

ENVIRONMENTAL, SOCIAL AND GOVERNANCE DISCLOSURE, INTEGRATED REPORTING, AND THE ACCURACY OF ANALYST FORECASTS

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ABSTRACT

The International Integrated Reporting Council advocates that integrated reporting (IR) should become the worldwide norm for corporate reporting aimed at serving the needs of investors. Nonetheless, only in South Africa has IR been mandated. We study the impact of the reporting regime change in South Africa on analyst forecast accuracy as a way of evaluating users' perceptions of the value of IR. We theorise that any effects of IR will be greater the greater is the level of disclosures of environmental, social and governance performance. We find results consistent with those who support IR and our theory that the level of environmental, social and governance disclosures is a mediating variable in determining the effectiveness of IR. Our results also suggest that an explicit investor focus is not required for IR to be useful to investors. The results are driven by the levels of environmental disclosure for non-financial services firms. This suggests that, first, focussing integrated reports on aspects of ESG performance is reasonable, but that, second, IR might not be a useful communication mechanism for all firms (in our case, financial services firms).

Key words: Environmental, social and governance disclosure; disclosure level; integrated reporting; analyst forecasts

1 INTRODUCTION

The idea that corporations have responsibilities to not only their shareholders but also to society overall has been around for centuries (Carroll and Shabana, 2010). In this context, a criticism of financial reporting is that it does not adequately satisfy the informational needs of all stakeholders who wish to assess a company's past and future performance, because it only provides a partial account of business activities, ignoring the social and environmental impact made by an entity (Flower, 2015). As a consequence, there have been calls for enhanced reporting on corporate responsibility, as well as for any additional information that can potentially impact on business performance. As a result, the number of companies disclosing their initiatives and performance with respect to environmental and social activities has grown. The preferred format for such disclosures has typically been a stand-alone report.¹

A criticism of stand-alone reports related to environmental and social activities is that they provide non-financial information which is non-integrated and compartmentalised and, therefore, not capable of providing stakeholders with the required links and connections that are fundamental to effectively evaluating business performance, strategy and potential for future value creation (Wild and van Staden, 2013, p.6). Integrated Reporting (IR) is seen as a response to this criticism. The International Integrated Reporting Council (IIRC) states that the purpose of IR is to provide '... information about an organisation's strategy, governance, performance and prospects in a way that reflects the commercial, social and environmental context within which it operates' (IIRC, 2011, p.2). Further, Higgins *et al.* (2014, p.1091)

¹ We use the term 'stand-alone report' to describe a number of differently titled reports. These titles include 'Sustainability Report', 'Corporate Social Responsibility Report', 'Sustainable Development Report' and 'Triple Bottom Line Reports'. The common characteristic of these reports is a focus on the environment and/or society.

suggest that IR goes beyond environmental and sustainability reporting because ‘... IR is oriented toward the future and seeks to capture interconnections between the financial and non-financial drivers of performance’. Additionally, they argue that ‘IR represents, at face value, a fundamental shift in how managers think about strategy and value creation – and also what and how they communicate with stakeholders’ (p.1091).

IR enthusiasts do not lack ambition. In particular, the IIRC has established a network of companies experimenting with IR and argues, for example, that these companies are ‘... leading the way in adopting IR with transformational effects not just on the way they report, but on the way they think and act’ (www.theiirc.org). Further, the IIRC advocates that IR should become the worldwide norm for corporate reporting to investors.

Research on the usefulness of IR is relatively sparse and impeded by two factors. First, only in South Africa has IR been mandated. As a consequence, the study of IR in other jurisdictions involves firms that adopt IR voluntarily. As Pope and McLeay (2011) point out, the study of firms that voluntarily adopt particular reporting practices does not necessarily produce results that are generalisable to all companies. This is because the firms studied could have cause to adopt the practices other than for reasons of good citizenship and a belief in transparency and, consequently, might be different from non-adopting firms in ways that bias the results of tests of usefulness. Second, the number of firms voluntarily adopting IR around the world is relatively small.

Given these arguments, studying South African firms has interest. Our analysis investigates South African firms covering the period 2008-2012. Therefore, we cover firms which are mandated to implement IR on an ‘apply or explain’ basis in the later part of the period

investigated. We study the impact of the reporting regime change on analyst forecast accuracy as a way of evaluating users' perceptions of the value of IR.

Our set of arguments relevant to why IR might have an impact on forecast accuracy is as follows. First, we argue, as in Dhaliwal *et al.* (2012), that environmental, social and governance performance has a potential link with financial performance.² This is clearly an assumption shared by the promoters of IR and is crucial in attempting to make any link between IR providing useful information to capital markets users. The second strand of our argument is that, if the claims of supporters of IR are valid, and that linking environmental, social and governance (ESG) performance with financial performance through an integrated report provides stakeholders with an improved (i.e., more holistic) understanding of the firm and its future, we would expect forecast accuracy to improve after the implementation of IR.³ The third strand of our argument is that any effects of IR will be greater the greater is the level of ESG disclosures. Put another way, the integrated reports of firms which do not disclose much on ESG performance are unlikely to enhance the understanding of the linkages between ESG performance and financial performance, whether current or in the future, or provide a holistic view of the firms activities much different from that provided in the conventional statements. In this circumstance, we would not expect to see much change in forecast accuracy for such firms.

² Any links are likely to be complex. For example, they might relate to factors affecting its revenue streams, such as the degree of consumer activism faced by the firm, its competitive position, and the markets served. They might also relate to its cost structure, including regulatory interventions, clean-up costs associated with pollution and other environmental damage, and labour market outcomes.

³ If it is argued that the low take-up of integrated reporting on a voluntary basis around the world referred to above is reflective of firms rationally choosing the optimal forms of disclosure, whether mandated or not, with regards to the informational needs of stock market participants, then we would not expect to see the mandating of integrated reporting having any positive effect on analyst forecast accuracy.

Nonetheless, there were no well accepted guidelines on just what constitutes an integrated report in South Africa, with the exception of a brief Discussion Paper entitled ‘Framework for Integrated Reporting and the Integrated Report’ issued in early 2011 by the Integrated Reporting Committee (IRC) of South Africa. How effective the implementation of IR is in South Africa is an empirical question, therefore. This also implies that tests on the usefulness of IR in South Africa are joint tests of the usefulness the underlying concept of IR and the effectiveness of the application of the concept.

South Africa later adopted the more detailed IIRC’s IR guidelines issued in 2013 (IIRC, 2013). The IIRC’s guidelines adopt a shareholder focus, a focus that is subject to debate in academic circles (see Adams, 2015; Flower, 2015; Thompson, 2015). Therefore, the period we study is one where firms were not expected to adopt an explicit investor focus in preparing integrated reports. If this implies that the integrated reports are less useful to analysts, our tests are less likely to find any impact of IR on the relationship between ESG disclosure levels and analyst forecast accuracy. If we do find results suggesting that there is an impact, such results provide evidence that an investor focus in IR is not necessary for the resulting integrated reports to be relevant to investors.

Further, these guidelines suggest that firms should concentrate on *material* links between aspects of ESG and financial performance in their integrated reports. This suggestion is consistent with the idea that underlying business models differ across firms and that firms have different key aspects of ESG performance that they need to manage. As a consequence, it is not clear which, if any, aspects of ESG disclosures will be linked to forecast accuracy. Therefore, we investigate the links between three different aspects of ESG disclosures (environmental, governance, and social) and forecast accuracy.

Using a balanced panel of forty firms (twelve in the financial services sector, twenty-eight outside of the financial services sector) with five years of data each, Bloomberg ESG disclosure scores to capture the level of disclosures, and controlling for firm and time fixed effects and other control variables, we find that ESG disclosure scores are not associated with analyst forecast accuracy in the period prior to the IR regime, but are significantly associated with increased forecast accuracy once the IR regime is introduced.⁴ This result is primarily driven by the environmental disclosure component of the ESG score. There is no evidence of any link between the level of governance and social disclosures and analyst forecast accuracy for our sample of firms. When we delve further into our results, by splitting up the sample into financial services and non-financial services firms, we find that there is no relationship between the level of any aspect of ESG disclosure and forecast accuracy for financial services firms, and that the results for the non-financial services firms are similar to the results for the whole sample.

Overall, we find some results consistent with those who support IR, and our theory that the level of ESG disclosures is a mediating variable in determining the effectiveness of IR in our capital markets context. This outcome is found despite the lack of a requirement for a specific shareholder focus in the guidance offer to South African companies concerning the preparation of the early versions of integrated reports. Perhaps this suggests that a shareholder focus is not

⁴ We use a small sample by the standards of capital markets research in accounting. Nonetheless, precedent exists for the use of small samples when the question is deemed interesting enough. For example, Leuz and Verrechia (2000) study a sample of 102 German Dax firm-years in considering the impact on measures of information asymmetry of German firms switching from German GAAP to some form of international accounting standards (US GAAP or IAS). Also, Leuz (2003) uses two small samples, one of 69 and the other of 195 German Neue Markt firm-years, to study the relative impacts of US GAAP and IAS on measures of information asymmetry. The research settings used in these two analyses were unique in providing a good site to study interesting research questions. We believe that South Africa provides such a unique site for the initial study of the impact of mandating IR, which we regard as a similarly interesting research question. We should also emphasise that our statistical tests have plenty of degrees of freedom available.

required for integrated reports to be effective for capital markets participants, notwithstanding the views of the IIRC. Our results also provide support for the idea that specific aspects of ESG performance are more important than others for some sets of firms in understanding future performance, and that firms should concentrate on those aspects that are particularly relevant to their business model in ESG disclosures, at least in providing information relevant to capital markets participants. Nonetheless, we find that IR does not help improve forecast accuracy for a specific sub-set of firms, those in financial services, consistent with a view that firm ESG and financial performance is not strongly linked for such firms. As such, IR is likely to have limited appeal as a disclosure mechanism to such firms, if they have a shareholder focus.

A complementary paper to this one is Zhou *et al.* (2015). They also study South African firms for very similar reasons to those expressed above. Using a sample of South African firm-years from 2009 to 2012, they first develop a measure which captures the extent to which the firms' reports are integrated in line with a framework developed by the IIRC in 2012. In particular, they find evidence suggesting that the higher the degree of integration of the reports, the higher the accuracy of analyst forecast errors, consistent with the idea of integrated reporting providing useful information to analysts.⁵

Our paper differs from theirs in the following key respects.⁶ Whereas they study the effects of the degree of integration of reports across their whole study period, they do not study the effects of the level of disclosure of the underlying ESG material. Essentially, they study how effective is the IIRC framework in defining the characteristics of good integrated reporting, applied to

⁵ They also study analyst forecast dispersion and the cost of capital as capital market outcomes that could be affected by IR. They find some evidence that the degree to which reports are integrated according to their measure is associated with reductions in the cost of capital, at least for some firms (those with smaller analyst followings).

⁶ Our study also differs from theirs in a number of research design choices. These differences are arguably second-order compared to the differences identified in the main text.

the South African context. In contrast, we focus on the disclosure levels of the base ESG material that arguably provides the input of non-financial information that needs to be integrated *via* an integrated report. Then, we consider how the relationship between ESG disclosure levels and analyst forecast accuracy changes with the *mandating* of IR. This approach also allows us to look at separate aspects of ESG disclosure and how their relationships with forecast accuracy changes with the mandating of IR. Nonetheless, unlike Zhou *et al.* (2015), we do not focus explicitly on the differing degrees of effectiveness across firms in integrating ESG and other non-financial information.

The rest of the paper is organised as follows. The next section provides relevant background, prior literature and the development of our main hypotheses. Section 3 introduces the methodology underlying our tests. Section 4 provides variable descriptions, data sources, and details of our sample. Section 5 provides the results of our tests. Finally, Section 6 provides a summary of our paper, the overall conclusions to be drawn from our work, a discussion of its limitations, and suggestions for further research.

2 BACKGROUND, PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT

2.1 Background

The genealogy of institutional developments in IR arguably is linked to the succession of three reports on corporate governance in South Africa. The first such report, the King Code of Corporate Governance Principles, commonly known as ‘King I’, was released in 1994. Named after Mervyn King, originally a justice of the Supreme Court of South Africa, King I ‘was especially noted for its inclusive stakeholder (rather than merely shareholder) view of the

corporation's ambit' (Gleeson-White, 2014, p. 151). Whilst King I does not call for environmental or social reporting, or any linking of these aspects of performance to financial performance, it advocates the '... disclosure of executive and nonexecutive directors' remuneration, ... guidelines for effective auditing ...' and encourages '... companies to implement a Code of Ethics to demand 'the highest standards of behavior' (Eccles and Krzus, 2014, p. 5).

The King II report (2002), inspired by the Johannesburg Earth Summit, provides a revision and updating of the King I report. It includes sections on sustainability, the role of the board, and risk management (Eccles and Krzus, 2014, p. 6). In particular, the King II report introduces 'Integrated Sustainability Reporting' as a concept, which resulted in the establishment of a task force '... to analyse a wide range of new and complex areas of non-financial reporting' (Gleeson-White, 2014, p. 156). This concept has its foundations in the Global Reporting Initiative (GRI) and Triple Bottom Line reporting (Gleeson-White, 2014, p. 157).

As Eccles and Krzus (2014, p. 7) point out, '... changes in international governance trends, as well as the passing of the new Companies Act No. 71 of 2008, made a third report necessary'. In the *King Report on Governance for South Africa - 2009 - King III* (IDSA 2009), IR is advocated as '... a holistic and integrated representation of the company's performance in terms of both its finances and its sustainability'. Therefore, King III contains a set of principles for IR and, on March 1, 2010, the Johannesburg Stock Exchange (JSE) mandated IR on a voluntary 'apply or explain basis' (IDSA 2009, p. 5) for all of its listed companies for financial year-ends

finishing after March 1, 2011.⁷ South Africa is currently the only jurisdiction that mandates IR.

Other aspects of the genealogy include a meeting in 2009 between Sir Michael Peat from the Prince of Wales' Accounting for Sustainability Project (A4S), Paul Druckman from the GRI and Mervyn King. At this meeting was discussed how IR, the A4S and the GRI could become one. A subsequent meeting, held at St. James's Palace in London on September 11, 2009, took place. This meeting is significant because, as Elkington (2009) outlines, '... it was the first time that two of the key bodies in the reporting field, Accounting for Sustainability (founded by HRH The Prince of Wales) and the Global Reporting Initiative ... had co-hosted leading organisations involved in accountability, accounting, reporting and sustainability to look at ways to drive the future integration of the multiple reports that so many major companies now produce'.

As a result, the International Integrated Reporting Council (IIRC) was formed in 2010 (at its outset, it was named the International Integrated Reporting Committee before changing its name in 2012) and issued its first Discussion Paper on IR in 2011. The Discussion Paper aimed to '... meet the needs of the 21st century' by building '... on the foundations of financial, management commentary, governance and remuneration, and sustainability reporting in a way that reflects their interdependence' (IIRC, 2011, p.1).

⁷ Departing from King I and King II, the 'comply or explain' stance of the prior South Africa Governance Code, which denotes a mandate to comply with the set of standards provided, evolved into 'apply or explain'. The reason for this is that the King Committee felt that the 'comply or explain' approach could result in a mindless response to the recommendations of the Code. By contrast, the 'apply or explain' regime appreciates the fact that it is often not a case of *whether* to comply or not, but rather of considering *how* the principles and recommendations can be applied (IDSA 2009, p. 6). King III itself notes how such a transition is intended to discourage a box ticking approach to the reporting of governance activities, and to reflect the self-regulatory nature of corporate governance in South Africa. In this respect, King advocates a voluntary basis for IR because '... there are always ways of getting around a rule. It's considerably harder to get around a principle' (Gleeson-White, 2014, p. 154).

Since then, the IIRC has released a proposed framework for IR, and gathered feedback from interested stakeholders. The process resulted in the publication of an IR Framework in December 2013 (IIRC, 2013). The IIRC states that an integrated report is ‘... a concise communication about how an organization’s strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term’ (IIRC, 2013, p.7, paragraph 1.1). Therefore, it can be argued that an integrated report has a vision which goes beyond the traditional timeframe and scope of the current financial report. This enhanced vision makes clear the link between financial and non-financial value by addressing the longer-term consequences of decisions and actions.

The aim of the current IIRC’s Framework is mainly to ‘... improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital’ (IIRC, 2013, p. 4), suggesting the IIRC adopts an investor-focussed perspective. Accordingly, the IIRC suggests IR is needed because ‘... investors need to understand how the strategy being pursued creates value over time’ (www.theiirc.org). Despite providers of financial capital being the primary target audience, however, the IIRC claims an integrated report and other communications resulting from IR will be of benefit to ‘... all stakeholders interested in an organization’s ability to create value over time, including employees, customers, suppliers, business partners, local communities, legislators, regulators and policy-makers’ (IIRC, 2013, p. 7, paragraph 1.8).

Other versions of IR exist. For example, in the USA, Eccles and Krzus (2010, p.10) present their version of IR in the book ‘One Report’ to introduce ‘... reporting financial and non-financial information in such a way that shows their impact on each other’. The book is

identified as their contribution to a ‘coordinated international response ... to the environmental crisis’ (Eccles and Krzus, 2010, p.9). One Report continues to develop independently of the current IIRC’s initiatives.

The above should not be taken to imply that IR has not occurred in practice, however, nor that the institutional developments necessarily lead practice. At the same time as the institutional developments described above, a few firms adopted practices similar to IR. For example, Eccles and Serafeim (2015) argue that ‘[l]ike other new management concepts, integrated reporting first started in practice’ and identify three early adopters of IR – a Danish enzymes company Novozymes (in 2002), a Brazilian cosmetics fragrances company Natura (in 2003), and a Danish pharmaceutical company Novo Nordisk (in 2004). They suggest that ‘[a]s in science, paradigm-changing ideas often occur independently and simultaneously once an “idea’s time has come.” So it would seem to be with integrated reporting.’

2.2 *Previous Research on IR*

One current line of IR research deals with the IIRC specifically, and its impact on the IR field. For example, Rowbottom and Locke (2015) and Humphrey *et al.* (2015) analyse the development of the standardisation of integrated reporting by the IIRC. Reuter and Messner (2015) analyse the responses, and who provided them, to the 2011 Discussion Paper. Others have critiqued and/or defended the process *via* which the IIRC and IR has, or could come to, focus on accountants and investors, as opposed to stakeholders in general, and the advantages and disadvantages of such a focus in the short- and long-term (Brown and Dillard, 2014; van Bommel, 2014; Adams, 2015; Flower, 2015; Thompson, 2015).

Research into IR itself, its preparation and its effects, is relatively sparse. A number of lines of inquiry exist. One line concerns identifying the characteristics of countries in which some firms voluntarily adopt IR (for example, Jensen and Berg, 2012; García-Sánchez *et al.*, 2013; Frías-Aceituno *et al.*, 2013, 2014). These studies suggest that cultural characteristics, legal and market systems, and degrees of market competition within countries affect the likelihood that firms in specific countries will voluntarily adopt IR. Nonetheless, it needs to be pointed out that relatively few firms voluntarily adopt IR.

Another line of research investigates the views of preparers within voluntarily adopting IR firms. Stubbs and Higgins (2014) interview managers from fifteen early adopting Australian IR firms. They do not find firms making ‘... radical, transformative change to reporting processes, but rather incremental changes to processes and structures that previously supported sustainability reporting’. Higgins *et al.* (2014) reflect on how the experiences and views of these same managers will impact on the institutionalisation of IR. Lodhia (forthcoming) reports on a case study of a customer-owned bank in Australia that is making the transition to IR. He suggests ‘... that organisations need to consider the entirety of business operations rather than merely combining existing social and environmental information with economic information to provide evidence of integrated reporting’.

The small amount of research on the effects of IR covers whether IR is directly or indirectly of relevance to capital markets or other stakeholders. Stubbs *et al.* (2014) interview Australian investors about their perceptions of IR and its potential and actual benefits. The views expressed suggest that, whilst the potential of IR to provide relevant information is accepted by the investors interviewed, the actuality with respect to voluntarily prepared Australian integrated reports is less obvious. In contrast, Knauer and Serafeim (2014) and Serafeim

(2015) suggest that IR (along with associated ‘integrated thinking’) is associated with a different, and more long-term, investor base, at least in the US, for voluntarily adopting IR firms. Churet and Eccles (2014, p.64) study voluntarily adopting IR firms worldwide and find a ‘... statistically significant relationship between the practice of integrated reporting and quality of ESG management, which ... is indicative of the overall quality of management over the long term’ but ‘... no statistically significant relationship between integrated reporting and financial performance.’ Zhou *et al.* (2015) study how the degree to which South African financial reports are integrated, according to a framework developed by the IIRC of what a desirable integrated report should look like, impacts upon analyst forecast accuracy, forecast dispersion, and the cost of capital. They find that the higher the degree of integration, the higher is the degree of forecast accuracy and the lower is the cost of capital, the latter especially for firms with small analyst followings.

As Pope and McLeay (2011) point out, research on voluntary adopters of an accounting or disclosure practice does not necessarily produce results that are generalisable to all companies. South Africa is the only site to study where IR is mandated, even if relatively little guidance was initially offered as to how to prepare an integrated report. Perhaps as a consequence, it is not surprising that some research on South African IR concerns the contents of the integrated reports (e.g., Solomon and Maroun, 2012; Hindley and Buys, 2012; Makiwane and Padia, 2013; Marx and Mohammadali-Haji, 2014). Overall, it might not be surprising to find that the practice of IR in South Africa is evolving over time and there are inconsistencies across firms. From a user perspective, Rensburg and Botha (2014) study the use of IR by stakeholders and suggest that, although IR increases financial communication, how all stakeholders use or value this information is not clear and that few stakeholders use the integrated report as their main source of investment information.

Overall, we can conclude that research on IR, whether for firms which voluntarily adopt the practice, or for those for which the practice is mandated, focuses little on users or capital market outcomes of IR. Further, on the one hand, some studies that do focus on user perceptions suggest that users do not see firms' current integrated reports as having a fully developed role in providing information relevant to investment decisions. On the other hand, other studies suggest that IR is associated with the quality of management and also a different type of investor base.

2.3 Development of Hypotheses

Given the potential importance of IR as a corporate reporting practice, but an associated lack of clarity on its actual effects on users and, in particular, investors, there is a clear gap in current research that can be filled by the further study of such effects. Additionally, given the potential difficulties of generalising the results of studying the impact of IR for voluntarily adopting firms, studying firms in a country that has mandatorily adopted the practice is desirable. Because South Africa is the only country that has mandated the provision of IR, studying South African listed firms is the only way of doing this.

Rather than further study the perceptions of South African users of IR, we investigate whether there are capital market outcomes that can be attributed to the mandating of IR in South Africa. This is a well-established form of accounting research associated with changes in accounting and/or disclosure practice. In the context of the adoption of IFRS, Pope and McLeay (2011, p.244) identify various potential outcomes. These include, for example, '... the ability of the accounting number(s) to explain market values or stock returns (valuation relevance), the

relations between accounting numbers and the estimated costs of equity or debt capital, as well as the links between directly observable market outcomes (such as bid–ask spreads) that in turn are conjectured to affect the properties of other user decision outcomes such as analyst forecasts and recommendations, institutional investment, investment by individuals and credit ratings.’

Given that IR does not *directly* affect the properties of accounting numbers, but does potentially affect the information set available *via* which the information content of accounting numbers is interpreted, we focus on the properties of analyst forecasts. In particular, we argue that, if IR in South Africa provides useful information to investors, by a much-needed linking of ESG and current and future financial performance, analyst forecast accuracy could improve subsequent to the start of the IR regime. Nonetheless, evidence from Bloomberg ESG disclosure scores for South Africa suggests that the quality of ESG reporting varies across firms. A priori, it seems unlikely that IR will provide much benefit to users and, specifically, analysts if there is little ESG disclosure to help link ESG performance to financial performance. Therefore, we argue that IR will improve the forecasting relevance of disclosures concerning ESG performance to analysts and, further, the higher the disclosure levels of ESG performance, the larger will be the improvement. Also, if the arguments of proponents of IR are correct – that, in the absence of IR, ESG disclosures will have limited impact on capital markets because the links to financial performance are not understood – we expect to observe less of a, or indeed no, relationship between ESG disclosure levels and analyst forecast accuracy prior to the IR regime.

Therefore, our formal hypothesis for the pre-IR regime period, in null and alternative form, is as follows:

H_{1N} Prior to the IR regime, ESG disclosure levels have no relationship with analyst forecast accuracy; and

H_{1A} Prior to the IR regime, ESG disclosure levels have a positive relationship with analyst forecast accuracy.

For the IR regime period, our second hypothesis, in null and alternative form, is as follows:

H_{2N} During the IR regime, ESG disclosure levels have no relationship with analyst forecast accuracy; and

H_{2A} During IR regime, ESG disclosure levels have a positive relationship with analyst forecast accuracy.

For differences between the pre-and post-IR regime periods, our third hypothesis, in null and alternative form, is as follows:

H_{3N} There is no difference in the relationship between ESG disclosure levels and analyst forecast accuracy before and after the IR regime; and

H_{3A} There is an increase in the relationship between ESG disclosure levels and analyst forecast accuracy before and after the IR regime.

Our research questions and hypotheses can be related to the study of Dhaliwal *et al.* (2012). Their study provides a multi-country analysis of the relationship between CSR disclosures, as captured by the existence of a standalone CSR report, and the accuracy of analysts' forecast errors over the period 1994 to 2007. South Africa is one of the countries they include in their

study. Overall, they find that CSR disclosures are associated with improvements in analyst forecast accuracy, although this is more prevalent in countries that are more stakeholder-oriented, and for firms with higher degrees of financial opacity. When they analyse South Africa individually, they find CSR disclosures do not improve forecast accuracy, consistent with their classification of South Africa as a country with a relatively low stakeholder orientation for the period they study. They argue that the lack of a stakeholder orientation in a country is consistent with a lack of an economic link between ESG and financial performance for firms in that country.

Accepting the conclusions at face value, if their view is correct and, further, the degree of stakeholder orientation in South Africa has not changed over time, we would expect that, irrespective of the degree of stakeholder orientation, there will be no relationship between ESG disclosure levels and analyst forecast accuracy in our study, and IR will not alter the situation, because there remains no economic link between ESG and financial performance.⁸ Nonetheless, the very existence of the various King reports suggests that, at least for some, the perception exists that there *is* a link between ESG disclosure levels and financial performance in South Africa, and that IR will help render it more visible. Our study can help resolve the conflict between the two arguments.

⁸ Dhaliwal *et al.* (2012) do not study the degree of ESG disclosure within the CSR standalone reports explicitly. As a consequence, their results are open to different, not necessarily mutually exclusive, interpretations with respect to the relationship between ESG disclosure levels and forecast accuracy and how it might evolve over time. For example, their results are consistent with the view put forward above that that ESG disclosure level does not affect analyst forecast accuracy for the period they study because South Africa is a country with a low stakeholder orientation and, as a consequence, there is little or no economic link between ESG and financial performance. Or, their result is consistent with there being an economic link, but standalone CSR reports in South Africa specifically have low disclosure levels over the period they study and, as a consequence, have no impact on forecast accuracy. Or, there is an economic link, but they capture an average effect across varying levels of disclosure, suggesting some levels of disclosure are associated with reduced levels of forecast accuracy, other levels are associated with improved forecast accuracy, with an overall effect of no net improvement in forecast accuracy across firms with a standalone CSR report.

3 METHODOLOGY

We adopt a regression approach to testing our hypotheses. Within that general approach, we adopt a balanced panel strategy. We do so for a number of reasons. Pope and McLeay (2011) argue that the experimental design necessary to pin down the impact of an accounting regime change can be difficult because, along with the regime change, firm and economic characteristics that might affect some outcome variable (in our case, analyst forecast accuracy) also change over time. As a consequence, the observation of a change in an outcome variable over time could be associated with the regime change, or changes in relevant firm and economic characteristics, or both. Disentangling the impact of one possible cause from the others is, therefore, problematic.

In this context, Pope and McLeay (2011) suggest that a balanced panel approach has some advantages because each firm observation prior to the regime change acts as a control for itself. If it can be assumed that relevant firm characteristics, and their impact on the outcome variable, do not change over time, the inclusion of firm fixed effects in the model can control for these effects (for example, how difficult it is to forecast the firm's earnings per share). Further, if there are time effects that are constant across firms in their impact on the outcome variable, they can be controlled for *via* the introduction of time fixed effects.

We adopt the approach of introducing firm and time fixed effects as a partial solution to controlling for the effects of firm and economic characteristics that change over time and affect analyst forecast accuracy. Given the implicit assumptions underlying the use of fixed effects, we also control for seven specific variables that have been found to affect analyst forecast accuracy in other studies – firm size, the size of analyst following, leverage, return on assets,

the sign of earnings, the book-to-market ratio, and lagged accuracy (as in, for example, Glaum *et al.*, 2013; Preiato *et al.*, 2015).⁹

We investigate the impact of the introduction of an IR regime in South Africa on forecast accuracy by initially estimating the following equation on a balanced panel of South African firms:

$$Accuracy_{it} = \alpha_0 + \alpha_1 ESG_{it} + \sum_{i=2}^n \beta_i F_i + \sum_{j=2}^t \gamma_j T_j + \sum_{k=1}^m \delta_k C_{ikt} + \varepsilon_{it} \quad (1)$$

where:

- $Accuracy_{it}$ = a measure of analyst forecast accuracy for firm i for year t ;
- F_i = a firm dummy which takes the value of one for any firm-year of firm i ($i = 2$ to n , where n is the number of firms in the sample); zero otherwise;
- T_j = a time dummy which takes the value of one for any firm-year with a financial year-end in calendar year j ($j = 2$ to t , where t is the number of calendar years containing financial year-ends in the sample); zero otherwise;
- C_{ikt} = control variable k for firm i for year t ($i = 2$ to n , where n is the number of firms in the sample); and
- ESG_{it} = the overall environmental, social and governance disclosure score for firm i for year t ;

⁹ Zhou *et al.* (2015) find that their measure of the degree of integration of reporting generally increases over their sample period from 2009 to 2012. If their measure is an omitted variable from our regressions, time dummies will at least help capture some of the average effects of this variable.

Then, we create two variables, *PreESG* and *PostESG*, that effectively decompose *ESG* into two components, one that takes the value of *ESG* during the period prior to the IR regime starting, and zero otherwise (*PreESG*), the other taking the value of *ESG* during the period after the IR regime starts, and zero otherwise (*PostESG*). Hence, we define *PreESG* and *PostESG* by the following equations:

$$PreESG_{it} = (1 - IRRD).ESG_{it} \quad (2)$$

and

$$PostESG_{it} = IRRD.ESG_{it} \quad (3)$$

where:

IRRD = one for any firm-year *t* with a financial year-end subsequent to March 2011; zero otherwise.

We then estimate the following equation:

$$Accuracy_{it} = \alpha_0 + \alpha_{11} PreESG_{it} + \alpha_{12} PostESG_{it} + \sum_{i=2}^n \beta_i F_i + \sum_{j=2}^t \gamma_j T_j + \sum_{k=1}^m \delta_k C_{ikt} + \varepsilon_{it} \quad (4)$$

We estimate equation (1) to allow us to see whether there is an average effect on forecast accuracy associated with environmental, social and governance disclosure levels across the period studied. This effect is captured by the coefficient of *ESG*, α_{11} . Equation (4) allows us to identify the effects before and after the IR regime is introduced. More specifically, α_{11}

captures the relationship between ESG disclosure levels and forecasting accuracy in the period prior to the introduction of IR and α_{12} captures the relationship between ESG disclosure levels and forecasting accuracy in the period subsequent to the introduction of IR. The coefficients α_{11} and α_{12} allow us to test hypotheses 1 and 2 and the difference between them allows the testing of hypothesis 3.

Having estimated equations (1) and (4) using *ESG*, the *overall* ESG disclosure score, we re-estimate the equations with *ED*, *SD* and *GD* substituted for *ESG*, together with the appropriately defined *Pre* and *Post* versions of the variables, where:

- ED* = the environmental disclosure score;
SD = the social disclosure score; and
GD = the governance disclosure score.

in order to see if any particular aspect of ESG disclosure has a different relationship with forecast accuracy than other aspects. In this regard, we first estimate (giving the most comprehensive models estimated):

$$Accuracy_{it} = \alpha_0 + \sum_{l=1}^3 \alpha_l' ESG_{it} + \sum_{i=2}^n \beta_i F_i + \sum_{j=2}^t \gamma_j T_j + \sum_{k=1}^m \delta_k C_{ikt} + \varepsilon_{it} \quad (5)$$

and then:

$$Accuracy_{it} = \alpha_0 + \sum_{l=1}^3 \alpha_{l1}' PreESG_{it} + \sum_{l=1}^3 \alpha_{l2}' PostESG_{it} + \sum_{i=2}^n \beta_i F_i + \sum_{j=2}^t \gamma_j T_j + \sum_{k=1}^m \delta_k C_{ikt} + \varepsilon_{it} \quad (6)$$

where ESG_l represents the l^{th} component (ED , SD and GD) of the overall ESG disclosure score.

We define analyst forecast accuracy in two ways and denote the measures by $Acc1$ and $Acc2$ respectively. In mathematical terms, the measures of forecast accuracy are defined as follows:

$$Acc1 = \log \left[\frac{|AEPS - MedFEPS|}{MVPS} \right] \quad (7)$$

and

$$Acc2 = \log \left[\frac{|AEPS - MedFEPS|}{|AEPS|} \right] \quad (8)$$

where:

$MedFEPS$ = the first median consensus analyst forecast of one year-ahead earnings *per* share produced after the financial year-end;

$AEPS$ = the actual earnings *per* share corresponding to the median consensus one year-ahead forecast of earnings *per* share; and

$MVPS$ = the market price *per* share of the firm at the financial year-end prior to the date of the consensus analyst forecast.

A property of both our measures of accuracy is that a *lower* value for the accuracy measures denotes a *higher* degree of forecast accuracy.¹⁰ Therefore, if increasing ESG disclosure levels

¹⁰ We use log measures of forecast accuracy to avoid having measures that are naturally truncated at zero, leading to possible specification problems for the estimated standard errors in our regressions, and attendant difficulties of economic interpretation of the coefficients. Inherently, the relationship between forecasting

increases forecast accuracy, whether in the whole period or in either of the sub-periods, we will see a *negative* value for α_1 , or α_{11} , or α_{12} . When separately considering the component scores of ESG disclosure, if increasing ESG component disclosure levels increases forecast accuracy, whether in the whole period or in either of the sub-periods, we will see a *negative* value for α'_1 , or α'_{11} , or α'_{12} .

We should emphasise that, at this stage, any conclusions that we draw from estimating equations (1), (4), (5) and (6), and, in particular, the estimates of the coefficients of the various ESG variables, are conditional upon accepting that our strategy of controlling for other factors that might affect analyst forecast accuracy by a combination of firm and time fixed effects and the seven firm-specific control variables adequately rules out alternative explanations of our results.

Nonetheless, we can make one point on this issue here. Our research design does not rely on a simple assertion that the IR regime change has a blanket impact on forecast accuracy, leading to some of the ‘identification’ problems discussed above. Instead, it suggests that the IR regime, if successful, could alter any relationship between ESG disclosure levels and forecast accuracy. As a consequence, to argue that some omitted variable explains away our results relies upon the existence of different correlations between that variable and ESG disclosure scores in the pre- and post-IR periods.

accuracy and the various explanatory variables must be non-linear. We posit no particular functional form for the relationship and, hence, taking the log of forecast accuracy is just one way of implementing a non-linear relationship. As a consequence of taking the log of forecast accuracy, for both measures, the numerator of the fraction of which we take the natural log can be zero if the consensus forecast is correct. It is not possible to take the log of zero. In such circumstances, we set the fraction equal to an arbitrary low number. In our case, the number is .00001.

Finally, Pope and McLeay (2011, p.246) argue that the ‘... challenge to researchers is therefore to find ways of more directly associating market outcomes with ... reporting, for example, by developing evidence showing that market outcomes are stronger for benchmark firms where the ... reporting regime change has had most impact’. We would argue that our research design responds to the *spirit* of their challenge in the South African context of IR by relating the impact of the introduction of the IR regime in South Africa, one that intends to enhance narrative disclosures relating ESG and financial performance, to the underlying level of ESG disclosures.

4 VARIABLE DEFINITIONS, DATA SOURCES, AND SAMPLE DESCRIPTIONS

We generate our data from three data sources – Bloomberg, IBES and Compustat Global. We use Bloomberg for ESG disclosure scores. Ioannou and Serafeim (2014) also use these scores in studying the effects of mandating ESG disclosure in China, Denmark, Malaysia, and South Africa. A brief description of the process employed by Bloomberg in calculating scores is as follows (borrowing from the description in Ioannou and Serafeim, 2014, pp.10-11). Overall, Bloomberg calculate an ESG disclosure score and, within the overall score, three sub-scores (ED, SD and GD) which quantify a company’s level of reporting ESG information. Environmental data used in constructing ED relate to emissions, water, waste, energy and operational policies around environmental impact. Social data used in constructing SD relate primarily to employees, products and impact on communities. GD is constructed from governance data related to board structure and function, a firm’s political involvement, and executive compensation. The overall ESG score is based on 100 out of 219 raw data points that Bloomberg collects. The construction of the score takes into account the most commonly disclosed fields and weights such disclosures more highly. The resulting weighted score is then normalized in order that scores lie in the interval from zero (for companies with no ESG

disclosure) to 100 (for those companies that have ‘perfect’ disclosure). Bloomberg also normalise the final scores by industry by considering a selected set of fields particularly applicable to an industry.

From IBES, we generate our forecast variables. In particular, we use the database to generate observations on the first median consensus one year-ahead earnings *per share* forecast subsequent to a financial year-end (*MedFEPS*), the number of analysts used by IBES in generating the consensus forecast (*NoA* – as a proxy for the number of analysts following the firm), the actual earnings *per share* figure subject to the forecast (*AEPS*), and the price *per share* at the financial year-end prior to the forecast date (*MVPS*). We also use IBES to identify the number of shares outstanding at the financial year-end which we multiply by *MVPS* to create the market capitalisation at the financial year-end prior to the forecast date, the log of which we take to create *Log MV*, our measure of firm size.

We generate accounting variables from Compustat Global. In particular, we generate data for total assets (TA), total liabilities (TL) and net income (NI). We then generate the following control variables: (i) leverage (*Lev*) as the ratio of TL to TA; (ii) return on assets (*RoA*) as the ratio of NI to TA; (iii) a loss dummy (*Loss*) equal to one if *RoA* is negative; zero otherwise; and (iv) the book-to-market ratio (*BM*) as the ratio of the difference between TA and TL to the market value of the firm (estimated using IBES data on the price *per share* and the number of shares outstanding).

From these data sources we then construct a balanced panel for the financial years 2008 to 2012 (with, as a consequence, consensus analyst forecasts for the years 2009 to 2013), after imposing further restrictions. We start our sample period at 2008 because the number of firms with ESG

disclosure scores is much lower in 2007 than 2008. We require firms: (i) to have the necessary accounting, ESG, IBES forecast and price data; (ii) to have consistent financial year-ends for 2008 to 2012;¹¹ (iii) to have their primary listing on the Johannesburg Stock Exchange;¹² and (iv) to report in South African Rands. Our sample consists of 40 firms with 5 years of consecutive observations, giving 200 firm-year observations. The names of the firms are given in Table 1.¹³

Insert Table 1

Because the use of a balanced panel imposes substantial data restrictions, we provide a brief description of how our final sample relates to other possible samples. First, for all firms listed on the Johannesburg Stock Exchange for the period 2008 to 2012, there are 1484 firm-year observations. Of those firm-years, 654 have the necessary IBES data and 481 have ESG scores.¹⁴ The intersection of the last two samples, combined with the further restrictions, produces our final sample.¹⁵

Our sample contains both financial services and non-financial services firms. In particular, there are twelve financial services firms (60 firm-years) and twenty-eight non-financial services firms (140 firms-years). Because it is accepted that ratios involving accounting

¹¹ This restriction ensures that all forecasts relate to the same length of reporting period.

¹² Firms whose primary listing is not on the Johannesburg Stock Exchange are not expected to produce integrated reports (see Solomon and Maroun, 2012, p.9, fn.2).

¹³ Dhaliwal *et al.* (2012) find 37 firms who issue standalone CSR reports at some time between 1994 and 2007, with 174 firm-years with reports. They compare these firm-years with 877 firm-years that do not feature standalone CSR reports. Perhaps coincidentally, Bloomberg have ESG scores for just 37 firms in 2007.

¹⁴ Of the firms with ESG scores, 68 of them have continuous data from 2008 to 2012 (340 firm-years).

¹⁵ Casual comparisons suggest that the sample contains the larger South African domiciled firms listed on the Johannesburg Stock Exchange.

variables are likely to have different characteristics for financial services firms relative to non-financial services firms, we split *Lev*, *RoA* and *BM* into two components, one representing the value of that variable when the firm is a financial services firm and zero otherwise (*Lev-FS*, *RoA-FS*, *BM-FS*), the other representing the value of that variable when the firm is a non-financial services firm and zero otherwise (*Lev-NFS*, *RoA-NFS*, *BM-NFS*). Table 2 provides descriptive statistics for our variables for the two sets of firms.¹⁶

Insert Table 2

Table 3 provides details of the correlations between the independent and dependent variables for both sets of firms.¹⁷

Insert Table 3

The correlations in Table 3 suggest that the two measures of forecast accuracy, *Acc1* and *Acc2*, are highly correlated. The sub-components of ESG are significantly and positively correlated, more so for financial services firms, but not to such an extent likely to cause multi-collinearity problems if they are included in the same regressions. Neither *ESG*, nor its sub-components, are significantly correlated at the 5% level with either accuracy measure, other than for *ESG*

¹⁶ No financial services firms had losses in the financial years ending in 2008-2012. As a consequence, we provide no statistics for that variable for financial services firms.

¹⁷ No financial services firms had losses in the financial years ending in 2008-2012. As a consequence, we provide no correlations for that variable for financial services firms.

and *Acc2* for financial services firms, where the correlation is negative. The ESG scores, and the sub-component scores, are significantly correlated with a number of the control variables, especially for financial services firms. Again, these correlations are not of a size likely to cause multi-collinearity problems if the variables are included in the same regression.

As a final description of our sample, we look at the way in which *ESG* scores (and, separately, its components: *ED*, *SD*, *GD*) have evolved over time, given the South African mandated requirement for sustainability reporting for financial year-ends ending in 2010 onwards (Ioannou and Serafeim, 2014) and subsequently for integrated reporting for financial year-ends ending in March 2011 onwards. We do so because the mechanism *via* which IR is hypothesised to affect forecast accuracy is through *ESG* (*ED*, *SD*, *GD*). As a consequence, we would like to identify, specifically, whether the introduction of IR had any incremental impact on *ESG* (*ED*, *SD*, *GD*). To this end, we first estimate:

$$ESG = \lambda_0 + \lambda_1 ESRD + \lambda_2 IRRD + \varepsilon \quad (7)$$

where *ESRD* is a dummy variable equal to 1 for a firm-year observation with a financial year-end of 2010 onwards, and zero otherwise. On the assumption that these changes in disclosure regimes produce a once-and-for-all effect on ESG disclosure scores, we interpret λ_1 as the impact of the ES regime and λ_2 as the *incremental* impact of the IR regime *relative* to the ES regime.

Second, we estimate:

$$ESG = \lambda_0 + \lambda_1 ESRD + \lambda_2 IRRD + \sum_{k=1}^m \lambda_{3k} C_{ik} + \varepsilon \quad (8)$$

(and for *ED*, *SD* and *GD* separately as dependent variables), in which we also include the control variables we use in our equations investigating forecast accuracy, alongside regime change effects. We do so because: (i) we wish to investigate the impact of variables some of which partially capture the level of disclosure in other jurisdictions in order to further check on the regime change effects; and (ii) in order to identify the (partial) associations of our control variables with the disclosure scores, given we will include them all in our regressions where a measure of forecast accuracy is the dependent variable.

The results of estimating equations (7) and (8) are reported in Table 4.

Insert Table 4

The results suggest that the introduction of the ES regime in 2010 has statistically significant and positive impacts on *ESG*, *ED* and *GD*. The estimates of the impacts on *SD* are positive but only marginally statistically significant at the 10% level. The introduction of the IR regime, however, has no statistically significant impacts at the 5% level on the levels of disclosure. The introduction of the IR regime has a positive coefficient for *GD* which is significant at the 10% level, but the result is not robust to the inclusion of the control variables which, in general, reduces the coefficient of the IR regime dummy. As a consequence, we can reasonably assume that any impact of IR that we identify in our subsequent analysis is a consequence of how IR

makes ESG disclosures more relevant to analysts, rather than by increasing disclosure levels.

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5 RESULTS

The results of estimating equations (1) and (4) are presented in Tables 5 and 6. Table 5 provides the results when *Acc1* is the dependent variable, with Table 6 providing the results when *Acc2* is the dependent variable.

Insert Tables 5 and 6

The results in Table 5 and 6 can be summarised as follows. First, in the absence of any IR regime effects (equations (1) and (5)), only *ESG* and *ED* have a statistically significant and negative relationship with forecast accuracy. When the other variables (*SD* or *GD*) are considered on their own, there is no evidence of a statistically significant relationship with forecast accuracy. When *ED*, *SD* and *GD* are entered into the regression simultaneously (as in equation (3)), there is no evidence of a significant relationship between any of the *ESG* disclosure score components and forecast accuracy.

¹⁸ We only report the results of estimating equation (8) when using *LAcc1* as the measure of lagged accuracy. The results with respect to the coefficients of *IRRD* are unchanged if we substitute *LAcc2* for *LAcc1* in the regressions. We also estimate equations (7) and (8) with firm fixed effects added. Doing so produces little qualitative change in our results other than the evidence in favour of a positive impact of the introduction of IR on *GD* is slightly strengthened.

¹⁹ The result here can be contrasted with the comment in Zhou *et al.* (2015) that the degree of integration, as captured by their measure, increases with the mandating of IR in South Africa. This suggests that their measure of the degree of integration is not necessarily fully capturing ESG disclosures, which appear to have been more affected by the introduction of mandatory ESG reporting in 2010.

When an IR regime effect is considered (equations (4) and (6)), there is no evidence that any of the ESG disclosure scores, whether considered overall, separately as components, or simultaneously as components, have any relationship with forecast accuracy *prior* to the IR regime, as judged by the ‘Pre’ coefficients. *PostESG* and *PostED* have a significant and negative relationship with forecast accuracy, however. Further, *PostED* has a significant and negative relationship with forecast accuracy, even when included in a regression equation with *PostSD* and *PostGD*. There is no evidence that the other elements of ESG disclosure have a relationship with forecast accuracy after the introduction of the IR regime.

We do not explicitly provide the results for testing our third hypothesis. Nonetheless, when *differences* between the coefficients of the ‘Pre’ and ‘Post’ variables are considered, untabulated results suggest that there is evidence of a statistically significant change in the relationship with forecast accuracy for *ESG* and *ED*, the latter whether considered on its own or simultaneously with *SD* and *GD*.^{20, 21}

The results for the control variables suggest that *Log MV* and *Lag Acc1/Lag Acc2* are consistent statistically significant across all specifications. When *Acc1* is the dependent variable, *BM*-

²⁰ There is some evidence that the coefficient of *GD* changes significantly between the two periods, despite its coefficient not being significant in either period. When the regression includes *PreGD*, *PostGD* and the control variables, the difference is significant at the 10% level when the dependent variable is *Acc1*, and at the 5% level when the dependent variable is *Acc2*. When the regression includes all the ESG components, there is no evidence of a difference between the *PreGD* and *PostGD* coefficients.

²¹ We expand our model specifications to allow for the coefficients of the control variables to change between the pre- and post-IR periods. Such an expansion has no impact on the qualitative nature of our results. We also restrict our sample to those firms that have at least two, or three, analysts making EPS forecasts, in order to guard against the possibility that our results are the results of the specific analysts associated with firms with limited analyst followings. Such restrictions have no impact on our results. Because *NoA* and *LogMV* are fairly highly correlated, we omit *NoA* from our regressions, with no substantive changes to our key results. We add in a measure of lagged daily return volatility, as another measure of the difficulty of forecasting earnings, to our regressions as an independent variable. Such an addition does not change our results. Finally, we also add in a proxy for the quality of the integrated report. We note that Zhou *et al.* (2015) point out that their measure of IR quality is similar to those produced by professional firms in South Africa. We use rankings produced by EY and available from their website for those firms common to our sample and those covered by EY. We use a set of dummy variables based upon the rankings available. Including these dummy ranking variables does not alter our results.

NFS is statistically significant at at least the 10% level for all specifications. When *Acc2* is the dependent variable, *Lev-NFS* is statistically significant at at least the 10% level for some of specifications. For all the other variables, the reported coefficients are not statistically significantly different from zero.²²

Therefore, overall, we find evidence that there does not appear to be a relationship between ESG disclosure scores, either overall or in terms of its components, and forecast accuracy prior to the start of the IR regime. Nonetheless, there is solid evidence of a relationship between ESG and, in particular, the ED component of the ESG disclosure score and forecast accuracy in the IR regime. Given that we have established above that the mandating of IR does not increase ESG disclosure levels, the results are consistent with the views of advocates of IR who suggest that IR establishes better links between ESG and financial performance, with the implied consequence that forecast accuracy will be higher in the IR period the higher is the level of disclosure.²³

²² We do not explicitly report the coefficients for the time dummies. Nonetheless, no particular effects are revealed by the pattern of coefficients, with few significant coefficients. There is no trend in the coefficients consistent with the degree of integration in South African financial reports improving with an associated improvement in analyst forecast accuracy. This could be caused by there being a relative lack of improvement over time in their measure for our sample companies and/or the effects of other time-dependent, omitted variables that cancel out the effects of the degree of integration.

²³ In an attempt to rule out the possibility that some unspecified effect associated with the passage of time and coincidental with the pre- and post-IR periods in South Africa has intervened in the relationship between ESG disclosure scores and forecast accuracy to increase its strength, we replicate our study using a balanced panel of 212 UK companies on data from the same period. We find very little evidence of any robust relationship between ESG disclosure scores and forecast accuracy. The only exception is for *ED*, which has a significant coefficient, at the 5% level, when explaining *LAcc1*. When explaining *LAcc2*, its coefficient is not significant at the 5% level, however. Furthermore, in both cases the coefficient is positive, not negative. More specifically to our study, there is no evidence of a significant and *negative* change in the coefficient for any of our measures of disclosure in any of our model specifications between the two periods. As a consequence, finding no UK evidence of any unspecified time effect on the relationship between ESG disclosure scores and forecast accuracy similar to that found in South Africa supports our interpretation that the South African outcomes can be attributed to the mandating of IR. The generic possibility identified above is a particular example of an omitted variable problem and one solution to the problem is to adopt what is typically referred to as a ‘difference-in-differences’ research design. This is what we have done. Such a design finds a benchmark sample without the effect under investigation (in our case, the mandating of IR) and replicates the study research design on the benchmark sample. If, as in our case, no effect is found for the benchmark sample, that strengthens the case that the outcome in the sample of interest can be attributed to a particular cause (in our case, the mandating of IR). Nonetheless, as Pope and McLeay (2011)

More specifically, this result seems to be driven by IR establishing better links between, in particular, *environmental* and financial performance. We should stress that, if the link between environmental disclosure levels and forecast accuracy is driven by the business models for the firms in our sample generating an economic link between environmental and financial performance, no attempt should be made to generalise the results of our study to other samples with different distributions of business models. Indeed, we develop this point immediately below. But, the results do suggest that some aspects of ESG disclosure might be more informative than others for some sets of firms, with implications for the focus of integrated reports seeking to inform, at least in part, capital markets participants.

It might be a little difficult to understand, however, why environmental disclosure scores should drive the link between ESG disclosure levels and forecast accuracy for all firms in our sample if it fundamentally reflects a strong economic link between environmental and financial performance. After all, it would not be clear why such a link should exist for financial services firms. As a consequence, we split our sample between financial services and non-financial services firms and re-run our regressions. We only report the results for equation (4), using *Acc1* as our measure of forecast accuracy (the results for *Acc2* are qualitatively similar). The results are reported in Table 7.

Insert Table 7

argue, such a research design does not completely solve the omitted variable problem, essentially because the identification of a benchmark sample is a non-trivial task.

The results are fairly clear-cut. For financial services firms, there is no evidence of any relationship between ESG disclosure levels, or any of its components, and forecast accuracy. Nor do the control variables affect forecast accuracy. For non-financial services firms, the results are similar to the results for the whole sample, suggesting it is the non-financial services firms that are driving the results for the whole sample.²⁴ These outcomes might not be surprising. Nonetheless, they suggest that IR is not necessarily an important disclosure mechanism for all firms in all sectors, at least for the context of this study.²⁵

6 SUMMARY AND CONCLUSIONS

We investigate the impact of mandating IR in South Africa on the accuracy of analyst one year-ahead forecasts of earnings. Given that IR is intended to link ESG and financial performance, we theorise that, if there is any impact, it will be higher for firms with higher ESG disclosure. Further, if there is a need for the link provided by IR, ESG disclosure levels will not be associated with analyst forecast accuracy before IR is implemented, whereas it will be once integrated reports are provided.

The results suggest that ESG disclosure levels are not associated with analyst forecast accuracy before the IR regime was introduced, whereas there is evidence that ESG disclosure levels, and, in particular, environmental disclosure levels, are associated with forecast accuracy after

²⁴ For the non-financial services firm sub-sample, the difference between the coefficients for *PreESG* and *PostESG* is only significant at the 10% level whereas, for *PreED* and *PostED*, it is significant at the 5% level irrespective of the specification within which the two variables are included. Unlike for the whole sample, there is no evidence of a difference between the coefficients of *PreGD* and *PostED* for either sub-sample.

²⁵ There are also other variables that could be used to capture any market effects of IR (Botosan, 2006). For example, if IR reduces information asymmetries between the firm and investors and between investors, the impact of IR on bid-ask spreads, price impact, zero returns and zero trading days (as measures of information asymmetry) could also be studied. For our sample of companies, we estimate these variables and, using firm size, return volatility and trading volume, along with firm and time fixed effects, as control variables (as in Daske *et al.* 2008; 2013) investigate the impact of ESG disclosure levels pre- and post-IR on them. We find no effects. Perhaps this is because, as noted above, the firms in our sample are already highly liquid.

the introduction of the IR regime. If accepted as valid, these results are consistent with not only IR providing useful information on links between ESG and financial performance but also our theory that the value of these links will improve the higher the level of ESG disclosure. Further, IR in South Africa over the period did not, of necessity, have an investor focus because relatively little guidance was on offer as to how integrated reports should be prepared. More recently, however, the IIRC has produced guidelines concerning IR recommending an investor focus. Our results, again if accepted as valid, suggest that an explicit investor focus is not required for IR to be useful to investors.

Nonetheless, we also find that the results described above are driven by the non-financial services firms in the sample we study, with no relationships being found between any of our measures of the level of ESG disclosure and forecast accuracy for financial services firms. This suggests that it would be difficult to conclude that IR is a useful disclosure mechanism for all firms in our sample, at least in the context we have studied.

There are limitations to our work. For example, our control variable strategy could be inadequate, leading to an omitted variable problem, leading in turn to biased coefficient estimates on our experimental variables and biased conclusions. This is the ‘identification’ problem associated with identifying the effects of accounting and regime changes. In our case, however, to argue that some omitted variable explains away our results relies upon both an association of the variable with forecast accuracy and the existence of different correlations between that variable and ESG disclosure scores in the pre- and post-IR periods, not merely a variable associated with forecast accuracy that changes over the time period of the regime change.

Our work suggests future research possibilities. For example, longer-term analyst forecasts could be studied (e.g., two year-ahead earnings *per* share forecasts) within our framework. Given that one of the benefits of IR is argued to be a focus on the future implications of various actions and decisions concerning ESG activities for financial performance, studying longer-term forecasts makes sense.²⁶ Also, following the idea in Zhou *et al.* (2015), as more data is gathered through the passage of time, the impact of firms having differing degrees of effectiveness in integrating ESG information into their reports could be studied within our research framework, given we only capture average effects associated with the mandating of IR.

²⁶ At the time of collecting the data, only one set of two-year forecasts, along with the associated outcomes, is available.

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TABLE 1	
LIST OF SAMPLE COMPANIES	
Aeci Ltd	Imperial Holdings Ltd
African Oxygen Ltd	JSE Ltd
African Rainbow Minerals Ltd	Kumba Iron Ore Ltd
Anglo American Platinum Ltd	Liberty Holdings Ltd
ArcelorMittal South Africa Ltd	Mediclinic International Ltd
Assore Ltd	Merafe Resources Ltd
Astral Foods Ltd	MTN Group Ltd
Barclays Africa Group Ltd	Murray & Roberts Holdings Ltd
Barloworld Ltd	Nedbank Group Ltd
Capitec Bank Holdings Ltd	Netcare Ltd
Clicks Group Ltd	Pick n Pay Stores Ltd
Coronation Fund Managers Ltd	PPC Ltd
Discovery Ltd	Sanlam Ltd
Exxaro Resources Ltd	Santam Ltd
FirstRand Ltd	Sasol Ltd
Grindrod Ltd	Shoprite Holdings Ltd
Group Five Ltd/South Africa	Standard Bank Group Ltd
Growthpoint Properties Ltd	Tiger Brands Ltd
Hulamin Ltd	Truworths International Ltd
Impala Platinum Holdings Ltd	Woolworths Holdings Ltd/South Africa

TABLE 2					
DESCRIPTIVE STATISTICS					
Panel A – Financial Services Firms – 60 Firm-Year Observations					
<i>Variables</i>	<i>Min</i>	<i>Median</i>	<i>Mean</i>	<i>Max</i>	<i>SD</i>
<i>Acc1</i>	-3.873	-1.981	-2.150	-0.957	0.602
<i>Acc2</i>	-2.864	-0.864	-1.021	1.029	0.658
<i>ESG</i>	10.526	34.868	33.849	63.597	13.331
<i>ED</i>	0.000	19.643	19.281	49.107	13.561
<i>SD</i>	0.000	40.000	39.123	88.333	20.744
<i>GD</i>	42.857	57.143	58.036	76.786	9.441
<i>Log MV</i>	3.356	4.526	4.545	5.285	0.486
<i>NoA</i>	2.000	6.000	7.333	16.000	3.891
<i>LAcc1</i>	-3.609	-1.859	-2.023	-0.957	0.607
<i>LAcc2</i>	-2.623	-0.795	-0.923	1.029	0.650
<i>Lev-FS</i>	0.355	0.910	0.822	0.973	0.169
<i>RoA-FS</i>	0.000	0.014	0.028	0.107	0.026
<i>BM-FS</i>	0.056	0.493	0.460	1.033	0.201
Panel B – Non-Financial Services Firms – 140 Firm-Year Observations					
<i>Variables</i>	<i>Min</i>	<i>Median</i>	<i>Mean</i>	<i>Max</i>	<i>SD</i>
<i>Acc1</i>	-3.873	-1.911	-1.958	-0.675	0.684
<i>Acc2</i>	-2.864	-0.795	-0.742	1.029	0.744
<i>ESG</i>	11.984	38.636	38.354	64.115	11.187
<i>ED</i>	0.000	27.907	27.746	65.289	15.489
<i>SD</i>	5.263	42.928	43.403	78.947	16.907
<i>GD</i>	32.143	57.143	56.327	71.429	6.406
<i>Log MV</i>	3.166	4.319	4.379	5.563	0.552
<i>NoA</i>	1.000	7.500	7.407	16.000	3.736
<i>Loss</i>	0.000	0.000	0.086	1.000	0.281
<i>LAcc1</i>	-3.609	-1.747	-1.872	-0.664	0.679
<i>LAcc2</i>	-2.623	-0.630	-0.712	1.029	0.713
<i>Lev-NFS</i>	0.135	0.537	0.534	1.023	0.188
<i>RoA-NFS</i>	-0.096	0.092	0.108	0.514	0.109
<i>BM-NFS</i>	-0.028	0.364	0.460	3.188	0.442

Notes: *Acc1* is the absolute value of the difference between actual earnings *per share* and the median consensus earnings *per share* forecast divided by market value *per share* at the previous financial year end. *Acc2* is the absolute value of the difference between actual earnings *per share* and the median consensus earnings *per share* forecast divided by the absolute value of actual earnings *per share*. *ESG* is the overall Bloomberg ESG disclosure score. *ED* is the environmental disclosure component score. *SD* is the social disclosure component score. *GD* is the governance disclosure component score. *Log MV* is the log of the market value of the firm at the financial year end prior to the year for which the earnings forecast is made. *NoA* is the number of analysts forecasts used to create a consensus forecast. *Loss* is a dummy variable equal to 1 if the firm made a loss in the year prior to the earnings forecast; 0 otherwise. *LAcc1* is the one year lag of *Acc1*. *LAcc2* is the one year lag of *Acc2*. *Lev-FS*

(Lev-NFS) is the ratio of total liabilities to total assets for financial services (non-financial services) firms; 0 otherwise. *RoA-FS (RoA-NFS)* is the ratio of net income to total assets for financial services (non-financial services) firms; 0 otherwise. *BM-FS (BM-NFS)* is the ratio of book value (total assets less total liabilities) to market value at the financial year-end prior to the forecast for financial services (non-financial services) firms; 0 otherwise.

TABLE 3

PEARSON CORRELATIONS BETWEEN VARIABLES

Panel A - Financial Services Firms – 60 Firm-years

<i>Variables</i>	<i>Acc1</i>	<i>Acc2</i>	<i>ESG</i>	<i>ED</i>	<i>SD</i>	<i>GD</i>	<i>Log MV</i>	<i>NoA</i>	<i>Lag Acc1</i>	<i>Lag Acc2</i>	<i>Lev-FS</i>	<i>RoA-FS</i>
<i>Acc2</i>	0.973											
<i>ESG</i>	-0.2287	-0.2619										
<i>ED</i>	-0.2249	-0.2584	0.9449									
<i>SD</i>	-0.2098	-0.2456	0.9166	0.7621								
<i>GD</i>	-0.1731	-0.1711	0.8145	0.7036	0.6843							
<i>Log MV</i>	-0.1296	-0.1601	0.7014	0.5764	0.6992	0.6704						
<i>NoA</i>	-0.1809	-0.2549	0.7203	0.6174	0.7456	0.5504	0.7985					
<i>Lag Acc1</i>	0.2011	0.1671	-0.2402	-0.1947	-0.3126	-0.0904	-0.1903	-0.1676				
<i>Lag Acc2</i>	0.1858	0.157	-0.2621	-0.2211	-0.3196	-0.1133	-0.2093	-0.212	0.9656			
<i>Lev-FS</i>	0.0849	0.0267	0.3432	0.2904	0.3245	0.3044	0.2045	0.463	0.0041	-0.0435		
<i>RoA-FS</i>	-0.0918	-0.061	-0.2777	-0.1986	-0.3067	-0.2971	-0.3368	-0.5072	-0.0824	-0.0691	-0.73	
<i>BM-FS</i>	-0.0132	-0.0332	0.3853	0.3317	0.383	0.3731	0.4967	0.4234	0.1474	0.0978	-0.1568	-0.348

TABLE 3 CONTINUED

Panel B – Non-Financial Services Firms – 140 Firm-years

<i>Variable</i>	<i>Acc1</i>	<i>Acc2</i>	<i>ESG</i>	<i>ED</i>	<i>SD</i>	<i>GD</i>	<i>Log MV</i>	<i>NoA</i>	<i>Loss</i>	<i>Lag Acc1</i>	<i>Lag Acc2</i>	<i>Lev-NFS</i>	<i>RoA-NFS</i>
<i>Acc2</i>	0.9402												
<i>ESG</i>	0.0871	0.0803											
<i>ED</i>	<i>0.1637</i>	<i>0.1516</i>	0.9195										
<i>SD</i>	0.0018	-0.0035	0.7293	0.4365									
<i>GD</i>	-0.0471	-0.0578	0.5242	0.3438	0.3738								
<i>Log MV</i>	-0.2219	<i>-0.1599</i>	0.1864	0.1683	<i>0.1396</i>	0.0947							
<i>NoA</i>	-0.17	-0.1161	0.2639	0.192	0.2591	0.1981	0.7036						
<i>Loss</i>	0.0734	0.0989	0.0617	0.0545	0.0535	0.082	-0.1119	0.1036					
<i>Lag Acc1</i>	0.3217	0.2804	0.0956	0.1984	-0.0282	-0.0677	-0.301	-0.2258	0.3082				
<i>Lag Acc2</i>	0.2892	0.3056	<i>0.1418</i>	<i>0.2213</i>	0.0178	-0.0062	-0.2441	-0.1368	0.3671	0.9278			
<i>LeV-NFS</i>	-0.1317	<i>-0.1471</i>	-0.3226	-0.3129	-0.233	-0.1174	-0.2308	0.0622	0.103	-0.0163	-0.0248		
<i>RoA-NFS</i>	<i>-0.1581</i>	-0.1939	0.0448	-0.0395	0.2038	-0.1211	0.3826	0.0465	-0.4186	-0.2844	-0.4082	-0.3583	
<i>BM-NFS</i>	0.4102	0.3774	0.1943	0.2101	0.1213	<i>0.1423</i>	-0.4942	-0.3491	0.1098	0.3682	0.3718	-0.2598	-0.4073

Notes: *Acc1* is the absolute value of the difference between actual earnings *per share* and the median consensus earnings *per share* forecast divided by market value *per share* at the previous financial year end. *Acc2* is the absolute value of the difference between actual earnings *per share* and the median consensus earnings *per share* forecast divided by the absolute value of actual earnings *per share*. *ESG* is the overall Bloomberg ESG disclosure score. *ED* is the environmental disclosure component score. *SD* is the social disclosure component score. *GD* is the governance disclosure component score. *Log MV* is the log of the market value of the firm at the financial year end prior to the year for which the earnings forecast is made. *NoA* is the number of analysts forecasts used to create a consensus forecast. *Loss* is a dummy variable equal to 1 if the firm made a loss in the year prior to the earnings forecast; 0 otherwise. *LAcc1* is the one year lag of *Acc1*. *LAcc2* is the one year lag of *Acc2*. *Lev-FS (Lev-NFS)* is the ratio of total liabilities to total assets for financial services (non-financial services) firms; 0 otherwise. *RoA-FS (RoA-NFS)* is the ratio of net income to total assets for financial services (non-financial services) firms; 0 otherwise. *BM-FS (BM-NFS)* is the ratio of book value (total assets less total liabilities) to market value at the financial year-end prior to the forecast for financial services (non-financial services) firms; 0 otherwise.

TABLE 4								
DETERMINANTS OF ESG SCORES AND ITS COMPONENTS								
Variables	Dependent Variable							
	ESG		ED		SD		GD	
<i>ESRD</i>	5.531	4.599	5.930	4.821	5.757	4.495	4.108	4.083
<i>p-value</i>	0.014	0.014	0.043	0.060	<i>0.084</i>	0.106	0.003	0.001
<i>IRR</i>	1.602	-0.047	1.388	-0.024	1.523	-1.476	2.345	1.621
<i>p-value</i>	0.469	0.980	0.635	0.993	0.653	0.608	<i>0.074</i>	0.161
<i>Log MV</i>		2.910		4.763		-0.825		3.829
<i>p-value</i>		0.180		0.103		0.806		0.038
<i>NoA</i>		1.135		1.069		2.164		0.099
<i>p-value</i>		0.000		0.005		0.000		0.648
<i>Loss</i>		2.041		-1.241		10.274		0.595
<i>p-value</i>		0.603		0.810		0.046		0.720
<i>Lev-FS</i>		-1.711		-10.081		8.527		3.348
<i>p-value</i>		0.785		0.134		0.403		0.425
<i>Lev-NFS</i>		-4.006		-12.507		4.865		4.799
<i>p-value</i>		0.502		0.114		0.589		0.195
<i>RoA-FS</i>		-40.572		-53.395		-10.987		-41.232
<i>p-value</i>		0.405		0.438		0.854		0.147
<i>RoA-NFS</i>		21.081		2.408		75.245		1.329
<i>p-value</i>		0.035		0.847		0.000		0.848
<i>BM-FS</i>		8.084		0.006		21.731		10.690
<i>p-value</i>		0.325		0.999		0.113		0.058
<i>BM-NFS</i>		11.055		10.380		19.444		5.103
<i>p-value</i>		0.000		0.001		0.000		0.000
<i>LAcc1</i>		0.951		3.623		-2.499		-0.083
<i>p-value</i>		0.500		0.049		0.256		0.912
<i>Adjusted R²</i>	0.065	0.320	0.039	0.256	0.024	0.316	0.142	0.282

Notes: The regressions are estimated using OLS for the coefficient estimates. The significance levels reported are based upon heteroscedasticity-adjusted standard errors. *ESRD* is a dummy variable equal to 1 if the firm financial year-end falls in the years 2010, 2011 and 2012; 0 otherwise. *IRR* is a dummy variable equal to 1 if the firm financial year-end falls after February 2011; 0 otherwise. *Acc1* is the absolute value of the difference between actual earnings *per share* and the median consensus earnings *per share* forecast divided by market value *per share* at the previous financial year end. *ESG* is the overall Bloomberg ESG disclosure score. *ED* is the environmental disclosure component score. *SD* is the social disclosure component score. *GD* is the governance disclosure

component score. *Log MV* is the log of the market value of the firm at the financial year end prior to the year for which the earnings forecast is made. *NoA* is the number of analysts forecasts used to create a consensus forecast. *Loss* is a dummy variable equal to 1 if the firm made a loss in the year prior to the earnings forecast; 0 otherwise. *LAcc1* is the one year lag of *Acc1*. *Lev-FS (Lev-NFS)* is the ratio of total liabilities to total assets for financial services (non-financial services) firms; 0 otherwise. *RoA-FS (RoA-NFS)* is the ratio of net income to total assets for financial services (non-financial services) firms; 0 otherwise. *BM-FS (BM-NFS)* is the ratio of book value (total assets less total liabilities) to market value at the financial year-end prior to the forecast for financial services (non-financial services) firms; 0 otherwise.

TABLE 5										
THE IMPACT OF ESG SCORES AND THE INTEGRATED REPORTING REGIME ON ANALYST FORECAST ACCURACY										
<i>Variables</i>	<i>Dependent Variable is Acc1</i>									
<i>ESG</i>	-0.017									
<i>(p-value)</i>	0.048									
<i>ED</i>			-0.013						-0.011	
<i>(p-value)</i>			0.040						0.169	
<i>SD</i>					-0.007				-0.004	
<i>(p-value)</i>					0.309				0.649	
<i>GD</i>							-0.004		0.001	
<i>(p-value)</i>							0.693		0.942	
<i>PreESG</i>		-0.011								
<i>(p-value)</i>		0.183								
<i>PreED</i>				-0.008						-0.005
<i>(p-value)</i>				0.255						0.553
<i>PreSD</i>						-0.005				-0.005
<i>(p-value)</i>						0.435				0.538
<i>PreGD</i>								0.000		0.001
<i>(p-value)</i>								0.992		0.920
<i>PostESG</i>		-0.025								
<i>(p-value)</i>		0.013								
<i>PostED</i>				-0.021						-0.020
<i>(p-value)</i>				0.002						0.027
<i>PostSD</i>						-0.009				-0.002
<i>(p-value)</i>						0.243				0.846
<i>PostGD</i>								-0.009		-0.001
<i>(p-value)</i>								0.371		0.892
<i>Log MV</i>	-1.397	-1.689	-1.374	-1.711	-1.428	-1.550	-1.398	-1.452	-1.392	-1.672
<i>(p-value)</i>	0.014	0.004	0.015	0.003	0.018	0.014	0.019	0.013	0.016	0.006
<i>NoA</i>	0.010	0.014	0.008	0.009	0.011	0.013	0.009	0.012	0.009	0.010
<i>(p-value)</i>	0.759	0.671	0.809	0.774	0.727	0.692	0.777	0.716	0.781	0.764
<i>Loss</i>	0.123	0.113	0.116	0.074	0.137	0.147	0.111	0.120	0.128	0.075

(<i>p-value</i>)	0.410	0.427	0.438	0.596	0.385	0.356	0.480	0.443	0.397	0.612
<i>LAcc1</i>	-0.224	-0.246	-0.222	-0.237	-0.225	-0.234	-0.216	-0.227	-0.226	-0.237
(<i>p-value</i>)	0.011	0.003	0.014	0.006	0.011	0.005	0.020	0.013	0.011	0.006
<i>Lev-FS</i>	0.602	0.556	0.906	1.023	-0.162	-0.199	-0.266	-0.424	0.817	0.885
(<i>p-value</i>)	0.827	0.825	0.740	0.682	0.953	0.941	0.924	0.875	0.768	0.733
<i>Lev-NFS</i>	-1.809	-1.945	-1.841	-2.188	-1.503	-1.483	-1.410	-1.372	-1.841	-2.200
(<i>p-value</i>)	0.153	0.136	0.139	0.096	0.245	0.253	0.263	0.263	0.138	0.094
<i>RoA-FS</i>	-4.493	-3.217	-4.309	-2.672	-5.164	-4.795	-6.127	-6.036	-4.070	-2.722
(<i>p-value</i>)	0.589	0.699	0.608	0.752	0.525	0.554	0.444	0.452	0.626	0.748
<i>RoA-NFS</i>	0.339	0.577	0.300	0.419	0.733	0.859	0.658	0.801	0.367	0.435
(<i>p-value</i>)	0.721	0.541	0.764	0.668	0.425	0.366	0.463	0.369	0.712	0.668
<i>BM-FS</i>	-1.602	-1.649	-1.448	-1.517	-1.814	-1.791	-1.681	-1.753	-1.546	-1.652
(<i>p-value</i>)	0.255	0.193	0.278	0.197	0.205	0.196	0.220	0.187	0.257	0.182
<i>BM-NFS</i>	0.750	0.715	0.746	<i>0.687</i>	<i>0.703</i>	<i>0.694</i>	<i>0.671</i>	<i>0.668</i>	0.754	<i>0.692</i>
(<i>p-value</i>)	0.047	0.045	0.044	<i>0.053</i>	<i>0.075</i>	<i>0.070</i>	<i>0.094</i>	<i>0.082</i>	0.044	<i>0.059</i>
<i>Adjusted R²</i>	0.221	0.242	0.222	0.252	0.213	0.212	0.206	0.212	0.215	0.238

Notes: The regressions include firm and time fixed effects and are estimated using OLS for the coefficient estimates. The significance levels reported are based upon heteroscedasticity-adjusted standard errors. *Acc1* is the absolute value of the difference between actual earnings *per share* and the median consensus earnings *per share* forecast divided by market value *per share* at the previous financial year end. *ESG* is the overall Bloomberg ESG disclosure score. *PreESG (PostESG)* equals *ESG* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *ED* is the environmental disclosure component score. *PreED (PostED)* equals *ED* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *SD* is the social disclosure component score. *PreSD (PostSD)* equals *SD* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *GD* is the governance disclosure component score. *PreGD (PostGD)* equals *GD* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *Log MV* is the log of the market value of the firm at the financial year end prior to the year for which the earnings forecast is made. *NoA* is the number of analysts forecasts used to create a consensus forecast. *Loss* is a dummy variable equal to 1 if the firm made a loss in the year prior to the earnings forecast; 0 otherwise. *LAcc1* is the one year lag of *Acc1*. *Lev-FS (Lev-NFS)* is the ratio of total liabilities to total assets for financial services (non-financial services) firms; 0 otherwise. *RoA-FS (RoA-NFS)* is the ratio of net income to total assets for financial services (non-financial services) firms; 0 otherwise. *BM-FS (BM-NFS)* is the ratio of book value (total assets less total liabilities) to market value at the financial year-end prior to the forecast for financial services (non-financial services) firms; 0 otherwise.

TABLE 6										
THE IMPACT OF ESG SCORES AND THE INTEGRATED REPORTING REGIME ON ANALYST FORECAST ACCURACY										
<i>Variables</i>	<i>Dependent Variable is Acc2</i>									
<i>ESG</i>	-0.020									
<i>(p-value)</i>	0.022									
<i>ED</i>			-0.015						-0.013	
<i>(p-value)</i>			0.022						0.133	
<i>SD</i>					-0.009				-0.006	
<i>(p-value)</i>					0.202				0.504	
<i>GD</i>							-0.003		0.002	
<i>(p-value)</i>							0.749		0.836	
<i>PreESG</i>		-0.013								
<i>(p-value)</i>		0.144								
<i>PreED</i>				-0.009						-0.007
<i>(p-value)</i>				0.201						0.433
<i>PreSD</i>						-0.006				-0.005
<i>(p-value)</i>						0.399				0.548
<i>PreGD</i>								0.001		0.001
<i>(p-value)</i>								0.943		0.943
<i>PostESG</i>		-0.030								
<i>(p-value)</i>		0.004								
<i>PostED</i>				-0.025						-0.022
<i>(p-value)</i>				0.001						0.017
<i>PostSD</i>						-0.013				-0.005
<i>(p-value)</i>						0.110				0.564
<i>PostGD</i>								-0.009		0.001
<i>(p-value)</i>								0.398		0.928
<i>Log MV</i>	-1.287	-1.650	-1.260	-1.657	-1.324	-1.537	-1.290	-1.347	-1.284	-1.685
<i>(p-value)</i>	0.029	0.006	0.032	0.005	0.033	0.018	0.039	0.027	0.031	0.008
<i>NoA</i>	0.008	0.012	0.005	0.007	0.010	0.012	0.007	0.010	0.007	0.009
<i>(p-value)</i>	0.827	0.725	0.880	0.846	0.786	0.727	0.848	0.785	0.842	0.812
<i>Loss</i>	0.141	0.129	0.131	0.083	0.158	0.175	0.127	0.138	0.150	0.100

(<i>p-value</i>)	0.401	0.414	0.433	0.591	0.366	0.320	0.463	0.423	0.367	0.527
<i>LAcc2</i>	-0.197	-0.227	-0.192	-0.213	-0.197	-0.215	-0.185	-0.200	-0.198	-0.219
(<i>p-value</i>)	0.023	0.004	0.028	0.009	0.021	0.007	0.040	0.023	0.019	0.006
<i>Lev-FS</i>	0.825	0.715	1.169	1.268	-0.047	-0.145	-0.178	-0.383	1.029	1.147
(<i>p-value</i>)	0.782	0.788	0.692	0.634	0.988	0.960	0.953	0.895	0.730	0.677
<i>Lev-NFS</i>	-2.136	-2.309	-2.166	-2.577	-1.796	-1.760	-1.658	-1.616	-2.160	-2.569
(<i>p-value</i>)	0.055	0.043	0.051	0.027	0.108	0.115	0.128	0.125	0.050	0.026
<i>RoA-FS</i>	-5.763	-4.454	-5.518	-3.804	-6.424	-5.953	-7.525	-7.573	-5.155	-3.533
(<i>p-value</i>)	0.526	0.623	0.549	0.681	0.464	0.494	0.391	0.388	0.570	0.699
<i>RoA-NFS</i>	0.006	0.233	-0.021	0.070	0.463	0.643	0.430	0.555	0.086	0.150
(<i>p-value</i>)	0.995	0.788	0.983	0.939	0.598	0.463	0.607	0.497	0.928	0.871
<i>BM-FS</i>	-1.863	-1.927	-1.687	-1.771	-2.125	-2.089	-1.952	-2.036	-1.831	-1.890
(<i>p-value</i>)	0.235	0.170	0.256	0.179	0.181	0.166	0.203	0.172	0.222	0.161
<i>BM-NFS</i>	0.546	0.506	0.539	0.473	0.494	0.481	0.451	0.449	0.550	0.484
(<i>p-value</i>)	0.236	0.232	0.239	0.273	0.307	0.293	0.369	0.350	0.230	0.263
<i>Adjusted R²</i>	0.174	0.205	0.173	0.213	0.164	0.171	0.154	0.161	0.167	0.197

Notes: The regressions include firm and time fixed effects and are estimated using OLS for the coefficient estimates. The significance levels reported are based upon heteroscedasticity-adjusted standard errors. *Acc2* is the absolute value of the difference between actual earnings *per share* and the median consensus earnings *per share* forecast divided by the absolute value of actual earnings *per share*. *ESG* is the overall Bloomberg ESG disclosure score. *PreESG (PostESG)* equals *ESG* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *ED* is the environmental disclosure component score. *PreED (PostED)* equals *ED* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *SD* is the social disclosure component score. *PreSD (PostSD)* equals *SD* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *GD* is the governance disclosure component score. *PreGD (PostGD)* equals *GD* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *Log MV* is the log of the market value of the firm at the financial year end prior to the year for which the earnings forecast is made. *NoA* is the number of analysts forecasts used to create a consensus forecast. *Loss* is a dummy variable equal to 1 if the firm made a loss in the year prior to the earnings forecast; 0 otherwise. *LAcc2* is the one year lag of *Acc2*. *Lev-FS (Lev-NFS)* is the ratio of total liabilities to total assets for financial services (non-financial services) firms; 0 otherwise. *RoA-FS (RoA-NFS)* is the ratio of net income to total assets for financial services (non-financial services) firms; 0 otherwise. *BM-FS (BM-NFS)* is the ratio of book value (total assets less total liabilities) to market value at the financial year-end prior to the forecast for financial services (non-financial services) firms; 0 otherwise.

TABLE 7

THE IMPACT OF ESG SCORES AND THE INTEGRATED REPORTING REGIME ON ANALYST FORECAST ACCURACY – SUB-SAMPLE ANALYSIS

Dependent Variable is Acc1

<i>Variables</i>	Financial Services Firms					Non-Financial Services Firms				
<i>PreESG</i>	-0.011					-0.013				
<i>(p-value)</i>	0.618					0.167				
<i>PreED</i>		-0.005			0.015		-0.010			-0.008
<i>(p-value)</i>		0.728			0.525		0.168			0.419
<i>PreSD</i>			0.001		-0.007			-0.008		-0.004
<i>(p-value)</i>			0.946		0.641			0.233		0.594
<i>PreGD</i>				-0.013	-0.016				0.003	0.004
<i>(p-value)</i>				0.596	0.574				0.788	0.737
<i>PostESG</i>	-0.020					-0.024				
<i>(p-value)</i>	0.491					0.007				
<i>PostED</i>		-0.018			-0.020		-0.022			-0.022
<i>(p-value)</i>		0.228			0.178		0.005			0.062
<i>PostSD</i>			0.000		0.011			-0.009		-0.001
<i>(p-value)</i>			0.981		0.439			0.229		0.896
<i>PostGD</i>				-0.017	-0.020				-0.003	0.006
<i>(p-value)</i>				0.489	0.430				0.779	0.655
<i>Log MV</i>	-0.242	-0.290	0.173	-0.012	0.076	-2.221	-2.319	-2.169	-2.068	-2.341
<i>(p-value)</i>	0.861	0.811	0.890	0.992	0.954	0.001	0.001	0.002	0.005	0.001
<i>NoA</i>	-0.031	-0.041	-0.037	-0.036	-0.061	0.012	0.010	0.013	0.014	0.011
<i>(p-value)</i>	0.674	0.591	0.648	0.625	0.461	0.755	0.781	0.728	0.719	0.778
<i>Loss</i>						0.180	0.147	0.217	0.202	0.148
<i>(p-value)</i>						0.205	0.297	0.174	0.189	0.339
<i>LAcc1</i>	-0.107	-0.116	-0.023	-0.038	-0.063	-0.278	-0.278	-0.280	-0.280	-0.280
<i>(p-value)</i>	0.447	0.380	0.884	0.837	0.652	0.006	0.008	0.006	0.007	0.010
<i>Lev</i>	1.364	1.597	0.589	0.812	0.924	-1.851	-2.134	-1.506	-1.250	-2.199
<i>(p-value)</i>	0.650	0.587	0.812	0.757	0.761	0.111	0.071	0.182	0.258	0.058
<i>RoA</i>	7.442	7.786	6.193	5.796	5.715	0.990	0.859	1.290	1.364	0.937
<i>(p-value)</i>	0.490	0.470	0.561	0.538	0.595	0.306	0.400	0.187	0.148	0.416
<i>BM</i>	-0.589	-0.510	-0.412	-0.644	-0.938	0.482	0.436	0.434	0.426	0.410

<i>(p-value)</i>	0.757	0.746	0.806	0.742	0.594	0.168	0.190	0.235	0.270	0.236
<i>Adjusted R²</i>	0.142	0.156	0.119	0.135	0.128	0.304	0.320	0.280	0.274	0.301

Notes: The regressions include firm and time fixed effects and are estimated using OLS for the coefficient estimates. The significance levels reported are based upon heteroscedasticity-adjusted standard errors. *Acc1* is the absolute value of the difference between actual earnings *per* share and the median consensus earnings *per* share forecast divided by market value *per* share at the previous financial year end. *ESG* is the overall Bloomberg ESG disclosure score. *PreESG (PostESG)* equals *ESG* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *ED* is the environmental disclosure component score. *PreED (PostED)* equals *ED* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *SD* is the social disclosure component score. *PreSD (PostSD)* equals *SD* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *GD* is the governance disclosure component score. *PreGD (PostGD)* equals *GD* for the period prior to (after the) introduction of the IR regime; 0 otherwise. *Log MV* is the log of the market value of the firm at the financial year end prior to the year for which the earnings forecast is made. *NoA* is the number of analysts forecasts used to create a consensus forecast. *Loss* is a dummy variable equal to 1 if the firm made a loss in the year prior to the earnings forecast; 0 otherwise. *LAcc1* is the one year lag of *Acc1*. *Lev-FS (Lev-NFS)* is the ratio of total liabilities to total assets for financial services (non-financial services) firms; 0 otherwise. *RoA-FS (RoA-NFS)* is the ratio of net income to total assets for financial services (non-financial services) firms; 0 otherwise. *BM-FS (BM-NFS)* is the ratio of book value (total assets less total liabilities) to market value at the financial year-end prior to the forecast for financial services (non-financial services) firms; 0 otherwise.