Long-Term Value Creation Reporting Mandate and Managerial Horizon*

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Abstract

I examine whether requiring firms to disclose their approach to long-term value creation encourages management to look beyond earnings and make long-run decisions. Using differences-in-differences and path analysis, I test whether such reporting mandate encourages managers to look beyond earnings and make long-run decisions. First, I examine whether the reporting mandate leads management to adopt a longer-term perspective on performance reporting, as evidenced by a relative increase in non-earnings focus in favor of longer-term indicators of value creation. Next, I test whether the greater focus on non-earnings measures enhances the quality of management decision-making evidenced by a decrease in real earnings management and investment inefficiency. Finally, I provide evidence on the external and internal channels through which the increase in non-earnings focus in performance reporting leads to changes in managerial behavior.

Keywords: reporting narrative, managerial horizon, managerial myopia, long-term value creation, real effects of disclosure

1. Introduction

I examine whether requiring firms to disclose their approach to long-term value creation encourages management to look beyond earnings and make long-run decisions. The traditional performance reporting centered on accounting earnings is consistently criticized for inducing an excessive focus on short-term results at the expense of long-term value creation (Bushee 1998; Fuller and Jensen 2002; CFA Institute 2006; Kay 2012). In contrast, research shows that non-earnings information provides useful indicators of long-term performance (Higgins and Diffenbach 1985; Kaplan and Norton 1996; Evans III et al. 2010; Banker et al. 2000; Ibrahim and Lloyd 2011; Matejka et al. 2009). In response, regulators and financial reporting professionals are increasingly encouraging management to articulate they create value over the long-run using non-earnings information such as business operation, strategy, and risk management (Financial Reporting Council 2010; European Commission 2017; International Integrated Reporting Council 2013; International Accounting Standards Board 2010; Financial Accounting Standards Board 2001; CFA Institute 2006). However, evidence concerning the real effects of such disclosures is sparse. To seek relevant evidence, I exploit a reporting mandate for London Stock Exchange (LSE) Main Market firms to describe how they deliver long-term success in the annual report. I begin by testing whether the disclosure mandate changes management approach to performance reporting evidenced by an increase in non-earnings focus in favor of long-term indicators of value creation. Next, I examine whether such greater focus on non-earnings information leads to better internal decisions that are consistent with long-term value creation. Finally, I provide evidence on the channels linking an enhanced value-based approach to performance reporting with changes in managerial behavior.

Although periodic performance reporting centers on measures of financial performance in general and accounting earnings in particular, theory and evidence highlight the limitations of single-period earnings information for performance measurement and business valuation (Tasker 1998; Lev and Zarowin 1999; Graham et al. 2005; Ball and Shivakumar 2008; Lev and Gu 2016; Edmans et al. 2018). Consistent with the limitations of earnings-centered performance reporting, a large body of research demonstrates the value of non-earnings information. For example, evidence indicates that non-earnings performance measures and information related to business operation, business model and strategy, and risk management affords better indicators of long-term performance of firm (Higgins and Diffenbach 1985; Kaplan and Norton 1996; Evans III et al. 2010; Banker et al. 2000; Ibrahim and Lloyd 2011; Matejka et al. 2009). Consistent with this view, research also shows that provision of non-earnings information is associated with improvements in firms' information environment (Botosan 1997; Jones 2007; Athanasakou et al. 2018; Lee and Yeo 2016; Bernardi and Stark 2016; Zhou et al. 2017; Barth et al. 2017).

Evidence on the impact of a non-earning focus in performance reporting on management is scarce in the literature. Such evidence is necessary because much of the current regulatory push is predicated on the view that a longer-term horizon supports sustainable value creation by reducing the risk of managerial myopia driven by an excessive emphasis on short-term earnings targets. Barth et al. (2017) provide preliminary evidence on this issue by exploiting the Johannesburg Stock Exchange's (JSE) requirement for primary listed firms to provide an integrated report for periods ending on or after 1 March 2010.[1] Using proprietary rankings of JSE firms' integrated reporting quality (IRQ), Barth et al. (2017) report a negative association between IRQ and investment inefficiency. Causation is

[1] The JSE requirement pre-dates formal establishment by the International Integrated Reporting Council (IIRC) of its integrated reporting <IR> Framework (2013). However, the guidelines established by the Integrated Reporting Committee of South Africa (IRC) (2010) share many commonalities with IIRC Framework. In March 2014 the IRC endorsed the IIRC Framework for South African firms and ceased issuing its guidance (Barth et al. 2017: 45).

nevertheless hard to establish given Barth et al.'s (2017) empirical design.[2] Furthermore, their analysis does not extend to evaluating the specific channel(s) through which changes in performance reporting lead to changes in managerial decision making. As disclosure quality, managerial behaviors, and economic consequences are highly endogenous, it is important to show causal paths or exploit a research setting that allows strong identification strategy (Leuz and Wysocki 2016).

I build on Barth et al.'s (2017) preliminary evidence regarding the link between performance reporting and the quality of management internal decision-making. I exploit a rule change by the U.K. financial reporting regulator in 2010 requiring LSE-listed Main Market firms (but not their Alternative Investment Market counterparts) to describe their long-term value creation using information on business model and strategy (Financial Reporting Council 2010). My analysis involves three distinct stages. In the first stage, I test whether the reporting mandate led management to adopt a longer-term perspective on performance reporting, as evidenced by a relative increase in the focus on non-earnings information in favor of longer-term indicators of value creation.[3] I construct two proxies for the relative weight attached to non-earnings information in management performance commentary. The first proxy is the ratio of non-earnings-related performance measures to total performance metrics discussed by management. The second proxy uses structural topic modeling (Roberts et al. 2013) to distinguish between earnings-focused themes and non-

[2] As the availability of IRQ measure is limited to the post-period of the reporting mandate, Barth et al. (2017) do not test whether the reporting mandate improves the quality of disclosure and investment decision. Also, the South African setting does not provide a control group to compare.

[3] This study focuses on earnings and non-earnings information rather than forecast information or long-term keywords. Forecasts do not show how the firm creates long-term value while regulators and reporting professionals require firms to explain how the firm creates value rather than what the value will be. Similarly, counting the number of long-term keywords such as 'long-term', '5-year', and 'long-run' does not construct a good measure. On the other hand, non-earnings measures provide detailed information regarding business operations and strategic activities for long-term success (Kaplan and Norton 1996). Thus, I measure the degree of focus on non-earnings information relative to earnings information, which is primarily backward-looking and promotes myopic behaviors.

earnings-focused themes in management performance commentary. I use these proxies to conduct a difference-in-differences (DiD) analysis of changes in the focus of performance reporting for Main Market and Alternative Investment Market (AIM) firms in response to the 2010 reporting mandate. If the reporting initiative was successful, I expect to observe a relative shift away from earnings-based metrics and narratives towards non-earnings metrics and narratives more for Main Market firms after 2010.

The second step in my analysis examines whether increases in the relative focus on non-earnings information leads to long-term oriented managerial decisions as proxied by improvements in investment efficiency (Biddle et al. 2009; McLean et al. 2012), and reductions in real earnings management (Roychowdhury 2006; Kothari et al. 2016). I use a Wald-DID estimator for the test as firms can react to the reporting mandate differently.[4]

Conditional on results from step two, the final stage of my analysis examines the specific channels through which an increase in non-earnings focus of performance reporting impacts managerial behavior. I distinguish between an internal (performance evaluation-related) channel and an external (investor-related) channel, neither of which I consider as mutually exclusive. My internal control channel draws on the value-based management view that firms should align external and internal systems to achieve goals and create value (Kaplan and Norton 1992; Ittner and Larcker 2001; Young and O'Byrne 2000). Prior research also highlights the positive impact on internal decision-making of linking performance evaluation more closely to non-earnings performance measures (Evans III et al. 2010;

[4] Although most firms comply with the requirements of the corporate governance code, the actual treatment of the corporate governance code is not sharp. Firms can explain why they do not comply with the code. However, firms' choice does not incur a self-selection problem because firms do not decide the assignment of treatment. The existence of the main market firm that does not comply with the code implies that the assignment of treatment is not a result of firms' selection. Therefore, DID estimator of this study is not likely to suffer a self-selection bias. However, under a fuzzy treatment, DID estimators show the intention-to-treat (ITT). Thus, I use a Wald-estimator to estimate the treatment effect on compliers within the Main Market. Wald-DID estimation is common in economics. De Chaisemartin and D'HaultfŒuille (2017) show that over 10% of all papers published in the American Economic Review between 2010 and 2012 use a Wald estimation for their DID design.

Ibrahim and Lloyd 2011; Baiman and Baldenius 2009). I, therefore, test whether increases of non-earnings focus in performance reporting lead to superior decision-making through the alignment of externally reported non-earnings information with information for performance evaluation.

My external channel linking value-based performance reporting with high-quality internal decision-making reflects the potential benefits of an enhanced interaction between management and investors. Several streams of research support the external dialogue channel. First, provision of information on long-term value creation attracts more analyst because it provides analysts with information to analyze and sell (Land and Lundholm 1996; Healy et al. 1999). It improves interactions between management and analysts and investors' monitoring (Yu 2008; Hong et al. 2014), which in turn impact managerial decision-making (Trueman and Titman 1988). Second, Long-term oriented performance reporting attracts investors with longer-term performance horizons (Serafeim 2015), mitigating pressures on managers for short-term earnings performance (Bushee 1998). I, therefore, test whether increases of long-term focus in performance reporting following the 2010 reporting mandate lead to superior internal decision-making outcomes through an increase in analyst coverage and long-term investors.

My research extends the literature of disclosure of non-earnings information. While researchers associate non-earnings information with capital market outcomes (Athanasakou et al. 2018; Lee and Yeo 2016; Bernardi and Stark 2016; Barth et al. 2017, Whittignton et al. 2016), there is little evidence on the real effects of such disclosure. Using a path analysis and a non-US research setting, I provide evidence on the real effects of non-earnings disclosure and make a causal inference, which Leuz and Wysocki (2016) call for.

My work also extends the literature of managerial myopia. The literature shows that short-term approaches to reporting induce managers to make myopic decisions (Cheng et al.

2007; Brochet et al. 2015; Fuller and Jensen 2002; Kay 2012). While research finds the association between non-earnings information on managerial myopia (Evans III et al. 2010; Ibrahim and Lloyd 2011; Baiman and Baldenius 2009), the findings are confined to the context of compensation contract. From the perspective of financial reporting, Fuller and Jensen (2002) argue that firms should be more transparent about their story for value creation from a long-term perspective to put an end to earnings game. However, empirical evidence on this argument is scarce. My research extends the literature by testing if changes in the focus of performance reporting translate into changes in managerial myopia.

This study will provide valuable insights not only to U.K. regulators but also to regulators worldwide as they have placed more attention to disclosure of information on long-term value creation. For example, a recent SEC concepts release aimed at modernizing Regulation S-K disclosure requirements seeks views on whether Item 101(a)(1) should be revised to require registrants to describe their business strategy and whether such disclosure should be included in the Management Discussion and Analysis (SEC 2016: 60). While the result of this paper must be carefully interpreted as measures may not capture the effects of reporting mandate fully, it may provide policymakers with useful information about potential needs for government intervention.

The remainder of the paper proceeds as follows. Section 2 reviews the relevant prior literature. Section 3 describes the institutional setting and hypothesis development. Section 4 describes the data and measurement, and Section 5 presents the identification strategy. Section 6 reports results and section 7 concludes.

2. Related Literature

Researchers and stakeholder representatives have expressed their concern about an excessive focus on earnings. The concern about an excessive focus on periodic earnings performance reflects several factors. First, research demonstrates that earnings alone do not convey sufficient information for measuring the fundamental value of a business (Lev and Gu 2016; Tasker 1998; Lev and Zarowin 1999, Ball and Shivakumar 2008). Valuation theory highlights the importance of information other than earnings for forecasting future performance and estimating value (Ohlson 1995). Ball and Shivakumar (2008) show that earnings have relatively low surprise content because the construct is primarily backward-looking. Tasker (1998) and Lev and Zarowin (1999) argue that accounting conservatism blurs the link between earnings and value for firms with R&D intensive activities. Second, theory demonstrates that periodic earnings may generate inappropriate signals for investment decisions that are inconsistent with discounted cash flow rules (Young et al. 2000; Stern et al. 1996; Brewer et al. 1999; Mauboussin and Johnson 1997). Consequently, earnings-centric reporting can promote dysfunctional managerial behavior such as earnings management, inefficient investment decisions, and other activities that are inconsistent with long-term value creation (Bushee 1998; Kaplan and Norton 2001; Jensen 2005; Graham et al 2005; Roychowdhury 2006; Xu et al. 2007; Kasznik 1999; He and Tian 2013; Bhojraj et al. 2009; Cheng et al. 2007; Edmans et al. 2018).

Given the limitations of earnings and backward-looking measures, Kaplan and Norton (2001) argue that firms should supplement short-term financial performance measures with leading indicators to support long-term value creation. Consistent with this view, studies find that the internal use of non-earnings performance metrics are positively associated with better alignment of interests between manager and shareholders (Banker et al. 2000; Campbell et al. 2015; Kaplan and Norton 1992; Ibrahim and Lloyd 2011; Matejka et al. 2009; Evans III et al. 2010) and better long-term performance (Ittner and Larcker 1998; Behn and Riley 1999; Banker et al. 2000; Nagar and Rajan 2001; Ittner et al. 2003; Anderson et al. 2004; Aksoy et al. 2008).

Regulators and financial reporting professionals have encouraged firms to disclose their approach to creating and preserving value over the long-term using non-earnings information (Financial Reporting Council 2010; European Commission 2017; International Integrated Reporting Council 2013; International Accounting Standards Board 2010; Financial Accounting Standards Board 2001; CFA Institute 2006). Supporting this view, disclosure literature shows that reporting non-earnings information such as business operation, strategy, and risk management provides useful insights to the capital market evidenced by significant market reactions and a lower level of information asymmetry (Botosan 1997; Higgins and Diffenbach 1985; Merkley 2014; Jones 2007; Athanasakou et al. 2018; Gu and Li 2007; Whittington et al. 2016; Bernardi and Stark 2016; Lee and Yeo 2016; Barth et al. 2018). However, evidence on the real effects of a non-earnings focus in performance reporting is scarce. The regulatory push for a longer-term approach to performance reporting is predicated on the idea that such disclosure encourages managers to take a long-term view and make better decisions (CFA Institute 2006; International Integrated Reporting Council 2013).

To the best of my knowledge, only Barth et al. (2017) provide preliminary evidence on this issue by exploiting the Johannesburg Stock Exchange's (JSE) requirement for primary listed firms to provide an integrated report for periods ending on or after 1 March 2010. Using proprietary rankings of JSE firms' integrated reporting quality (IRQ), Barth et al. (2017) report a positive association between IRQ and firm value and a negative association between IRQ and investment inefficiency. Causation is nevertheless hard to establish given Barth et al.'s (2017) empirical design as the observation is limited to the post-period of the reporting mandate and a control group is not available. Furthermore, their analysis does not extend to evaluating the specific channels through which reporting impacts investment efficiency. While Barth et al. (2017) provide potential explanations for the association between IRQ and managerial decision-making such as integrated thinking of managers and investor's monitoring, they do not directly test if the association is mediated by the two factors. It is important to show causal paths or exploit a research setting that allows strong identification strategy as disclosure quality, managerial behaviors, and economic consequences are highly endogenous (Leuz and Wysocki 2016). The literature still has little evidence on if and how mandating firms to describe how they create long-term value creation affects management approach to performance reporting and internal decision making. My study builds on the initial evidence of Barth et al. (2017) by using a novel research setting and a path analysis to examine the impact of mandating firms to report their approach to long-term value creation.

3. Institutional setting and hypothesis development

3.1. The institutional setting of the U.K. corporate disclosure

My main tests regarding the degree and the effects of non-earnings information in performance reporting exploit the U.K. Corporate Governance Code (FRC 2010).[5] In June 2010, the Financial Reporting Council (FRC) revised its Combined Code on Corporate Governance to the UK Corporate Governance Code (the Code) and proposed new provisions to fill a gap in the annual report: the company's strategy for generating long-term value (FRC 2010b, paragraph 30). The new code emphasizes a long-term perspective, adding the word "*long-term*" to the first principle. The first principle describes the role of the board as "*Every company should be headed by an effective board which is collectively responsible for the*

[5] U.K. financial market regulators have implemented a series of recommendation and requirements for firms to describe long-term value creation: the operating and financial review (Accounting Standards Board 2006), the U.K. Corporate Governance Code (Financial Reporting Council 2010), and the strategic report (Companies Act 2006 regulation 2013). Appendix A provides detailed information on these requirements and the reason for the selection of the Corporate Governance Code (2010).

long-term success of the company” (A.1). In addition, the new code adds the following new provision: “*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*" (C.1.2).[6] Although the Code is not a regulation, it applies to all companies with a primary listing on the LSE (i.e., the Main Market firms) based on the UK Listing Regime.

In the same year, International Accounting Standards Board (IASB) issued IFRS Practice Statement Management Commentary to provide a non-binding framework under which management provides a narrative description on their business prospect, objectives, and strategies as well as performances and financial position (IN3 of IASB 2010). Although IASB introduced the framework independently, the underpinning ideas are consistent with the Code (2010). As the IFRS Practice Statement Management Commentary of IASB (2010) was introduced contemporaneously with the U.K. Corporate Governance Code (2010), the Code does not offer an ideal setting for DID identification strategy. However, it is not clear whether IASB (2010) had a significant impact as it was not a reporting mandate. Even if IASB (2010) has a significant impact, the objective of this study is to examine the impact of disclosing information on long-term value creation. As both the Code (2010) and ISAB (2010) share consistent underpinning on the disclosure of long-term value creation, I do not separate the impact of the Code (2010) from that of IASB (2010).

3.2. Hypothesis Development

Since the early 2000s, researchers and regulators have discussed the disclosure of non-earnings information. Research shows that non-earnings information provides better

[6] The corporate governance code (2010) includes other new provisions. Appendix B provides detailed information on other major changes, and I control the effects of the other provisions added in 2010.

indicators of long-term performance than earnings information as it provides more specific measures on the management of business operation and strategic activities (Higgins and Diffenbach 1985; Kaplan and Norton 1996; Evans III et al. 2010; Banker et al. 2000; Ibrahim and Lloyd 2011; Matejka et al. 2009). Consistent with this finding, Maines et al. (2002) and CFA Institute (2006) argue that firms should provide non-earnings information such as business model and strategy to explain how they create value over the long-term. Financial Accounting Standard Board (2001) provided a guideline on voluntary disclosure and recommended firms to discuss non-earnings information such as business environment, risk, and critical success factors. According to the survey of PwC (2006), investors and analysts appreciate such non-earnings information to understand the underlying value of firms' business. In response, the U.K. government took a proactive approach and amended the Corporate Governance Code to require Main Market firms of LSE to explain how they deliver long-term success in the annual report. If this reporting mandate causes a demand shock and affects management approach to performance reporting, firms will provide more non-earnings information in favor of longer-term indicators of value creation.

Whether firms make significant changes in the focus of performance reporting in response to the reporting mandate is an empirical question. Proprietary costs and voluntary disclosure provide reasons that disclosure mandates of the type introduced by the FRC (2010) may not change underlying reporting practice. First, firms may not wish to disclose strategic information because the benefits associated with greater transparency are outweighed by the costs of disclosing proprietary information (Verrecchia 1983; Ellis et al. 2012; Jones 2007; Mohamed and Schwienbacher 2016). Although the Code (2010) shifts demand curve of information to the right, it does not make a significant change in the equilibrium if the marginal cost curve (supply curve) is steep due to high proprietary costs. Then, management may adopt a compliance approach and issue boilerplate and generic disclosures to gain legitimacy while limiting proprietary costs (Abraham and Shrives 2014). Accordingly, the Code reporting requirements are expected to have had little effect on the focus of performance reporting for firms with high proprietary costs. Second, it is possible that management was already aware of, and responsive to, the demand for non-earnings information on long-term value creation before 2010. Theory and evidence indicate that managers voluntarily report non-earnings results in response to information asymmetry and investor pressure (Lang and Lundholm 1993; Ittner et al. 1997; Lev and Zarowin 1999; Tasker 1998; Merkley 2014). For these companies, the Code does not cause a demand shock for information because they were already providing the information required by the Code. Accordingly, the Code reporting requirements may have had a little discernable effect on the focus of performance reporting. I, therefore, offer the following null hypothesis regarding changes in the focus of performance reporting for the average Main Market firm on LSE:

> *H1: The degree of non-earnings focus in performance reporting does not increase in response to the implementation of the U.K. Corporate Governance Code (2010).*

I then examine whether greater non-earnings focus in performance reporting is followed by managerial behaviors consistent with long-term value creation in the form of reductions in earnings management and investment inefficiency. An increase of non-earnings focus in performance reporting can curb dysfunctional behaviors through external capital market channels. If firms disclose broader sets of information associated with long-term value creation, they can attract investors with a longer-term horizon (Serafeim 2015). As long-term investors make investment decisions based on fundamental business value and are less likely to change their position based on a short-term earnings performance, they place less pressure on managers for short-term earnings target (Bushee 1998). Managers then are less likely to engage in myopic decisions, which undermine long-term value creation. Also, firms' discussion on their long-term value creation attracts more analysts because it reduces the costs of information acquisition and provides analysts with information to analyze and sell (Land and Lundholm 1996; Healy et al. 1999). The increase in analyst coverage enhances investors' monitoring through more interaction between analysts and management at conference calls, curbing opportunistic behaviors (Yu 2008; Hong et al. 2014).

The reporting mandate can create a positive impact on managerial decision-making through an internal control channel. Value-based management literature emphasizes the alignment of external information system with internal control system to implement the firm's strategic plan and create value over the long-term (Kaplan and Norton 1992; Ittner and Larcker 2001). Research also finds that performance evaluation using non-financial information controls economic agents' behaviors and improves future performances (Evans III et al. 2010; Banker et al. 2000; Rajagopalan 1996; Govindarajan and Gupta 1985). If the long-term approach to performance reporting leads to an internal performance evaluation that considers more non-earnings performances, managers change their decision-making. I, therefore, propose the following hypotheses:

H2a: All else equal, an increase in the degree of non-earnings focus in performance reporting reduces the level of earnings management.

H2b: All else equal, an increase in the degree of non-earnings focus in performance reporting reduces the level of investment efficiency.

4. Measurement and Data

4.1 Measuring non-earnings focus in performance reporting

The primary variable of interest in my empirical tests is the degree of non-earnings focus in performance reporting. I measure the non-earnings focus using top-down and bottom-up approaches. First, from a top-down approach, I collect performance measures that appear in the highlights, chairman's statement, and CEO review of firms' annual reports and calculate relative weight given to non-earnings measure.[7] I identify the highlights, the chairman's statement, and the CEO review section of firms' annual reports automatically using the method developed by El-Haj et al. (2018). Then, I extract performance measures from these sections automatically using natural language processing (NLP) methods. Specifically, I will employ Named Entity Recognition (NER) approaches to locate performance measures highlighted in performance narratives, defined as running text and bullet points. I will train my machine learning NER algorithm on a large sample of data on performance metrics collected manually from firms' annual reports. Consistent with the NER methodology, I will use my manually annotated dataset to construct a comprehensive list of performance metrics that will form the basis of my NER algorithm. Using the NER algorithm, I extract sentences that include keywords in my NER algorithm and check if the keywords are performance measures. Then, I will also develop a classification scheme that differentiates between earnings-focused performance metrics (e.g., variants of gross profit, profit margin, operating profit, earnings per share, EBIT, EBITDA, ROA, ROE, etc.) and non-earnings-focused measures including both financial measures such as research and development expenditure and non-financial measures such as customer satisfaction, market share, employee retention rate, etc. The underlying rationale of this classification is whether the measure shows how the firm creates value in a long-term perspective. Then, I calculate

[7] While I acknowledge that firms may discuss non-earnings performance measures in other parts of the annual report, I focus on these sections because they provide the highest profile discussions of periodic performance and therefore serve as an intuitive proxy for the overall focus of firms' performance commentary. Focusing on these sections also ensures the data collection task is feasible, as collecting information on all performance measures disclosed in the annual report is not a viable option.

the ratio of non-earnings performance measures to all performance measures reported in the annual report to capture the non-earnings focus in performance reporting (*NEM*).

$$NEM_{it} = \frac{\sum_j^J NE_{ijt} * M_{ijt}}{\sum_j^J NE_{ijt} * M_{ijt} + \sum_k^K E_{ikt} * M_{ikt}}$$

NE_{ijt}= *j*-th non-earnings measure of firm *i* in year *t*

E_{ikt}= *k*-th earnings measure of firm *i* in year *t*

M_{ijt}= the number of *j*-th measure appearing in firm *i*'s year *t annual report*

As firms may provide valuable insights on long-term value creation using qualitative narratives on non-earnings information, the first variable may pick up only the partial effects of the Code (2010). To capture more comprehensive information from annual reports, I use topic modeling, a bottom-up approach model. I use structural topic modeling (Roberts et al. 2013) to identify latent topics, which are characterized by the co-occurrence of related words. Based on the co-occurrence of words, topic modeling enables researchers to infer the topic of a given word. For example, the word "R&D" that occurs with words such as IAS 38, accounting, conditions, and capitalization is related to topic "accounting policy" while "R&D" that occurs with words such as investment, customer, strategies, and competition is related to topic "strategy."[8] It allows researchers to identify the proportions of each topic within a document. Using this feature of topic modeling, Dyer et al. (2017) examine overall trends in the proportion of each latent topic in 10-K disclosure. Using similar approach but focusing on topics related to information on value creation, I examine if the proportion of the

[8] This example shows that one word can be included in multiple topics. In addition, one topic can occur multiple times throughout a document with other topics. It allows researchers to identify proportions of each topic within a document no matter how topics are scattered over the document.

non-earnings topics (*NET*) increases for MM firms relative to AIM firms after the implementation of the Code. To get a better understanding of the management approach to performance reporting, I will show the locations and length of value-oriented topics using the approach of Murakami et al. (2017). I will also test textual attributes such as specificity (Hope et al. 2016), boilerplate (Lang and Stice-Lawrence 2015), redundancy (Cazier and Pfeiffer 2016), and hard information (Blankespoor 2016) to examine information quality.

For the textual analysis, I create a corpus by aggregating the annual reports of MM and AIM firms. To capture specific distributions and locations of topics within-annual report, I divide each annual report into multiple text blocks by the number of words (Murakami et al. 2017) and by section of the annual report (Dyer et al. 2017). Then, I pre-process texts following linguistics literature such as excluding stop words, stemming words, and removing infrequent words (Murakami et al. 2017). To conduct topic model analysis, researchers need to choose the number of topics that they want the model to generate because the model takes a bottom-up approach. Setting a too low number of topics may identify distinguishable topics as the same topic, and too high number of topics may identify too many indistinguishable topics. To choose the best model, I apply the methods by Roberts et al. (2013) and Dyer et al. (2017). I will try initializations such as different ways of processing texts, different numbers of topics, combination with Named Entity Recognition (Krasnashchok and Jouili 2018), making corpora by industry, and using only chairman's statement and CEO review to create corpora. Then, I conduct structural topic modeling (Roberts et al. 2013) and calculate the measures of cohesion and exclusivity for each model. Comparing these measures, I will get a set of frontier models that are not strictly dominated by other models. Then, I conduct a word intrusion task (Dyer et al. 2017) using human coder to get the best model. Finally, I review word lists and representative texts and give a label to each topic. As the number of topics is expected to be greater than 100, I will classify the labeled topics into a broader category of non-earnings topic. As the categorization can be subjective, I will try different ways of categorization and check if empirical results remain qualitatively the same.

4.2. Sample and Data

I conduct the tests using a sample of LSE listed firms over the period from 2008 to 2012. I use a comprehensive window to compare the degree of earnings-centric reporting before and after the revision of the Code in 2010. Financial industry and oil and mining sectors are excluded because of their idiosyncratic performance reporting environment.

Financial variables and analyst information are collected from Thomson Reuters Datastream and I/B/E/S, respectively. For performance measure data, I use a web crawler to harvest PDF files of annual reports from Perfect Information. Then, I apply the aforementioned method of El-Haj et al. (2018) and NER approach to extract performance measures reported in the highlights, chairman's statement, and CEO review or to create corpora for textual analysis. In the unlikely event that I am unable to develop a reliable means of extracting performance measures automatically, I will default to hand-collection of data. Although hand-collection will restrict my final sample size, the relatively straightforward nature of the data collection task means that I will still be able to work with a sample large enough to ensure sufficient statistical power (e.g., 500 firms per year across my sample period).

To provide the average management approach to performance reporting, I will show the list of most frequently discussed earnings and non-earnings performance measures and the ratio of non-earnings performance over time. I also provide the proportion of each topic, the list of most frequently mentioned words and representative texts for each topic over time.

5. Identification strategy

I test H1 using a difference-in-differences design with the Code 2010, which applies to Main Market (MM) firms but not to their Alternative Investment Market (AIM) counterparts. The DID test examines whether MM firms improve non-earnings focus in performance reporting in favor of long-term indicators of value creation more than AIM firms after the implementation of the Code 2010. I use the following model (1) and (2) to implement this approach. The dependent variables are the proportion of non-earnings performance measures (*NEM*) and the proportion of non-earnings topics (*NET*) respectively as explained in section 4. The variable of interest is an indicator for the assignment of treatment that takes one if the firm is in the Main Market and the year is after the code 2010. I used firm-fixed and year-fixed effects model to implement the differences-in-differences design. As the effect of the code may vary across the industry due to idiosyncratic industry characteristics, I also include industry-level fixed effects in the model. If the Code encourages managers to take a long-term approach to value creation, the management discusses more non-earnings performances measures and value-oriented topics, which will be shown as positive α_1 and β_1.

To check the validity of the research design, I conduct a series of diagnostic tests: checking parallel trend graphically and conducting falsification tests such as using placebo treatment periods and placebo-treated groups. To further mitigate the concern about the parallel trend, I use entropy balancing to compare firms with similar characteristics.[9] Alternatively, I can use industry level synthetic control methods where a linear combination of units within control duplicates the trend of the treated group following the approach of Abadie et al. (2010) and Kreif et al. (2016).

[9] Entropy balancing is an advanced model of propensity score matching suggested by Hainmueller, J. (2012). The model includes a reweighting scheme to obtain a high level of covariate balance.

$$NEM_{it} = \beta_0 + \beta_1 POSTMAIN_{it} + CONTROL + FIRM\_FE + YEAR\_FE + IND\_FE + \varepsilon_{it} \quad (1)$$

$$NET_{it} = \alpha_0 + \alpha_1 POSTMAIN_{it} + CONTROL + FIRM\_FE + YEAR\_FE + IND\_FE + \varepsilon_{it} \quad (2)$$

I test cross-sectional variations by adding proxies for proprietary costs and voluntary disclosure. To test proprietary costs theory, I use proxies for the costs of proprietary information such as the ratio of R&D expenditure to sales (*PROC1*) and intangible asset net of goodwill divided by total assets (*PROC2*), which show firms' strategic efforts to develop new products but may benefit competitors (Ellis et al. 2012; Jones 2007). As the costs of disclosing proprietary information are higher in the competitive market (Chemmanur et al. 2010; Merkley 2014; Mohamed and Schwienbacher 2016), I also use the inverse value of the market share as a proportion of sales within the industry (*PROC3*), the inverse value of the Herfindahl index (*PROC4*) to measure the level of competition, the inverse value of sales-weighted average of the firm's industry gross margin (*PROC5*) to measure substitutability of products, and the inverse value of sales-weighted average of the logarithm of PP&E (*PROC6*) to measure ease of entry. To examine cases in which firms voluntarily disclose information on their long-term value creation before the implementation of the Code, I use lagged variables of non-earnings performance measures (*LNEM*) and non-earnings topics (*LNET*).[10] I use model (3) and (4), which includes one of *PROC*, *LNEM* and *LNET* and an interaction term between *POSTMAIN* and the new variable. As I expect that the firms with high proprietary costs or with a high level of non-earnings focus in the past are less likely to show a significant increase in non-earnings focus after the Code, I predict that α_1 and β1 are negative.

[10] Including a lagged-dependent variable as an independent variable makes the model a dynamic panel model. To conduct fixed-effects models, I use Arellano-Bond (1991) first-difference GMM estimation and Blundell and Bond (1998) system GMM estimation.

$$VEM_{it} = \beta_0 + \beta_1 POSTMAIN*PRX_{it} + \beta_2 POSTMAIN_{it} + \beta_3 PRX_{it} + CONTROL + FIRM\_FE + YEAR\_FE + IND\_FE + \varepsilon_{it} \quad (3)$$

$$NET_{it} = \alpha_0 + \alpha_1 POSTMAIN*PRX_{it} + \alpha_2 POSTMAIN_{it} + \alpha_3 PRX_{it} + CONTROL + FIRM\_FE + YEAR\_FE + IND\_FE + \varepsilon_{it} \quad (4)$$

Where *PRX* is either *PROC, LNEM, or LNET*

To test the impact of the reporting mandate on real earnings management (H2a), I use the following models based on Roychowdhury (2006) with fixed-effects and lagged dependent variable (Kothari et al 2016). I use model (5), (6), and (7) to estimate real earnings management. The dependent variables are: cash flow from operation (*CFO*), cash flow from operating activities scaled by lagged assets; discretionary expenditures (*DISCEXP*), sum of R&D, advertising, and SG&A expenses scaled by lagged total assets; and production costs (*PROD*), sum of the costs of goods sold and the change in inventory. I get the residual value of each regression to calculate abnormal CFO (*ACFO*), abnormal discretionary expenses (*ADISCEXP*), and abnormal production (*APROD*). Following Cohen and Zarowin (2010), I create two aggregated measure of real earnings management: abnormal production minus abnormal CFO (*EM1*) and negative value of the sum of abnormal discretionary expenses and abnormal CFO (*EM2*).

$$CFO_{it} = \beta_0 + \beta_1 CFO_{it-1} + \beta_2 (1/ASSETS_{it-1}) + \beta_3 SALES_{it} /ASSETS_{it-1} + \beta_4 \Delta SALES_{it} /ASSETS_{it-1} + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (5)$$

$$DISCEXP_{it} = \beta_0 + \beta_1 DISCEXP_{it-1} + \beta_2 (1/ASSETS_{it-1}) + \beta_3 (SALES_{it-1}/ASSETS_{it-1}) + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (6)$$

$$PROD_{it} = \beta_0 + \beta_1 PROD_{it-1} + \beta_2 (1/ASSETS_{it-1}) + \beta_3 (SALES_{it}/ASSETS_{it-1}) + \beta_4 (\Delta SALES_{it}/ASSETS_{it-1}) + \beta_5 (\Delta SALES_{it-1}/ASSETS_{it-1}) + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (7)$$

I use model (8) to test the impact of the reporting mandate on real earnings management. If the reporting mandate encourages management to take a long-term perspective, firms are less likely to engage in earnings management. Thus, I expect that β_1 is negative.[11]

$$EM_{it} = \beta_0 + \beta_1 POSTMAIN_{it} + \text{CONTROL} + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (8)$$

Where *EM* is one of *EM1* and *EM2*

To test the impact of the reporting mandate on investment inefficiency (H2b), I use both ex-ante approach of Biddle et al. (2009) and ex-post approach of McLean et al. (2012). For the ex-ante approach, I use model (9) that tests an association between investment and on lagged sales growth. I take the absolute value of residual from the model to capture investment inefficiency (*INEFF1*) as positive and negative residual values respectively imply over- and under-investment. For the ex-post approach, I use regression model (10) that tests associations between investment (*INV*) and 5-year growth in performance measured by growth in revenue (*GREV*), growth in factor productivity defined by McLean et al. 2012 (*GFP*), or growth in ROA (*GROA*). I take the negative of residual value to measure ex-post investment inefficiency (*INEFFI2*) because positive residual of model (10) implies that the firm invested more efficiently than others.

[11] To correct the bias of two-step regression models where the second step model uses the residual value of the first regression (Chen et al. 2018) as a dependent variable, I include all first step regressors in the second stage.

$$INV_{it+1} = \beta_0 + \beta_1 (\Delta SALES_{it} / ASSETS_{it-1}) + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (9)$$

$$GROWTH_{it} = \beta_0 + \beta_1 (INV_{it} / ASSETS_{it-1}) + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (10)$$

Then, I use *INEFF* as a dependent variable of model (11) and examine if the reporting mandate affects investment inefficiency. As I expect that reporting value-oriented information improves investment efficiency, I predict negative β_1.

$$INEFF_{it} = \beta_0 + \beta_1 POSTMAIN_{it} + \text{CONTROL} + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (11)$$

Where *INEFF* is either *INEFF1* or *INEFF2*

The above tests show the effect of reporting mandate on the Main Market of LSE. However, the cross-sectional variation in hypothesis 1 implies heterogeneous responses to the reporting mandate (i.e., assignment of treatment and exposure to treatment can be different). As the treatment is not sharp, the effects on the Main Market show intention-to-treat (ITT) and may not show the treatment effect on managerial decision-making of non-earnings focus in performance reporting. To estimate the impact on managerial behaviors of the increase in non-earnings focus rather than the intention to treat (ITT), I use a Wald-estimator. Contrary to the previous models, I differentiate the assignment of treatment from treatment. I create an indicator variable *POSTTRT*, which takes one if firms' change in non-earnings focus in performance reporting after the implementation of the code (ΔVEM or ΔNET) is greater than median value and the year is post-event period. *POSTMAIN* becomes an assignment variable, and *POSTTRT* becomes a treatment variable. Then, I get Wald-DID (γ_1) using *POSTTRT* as an instrumental variable in the following two-steps regression models (12) and (13). The

Wald-DID estimator shows the treatment effect on main market firms with a significant increase in non-earnings focus in performance reporting.[12]

$$POSTTRT_{it} = \beta_0 + \beta_1 \, POSTMAIN_{it} + FIRM\_\mathrm{FE} + YEAR\_FE + \varepsilon_{it} \tag{12}$$

$$EM \text{ (or } INEFF)_{it} = \gamma_0 + \gamma_1 \, POSTTRT_{it} + CONTROL + FIRM\_\mathrm{FE} + YEAR\_FE + \varepsilon_{it} \tag{13}$$

I then examine the external capital market and internal control channels through which the increase in non-earnings focus in performance reporting affects managerial decisions making. The first channel is the external capital market where disclosure on long-term value creation attracts long-term investors (Serafeim 2015). To identify long-term investors, I follow the approach of Elyasiani et al. (2010). I check the volatility of each institutional investors' position and test whether investors change their position based on short-term earnings. Based on this classification, I calculate the proportion long-term investor (*LTI*) as the difference between the percentage of firm's share held by dedicated investors and that by transient investors following the approach of Serafeim (2015). The second variable of the external capital market channel is analyst following (*AF*) measured by the number of analysts who provides forecasts on the firm in the year.

Next, I examine if an enhanced non-earnings focus in performance reporting affects managerial decisions through changes in the internal control system evidenced by changes in key performance indicator. If internal performance evaluation that relies less on short-term earnings and considers more non-earnings performances in favor of long-term value creation, managers may change their decision-making. To capture the non-earnings focus of internal

[12] While Wald-DID estimators are widely used, they do not necessarily show the exact local average treatment effect (De Chaisemartin and D'HaultfŒuille 2017). Thus, I calculate Wald-TC estimator for robustness check.

control system, I calculate non-earnings focus in key performance indicator (*KPI*) using a similar approach to calculating *NEM*.

Some factors other than internal and external channel can also explain the impact of non-earnings focus in performance reporting on managerial decision making. Thus, I allow a direct channel which does not have a mediator. To consider the indirect channels of external market and internal control system and a direct channel at the same time, I apply path analysis. I expand model (8) and model (11) to create structural equations (model 14 – 16) for relations among treatment, mediators, and dependent variable. The path analysis decomposes the direct and indirect effects of treatment. The direct effect of the treatment on managerial behavior is represented by a_1. The indirect effects through the external channel and internal channel are calculated by a_2*b_1 and a_3*c_1, respectively. The total effect, the sum of direct and indirect effects, is $a_1 + a_2*b_1 + a_3*c_1$. To consider the fuzzy treatment, I can take two-steps IV approach again where I conduct DID on *POSTTRT* as a first stage, replace *POSTMAIN* of model (14), (15), and (16) with the fitted value of *POSTTRT* from the first stage regression, and solve the new structural equations.

$$RM \text{ (or } INEFFI)_{it} = a_0 + a_1 POSTMAIN_{it} + a_2 LTI \text{ (or } AF)_{it} + a_3 KPI_{it} + \text{CONTROL} + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (14)$$

$$LTI \text{ (or } AF)_{it} = b_0 + b_1 POSTMAIN_{it} + \text{CONTROL} + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (15)$$

$$KPI_{it} = c_0 + c_1 POSTMAIN_{it} + \text{CONTROL} + FIRM\_FE + YEAR\_FE + \varepsilon_{it} \quad (16)$$

6. Conclusion

This research examines whether requiring firms to articulate their approach to long-term value creation encourages management to look beyond earnings and make long-term decisions. Using the U.K. Corporate Governance Code 2010, I test whether such reporting mandate induces firms to provide more description of non-earnings aspects in favor of leading indicators of performance. Next, I examine whether such increase in non-earnings focus in performance reporting leads to improvements in managerial decisions evidenced by a lower level of real earnings management and investment inefficiency. I further show the external capital market and internal control system channels that link the increase in non-earnings focus to enhanced managerial decision-making.

My research offers three contributions. First, using path analysis and non-US research setting, I provide novel evidence on the real effects of disclosure and make causal inferences, which are rare in the disclosure literature. Second, my work also extends the literature of managerial myopia by providing empirical evidence on whether an increase in non-earnings focus of performance reporting translates into managerial decisions consistent with long-term value creation. Lastly, this study offers valuable insights to financial reporting regulators. While the result of this paper must be carefully interpreted, it may provide policymakers with useful information about potential needs for government intervention.

This study has potential limitations. First, the event (the implementation of the corporate governance code in 2010) is not strictly exogenous or sharp. It is possible that some firms voluntarily disclosed relevant information before 2010 or do not change their performance reporting even after 2010. However, DID estimator of this study is not likely to suffer a self-selection bias as the assignment of treatment is not chosen by the firm. However, under a fuzzy treatment, a classical DID estimator shows the intention-to-treat (ITT) regardless of actual treatment. Thus, I use a Wald-estimator to estimate the treatment effect on compliers within the Main Market. Second, the IFRS Practice Statement Management Commentary of IASB (2010) was introduced contemporaneously with the U.K. Corporate Governance Code (2010). However, it is not clear if IASB (2010) had a significant impact as it was not a reporting mandate. As it was not partially implemented to the Main Market only, it is not likely to affect result because the DID estimator captures incremental effects on the treated group. Even if IASB (2010) has any significant impact, the objective of this study is to examine the impact of disclosing information on long-term value creation. As both the Code (2010) and ISAB (2010) share consistent underpinning on the disclosure of long-term value creation, it is not imperative to separate the impact of the Code (2010) from that of IASB (2010). Third, the ratio of non-earnings performance measure may capture the effects of the reporting mandate only partially. As non-earnings performances are less standardized and descriptively explained than earnings measures, my algorithm potentially misses non-earnings information more than earnings information. However, it creates a bias against my prediction, and I supplement it with topic modeling, which does not require quantified numbers.

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Appendix A. Structural Changes

	The Reporting Statement: Operating and Financial Review	The UK Corporate Governance Code	The Companies Act 2006 Regulations 2013
Year	January 2006	June 2010	October 2013
Publisher	Accounting Standard Board	Financial Reporting Council	the Parliament of the UK
Mandatory?	Best practice	Comply or Explain	Mandatory
Main Market	Narratives on business operation and financial review and KPIs in relation to business strategy and long-term success	A description of the business, long-term value generation and the delivery of business strategy	Strategic report (Review of business, risk, and uncertainty, KPIs). Description of the business model and strategy
Alternative Investment Market		Not applied	Strategic report (Review of business, risk, and uncertainty, KPIs)

The U.K. government introduced the notion of an Operating and Financial Review (OFR) in 2002 and gave a statutory power to the Accounting Standard Board (ASB) to prepare a relevant reporting standard (RS1). The purpose OFR is to give forward-looking information that helps stakeholders to assess the current and future performance of the firm and the delivery of long-term objectives and strategies. The new reporting standard was introduced in March 2005, only to be repealed in December 2005 due to overlaps with the EU Accounts Modernization Directive. The ASB subsequently reissued RS1 as non-mandatory guidance in January 2006 recommending companies prepare an OFR. In October 2013, the U.K. government amended the Companies Act 2006 to replace the requirement for a business review (S417) with a requirement for a strategic report as part of the annual report (S414A). The requirement for strategic report applies to all firms except for small companies defined by S382 of the Act. The strategic report must include a review of the business and the description on uncertainties and risks, and the review must provide an analysis using key performance indicators (S414C).

Although the OFR (2006) recommends disclosure of business strategies and emphasizes a long-term perspective, it does not mandate disclosure on these topics. In the survey review on FTSE 350 firms, PwC (2007) shows that firms follow the requirement of the Act 2006, but only 17 percent of FTSE 350 firms reported an OFR as part of their annual report. It concludes that strategic information did not underpin annual reports in most cases. FRC (2010b) also mentions that there was a gap in current reporting (i.e., business review under the Act 2006), and firms should explain their long-term value creation. In contrast, revisions to the U.K. Corporate Governance Code (2010) clearly emphasize the importance of a long-term perspective to business reporting insofar as it requires main market firms to discuss business model and long-term strategy. While the regulation 2013 requires an independent section of strategic report, most required information overlaps with that of the Companies Act 2006 and the Code 2010. FRC (2014) states that the regulation of 2013 represents a modest change. Therefore, my tests focus on the Code in 2010.

Appendix B. Major Amendments to the Provisions of the Corporate Governance Code

Provisions	The Combined Code on Corporate Governance 2008	The UK Corporate Governance Code 2010
Provision B.6.2	-	**Evaluation of the board of FTSE 350 companies should be externally facilitated at least every three years. A statement should be made available on whether an external facilitator has any other connection with the company.**
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. (A.7.1)	**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. **Nonexecutive 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.
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.**

The UK Corporate Governance Code 2010 consists of principles and relevant provisions. The above table shows major changes (i.e., excluding minor changes in wording and tone) at the provision level. While the code 2010 also includes changes at the principle level, they do not require specific reactions from firms as the principles provide general terms of ideas rather than giving specific directions (e.g., the role of chairman and non-executive board members and board member's commitment).