.11 about here]

I also test the coherence scores, which evaluate semantic relationships between topic words, by testing the co-occurrence of word pairs in external corpora such as *The New York Times* and Wikipedia. I use the C_V metric, which has the strongest correlation with human ratings (Röder et al. 2015). The score range is from zero to one, and a higher score means higher quality. As shown in Figure 2.2, the coherence score is maximized at 20 topics.

[Insert Figure 2.2 about here]

Based on the results of the coherence score test and the word intrusion task, I choose 20 topics for the main analysis. As a robustness check, I also use 40 and 60 topics to create alternative measures of *TEPR*. Untabulated results are robust to alternative measurement.

Figure 2.1 Parallel Trends Test

Panel A. EPR Variables
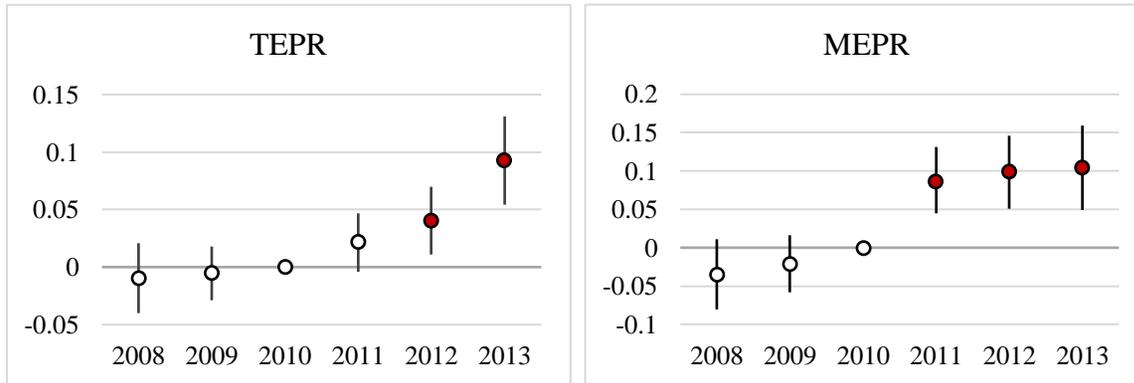
Panel B. Investment Variables
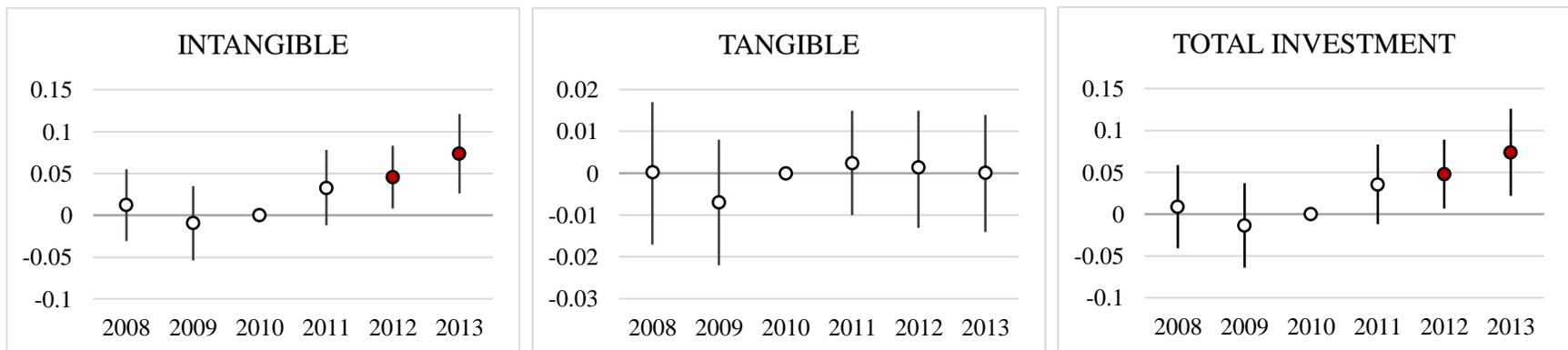
This figure reports the results of a parallel trends test, mapping counterfactual treatment effects over the sample period. I replace the single post-treatment indicator of standard DiD with year-treatment indicators, while excluding the benchmark year 2010, which is the last year of the pre-treatment period. The estimated effects of year 2010 are constrained to zero. Dot points are the estimated treatment effect of each year, colored red if significant. The vertical lines are two-tailed 90% confidence intervals for the estimated treatment effects.

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Figure 2.2 Coherence Scores
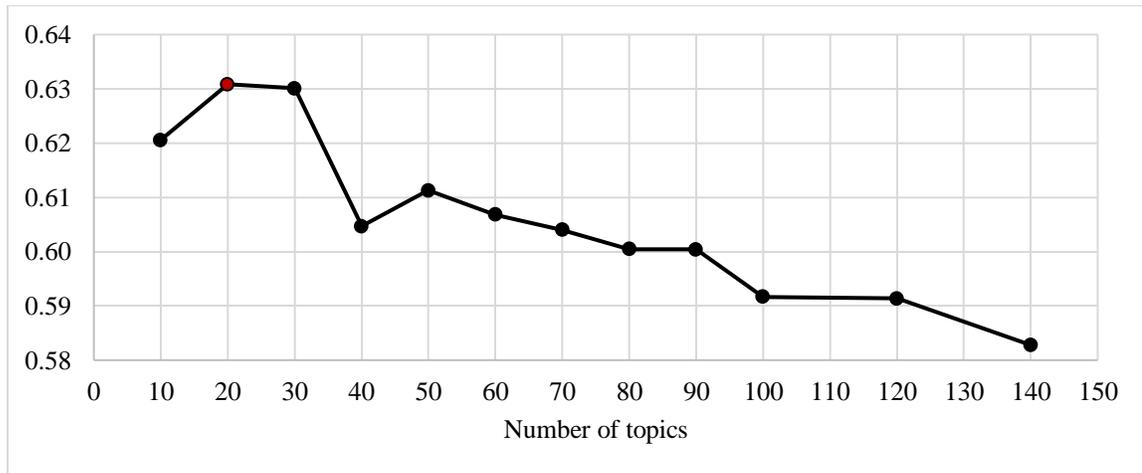
This figure reports Röder's et al. (2015) coherence scores for models with 10-topic increments.

Table 2.1 Sample Selection and Descriptive Statistics

Panel A. Sample Selection

	Firms	Firm-years
Observations for the sample period, fiscal years 2008 to 2013	2,055	8,555
(-) Missing variables	(583)	(2,226)
(-) Unbalanced panel	(649)	(1,591)
(-) Random sampling	(623)	(3,538)
Observations for tests	**200**	**1,200**

Panel B. Descriptive Statistics of all firms

	N	5%	25%	Mean	Med	75%	95%	SD
INTGBLINV	1,200	-0.055	0.000	0.057	0.009	0.059	0.360	0.167
TGBLINV	1,200	0.000	0.009	0.045	0.024	0.055	0.167	0.061
TOTALINV	1,200	-0.029	0.018	0.104	0.057	0.136	0.446	0.183
MEPR	1,200	0.000	0.083	0.242	0.200	0.364	0.620	0.214
TEPR	1,200	0.424	0.591	0.693	0.689	0.807	0.956	0.157
LTINV	1,200	0.011	0.165	0.416	0.410	0.663	0.849	0.274
PSE	1,200	0.129	0.353	0.462	0.504	0.604	0.676	0.188
SIZE	1,200	7.885	9.976	11.814	11.814	13.579	16.211	2.462
Q	1,200	0.558	1.054	2.687	1.687	2.842	7.357	3.733
LEV	1,200	0.000	0.002	0.180	0.131	0.270	0.561	0.208
CASH	1,200	0.005	0.034	0.143	0.077	0.180	0.517	0.170
LOSS	1,200	0.000	0.000	0.270	0.000	1.000	1.000	0.444
AGE	1,200	3.000	6.000	12.037	12.000	18.000	22.000	6.542
RAISE	1,200	0.000	0.000	0.691	1.000	1.000	1.000	0.462
ROA	1,200	-0.548	-0.017	-0.004	0.074	0.127	0.243	0.313

Panel C. Descriptive Statistics of MM and AIM

	MM				AIM			
	N	Mean	Med	SD	N	Mean	Med	SD
INTGBLINV	600	0.039	0.006	0.110	600	0.075	0.014	0.208
TGBLINV	600	0.051	0.033	0.055	600	0.039	0.015	0.067
TOTALINV	600	0.091	0.060	0.121	600	0.117	0.051	0.228
MEPR	600	0.261	0.245	0.176	600	0.223	0.167	0.246
TEPR	600	0.640	0.646	0.126	600	0.746	0.760	0.167
LTINV	600	0.594	0.640	0.214	600	0.237	0.190	0.202
PSE	600	0.440	0.461	0.159	600	0.485	0.533	0.212
SIZE	600	13.757	13.569	1.545	600	9.871	9.976	1.476
Q	600	2.229	1.841	1.681	600	3.146	1.543	4.965
LEV	600	0.223	0.200	0.187	600	0.138	0.039	0.219

CASH	600	0.086	0.059	0.089	600	0.199	0.131	0.208
LOSS	600	0.083	0.000	0.277	600	0.457	0.000	0.499
AGE	600	15.202	17.000	6.267	600	8.872	7.500	5.131
RAISE	600	0.747	1.000	0.435	600	0.635	1.000	0.482
ROA	600	0.104	0.100	0.086	600	-0.113	0.018	0.407

This table provides summary statistics of the main and control variables in the multivariate analysis. Continuous variables are winsorized at the 1% and 99% levels. Definitions of all variables are given in Appendix 2.1.

Table 2.2 Validity of EPR

Panel A. Determinants of EPR

	MEPR	TEPR
	(1)	(2)
Q	0.003	0.005 **
	(0.849)	(2.475)
SIZE	0.029 ***	-0.010 **
	(4.916)	(-2.418)
LEV	-0.121 ***	-0.075 *
	(-2.688)	(-1.942)
CASH	-0.031	0.065
	(-0.515)	(1.762)
LOSS	0.122 ***	0.049 **
	(4.556)	(2.590)
AGE	-0.003	-0.003 **
	(-1.439)	(-2.383)
RAISE	0.007	-0.008
	(0.420)	(-0.658)
ROA	-0.008	0.009
	(-0.227)	(0.311)
Observations	1,200	1,200
Adjusted R^2	0.096	0.180

Panel B. EPR and near-term performance

	ROA_{t+1}	ROA_{t+1}
	(1)	(2)
MEPR	-0.021	
	(-0.305)	
TEPR		-0.121 *
		(-1.693)
Q	-0.007	-0.006
	(-1.268)	(-1.128)
SIZE	0.028 ***	0.026 ***
	(4.247)	(3.659)
LEV	-0.175	-0.181
	(-1.418)	(-1.472)
CASH	-0.369 ***	-0.359 ***
	(-2.789)	(-2.732)
LOSS	-0.225	-0.222

	(-6.079)	(-6.857)
AGE	0.002	0.002
	(1.622)	(1.464)
RAISE	-0.061 ***	-0.061 **
	(-2.601)	(-2.671)
Observations	1,200	1,200
Adjusted R^2	0.337	0.339

This table reports the results of analyzing the determinants of *MEPR* and *TEPR* and the association between EPR and near-term earnings performance (*ROA$_{t+1}$*). All regressions include the following variables: *SIZE*, *LEV*, *CASH, LOSS*, *Q*, *AGE*, and *RAISE*. Z-statistics, shown in parentheses, are based on robust standard errors clustered at the firm level. ∗∗∗, ∗∗, and ∗ indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 2.3 Standard Difference-in-Differences

	INTGBLINV	TGBLINV	TOTALINV
	(1)	(2)	(3)
POSTMAIN	0.056***	0.003	0.060***
	(3.592)	(0.442)	(3.464)
Q	0.007	0.001	0.010*
	(1.610)	(1.146)	(1.899)
SIZE	-0.073***	-0.010**	-0.094***
	(-3.624)	(-1.964)	(-4.186)
LEV	-0.020	-0.030	-0.050
	(-0.270)	(-1.470)	(-0.591)
CASH	0.029	0.022	0.025
	(0.428)	(1.266)	(0.341)
LOSS	-0.027	0.005	-0.024
	(-1.285)	(0.723)	(-0.996)
AGE	-0.009	-0.016***	-0.025***
	(-1.423)	(-3.744)	(-4.167)
RAISE	0.021**	0.013***	0.032**
	(2.036)	(2.652)	(2.369)
ROA	-0.107*	-0.004	-0.113*
	(-1.869)	(-0.251)	(-1.673)
Intercept	1.036***	0.216***	1.354***
	(5.434)	(4.033)	(6.320)
Firm Fix	YES	YES	YES
Year Fix	YES	YES	YES
Observations	1,200	1,200	1,200
Adjusted R^2	0.389	0.566	0.397

This table reports the results of analyzing the effect of the Corporate Governance Code (2010) on intangible investments (*INTGBLINV*), tangible investments (*TGBLINV*), and the sum of tangible and intangible investments (*TOTALINV*). *POSTMAIN* is an interaction between an indicator for the post-treatment period (*POST*) and an indicator for the treatment group (*MAIN*). All regressions include the following control variables: *SIZE*, *LEV*, *CASH, LOSS*, *Q*, *AGE*, *RAISE,* and *ROA*. Z-statistics, shown in parentheses, are based on robust standard errors clustered at the firm level. ∗∗∗, ∗∗, and ∗ indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 2.4 Instrumented Difference-in-Differences

Panel A. Effects of the Code on MEPR (1st stage) and investments (2nd stage)

Stage	**1st**	**2nd**	**2nd**	**2nd**
	MEPR	*INTGBLINV*	*TGBLINV*	*TOTALINV*
	(1)	**(2)**	**(3)**	**(4)**
POSTMAIN	0.101 ***			
	(5.653)			
MEPR		0.555 ***	0.028	0.597 ***
		(3.134)	(0.445)	(3.088)
Control	YES	YES	YES	YES
Firm Fix	YES	YES	YES	YES
Year Fix	YES	YES	YES	YES
Observations	1,200	1,200	1,200	1,200
Adjusted R^2	0.634			
Chi^2		176.177	54.409	151.523
$P > Chi^2$		0.000	0.000	0.000

Panel B. Effects of the Code on TEPR (1st stage) and investments (2nd stage)

Stage	**1st**	**2nd**	**2nd**	**2nd**
	TEPR	*INTGBLINV*	*TGBLINV*	*TOTALINV*
	(1)	**(2)**	**(3)**	**(4)**
POSTMAIN	0.040 ***			
	(3.015)			
TEPR		1.406 **	0.070	1.511 **
		(2.349)	(0.440)	(3.134)
Control	YES	YES	YES	YES
Firm Fix	YES	YES	YES	YES
Year Fix	YES	YES	YES	YES
Observations	1,200	1,200	1,200	1,200
Adjusted R^2	0.758			
Chi^2		165.683	54.210	141.488
$P > Chi^2$		0.000	0.000	0.000

This table reports the results of analyzing the effect of the Corporate Governance Code (2010) on investments in tangible and intangible capital (*INTGBLINV, TGBLINV*, and *TOTALINV*) through enhanced performance reporting. Panel A (B) shows the effects of the reporting mandate on *MEPR* (*TEPR*) and the effects of EPR on investments. *POSTMAIN* is an interaction between an indicator for the post-treatment period (*POST*) and an indicator for the treatment group (*MAIN*). *MEPR* is the proportion of performance measures other than earnings and variants of earnings. *TEPR* is the proportion of themes in annual reports that describe operational and strategic aspects of value creation. All regressions include the following control variables: *SIZE, LEV, CASH, LOSS, Q, ROA, AGE*, and *RAISE*. Z-statistics, shown in parentheses, are based on robust standard errors clustered at the firm level. ∗∗∗, ∗∗, and ∗ indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 2.5 External Channel Analysis

Panel A. Effects of the Code on investor pool and investments (MEPR)

Stage	1st	2nd	3rd	3rd	3rd
	MEPR	*LTINV*	*INTGBLINV*	*TGBLINV*	*TOTALINV*
	(1)	(2)	(3)	(4)	(5)
POSTMAIN	0.101 ***				
	(5.653)				
MEPR		0.717 ***			
		(3.702)			
LTINV			0.775 ***	0.039	0.832 ***
			(2.940)	(0.442)	(2.887)
Control	YES	YES	YES	YES	YES
Firm Fix	YES	YES	YES	YES	YES
Year Fix	YES	YES	YES	YES	YES
Observations	1,200	1,200	1,200	1,200	1,200
Adjusted R^2	0.634				
Chi^2		225.099	155.843	192.004	174.962
P > Chi^2		0.000	0.000	0.000	0.000

Panel B. Effects of the Code on investor pool and investments (TEPR)

Stage	1st	2nd	3rd	3rd	3rd
	TEPR	*LTINV*	*INTGBLINV*	*TGBLINV*	*TOTALINV*
	(1)	(2)	(3)	(4)	(5)
POSTMAIN	0.040 ***				
	(3.015)				
TEPR		1.815 ***			
		(2.613)			
LTINV			0.775 ***	0.039	0.832 ***
			(2.940)	(0.442)	(2.887)
Control	YES	YES	YES	YES	YES
Firm Fix	YES	YES	YES	YES	YES
Year Fix	YES	YES	YES	YES	YES
Observations	1,200	1,200	1,200	1,200	1,200
Adjusted R^2	0.758				
Chi^2		95.073	155.843	192.004	174.962
P > Chi^2		0.000	0.000	0.000	0.000

This table reports the results of analyzing the effect of the Corporate Governance Code (2010) on investments in tangible and intangible capital (*INTGBLINV, TGBLINV*, and *TOTALINV*) through external monitoring of investors (*LTINV*). Panel A (B) shows the effects of the reporting mandate on *MEPR* (*TEPR*), the effects of the increase in *MEPR* (*TEPR*) on the proportion of long-term investors *LTINV*, and the effects of the increase in long-term investors on investments. *POSTMAIN* is an interaction between an indicator for the post-

treatment period (*POST*) and an indicator for the treatment group (*MAIN*). *MEPR* is the proportion of performance measures other than earnings and variants of earnings. *TEPR* is the proportion of themes in annual reports that describe operational and strategic aspects of value creation. *LTINV* represents the proportion of quasi-indexers and dedicated investors based on Bushee and Noe's (2000) approach to classifying investment style. All regressions include the following control variables: *SIZE*, *LEV*, *CASH, LOSS*, *Q*, *AGE, ROA*, and *RAISE*. Z-statistics, shown in parentheses, are based on robust standard errors clustered at the firm level. ∗∗∗, ∗∗, and ∗ indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 2.6 Pay Sensitivity to Earnings (PSE)

	COMP				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
TSR	0.148 ***	0.046			0.039
	(3.510)	(0.817)			(0.700)
*TSR*MEPR*		0.407 *			0.416 *
		(1.775)			(1.676)
EBIT (β_3)			0.003 *	0.008 ***	0.008 ***
			(1.701)	(2.779)	(2.787)
*EBIT*MEPR (β_4)*				-0.013 ***	-0.012 ***
				(-2.641)	(-2.605)
MEPR		-0.305		-0.159	-0.186
		(-1.151)		(-0.608)	(-0.714)
Control	YES	YES	YES	YES	YES
CEO Fix	YES	YES	YES	YES	YES
Year Fix	YES	YES	YES	YES	YES
Observations	1,200	1,200	1,200	1,200	1,200
Adjusted R^2	0.828	0.829	0.828	0.829	0.831

This table reports the results of analysis of pay sensitivity to earnings performance. The outcome variable is the natural log of CEO compensation (*COMP*). *TSR* is the one-year shareholder return, and *EBIT* is earnings before interest and tax divided by 1,000. *TSR* and *EBIT* are interacted with *MEPR*. CEO fixed effects are included in this analysis, rather than firm-fixed effects. All regressions include the following control variables: *SIZE*, *LEV*, and *LOSS*. Z-statistics, shown in parentheses, are based on robust standard errors clustered at the CEO level. ∗∗∗, ∗∗, and ∗ indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 2.7 Internal Channel Analysis

Stage	1st PSE (1)	2nd INTGBLINV (2)	2nd TGBLINV (3)	2nd TOTALINV (4)
POSTMAIN	-0.125 ***			
	(-5.653)			
PSE		-0.449 ***	-0.022	-0.482 ***
		(-3.134)	(-0.445)	(-3.088)
Control	YES	YES	YES	YES
Firm Fix	YES	YES	YES	YES
Year Fix	YES	YES	YES	YES
Observations	1,200	1,200	1,200	1,200
Adjusted R^2	0.634			
Chi^2		163.167	55.587	157.021
$P > Chi^2$		0.000	0.000	0.000

This table reports the results of analyzing the effects of the Corporate Governance Code (2010) on pay sensitivity to earnings (*PSE*) and subsequent effects on tangible and intangible investments (*INTGBLINV, TGBLINV* and *TOTALINV*). *PSE* is calculated as $\beta_3 + \beta_4$ *EPR* from Table 2.6. As *PSE* reflects EPR, analysis of the internal channel does not include a regression for the effect of the reporting mandate on *EPR*. All regressions include the following control variables: *SIZE*, *LEV*, *CASH, LOSS*, *Q*, *AGE*, and *RAISE*. Z-statistics, shown in parentheses, are based on robust standard errors clustered at the firm level. ∗∗∗, ∗∗, and ∗ indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 2.8 Matching Analysis

Panel A. Covariate Balance Before and After Matching

	Before Matching			After Matching		
	MM	**AIM**	**Difference**	**MM**	**AIM**	**Difference**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
SIZE	13.741	9.801	3.940 ***	12.830	11.669	1.161
Q	2.266	3.165	-0.899 ***	1.938	1.806	0.132
LEV	0.241	0.153	0.089 ***	0.165	0.169	-0.005
CASH	0.092	0.200	-0.108 ***	0.101	0.104	-0.003
LOSS	0.097	0.467	-0.370 ***	0.133	0.170	-0.037
AGE	14.723	8.371	6.352 ***	12.350	11.730	0.620
RAISE	0.763	0.607	0.157 ***	0.783	0.545	0.239
ROA	0.105	-0.126	0.231 ***	0.079	0.053	0.025
Observations	600	600		120	156	

Panel B. Matched Sample DiD

	Without CEM weightings			With CEM weightings		
	INTGBLINV	*TGBLINV*	*TOTALINV*	*INTGBLINV*	*TGBLINV*	*TOTALINV*
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
POSTMAIN	0.095 ***	0.001	0.093 ***	0.091 *	0.011	0.097 **
	(3.233)	(0.085)	(3.244)	(1.880)	(1.194)	(2.208)
Control	YES	YES	YES	YES	YES	YES
Firm Fix	YES	YES	YES	YES	YES	YES
Year Fix	YES	YES	YES	YES	YES	YES
Observations	276	276	276	276	276	276
Adjusted R^2	0.173	0.139	0.191	0.218	0.289	0.264

This table reports the results of a matching analysis. Panel A reports the covariate balance between MM and AIM before and after coarsened exact matching, which eliminates observations outside the common support of the two groups' covariate distribution, and calculates weightings that balance the covariates of the remaining observations. Panel B reports the results of analyzing the effect of the Corporate Governance Code (2010) on *INTGBLINV*, *TGBLINV*, and *TOTALINV* using standard DiD regression. *POSTMAIN* is an interaction between an indicator for the post-treatment period (*POST*) and an indicator for the treatment group (*MAIN*). All regressions include the following control variables: *SIZE, LEV, CASH, LOSS, Q, AGE, ROA*, and *RAISE*. Z-statistics, shown in parentheses, are based on robust standard errors clustered at the firm level. ∗∗∗, ∗∗, and ∗ indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 2.9 Alternative Control Group

	INTGBLINV	TGBLINV	TOTALINV
	(1)	(2)	(3)
POST*ALTTRT	0.024 *	0.005	0.029 **
	(1.721)	(0.912)	(1.856)
Control	YES	YES	YES
Firm Fix	YES	YES	YES
Year Fix	YES	YES	YES
Observations	600	600	600
Adjusted R^2	0.627	0.793	0.648

This table reports the result of analyzing the effects of the Corporate Governance Code (2010) on investments (*INTGBLINV, TGBLINV, TOTALINV*), using an alternative control group with a subsample of MM firms with high levels of *TEPR* prior to the reporting mandate. I divide MM firms into two groups by median value of average *TEPR* in the pre-treatment period, and use the group with higher EPR as a control group. *ALTTRT* is an indicator of firms with lower levels of EPR in the pre-treatment period. All regressions include the following control variables: *SIZE, LEV, CASH, LOSS, Q, AGE, ROA*, and *RAISE*. Z-statistics, shown in parentheses, are based on robust standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10%x levels (two-tailed), respectively.

Table 2.10 Effects on Individual Topics

Ranking	EPR	Topic	β_1	Z-value
1	1	Strategy	0.017	2.570
2	1	Health, Safety, Environment	0.013	1.846
3	1	Production	0.008	1.341
4	1	Progress	0.008	0.865
5	1	Oil & Gas	0.006	1.437
6	1	Contract	0.005	1.282
7	1	Healthcare	0.004	1.198
8	0	Board	0.003	2.405
9	1	Marketing	0.003	0.753
10	0	Audit	0.003	1.788
11	0	Executive Compensation	0.001	0.981
12	0	Accounting	-0.001	-1.779
13	1	Mining	-0.002	-0.155
14	0	Director	-0.002	-1.498
15	0	Financial Performance	-0.004	-0.647
16	0	Annual General Meeting	-0.005	-1.869
17	1	Technology	-0.006	-0.966
18	0	Financial Statement	-0.010	-1.540
19	0	Risk	-0.016	-2.958
20	0	Borrowing	-0.024	-5.151

This table shows the ranking of the reporting mandate's estimated treatment effects on individual topics. The estimates are the results of the regression: $Topic_{ikt} = \beta_0 + \beta_1 POSTMAIN_{it} + \gamma' X_{it} + \alpha_i + \alpha_t + \varepsilon_{it}$. $Topic_k$ is the proportion of topic k in the annual report. *POSTMAIN* is an interaction between an indicator for the post-treatment period (*POST*) and an indicator for the treatment group (*MAIN*). All regressions include the following control variables: *SIZE*, *LEV*, *CASH, LOSS*, *Q*, *AGE*, *ROA*, and *RAISE*. Z-statistics are provided and calculated based on robust standard errors clustered at the firm level. ∗∗∗, ∗∗, and ∗ indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 2.11 Word Intrusion

		(1)	(2)	(3)	(4)	(5)
No. of topics		20	30	40	50	60
Accuracy (%)	Coder 1	90	83.3	92.5	88	81.6
	Coder 2	95	86.6	90.0	94	88.3
	Coder 3	90	86.6	92.5	86	85.0
	Average	**92**	**85.5**	**91.6**	**89**	**85.0**
Rank	Coder 1	2	4	1	3	5
	Coder 2	1	5	3	2	4
	Coder 3	2	3	1	4	5
	Average	**1.6**	**4**	**1.6**	**3**	**4.6**

This table shows the result of word intrusion task in which three independent readers review five topic models with 10-topic increments ranging from 20 to 60 topics. For each topic, the task provides the reviewers with six keywords - top five keywords of the topic and an intruder word that is unlikely to appear in that topic but frequently appear in another topic. The reviewers are asked to identify the intruder word. The table provides the accuracy and the rank across model within coder.

Chapter 3: Relative Emphasis on Accruals and Cash Flows in Performance Commentary

3.1 Introduction

I study the relative emphasis on cash flows and accruals-based (earnings) performance measures in management communications with investors, and the consequences for market pricing. Theory and evidence highlight the relative and incremental importance of accrual accounting for evaluating and predicting operating performance when cash flows face timing and mismatching problems (Dechow 1994; Dechow et al. 1998; Bushman et al 2016; Nallareddy et al. 2020). Nevertheless, the impact of accruals is not universally positive. For example, evidence reveals that non-working capital accruals are often far from addressing mismatching problems and that the incremental ability of non-working capital accruals in predicting future performance is weak (Lev et al 2010; Nallareddy et al 2020). In addition, research and development (R&D) reduces the predictive ability of earnings due to lower matching (Lev and Zarowin 1999; Bushman et al. 2016). Further, cash flow information is particularly important to stakeholders with high short-term liabilities (Beaver 1966; Gombola et al. 1987). A notable feature of work to date in this area is the exclusive focus on financial statement information. How management discuss and emphasize accruals and cash flow information in their communications with investors remains unexplored despite research showing that management commentaries are incrementally relevant (Huang et al. 2014; Allee et al. 2015).

I argue that in a similar way to accrual accounting, management commentary may either provide useful information on periodic performance or obscure economic reality. On the one hand, managers can report informatively by giving more emphasis to accrual-based (cash flow) measures when earnings (cash flow) provide a more reliable signal of periodic returns and future performance. For example, managers of businesses with a long operating cycle can elect to emphasize earnings performance to alleviate mismatching problems of cash flows, whereas management commentary for early-stage R&D-intensives or firms with high liabilities can place more emphasis on cash flows to help stakeholders evaluate the entity's ability to repay debt. On the other hand, managers can use performance commentary opportunistically to obfuscate (Li 2008; Huang et al. 2014) and management stakeholder perceptions, which might include giving relatively more (less) weight to accrual-based metrics when the earnings signal is more (less) favorable.

To examine how cash flow and accrual-based measures feature in performance commentary, I construct a measure of managers' relative emphasis on accruals (REA) in discourse accompanying results announcements. Using a self-constructed dictionary of performance measures, I count the incidence of cash flow and earnings (accrual-based) metrics in conference call transcripts of S&P 500 firms. I split the performance metrics into three groups based on the amount of accruals content. The three groups are (1) cash flows (*ACC0*), (2) earnings with working capital accruals (*ACC1*), and (3) earnings with both working and non-working capital accruals operating accruals (*ACC2*). I count the number of measures for each class and assign weights of zero to *ACC0*, one to *ACC1*, and two to *ACC2* to estimate the relative emphasis placed on accruals information in management commentaries.

I then examine REA conditional on managers' reporting incentives (obfuscation hypothesis) and the ability of accruals to overcome mismatching problems in cash flows (informative reporting hypothesis). I find that REA associates positively with operating cycle and the change in non-cash working capital, and negatively with intangible intensity and short-term liabilities. These findings support the informative reporting hypothesis. However, I also find evidence that REA reflects managerial obfuscation incentives. Specifically, REA is correlates positively with earnings and negatively with losses and operating cash flows, consistent with managers emphasizing measures that give a favorable impression and deemphasizing metrics that create unfavorable impression. I also find that such commentaries are not informative about future performance, insofar as a lower emphasis on earnings (cash flows) does not predict a future decrease in earnings (cash flows). These results support the obfuscation hypothesis. Like accruals, therefore, REA reflects two conflicting, non-mutually exclusive effects. However, I find that the explanatory power of the informative reporting hypothesis is significantly higher than the obfuscation hypothesis in the cross-section. Following Lindeman, Merenda, and Gold (1980), I calculate the relative importance of regressors and find that regressors proxying for informative reporting explain 44 percent of the adjusted R-square compared with 13 percent for obfuscation proxies. My results suggest that the first order effect of REA is the provision of useful information.

Next I examine the association between REA, future performance, and market pricing. I decompose REA into informative and obfuscation components and then test the effects of obfuscating component. I define the obfuscation component of REA as the absolute value of the residual from a regression of REA on proxies for informative

reporting (|*AREA*/). I use the absolute value of the residual because both positive and negative residuals imply abnormally high (low) and low (high) emphasis on earnings (cash flows). I find that the obfuscation component in management commentary that reflects unusual emphasis on earnings metrics associates with weaker future earnings performance, as evidenced by a negative association between |*AREA*| and one- through four-quarter-ahead operating profit. Robustness tests reveal that results are not a consequence of measurement error in the residual-based proxy for the obfuscation component of *REA*.

Finally, I test whether investors incorporate the negative implications of |*AREA*/ into stock prices. I find no association between |*AREA*/ and three-day abnormal returns following the date of the conference call. I also find |*AREA*/ has no predictive ability for abnormal returns in the three quarters following the call. However, |*AREA*/ loads negatively for returns in quarters four through eight and its explanatory power *increases* over time. This result contrasts with earnings surprises whose predictive ability to explain abnormal returns *decreases* over the same period. Further analysis reveals that |*AREA*/ generates post-earnings announcement drift (PEAD) that is incremental to PEAD from unexpected earnings. I find that the positive (negative) drift associated with a positive (negative) earnings surprise is dampened or even reversed over time among firms with high (low) |*AREA*|. The result suggests that |*AREA*| is an economically significant factor generating PEAD that is not attributable to the earnings surprise.

I conduct a series of additional tests to assess the robustness of my conclusions. First, I examine whether abnormal emphasis on accruals and cash flows affects sophisticated investors by analyzing the accuracy and dispersion of analyst forecasts for the subsequent one to four quarters following the earnings conference call. I find that

|*AREA*| is associated with significantly higher forecast error and dispersion, suggesting that even sophisticated investors are influenced by abnormal component in management commentaries on periodic performance. Second, I construct an alternative measure of *REA* that assigns a higher weight to performance measures mentioned earlier in the conference call. Results replicate those in my main analyses.

Collectively, my findings suggest that management discussions of accruals and cash flows provide useful information to capital market participants, and that abnormal emphasis on earnings-based metrics signals poor future performance. Investors, however, do not appear to incorporate information contained in the abnormal relative emphasis signal in a timely manner. These results make several contributions to prior research. My study extends research on the different roles and relative importance of accruals and cash flows (Dechow 1994; Barth et al. 1999; Subramanyam and Venkatachalam 2007; Ball et al. 2016). Extant work focuses exclusively on financial statement values and ignores how managers present different aspects of performance in their communications with investors. I fill this gap by constructing a new measure of managers' relative emphasis on accruals and cash flows in their performance commentary, which I then use to study the determinants and capital market effects of this relative emphasis.

I also investigate an underexplored technique that managers may use in their commentaries to manipulate investor perception. Previous research shows that firms strategically emphasize non-GAAP and GAAP measures to influence investor perception (Bowen, Davis, and Matsumoto 2005; Marques 2010; Chen et al. 2021). This has prompted policymakers and researchers to issue guidance and impose reporting requirements for non-GAAP measures to counteract potential manipulation. For instance, Regulation G Item

10(e) and Compliance and Disclosure Interpretations (2016) mandate clear labeling of GAAP and non-GAAP measures, equal representation of both, and clear reconciliation. I investigate a complementary but under-researched technique that managers may use in their commentaries to influence investor perceptions. I find that managers use their commentaries on earnings and cash flows to steer investor attention toward certain performance outcomes and away from others, and that this strategy is partially effective. Insights derived from my research will be valuable to market participants and regulators.

I also provide new evidence on post-earnings announcement drift. Previous studies investigate various factors that influence PEAD for earnings surprises including information uncertainty (Callen et al. 2013; Ayers et al. 2011; Francis et al. 2007), the role of institutional investors (Bartov et al. 2000; Shu 2013; Ke and Ramalingegowda 2013), trading frictions (Ng et al. 2008; Chen et al. 2017), and bias in earnings forecast (Mendenhall 1991; Mikhail et al 2003). My research discovers a new factor in the form of abnormal relative emphasis on accruals that generates PEAD. This factor is economically significant to the extent that it can reverse the direction of the earnings surprise PEAD, causing a downward drift in stocks with a positive earnings surprise and an upward drift in stocks with a negative earnings surprise.

3.2 Related Literature and Hypotheses

An extensive stream of literature shows that earnings conference calls are a useful source of information. Frankel et al. (1999) argue that "conference calls, being less formal than written press releases, are subject to a lower standard of legal liability than statements made during press releases." They find that managers provide information beyond what

they disclose in a press release, making the call incrementally more informative. Bowen et al. (2002) find that conference calls increase the amount of public information available to analysts, improving their earnings forecast accuracy. Kimbrough (2005) finds that the initiation of conference calls is negatively associated with post-earnings announcement drift, which implies that conference calls improve the efficiency of the market. Using intraday trading data, Matsumoto et al. (2011) find that the earnings conference call provides incremental information content over the accompanying press release. A survey of Investor Relations officers by Brown et al. (2019) indicates that conference calls are the most important venue for management to deliver their message to investors.

Some studies exploit textual analysis to deepen our understanding of the relevance of earnings conference call. A strand of research in this literature measures linguistic tone and examines the informativeness and obfuscation in the management commentary section of the conference call (Price et al. 2012; Allee and DeAngelis 2015). Price et al. (2012) show that linguistic tone in earnings calls is a significant predictor of market reaction and trading volume around the conference call date. Using intraday trading data, Mayew et al (2020) also report that stock prices immediately respond to analysts' linguistic tone and managers' voice pitch during conference calls. Firms also manage the linguistic tone of their management presentation to manage investor perceptions (Allee and DeAngelis 2015; Blau et al. 2015). Allee and DeAngelis (2015) predict and find that management increase the dispersion of positive tone and decrease the dispersion of negative tone to manage investor perceptions. Blau et al. (2015) find that short-sellers are better than naïve investors at interpreting unusually positive tone in management commentaries.

Researchers also measure linguistic complexity during earnings conference call to examine managerial incentives to obfuscate (Burgoon et al. 2016; Brochet et al. 2016; Bushee et al. 2018). Burgoon et al. (2016) show that fraudulent management remarks are characterized by more linguistic complexity. Consistent with this notion, Allee and DeAngelis (2015) document that analyst optimism is lower when the complexity during earnings conference call is higher, and Brochet et al. (2016) find that firms with greater linguistic complexity experience lower trading volume and price movements following their conference call. However, Bushee et al. (2018) predict and find that complexity reflects both informative and obfuscation component.

Research also examines the effects of other linguistic features in earnings conference call. Larcker and Zakolyukina (2012) develop a list of keywords to predict deceptive management commentaries. Brochet et al. (2015) use a keyword analysis to measure management time horizon, examining the association between their text-based horizon and managerial myopia. Lee (2016) demonstrates that managers who stick to a prepared script during Q&A sessions of the conference call experience negative market reactions. Allee et al. (2021) find that firms facing high product market competition use more uncertain language while Fei et al. (2023) show that credit suppliers provide less credit to managers who use more uncertain language. Rennekamp et al. (2022) find that conversational engagement between managers and analysts in earnings calls, measured by similarity in the use of function words, is informative to market participants.

Prior research on earnings and cash flows focuses mainly on financial statement numbers despite research demonstrating that textual data from earnings conference calls is valuable in revealing managerial incentives and explaining future performance and capital

market effects. In a departure from extant research, I measure references to earnings and cash flows in conference call presentations and test if the relative emphasis on earnings metrics over cash flow measures provides incremental information on firm performance or serves to obscure economic reality.

Research shows that the smoothing property of accruals makes earnings a less noisy performance measure of periodic performance than cash flows, particularly when cash flows suffer from timing and mismatching problems (Dechow 1994; Dechow et al. 1998; Bushman et al. 2016; Nallareddy et al. 2020). Dechow (1994) shows that accruals mitigate the noise in cash flows arising from long-term operating cycles. Growth in non-cash working capital such as increases in inventory due to inventory purchase or a rise in accounts receivable due to delayed payments, generates fluctuations in cash flows while earnings remain unaffected (Bushman et al. 2016; Nallareddy et al. 2020). Therefore, a higher degree of emphasis on accrual-based measures in conference call presentations by management is expected when cash flow measures suffer mismatching problems.

The impact of accruals is not universally positive, however. Accounting rules such as expensing intangible investments and similar forms of unconditional conservatism restrict ability of earnings to address timing and mismatching problems relative to cash flows (Ball and Shivakumar 2006; Nallareddy et al 2020). Further, pure cash flow performance is relevant for stakeholders of high-leverage firms as it helps investors evaluate firms' ability to pay debts (Hayn 1995; Franzen and Radhakrishnan 2009). Therefore, a lower degree of emphasis on earnings measures is expected among firms with high R&D intensity or high short-term liabilities. These arguments lead to the informative

reporting perspective on the relative emphasis that management place on accruals versus cash flow in their conference call discussions of periodic performance:

H1:   The relative emphasis on accruals over cash flows in earning call presentations is positively associated with operating cycle and growth in non-cash working capital, and negatively associated with intangible intensity and short-term liabilities.

Contrary to H1, research also shows that managers have strong incentives to adjust earnings or otherwise influence investor expectations because they are penalized for missing analyst forecasts (Dechow and Skinner 2000; Bartov et al. 2001; Bhojraj et al. 2009; Doyle et al. 2013). Similarly, studies demonstrate that managers use performance narratives to highlight favorable measures and downplay unfavorable measures. For example, Li (2008) and Huang et al. (2014) find that managers adjust the tone and readability of their performance commentaries to obfuscate poor performance. A stream of research also shows that managers strategically emphasize non-GAAP and GAAP measures to influence investor perceptions (Bowen, Davis, and Matsumoto 2005; Marques 2010; Chen et al. 2021). I therefore propose and test the obfuscation hypothesis that predicts managers adjust their emphasis on performance measures opportunistically to manage investor perceptions.

H2:   Relative emphasis on accruals is positively associated with earnings performance, and negatively associated with cash flow performance and negative earnings surprises.

3.3 Research Design, Sample, and Data

3.3.1 Measuring Relative Emphasis on Accruals

I measure the relative emphasis given by management to accruals information by extracting performance measures from the management presentation section of earning conference calls. I focus on the presentation session because it is scripted by management and therefore provides direct insight into their reporting incentives and intentions. In contrast, the agenda in the Q&A section of the conference call is set by analysts and reflects their efforts to clarify understanding and acquire additional information. I use a self-constructed dictionary to extract performance measures. I build my dictionary of performance measures by generating unigrams, bigrams, trigrams, and quad-grams appearing in more than 100 earnings call transcripts in my sample, and then I manually curate the list to identify performance metrics related to earnings and cash flow measures.

I categorize performance metrics into the following three groups based on the level and type of accrual adjustments: (1) cash flows (ACC0), (2) earnings with working capital accruals (ACC1), and (3) earnings with both working and non-working capital accruals (ACC2). Examples of ACC1 include revenues and gross profit, while ACC2 includes operating profit, profit before/after tax, and earnings per share. A detailed list of performance measures for each group is available in Appendix 3.1. I divide earnings measures into two categories (ACC1 and ACC2) because measures below gross profit such as operating profit and net income contain a non-working capital accrual component, such as impairment and fair value adjustment. Non-working capital accruals provide limited contribution to addressing mismatching problems of cash flows and the prediction of future

performance (Lev et al. 2010; Nallareddy et al 2020). In addition, conservative accounting rules for R&D expenditure reduce the predictive ability of operating profits and EPS (Lev and Zarowin 1999; Bushman et al. 2016), leading R&D intensive firms (with high employee training, marketing, and R&D activities) to emphasize revenues and gross margin (Xu and Cai 2016). Assigning equal weight to ACC1 and ACC2 therefore makes it difficult to detect the incentives of R&D intensive firms.

To calculate the relative emphasis on accruals in performance commentary, I count the number of performance measures in each performance measure class, assign weights of zero to *ACC0*, one to *ACC1*, and two to *ACC2*, and then calculate a weighted average measure of the relative emphasis on accruals (REA):

$$REA_{it} = \frac{1 \times \sum ACC1_{it} + 2 \times \sum ACC2_{it}}{\sum ACC0_{it} + \sum ACC1_{it} + \sum ACC2_{it}}$$

I use regular expressions to count the number of performance measures by class. For example, 'gross profit margin' is working capital level item (ACC1) but it can be miscounted by a keyword search of 'profit margin' when I count profit margin (ACC2). I therefore use a regex that does not allow the word 'gross' to appear ahead of 'profit margin' when I count metrics for ACC2 that include both working and non-working capital accruals. The regex approach also captures variation in the names that management assign to the same construct such as cash flow from operations, cash flow from operating activities, and cash generated from operations.

I exclude the following types of performance metrics from my analysis: cash flows from financing and investing activities, non-cash stock items (such as inventory, accounts

receivable, payables, and property, plant, and equipment), and expenses (including administrative costs, advertising costs, research and development costs, and other gains and losses). I omit these measures for the following reasons. I exclude cash flows from non-operating activities as they do not provide information about current operational performance. I exclude non-cash stock measures because it is difficult to determine whether discussions of items such as inventory reflect a greater or lesser emphasis on earnings. Discussion of stock measures is also less likely to summarize periodic performance. I exclude expenses because they are less representative of current periodic performance compared to operating cash flows or earnings measures. Specifically, while management highlight R&D costs to provide insight into future growth, they do not use R&D expenditure as a proxy for contemporaneous earnings performance. Similarly, other gains and losses are not typically the focus of periodic performance.

3.3.2 Sample and Data

I use a sample of S&P 500 firms between 2002 and 2019. I exclude financial firms due to the idiosyncratic nature of their accruals and cash flow process. I use quarterly earnings conference call transcripts as my text source as they provide more timely information than annual report commentary and therefore are more appropriate for my market-based tests. I obtain earnings conference call transcripts from Refinitiv Eikon and extract managers' prepared remarks using a python script. As common text preprocessing such as removing stop words and stemming makes keyword search more complicated (e.g., earnings per share becoming earn share), I do not apply any text processing. I exclude transcripts where prepared remarks comprise fewer than 500 letters. I collect accounting

variables from Compustat, analysts' forecasts from I/B/E/S, and stock prices and returns from CRSP.

My sample consists of 477 unique firms and 11,370 firm-quarters after accounting for missing transcript and financial data. Panel A of Table 3.1 summarizes the sample selection process, while Panel B shows SIC industry division. The industry distribution of my sample is comparable to S&P 500 population excluding financial firms as the differences in percentage of each industry in my sample and S&P 500 are within two percentage points. Table 3.2 provides descriptive statistics for the dependent, independent, and control variables. By definition, the range of REA is from 0 to 2, with a higher value indicating more emphasis on accruals-based measures. The mean and median value of *REA* are respectively 1.361 and 1.342. Even firms at the fifth percentile have an *REA* of 0.952. It implies that firms on average mention accruals-based measures more frequently than cash flow measures. The sample firms are established firms with a relatively long history of business operation. The mean logarithm firm age (*AGE*) is 3.306, which corresponds to 36 years. The mean logarithm value of following analysts (*NUMEST*) is 2.786, with a raw value is 16.884. This suggests that sample firms are of interests to many investors and serve as a suitable sample for examining market reactions. Consistent with prior research reporting sentiment bias in management commentaries (Huang et al. 2014; Chou et al. 2018), the mean of *Tone* (0.347) suggests a positive bias. Appendix 3.1 provides the definitions of the variables.

[Insert Table 3.1 about here]

3.4 Results for the Informative Reporting and Obfuscation Hypotheses

3.4.1 Determinants of Relative Emphasis on Accruals

The first step of my analysis examines whether management commentaries on accruals and cash flows reflect provision of useful information (H1) or attempts at obfuscation (H2). I estimate the following equation with standard errors clustered by firm and quarter.

$$REA_{it} = \beta_0 + \beta_1\,INTGBL_{it} + \beta_2\,OPCYCLE_{it} + \beta_3\,NCWC_{it} + \beta_4\,INVCRNT_{it} + \beta_6\,NI_{it}$$

$$+\ \beta_7\,CFO_{it} + \beta_8\,\Delta NI_{it+1} + \beta_9\,\Delta CFO_{it+1} + \beta_5\,MISS_{it} + \beta_4\,LOSS_{it} + \beta_{10}$$

$$LOSS{\times}MISS_{it} + \beta_{10}\,SIZE_{it} + \beta_{11}\,SEG_{it} + \varepsilon_{it} \qquad (3.1)$$

REA_{it} is relative emphasis on accruals-based performance in the earnings call transcript of firm i in quarter t. I test the informative reporting hypothesis (H1) using intangible intensity (*INTGBL*), operating cycle (*OPCYCLE*), growth in non-cash working capital (*NCWC*), and the inverse value of current ratio (*INVCRNT*). H1 predicts a positive association between *REA* and *OPCYCLE* and *NCWC* as earnings information helps to address the mismatching problems of cash flow information for firms with a long operating cycle (Dechow 1994; Bushman et al. 2016) and high growth in non-cash working capital (Bushman et al. 2016; Nallareddy et al. 2020), respectively. On the other hand, H1 predicts a negative association between *REA* and *INTGBL* as research and development (R&D) reduces the predictive ability of earnings (Ball and Shivakumar 2006; Bushman et al. 2016), and also between *REA* and *INVCRNT* as cash flow information acquires greater relevance for stakeholders of firms with liquidity issues (Hayn 1995; Franzen and Radhakrishnan 2009).

I test the managerial obfuscation hypothesis (H2) using income before extraordinary items (NI_t) and operating cash flow (OCF_t) for the current quarter, the difference between one-quarter ahead and current income before extraordinary items (ΔNI_{t+1}), the comparable first-difference in operating cash flow (ΔOCF_{t+1}), and an indicator for firms that miss their earnings performance target (*MISS*). I predict *REA* is correlates positively with IB_t and ΔIB_{t+1}, and negatively with OCF_t and ΔOCF_{t+1} as firms may opportunistically adjust their commentaries to manage investor perceptions (Li 2008; Huang et al. 2014) and emphasize specific information to steer attention towards favorable news and away from less favorable information (Bowen, Davis, and Matsumoto 2005; Marques 2010). I also predict a negative association between *REA* and *MISS* as managers have incentives to move investors' attention away from unfavorable news evidenced by earnings performance lower than analyst forecast (Dechow and Skinner 2000; Bartov et al. 2001; Bhojraj et al. 2009).

While equation (3.1) includes an indicator of loss-making quarters (*LOSS*) as a control variable, it is important to highlight that a negative association between *REA* and *LOSS* does not necessarily support H2 as this relation may reflect informative reporting. Specifically, loss-making firms may reduce *REA* because losses are less informative for valuation than profits (Dopuch et al. 2010) and because cash flow information is of particular interest to investors of firms with weak financial health (DeFond and Hung 2003). I therefore include the interaction between *LOSS* and *MISS* (*LOSS×MISS*) to help disentangle informative reporting and obfuscation incentives associated with losses. The obfuscation hypothesis predicts that loss firms that also miss their earnings target will

reduce *REA* more than those that meet the target. I therefore interpret a negative coefficient

estimate on *LOSS×MISS* as evidence supporting H2.

Regression (3.1) includes firm size (*SIZE*) and the number of business segments

(*SEG*) to control for the effects of business complexity on management commentaries

(Huang et al. 2014). As firms often report their segment-level performance and there are

more earnings-related metrics than cash flow metrics to report, I predict that *SIZE* and *SEG*

correlate positively with *REA*. The model includes quarter-fixed effects to address time-

specific effects on management commentaries. Conversely, I do not include firm- or

industry-fixed effects in the main model as the degree of within variation for operating

cycle and intangible intensity is small (i.e., relatively large between variations), creating a

risk that their explanatory power will be subsumed by industry or firm-fixed effects. I

estimate regression 3.1 using OLS with standard errors robust to heteroskedasticity and

clustering on firm and quarter.

Table 3.3 presents results for equation (3.1). Columns (1) and (2) test H1 and H2,

respectively. In column (1), the coefficient estimates for *OPCYCLE* and *NCWC* are 0.005

and 0.390, respectively. The effects are statistically significant. A one standard deviation

increase in *OPCYCLE* (*NCWC*) is corresponds to a 0.07 (0.03) standard deviation increase

in *REA*.[21] Results suggest that firms with a longer operating cycle and a larger change in

non-cash working capital give more relative emphasis to accruals when describing periodic

performance because cash flows suffer timing and mismatching problems. Meanwhile,

INTGBL and *INVCRNT* load negatively as H1 predicts. A one standard deviation increase

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[21] This interpretation is equivalent to the standardized beta coefficient, which is widely used as a measure
of relative importance of independent variables.

in *INTGBL* (*INVCRNT*) corresponds to a 0.17 (0.10) standard deviation decrease in *REA*. Firms with high intangible intensity place lower relative emphasis on earnings as non-timing-related accruals generated from R&D activities make earnings information a less reliable indicator of periodic performance. Firms with higher *INVCRNT* exhibit lower *REA* as they have a large amount of short-term debt to repay and therefore need to discuss their cash flows. Collectively, results in column (1) suggest that managers emphasize accruals and cash flows in a way that provides valuable insights for investors, as predicted by H1.

The coefficient on *MISS* in column (2) of Table 3.3 is 0.011 and indistinguishable from zero. This result does not support the obfuscation hypothesis (H2) as firms that miss their earnings target do not necessarily reduce their focus on earnings performance. However, the coefficient estimates on *LOSS* and *MISS*×*LOSS* are negative and significant. While loss-making firms that meet their earnings target reduce *REA* by 0.078, firms that report losses *and* fail to achieve their earnings targets reduce *REA* by 0.12 (-0.078 − 0.043). Results indicate that a lower relative emphasis on earnings among loss-making firms that also miss their earnings target reflects obfuscation behavior. While the sum of coefficient on *MISS* and *MISS*x*LOSS* is negative with the value of -0.032 (0.011 – 0.043), it is statistically insignificant. It implies that *REA* is unrelated to negative earnings surprises regardless of whether it is accompanied by positive or negative earnings.

The positive coefficients of 1.563 and 1.000 for NI_t and ΔNI_{t+1}, respectively, in column (2) support H2. A one standard deviation increase in NI_t results in a 0.11 standard deviation increase in *REA,* while the corresponding increase in ΔNI_{t+1} leads to a 0.07 standard deviation increase in *REA* The negative coefficients estimates on OCF_t and ΔOCF_{t+1} also support H2. The estimates imply that a one standard deviation increase in OCF_t

($ΔOCF_{t+1}$) leads to a 0.20 (0.11) standard deviation decrease in *REA*. The positive associations between *REA* and NI_t and $ΔNI_{t+1}$, and the negative associations between *REA* and OCF_t and $ΔOCF_{t+1}$, reveal that management emphasize favorable (current and future) performance and deemphasize weak information by stressing the metric that offers the more flattering view of performance. Conclusions for H1 and H2 hold in column (3) where the two hypotheses are testing jointly. In contrast to column (1) and (2), both coefficients of -0.039 and 0.004 for *LOSS* and *MISS* are insignificant while the coefficient on *MISS*x*LOSS* is -0.056. The sum of coefficient on *LOSS* and *MISS*x*LOSS* is negative and significant with the value of -0.095 (-0.039 -0.056) and the sum of coefficient on *MISS* and *MISS*x*LOSS* is negative and significant with the value of -0.052 (0.004 – 0.056).[22] It implies that not all firms with a negative earnings or negative earnings surprise opportunistically reduce their emphasis on earnings information, but firms with strong incentives to hide bad news, evidenced by failing to meet the target and making loss at the same time, do so.

To gain a deeper understanding of managers' incentives for obfuscation, I test whether the positive (negative) association between *REA* and one period-ahead quarterly change in income before extraordinary item (operating cash flow) partially reflects incentives to provide useful information about future performance. If managers' choices are informative about future performance, they should place greater emphasis on earnings (cash flows) when the change in future earnings (cash flow) is large, regardless of the sign of the change. To test this corollary, I replace the signed change in earnings and cash flows

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[22] In column (2), the sum of coefficients on *MISS* and *MISS*x*LOSS* is found to be statistically insignificant, whereas in column (3), it is significant. This inconsistence may be attributed to the omission of information hypothesis variables in column (2).

(ΔNI_{t+1} and ΔCFO_{t+1}) with their corresponding absolute values ($ABS\Delta IB$ and $ABS\Delta CFO$). I also construct indicators of a negative change in one-quarter-ahead earnings and cash flows ($NEG\Delta NI_{t+1}$ and $NEG\Delta CFO_{t+1}$) and include the interaction between the negative change indicator and the absolute value of one-quarter-ahead change in earnings and cash flows ($ABS\Delta NI \times NEG\Delta NI_{t+1}$ and $ABS\Delta CFO \times NEG\Delta CFO_{t+1}$). If managers report informatively and symmetrically about future earnings (cash flow) performance, $ABS\Delta IB$ ($ABS\Delta CFO$) will load positively (negatively), while $ABS\Delta IB \times NEG\Delta IB_{t+1}$ ($ABS\Delta CFO \times NEG\Delta CFO_{t+1}$) will not load. Conversely, if managers obfuscate future unfavorable news, then $ABS\Delta IB \times NEG\Delta IB_{t+1}$ ($ABS\Delta CFO \times NEG\Delta CFO_{t+1}$) will load negatively (positively).

The coefficient estimate on $ABS\Delta NI$ in column (4) of Table 3.3 shows the sensitivity of REA to positive one-quarter-ahead change in earnings. The estimate is 0.673 and insignificant. Conversely, the coefficient on $ABS\Delta NI \times NEG\Delta NI_{t+1}$ is -1.896 and significant. The sensitivity to a negative one-quarter-ahead earnings change is -1.222 ($ABS\Delta NI + ABS\Delta NI \times NEG\Delta NI_{t+1}$) and significant. This result implies that REA is not informative about future earnings news generally, and that managers actively seek to distract investors' attention from future bad news (decrease in earnings). Similarly, the coefficient on $ABS\Delta CFO$ is -0.213 but insignificant, while the sum of the estimates on $ABS\Delta CFO$ and $ABS\Delta CFO \times NEG\Delta CFO_{t+1}$ is 1.294 and significant. This implies that managers reduce their emphasis on cash flows in the face of future negative cash flow news (decrease in cash flow); nor do they give relatively more emphasis to cash flow when future cash flows are increasing. Overall, the results suggest that REA in management

presentations is not informative about future earnings and cash flow performance, and further that managers strategically downplay measures with unfavorable future outcomes.

Results in Table 3.3 suggest that *REA* consists of both useful and obfuscation components. I follow Lindemann, Merenda and Gold (1980) and estimate the proportionate contribution that each variable makes to R-squared to assess the relative importance of the informative reporting and obfuscation explanations (Groemping and Matthias 2018). Findings demonstrate that variables associated with H1 (*INTNGBL, OPCYCLE, NCWC* and *INVCRNT*) collectively explain 44.15% (24.78%, 1.66%, 0.51%, and 17.19%, respectively) of the variation in model (3) of Table 3.3. Variables associated with H2 (*MISS, LOSS×MISS*, *IB*, *CFO*, *ΔIB*, and *ΔCFO*) together explain 17.97% (0.01%, 3.95%, 4.19%, 7.04%, 1.09%, and 1.54%, respectively) of the variation in the same model. These findings reveal that informative reporting represents the primary determinant of managers' relative emphasis on accruals-based performance measures in conference call presentations, but that obfuscation behavior aimed at presenting performance in a favorable light is nevertheless material. In the following section, I explore obfuscation behavior more closely by investigating the relation between abnormal *REA* and future poor performance.

[Insert Table 3.3 about here]

3.4.2 Predictiveness of Abnormal Emphasis on Accruals for Future Performance

Findings in the previous section are in line with the view that managers opportunistically emphasize or deemphasize performance measures in certain settings to influence investor perceptions rather than communicate unbiased information about future performance. Specifically, column (4) of Table 3.3 shows that high *REA* does *not* associate

with higher future earnings performance and that low *REA* correlates with lower future earnings performance. Results imply that abnormally low *REA* (less emphasis on earnings) reflects managerial attempts to hide negative news about future earnings, while abnormally high *REA* (greater emphasis on earnings) overstates the usefulness of realized earnings. In both cases, managers attempt to present an upward-biased view of performance. I therefore seek further evidence on the obfuscation hypothesis test by directly testing if *abnormally high and low REA* predict poor future earnings performance.

To examine the effects of abnormal emphasis on earnings and cash flows, I first separate the obfuscation component from informative component embedded in raw *REA* by estimating the following regression model that includes variables from regression (3.1) supporting the informative reporting hypothesis:

$$REA_{it} = \beta_0 + \beta_1\, SIZE_{it} + \beta_2\, SEG_{it} + \beta_3\, INTGBL_{it} + \beta_4\, OPCYCLE_{it} + \beta_4\, NCWC_{it}$$
$$+ \beta_5\, INVCRNT_{it} + \varepsilon_{it} \tag{3.2}$$

I estimate model (3.2) by industry-quarter to obtain the normal level of *REA* (i.e., useful component), with the residual value therefore capturing the abnormal component of *REA* that is unrelated to informative reporting (*AREA*). Since I predict both abnormally high and low emphasis on accruals signal future poor performance, I proceed by taking the absolute value of *AREA* (|*AREA*|). Appendix 3.3 provides average beta coefficient estimates and t-statistics for industry-quarter versions of equation (3.2), together with the proportion

of industry-quarters in which the sign of the coefficient on each covariate is consistent with its corresponding prediction in Table 3.3.[23]

I examine the association between $|AREA|$ and future operating performance using the following model:

$$NI_{it+q} = \beta_0 + \beta_1 |AREA|_{it} + \beta_2 MV_{it} + \beta_3 SEG_{it} + \beta_4 NUMEST_{it} + \beta_5 OPCYCLE_{it} +$$
$$\beta_6 BTM_{it} + \beta_7 MOM_{it} + \beta_8 TACC_{it} + \beta_9 CFO_{it} + \beta_{10} TONE_{it} + \beta_{11} FOG_{it}$$
$$+ \beta_{12} AGE_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it} \qquad (3.3)$$

The dependent variable is either one-quarter-, four-quarter-, or eight-quarter-ahead income before extraordinary item scaled by total assets (NI_{t+1}, NI_{t+4}, or NI_{t+8}). The primary test variable is $|AREA|_t$, which is my proxy for the obfuscation component of REA.[24] All models include quarter and industry fixed effects. Table 3.4 reports results for equation (3.3). While the coefficient estimate on $|AREA|$ is negative in column (1) for one-quarter-ahead income, it is insignificant suggesting that $|AREA|$ does not indicate poor earnings performance in the next quarter. However, the negative association between four-quarter- and eight-quarter-ahead earnings and $|AREA|$ is significant in columns (3) and (5), respectively, indicating that $|AREA|$ predicts weak earnings performance in the longer-term. Results reveal that a one standard deviation increase in $|AREA|$ results in a 0.026 (0.027) standard deviation decrease in earnings in four (eight) quarters ahead.

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[23] Just as popular measures of discretionary accruals are mixture of earnings management and accruals related to normal economic activities and factors unexplained by regression model (Armstrong et al. 2016; Owens et al. 2017), my measurement of abnormal REA may reflect both obfuscation and normal commentaries stemming from economic factors and events not controlled in my regression model. To alleviate the identification problem, I follow Armstrong's et al. (2016) suggestion and supplement my analysis with tests of managerial incentives by focusing on abnormal REA with strong incentives to obfuscate. Section 3.6.3 provides the details of the robustness test.

[24] To control the effects of extreme cases, I also test the association between future earnings and a quintile variable of $|AREA|$ ($Q|AREA|$). Results are robust to this alternative specification.

To examine if the effects of abnormal emphasis on accruals vary by sign (i.e., overemphasis vs. underemphasis), I add the interaction between $|AREA|$ and an indicator for negative $AREA$ ($NEGAREA$) to regression model (3.3). In columns (2), (4), and (6) of Table 3.4, the coefficient on $|AREA|$ (β_1) represents the effects of overemphasis on future earnings while the sum of the coefficients of $|AREA|$ and $|AREA| \times NEGAREA$ ($\beta_1 + \beta_2$) reflects the effect of underemphasis on future earnings. Tests for the significance of $\beta_1 + \beta_2$ are provided at the bottom of the table. The coefficient on $|AREA|$ (β_1) is insignificant in columns (2) and (4) for one quarter to four quarters, whereas β_1 loads negatively in column (6) for quarter eight. Among firms with positive $AREA$, a one standard deviation increases in $|AREA|$ results in a 0.020 standard deviation *decrease* in earnings in eight quarters ahead. The coefficient for $|AREA| \times NEGAREA$ (β_2) is insignificant in column (2), (4) and (6). However, the sum of coefficient $|AREA|$ and $|AREA| \times NEGAREA$ ($\beta_1 + \beta_2$) is consistently significant. For firms with negative $AREA$, a one standard deviation increase in $|AREA|$ associated with a 0.037, 0.044, and 0.036 standard deviation decrease in one-, four-, and eight-quarters-ahead earnings, respectively. Results indicate that underemphasis on accruals ($\beta_1 + \beta_2$) predicts poor earnings performance in both the short-term and longer-term, while overemphasis on accruals (β_1) predicts longer-term poor performance. These results are consistent with findings in column (3) and (4) of Table 3.3 documenting that the positive association between the change in one-quarter-ahead earnings and REA is attributable mainly to earnings declines.

[Insert Table 3.4 about here]

Results in columns (3) and (4) of Table 3.3 suggest that management strategically weight their emphasis on cash flows performance to obfuscate future decreases in cash flow performance. To further investigate this effect, I replace the dependent variable in regression (3.3) with one-quarter-, four-quarters-, or eight-quarters-ahead cash flow from operating activities scaled by total assets (CFO_{t+1}, CFO_{t+4}, or CFO_{t+8}):

$$CFO_{it+q} = \beta_0 + \beta_1 |AREA|_{it} + \beta_2 MV_{it} + \beta_3 SEG_{it} + \beta_4 NUMEST_{it} + \beta_5 OPCYCLE_{it}$$
$$+ \beta_6 BTM_{it} + \beta_7 MOM_{it} + \beta_8 TACC_{it} + \beta_9 NI_{it} + \beta_{10} TONE_{it} + \beta_{11} FOG_{it}$$
$$+ \beta_{12}AGE_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it} \qquad (3.4)$$

Table 3.5 reports results for equation (3.4) with quarter and industry fixed effects. In contrast to Table 3.4 where the negative coefficients for $|AREA|$ become significant for the long-term period, the coefficient estimate on $|AREA|$ in columns (1), (3), and (5) of Table 3.5 consistently insignificant. To examine if the effects of overemphasis and underemphasis on future cash flow differ, I include the interaction between $|AREA|$ and an indicator of positive $AREA$ ($|AREA|\times POSAREA$) in column (2), (4), and (6) of Table 3.5. Note that positive $AREA$ represents *underemphasis* on cash flows. The coefficient on $|AREA|$ captures the effect of overemphasis on cash flow, whereas the sum of the coefficients on $|AREA|$ and $|AREA|\times POSAREA$ represent the effect of underemphasis on cash flows. Tests of significance for the sum of coefficients are provided at the end of the table. The sensitivity of future cash flow from operations to overemphasis on cash flows is consistently insignificant. Results imply that overemphasis on cash flows is unrelated to future cash flows. Conversely, the sensitivity of one-quarter- and eight-quarter-ahead operating cash flow to underemphasis is significant. For firms downplaying cash flow information, a one standard deviation increase in $|AREA|$ implies a 0.020 and 0.021

standard deviation decrease in one- and eight-quarter-ahead operating cash flows, respectively. Findings in Tables 3.4 and 3.5 jointly demonstrate that abnormal relative emphasis on accruals in management conference call presentations predicts poor future performance. Abnormal emphasis on accruals, regardless of the sign, predicts future poor earnings in the long run, while relative *underemphasis* on cash flow predicts weak future cash performance. A robustness test in section 3.6.3 reveals that my inferences are not confounded by measurement errors in the residual-based proxy for the obfuscation component of *REA*.

[Insert Table 3.5 about here]

3.5. Relative Emphasis on Accruals and Mispricing

In this section, I examine whether investors price information about future performance contained in managers' abnormal emphasis on accruals appropriately. As |*AREA*| predicts poor future performance, I expect |*AREA*| will be negatively associated with stock returns during the conference call period if investors impound the signal in a timely manner. However, due to the obfuscating nature of abnormal relative emphasis on accruals, investors may not fully recognize the negative effects of |*AREA*| on future earnings until firms report poor results in the future. I therefore examine whether investors incorporate the negative signal of |*AREA*| into stock prices immediately or whether |*AREA*| explains long-run returns in a similar vein to the accrual anomaly (Sloan 1996), resulting in predictable post-earnings announcement drift (PEAD).

I generate portfolios sorted by |*AREA*| quintile and plot the size-adjusted buy-and-hold abnormal return over time. Figure 3.1 presents the results. Returns for the first and

second |*AREA*| quintile portfolios (e.g., stocks with a low obfuscation component) for the three-day period starting on the conference call date are higher than the returns of the remaining quintiles (e.g., portfolio of stocks with a higher obfuscation component), although the differences are small. Returns for the first two quintile portfolios increase through eight quarters, while returns for the fourth and fifth quintile portfolio slightly increase for the first two quarters and then stagnate or decline afterwards. The positive drift generated by firms with a low obfuscation component suggests that obfuscation is not the only factor generating PEAD. It appears that investors do not differentiate obfuscating commentaries from informative commentaries in the short-run and therefore firms with low |*AREA*| experience positive drift through eight quarters.

[Insert Figure 3.1 about here]

As abnormal emphasis on accruals is predicted to correlate earnings performance, the drift shown in Figure 3.1 may merely reflect PEAD driven by the earnings surprise. I therefore examine if |*AREA*| generates PEAD after controlling for unexpected earnings (*UE*). I generate one-way sorted quintile portfolios based on *UE* and two-way sorted quintile portfolios based on *UE* and |*AREA*|. I then test if |*AREA*|-sorted portfolios in each UE quintile show significant variations. If |*AREA*| does not contribute incremental PEAD, returns for the portfolio comprising the first *UE* quintile and the first |*AREA*| quintile (Q1*UE*_Q1|*AREA*|), as well as the returns for the portfolio comprising the first *UE* quintile and the fifth |*AREA*| quintile (Q1*UE*_Q5|*AREA*|), will be indistinguishable from returns of the first *UE* quintile (Q1*UE*). Similarly, returns for the Q5*UE*_Q1|*AREA*| portfolio and the Q5*UE*_Q5|*AREA*| portfolio will be indistinguishable from Q5*UE* portfolio returns if the |*AREA*| signal is subsumed by *UE* signal.

I plot the buy-and-hold abnormal return for the fifth *UE* quintile portfolio (Q5*UE*) in Panel A of Figure 3.2 for benchmark purposes. I then plot the buy-and-hold abnormal returns for the Q5*UE*_Q1|*AREA*| portfolio and Q5*UE*_Q5|*AREA*| portfolio to examine if |*AREA*| generates variations in buy-and-hold abnormal returns after controlling for *UE*. The abnormal returns for Q5*UE* drift from 0.024 over three trading days to 0.068 over eight quarters. Q5*UE*_Q1|*AREA*| portfolio firms have higher returns than Q5*UE* firms (0.028 over three trading days to 0.105 over eight quarters), while Q5*UE*_Q1|*AREA*| portfolio firms have returns lower than the average for Q5*UE* portfolio firms (0.018 over three-day period to 0.028 over eight quarters). Plots suggest that the effect of high |*AREA*| is substantial, to the extent that the positive abnormal return in the Q5*UE* portfolio is muted. In Panel B, Q1*UE* firms show negative drift over time, with abnormal returns declining from -0.02 for three trading days to -0.03 for eight quarters. Meanwhile, Q1*UE*_Q5|*AREA*| portfolio firms show an even more pronounced negative drift from -0.016 for three trading days to -0.050 for eight quarters. Conversely, negative drift for the Q1*UE* portfolio is muted in for Q1*UE*_Q1|*AREA*| portfolio firms, with the abnormal return *increasing* from -0.018 for the three-day period to -0.005 for eight quarters. Results suggest that high |*AREA*| firms generate negative drift whereas low |*AREA*| firms generate positive drift even after controlling for earnings surprise.

[Insert Figure 3.2 about here]

Table 3.6 presents buy-and-hold-returns for two-way sorted portfolios. The intersection of two-way sort yields 25 portfolios, where all stocks are equally weighted in each portfolio. Panels A and B report four-quarter and eight-quarter buy-and-hold abnormal returns, respectively. The number of observations in each portfolio is reported in

parentheses. In Panel A, the four-quarter buy-and-hold returns of the two extreme one-way |AREA| sorted portfolios (Q1|AREA| and Q5|AREA|) are 0.028 and 0.005, respectively (difference = 0.023). By comparison, returns for the Q1*UE* and Q5*UE* portfolios are -0.031 and 0.045, respectively (difference = 0.076). Casual inspection suggests that |AREA| may not provide a significant signal for abnormal returns compared with *UE*. However, closer analysis reveals that |AREA| helps *UE* separate well performing and poorly performing firms more clearly. Insofar as low (high) |AREA| is a positive (negative) signal and high (low) *UE* is a positive (negative) signal, I predict that the four-quarter Q5*UE*_Q1|AREA| portfolio outperforms the four-quarter Q5*UE* portfolio and that the corresponding Q1*UE*_Q5|AREA| portfolio underperforms the Q1*UE* portfolio. Four-quarter portfolio returns for Q5*UE*_Q1|AREA| and Q1*UE* & Q5|AREA| are 0.049 and -0.040, respectively. The difference between the two portfolios is 0.089 and significant. This value is greater than the difference between the four-quarter Q5*UE* and Q1*UE* (0.076) portfolios using a single sort.

Panel B shows that the |AREA| signal explains abnormal returns better for a longer-term period and helps the *UE* signal separate good performing and poor performing firms more accurately. For the eight-quarter period, abnormal returns for two extreme one-way |AREA| sorted portfolios (Q1 |AREA| and Q5 |AREA|) are 0.056 and 0.005, respectively (different = 0.051). In comparison, abnormal returns for portfolios Q1*UE* and Q5*UE* are -0.03 and -0.067, respectively (difference = 0.097). In line with Panel A, however, two-way sorted portfolios based on |AREA| and *UE* yield sharper separation than these one-way sorts. For example, portfolio returns for Q1|AREA|_Q5*UE* and Q5|AREA|_Q1*UE* are 0.105 and -0.05, respectively (difference = 0.155 and significant). This value is also significantly

greater than the difference between Q1*UE* and Q5*UE* (0.097). The result suggests that *|AREA|* combined with *UE* explains substantial variations in stock returns that are not explained by the earnings surprise alone.

[Insert Table 3.6 about here]

I use the following regression to test the effect of the obfuscation component in *REA* after controlling for a suite of additional factors that may affect buy-and-hold returns:

$$BHR_{it+q} = \beta_0 + \beta_1 |AREA|_{it} + \beta_2 UE_{it} + \beta_3 MV_t + \beta_4 LEV_{it} + \beta_5 BTM_{it} + \beta_6 BETA_{it}$$
$$+ \beta_7 MOM_{it} + \beta_8 NUMEST_{it} + \beta_9 TACC_{it} + \beta_{10} CFO_{it} + \beta_{11} MISS_{it} +$$
$$\beta_{12} LOSS_{it} + \beta_{13} TONE_{it} + \beta_{14} FOG_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it} \qquad (3.5)$$

The dependent variable in this regression is either buy-and-hold raw return (*BHR $_{it+q}$*) or abnormal return (*BHAR $_{it+q}$*) over the short window (three days where *q* is zero) and the longer window, defined as quarters one through eight relative to conference call date *t*. I assume a zero return where a firm's return is missing for the day and I use the CRSP delisting return where a firm delists during the day. If the delisting return is missing and the delisting code is between 520 and 580, I assume a delisting return of -100 percent following Sloan (1996). As cumulative abnormal returns based on risk models such as CAPM and Fama-French three factor model generate a bias in long-term returns (Dimson and Marsh 1986), I use size matched portfolio returns as a benchmark to calculate abnormal return.[25] Equation (3.5) includes the following controls. Unexpected earnings (Bamber 1987) is a fundamental determinant of market reaction. I also control for other risk factors such as beta, size, book-to-market, and momentum (Sharpe 1964; Fama and French 1992;

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[25] The results are robust to CAPM based abnormal returns.

Fama and French 2012). Research also finds that leverage (Muradoğlu and Sivaprasad 2012), analysts following (Ayers and Freeman 2003), accruals and cash flows components of earnings (Collins and Hribar 2000) influence stock returns. As recent research on textual attributes documents their impacts on investors' perception and stock prices (Huang et al 2014; Lee 2012), I control for tone and readability. Definitions of control variables are provided in Appendix 3.1.

Table 3.7 reports results for equation (3.5) for the three-day announcement window. The coefficient on $|AREA|$ is indistinguishable from zero in columns (1) and (2). The result implies that investors may not fully reflect the negative $|AREA|$ signal into stock price in a timely manner. Columns (3) and (4) examine whether the association between abnormal component of *REA* and returns varies depending on the sign of *AREA* by adding an interaction between $|AREA|$ and an indicator for negative *AREA*. The coefficient on $|AREA|$ and the sum of $|AREA|$ and $|AREA|\times NEGAREA$ reflect the effect of over- and under-accruals emphasis on short-term returns, respectively. Coefficient estimates on $|AREA|$ and the sum of $|AREA|$ and $|AREA|\times NEGAREA$ are indistinguishable from zero. Results in Table 3.7 therefore suggest that investors do not fully impound negative signals from $|AREA|$ about future performance into stock prices in the short-term, regardless of the sign of *AREA*.

[Insert Table 3.7 about here]

Evidence that investors appear not to fully incorporate the negative $|AREA|$ signal into stock price immediately raises the question of whether $|AREA|$ explains future returns as the poor performance of high $|AREA|$ firms is realized. Such mispricing may explain the post-earnings announcement drift depicted in Figure 3.1. I estimate equation (3.5) for

return periods extending from one to eight quarters after the conference call. Panels A and B of Table 3.8 show long-term buy-and-hold raw and abnormal returns, respectively. Coefficient estimates on |AREA| are negative but insignificant for quarters one through five (four) in Panel A (B). The negative coefficient on |AREA| nevertheless becomes significant from quarter six in Panel A and quarter five in Panel B, with the magnitude and significance level increasing monotonically. Conversely, the coefficient on UE loads positive in quarters one through four (three) in Panel A (B) but becomes insignificant thereafter. These results suggest that |AREA| generates post-earnings announcement drift even after controlling PEAD generated by the earnings surprise.

Panels C and D of Table 3.8 include the interaction between |AREA| and an indicator for negative AREA. The coefficient on |AREA| and the sum of coefficients on |AREA| and |AREA|×NEGAREA reflect the effects of overemphasis and underemphasis on accruals on long-term returns, respectively. In both panels through all quarters, the coefficient on |AREA|×NEGAREA is positive. In quarters five through eight in Panel C, and quarters three through eight in Panel D, the coefficient on |AREA| is negative and significant, while the sum of coefficients on |AREA| and |AREA|×NEGAREA is insignificant. These results suggest that the negative effect of |AREA| on long-term returns is weaker among firms that downplay accruals information compared with firms that overemphasize accruals.

[Insert Table 3.8 about here]

3.6 Additional tests

3.6.1. Effects of Relative Emphasis on Accruals on Forecast

The analysis in Section 3.5 suggests that managerial efforts to mislead investors through the relative weight they attach to accruals-based performance in conference call presentations are partially successful. However, sophisticated investors may be better able to detect obfuscation in management commentaries associated with the abnormal component of *REA*. I therefore examine the association between $|AREA|$ and analyst forecasts. Specifically, I test whether $|AREA|$ influences analyst forecast error (*FERR*) using the following equation.

$$FERR_{it+q} = \beta_0 + \beta_1 |AREA|_{it} + \beta_2 MV_{it} + \beta_3 SEG_{it} + \beta_4 NUMEST_{it} + \beta_5 OPCYCLE_{it}$$
$$+ \beta_6 BTM_{it} + \beta_7 MOM_{it} + \beta_8 TACC_{it} + \beta_9 INTGBL_{it} + \beta_{10} TONE_{it} \qquad (3.6)$$
$$+ \beta_{11} FOG_{it} + \beta_{12} AGE_{it} + \beta_{13} LOSS_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it}$$

The dependent variable is either forecast error for the next quarter (*FERR$_{t+1}$*) or the next year period (*FERR$_{t+4}$*), calculated as the difference between actual EPS of period t+q and median forecast made after the earnings conference call for the period t+q, scaled by stock price at the beginning of the period t. Forecasts are obtained from I/B/E/S unadjusted files, and actual EPS is adjusted for stock split events based on the CRSP cumulative factors. The variables of interest are abnormal *REA* ($|AREA|$). I also repeat the tests with forecast dispersion for the next quarter (*FDISP$_{t+1}$*) and the same quarter of the next year (*FDISP$_{t+4}$*) as an alternative dependent variable.

Table 3.9 shows that the coefficients on $|AREA|$ are positive but insignificant in column (1), (3), (5), and (7). The results imply that $|AREA|$, on average, does not worsen

forecast quality. However, when an interaction term between $|AREA|$ and an indicator for negative $AREA$ ($NEGAREA$) are added, $|AREA|$ is negatively associated with one-quarter-ahead forecast error ($FERR_{t+1}$) and one-quarter and one-year ahead forecast dispersion ($FDISP_{t+1}$) in column (2), (6), (8). It implies that sophisticated investors pay extra attention to firms with overemphasis on accruals-based performances. On the other hand, the sum of coefficient on $|AREA|$ and $|AREA|$x$NEGAREA$ is positive and significant in column (2), (4), (6), and (8). These results imply that the abnormal component in REA, and in particular abnormal underemphasis on accruals, may confuse even sophisticated investors.

3.6.2. Alternative measure of REA

The REA measure in my main tests counts the number of performance measures per category, ignoring the linguistic structure of the surrounding text. Allee and DeAngelis (2015) show that the placement of words influences how investors interpret information. It is therefore possible that the position of performance measures in the text, as well as their frequency, may reflect relative emphasis on earnings and cash flows in narratives. Specifically, performance measures occurring earlier (later) in the presentation may attract more (less) investor attention. To explore this possibility, I construct an alternative measure of REA that considers the relative position of performance measures within the narrative. I divide the management presentation section of the conference call text into sentences and assign a weight based on the order in which the sentence appears. For example, if a sentence is the 5th out of 100 sentences, the metrics mentioned in this sentence receive a weight of (100-5)/100. I apply this weight to the calculation of REA to consider the placement of performance measure. I find that the results of Table 3.3 are robust to this alternative measurement of REA. While current paper does not directly examine whether positioning

of information impacts how investors interpret information, I find a 1.3 percent to 2.3 percent increase in R-squared of regression models, which suggests positioning may impact investors' interpretation.

3.6.3 Addressing noise in the |*AREA*| measure

Just as popular measures of discretionary accruals contain a mixture of earnings management and accruals related to normal economic activities due to model misspecification (Armstrong et al. 2016; Owens et al. 2017), my measure of abnormal *REA* may also conflate obfuscation and informative commentary due to a failure to control adequately for all the drivers of normal relative emphasis. To alleviate the identification problem, I follow Armstrong et al. (2016) and supplement my analysis by testing the effects of abnormal *REA* in specific circumstances in which managers have strong incentives to obfuscate. As firms have a strong incentive to conceal their poor performance, I examine effects of negative abnormal emphasis on accruals information when firms miss an important performance target. I therefore add a three-way interaction among the abnormal component (|*AREA*|), an indicator of low emphasis on accruals (*NEGAREA*), and an indicator of firms missing earnings target (*MISS*) to regression (3.3), (3.5) and (3.6). Table 3.10 reports the coefficients on |*AREA*| and the sum of coefficients on |*AREA*| and interaction terms among |*AREA*|, *NEGAREA*, and *MISS*. Panel A reveals that the negative correlations between |*AREA*| and future earnings performance (NI_{t+q}) are stronger among firms with a stronger incentive for obfuscation. In Panel B, the negative effects of |*AREA*| on long-term returns are significant in quarter four through eight. However, the negative effects of |*AREA*| are muted among firms downplaying their accruals-based information and missing earnings target compared with firms that overemphasize accruals. This result

is consistent with Table 3.8. In Panel C, the relations between |*AREA*| and future forecast error (*FERR*) and dispersion (*FISP*) are positive and significant among firms underemphasizing accruals information and missing their earnings targets. The results add further confidence to my inference that firms attempt to steer investors' attention away from bad-looking measures toward good-looking information and that such efforts are partially successful.

3.7 Conclusion

This research examines management discussion of accruals and cash flows in earnings call. Using earnings call transcripts of S&P 500 sample during the period 2002-2019, I extract cash flows and earnings measures and calculate the weighted average of accruals attention to measure relative emphasis on accruals. I find that relative emphasis on accruals is positively associated with growth in non-cash working capital and operating cycle and negatively associated with intangible intensity. The evidence implies that management commentary of accruals and cash flows is useful as *REA* varies with the ability of accruals addressing the mismatching problem of cash flows and the limitation of accruals. However, I also find that relative emphasis on accruals also reflects managerial incentives to downplay unfavorable information evidenced by positive (negative) association between *REA* and earnings (cash flows). While the evidence supports both informative reporting and obfuscation, my analysis shows that the provision of useful information is the first order effect of REA. I also find that abnormal emphasis on accruals predicts one year ahead poor performance. However, the return analysis shows that the negative signal of abnormal emphasis on accruals is not incorporated into stock prices immediately but takes four or more quarters. The evidence suggests that abnormal

emphasis on accruals may obscure true picture of periodic performance and influence investors' decision-making.

This study extends the accounting literature of accruals and cash flows. While prior research shows the different roles and relative importance of accruals and cash flows, it lacks evidence on whether management commentaries are consistent with theories. This study fills this gap by measuring the relative emphasis on accruals in performance narratives. My results reveal that managerial commentary on accruals and cash flows contains information incremental to financial statement data but that investors do not appear to make full use of it. My paper provides useful evidence to market participants and regulators. Previous research has shown that firms strategically emphasize non-GAAP and GAAP measures, prompting policymakers and researchers to issue guidelines and impose reporting requirements to counteract potential manipulation. However, there is limited evidence on the strategic emphasis of earnings versus cash flows measures in management commentaries. The study finds that managers use their commentaries on earnings and cash flows to steer investor attention toward specific results and away from others, and this strategy is partially effective. Lastly, this paper discovers a factor ($|AREA|$) from earnings news that signals future performance and strengthens or weakens PEAD related to earnings surprise. This finding is intriguing and provides new insights into the factors that influence PEAD.

Appendix 3.1 Variable Definitions

Variable	Description
REA	Relative Emphasis on Accruals in performance commentary. $$\frac{\sum Acc1_{it}+2*\sum Acc2_{it}}{\sum Acc0_{it}+\sum Acc1_{it}+\sum Acc2_{it}}$$ where Acc0, Acc1, and Acc2, are the number of cash flows, working capital level earnings, and earnings below gross profits, respectively.
SIZE	Natural logarithm of total assets
LOSS	Indicator of loss, which is one if income before extraordinary items is below zero.
INTGBL	R&D expenditure scaled by total expenditure
OPCYCLE	Operating cycle calculated as (365/Sales)*Receivables + (365/COGS)* Inventory divided by 100
SEG	Natural logarithm of the number of business segment
NCWC	Absolute value of change in non-cash working capital, which is calculated as current assets minus cash and cash equivalents minus current liabilities scaled by total assets
UE	Unexpected earnings calculated as actual earnings minus median forecast scaled by stock price at the beginning of the quarter
BTM	Book value divided by market capitalization
NUMEST	Natural logarithm of one plus the number of analysts following for the period
FERR	Forecast error calculated as the absolute value of the difference between actual EPS and median EPS forecast scaled by stock price at the beginning of the period. Forecasts are obtained from I/B/E/S unadjusted files and actual EPS is adjusted for stock split events based on the CRSP cumulative factors.
FDISP	Standard deviation of analyst forecasts for the period
MISS	Indicator of a negative earnings surprise
INVCRNT	Inverse value of current ratio calculated as current assets divided by current liabilities.
NI	Income before extraordinary items scaled by total assets.
ΔNI_{t+i}	Difference between *NI* in current quarter t and quarter t+i.
$ABS\Delta NI_{t+1}$	Absolute value of ΔNI_{t+i}
$NEG\Delta NI$	Indicator of a negative value of ΔNI_{t+i}
CFO	Cash flow from operations scaled by total assets
ΔCFO_{t+i}	Difference between *CFO* in current quarter t and quarter t+i.
$ABS\Delta CFO_{t+i}$	Absolute value of ΔCFO_{t+i}
$NEG\Delta CFO$	Indicator of a negative value of ΔCFO_{t+i}
|AREA|	Absolute value of residual from the following regression run by industry-year $REA = \alpha_0 + \alpha_1\,SIZE + \alpha_2\,INTGBL + \alpha_3\,OPCYCLE + \alpha_4\,SEG + \alpha_5\,NCWC + \alpha_6\,INVCRNT + \varepsilon$

NEGAREA	Indicator of a negative value of *AREA*
$BHR_{0,d}$	Buy-and-hold return for the period of d trading days from the date of earnings conference call.
$BHAR_{0,d}$	Size-adjusted buy-and-hold abnormal returns for the period of d trading days from the date of earnings conference call
BETA	Market beta estimated on daily returns for the prior 12-month period.
MOM	Past returns for the prior 12-month period excluding month t-1
LEV	Leverage calculated as total debt divided by total assets
TACC	Total accruals calculated as changes in non-cash current asset minus changes nondebt current liabilities minus depreciation expenses scaled by total assets.
AGE	Logarithm of one plus the age from the first year the firm entered the CRSP dataset
TONE	Tone of management commentary calculated as (# positive words - # negative words) / (# positive words + # negative words). The positive and negative keywords are based on Loughran and McDonald (2011)
FOG	Gunning Fog index calculated as (word per sentence + percentage of = words with more than three syllables) * 0.4
LEN	Logarithm of the number of letters during management presentation.

Appendix 3.2 Performance Metrics

This table provides the regular expressions of performance measures for each class: Acc0, Acc1, and Acc2. Acc0 includes cash flows measures excluding cash flows from financing or investing activities. Acc1 includes earnings measures at or above gross profit, which mainly consists of working capital accruals. Acc2 includes earnings measures below gross profit, which consists of both working capital and non-working capital accruals. I use a wildcard approach to allow inflections and modifiers and regular expressions to accurately count the performance measures by class. For example, negative lookbehind in the expression '(?<!(gross))profit# margin' makes sure gross profit margin (Acc1) is not counted when counting Acc2 measures.

Class	Measure
Acc0	cash conversion
	cash cycle
	cash flow# from operat#
	cash flow# generat# from (#continu#){0,1}operat#
	cash flow# provided by (#continu#){0,1}operat#
	cash from operat#
	cash generat# from (#continu#){0,1}operat#
	cash provided by (#continu#){0,1}operat#
	cash used in operat#
	cash yield# from operat#
	cash yield# generat# from (#continu#){0,1}operat#
	cash yield# provided by (#continu#){0,1}operat#
	day# inventory outstanding
	day# payable outstanding
	day# sales in inventor#
	day# sales in receivable#
	day# sales outstanding
	dio
	dpo
	dso
	ffo
	fund# from (#continu#){0,1}operat#
	inventor# day#
	inventor# turn#
	ocf
	operat#(activit#){0,1} cash flow#
	operat#(activit#){0,1} cash generat#
	operat#(activit#){0,1} cash yield#
	payable turnover
	payable#(?! (turnover|day#))
	receivable# day#
	receivable# turnover
	receivable#(?! (turnover|day#))
	(?<!(financ#|operat#|invest#)) cash generat#(?! from)
	(?<!(financ#|operat#|invest#)) cash inflow#(?! from)

(?<!(financ#|operat#|invest#)) cash outflow#(?! from)
(?<!(non|non-))cash(cost#| charge#| expen#)
(?<!(statement# of|invest#|financ#|operat#))cash flow#(?! (from|generat|statement))
(?<!(statement# of|invest#|financ#|operat#))cash yield#(?! (from|generat|statement))
cash burn
cash used#(?! in)
creditor day#
debtor day#
free cash flow#
gross burn rat#
net cash flow#
earnings to cash
(?<!(non|non-))cash(?! (flow|inflow|outflow|conversion|cycle|burn|cost#|expen#|from|generat#))
cash and cash equivalent#',
net cash(?! flow)'

Acc1
  contribution margin#
gross margin#
gross profit# margin#
gross profit#(?! margin)
revenue#
asset# turnover

Acc2
  (loss|income|earnings|profit#) from (#continu#){0,1}operat#
(loss|income|earnings|profit#) generat# from (#continu#){0,1}operat#
(loss|income|earnings|profit#) provided by (#continu#){0,1}operat#
(loss|income|earnings|profit#) associated with (#continu#){0,1}operat#
(loss|income|earnings|profit#) related to (#continu#){0,1}operat#
operat# (earning#|income|loss#|margin#|profit#|return#)
trading profit#
(?<!(operat#|gross))profit#(?! (before|after|attributable|from|margin#))
(?<!|operat#|gross))profit# margin#
(?<!(profit#|gross#|ebit#|operat#|contribution#|net))margin(s){0,1}
comprehensive income#(?! from (#continu#){0,1}operat#)
dividend# cover
(?<!operat#)earnings before
(?<!operat#)earnings per (common){0,1}share
(?<!operat#)earnings per diluted share
(?<!operat#)earnings(?! (from|generat#|before|after|per))
ebit#
ebt
eps
loss (before|after) tax#
loss per (common){0,1}share
(?<!(gross|operat#))loss#(?! (before|after|from|per))
net earnings
net income
net loss#
net profit#
pbit#
pbt

(pretax|pre-tax) (earnings|income|loss|profit#)
(?<!(gross|operat#))profit# (before|after)
profit# attributable to shareholder#
return# on (operat# asset#|asset#|capital|equity|invest#|revenue#|sales)
roa
roce
roe
roi
roic

Appendix 3.3 Industry-year level estimation of REA

		Prediction	Mean of coefficient (t-stat)	Std.Dev of coefficient (t-stat)	Proportion of regressions consistent with predicted sign
SIZE	*Beta*	+	0.018	1.605	53.2%
	t-stat		(0.319)	1.541	
INTGBL	*Beta*	-	-0.149	0.202	88.7%
	t-stat		(-1.285)	1.594	
OPCYCLE	*Beta*	+	0.049	1.550	55.5%
	t-stat		(0.627)	1.617	
SEG	*Beta*	+	0.116	3.016	78.6%
	t-stat		(0.935)	1.474	
NCWC	*Beta*	+	-0.002	2.981	55.5%
	t-stat		(0.159)	1.805	
INVCRNT	*Beta*	-	-0.115	2.885	66.2%
	t-stat		(-0.900)	1.558	
Observations			38.965	40.072	
Adjusted R^2			0.089	0.342	

Figure 3.1 Buy and hold Return by |*AREA*| Quintile

For each |*AREA*| quintile, I plot buy-and-hold abnormal returns from the date of earnings conference call.
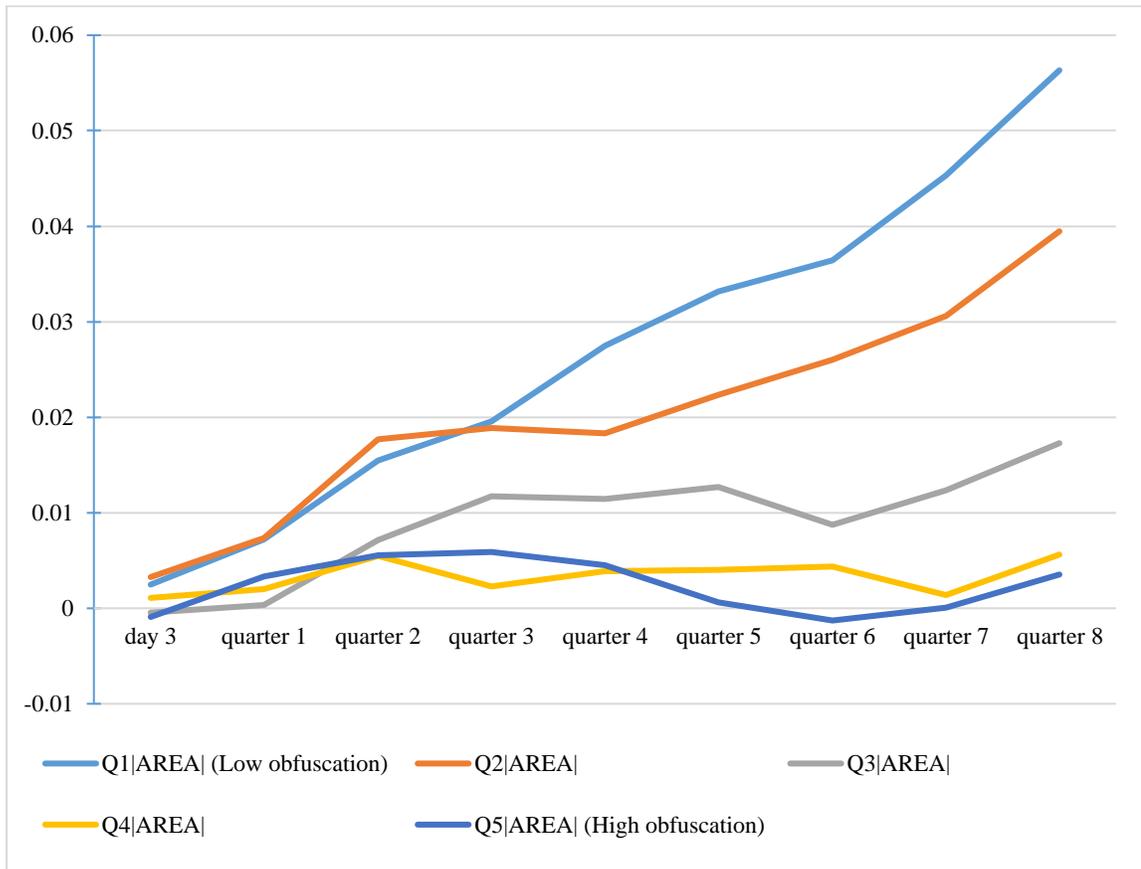
Figure 3.2 Buy and hold Return of high *UE* & low *|AREA|* and high *UE* & high *|AREA|*

This figure plots size adjusted buy and hold abnormal return by first and fifth quintile of *|AREA|* and *UE*.

Panel A. Buy-and-hold abnormal return of firms with 5th quintile *UE*
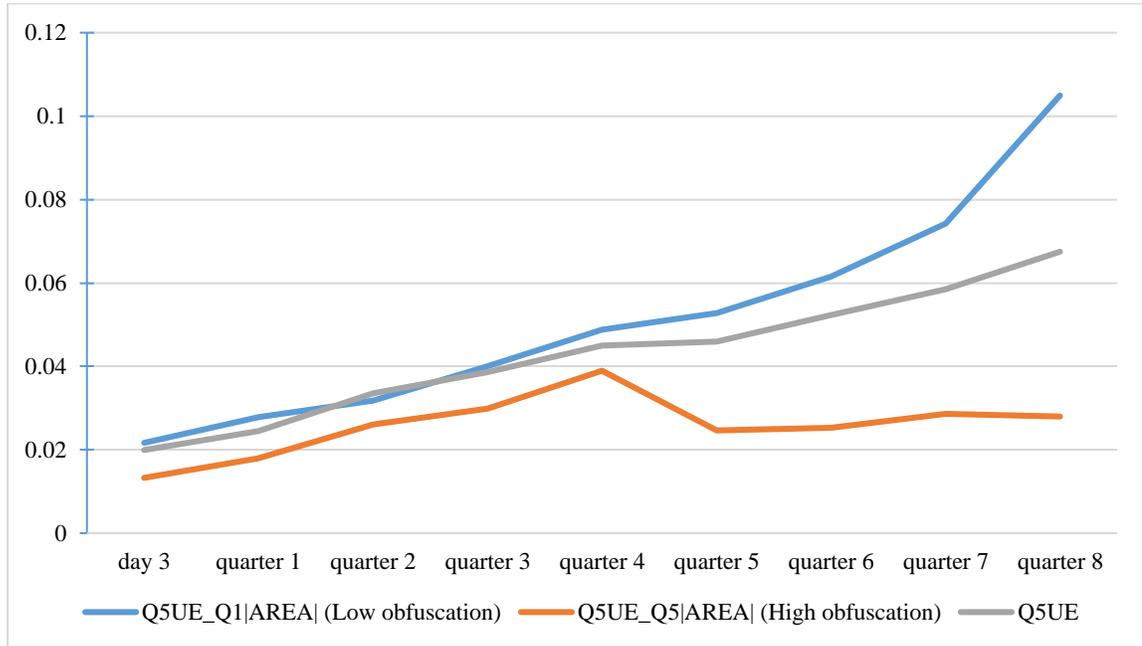
Panel B. Buy-and-hold abnormal return of firms with 1st quintile *UE*
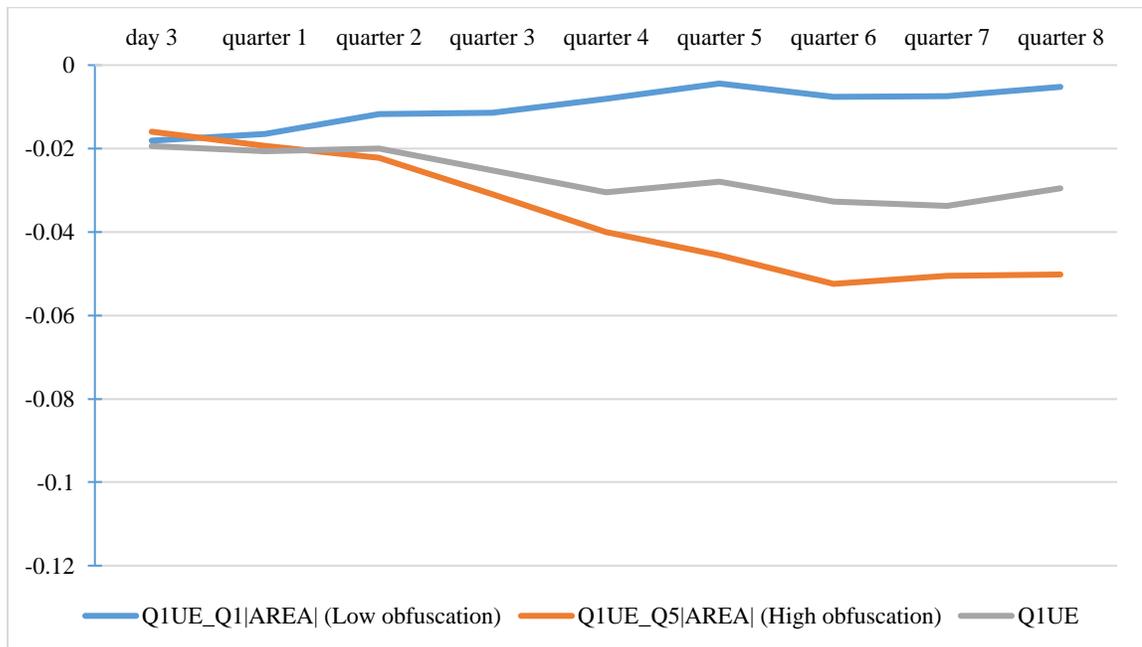
Table 3.1 Sample

Panel A. Sample Selection	Firm-quarter	Firm
S&P500 quarters between 2003 and 2019	36,770	886
(-) missing earnings call text	(6,425)	(163)
(-) missing variables	(18,975)	(246)
Observations for testing	**11,370**	**477**

Panel B. Industry	Firm-quarters		Firms	
	N	**Percent**	**N**	**Percent**
Mining	646	5.68	26	5.45
Manufacturing	5,685	50	238	49.9
Transportation, Electric, Gas, Sanitary	2,004	17.63	81	16.98
Wholesale	288	2.53	11	2.31
Retail	966	8.5	40	8.39
Services	1,781	15.66	81	16.98
Total	**11,370**	**100**	**477**	**100**

This table shows sample selection and industry composition of test sample.

Table 3.2 Descriptive Statistics

	N	Mean	5%	Median	95%	STD
REA	11,370	1.361	0.952	1.342	1.833	0.268
|AREA|	11,370	0.167	0.010	0.135	0.438	0.133
UE	11,370	0.001	-0.002	0.001	0.005	0.003
MISS	11,370	0.203	0.000	0.000	1.000	0.402
NUMEST	11,370	2.786	1.946	2.833	3.434	0.456
FDISP	11,370	0.043	0.010	0.020	0.140	0.058
SIZE	11,370	9.410	7.715	9.369	11.308	1.099
MV	11,370	9.568	7.891	9.473	11.658	1.096
BTM	11,370	0.393	0.063	0.330	0.901	0.283
LOSS	11,370	0.088	0.000	0.000	1.000	0.283
IB	11,370	0.018	-0.007	0.016	0.049	0.019
CFO	11,370	0.031	-0.008	0.028	0.079	0.027
ΔIB_{t+1}	11,370	0.000	-0.025	0.000	0.022	0.019
ΔCFO_{t+1}	11,370	0.000	-0.055	0.001	0.052	0.033
INTGBL	11,370	0.053	0.000	0.000	0.254	0.088
OPCYCLE	11,370	5.031	1.300	4.133	11.835	4.041
SEG	11,370	1.957	1.099	2.197	2.996	0.775
AGE	11,370	3.306	1.609	3.466	4.419	0.861
LEV	11,370	0.586	0.244	0.590	0.888	0.191
TACC	11,370	-0.010	-0.048	-0.010	0.027	0.023
MOM	11,370	0.124	-0.377	0.111	0.673	0.315
BETA	11,370	1.045	0.533	1.020	1.685	0.340
NCWC	11,370	0.021	0.001	0.013	0.066	0.024
INVCRNT	11,370	1.868	0.674	1.520	4.319	1.214
TONE	11,370	0.347	-0.407	0.400	1.000	0.417
FOG	11,370	14.539	12.110	14.564	16.801	1.393

This table provides summary statistics of main variables and control variables. Continuous variables are winsorized at the 1% and 99% level. Variable definitions are in Appendix A.

Table 3.3 Determinants of Relative Emphasis on Accruals

	Hypothesis	Prediction	(1)	(2)	(3)	(4)
$INTGBL$ (β_1)	Informative	-	-0.516 ***		-0.500 ***	-0.490 ***
			(-5.470)		(-5.572)	(-5.481)
$OPCYCLE$ (β_2)	Informative	+	0.005 ***		0.004 **	0.004 **
			(2.894)		(2.481)	(2.439)
$NCWC$ (β_3)	Informative	+	0.390 **		0.300 *	0.158
			(2.154)		(1.865)	(1.155)
$INVCRNT$ (β_4)	Informative	-	-0.022 ***		-0.025 ***	-0.024 ***
			(-3.470)		(-3.811)	(-3.718)
$LOSS$ (β_5)	Informative / Obfuscation	- / -	-0.111 ***	-0.078 ***	-0.039	-0.040
			(-5.271)	(-2.830)	(-1.385)	(-1.435)
$MISS$ (β_6)	Obfuscation	-		0.011	0.004	0.004
				(1.343)	(0.518)	(0.476)
$MISS*LOSS$ (β_7)	Obfuscation	-		-0.043 *	-0.056 **	-0.054 **
				(-1.887)	(-2.413)	(-2.326)
NI_t (β_8)	Obfuscation	+		1.563 ***	2.197 ***	2.048 ***
				(2.900)	(4.401)	(4.080)
CFO_t (β_9)	Obfuscation	-		-1.996 ***	-1.739 ***	-1.704 ***
				(-5.779)	(-5.609)	(-5.596)
ΔNI_{t+1} (β_{10})	Obfuscation	+		1.000 ***	1.020 ***	
				(4.288)	(4.076)	
ΔCFO_{t+1} (β_{11})	Obfuscation	-		-0.897 ***	-0.779 ***	
				(-4.446)	(-4.281)	
$ABS\Delta NI_{t+1}$ (β_{12})	Informative / Obfuscation	+ / ?				0.673
						(1.553)
$ABS\Delta NI_{t+1}*NEG\Delta NI_{t+1}$ (β_{13})	Obfuscation	-				-1.896 ***
						(-3.662)
$ABS\Delta CFO_{t+1}$ (β_{14})	Informative / Obfuscation	- / ?				-0.213
						(-0.728)
$ABS\Delta CFO_{t+1}*NEG\Delta CFO_{t+1}$ (β_{15})	Obfuscation	+				1.508 ***
						(4.141)

SIZE (β_{16})	Control	?	0.014	0.019 *	0.013	0.015
			(1.315)	(1.764)	(1.290)	(1.443)
SEG (β_{17})	Control	?	0.050 ***	0.056 ***	0.047 ***	0.047 ***
			(3.891)	(4.358)	(3.736)	(3.726)
Quarter Fix			YES	YES	YES	YES
Observations			11,370	11,370	11,370	11,370
Adjusted R^2			0.099	0.066	0.112	0.114

Test

$\beta_{12+}\beta_{13} = -1.222$

$Z = -4.057$

p-value $= 0.001$

$\beta_{14+}\beta_{15} = 1.294$

$Z = 4.138$

p-value $= 0.001$

This table reports the results from analysis of the determinants of relative emphasis on accruals. The dependent variable is *REA*, calculated as the weighted average of accruals intensity in performance commentary. *INTGBL* is the intangible intensity. *OPCYCLE* is operating cycle. *NCWC* is growth in non-cash working capital. *INVCURRET* is the ratio of current assets to current liabilities. performance adjusted discretionary accruals. *LOSS* is an indicator of loss. *MISS* is an indicator for firms failing to meet earnings target. *NI* is income before extraordinary items. ΔNI_{t+1} is the difference between *NI* in the next and current quarter. $ABS\Delta NI_{t+1}$ is the absolute value of ΔNI. $ABS\Delta NI_{t+1}*NEG\Delta NI_{t+1}$ is an interaction between $ABS\Delta NI_{t+1}$ and an indicator for a negative change in *NI*. *CFO* is cash flow from operations scaled by total assets. ΔCFO is the difference between *CFO* in next and current quarter. $ABS\Delta CFO_{t+1}$ is the absolute value of ΔCFO. $ABS\Delta CFO*NEG\Delta CFO_{t+1}$ is an interaction between $ABS\Delta CFO_{t+1}$ and an indicator for a negative change in *CFO*. *SIZE* is the natural logarithm of total assets. *SEG* is the number of business segment. Z-statistics are provided in parentheses based on two-way robust standard error clustered on firm and quarter. ***, **, * Indicate $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively (two-tailed).

Table 3.4 Effects of Abnormal REA on Future Earnings Performance

	NI_{t+1} (1)	NI_{t+1} (2)	NI_{t+4} (3)	NI_{t+4} (4)	NI_{t+8} (5)	NI_{t+8} (6)
$|AREA|$ (β_1)	-0.003	-0.001	-0.004 **	-0.002	-0.004 **	-0.003
	(-1.393)	(-0.359)	(-2.277)	(-0.909)	(-2.209)	(-1.556)
$|AREA|*NEGAREA$ (β_2)		-0.004		-0.004		-0.002
		(-1.354)		(-1.311)		(-0.582)
NEGAREA		-0.000		0.000		0.000
		(-0.037)		(0.150)		(0.188)
MV	0.002 ***	0.002 ***	0.002 ***	0.002 ***	0.001 ***	0.001 ***
	(5.621)	(5.557)	(4.596)	(4.567)	(2.752)	(2.753)
SEG	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001
	(-0.846)	(-0.805)	(-0.889)	(-0.852)	(-1.041)	(-1.032)
NUMEST	-0.002 **	-0.002 **	-0.003 ***	-0.003 ***	-0.003 **	-0.003 **
	(-2.158)	(-2.102)	(-2.657)	(-2.617)	(-2.302)	(-2.301)
OPCYCLE	0.000	0.000	0.000	0.000	0.000	0.000
	(0.049)	(0.064)	(0.226)	(0.245)	(0.054)	(0.063)
BTM	-0.020 ***	-0.020 ***	-0.015 ***	-0.015 ***	-0.015 ***	-0.015 ***
	(-10.360)	(-10.362)	(-10.735)	(-10.643)	(-9.327)	(-9.256)
MOM	0.004 ***	0.003 ***	0.003 ***	0.003 ***	0.001	0.001
	(4.142)	(4.125)	(3.692)	(3.668)	(1.141)	(1.135)
TACC	0.230 ***	0.230 ***	0.208 ***	0.207 ***	0.178 ***	0.177 ***
	(11.396)	(11.381)	(7.827)	(7.777)	(7.747)	(7.700)
CFO	0.320 ***	0.320 ***	0.336 ***	0.336 ***	0.280 ***	0.281 ***
	(11.928)	(11.913)	(13.892)	(13.888)	(13.278)	(13.292)
TONE	0.001 ***	0.001 ***	0.000	0.000	0.000	0.000
	(2.642)	(2.631)	(0.547)	(0.556)	(0.525)	(0.530)
FOG	-0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(-0.066)	(0.023)	(-0.228)	(-0.148)	(-1.086)	(-1.058)

AGE	-0.000	-0.000	0.000	0.000	0.000	0.000
	(-0.446)	(-0.564)	(0.369)	(0.245)	(0.282)	(0.236)
Industry Fix	YES	YES	YES	YES	YES	YES
Quarter Fix	YES	YES	YES	YES	YES	YES
Observations	9,710	9,710	9,696	9,696	9,700	9,700
Adjusted R^2	0.295	0.295	0.254	0.254	0.195	0.195

Test

$\beta_{1+}\beta_2 = -0.005$ $\qquad\qquad$ $\beta_{1+}\beta_2 = -0.006$ $\qquad\qquad$ $\beta_{1+}\beta_2 = -0.005$

$Z = -1.645$ $\qquad\qquad$ $Z = -2.095$ $\qquad\qquad$ $Z = -1.654$

p-value $= 0.100$ $\qquad\qquad$ p-value $= 0.036$ $\qquad\qquad$ p-value $= 0.098$

This table reports the results from analysis of the effects of relative emphasis on accruals on future earnings performance. The dependent variable is income before extraordinary items i quarters after earnings conference call in quarter t (NI_{t+i}). |AREA| is absolute value of abnormal relative emphasis on accruals (AREA). NEGAREA is an indicator of negative AREA. MV is the natural logarithm of market capitalization. SEG is natural logarithm of one plus the number of business segments. NUMEST is the logarithm value of one plus the number analyst following for the quarter. OPCYCLE is operating cycle. BTM is book to market ratio. MOM is momentum calculated as past returns for the prior 12-month period excluding one month before the conference call. TACC is total accruals. CFO is operating cash flow of current period scaled by total assets. TONE is the tone of the earnings conference call. FOG is Gunning fog index. AGE is firm age. Z - statistics are provided in parentheses based on two-way robust standard error clustered on firm and quarter. ***, **, * Indicate p < 0.01, p < 0.05, and p < 0.10, respectively (two-tailed).

Table 3.5 Effects of Abnormal REA on Future Cash Flow Performance

	CFO_{t+1} (1)	CFO_{t+1} (2)	CFO_{t+4} (3)	CFO_{t+4} (4)	CFO_{t+8} (5)	CFO_{t+8} (6)
$|AREA|$ (β_1)	-0.002	0.003	-0.001	0.002	-0.002	0.001
	(-0.749)	(1.002)	(-0.405)	(0.565)	(-0.862)	(0.329)
$|AREA|*POSAREA$ (β_2)		-0.009 **		-0.005		-0.007
		(-2.315)		(-1.435)		(-1.545)
POSAREA		-0.000		-0.000		-0.000
		(-0.116)		(-0.292)		(-0.239)
MV	0.000	0.000	0.000	0.000	0.000	0.000
	(0.683)	(0.761)	(0.620)	(0.688)	(0.447)	(0.516)
SEG	-0.003 ***	-0.003 ***	-0.002 ***	-0.002 ***	-0.003 ***	-0.003 ***
	(-4.085)	(-4.203)	(-4.009)	(-4.092)	(-4.317)	(-4.412)
NUMEST	0.005 ***	0.005 ***	0.003 **	0.002 **	0.003 **	0.003** **
	(3.351)	(3.321)	(2.097)	(2.044)	(2.318)	(2.257)
OPCYCLE	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.140)	(-1.171)	(-0.558)	(-0.572)	(-0.854)	(-0.872)
BTM	-0.014 ***	-0.014 ***	-0.010 ***	-0.010 ***	-0.011 ***	-0.011 ***
	(-6.705)	(-6.782)	(-5.798)	(-5.859)	(-5.517)	(-5.582)
MOM	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000
	(-0.840)	(-0.805)	(-0.768)	(-0.742)	(-0.344)	(-0.311)
TACC	0.166 ***	0.168 ***	-0.444 ***	-0.443 ***	-0.417 ***	-0.416 ***
	(4.989)	(5.048)	(-14.575)	(-14.508)	(-13.816)	(-13.751)
NI	0.405 ***	0.407 ***	0.501 ***	0.502 ***	0.429 ***	0.431 ***
	(8.529)	(8.580)	(12.454)	(12.528)	(10.258)	(10.317)
TONE	0.000	0.000	0.001	0.001	0.000	0.000
	(0.581)	(0.553)	(1.023)	(1.003)	(0.679)	(0.655)
FOG	0.000	0.000	0.000	0.000	-0.000	-0.000
	(0.946)	(0.799)	(0.511)	(0.404)	(-0.695)	(-0.832)

AGE	-0.001	-0.001	-0.001 **	-0.001 *	-0.001 **	-0.001 **
	(-1.596)	(-1.402)	(-2.091)	(-1.935)	(-2.146)	(-2.006)
Industry Fix	YES	YES	YES	YES	YES	YES
Quarter Fix	YES	YES	YES	YES	YES	YES
Observations	9,701	9,701	9,679	9,679	9,686	9,686
Adjusted R^2	0.176	0.177	0.333	0.333	0.286	0. 287

Test

$\beta_{1+}\beta_2 = -0.006$		$\beta_{1+}\beta_2 = -0.003$	$\beta_{1+}\beta_2 = -0.005$
$Z = -2.376$		$Z = -1.409$	$Z = -2.028$
p-value $= 0.018$		p-value $= 0.159$	p-value $= 0.043$

This table reports the results from analysis of the effects of relative emphasis on accruals on future cash flow. The dependent variable is cash flow from operating activities q quarters after earnings conference call in quarter t (CFO_{t+q}). |AREA| is absolute value of abnormal relative emphasis on accruals (*AREA*). *POSAREA* is an indicator of positive *AREA*. *MV* is the natural logarithm of market capitalization. *SEG* is natural logarithm of one plus the number of business segments. *NUMEST* is the logarithm value of one plus the number analyst following for the quarter. *OPCYCLE* is operating cycle. *BTM* is book to market ratio. *MOM* is momentum calculated as past returns for the prior 12-month period excluding one month before the conference call. *TACC* is total accruals. *NI* is income before extraordinary items. *TONE* is the tone of the earnings conference call. *FOG* is Gunning fog index. *AGE* is firm age. Z-statistics are provided in parentheses based on two-way robust standard error clustered on firm and quarter. ***, **, * Indicate p < 0.01, p < 0.05, and p < 0.10, respectively (two-tailed).

Table 3.6 Holding Period Returns for Portfolios Ranked by |AREA| and Unexpected Earnings

Panel A. 1yr-buy-and-hold-return	1 (low)	2	3	4	5 (high)	Total
|AREA|						
1 (low)	-0.008	0.020	0.034	0.044	0.049	0.028
	(482)	(339)	(483)	(477)	(427)	(2,208)
2	-0.022	0.000	0.014	0.029	0.071	0.018
	(482)	(352)	(463)	(477)	(421)	(2,195)
3	-0.028	0.000	0.018	0.033	0.033	0.011
	(519)	(329)	(467)	(468)	(405)	(2,188)
4	-0.049	0.009	0.002	0.027	0.035	0.003
	(548)	(330)	(400)	(432)	(497)	(2,207)
5 (high)	-0.040	-0.011	0.019	0.035	0.039	0.005
	(658)	(351)	(416)	(417)	(476)	(2,318)
Total	-0.031	0.004	0.018	0.034	0.045	0.013
	(2,689)	(1,701)	(2,229)	(2,271)	(2,226)	(11,116)

Panel B. 2yr-buy-and-hold-abnomal return	1 (low)	2	3	4	5 (high)	Total
|AREA|						
1 (low)	-0.005	0.043	0.057	0.084	0.105	0.056
	(482)	(339)	(483)	(477)	(427)	(2,208)
2	-0.008	0.007	0.023	0.051	0.125	0.039
	(482)	(352)	(463)	(477)	(421)	(2,195)
3	-0.015	-0.024	0.024	0.059	0.036	0.017
	(519)	(329)	(467)	(468)	(405)	(2,188)
4	-0.060	0.013	-0.020	0.056	0.050	0.006
	(548)	(330)	(400)	(432)	(497)	(2,207)
5 (high)	-0.050	0.005	0.019	0.051	0.028	0.005
	(658)	(351)	(416)	(417)	(476)	(2,318)
Total	-0.030	0.009	0.022	0.061	0.067	0.025
	(2,689)	(1,701)	(2,229)	(2,271)	(2,226)	(11,116)

This table reports buy-and-hold-returns of portfolios where firms are sorted into quintiles independently based on their unexpected earnings and AREA. The intersection of two-way sort results in 25 portfolios. All stocks are equally weighted in a portfolio. Panel A, B, and C, respectively, report size-adjusted buy-and-hold abnormal for one-quarter, one-year, and two-year period. The number of observations in each portfolio is reported in parenthesis.

Table 3.7 Effects of Abnormal REA on Short-run return

	BHR$_{3d}$ (1)	BHAR$_{3d}$ (2)	BHR$_{3d}$ (3)	BHAR$_{3d}$ (4)
|AREA| (β_1)	-0.002	-0.003	-0.004	-0.006
	(-0.506)	(-0.881)	(-0.821)	(-1.206)
|AREA| x NEGAREA (β_2)			0.005	0.005
			(0.595)	(0.741)
NEGAREA			-0.001	-0.001
			(-0.692)	(-0.909)
UE	2.378 ***	2.419 ***	2.379 ***	2.420 ***
	(7.661)	(8.079)	(7.684)	(8.103)
MV	0.001	0.001	0.001	0.001
	(1.031)	(1.015)	(1.025)	(1.007)
LEV	-0.002	-0.004	-0.002	-0.004
	(-0.668)	(-1.286)	(-0.677)	(-1.281)
BTM	0.003	0.003	0.003	0.003
	(1.210)	(1.454)	(1.224)	(1.460)
BETA	0.003	0.003	0.002	0.003
	(1.134)	(1.351)	(1.128)	(1.338)
MOM	-0.011 ***	-0.011 ***	-0.011 ***	-0.011 ***
	(-4.413)	(-4.516)	(-4.411)	(-4.515)
NUMEST	-0.004 *	-0.004 *	-0.004 *	-0.004 *
	(-1.807)	(-1.848)	(-1.788)	(-1.834)
TACC	-0.074	-0.086 **	-0.074	-0.086 **
	(-1.583)	(-2.210)	(-1.575)	(-2.197)
CFO	0.138 ***	0.134 ***	0.138 ***	0.134 ***
	(3.296)	(3.469)	(3.308)	(3.482)
MISS	-0.015 ***	-0.014 ***	-0.015 ***	-0.014 ***
	(-10.399)	(-10.349)	(-10.409)	(-10.370)
TONE	0.009 ***	0.009 ***	0.009 ***	0.009 ***
	(6.277)	(7.141)	(6.300)	(7.164)
FOG	-0.000	-0.000	-0.000	-0.000

	(-0.329)	(-0.173)	(-0.341)	(-0.186)
LOSS	-0.003	-0.003	-0.003	-0.003
	(-1.530)	(-1.404)	(-1.538)	(-1.409)
Industry Fix	YES	YES	YES	YES
Quarter Fix	YES	YES	YES	YES
Observations	11,278	11,278	11,278	11,278
Adjusted R^2	0.056	0.062	0.056	0.061

			TEST	
			$\beta_{1}+\beta_2 = 0.000$	$\beta_{1}+\beta_2 = -0.001$
			$Z = 0.025$	$Z = -0.092$
			p-value $= 0.980$	p-value $= 0.927$

This table reports the results from analysis of the effects of *REA* on short-run returns. The dependent variable is three-day window buy-and-hold raw return (BHR_{3d}) or size-adjusted buy-and-hold-abnormal returns ($BHAR_{3d}$) from the date of conference call. *|AREA|* is an absolute value of abnormal relative emphasis on accruals. *MV* is the natural logarithm of market capitalization. *UE* is unexpected earnings calculated as actual earnings minus median forecast scaled by stock price at the beginning of the quarter. *NUMEST* is the logarithm value of one plus the number analyst following for the quarter. *LEV* is leverage. *BTM* is book to market ratio. *MOM* is momentum calculated as past returns for the prior 12-month period excluding one month before the conference call. *TACC* is total accruals. *BETA* is market beta of the stock based on the past 12 months returns. *CFO* is cash flow from operations scaled by total assets. *TONE* is the tone of the earnings conference call. *FOG* is Gunning fog index. *LOSS* is an indicator of loss. *MISS* is an indicator for firms failing to meet earnings target. Z -statistics are provided in parentheses based on two-way robust standard error clustered on firm and quarter. ***, **, * Indicate p < 0.01, p < 0.05, and p < 0.10, respectively (two-tailed).

Table 3.8 Effects of Abnormal REA on Long-term Returns

	Q1 (1)	Q2 (2)	Q3 (3)	Q4 (4)	Q5 (5)	Q6 (6)	Q7 (7)	Q8 (8)
Panel A. BHR								
|AREA|	-0.008	-0.016	-0.027	-0.037	-0.048	-0.074 *	-0.087 *	-0.102 *
	(-0.741)	(-0.875)	(-1.128)	(-1.156)	(-1.229)	(-1.683)	(-1.698)	(-1.759)
UE	3.757 ***	4.114 ***	4.814 ***	3.973 **	3.412	5.009 *	4.889	5.790
	(4.923)	(3.692)	(3.561)	(2.032)	(1.543)	(1.868)	(1.514)	(1.589)

	Q1 (1)	Q2 (2)	Q3 (3)	Q4 (4)	Q5 (5)	Q6 (6)	Q7 (7)	Q8 (8)
Panel B. BHAR								
|AREA|	-0.006	-0.020	-0.031	-0.044	-0.062 *	-0.075 *	-0.099 **	-0.112 **
	(-0.553)	(-1.142)	(-1.321)	(-1.503)	(-1.782)	(-1.882)	(-2.128)	(-2.129)
UE	2.679 ***	2.570 ***	2.361 **	0.974	0.444	1.265	2.055	1.817
	(3.832)	(2.712)	(2.091)	(0.576)	(0.251)	(0.582)	(0.761)	(0.609)

	Q1 (1)	Q2 (2)	Q3 (3)	Q4 (4)	Q5 (5)	Q6 (6)	Q7 (7)	Q8 (8)
Panel C. BHR								
|AREA|	-0.019	-0.037	-0.051 *	-0.066	-0.082 *	-0.106 **	-0.138 **	-0.158 **
	(-1.220)	(-1.524)	(-1.725)	(-1.636)	(-1.726)	(-1.983)	(-2.277)	(-2.303)
|AREA|*NEGAREA	0.021	0.041	0.048	0.057	0.067	0.064	0.100	0.109
	(1.068)	(1.256)	(1.065)	(0.980)	(0.976)	(0.792)	(1.083)	(1.036)
UE	3.764 ***	4.133 ***	4.836 ***	4.000 **	3.439	5.036 *	4.930	5.834
	(4.924)	(3.726)	(3.586)	(2.050)	(1.556)	(1.881)	(1.529)	(1.605)
TEST								
	$\beta_{1}+\beta_{2}=0.002$	$\beta_{1}+\beta_{2}=0.004$	$\beta_{1}+\beta_{2}=-0.003$	$\beta_{1}+\beta_{2}=-0.009$	$\beta_{1}+\beta_{2}=-0.015$	$\beta_{1}+\beta_{2}=-0.042$	$\beta_{1}+\beta_{2}=-0.038$	$\beta_{1}+\beta_{2}=-0.048$
	Z= 0.172	Z= 0.172	Z= -0.095	Z= -0.193	Z= -0.265	Z= -0.656	Z= -0.496	Z= -0.558

	p-value = 0.864	p-value = 0.863	p-value = 0.924	p-value = 0.847	p-value = 0.791	p-value = 0.512	p-value = 0.620	p-value = 0.577
	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Panel D. BHAR								
$|AREA|$	-0.017	-0.033	-0.047 *	-0.074 **	-0.091 **	-0.108 **	-0.142 ***	-0.139 **
	(-1.328)	(-1.603)	(-1.793)	(-2.211)	(-2.340)	(-2.354)	(-2.652)	(-2.306)
$|AREA|*NEGAREA$	0.023	0.026	0.031	0.060	0.058	0.065	0.085	0.055
	(1.240)	(0.865)	(0.709)	(1.075)	(0.918)	(0.851)	(0.960)	(0.545)
UE	2.692 ***	2.585 ***	2.376 **	0.999	0.468	1.293	2.089	1.844
	(3.866)	(2.737)	(2.106)	(0.592)	(0.265)	(0.595)	(0.774)	(0.619)
	$\beta_{1+}\beta_2 = 0.006$	$\beta_{1+}\beta_2 = -0.007$	$\beta_{1+}\beta_2 = -0.016$	$\beta_{1+}\beta_2 = -0.014$	$\beta_{1+}\beta_2 = -0.033$	$\beta_{1+}\beta_2 = -0.043$	$\beta_{1+}\beta_2 = -0.057$	$\beta_{1+}\beta_2 = -0.084$
	Z = 0.394	Z = -0.271	Z = -0.437	Z = -0.309	Z = -0.625	Z = -0.680	Z = -0.785	Z = -1.020
	p-value = 0.694	p-value = 0.786	p-value = 0.662	p-value = 0.757	p-value = 0.532	p-value = 0.497	p-value = 0.432	p-value = 0.308

This table reports the results from analysis of the effects of relative emphasis on accruals on stock returns. The dependent variable is buy-and-hold raw return or abnormal return for one quarter to eight quarters where the benchmark return is a size matched portfolio. $|AREA|$ is absolute value of abnormal relative emphasis on accruals. Control variables include *UE, NUMEST, TACC, BETA, BTM, LEV, MV, MOM, CFO, LOSS, MISS, TONE, FOG.* All regressions include industry and quarter fixed effects. Z-statistics are provided in parentheses based on two-way robust standard error clustered at the firm and quarter level. ***, **, * Indicate $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively (two-tailed).

Table 3.9 Effects of Abnormal REA on Future Earnings Forecast

	$FERR_{t+1}$ (1)	$FERR_{t+1}$ (2)	$FERR_{t+4}$ (3)	$FERR_{t+4}$ (4)	$FDISP_{t+1}$ (5)	$FDISP_{t+1}$ (6)	$FDISP_{t+4}$ (7)	$FDISP_{t+4}$ (8)
$|AREA|$ (β_1)	0.000	-0.001 ***	0.002	-0.001	0.004	-0.073 ***	0.025	-0.046 *
	(0.663)	(-2.606)	(1.546)	(-0.652)	(0.206)	(-3.612)	(1.084)	(-1.775)
$|AREA|*NEGAREA$ (β_2)		0.004 ***		0.006 ***		0.151 ***		0.135 ***
		(4.097)		(2.778)		(4.119)		(3.114)
NEGAREA		-0.000 *		-0.000		-0.011 **		-0.003
		(-1.709)		(-1.487)		(-2.467)		(-0.663)
MV	-0.001 ***	-0.001 ***	-0.002 ***	-0.002 ***	-0.029 ***	-0.028 ***	-0.036 ***	-0.035 ***
	(-5.291)	(-5.247)	(-5.421)	(-5.415)	(-5.267)	(-5.210)	(-4.950)	(-4.919)
SEG	0.000	0.000	0.000	0.000	0.002	0.001	-0.003	-0.003
	(0.517)	(0.386)	(1.031)	(0.984)	(0.353)	(0.229)	(-0.370)	(-0.458)
NUMEST	-0.001	-0.001 *	0.001	0.001	-0.013	-0.015	0.014	0.012
	(-1.620)	(-1.766)	(1.346)	(1.233)	(-0.990)	(-1.150)	(0.861)	(0.729)
OPCYCLE	0.000	0.000	0.000 *	0.000	-0.000	-0.000	-0.000	-0.000
	(1.047)	(0.944)	(1.678)	(1.632)	(-0.037)	(-0.142)	(-0.258)	(-0.327)
BTM	0.003 ***	0.003 ***	0.007 ***	0.007 ***	0.168 ***	0.168 ***	0.237 ***	0.236 ***
	(4.630)	(4.591)	(3.924)	(3.926)	(5.568)	(5.549)	(6.113)	(6.127)
MOM	-0.001 **	-0.001 **	-0.001	-0.001	-0.005	-0.005	0.003	0.003
	(-2.268)	(-2.240)	(-1.479)	(-1.467)	(-0.392)	(-0.358)	(0.144)	(0.178)
INTGBL	0.002 **	0.003 **	-0.001	-0.001	0.044	0.054	0.140 *	0.153 *
	(2.181)	(2.399)	(-0.485)	(-0.365)	(0.881)	(1.097)	(1.715)	(1.882)
TACC	-0.003	-0.002	-0.011	-0.009	-0.092	-0.069	-0.417 ***	-0.393 ***
	(-1.329)	(-1.053)	(-1.264)	(-1.155)	(-1.155)	(-0.870)	(-2.927)	(-2.829)
TONE	-0.000 *	-0.000 *	-0.001 *	-0.001 *	-0.018 ***	-0.019 ***	-0.018 ***	-0.019 ***
	(-1.757)	(-1.849)	(-1.882)	(-1.938)	(-2.912)	(-2.991)	(-2.681)	(-2.709)
FOG	0.000	-0.000	-0.000	-0.000	0.002	0.001	-0.001	-0.001
	(0.012)	(-0.168)	(-0.191)	(-0.335)	(0.575)	(0.418)	(-0.176)	(-0.331)

AGE	0.000	0.000	0.000	0.000	0.007	0.009	0.014 **	0.015 **
	(1.011)	(1.257)	(0.951)	(1.130)	(0.969)	(1.213)	(2.024)	(2.288)
LOSS	0.003 ***	0.003 ***	0.003 ***	0.003 ***	0.127 ***	0.125 ***	0.129 ***	0.127 ***
	(5.424)	(5.402)	(3.929)	(3.870)	(6.192)	(6.211)	(6.699)	(6.715)
Industry Fix	YES	YES	YES	YES	YES	YES	YES	YES
Quarter Fix	YES	YES	YES	YES	YES	YES	YES	YES
Observations	11,326	11,326	11,326	11,326	11,351	11,351	10,680	10,680
Adjusted R^2	0.138	0.141	0.077	0.079	0.215	0.219	0.213	0.217

TEST

$\beta_{1+}\beta_2=0.002$	$\beta_{1+}\beta_2=0.005$	$\beta_{1+}\beta_2=0.078$	$\beta_{1+}\beta_2=0.089$
$Z=2.624$	$Z=2.619$	$Z=2.447$	$Z=2.522$
p-value $=0.009$	p-value $=0.009$	p-value $=0.014$	p-value $=0.012$

This table reports the results from analysis of the effects of relative emphasis on accruals on forecast quality. The dependent variable is forecast error or forecast dispersion for the period of i quarters after earnings conference call in quarter t ($FERR_{t+i}$ or $FDISP_{t+i}$). |*AREA*| is absolute value of abnormal relative emphasis on accruals (*AREA*). *NEGAREA* is an indicator of negative *AREA*. *MV* is the natural logarithm of market capitalization. *SEG* is natural logarithm of one plus the number of business segments. *NUMEST* is the logarithm value of one plus the number analyst following for the quarter. *OPCYCLE* is operating cycle. *BTM* is book to market ratio. *MOM* is momentum calculated as past returns for the prior 12-month period excluding one month before the conference call. *TACC* is total accruals. *INTGBL* is the intangible intensity. *LOSS* is an indicator of loss. *TONE* is the tone of the earnings conference call. *FOG* is Gunning fog index. *AGE* is firm age. Z -statistics are provided in parentheses based on two-way robust standard error clustered on firm and quarter. ***, **, * Indicate p < 0.01, p < 0.05, and p < 0.10, respectively (two-tailed).

Table 3.10 Three-way Interaction Effects

Panel A. Three-way interaction effects on future earnings performance

$NI_{it+q} = \beta_0 + \beta_1|AREA|_{it} + \beta_2|AREA|*NEGAREA_{it} + \beta_3|AREA|*MISS_{it} + \beta_4|AREA|*NEGAREA*MISS_{it} + \beta_5 NEGAREA*MISS_{it} + \beta_6 NEGAREA_{it} + \beta_7 MISS_{it} + \beta_8 MV_{it} + \beta_9 SEG_{it} + \beta_{10} NUMEST_{it} + \beta_{11} OPCYCLE_{it} + \beta_{12} BTM_{it} + \beta_{13} MOM_{it} + \beta_{14} TACC_{it} + \beta_{15} CFO_{it} + \beta_{16} TONE_{it} + \beta_{17} FOG_{it} + \beta_{18} AGE_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it}$ (3.7)

	NI_{t+1}	NI_{t+4}	NI_{t+4}
	(1)	**(7)**	**(8)**
$\beta_1 =$	-0.003	-0.001	-0.003
$Z =$	(-1.480)	(-0.681)	(-1.545)
p-value =	0.139	0.496	0.122
$\beta_1 + \beta_2 + \beta_3 + \beta_4 =$	-0.009	-0.010	-0.006
$Z =$	(-2.577)	(-2.927)	(-1.72)
p-value =	0.010	0.003	0.086

Panel B. Three-way interaction effects on pricing

$BHAR_{it+q} = \beta_0 + \beta_1|AREA|_{it} + \beta_2|AREA|*NEGAREA_{it} + \beta_3|AREA|*MISS_{it} + \beta_4|AREA|*NEGAREA*MISS_{it} + \beta_5 NEGAREA*MISS_{it} + \beta_6 NEGAREA_{it} + \beta_7 MISS_{it} + \beta_8 UE_{it} + \beta_9 MV_t + \beta_{10} LEV_{it} + \beta_{11} BTM_{it} + \beta_{12} BETA_{it} + \beta_{13} MOM_{it} + \beta_{14} NUMEST_{it} + \beta_{15} TACC_{it} + \beta_{16} CFO_{it} + \beta_{17} LOSS_{it} + \beta_{18} TONE_{it} + \beta_{19} FOG_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it}$ (3.8)

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
$\beta_1 =$	-0.011	-0.023	-0.035	-0.068	-0.102	-0.124	-0.164	-0.173
$Z =$	(-0.652)	(-0.085)	(-1.056)	(-1.688)	(-2.362)	(-2.460)	(-2.900)	(-2.753)
p-value =	0.514	0.393	0.291	0.091	0.018	0.014	0.004	0.006
$\beta_1 + \beta_2 + \beta_3 + \beta_4 =$	-0.006	-0.026	-0.037	-0.042	-0.087	-0.099	-0.119	-0.139
$Z =$	(-0.345)	(-0.781)	(-0.802)	(-0.767)	(-1.372)	(-1.396)	(-1.381)	(-1.487)
p-value =	0.730	0.435	0.423	0.443	0.170	0.163	0.167	0.137

Panel C. Three-way interaction effects on earnings forecast

$Forecast_{it+q} = \beta_0 + \beta_1 |AREA|_{it} + \beta_2 |AREA|*NEGAREA_{it} + \beta_3 |AREA|*MISS_{it} + \beta_4 |AREA|*NEGAREA*MISS_{it} + \beta_5 NEGAREA*MISS_{it} + \beta_6 NEGAREA_{it} + \beta_7 MISS_{it} + \beta_8 MV_{it} + \beta_9 SEG_{it} + \beta_{10} NUMEST_{it} + \beta_{11} OPCYCLE_{it} + \beta_{12} BTM_{it} + \beta_{13} MOM_{it} + \beta_{14} TACC_{it} + \beta_{15} INTGBL_{it} + \beta_{16} TONE_{it} + \beta_{17} FOG_{it} + \beta_{18} AGE_{it} + \beta_{19} LOSS_{it} + IND\_FE + YEAR\_FE + \varepsilon_{it}$ (3.9)

	$FERR_{t+1}$	$FERR_{t+4}$	$FDISP_{t+1}$	$FDISP_{t+4}$
	(1)	**(2)**	**(3)**	**(4)**
$\beta_1 =$	-0.001	0.000	-0.059	-0.026
$Z =$	(-2.574)	(0.390)	(-3.084)	(-0.942)
$p\text{-}value =$	0.010	0.697	0.002	0.346
$\beta_1 + \beta_2 + \beta_3 + \beta_4 =$	0.003	0.010	0.150	0.118
$Z =$	(2.338)	(2.816)	(2.517)	(2.342)
$p\text{-}value =$	0.019	0.005	0.012	0.019

This table reports coefficients on |AREA| and the sum of coefficients on |AREA|, |AREA|*NEGAREA, |AREA|*MISS, and |AREA|*NEGAREA*MISS from regression model (3.7), (3.8), and (3.9). Each panel provides the regression model and Z statistics and p-values. |AREA/ is absolute value of abnormal relative emphasis on accruals. NEGAREA is an indicator of negative AREA. MISS is an indicator for firms failing to meet earnings target.

Chapter 4: Conclusion

With an aim to answer fundamental research questions on performance reporting, this thesis examines two important aspects of management commentaries on periodic performance: (1) operational activities and strategies and (2) earnings and cash flows. Specifically, I examine the real effects of a disclosure mandate for firms to discuss their strategies and business activities, and also the determinants and pricing effects of the relative emphasis that management place on earnings and cash flow metrics in their performance commentaries. These two questions are important because the literature lacks evidence on how the discussion of long-term value creation impacts managerial decision-making despite regulators' belief that such disclosure mitigates managerial myopia. Further, the significant body of research studying the roles of earnings and cash flows focuses mainly on financial statement numbers despite the relevance of management narratives. I leverage textual analysis methods to explore these issues.

Chapter 2 examines textual information on business operations and strategies, and its effects on firm decisions. I exploit a UK disclosure mandate that requires Main Market firms of London Stock Exchange to describe business operations and strategies for value creation in their annual reports. For empirical tests, I calculate the proportion of performance measures and topics related to operations and strategies in the annual report. I find that the Main Market LSE firms disclose more performance metrics and commentaries relating to business operations and strategies compared to Alternative Investment Market firms. Furthermore, I demonstrate that an increase in such information promotes intangible investments. I also analyze external and internal control systems,

revealing that enhanced performance reporting attracts long-term investors and reduces the CEO pay sensitivity to earnings performance, thus promoting investments.

Chapter 2 contributes to the disclosure literature by answering Leuz and Wysocki's (2016) call for research on the real effects of reporting mandates. I particularly exploit a UK institutional setting in which firms are required to discuss their strategies for long-term value creation and show that the disclosure mandate encourages long-term investment. The real effect evidence also speaks to the debate on the myopic effects of performance reporting. Criticizing traditional reporting practice of focusing on earnings performance, regulators and practitioners suggest that management discussion of long-term value creation may curb myopic decisions by management (FRC 2010; European Commission 2017; PwC 2006). Despite this belief, previous research focuses mainly on the capital-market effects of strategy disclosures (Whittington et al. 2016; Athanasakou et al. 2019). Chapter 2 fills a significant gap in the literature by providing evidence that disclosures focusing on process aspects of value creation may curb myopic behaviors and catalyze firm-level discussion of sustainable value creation.

Chapter 3 examines the determinants of the relative emphasis that management place on cash flows and accruals-based performance metrics in their earnings conference call presentations, as well as the pricing effects of such emphasis. Despite extensive research on the role of accruals and cash flows, prior research has primarily focused on financial statement numbers neglecting the discussion of how firms discuss accruals and cash flows. To fill this gap, I introduce a measure of relative emphasis on accruals (*REA*) in management discourse and examine its information and obfuscation components. My

analysis shows that *REA* is associated with the relative importance of accruals and cash flows information, which supports the information role of *REA*. However, I also find that managers tend to (de)emphasize measures that provide an (un)favorable picture of periodic performance in their commentaries for obfuscation purpose. In addition, the obfuscation component of *REA* is negatively associated with future earnings and cash flow performance, indicating that it is a negative signal. However, further analysis reveals that the capital market takes time to incorporate the obfuscation component into stock prices.

These results make several contributions to prior research. My study extends research on the different roles of accruals and cash flows (Dechow 1994; Barth et al. 1999; Subramanyam and Venkatachalam 2007; Ball et al. 2016). Extant work focuses exclusively on financial statement values and ignores how managers present earnings and cash flow performance in their communications with investors. I fill this gap by constructing a measure of managers' relative emphasis on accruals and exploring its determinants. My study also provides helpful insights to investors and regulators by investigating an underexplored technique that managers may use in their commentaries to influence investor perceptions. My research finds that managers use their commentaries on earnings and cash flows to steer investor attention toward certain performance outcomes and away from others, and this strategy is partially effective. Finally, my research uncovers a new factor that generates PEAD in the form of abnormal relative emphasis on accruals. This factor is economically significant to the extent that it can reverse the direction of the earnings surprise PEAD.

My findings in chapters 2 and 3 are subject to several limitations, which yield opportunities for further research. First, both the keywords search in chapter 2 and the topic modeling in chapter 3 rely on bag-of-words methods (i.e., unigram word list) that may not accurately reflect context and meaning. This simple approach overlooks nuanced meanings of individual words or semantically meaningful multiword expressions (El-Haj et al. 2019). For example, distinguishing whether the term 'leverage' refers to financial leverage or utilization of resources can improve the performance of topic modeling. To address this limitation, future research can take advantage of the state-of-the-art language models such as Google Bidirectional Encoder Representation of Transformer (BERT) and OpenAI's Generative Pretrained Transformer (GPT). These models generate a comprehensive vector representation of input sentences, considering the inflections and the order and combinations of all input words. This enables researchers to capture different contextual interpretations of words. However, a challenge lies in the need for careful fine-tuning of these AI models to suit specific downstream tasks undertaken by researchers. Second, each of my studies focuses on one particular disclosure channel. For example, in chapter 2, I focus on the management commentary section of annual reports. However, firms may discuss their strategies for long-term value creation in alternative channels such as earnings conference calls and sustainability reports. In chapter 3, I focus only on the management presentation session of earnings conference call, leaving textual information in Q&A session unexplored. As analysts' questions during conference call may influence manager disclosure choices (Chapman and Green 2018), drawing causality from the results in chapter 3 requires caution. In future research, it will be valuable to investigate alternative disclosure channels collectively in order to gain insights into the

relationships and interactions between these channels. For instance, it will be interesting to explore whether these channels exhibit substitution or complementary effects. However, there are challenges associated with this idea, such as identifying and accessing alternative channels and collecting textual data from diverse sources. Overcoming these challenges would be essential to fully explore the dynamics and implications of different disclosure channels in a comprehensive manner.

Third, both chapter 2 and chapter 3 do not explore the disclosure effects on peer firms, while firms consider the disclosure and information by peers (Cho and Muslu 2021). Given that managers make decisions while taking into account both the reactions of their peers and investors, future research can extend my work by examining the effects of peer firms. Finally, my studies use relatively small samples. In chapter 2, I rely on a specific institutional setting in the UK with a limited sample period around the reporting mandate. However, it is important to note that long-run effects of regulations may differ from the immediate effects. For example, research shows that weak enforceability of Regulation Fair Disclosure (Reg FD) limits its ability to restrict private information flow (Allee, Bushee, Kleppe, and Pierce 2022). Future research can examine long-term consequences as the effects of the disclosure mandate can be weakened or reversed over time. Chapter 3 also uses a relatively narrow sample. While S&P 500 firms represent significant portion of the US market, it is an open question whether my findings are generalizable to smaller firms. Due to limited investor monitoring or low liquidity among smaller firms, the result may not apply to smaller firms. Despite these limitations, this dissertation contributes to accounting research by examining important pieces of information relating to value creation beyond surface-level linguistic features.

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