The International Integrated Reporting Framework: Determinants and Consequences of Voluntary Adoption

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ABSTRACT

The International Integrated Reporting Framework (IIRC Framework) is an internationally recognised guideline for the preparation of integrated reports. It frames integrated reporting (IR) as a concept about understanding and communicating organisational value creation. Despite the international interest and importance of the IIRC Framework, the IR literature is inconclusive about the determinants and consequences of voluntary IIRC Framework adoption. Accordingly, this thesis investigates the rationales behind voluntary IIRC Framework adoption and its subsequent capital market and sustainability outcomes.

The determinants results show that voluntary IIRC Framework adoption is founded on established sustainability practices. In most countries, voluntary adoption is more likely for firms with stronger environmental and social performance, a corporate social responsibility (CSR) committee and experience with the Global Reporting Initiative (GRI) guidelines. Such findings are consistent with resource dependence theory, which suggests that firms with leaders and internal mechanisms that support sustainability practices have the knowledge and resources to adopt the IIRC Framework as part of their business strategy. Further, these findings are consistent with signalling theory, which suggests firms with superior sustainability performance over their competitors use integrated reports to indicate competitive advantages and commitment to IR values for reputational and economic benefits.

Unique results are obtained for Japanese firms, where there are no significant differences between IR firms and matched non-IR firms. Japanese firms may adopt the IIRC Framework for reasons not related to their observable firm characteristics. As Japanese firms are acknowledged leaders of integrated disclosure practices, Japanese firms appear to be implementing values encouraged in the IIRC Framework regardless of specifically referencing the IIRC Framework. Hence, there may be no clear differences between reports prepared according to the IIRC Framework and other forms of integrated disclosure in Japan.

The consequences results found no evidence of relationships between voluntary IIRC Framework adoption and changes in the information environment, cost of equity, firm value and environmental and social performance. The results show no statistically significant changes in the investigated consequences when comparing pre- and post-IR initiation. Further, any changes experienced by IR firms are not statistically different to those experienced by non-IR firms. These results are robust to controlling for self-selection using a matched sample and treatment effect models, to assessments using level and change specifications, to a difference-in-differences design, to alternative model specifications and matched samples, and to a number of additional analyses.

This thesis contributes to the IR literature by extending theoretical and empirical understanding of voluntary IR. Taken together, it provides evidence that voluntary IIRC Framework reflects a continuation of established sustainability management and reporting practices. Therefore, any changes in management and reporting practices are likely gradual rather than transformational. This finding is consistent with the non-significant results in the consequences analysis. Voluntary IIRC Framework adoption may not result in immediate improvements in sustainability performance and corporate disclosure content relative to prior years, and any changes experienced by IR firms may not be substantially different relative to any changes in non-IR firms.

Overall, policy makers and report preparers need to consider whether there are substantial benefits to adoption of the IIRC Framework over engagement in other forms of integrated disclosure practices or application of alternative disclosure guidelines. The study reaffirms the need for greater support and incentives for firms with weaker sustainability practices to engage in IR, as these firms need to be involved in the IR movement for progress towards the vision of financial stability and sustainable development. Further, there is a need for accounting developments that can support integrated thinking and connecting information in order to realise substantial improvements in management and reporting practices.

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TABLE OF CONTENTS

ABSTRACT I
ACKNOWLEDGEMENT III
TABLE OF CONTENTS IV
LIST OF TABLES VII
LIST OF FIGURES VIII

CHAPTER ONE
INTRODUCTION 1
1.1 Introduction 1
1.2 Motivation 1
1.3 Background to Integrated Reporting 4
1.3.1 Purpose and Vision 4
1.3.2 Development and Interpretations 4
1.3.3 The IIRC Framework 5
1.4 Research Objective 7
1.5 Summary of Major Findings and Contributions to Literature 8
1.6 Thesis Structure 10

CHAPTER TWO
LITERATURE REVIEW AND CONCEPTUAL MODEL 12
2.1 Introduction 12
2.2 Integrated Reporting from the Reporter Perspective 12
2.2.1 Motivators 12
2.2.1.1 Institutional and Regulatory Pressure 12
2.2.1.2 Reputation and Impression Management 13
2.2.1.3 Improving Internal Systems, Reporting Practices and Performance 14
2.2.2 Deterrents 14
2.2.2.1 Disclosure-related Costs 14
2.2.2.2 Perspectives and Resistance 15
2.3 Determinants of Voluntary Disclosure 16
2.3.1 Firm-level Characteristics 16
2.3.1.1 Economic Resources, Capability, and Performance 16
2.3.1.2 Environmental and Social Performance 17
2.3.1.3 Corporate Governance and Ownership Structure 18
2.3.1.4 Media Coverage 19
2.3.2 Industry-level Characteristics 20
2.3.3 Country-level Characteristics 21
2.3.3.1 Cultural Systems 21
2.3.3.2 Institutional Systems 21
2.4 Integrated Reporting from the User Perspective 22
2.4.1 Concerns with the International Integrated Reporting Framework 22
2.4.2 Relevance to Capital Providers 23
2.4.3 Quality and Content of Integrated Reports 24
2.5 Consequences of Voluntary Disclosure 25
2.5.1 Investor and Analyst 25
2.5.2 Firms 26
2.5.2.1 Institutionalisation and Internal Change 26
2.5.2.2 Economic Performance 27
2.5.2.3 Non-financial Performance 28
2.6 Summary and Conceptual Model 28

CHAPTER THREE
RESEARCH DESIGN....32
3.1 Introduction....32
3.2 Research Design....32
3.2.1 Initiation Year....32
3.2.2 Lead-lag Models....33
3.2.3 Matching....34
3.2.4 Treatment Effect Model....35
3.2.5 Level and Change Specifications....36
3.2.6 Difference-in-differences....37
3.2.7 Data Screening, Data Reduction and Model Building....38
3.3 Initial Sample of IR Firms....39
3.4 Samples....40
3.4.1 Determinants: Main Sample....40
3.4.2 Consequences: Main Samples....40
3.4.2.1 Information Environment....40
3.4.2.2 Cost of Equity....41
3.4.2.3 Firm Value....41
3.4.2.4 Environmental and Social Performance....42
3.5 Data Sources and Variable Definitions....42
3.5.1 Data Sources....42
3.5.2 Firm-level Variables....43
3.5.3 Industry-level Variables....51
3.5.4 Country-level Variables....53
3.6 Model Development....56
3.6.1 Determinants....56
3.6.1.1 Full Model....56
3.6.1.2 Initial Filter....57
3.6.1.3 Model Selection....59
3.6.2 Consequences: Information Environment....61
3.6.3 Consequences: Cost of Equity....63
3.6.4 Consequences: Firm Value....64
3.6.5 Consequences: Environmental and Social Performance....65
3.7 Summary....67

CHAPTER FOUR
DETERMINANTS OF VOLUNTARY INTEGRATED REPORTING....83
4.1 Introduction....83
4.2 Hypothesis Development....86
4.2.1 Environmental and Social Performance and IR Initiation....86
4.2.2 CSR Committee and IR Initiation....87
4.2.3 Institutional Shareholding and IR Initiation....88
4.2.4 Media Coverage and IR Initiation....89
4.2.5 Board Skills and IR Initiation....90
4.3 Sample....90
4.4 Empirical Models and Variable Definitions....91
4.5 Descriptive Statistics and Bivariate Tests....94
4.6 Logistic Regression Results....95
4.6.1 Regression Results....95
4.6.2 IR in Japan....97
4.6.3 Early IR Adopters and Later IR Adopters....99
4.6.4 Extension of Lagged Period....100

4.7 Additional Analyses 101
4.7.1 Influential Observations, Winsorisation and Fixed Effect Dummies 101
4.7.2 Alternative Models and Variables 101
4.7.3 Tests of Simultaneity 103
4.7.4 Alternative Matches 103
4.8 Summary 104

CHAPTER FIVE
CONSEQUENCES OF VOLUNTARY INTEGRATED REPORTING 129
5.1 Introduction 129
5.2 Hypothesis Development 131
5.2.1 IR Initiation and the Information Environment 131
5.2.2 IR Initiation and Cost of Equity 132
5.2.3 IR Initiation and Firm Value 133
5.2.4 IR Initiation and Environmental and Social Performance 134
5.3 Samples 135
5.4 Information Environment 136
5.4.1 Model and Variable Definitions 136
5.4.2 Results 138
5.5 Cost of Equity 139
5.5.1 Model and Variable Definitions 139
5.5.2 Results 140
5.6 Firm Value 142
5.6.1 Model and Variable Definitions 142
5.6.2 Results 142
5.7 Environmental and Social Performance 144
5.7.1 Model and Variable Definitions 144
5.7.2 Results 145
5.8 Summary 147

CHAPTER SIX
CONCLUSION 169
6.1 Summary 169
6.2 Contributions and Implications 171
6.3 Limitations of the Study 176
6.4 Directions for Future Research 177

APPENDICIES 178
Appendix A – Variable Definitions and Data Source 178
Appendix B – Treatment effect models 184
Appendix C – Difference-in-differences: Common trend tests 187

REFERENCES 189

LIST OF TABLES

Table 3.1: Sample elimination process 68
Table 3.2: Characteristics of identified IR firms 68
Table 3.3: Determinants sample composition 69
Table 3.4: Information environment sample composition 70
Table 3.5: Cost of equity sample composition 71
Table 3.6: Ohlson models sample composition 72
Table 3.7: Tobin's Q sample composition 73
Table 3.8: Environmental and social performance sample composition 74
Table 3.9: First round variable exclusion 75
Table 3.10: Second round variable exclusion 78
Table 3.11: Multicollinearity tests 80
Table 4.1: Descriptive statistics and bivariate test results 107
Table 4.2: Correlation matrix 109
Table 4.3: Determinants of voluntary IR initiation 111
Table 4.4: Manufacturing and non-manufacturing firms 112
Table 4.5: Japanese and non-Japanese firms 114
Table 4.6: Early Adopters and Later Adopters 116
Table 4.7: Independent variables on a two-year lag 117
Table 4.8: Effects of influential observations 118
Table 4.9: Fixed effect dummies 119
Table 4.10: Alternative models and variables 120
Table 4.11 Independent *t*-tests for alternative matches 125
Table 4.12: Regressions on alternative matches 127
Table 5.1: Information environment - Descriptive statistics and independent *t*-tests 150
Table 5.2: Information environment - Correlation matrix 151
Table 5.3: Information environment and IR 153
Table 5.4: Cost of equity - Descriptive statistics and independent *t*-tests 157
Table 5.5: Cost of equity - Correlation matrix 158
Table 5.6: Cost of equity and IR 159
Table 5.7: Firm value - Descriptive statistics and independent *t*-tests 160
Table 5.8: Firm value - Correlation matrix 161
Table 5.9: Firm value and IR 162
Table 5.10: Environmental and social performance - Descriptive statistics and independent *t*-tests 164
Table 5.11: Environmental and social performance - Correlation matrix 165
Table 5.12: Environmental and social performance and IR 167
Table B1: First stage estimates 184

LIST OF FIGURES

Figure 2.1: Conceptual model - Determinants 30
Figure 2.2: Conceptual model - Consequences 31
Figure C1: Information environment - analyst forecast error (*FERROR(0)*) 187
Figure C2: Information environment – analyst forecast dispersion (*DISPERSION*) 187
Figure C3: Cost of equity (*COE*) 187
Figure C4: Firm value – share price (*PRICE*) 188
Figure C5: Firm value – cum-dividend market value (*MVCDA*) 188
Figure C6: Environmental and social performance (*ESP*) 188

CHAPTER ONE
INTRODUCTION

1.1 Introduction

Integrated reporting (IR) is at the frontier of corporate reporting and thus more research is needed to better understand its determinants and effects (Cheng, Green, Conradie, Konishi, & Romi, 2014; de Villiers, Rinaldi, & Unerman, 2014; de Villiers, Venter, & Hsiao, 2017b; Dumay, Bernardi, Guthrie, & Demartini, 2016). It is a management and reporting practice focused on understanding and communicating a holistic view of organisational value creation (International Integrated Reporting Council (IIRC), 2013b). The International Integrated Reporting Framework (IIRC Framework), hereafter interchanged with 'the Framework', provides principles-based guidance for the preparation of integrated reports. The Framework defines an integrated report as a concise and forward-looking communication that integrates financial and non-financial information, and details how an organisation's strategy, governance, performance and prospects lead to value creation over time (IIRC, 2013b). While IR intends to mitigate the problems of information overload, capital market instability and unsustainable economic development (Eccles, Krzus, & Ribot, 2015; IIRC, 2013b), there are no conclusive evidence as to whether implementing IR substantially changes organisational practices and capital allocation decisions.

Accordingly, this exploratory study investigates an international sample of listed firms and provides empirical evidence on the rationales behind voluntary adoption of the IIRC Framework and release of an integrated report, and its subsequent consequences. The determinants analysis focus on the effects environmental and social performance, establishment of a corporate social responsibility (CSR) committee, institutional shareholding, media coverage and board skills have on the tendency to release an integrated report. The consequences analysis examines the effects integrated reports prepared in accordance with the Framework have on the information environment, cost of equity, firm value and sustainability performance.

1.2 Motivation

This study responds to calls for practical research on the application and impact of IR (Burritt, 2012; de Villiers, Hsiao, & Maroun, 2017a; de Villiers et al., 2017b; Dumay et al., 2016). Interest in sustainable development and capital market stability provides support for IR in becoming a global corporate norm (Eccles & Krzus, 2010; IIRC, 2010, 2013b). International surveys by KPMG (2015, 2017) show that the Framework's rate of adoption among large firms has been low, but the adoption rate has been increasing at a slow and steady rate over

recent years. Approximately 3% (87 firms), 6% (196 firms) and 9% (457 firms)[1] of surveyed firms referenced the Framework in 2013, 2015 and 2017, respectively. South Africa, where IR is mandatory, has the highest reported rate of IIRC Framework adoption amongst surveyed countries. While there is gradual momentum in the adoption of the IIRC Framework, it is unclear whether firms will accept the Framework as a reporting norm and whether its adoption influences management and investment practices.

Emerging studies found managers viewed IR as an ambiguous concept, often considering it an extension or repackaging of sustainability reporting (Chaidali & Jones, 2017; Lodhia, 2015; Stubbs & Higgins, 2014). Managers face difficulties in measuring the impacts of changes in capitals and establishing direct relationships between non-financial performance and financial performance, which limits the amount of incremental information in integrated reports (Adams, Potter, Singh, & York, 2016; Haji & Anifowose, 2016). These measurement problems are reflected in available integrated reports. Integrated reports have been criticised to lack connectivity, comparability and disclosure of material information (Doni, Gasperini, & Pavone, 2016; IIRC, 2013c; Stacchezzini, Melloni, & Lai, 2016). Considering these issues, it is important to examine the determinants and consequences of IIRC Framework adoption to understand this new reporting mechanism better.

The IR literature is sparse and there are many areas to explore (de Villiers et al., 2017a; de Villiers et al., 2014; Rinaldi, Unerman, & de Villiers, 2018). While regulatory requirements drive IR disclosures in South Africa (Haji & Anifowose, 2017; Vaz, Fernandez-Feijoo, & Ruiz, 2016), little is known about the drivers of voluntary IR. The limited number of studies on IR determinants has not distinguished between reporters that adopted the Framework and those that compiled a single report for financial and sustainability information. It is potentially important to distinguish between different types of integrated reports, as they are conceptually different. An integrated report according to the Framework is investor-centric and requires disclosure of specific content elements, while other forms of integrated disclosure are typically stakeholder-centric and focuses on communicating accountability to stakeholders (Eccles & Krzus, 2010; IIRC, 2013b)[2].

Prior studies, for instance Frías-Aceituno, Rodríguez-Ariza, and Garcia-Sánchez (2013a), García-Sánchez, Rodríguez-Ariza, and Frías-Aceituno (2013) and Jensen and Berg (2012), suggest integrated disclosure is used to enhance stakeholder engagement and to meet

[1] The 2017 figure is estimated from the statement: "[a]round two thirds of these [14%] also reference the International Integrated Reporting Council framework" (KPMG, 2017, p. 24). The 2017 figure is not perfectly comparable with prior year figures as it is based on all sampled firms (4,900), while the 2013 (2,884) and 2015 (3,267) figures are based on sampled firms that report CSR information.

[2] See Section 1.3.2 for a brief history of IR development and alternative interpretations.

stakeholder expectations. These studies found integrated disclosure practices are more common for firms operating in stakeholder-orientated countries, as characterised by civil law, collectivist and feminist cultures, or higher national corporate responsibility and self-expression values. The results of these studies do not parse out the effects attributable to different forms of integrated disclosure, and thereby do not directly assess the rationales behind voluntary IIRC Framework adoption. Given growing promotion, attention and awareness of the IIRC Framework (Eccles et al., 2015; IIRC, 2017a; KPMG, 2017), it is important to investigate IR in relation to the Framework's definition. If in practice reports prepared in accordance with the Framework differ from other forms of integrated disclosure, the determinants and consequences of these reports could differ. Alternatively, if there are no differences between different forms of integrated disclosure, it is questionable whether it is important to promote and encourage adoption of the Framework.

While the Framework is novel and promotes distinct concepts, such as integrated thinking and connectivity, it is unclear whether there are unique characteristics that determine voluntary adoption of the Framework or whether its drivers are similar to that of other forms of voluntary disclosure. This study improves the models employed by prior studies to better address endogeneity concerns. As the rationales behind IR potentially influence reporting content, it could provide a theoretical basis for interpreting any respective consequences. Thereby, the findings from the determinants analysis not only provide new insights on this reporting phenomenon, but also supplement the consequences analysis.

Extant studies on the effects of IR focus on economic consequences and are predominantly based on the mandatory setting of South Africa. Prior studies have associated higher quality integrated reports, often defined by the researchers as reports aligned with the IIRC Framework, with benefits such as increased analyst forecast properties and firm value (Barth, Cahan, Chen, & Venter, 2017; Zhou, Simnett, & Green, 2017). As these findings may reflect country-specific characteristics or regulatory effects, generalisability of the findings beyond the mandatory South African setting is possibly limited. Thereby, investigations on the effects of voluntary IR contribute to the existing IR literature and inform regulators and practitioners of its possible effects. Moreover, the new insights obtained from this study enable further interpretation of results on mandatory IR.

In addition, prior quantitative IR studies tend to focus on the external reporting aspect of IR. However, IR is a process about improving both internal management and external reporting practices. Early qualitative studies suggest IR has not lead to real changes in internal communication and management practices (Dumay & Dai, 2017; Stubbs & Higgins, 2014). These findings have not yet been substantiated by archival research. Thus, understanding

whether adoption of IR improves sustainability performance supplements prior studies and extends our knowledge of the internal consequences of voluntary IR.

1.3 Background to Integrated Reporting

1.3.1 Purpose and Vision

Firms face an increasingly challenging reporting environment due to globalisation, regulatory change and rising information demands from internal and external stakeholders (EY, 2014). This challenge has resulted in the length of annual reports growing over time, financial reports becoming increasingly complex, and reporters producing disconnected and static communications (Bradbury, Hsiao, & Scott, 2018; Eccles & Krzus, 2010; EY, 2014; IIRC, 2013b; Rowbottom & Locke, 2016). As investors have limited attention and information processing power, information overload could lead to neglect of relevant information and result in inefficient capital allocations (Hirshleifer & Teoh, 2003). In addition to a need to address reporting complexity, recurring financial crises warn of the risks to viewing businesses solely from a narrow and short-term perspective, providing momentum for reporting practices that encourages a long-term orientation and a balanced view of value creation (Rowbottom & Locke, 2016). Further, a more holistic and multi-dimensional approach to management and reporting coincides with the need to address environmental and social challenges faced by societies today (Eccles & Krzus, 2010; IIRC, 2010).

As a response to the above challenges, the IIRC (2013b) has deemed the purpose of integrated reports to be improving the quality of information available to capital providers and encourage efficient capital allocation decisions. Ultimately, the IIRC envisions IR as a global reporting norm that supports capital market stability and sustainable economic development (IIRC, 2013b).

1.3.2 Development and Interpretations

Two alternative perspectives of integrated reports emerged over the past decade: one stakeholder-centric and the other investor-centric. Eccles and Krzus (2010) initially referred to integrated reports as One Reports, describing it as a tool to communicate accountability to stakeholders. A One Report demonstrates the relationship between key information in annual reports and sustainability reports. Engagement in such practices resembled a step towards developing sustainable economies. One of the first integrated report is produced by the Danish firm Novozymes (2002), stating IR as "a natural consequence of business and sustainability moving ever closer together, and of various stakeholders asking for a wider overview of the business" (p. 5).

South Africa became the first country to mandate IR on an 'apply or explain' basis (Institute of Directors Southern Africa, 2009). The King Code of Corporate Governance Principles (King III) was incorporated into the Johannesburg Stock Exchange (JSE) listing requirements, requiring listed firms to prepare integrated reports from March 2010 onwards. Similar to Eccles and Krzus (2010), King III encourages communication of forward-looking information across all areas of performance. King III describes an integrated report as an annual disclosure that conveys financial and sustainability performance (Institute of Directors Southern Africa, 2009).

In August 2010, the Prince's Accounting for Sustainability Project (A4S) and the Global Reporting Initiative (GRI) jointly formed the IIRC (IIRC, 2010). The IIRC is a global coalition of regulators, standard settlers, firms, investors, the accounting profession and non-governmental organisations. Its purpose is to create a globally accepted framework for accounting for sustainability. The IIRC Framework was released in December 2013 as a voluntary principles-based framework. The Framework frames IR as a process that encourages changes in internal operations and performance measurement systems, with the process and outcomes reflected in an integrated report targeted at capital providers.

While both perspectives encourage a long-term orientation and integration of financial and non-financial information, a number of academics voiced concerns over the IIRC deviating from its original intention of promoting sustainability. Brown and Dillard (2014) and Milne and Gray (2013) suggest the Framework's narrow emphasis on capital providers reinforce business-as-usual practices. Flower (2015) argues that the Framework encourages businesses to report their impacts on stakeholders only to the extent that there is a material impact on its own operations. Hence, firms are not required to account for the full impact of their activities, which is inconsistent with reporting about sustainability. Further, as information material to broader stakeholders may not be material to capital providers, according to the Framework, such information need not be disclosed (Flower, 2015; Rowbottom & Locke, 2016; van Bommel, 2014). Based on these arguments, it is possible that the contents and focus of an integrated report prepared according to the IIRC Framework differs from a stakeholder-centric integrated report.

1.3.3 The IIRC Framework

Integrated thinking is the foundation of the IR process. Integrated thinking requires active consideration of the interrelationships between an organisation's operations and the resources and relationships it uses and affects. The Framework provides an interpretation of value creation, introduces the concept of the six capitals and explains the value creation process.

An organisation's ability to create value links with the value it creates for others. Value is created, transformed or destroyed based on a wide range of activities and relationships. The Framework suggests six categories to reflect activities and relationships: financial, manufactured, intellectual, human, social and relationship, and natural. Financial capital relates to the pool of funds available to an organisation. Manufactured capital reflects physical objects available for production or used in the provision of goods and services. In addition to traditional factors of production pertaining to money and machinery, the other capitals relate to intangible resources and relationships that influence an organisation's continued success. Intellectual capital captures knowledge-based intangibles. Human capital relates to qualities of competency and innovative abilities within personnel. Social and relationship capital refers to relationships and abilities to share information with communities and stakeholder groups, and an organisation's ability to enhance social well-being. Natural capital includes all renewable and non-renewable environmental resources. The six capitals concept reflects the inputs and outcomes of the value creation process. As the six capitals are not equally applicable across organisations, reporters are not required to adhere to this categorisation scheme.

An organisation's business model is at the centre of its value creation process. The business model draws on various capitals as inputs and converts them into outputs and outcomes through business activities. The process of transforming capitals can have positive and negative effects on capitals, the organisation and stakeholders. Managers are encouraged to assess the value created over different time horizons and to whom the value has been created. The Framework suggests that sustainable value creation is unlikely achieved through maximisation of a single capital; therefore, organisations need to find an optimal balance and adjust their business model and strategies accordingly.

The Framework provides seven guiding principles and eight content elements. The guiding principles suggest integrated reports should: (1) be strategic-focused and future-orientated, (2) connect information to reflect a holistic view of value creation over time, (3) provide insights into stakeholder relationships, (4) contain material information, (5) be concise, (6) be reliable and complete by including all matters in a balanced and unbiased way, and (7) be consistent and comparable. For a report to comply with the Framework, it needs to cover the eight content elements and include: (1) an overview of the organisation and its external environment, (2) governance structure, (3) business model, (4) risks and opportunities, (5) strategy and resource allocation, (6) performance, (7) outlook, and (8) basis of presentation on how matters are quantified or evaluated.

The Framework provides general guidance on the preparation of an integrated report and does not specify key performance indicators or disclosure matrices for reporters. Thereby, reporters should supplement the Framework with other reporting guidelines such as GRI guidelines and World Intellectual Capital Initiative's Intangibles Reporting Framework.

1.4 Research Objective

The objective of the study is to conduct an empirical study on the determinants and consequences of voluntary IR. The study focuses on voluntary adoption of the IIRC Framework and the first integrated report firms release. Five research questions are explored in relation to this objective.

The first focuses on the rationales behind voluntary IIRC Framework adoption:

RQ1: What characteristics are associated with voluntary adoption of the IIRC Framework and initiation of integrated reports?

A broad set of firm, industry and country-level characteristics are tested, while specific focus is placed on environmental and social performance, presence of a CSR committee, institutional shareholding, media coverage and board skills. These characteristics are potentially important drivers of IIRC Framework adoption. Apart from environmental and social performance, prior studies have not provided quantitative evidence on how these characteristics influence the decision to issue an integrated report.

Questions two to five focus on the consequences of voluntary IIRC Framework adoption, examining its potential costs and benefits. Questions two to four focus on capital market consequences, while question five focuses on sustainability consequences. In relation to capital market consequences, the questions relate to whether integrated reports influence investment decision-making:

RQ2: How does voluntary adoption of the IIRC Framework and initiation of integrated reports affect the information environment?

RQ3: How does voluntary adoption of the IIRC Framework and initiation of integrated reports affect cost of equity?

RQ4: How does voluntary adoption of the IIRC Framework and initiation of integrated reports affect firm value?

Analyst forecast error and analyst forecast dispersion reflect information uncertainty and are proxies for the information environment (Lang, Lins, & Miller, 2003). Changes in these two measures show that information in integrated reports, or the act of releasing an integrated report, affects the information environment and investor consensus.

Changes in the information environment should subsequently affect cost of capital and firm value. Cost of capital reflects the rate of return capital providers require for a particular investment. Cost of equity is affected by information that changes risk-sharing, covariance of cash flows, liquidity and transaction costs (Dhaliwal, Li, Tsang, & Yang, 2011). Changes in cost of equity following the release of an integrated report suggest integrated reports provide incremental information that affects equity providers' perception of risk and return. The cost of equity provided by Bloomberg is used.

Similarly, if release of an integrated report increases firm value, it would suggest integrated reports contains incremental information useful for investors in assessing future cash flows and investment risk. The proxies used for firm value are share price, cum-dividend market value and Tobin's Q.

In relation to sustainability consequences, question five relates to whether voluntary IR improves sustainability performance:

> *RQ5:* How does voluntary adoption of the IIRC Framework and initiation of integrated reports affect environmental and social performance?

As the IR process involves assessment and integration of sustainability information into business models and strategies, adoption of the Framework should improve sustainability management and subsequently sustainability performance. The measures used for sustainability performance are the environmental and social scores provided by the ASSET4 database. These scores are based on analyst assessment of firm disclosures, non-governmental websites and reputable media outlets (Thomson Reuters, 2013).

1.5 Summary of Major Findings and Contributions to Literature

Results from the determinants analysis show that drivers of voluntary IIRC Framework adoption differ on a country level. Firms that voluntarily adopt the IIRC Framework are generally those with established sustainability management and reporting practices. Firms with stronger sustainability performance, a CSR committee and experience with GRI guidelines are more likely to adopt the Framework and issue integrated reports. This finding is consistent with the resource dependence perspective. Firms that have leaders and internal mechanisms that support sustainability practices have the knowledge and resources to adopt the IIRC Framework voluntarily as part of their business strategy. Further, the positive association between voluntary IIRC Framework adoption and environmental and social performance is consistent with signalling theory. This finding suggests firms with superior sustainability performance relative to competitors use integrated reports to convey competitive advantages and commitment to IR values for reputational and economic purposes.

In addition, the results provide evidence that voluntary IIRC Framework adoption is influenced by visibility, reputational and legitimacy concerns. Greater media coverage and negative media sentiment have weak statistical associations with voluntary IIRC Framework adoption. This finding suggests socially and politically visible firms tend to adopt the Framework voluntarily, and firms may adopt the Framework as a long-term strategy to respond to negative media sentiment. Further, the results show that early adopters have stronger sustainability performance and better corporate governance practices relative to later adopters. Thereby, these firms may have been invited to participate in the IIRC pilot programme due to their reputation and management practices. Alternatively, participants of the pilot programme or adopters of the draft Framework could have chosen to participate in this initiative to manage organisational complexity or to participate in the development of the Framework.

Subsample analysis shows no differences between IR firms and matched non-IR firms in Japan. For Japanese firms, none of the sustainability-related characteristics, or any other observable characteristics tested, are statistically significant determinants of voluntary IIRC Framework adoption. Thereby, Japanese firms may adopt the Framework for reasons not related to observable firm characteristics. While the study could not identify the factors that drive Japanese firms to adopt the Framework voluntarily, there may be no differences in the reporting practices of IR firms and matched non-IR firms. Japan has a history and culture of CSR, is a leader of CSR reporting and has a growing number of self-declared integrated reporters[3]. From the perspective of institutional theory, the reporting practices of Japanese firms could be similar and reflect IR practices regardless of adopting the Framework. There may be no clear differences between reports prepared according to the Framework and other forms of integrated disclosure in Japan.

The findings from the consequences analysis are reflective of the findings from the determinants analysis. The results failed to find evidence that voluntary IIRC Framework Adoption changes the information environment, cost of equity, firm value or environmental and social performance. That is, there are no statistically significant changes in the investigated consequences when comparing pre- and post-IR initiation, and any changes are not statistically different to that of matched non-IR firms. While the results indicate that IR does not change sustainability performance, similar to the determinants analysis, it shows that IR firms have higher levels of environmental and social performance relative to non-IR firms.

[3] Self-declared integrated reporters include firms that report financial and non-financial information in one report and firms that prepare reports according to the IIRC Framework.

This study contributes to the IR literature in many ways. Not only are there few studies that investigate the determinants and consequences of voluntary IR, this study is the first to examine IR in relation to adoption of the IIRC Framework. The results provide novel insights into the rationales behind voluntary IIRC Framework adoption, identifying the key differences between firms that choose to adopt the Framework and those that do not. The results enhance our understanding of the nature of IR and provide evidence that IR is a process that builds on sustainability reporting rather than a stand-alone process. Further, the results indicate that there are no substantial changes in the information environment, cost of equity, firm value or environmental and social performance following voluntary IIRC Framework adoption. Hence, it is improper to assume that adoption of the Framework automatically equates to better quality disclosures. In environments where integrated disclosure or alternative disclosure guidelines that encourage IR principles are common, disclosures signalled in accordance with the IIRC Framework are not necessarily an improvement from, or provide incremental information relative to, a firm's prior year disclosures or the disclosures of non-IR firms.

1.6 Thesis Structure

The remainder of the thesis is structured as follows. Chapter 2 reviews the IR and the voluntary disclosure literatures and develops the theoretical foundation for the study. The review is presented in terms of both the reporter and user perspectives, reflecting the determinants and consequences of IR, respectively.

Chapter 3 details the research design. The chapter explains the research design in relation to how different techniques are applied to address possible endogeneity problems. It describes the characteristics of all identified IR firms, before describing each sample used in the determinants and consequences analyses. Then, the databases used and definitions of all the variables tested are presented. This is followed by details on the model development process for each determinants and consequences analysis.

Chapter 4 examines the determinants of voluntary IR. The hypothesis development focuses on theorising the relations between environmental and social performance, establishment of a CSR committee, institutional shareholding, media coverage and board skills and the likelihood of voluntary IIRC Framework adoption. It details the empirical models and sample tested, before presenting the descriptive statistics, bivariate tests results and logistic regression results. Additional analyses in the forms of subsample analyses, extended time lags, alternative model specifications and alternative matches are conducted.

Chapter 5 examines the consequences of voluntary IR. The hypothesis development focus on theorising the associations between voluntary IR and the information environment, cost of equity, firm value, and environmental and social performance. The sample analysed for each analysis is described. For each investigated consequence, details of the models are presented, followed by descriptive statistics, bivariate test results, regression results and additional analyses.

Chapter 6 concludes. The chapter summarises findings from the previous chapters and discusses contributions and potential implications of the study. Study limitations are identified and directions for future research are provided.

CHAPTER TWO
LITERATURE REVIEW AND CONCEPTUAL MODEL

2.1 Introduction

This chapter draws on the IR and the voluntary disclosure literatures to develop a conceptual model for the determinants and consequences of IR. The literature review summarises relevant research and is descriptive by nature. Specific hypotheses for the investigated determinants and consequences are presented in their respective chapters.

This chapter is organised in terms of the reporter perspective and the user perspective, representing determinants and consequences, respectively. In relation to the former, Section 2.2 discusses factors that motivate and deter engagement in IR and Section 2.3 summarises characteristics found to have influenced the decision to prepare non-financial disclosures. In relation to the latter, Section 2.4 reviews studies on the use and quality of integrated reports and Section 2.5 identifies the influence voluntary disclosure have on capital market participants and corporate operations. Section 2.6 concludes the chapter with a conceptual model that summarises the literature reviewed and indicates additional considerations.

2.2 Integrated Reporting from the Reporter Perspective

2.2.1 Motivators

2.2.1.1 Institutional and Regulatory Pressure

Institutional pressure, in the forms of peer pressure and stakeholder pressure, influence voluntary disclosure. Higgins, Stubbs, and Love (2014) found Australian managers saw a degree of inevitability to IR irrespective of its value. Senior executives faced pressures to match up with the reporting practices of peers, and reporting managers faced pressures from the CEO and institutional expectations regarding disclosure transparency, comparability and materiality.

In addition, Islam and Deegan (2008) and Lueg, Lueg, Andersen, and Dancianu (2016) document that stakeholder demands influence disclosure practices. These studies found that greater disclosure of environmental, social and governance (ESG) and integrated information were motivated by pressures to satisfy social standards and stakeholder demands. Stakeholder demands arose from various parties including the government, customers, employees, investment analysts, and environmental organisations.

Regulatory change is another driver for the preparation of integrated reports. Haji and Anifowose (2017) found integrated reports in South Africa were disclosed in response to regulatory requirements. Reports based on the ideas of IR did not necessarily reflect improved disclosure quality as firms neglected to provide meaningful disclosures on the

interdependencies and trade-off between capitals. This finding of form over substance was not limited to South African firms (see also: IIRC, 2013c; Stacchezzini et al., 2016).

2.2.1.2 Reputation and Impression Management

Managers can actively influence insiders' and outsiders' perception of their business through shareholder meetings, press releases and disclosures (Bansal & Clelland, 2004). Hence, voluntary disclosure can be released with the intention to manage corporate reputation or for impression management.

In terms of reputational management, firms with low environmental legitimacy could reduce systematic risk by expressing commitment to the natural environment (Bansal & Clelland, 2004). De Villiers and van Staden (2011) found firms disclosed more environmental information on websites and annual reports when faced with a poor environmental reputation or environmental crises. Similarly with IR, Steyn (2014) found managers were motivated to produce integrated reports because of its perceived legitimising effects.

Integrated reports have been associated with advancements in corporate reputation, improved relationships with stakeholders, more meaningful stakeholder engagement and lower reputation risk (Beck, Dumay, & Frost, 2015; Lodhia, 2015; Steyn, 2014). There are instances where integrated reports were used as a legitimacy tool for managers to validate their activities and to portray the firm as trustworthy. Zappettini and Unerman (2016) found that early examples of integrated reports supported a business-as-usual mindset. Rather than enabling sustainability to drive corporate actions, sustainability-related discourses were embedded in financial and macroeconomic propositions, often used to support the pursuit of commercial and financial objectives. Adams (2017) suggested the possibility that firms could label or signal their reports as integrated, but in actuality produce disconnected reports with managers failing to engage in the IR process.

Impression management relates to active manipulation of stakeholder perceptions through biased disclosure of favourable information (Melloni, 2015). Stacchezzini et al. (2016) found that sustainability disclosures expressed opportunistic behaviour as managers avoided providing information when their sustainability performance is poor and focused on their actions over performance. Presence of bias and hypocrisy in non-financial disclosures were also found by Boiral (2013) and Chong, Monroe, and Cahan (2015). For integrated reports, Melloni (2015) and Melloni, Stacchezzini, and Lai (2016) found a positive tone in intellectual capital disclosures when firms are facing declining financial performance, suggesting integrated reports resembled managerial opportunism.

2.2.1.3 Improving Internal Systems, Reporting Practices and Performance

IR has been promoted as a business case that improves the understanding of value creation, measurement systems, interdepartmental communication and decision-making, and stakeholder relations (Black Sun, 2014). It is possible that managers implement IR seeking to attain its associated benefits.

A case study by Del Baldo (2017) found that managers of a small and medium enterprise initiated IR as they wanted to systematise and consistently account for different corporate actions and performance. The managers were interested in improving management, interpretation and communication of their value creation to all stakeholders. Another case study by Dumay and Dai (2017) showed integrated reports were used as a tool to assist communication of business culture and activities to stakeholders. Furthermore, integrated reports acted as an initiative to drive the business.

In addition, economic benefits have been found to motivate non-financial disclosures and thereby possibly motivate adoption of IR. CSR disclosures have been used as a means of improving financial performance and competitive standing (Maignan & Ralston, 2002). Further, Graham, Harvey, and Rajgopal (2005) suggested that firms voluntarily disclose information to provide investors with more timely information, in return lowering information costs and increase analyst coverage.

2.2.2 Deterrents

2.2.2.1 Disclosure-related Costs

From an economic perspective, disclosure of voluntary information is justified if its benefits outweigh the costs (Dye, 1985; Verrecchia, 1983). Disclosure costs arise from preparing, disseminating and auditing information, and costs relating to disclosure of proprietary information. The Corporate Value Reporting Lab (2016) reported that production of an integrated report takes on average two months longer when compared to traditional annual reports, as it requires greater investment in time and mediation among departments.

Although integrated reports require more resources to prepare, managers may be willing to adopt the Framework if it improves existing disclosure practices. However, the costs of adopting the Framework potentially outweigh its benefits due to overlapping motives with other disclosure guidelines. Regulatory initiatives such as ‘Connected Reporting’ developed by A4S and ‘Strategic Report’ by the UK Financial Reporting Council resemble the IIRC Framework concepts (Chaidali & Jones, 2017; Rowbottom & Locke, 2016). The ‘Management Discussion and Analysis’ disclosure required by the US Securities Exchange Commission has several items similar to the IIRC Framework (Lee & Yeo, 2016). IR reflects

similar information to management reports, and leads to additional disclosure and assurance costs (Briem & Wald, 2018). Existing reporting practices and overlapping guidelines are potential sources of instability for the Framework as reporters may be familiar with alternative guidelines. As there are alternative guidelines, it is possible that firms are adopting IR concepts regardless of adopting the IIRC Framework and corporate reports may resemble integrated reports without being signalled as one (Adams et al., 2016).

Information disclosure poses a potential risk for firms. Competitors and external stakeholders can exploit publically disclosed information if it signals weakness or reveal competitive advantages. Thus, voluntary disclosure can become financially harmful to a firm (Clarkson, Li, Richardson, & Vasvari, 2008). The fundamental source of competitive advantages is from utilising resources and capabilities, which facilitates reduction of costs, market opportunities and resistance to competitive threats (Newbert, 2008). Although many exogenous factors affect corporate performance, competitive advantages are important means of improving performance. From a proprietary cost perspective, revealing decision-relevant information may jeopardise a firm's competitive position in the market (Graham et al., 2005). This issue is echoed in Steyn (2014), which reported that senior executives expressed concerns over the forward-looking approach required by IR. It is challenging to reach a satisfactory compromise between corporate transparency and business confidentiality, meaning integrated disclosures are often superficial and merely provided to comply with mandatory requirements.

Another deterrent to IR is potential litigation risks that arise from disclosure of forward-looking information. The threat of litigation reduces incentives to provide forward-looking information (de Villiers & Marques, 2016; Graham et al., 2005). Perego, Kennedy, and Whiteman (2016) found managers were reluctant to adopt the Framework as it was viewed as an additional reporting burden and unnecessary exposure to litigation risks. Alternatively, there is a contrary argument suggesting managers may be motivated to use ESG disclosures to provide an early warning for stakeholders, mitigating the risks of lawsuits and financial penalties (Murphy & McGrath, 2013).

2.2.2.2 Perspectives and Resistance

Reporters may choose not to adopt the Framework because they do not trust in the IIRC and the usefulness of the Framework. Chaidali and Jones (2017) interviewed preparers of sustainability reports and found a lack of trust in the IIRC and in the intentions of its members. Integrated reports were viewed as a self-serving initiative for accounting firms, lawyers and consultants to market additional services. Sustainability report preparers did not believe that

following the IIRC Framework could lead to improvements in performance, considering the Framework ill-defined and simply a rebranding of existing disclosures. A case study by Gibassier, Rodrigue, and Arjaliès (2018) highlighted that managers disagreed with the IIRC's ideas. While the firm participated in the IIRC pilot programme, it later deviated from the IIRC's interpretation of IR. Their integrated report followed the GRI guidelines instead of referring to the IIRC Framework.

Reporters may resist the idea of IR if it conflicts with, or threatens, existing organisational culture and beliefs. Del Baldo (2017) documented the experience of a business that has successfully implemented IR. There were initial resistances to IR due to a culture of weak accountability, and weak non-financial disclosures and measurement systems, which slowed down the reporting process. Thereby, organisational culture can affect the adoption of IR and its rate of success. Another case study by Dumay and Dai (2017) found the idea of integrated thinking clashed with the dominant culture of responsible banking, resulting in IR supplementing existing operations and reporting practices rather than resulting in transformative changes to the reporting process.

2.3 Determinants of Voluntary Disclosure

2.3.1 Firm-level Characteristics

2.3.1.1 Economic Resources, Capability, and Performance

Firm size, profitability, performance, growth opportunities and financing are factors that influence information disclosure. From a resource capability perspective, firms larger in size and profitability have the ability to devote more resources to reporting practices and to make their activities known to stakeholders (de Villiers & van Staden, 2011). From a corporate visibility argument, larger firms have greater visibility in society and capital markets; therefore, they face greater exposure to public scrutiny, political pressure and regulatory pressure (Brammer & Pavelin, 2006). External pressures may drive larger firms to disclose information in order to preserve public image and demonstrate that their actions are legitimate.

Prior CSR studies have found larger firms have a higher probability of preparing CSR disclosures (Cahan, de Villiers, Jeter, Naiker, & van Staden, 2016). The same relationship is found for firms with better profitability (Dhaliwal et al., 2011). However, the direction of these relationships is inconsistent for IR studies. Arguelles, Balatbat, and Green (2016) and Frías-Aceituno, Rodríguez-Ariza, and Garcia-Sánchez (2014) found a positive association between firm size and tendency to prepare integrated disclosures. In contrast, Lai, Melloni, and Stacchezzini (2016) did not find firm specific factors to explain adoption of integrated

practices, and Vaz et al. (2016), which measured size in terms of multinational enterprises and small and medium firms, found no significant relation between firm size and IR.

In terms of financial performance, Needles, Frigo, Powers, and Shigaev (2016) found high performance companies (HPCs), defined as firms with superior asset turnover, revenue growth, profit margin, return on equity and return on assets, had weaker engagement in sustainability reporting and IR. Firms involved in IR or GRI generally did not match the financial performance of HPCs.

Firms with high growth opportunities face greater demands from investors for information about their long-term prospects; thereby, such firms disclose information to reduce problems with information asymmetry (Frías-Aceituno, Rodríguez-Ariza, & Garcia-Sánchez, 2013b; Serafeim, 2015). In support of this explanation, Frías-Aceituno et al. (2013b) found firms with high growth opportunities are more likely to produce integrated reports. In contrast, García-Sánchez et al. (2013) found firms with lower growth opportunities are more likely to produce integrated reports.

Managers may attempt to reduce financing and transaction costs by reducing information asymmetry. Dhaliwal et al. (2011) argued that firms increase the level of voluntary disclosure to reduce investor uncertainty, subsequently lowering the cost of future financing and cost of equity. As debt reliance is commonly associated with greater risk, highly leveraged firms would disclose more information to satisfy the needs of lenders. Firms with high levels of debt are expected to incur higher monitoring costs and therefore managers will seek to reduce costs by disclosing more information (Xiao & Yuan, 2007).

2.3.1.2 Environmental and Social Performance

Prior studies have found a positive association between environmental and social performance and tendency to engage in voluntary disclosure. Cahan et al. (2016) suggested that managers are incentivised to communicate superior CSR performance as it signals better performance compared to competitors. Signalling better performance is linked to increased sales, recruitment of higher quality employees and lower cost of capital. Dhaliwal et al. (2011) found firms that voluntarily published CSR reports tend to have superior CSR performance compared to their industry peers. Similarly, Clarkson et al. (2008) found environmental performance is positively associated with the level of discretionary environmental disclosures.

The findings from the voluntary disclosure literature are extendable to integrated reports. Lai et al. (2016) found firms that adopt IR practices had significantly higher ESG disclosure ratings, reflecting greater management engagement with sustainability. Similarly, Mervelskemper and Streit (2017) found firms compliant with the IIRC Framework had

stronger ESG scores compared to those publishing a stand-alone sustainability report. Arguelles et al. (2016) analysed the determinants of being an early-moving IR firm and found higher performance in financial, human, natural, and social and relationship capitals were significant determinants.

2.3.1.3 Corporate Governance and Ownership Structure

Governance structures and voluntary disclosure are two mechanisms that monitor the actions of managers and mitigate agency problems. The relationship between these internal controls can be complementary or substitutive. A complementary relationship arises in situations where directors adopt further monitoring methods to strengthen internal control, resulting in a more intensive monitoring environment where managers are less likely to withhold information. Donnelly and Mulcahy (2008) found voluntary disclosure increased with board independence, associating board independence with greater transparency, better monitoring and increased disclosures. In contrast, a substantive relationship arises when one of the two mechanisms is adequate to address agency problems. Due to costs associated with voluntary disclosure, there are fewer incentives to disclose if internal governance structures are effective in mitigating agency problems and information asymmetry. This relationship is supported by Eng and Mak (2003).

Board characteristics have been found to influence disclosure practices. Viljoen, Bruwer, and Enslin (2016) found the number of board meetings and presence of a designated risk officer affect risk-related disclosures. Michelon and Parbonetti (2012) found the proportion of community influential board members, such as academics, politicians, army officers and directors of non-profit organisations, have a positive effect on the disclosure of environmental and strategic information. The study also found a positive association between the establishment of a CSR committee and environmental and strategic disclosures. Similarly, Guthrie, Manes-Rossi, and Orelli (2017) found sustainability committees have a major role in public sector organisations adopting the IIRC Framework.

Further, board size and gender diversity have been identified to increase the likelihood of preparing integrated disclosures (Frías-Aceituno et al., 2013b). Frías-Aceituno et al. (2013b) associated gender diversity with the tendency to apply ethical frameworks and criteria that differ from those commonly used by men. For board size, Frías-Aceituno et al. (2013b) argued that larger and more diverse boards have broader knowledge to adopt IR practices. However, Fasan and Mio (2016) found a negative association between board size and diversity with materiality disclosure practices. Fasan and Mio (2016) argued that it is

more difficult for larger boards to reach consensus and disclose information on how their decision was made.

Information asymmetry resulting from absence of effective monitoring mechanisms may result in adverse investor reactions (Brammer & Pavelin, 2006; Xiao & Yuan, 2007). As the proportion of outside ownership increases, there is greater demand from shareholders to monitor management behaviour. In situations where internal controls are ineffective, such as the presence of large controlling shareholders that influence decision-making, there will be calls for additional monitoring. Managers will engage in voluntary disclosure to reduce monitoring costs. Brammer and Pavelin (2006) found a positive relationship between environmental disclosures and dispersed ownership, suggesting managers have incentives to provide information voluntarily when shareholders lack authority over managers and need to monitor their activities.

In addition, certain types of investors tend to influence disclosure decisions. Xiao and Yuan (2007) found higher blockholder ownership or foreign ownership is associated with increased voluntary disclosure. Based on an agency perspective, blockholders have greater power and incentive to monitor management since their wealth is tied to the target's financial performance. Foreign shareholders face a higher level of information asymmetry due to geographic distance, potential language barriers and differences in regulation; thereby, firms will report more information in order to compete effectively in capital markets. In relation to integrated reports, a higher level of institutional ownership may encourage engagement in IR as long-term investors are argued to have greater demand for IR practices (Knauer & Serafeim, 2014; Serafeim, 2015). Serafeim (2015) found the relation between IR and attraction of a long-term investor base is stronger when there is no family ownership, suggesting the signalling value of IR is significantly lower for family-owned firms.

2.3.1.4 Media Coverage

Media coverage increases firm visibility and exposes firms to public attention and scrutiny. The media is a function of corporate reputation as it influences stakeholder knowledge and their opinions of a firm (Deephouse, 2000). Deephouse and Heugens (2009) proposed that media focus on a particular issue acts as a catalyst for managers to react to that issue.

Empirical results relating media characteristics to voluntary disclosure have been mixed. Some studies found the media influences reporting behaviour by creating a need for managers to legitimise their actions. In a Spanish setting, Reverte (2009) found media exposure is an explanatory factor for variation in CSR disclosures, supporting the assertions that firms under more public visibility face greater needs to respond to public pressures and

sustain corporate legitimacy. Nikolaeva and Bicho (2011) found a firm's media visibility regarding CSR and CSR publicity, along with media pressures, were important determinants for the adoption of GRI. Bansal and Clelland (2004) asserted that investors would seek information from any available sources to assess corporate legitimacy, including the media and other informed parties as well as actions of stakeholders. However, there are also studies that found no significant relationship between media coverage and voluntary disclosure (Brammer & Pavelin, 2006; Clarkson et al., 2008).

2.3.2 Industry-level Characteristics

Cahan et al. (2016) and Mio and Fasan (2013) described that there are major financial consequences associated with corporate involvement in environmental disasters, resulting in market participants expecting firms in environmentally sensitive industries to disclose how they manage and protect themselves against environmental liabilities. Without adequate information to assess investment prospects, investors will protect themselves by lowering their estimate of a firm's future cash flows and increase the level of risk they are prepared to accept. Studies on sustainability disclosures support the proposition that firms operating in environmentally sensitive industries disclose more non-financial information (Cahan et al., 2016; de Villiers & Marques, 2016); however, this relation is not always found in IR studies. Vaz et al. (2016) did not find a significant relation between industry membership and IR. Similarly, Frías-Aceituno et al. (2014) and Lai et al. (2016) did not find a significant relation between sector membership and IR engagement. In contrast, Lai et al. (2016) found firms in the basic materials, industrials and financials industries were more likely to adopt IR relative to firms in the oil and gas industry. This finding contrasts with the proposition that firms in environmentally sensitive industries tend to use disclosures to enhance strategic legitimacy.

Frías-Aceituno et al. (2014) found firms located in less competitive industries tended not to engage in IR, suggesting monopolistic firms protect their competitiveness by avoiding disclosure of relevant information on business operations. Mio and Fasan (2013) evidenced that industry membership is the main driver of materiality determination processes in integrated reports. Further, Fasan and Mio (2016) identified that firms in the telecommunications industry were disclosing materiality processes to a greater extent than those in the consumer goods or oil and gas industries. García-Sánchez et al. (2013) found firms in the capital goods and utilities sectors were more likely to publish integrated reports, arguing that corporate transparency varies across sectors as stakeholder groups have different areas of concern.

2.3.3 Country-level Characteristics

2.3.3.1 Cultural Systems

Cultural background affects individual beliefs, values and attitudes, and influences cognitive processes which determine individual perceptions of the world (Hofstede, Hofstede, & Minkov, 2010; Nisbett, Peng, Choi, & Norenzayan, 2001). Studies have applied Hofstede's national culture dimensions to examine patterns in integrated disclosure practices. García-Sánchez et al. (2013) found firms operating in countries with stronger collectivist and feminist values are leaders of information integration. Collectivist and feminist cultures are associated with greater societal demand for ESG performance as these cultures focus on improving quality of life for society overall. Hence, issuance of integrated reports is a means for managers to respond to societal demands. This finding is partially supported by Vaz et al. (2016), which found collectivism, but not feminism, a significant factor to preparation of integrated reports.

2.3.3.2 Institutional Systems

North (1991) and Barley and Tolbert (1997) define institutions as constraints created by humans that structure political, economic and social interaction. Despite standardisation of reporting standards, reporting practices vary on a national level due to differences in institutional systems. Chen and Bouvain (2009) found significant variations in the contents of CSR reports produced in US, UK, Australia and Germany. Reports differ in the extent of CSR promotion and CSR issues emphasised. The study suggested that variations were due to different interpretations of capitalism and the role of businesses amongst countries. Maignan and Ralston (2002) and Chapple and Moon (2005) also identified differences in the extent and focus of non-financial disclosures across countries. While disclosure practices vary across countries, firms operating in similar institutional systems exhibit homogeneous patterns of behaviour.

Economies where stakeholders and the media hold greater power and influence tend to be associated with higher levels of non-financial disclosures. Investors and stakeholders who have established strong political accountability and media freedom are more demanding of CSR activities and information, and firms respond to such demands by disclosing information (Cahan et al., 2016; de Villiers & Marques, 2016; Dhaliwal, Radhakrishnan, Tsang, & Yong George, 2012). Cahan et al. (2016) identified a relation between higher levels of CSR disclosure and countries that have characteristics of stronger law enforcement, greater ability to implement sound policies and regulations, greater social participation in government selection, more pressure on firms to be sustainable, a more progressive environmental agenda

and greater media freedom. While de Villiers and Marques (2016) found higher disclosure of CSR information in countries with lower commitment to environmental policies, results are similar for the other factors.

Prior studies have found legal systems influence preparation of integrated disclosures. Legal systems are commonly classified into civil law and common law, and have been used to determine whether a country is shareholder or stakeholder-orientated. Frías-Aceituno et al. (2013a) described a civil law system to be more stakeholder-orientated compared to common law systems. Civil law systems tend to be more sensitive to stakeholder interests and have a communitarian perspective, characterised by stronger laws that protect employees. In contrast, common law systems have a stronger tradition of developments on ownership rights and shareholder protection. Although Frías-Aceituno et al. (2013a) found firms in civil law systems were more likely to issue integrated reports, Vaz et al. (2016) did not find legal systems a significant determinant. Fasan and Mio (2016) assessed the legal origin of countries, classifying legal environment into English, French, Scandinavian and German, and found that the legal environment does not affect the disclosure of materiality selection processes in integrated reports.

Regulatory requirements drive the preparation of integrated reports in the mandatory setting of South Africa (Haji & Anifowose, 2017; Vaz et al., 2016). In absence of explicit regulation of IR, García-Sánchez et al. (2013) argued that the decision to prepare integrated disclosures was not affected by the level of regulation or stratification of power. Their findings did not show dimensions of power distance, long-term orientation and uncertainty avoidance as significant variables. In terms of investor protection, de Villiers and Marques (2016) found the probability of CSR disclosure was higher for countries with better investment protection. In contrast, for integrated reports, Vaz et al. (2016) found IR is less likely in economies with higher investor protection.

2.4 Integrated Reporting from the User Perspective

2.4.1 Concerns with the International Integrated Reporting Framework

A number of academics questioned the Framework's potential to change existing corporate practices. Concerns surround the IIRC's promotion of IR as a business case and the Framework's tendency towards business needs. The level of discretion left to management in preparing an integrated report and the Framework's narrow emphasis on capital providers reinforce business-as-usual practices rather than encourage critical reflection (Brown & Dillard, 2014; Milne & Gray, 2013). The investor-centric nature of the Framework raised doubts on its potential to drive sustainable business practices and its ability to encourage

communication of information useful to other key stakeholders. It was anticipated that IR practices following the IIRC Framework would not stimulate significant changes in internal operations and external reporting practices.

Moreover, the IIRC's assumption that shareholder value will convert into stakeholder value is not justified. It is improper to assume that the interests of firms, investors and society will converge given time without a motivating force to drive changes in mindsets (Flower, 2015; Rowbottom & Locke, 2016; van Bommel, 2014). Gray (2010) argued that if the sustainable costs of corporate activity are properly accounted for, where reporters ensure all man-made, renewable and critical natural capitals are maintained over an accounting period, there would be few firms that are actually sustainable. Organisations are not expected to include accounts that threaten their existence willingly. Gray (2010) warned that the resulting sustainability claims based on a weak sustainability perspective are largely unsupported and potentially dangerous. Arguably, IR practices according to the IIRC support shareholder supremacy rather than stakeholder accountability. As found by Chaidali and Jones (2017), reporters who adopted the Framework were focused on their business model and financial aspects rather than on social and environmental issues.

Another concern is that the Framework may not reflect the needs of report users, nor may it be equally applicable to organisations in non-English speaking or less-developed economies (Reuter & Messner, 2015). As the Framework deems capital providers the primary target audience for integrated reports, integrated reports may not be suitable for all organisational types. For instance, the primary objective of most public sector organisations is to deliver services to the public rather than to generate return to investors or make a profit (IPSASB, 2014). Thereby, the focus for the public sector is on communicating accountability and resource utility and not necessarily on long-term creation of financial value. However, adoption of IR would not be restricted to organisations seeking external funding if managers employ IR as a tool to improve internal systems and manage organisational complexity.

2.4.2 Relevance to Capital Providers

Integrated reports will be relevant to investors if they provide incremental and material information for investment decision-making. However, given this assumption, it is still possible that integrated reports may only be of interest to certain types of investors or is of minor consideration in investment considerations.

A short-termism mindset to investing dominates the investment industry, making information focused on long-term sustainability more relevant to long-term investors or non-mainstream financial analysts (Atkins & Maroun, 2015; IIRC, 2012; Rieg, 2015; Stubbs,

Higgins, Milne, & Hems, 2014). Stubbs et al. (2014) suggested that mainstream financial analysts were not educated to analyse broader ESG information, and investors who already utilised an ESG framework preferred their own to the six capitals concept. Further, investors may not be supportive of firms reducing information asymmetry as investors want to be the only ones to recognise value in order to gain a competitive advantage in investments. Adams (2017) reported managers' frustration on a lack of investor understanding concerning ESG issues, where investors' concerns were limited to executive remuneration policy.

In relation to investment decision-making, Hsiao and Kelly (2018) identified disconnections between investment considerations and the concepts promoted by the IIRC Framework. The relevance of integrated reports to investors is affected by investment appraisal techniques and accessibility to private information. It is anticipated that integrated reports play a minor role in investment decisions and may not influence investment decisions. The same conclusion is reached by Abhayawansa, Elijido-Ten, and Dumay (2018), which found integrated reports are not considered a relevant information source for sell-side analysts. IR had not affected the way information was collected or used for investment appraisal. Analysts were reliant on third-party sources for information and their valuation models centres on financial data and quantitative information.

Another problem limiting the reliability of integrated reports is difficulty of assurance. Auditors can only audit against criteria. The absence of mature reporting systems for non-financial information and no basis for defining risk of misstatement make it difficult for assurers to express an opinion for integrated reports (Maroun, 2018).

2.4.3 Quality and Content of Integrated Reports

There are multiple areas for improvement in the quality and content of emerging integrated reports. Institutional investors suggested a need for more risk-orientated information, disclosure of relevant information rather than simply more information, greater explanation of materiality assessment processes and a more balanced representation of corporate performance (IIRC, 2013c). There were concerns with report length, excessive repetition and a box-ticking approach to reporting (Atkins & Maroun, 2015). Similar issues were identified by Haji and Anifowose (2016), which found low connectivity of information, incomparability as a result of a wide diversity in the type and quality of information reported, and limited external assurance. Furthermore, available integrated reports appear to pay more attention to form over substance. Available integrated reports lacked quantitative and capital-specific information, materiality assessment processes, and forward-looking information about

opportunities, risks and outlook (Doni et al., 2016; Kılıç & Kuzey, 2018; Pistoni, Songini, & Bavagnoli, 2018; Solomon & Maroun, 2012; Stacchezzini et al., 2016; Stubbs et al., 2014).

Melloni, Caglio, and Perego (2017) associated integrated reports with impression management, suggesting early IR reporters manipulate report content and tone as impression management strategies. The study found firms with weaker financial performance tended to release longer and less readable reports, communicated using a more optimistic tone. Further, firms with weak social performance provided less concise and complete information concerning sustainability information.

In addition to integrated reports lacking content, it is possible that reports are not substantially different from traditional forms of disclosure. Haji and Anifowose (2016) found IR in South Africa is more ceremonial than substantive. The practice had not brought about major changes in how firms connected information. Adams et al. (2016) found isopraxism in corporate disclosures. Firms not claiming involvement with the IIRC or application of the Framework were drawing broad links between financial performance and value creation in their disclosures, reflecting the idea of IR. However, despite attempts to improve connectivity of information, reports lacked discussions of value created from social investment. Adams et al. (2016) suggested that as firms had not sufficiently progressed in measuring and communicating value, the IIRC Framework does not ensure that reports represent broader dimensions of corporate activity any more effectively than alternative forms of reporting.

2.5 Consequences of Voluntary Disclosure

2.5.1 Investor and Analyst

Prior studies have found that engagement in voluntary disclosure influence investor and analyst behaviour. Dhaliwal et al. (2011) found firms that initiated CSR disclosures and had superior CSR performance attracted dedicated institutional investors. In addition, analyst forecasts were more accurate and less dispersed, leading to subsequent decreases in cost of capital. Similarly, Dhaliwal et al. (2012) found an association between CSR reports and lower sell-side analyst forecast error. This relationship was stronger in stakeholder-orientated countries and stronger for firms and countries that had more opaque financial disclosure. Elliott, Jackson, Peecher, and White (2014) conducted an experimental study using business students as surrogates for investors. The study found investors placed higher value on a firm if investors were exposed to CSR information, but this exposure effect was significantly diminished for investors who explicitly assessed CSR performance.

IR studies found similar associations between integrated reports and investor behaviour. Integrated thinking and reporting practices signal stronger commitment to CSR

and sustainability, leading to a greater long-term investor base compared to competitors that have not adopted such practices (Knauer & Serafeim, 2014; Serafeim, 2015). Zhou et al. (2017) suggested the quality of integrated reports affects firms' information environment. The study found improvements in analyst forecast error following more alignment with the IIRC Framework, leading to subsequent reductions in cost of capital for firms with lower analyst following. This finding is consistent with the explanation that investors are willing to accept lower rates of return when there is less information risk. Specifically, the quality of connectivity results in less analyst forecast error, suggesting new features in integrated reports were useful for analysts in assessing firms' future profitability. Zhou et al. (2017) also found marginal evidence that the level of alignment to the Framework is negatively associated with analyst forecast dispersion. Bernardi and Stark (2018) found ESG scores were not associated with analyst forecast accuracy prior to the IIRC regime, but are significantly associated with increased forecast accuracy once the Framework was introduced. This result is primarily driven by the environmental disclosure of non-financial firms, which lead Bernardi and Stark (2018) to propose that IR does not need to be focused on shareholders and may not be suitable for all industries.

2.5.2 Firms

2.5.2.1 Institutionalisation and Internal Change

A primary goal of IR is to embed a holistic view of value creation and long-term orientation into corporate practices and disclosures; however, there is no evidence of radical changes in corporate operations in its early stages of adoption. Financially focused individuals appeared to be resisting the idea of IR and managers perceived integrated reports to be more about story-telling instead of stakeholder engagement and interaction (Higgins et al., 2014). IR was considered an extension of sustainability reporting, especially for firms who thought their values were already aligned with sustainability (Lodhia, 2015; Stubbs & Higgins, 2014). Dumay and Dai (2017) found that while a number of managers considered IR helped align some lack of direction about the purpose of reporting and improved communication across departments, there were managers who thought IR did not have a real impact on how the teams worked together. Firms were still waiting to see how standards and regulations develop, and acknowledged a need for developments in integrated measurement systems and metrics to assist in the practice of integrated thinking and disclosures (Stubbs & Higgins, 2014).

Better resource allocation decisions and cost reductions were not indicated as significant outcomes of IR in Steyn (2014), nor were there any anticipated benefits for a firm to reconsider its business model and encourage sustainable product development. However,

Mio, Marco, and Pauluzzo (2016) found 'internal IR' to improve internal operations as it clarified shared value and the value creation path to each function. Internal IR strengthened collaboration amongst business units and connection with external stakeholders. The Framework acted as a bottom-up tool to help a function present itself, leading Mio et al. (2016) to suggest that the internal implications of IR emerge in mature phases of the IR process rather than in early stages. Similarly, Lai, Melloni, and Stacchezzini (2018) found that sustainability is marginalised by the preparer as the organisational context was not ready to integrate sustainability into its value creation story. The preparers expect to integrate sustainability into their integrated reports in mature phases of IR.

2.5.2.2 Economic Performance

For voluntary disclosure to influence firm value, disclosures need to provide incremental information that is useful for investors in assessing future cash flows and investment risk (Cahan et al., 2016; Lee & Yeo, 2016). While informative and credible information could lead to increases in firm value, incremental information that is perceived as opportunistic or biased would decrease firm value or leave it unchanged (Cahan et al., 2016).

Corporate disclosures can affect cost of capital through direct and indirect links. Direct effects arise when higher quality information affects market participants' assessment of future cash flow distribution, such as through risk sharing and reduction of estimation risk (Lambert, Leuz, & Verrecchia, 2007; Lang et al., 2003; Merton, 1987). Indirect effects arise when higher quality information affects a firm's real decisions or affects market liquidity, which influences the expected value of a firm and covariance of cash flows (Lambert et al., 2007; Verrecchia, 2001). Changes in investor and analyst behaviours from increased disclosures lead to subsequent reductions in cost of capital and increases in firm value. Cahan et al. (2016) argued that the value of the information disclosed would be lower if investors had expectations about the extent of CSR disclosure a firm was likely to provide. Their findings showed expected levels of CSR disclosures were not significantly associated with firm value, but firm value increased overall when considering total CSR disclosure. Other studies also support a positive relation between ESG disclosure and firm value (de Klerk, de Villiers, & van Staden, 2015; de Villiers & Marques, 2016).

For IR, Barth et al. (2017) found higher quality integrated reports were associated with greater stock liquidity and increased firm value. This effect is primarily through increases in expected future cash flows. Barth et al. (2017) associated such improvements with the rationale that integrated thinking and reporting result in more efficient internal decision-making and capital allocation decisions. Similarly, Lee and Yeo (2016) found that more

alignment with the Framework is associated with higher firm value. This association is stronger for firms with more complex operations. Arguelles et al. (2016) found disclosures aligned with the Framework principles are positively associated with higher market value of equity. From the perspective of IR under King III, Baboukardos and Rimmel (2016) identified a sharp increase in earnings per share (EPS) and a decline in value of net assets after mandatory adoption of IR. While increase in earnings was explained as benefits associated with connecting disconnected information, the decline in value of net assets may be due to more reliable estimation of liabilities after the introduction of IR.

2.5.2.3 Non-financial Performance

Maniora (2015) found IR was a superior mechanism only when compared to firms that had not previously published a stand-alone ESG report. This finding suggested that there were no economic or ESG benefits by switching from preparing stand-alone ESG reports to integrated reports. Similarly, Churet and Eccles (2014) did not find any significant relationship between IR and financial performance, but suggested a positive relationship between IR and management of ESG issues, which will help businesses meet short-term goals while maintaining long-term competitiveness. Based on a self-developed matrix, Needles et al. (2016) found that HPCs and GRI firms scored lower on sustainability and integrated practices compared to firms that adopted the IIRC Framework.

2.6 Summary and Conceptual Model

The insights drawn from the IR and voluntary disclosure literatures are summarised in Figure 2.1 and Figure 2.2, relating to the determinants and consequences of IR, respectively. It is important to note that the constructs identified are limited to available research and the author's speculation[4]. Additional and possibly key factors may emerge as the IR process and IR literature matures. Nevertheless, the models provide a foundation for emerging IR research.

Figure 2.1 reflects the determinants of IR, indicating characteristics that potentially influence the decision to release an integrated report. Characteristics are categorised into firm, industry and country-levels. In addition to factors identified from prior studies, associations with individuals involved in IR or with the IIRC could motivate preparation of an integrated report. Associations could increase exposure to IR practices and act as a form of external pressure. For instance, the Big Four and other large accounting firms are associated with the

[4] Items with an asterisk denote speculations derived from considering the purpose of IR. They are characteristics that have not been directly examined by extant IR studies.

IIRC. Their members may promote the Framework to clients, thereby pushing reporters toward preparing an integrated report.

Figure 2.2 reflects the consequences of IR, summarising the anticipated changes following engagement in the IR process. As evident from the literature review, it is debatable whether adoption of the IIRC Framework can substantially change existing management and reporting practices. Any consequences on capital markets, organisational operations, sustainable economic development and stakeholder behaviour are arguably dependent upon whether IR changes corporate operations.

The conceptual model should be viewed collectively although it is presented separately to enhance presentation and readability. A number of constructs within and between the determinants and consequences are interrelated. Factors that influence IR initiation could reflect resulting consequences. For instance, if addressing institutional pressures or legitimacy concerns motivated the release of integrated reports, the consequences may be a decrease in institutional or legitimacy pressures. Another example is that preparation of integrated reports potentially increases disclosure costs and litigation risks, leading to increased liabilities for firms that prepare integrated reports. Similarly, constructs identified as consequences could feed into determinants. For instance, anticipated improvements in efficiency, performance and the information environment may motivate managers to engage in IR.

It is possible that there are alternative hypotheses for the direction and effects of the constructs identified. For example, with the relation between integrated reports and analyst forecast accuracy, accuracy could improve if incremental and material information is disclosed in integrated reports. Alternatively, accuracy could decrease if integrated reports contribute to information overload by introducing more disconnected and irrelevant information for analysts. It is also possible that there is no relation between integrated reports and analyst forecast accuracy if investors are not considerate of such disclosures.

This chapter summarises characteristics that theoretically affect adoption of IR and its subsequent consequences. A challenge for researchers is to accurately measure or proxy for the factors identified, as many are unobservable characteristics, such as organisational culture and long-term consequences of IR. While it was not possible to examine all identified aspects, the study provides greater insights into this reporting practice by investigating aspects not examined in prior IR literature. The next chapter details the overall research design and measures employed in researching the determinants and consequences of voluntary IR.

Figure 2.1: Conceptual model - Determinants

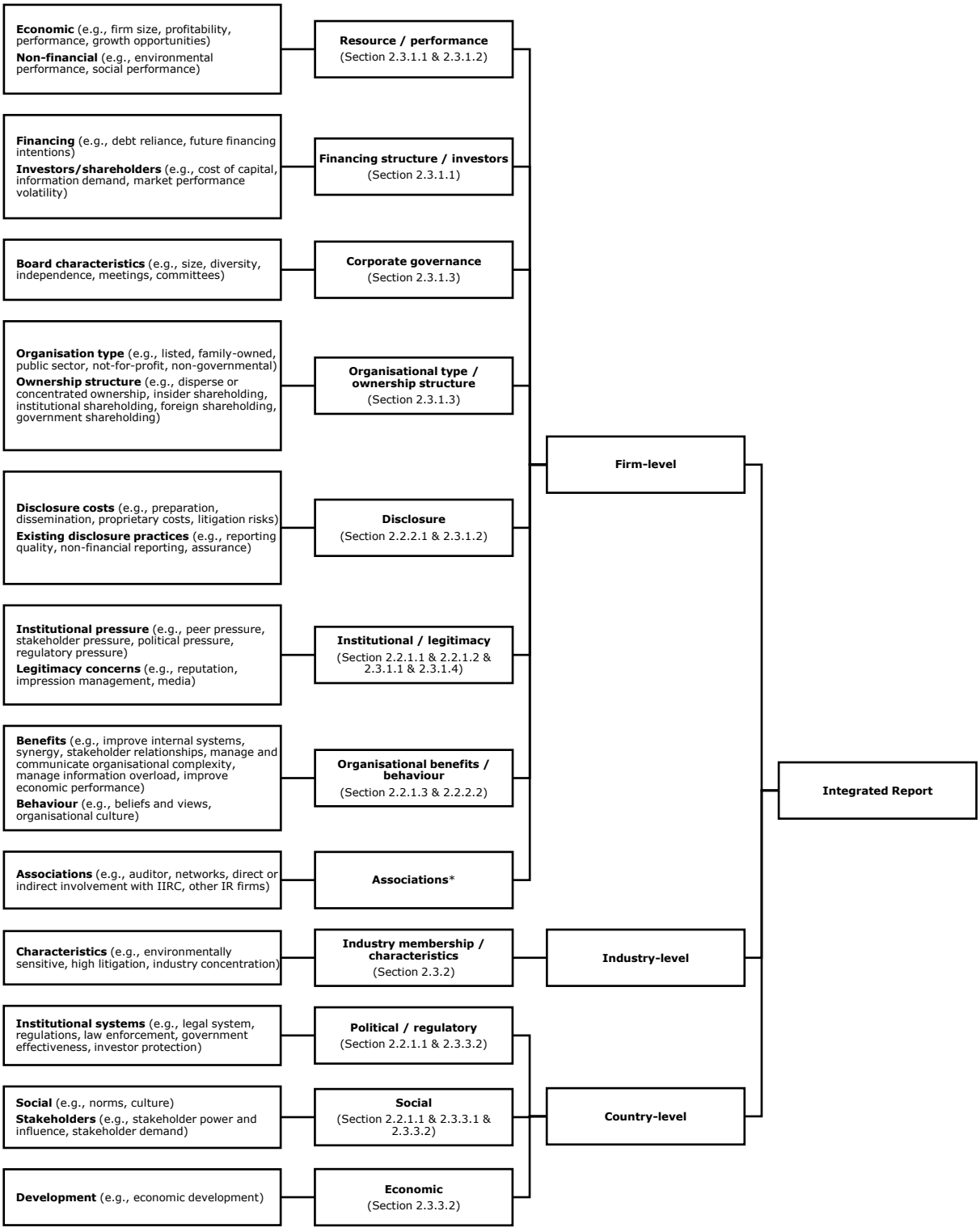
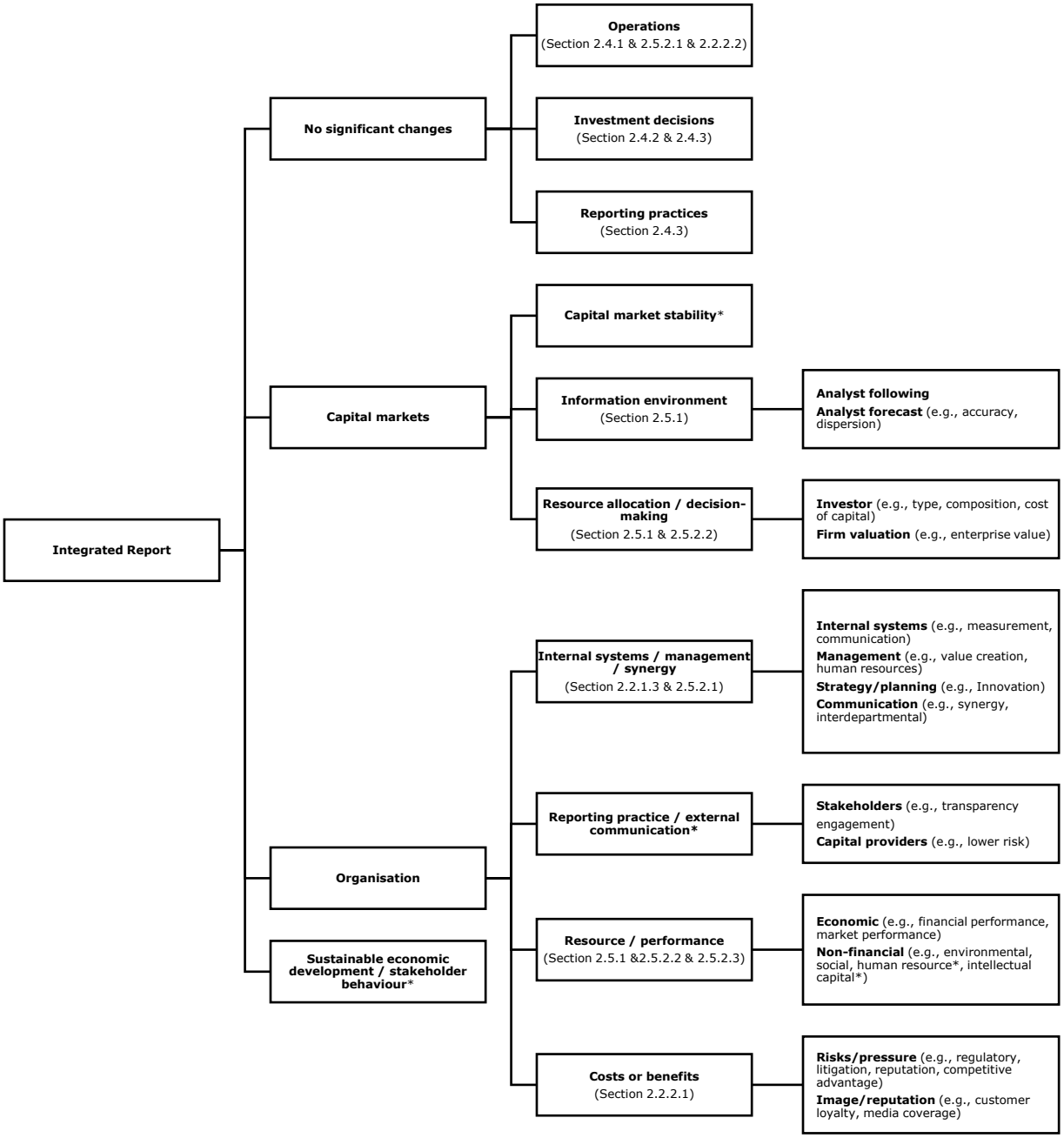


Figure 2.2: Conceptual model - Consequences



CHAPTER THREE
RESEARCH DESIGN

3.1 Introduction

This chapter provides a detailed overview of the sample and research method employed for the determinants and consequences analyses.

The chapter proceeds as follows. Section 3.2 explains the research design, detailing the research strategies and techniques applied. Section 3.3 describes the characteristics of identified IR firms. Section 3.4 describes the sample composition for the determinants and consequences analyses. Section 3.5 details the data sources used and provides variable definitions and measurements. Section 3.6 details the model development process for each determinants and consequences analysis. Section 3.7 summarises the chapter.

3.2 Research Design

Endogeneity problems can yield biased and inconsistent parameter estimators in maximum likelihood and ordinary least squares (OLS) estimations. Simultaneity, omitted variables and measurement errors are main causes of endogeneity. A focus on IR initiation year and employment of lead-lag models relate to addressing simultaneity. Tests of level specification and change specification, difference-in-differences (DID) estimators, matching techniques and treatment effect models (TEM) aim to mitigate issues with omitted variables. Problems pertaining to measurement errors were mitigated through the data screening process and testing of alternative variables.

3.2.1 Initiation Year

The study investigates the determinants and consequences associated with the first integrated report, prepared in accordance with the IIRC Framework, released by firms. A focus on initiation year mitigates threats to internal validity, specifically threats that arise from history effects. As firms initiate integrated reports in different years, the results are less likely affected by external events that occur in a specific year or over specific years.

The dichotomous measure of IR is relatively simple when compared to assessment of reporting quality. Despite its simplicity, it is a clean measure with a clear interpretation. While reporting quality could be a moderator variable, assessment of reporting quality is difficult and often subjective. A one-size-fits-all disclosure index, or even assessment based on the IIRC Framework, may not reflect the true value of integrated reports. Conceptually, an integrated report is a unique report for each reporting entity. It tells the value creation story of an organisation in relation to its business models and strategies. The idea of value creation

and concepts such as connectivity are not easily assessable. Moreover, there is no consensus on what makes a good integrated report and it is ambiguous what a high or low quality report is.

Lee and Yeo (2016) used compliance with the IIRC Framework as a measure of reporting quality; however, following criticisms of the Framework and issues with available integrated reports, compliance with the Framework does not necessarily equate to disclosure of material information and greater reporting quality (Adams et al., 2016). Barth et al. (2017) measured reporting quality using proprietary data obtained from EY ratings, which are also assessed using the IIRC Framework. While this data could provide a more reliable measure of reporting quality, the ratings may not reflect the perspectives of capital providers as the EY rating process was developed by three academics and members of EY. Further, the scores are highly subjective as the three adjudicators did not attempt to achieve consensus on the scores (EY, 2015a).

3.2.2 Lead-lag Models

Lead-lag models are used to mitigate time lag effects. The factors that motivate reporters to prepare an integrated report could have occurred periods prior to the release of a firm's first integrated report. Similarly, consequences may become apparent periods after the release of an integrated report. Accordingly, the determinants models test independent variables on the pre-initiation year (t-1) and set the dependent variable, *IR*, on the initiation year (t). The consequences models test dependent variables on the post-initiation year (t+1) and independent variable, including *IR*, on the initiation year (t).

Surveys on self-declared IR firms in Japan show that the time between implementing IR and the release of an integrated report could range from one year to 12 years (Corporate Value Reporting Lab, 2016). For the 190 firms with complete data, the mode is one year and median is two years. As firms commonly initiate and report within two fiscal years, independent variables set at two years prior to the release year (t-2) is tested for determinants. Additional consequences analyses set the dependent variables at two years post the release year (t+2).

Reverse causality is a problem as factors that influence IIRC Framework adoption could also be subsequent consequences, and vice versa (see Chapter 2, Section 2.6). Under the assumption that the variables of interest are not time-invariant or exhibit consistent variations, lead-lag models in conjunction with a focus on initiation year mitigate the issue of reverse causality and simultaneity. It is reasonable to expect that variables measured on a lagged period could affect IR initiation at a later period, rather than vice versa, while release of an

integrated report would affect consequences at a later period, rather than vice versa. If the assumptions do not hold, results from a DID design remain reliable given satisfaction of its own assumptions (see Section 3.2.6).

3.2.3 Matching

Self-selection bias is a problem as the differences between IR firms and non-IR firms may be systematic. Thereby, analyses on a sample of IR firms would lead to a biased estimation of treatment effects. Matching techniques attempt to re-establish the conditions of an experiment by constructing a control group based on similar observable characteristics (Stuart & Rubin, 2008).

Exact matching was done on country, industry and year, and then the closest match in terms of market capitalisation was taken. The matching algorithm was a one-to-one match using nearest neighbour with replacement. Despite this setting, there are no duplicates of firms in the final samples. The base sample for all analyses consist the same group of IR firms and matched non-IR firms, 358 observations for determinants analyses and 356 observations for consequences analysis. As the matches are one-to-one, dropping an observation due to missing data simultaneously dropped the paired firm. If a non-IR firm was dropped due to missing data, attempts were made at re-matching the paired IR firm. Samples were also re-matched after checking the cleanness of the non-IR group, where a number of matched firms were identified as IR firms[5]. As the study sought to maximise statistical power, the sample size varies across the models tested. As shown in Section 3.3 and Section 3.4, the samples share similar characteristics with each other and all identified IR firms.

A close match is important for strengthening the reliability of results, but there is a trade-off between closeness of matches and data availability. First, it was difficult to obtain close matches for firms based on a narrow specification of industry groups. Second, ASSET4 was the only database the researcher had access to for ESG performance and corporate governance data. The database coverage is however limited to firms in market indexes. In order to obtain a reasonable sample size, the main analysis is based on matches on two-digit SIC using the ASSET4 universe. For sensitivity tests, non-IR firms were matched on two-digit GICS, four-digit GICS and three-digit SIC using the Worldscope and ASSET4 universes.

Matching on firms covered in ASSET4 reduced the number of observations excluded due to missing ESG data; however, matches on the Worldscope universe offered a broader

[5] Despite attempts at re-matching, a number of IR firms were unable to be paired due to two reasons: (1) there are no other non-IR firms operating in a particular country and industry (two-digit SIC) with database coverage, or (2) other non-IR firms faced problems with missing data for key variables.

selection of firms, which potentially results in closer matches in firm size and industry. Additional matches are based on two alternative industry classification schemes: SIC and GICS. Bhojraj, Lee, and Oler (2003) explained that SIC categories are product and technology orientated, whereas GICS categories are based on principal business activity. Bhojraj et al. (2003) found GICS classifications were significantly better at explaining market returns and performance and profitability ratios, whereas SIC classification resulted in closer matches for leverage ratios. Bhojraj et al. (2003) corresponded two-digit SIC to six-digit GICS; thereby, ranking industry codes from a broad to narrow classification results in: two-digit GICS, four-digit GICS, two-digit SIC and three-digit SIC.

Exact matching is more suitable for the study when compared to propensity score matching (PSM). PSM matches on a single propensity score that represents the probability of initiating IR given a set of observed characteristics. This is useful when there are a large number of potential confounding factors and the match is not reliant on certain baseline characteristics. However, a drawback is the risk of matching firms who have similar scores but are different in key variables of interest (Shipman, Swanquist, & Whited, 2017). Exact matching has the advantage of ensuring that the non-IR group was paired on specific characteristics. Furthermore, key variables that determine IR initiation should be included in the PSM prediction model; however, the IR literature is not clear on what the key determinants are. Matching on a few variables decreases the number of IR firms excluded due to the absence of selected variables, increasing sample size and variability in the sample tested.

3.2.4 Treatment Effect Model

Notwithstanding benefits of matching techniques, it is not an alternative to Heckman-type selection models (Shipman et al., 2017). Selection models rely on a specific functional form to provide an indirect estimate of treatment effects, whereas matching techniques assume that the effects of unobservable characteristics are not pertinent to estimating treatment effects. As unobserved characteristics could affect the investigated consequences, TEM are tested in the consequences analysis.

TEM first estimates a probit model for selection and then inserts a correction factor calculated from the probit model into the regression model of interest. Two methods are used to estimate the average treatment effect and other parameters: two-step consistent estimator (TSE) and full maximum likelihood estimator (MLE). Puhani (2000) explains that TSE may be more robust in situations with multicollinearity problems, but in the absence of multicollinearity problems, the MLE is usually more efficient and is preferable. However,

MLE relies more heavily on the normality assumption and deviance from this assumption results in less robust estimates when compared to TSE (Bushway, Johnson, & Slocum, 2007).

Lennox, Francis, and Wang (2012) explain that proper choice of exclusion restrictions is vital to control for endogeneity in the endogenous indicator variable. The exclusion restriction must be exogenous in the first stage choice model and is able to be validly excluded from the set of independent variables in the second stage regression. Failure to satisfy this criterion leads to bias in the first stage coefficient estimates and therefore bias the non-selection hazard rate (*lambda* or inverse Mills ratio). The selection model specifies a probit regression that models the firm's decision to initiate IR voluntarily. It modifies the determinants equation (Equation 3.5), excluding media measures, institutional ownership and board skills due to data limitations. The selection model maintains key variables important in determining engagement in IR (see Chapter 4). Equation 3.4 is used as an alternative specification for sensitivity tests. The following probit model is used:

$$\begin{aligned} IR_{i,t} = \beta_0 &+ \beta_1 BOARDCOM\_CSR_{i,t-1} + \beta_2 BOARDSIZE_{i,t-1} + \beta_3 GENDIV_{i,t-1} \\ &+ \beta_4 LEV_{i,t-1} + \beta_5 LnSUBSIDIARY_{i,t-1} + \beta_6 INTASSET_{i,t-1} \\ &+ \beta_7 CONCENTRATE_{i,t-1} + \beta_8 SENSITIVE_{i,t-1} \\ &+ \beta_9 CULTURE\_MUL_{i,t-1} + \beta_{10} NATION\_VF_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (3.1)$$

A statistically significant *lambda* indicates the presence of self-selection and TEM is appropriate in avoiding omitted variable issues or sample truncation bias. For TEM using MLE, an assumption is that the level of correlation between the two error terms is non-zero and violation of this assumption can lead to estimation bias (Guo & Fraser, 2010). This assumption was assessed by comparing the joint likelihood of the selection equation and the regression model on the observed data against the TEM likelihood. A significant *p*-value for the likelihood ratio test implies that the correlation is non-zero, suggesting application of the TEM is appropriate. Potential issues with multicollinearity were checked by examining the correlation between variables in the second equation and *lambda*.

3.2.5 Level and Change Specifications

Both level and change regression specifications are used in examining the links between IR initiation and its consequences. Assessing variables on level specification reflects whether IR firms have on average a different level of the investigated consequences relative to non-IR firms, indicating whether IR is a relevant predictor for the investigated consequences.

Models ran with a change specification can study the direct relation between IR initiation and future changes in the investigated consequences. Further, as explained by Wooldridge (2002) and Nikolaev and van Lent (2005), first differencing controls for

unobserved characteristics that remain relatively fixed over time periods. Thereby, change specification implicitly controls for time-invariant or low variation characteristics that affect the investigated consequences, such as firm complexity and management behaviour. However, a potential problem with this approach is that the investigated characteristics do not respond to changes in IR initiation as quickly as theoretically predicted (i.e., within *t*+1 or *t*+2). In this instance, effects of IR initiation may not be fully reflected in observed changes.

3.2.6 Difference-in-differences

In addition to estimates on level specification, change specification and treatment effects for the consequences analysis, a DID design is employed. DID compares the change in the investigated consequences for IR firms before and after implementing IR with the corresponding change for matched non-IR firms. Investigated consequences are regressed on an indicator variable for the type of adopter (*IR*), an indicator variable for the time period (*POST*), the interaction term between these two indicators and a set of control variables. Equation 3.2 states the DID model in general form:

$$y_{it} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 POST_{i,t} + \beta_3 IR * POST_{i,t} + \sum CONTROLS_{i,t} + \varepsilon_{i,t} \quad (3.2)$$

The treatment variable (*IR*) equals 1 if a firm is an IR firm, and 0 otherwise. The post-treatment period (*POST*) equals 1 for post-treatment periods (*t*+1 and after), and 0 for pre-treatment periods (*t*-1 and before). The interaction (*IR***POST*) captures the difference-in-differences effect. If IR firms experience a relative improvement in the investigated consequence (*y*) when comparing the pre-treatment period to the post-treatment period, the coefficient of the interaction is expected to be statistically significant and positive.

A key assumption of DID estimators is common trends. This assumption posits that the average change for the non-IR firm group represents the counterfactual change for the IR firm group if there was no treatment. In order to validate the estimator, it is necessary for trends of the outcome variable to be similar for the IR group and non-IR group during the pre-treatment era. While this assumption is untestable, sensitivity or robustness tests can be performed.

Drawing from Roberts and Whited (2013), the study tests common trends in four ways. First, a visual inspection of the outcome variable over *t*-10 to *t*+5 in both level and change forms. Second, independent *t*-tests were used to test whether changes in pre-treatment trends for IR firms and matched non-IR firms are statistically different. The average change in the outcome variables in the pre-treatment periods (*t*-1 to *t*-2 and *t*-1 to *t*-4) for IR firms and matched non-IR firms were estimated. Statistically and economically non-significant results

lend more confidence in satisfying this identifying assumption. Third, the DID analysis were repeated assuming the treatment occurs in pre-event years (*t*-1, *t*-2 or *t*-3). Statistically non-significant results for the treatment effect suggest that the observed change is more likely due to the treatment as opposed to alternative events. Last, DID regressions were ran with and without control variables. While control variables are not necessary for DID estimates, adding control variables could improve precision and control for firm-specific effects that could influence the common trends assumption.

3.2.7 Data Screening, Data Reduction and Model Building

Summary statistics, histograms and box plots were used for data screening. Observations over three standard deviations and disconnected from the distribution were checked to ensure data accuracy. Financial reports were used to check accounting information and to fill in missing values. Analyst-related data and ESG data were assumed accurate, as it was not possible to determine whether the outliers were errors. Independent *t*-tests and chi-square tests were used to detect any missing data patterns prior to dropping observations with missing data.

Transformations are applied to variables with extreme skews. Variables not transformed had skewness less than or around ±1.5. A number of variables had kurtosis above four, indicating departure from normality. Thereby, parametric and non-parametric methods are used for univariate and bivariate analyses.

For the main determinants analysis, the logistic regression tests the raw data. Additional analyses include winsorising continuous variables at the 1st and 99th percentile. For the main consequences analysis, continuous variables are winsorised at the 1st and 99th percentile as this dealt with extreme outliers. OLS regression assumptions were checked and variables transformed accordingly to fit assumptions of linearity. All tests are estimated using robust standard errors to mitigate heteroscedasticity.

Removal of influential observations is tested in additional analyses. For logistic regressions, deviance residuals, DFFITS, DFBETAS and Cook's Distance were used to identify influential observations. Deviance residuals measure the contribution of each observation to the model deviance. Observations with a deviance residual above 2.0 or below -2.0 were removed as they are potentially influential outliers. DFFITS measures the influence a single observation has on the predicted value Y-hat and DFBETAS measures the influence an observation has on regression coefficients. Similar to DFBETAS, Cook's Distance provides information on the influence each observation has on parameter estimates. About half the sample is influential based on the threshold of $2\sqrt{(k+1)/n}$ for DFFITS and $2/\sqrt{n}$ for DFBETAS, and over three-quarters of the sample is influential based on the cut-off of $4/n$

for Cook's Distance (where k is the number of parameters in the model and n is the number of observations used to fit the model). Thereby, plots of DFFITS, DFBETAS and Cook's Distance were used to check for dispersion patterns and deviations instead. Standardised Pearson residuals were assessed instead of deviance residuals for OLS regressions.

All models were checked for problems with multicollinearity in the model development stage using bivariate correlations and the variance inflation factor (VIF). Unless otherwise stated, continuous variables with correlations greater than 0.70 were assessed in additional tests or were reduced using principal component analysis. For categorical variables, chi-squared tests and Fisher's exact tests were used to assess whether a relationship existed between variables. Strongly related categorical variables were used in additional tests.

3.3 Initial Sample of IR Firms

IR firms were initially identified from three sources: the IIRC website, the GRI database and Google. Additional IR firms were identified through the matching process. First, a list of potential IR firms was constructed from all organisations listed on the IIRC website and all organisations in the GRI database with reports labelled or tagged as 'integrated'. Google searches using the search phrase 'integrated report*' in English and other languages were used to identify IR firms not captured in the previous two sources. Additional IR firms were identified when checking the cleanness of the matched non-IR group.

Table 3.1 shows the sample elimination process. As the study focuses on publically traded firms that voluntarily issued integrated reports, non-publicly listed organisations and firms listed on the JSE were filtered out. Further, firms that do not satisfy the IR firm criteria were removed (see Section 3.5.2). As at 22 September 2017, 304 listed firms were identified as firms that voluntarily prepared integrated reports using the IIRC Framework. Arguably, the group of identified IR firms captures most, if not all, firms that voluntarily adopted the IIRC Framework at that point in time.

Table 3.2 Panel A, Panel B and Panel C reports the initiation year, industry and country distributions of all identified IR firms, respectively. The initiation year is concentrated around the years 2014 and 2015 (29.28% and 27.63%, respectively). While the adoption rate for 2017 and onwards are not observable, the rate of voluntary adoption declined in 2016 (10.53%). Hence, the adoption rate is decreasing relative to the initial momentum during the development and release of the Framework (EY, 2014; KPMG, 2015). Identified IR firms spread across all SIC industry divisions, with the most common industries being the manufacturing (37.83%); finance, insurance and real estate (22.70%); or transportation, communications, electric, gas and sanitary service (17.11%) industries.

Identified IR firms spread across 38 countries with Japan emerging as the country with the highest number of IR firms (28.95%), followed by Sri Lanka (8.55%) and Spain (6.91%).

3.4 Samples

3.4.1 Determinants: Main Sample

Removal of observations with missing ESG (84), ownership and cost of equity (48), and subsidiary and listing data (12) resulted in a sample of 107 IR firms and 107 matched non-IR firms. Independent *t*-tests[6] (untabulated) show that the pairs excluded due to missing values are smaller. Excluded pairs have relatively fewer subsidiaries and market listings, and lower media coverage, CSR media sentiment and analyst following. Moreover, pairs excluded have higher board independence, price and return volatility, and insider ownership. Tests of independence (untabulated) found no significant differences for tested categorical variables. Overall, the sample analysed is biased towards larger, more visible and more stable firms.

Table 3.3 Panel A compares IR firms included in and excluded from the analysis. There are no significant differences in financial performance, sustainability performance and leverage. However, excluded IR firms are smaller and have a lower percentage of financial or industry skilled board members. Panel B, Panel C and Panel D show the initiation year, industry and country distributions, respectively. These distributions are reflective of all identified IR firms.

3.4.2 Consequences: Main Samples

3.4.2.1 Information Environment

Removal of observations with missing analyst forecast (84), listing (16) or fundamental accounting data (20) resulted in a sample of 118 IR firms and 118 matched non-IR firms for multiple linear regressions (MLR). Independent *t*-tests[7] (untabulated) show the pairs excluded are smaller and less visible, and have lower analyst following. There are statistically significant differences in national culture and legal systems, with pairs excluded based in relatively more collectivist and feminine cultures. Tests of independence (untabulated) identify a statistically significant relation between the pairs excluded and the legal system, with a greater proportion of the sample excluded based in the civil legal system. Observations

[6] Means for excluded and included, *LnSIZE*: 8.14 and 9.03, $p<0.01$; *LnSUBSIDIARY*: 4.26 and 4.88; $p<0.01$; *LISTING*: 4.90 and 5.88, $p<0.01$; *LnMEDIA_ALL*: 5.93 and 6.51, $p<0.01$; *MEDIA_JFCSR*: 0.50 and 0.69, $p<0.01$; *FOLLOW*: 12.84 and 16.15, $p<0.01$; *BOARDIND*: 68.88 and 55.48, $p<0.00$; *PRICEVOLI*: 0.37 and 0.31, $p<0.01$; *RETVOLI*: 0.33 and 0.29, $p<0.05$; *OWNERSHIP_INS*: 4.38 and 1.25, $p<0.01$.

[7] Means for excluded and included, *LnSIZE*: 7.79 and 8.89, $p<0.01$; *LISTING*: 4.83 and 5.72, $p<0.05$; *FOLLOW*: 10.92 and 15.96, $p<0.01$.

were lost in estimating TEM and DID due to data requirements for ESG variables or multiple periods, respectively (see Chapter 5, Section 5.3 for details).

Table 3.4 shows that the attributes for the MLR and TEM samples are similar, this is extendable to the DID sample (untabulated). For IR firms included in and excluded from the analysis, Panel A shows that there are no significant differences in firm performance, leverage and analyst forecast error. However, excluded IR firms are statistically smaller and have lower analyst following. Panel B, Panel C and Panel D show the initiation year, industry and country distributions, respectively. These distributions are reflective of all identified IR firms.

3.4.2.2 Cost of Equity

Removal of observations with missing cost of equity (40), long-term growth (82), analyst forecast dispersion (14) or fundamental accounting data (6) resulted in a sample of 107 IR firms and 107 matched non-IR firms for MLR. Independent *t*-tests[8] (untabulated) show the pairs excluded are smaller and have lower analyst following. Observations were lost in estimating TEM and DID (see Chapter 5, Section 5.3 for details).

Table 3.5 shows that the attributes for the MLR and TEM samples are similar, this is extendable to the DID sample (untabulated). For IR firms included in and excluded from the analysis, Panel A shows that there are no significant differences in firm performance and leverage. However, excluded IR firms are significantly smaller, and have lower cost of equity and analyst following. Panel B, Panel C and Panel D show the initiation year, industry and country distributions, respectively. These distributions are reflective of all identified IR firms.

3.4.2.3 Firm Value

For analysis based on the Ohlson model, removal of observations with missing abnormal earnings (56) or market data (18) resulted in a sample of 141 IR firms and 141 matched non-IR firms for MLR. Independent *t*-tests (untabulated) show no differences between the pairs excluded from and pairs included in the analysis.

Table 3.6 shows that the attributes for the MLR and TEM samples are similar, this is extendable to the DID sample (untabulated). For IR firms included in and excluded from the analysis, Panel A shows that there are no significant differences in firm performance and leverage. However, excluded IR firms are significantly smaller and have lower cost of equity. Observations were lost in estimating TEM and DID (see Chapter 5, Section 5.3 for details). Panel B, Panel C and Panel D show the initiation year, industry and country distributions, respectively. These distributions are reflective of all identified IR firms.

[8] Means for excluded and included, *LnSIZE*: 8.02 and 9.05, $p<0.01$; *FOLLOW*: 9.70 and 17.62, $p<0.01$.

For the Tobin's Q analysis, removal of observations with missing governance (110) or fundamental accounting and market data (22) resulted in a sample of 112 IR firms and 112 matched non-IR firms for MLR. Independent *t*-tests[9] (untabulated) show pairs excluded due to missing data are smaller and have relatively smaller boards.

Table 3.7 shows that the attributes for the MLR and TEM samples are similar, this is extendable to the DID sample (untabulated). For IR firms included in and excluded from the analysis, Panel A shows that there are no significant differences in firm performance, leverage and Tobin's Q. However, excluded IR firms are smaller. Panel B, Panel C and Panel D show the initiation year, industry and country distributions, respectively. These distributions are reflective of all identified IR firms.

3.4.2.4 Environmental and Social Performance

Removal of observations with missing ESG (164) or listing data (14) resulted in a sample of 89 IR firms and 89 matched non-IR firms for MLR and TEM. Independent *t*-tests[10] (untabulated) show that pairs excluded have relatively lower environmental and social performance. Moreover, the pairs excluded are smaller, have higher financial slack, lower analyst following, fewer listing and smaller boards.

For IR firms included in and excluded from the analysis, Table 3.8 Panel A shows that there are no significant differences in firm performance, leverage and environmental and social performance. However, excluded IR firms are significantly smaller and have lower analyst following. Panel B, Panel C and Panel D show the initiation year, industry and country distributions, respectively. While these distributions are similar to all identified IR firms, they are not as reflective when compared to the samples used in analysing capital market consequences. The sample has a relatively narrower time span and Japanese firms account for a lower proportion overall.

3.5 Data Sources and Variable Definitions

Appendix A provides a summary of all variables, the databases used and which model(s) it is used in. Subscripts *i* and *t* denote firm and year, respectively.

3.5.1 Data Sources

The following databases are used:

[9] Means for excluded and included, *LnSIZE*: 7.91 and 9.07, $p<0.01$; *BOARDSIZE*: 10.28 and 11.36, $p<0.05$.

[10] Means for excluded and included, *ESP*: 63.55 and 78.96, $p<0.01$; *LnSIZE*: 8.20 and 9.07, $p<0.01$; *SLACK*: 0.14 and 0.11, $p<0.05$; *FOLLOW*: 11.77 and 17.15, $p<0.01$; *LISTING*: 4.77 and 6.13, $p<0.01$; *BOARDSIZE*: 10.33 and 11.62, $p<0.01$.

- Worldscope – accounting data
- Datastream – share market data
- Compustat – industry and country information
- I/B/E/S – analyst-related variables
- Factiva – media-related variables
- GRI database – identifying firms' history of GRI adoption
- ASSET4 – ESG-related data
- OSIRIS – accounting standards, subsidiaries, business and geographic segments, market listing and auditor information
- OCED database – interest rate data
- Hofstede's website – cultural dimension measures
- Central Intelligence Agency, World Bank, Reporters Without Borders and Yale Center for Environmental Law and Policy – national institution measures

Missing data were hand collected from financial statements or supplemented with alternative databases that provides the same type of information where possible. Variables expressed in local currencies are converted to USD based on the corresponding fiscal year end exchange rate obtained from Worldscope.

3.5.2 Firm-level Variables

Abnormal earnings ($ABEARN_{i,t}$) is calculated based on the Ohlson (1995) model, computed as firm *i*'s net income before extraordinary expenses at year-end *t*, less its cost of equity at year-end *t* multiplied by book value of equity at *t*-1:

$$x_{i,t}^{a} = x_{i,t} - er_{i,t} * b_{i,t-1}$$

Where: $x_{i,t}^{a}$ = abnormal earnings; $x_{i,t}$ = income before extraordinary expenses; $er_{i,t}$ = cost of equity capital; $b_{i,t-1}$ = prior year book value of equity. It is calculated on a per share basis.

Analyst following ($FOLLOW_{i,t}$) is the number of analysts following firm *i* throughout year *t*. It is the median number of analysts who provided an EPS forecast for the forecast period end date. *Note*. For firms with an I/B/E/S code but no data for the relevant period, it was assumed that the number of analyst following was zero for that year.

Analyst forecast dispersion ($DISPERSION_{i,t}$) is the standard deviation of firm *i*'s one-year ahead analyst EPS forecast, scaled by its absolute value of the median consensus EPS forecast for the forecast year *t*.

Analyst forecast error ($\boldsymbol{FERROR_{i,t}}$) is the mean absolute forecast errors made in year *t* for firm *i*, scaled by firm *i*'s year-end price:

$$FERROR(Y)_{i,t} = \frac{1}{N}\sum_{j=1}^{N}\frac{\left|Forecast\ EPS^{Y}_{i,t,j} - Actual\ EPS^{Y}_{i,t}\right|}{Price_{i,t}}$$

Subscripts *j* denote forecast. Indicator *Y* takes three values (0, 1 or 2), representing whether the target earnings and the forecast are for the current year, one-year ahead, or two-years ahead.

Auditor ($\boldsymbol{AUDITOR_{i,t}}$) is an indicator variable coded 1 if firm *i* is audited by an accounting firm involved in the IIRC at year *t*, and 0 otherwise. Accounting firms involved with the IIRC are identified as BDO International, Deloitte, EY, Grant Thornton, KPMG and PwC (IIRC, 2017b). *Note*. **Big Four auditors ($\boldsymbol{BIG4_{i,t}}$)** is used for the consequences analysis. It is an indicator variable coded 1 if firm *i* is audited by a Big Four auditor at year *t*, and 0 otherwise.

Beta ($\boldsymbol{BETA_{i,t}}$) is derived by performing an OLS regression between adjusted share price of firm *i* and its corresponding market index. It compares the monthly price movements of firm *i*'s share price over a five year period, ending at year-end *t*, with the total market index for the respective country. It is a measure of volatility and systematic risk of a security.

Board committee ($\boldsymbol{BOARDCOM\_CSR_{i,t}}$) is an indicator variable coded 1 if firm *i* has a CSR committee in year *t*, and 0 otherwise. *Note.* Alternative measures: (1) **audit committee ($\boldsymbol{BOARDCOM\_AUD_{i,t}}$)** and (2) **corporate governance committee ($\boldsymbol{BOARDCOM\_CG_{i,t}}$)**.

Board independence ($\boldsymbol{BOARDIND_{i,t}}$) is the percentage of independent and non-executive directors to total number of directors on the board of firm *i* in year *t*. *Note.* Strict board independence[11] was considered as an alternative but was not tested due to data missing for over half the sample.

Board meetings ($\boldsymbol{BOARDMEET_{i,t}}$) is the number of board meetings held by firm *i* during year *t.* It is a measure of board activities.

[11] Defined as individuals who are not employed by the firm, served on the board for less than ten years, not a reference shareholder with more than 5% of holdings, no cross-board membership, no immediate family ties to the firm and not accepting any compensation other than compensation for board service.

Board size ($\boldsymbol{BOARDSIZE_{i,t}}$) is the number of directors on the board of directors of firm *i* at year-end *t*.

Board skills ($\boldsymbol{BOARDSKILL_{i,t}}$) is the percentage of board members in firm *i* with either an industry specific background or a strong financial background for the year *t*.

Book value per share ($\boldsymbol{BVPS_{i,t}}$) is the book value per share of common shareholders' equity for firm *i* at year-end *t*.

Cost of equity ($\boldsymbol{COE_{i,t}}$) is derived by the Capital Asset Pricing Model, calculated by Bloomberg as:

$$COE = \text{Risk} - \text{free rate} + (\text{Beta} * \text{Country risk premium})$$

It is a measure of the rate of return required by equity investors to invest in the firm, representing the opportunity costs that could have been earned on alternative investments at an equivalent level of risk. *Note.* The main analysis use data available from Bloomberg as the implied cost of equity capital measures by Gebhardt, Lee, and Swaminathan (2001), Claus and Thomas (2001) and Easton (2004) face problems with missing data.

Alternative measure: **WACC ($\boldsymbol{WACC_{i,t}}$)** – Calculated by Bloomberg as:

$$WACC_{i,t} = \left(COC_{i,t} * \frac{TE_{i,t}}{TC_{i,t}}\right) + \left(COP_{i,t} * \frac{TP_{i,t}}{TC_{i,t}}\right) + \left(COD_{i,t} * \frac{TD_{i,t}}{TC_{i,t}}\right)$$

Where: $COC_{i,t}$ = Cost of equity (as above); $TE_{i,t}$ = Equity capital; $TC_{i,t}$ = Total capital (sum of common equity, preferred equity, long-term debt, and short-term debt); $COP_{i,t}$ = Cost of preferred equity; $TP_{i,t}$ = Preferred equity; $COD_{i,t}$ = Cost of debt (calculated as: Short-term debt*Pre-tax cost of short-term debt + Long-term debt*Pre-tax cost of long-term debt)/Total debt)*(1-Tax rate)); $TD_{i,t}$ = Total debt.

Cum-dividend market value ($\boldsymbol{LnMVCDA_{i,t}}$) is the natural logarithm of the cum-dividend adjusted market value, scaled by opening book value, for firm *i* at year-end *t*.

$$LnMVCDA_{i,t} = \frac{MV_{i,t} + DI_{i,t}}{BV_{i,t-1}}$$

Where: $MV_{i,t}$ = Market value; $DI_{i,t}$ = Dividends distributed; $BV_{i,t-1}$ = Opening book value.

Earnings per share ($\boldsymbol{EPS_{i,t}}$) is the annualised rate of EPS for firm *i* at year-end *t*.

Earnings quality ($\boldsymbol{EARNQLTY_{i,t}}$) is the absolute value of discretional accruals from the modified Jones model (Dechow, Sloan, & Sweeney, 1995). The modified Jones model is a cross-sectional estimation by country, industry and year, based on two-digit SIC. All variables were scaled by lagged total assets.

$$TA_{i,t} = \alpha_0 \frac{1}{Assets_{i,t-1}} + \alpha_1 \Delta REV_{i,t} - \Delta REC_{i,t} + \alpha_2 PPE_{i,t} + \varepsilon_{i,t}$$

Where: $TA_{i,t}$ = total accruals (calculated based on the cash flow method, measured as net income before extraordinary expenses less net cash flows of operating activities); $Assets_{i,t-1}$ = lagged total assets; $REV_{i,t}$ = revenues; $REC_{i,t}$ = accounts receivable; $PPE_{i,t}$ = gross property, plant, and equipment. A minimum number of observations are required to obtain reasonable parameter estimates from the cross-sectional model. Following Ayers, Jiang, and Yeung (2006), it was required that there are at least 10 two-digit SIC observations to estimate the parameters.

Earnings surprise ($\boldsymbol{EARNSURP_{i,t}}$) is the absolute value of the difference between firm *i*'s EPS at year *t* and EPS at year *t*-1, scaled by year-end *t* share price.

$$EARNSURP_{i,t} = \left| \frac{EPS_{i,t} - EPS_{i,t-1}}{PRICE_{i,t}} \right|$$

Earnings volatility ($\boldsymbol{LnEARNVOLI_{i,t}}$) is the natural logarithm of the standard deviation of annual EPS for firm *i* over the previous ten years ending at year *t. Note.* A five year moving average is calculated for DID.

Environmental and Social Performance ($\boldsymbol{ESP_{i,t}}$) is the mean environmental score and social score available from ASSET4. **Environmental score ($\boldsymbol{ENV_{i,t}}$)** relates to resource use, emissions and product innovation. **Social score ($\boldsymbol{SOC_{i,t}}$)** relates to employment quality, health and safety, training and development, diversity and opportunity, community, and product responsibility. *Note.* Alternative measures: (1) *ENV* and *SOC* tested separately, and (2) **integration vision and strategy ($\boldsymbol{IVS_{i,t}}$)**, which is reflective of integrated thinking as it measures the level of integration of economic, environmental and social dimensions into corporate strategy and day-to-day decision-making.

Financial slack ($\boldsymbol{SLACK_{i,t}}$) is measured as cash and cash equivalents scaled by total assets for firm *i* at year-end *t*.

Firm complexity ($COMPLEX_{i,t}$) is measured as the number of business segments firm *i* has at year-end *t*. It is a proxy for external complexity in terms of the diversity of a firm's external environment.

Firm size ($LnSIZE_{i,t}$) is the natural logarithm of market capitalisation for firm *i* at year-end *t*.

Forecast horizon ($HORIZON_{i,t}$) the median number of days between earnings announcement and forecast date for firm *i* in year *t.*

Gender diversity ($GENDIV_{i,t}$) is the percentage of female directors to total number of directors on the board of firm *i* at year-end *t.*

Governance score ($GOV_{i,t}$) is a score from ASSET4 that relates to board structure, compensation policy, board functions, shareholder rights, and vision and strategy. It is used as an alternative to other corporate governance measures.

GRI adoption ($GRI_{i,t}$) is an indicator variable coded 1 if firm *i* applied GRI standards prior to year *t*, and 0 otherwise.

International Financial Reporting Standards (IFRS) adoption ($IFRS_{i,t}$) is an indicator variable coded 1 if firm *i* applies IFRS in year *t*, and 0 otherwise. IFRS has resulted in improvements in accounting quality and therefore has an impact on internal reporting methods, implying a change to internal decision-making (Maniora, 2015).

Intangible assets ($INTASSET_{i,t}$) is intangible assets scaled by total assets for firm *i* at year-end *t.*

Integrated report ($IR_{i,t}$) is an indicator variable coded 1 if firm *i* issues an integrated report for the first time in year *t*, and 0 otherwise. *Note.* Corporate websites and Mergent Online were used to download corporate reports used in identifying the first year a firm issued an integrated report. The Framework's concepts were first introduced to practice in 2010 through the IIRC's pilot programme; hence, all available annual reports, annual reviews, management reports and sustainability reports from the year 2009 were obtained for each potential IR firm. The initiation year is identified as the year firm *i*'s report satisfies the following two criterion:

1. Acknowledge use of the IIRC Framework or involvement in the IIRC's pilot programme
2. Includes the eight content elements required of an integrated report: (1) Organisational overview and external environment, (2) Governance, (3) Business model, (4) Risks and opportunities, (5) Strategy and resource allocation, (6) Performance, (7) Outlook, and (8) Basis of preparation

Content analysis was performed on all reports using the key words from each criterion and then checked by manual screening. In situations where there were reports missing for a particular year, the firm is excluded if there was a possibility that the missing report may be the firm's first integrated report. The identification process was documented with detailed explanations to ensure consistency and reliability. Matched firms were checked using the same process to ensure a clean match.

Leverage ($\boldsymbol{LEV_{i,t}}$) is total debt scaled by total assets for firm *i* at year-end *t*. It is a measure of a firm's reliance on external financing.

Long-term growth ($\boldsymbol{LTG_{i,t}}$) is the consensus (median) long-term growth forecast for firm *i* at year-end *t*.

Loss reported ($\boldsymbol{LOSS_{i,t}}$) is an indicator variable coded 1 if firm *i* reports negative earnings for year *t*, and 0 otherwise.

Market listing ($\boldsymbol{LISTING_{i,t}}$) is the number of stock exchanges firm *i* is listed on at year-end *t*.

Market-to-book ($\boldsymbol{MTB_{i,t}}$) is the market capitalisation over book value of shareholders' equity for firm *i* at year-end *t*. It is a proxy for growth opportunities.

Media coverage ($\boldsymbol{MEDIA_{i,t}}$) consists of two main alternative media measures for firm *i* during year *t*: (1) **general media coverage ($\boldsymbol{LnMEDIA\_ALL_{i,t}}$)**, measured as the natural logarithm of the total number of articles released in year *t* with firm *i* mentioned in the headlines, and (2) **media sentiment ($\boldsymbol{MEDIA\_JFALL_{i,t}}$)**, based on the Janis-Fadner coefficient of imbalance (Janis & Fadner, 1943):

$$MEDIA\_JF_{i,t} = \frac{{f_{i,t}}^2 - fu_{i,t}}{t_{i,t}} \text{ if } f_{i,t} > u_{i,t} \text{ and } \frac{fu_{i,t} - {u_{i,t}}^2}{t_{i,t}} \text{ if } f_{i,t} < u_{i,t}$$

Where: $f_{i,t}$ = Number of favourable articles for firm *i* in year *t;* $u_{i,t}$ = Number of unfavourable articles for firm *i* in year *t;* $t_{i,t}$ = Total number of articles for firm *i* in year *t*, the sum of $f_{i,t}$ and $u_{i,t}$. The measure produces a score between ±1.0 for each firm. Positive media coverage yields a value closer to +1.0, while negative media coverage yields a value closer to -1.0. Zero implies neutral perceptions regarding the favourability of the media coverage. The Janis-Fadner coefficient also acts as a measure of social legitimacy.

Note. Media coverage measures were obtained by systematic searches using Factiva's intelligent indexing[12]. Factiva is the world's leading news source with access to thousands of premium news and information sources on more than 22 million public and information sources (Dow Jones, 2016). Factiva includes both printed media and web-based news, providing a complete coverage of news. The applied search settings returned articles related to firm *i* within the time period specified. Following Bushee, Core, Guay, and Hamm (2010), articles carried on press release wires were presumed firm-initiated and were excluded from the search output. All other sources with editorial control over the content were considered press-initiated and were included. This distinction ensures the visibility measure captures the impact of the media in creating and disseminating information, rather than the effects of a firm's own disclosure practices. It was presumed that a firm's own news release does not generate unwarranted institutional pressure. The applied settings excluded duplicates and republished news, and included articles of all available languages.

For general media coverage, searches were based on the total number of articles with firm *i*'s name in the headlines, this is similar to Bushee and Miller (2012) and Dawkins and Fraas (2011). For media sentiment, Factiva Expert Search provides pre-set functions that returns negative news mentions and positive news mentions about a firm. In addition to the main measures, CSR-related media coverage was examined. For CSR-related media, Factiva's subject categories were used to identify the number of articles tagged relating to socially responsible practices, labour and human resource issues, environmental issues, and issues affecting the community or society.

Alternative measures include: (1) **CSR-related news ($LnMEDIA\_CSR_{i,t}$)** and (2) Janis-Fadner coefficient for **CSR-related news ($MEDIA\_JFCSR_{i,t}$)**.

Ownership ($OWNERSHIP_{i,t}$) is the percentage of outstanding shares held by institutional holders for firm *i* at year-end *t. Note.* **Insider ownership ($OWNERSHIP\_INS_{i,t}$)** is used as

[12] Factiva is a common source used by prior studies in measuring media variables. For instance, it has been used to assess the relation between corporate visibility and communications; e.g., Bushee and Miller (2012), Pollach (2014) and Brammer and Pavelin (2006).

an alternative measure in additional analysis. It is the percentage of outstanding shares held by insiders for firm *i* at year-end *t.*

Post-treatment period ($POST_{i,t}$) is an indicator variable coded 1 if the firm observation relates to post-treatment periods (*t*+1 and after), and 0 for pre-treatment periods (*t*-1 and before).

Pre-release firm ($PRE_{i,t}$) is an indicator variable coded 1 if the firm observation relates to 2014 and before, and 0 otherwise.

Price volatility ($PRICEVOLI_{i,t}$) is the annualised volatility of firm *i*'s weekly share price over a historical three year period, ending at year-end *t*. It is calculated as the standard deviation of weekly price over a three-year period, multiplied by the square root of 52 weeks.

Research and development ($RESEARCH_{i,t}$) is the research and development expenditure scaled by total assets for firm *i* at year-end *t.*

Return on assets ($ROA_{i,t}$) is net income before extraordinary items scaled by the average total assets for firm *i* at year-end *t*. It is a measure of profitability.

Return volatility ($RETVOLI_{i,t}$) is the annualised standard deviation of daily share returns for firm *i* over year *t.*

Selling, general and administrative ($SGA_{i,t}$) is the selling, general and administrative expenditure scaled by total assets for firm *i* at year-end *t.*

Share price ($LnPRICE_{i,t}$) is the natural logarithm of the closing share price for firm *i* at year-end *t.*

Share price performance ($SPP_{i,t}$) is the abnormal share price performance of firm *i* compared to the performance of its respective market at year-end *t.* It is computed as the difference between the natural logarithm of firm *i*'s share price at year-end *t*, scaled by share price at year-end *t*-1, and natural logarithm of market return at year-end *t*, scaled by market return at year-end *t*-1:

$$SPP = In\left(\frac{P_{i,t}}{P_{i,t-1}}\right) - In\left(\frac{M_t}{M_{t-1}}\right)$$

Note. Market performance is based on the benchmark share market index noted in Datastream. Specifically: Argentina (MERVAL Index), Austria (ATX), Australia (ASX200), Belgium (BEL20), Hong Kong (Hang Seng Index), Brazil (Bovespa Index), Canada (TSX Composite), Switzerland (Swiss Market Index), Chile (IGPA Index), Colombia (COLCAP), Germany (DAX), Denmark (KFX), Spain (IBEX35), Finland (OMXH25), France (CAC40), United Kingdom (FTSE All-Share Index), Greece (Athens Stock Exchange General Index), India (S&P CNX 500), Italy (FTSE MIB), Japan (TOPIX), Kenya (NSE20), South Korea (KOSPI), Sri Lanka (ASPI), Mauritius (SEMDEX), Mexico (IPC), Netherlands (AEX Index), New Zealand (NZX50), Pakistan (KSE100), Poland (WIG), Portugal (PSI20), Russian Federation (RTS Index), Sweden (OMX Stockholm 30), Singapore (FTSE STI), Turkey (ISE National-100), Taiwan (TAIEX) and United States of America (S&P 500).

Subsidiaries ($LnSUBSIDIARY_{i,t}$) is the natural logarithm of the number of recorded subsidiaries of firm *i*. *Note.* The number is based on 2017 data as time-series data was not available. Number of **foreign subsidiaries ($LnSUBSIDIARY\_FOR_{i,t}$)** is used as an alternative measure.

Tobin's Q ($TOBIN_{i,t}$) is the sum of firm *i*'s market capital, preferred shares and total debt, scaled by total assets in year-end *t.* It is an alternative measure of firm value.

Year ($YEAR_{i,t}$) is the calendar year firm *i* released its first integrated report.

3.5.3 Industry-level Variables

Environmentally sensitive ($SENSITIVE_{i,t}$) is an indicator variable coded 1 if firm *i* operates in an environmentally sensitive industry, and 0 otherwise. Following Cahan et al. (2016), environmentally sensitive industry is defined as SIC codes: 800–899 (forestry), 1000–1099 (metal mining), 1200–1399 (coal mining, oil and gas extraction), 2600–2699 (paper and allied products), 2800–3099 (chemical and allied products, petroleum refining and related industries, rubber and miscellaneous plastics products), 3300– 3399 (primary metal industries), and 4900–4999 (electric gas and sanitary services).

Finance industry ($FINANCE_{i,t}$) is an indicator variable coded 1 if firm *i* operates in the finance industry, and 0 otherwise. Finance industry is defined as SIC codes 6000-6799.

Industry ($INDUSTRY_{i,t}$) the industry membership for firm *i* at year *t* based on two-digit SIC. *Note.* Alternative classifications include: (1) two-digit GICS, (2) four-digit GICS and (3) three-digit SIC.

Industry concentration ($CONCENTRATE_{i,t}$) is proxied by the Herfindahl–Hirschman index. It is calculated as the sum of squares of market shares for firm *i* in industry *j*, based on two-digit SIC. Market shares are in terms of sales*:*

$$HHI_j = \sum_{i=1}^{I} \left(\frac{s_{ij}}{s_j}\right)^2$$

Where: s_{ij} = sales of firm *i* in industry *j;* s_j = total sales of all firms in industry *j*; *I* = number of firms in industry *j*. *Note.* It is calculated for each year, industry and country. The values are then averaged over the past three years to reduce the influence of potential data errors on the measure. Industry concentration is a measure of industry competition and reflects proprietary costs (Dhaliwal et al., 2011). According to the United States Department of Justice (2015), an index below 0.10 is classified as 'unconcentrated', between 0.10 and 0.18 is 'moderately concentrated', and above 0.18 is 'highly concentrated'.

Litigation risk ($LITIGATION_{i,t}$) is an indicator variable coded 1 if firm *i* operates in a high-litigation industry, and 0 otherwise. Following Dhaliwal et al. (2011), high-litigation industries are defined as SIC codes: 2833–2836 (drugs), 3570–3577 (computer and office equipment), 3600–3674 (communications equipment, electronic components and accessories), 5200–5961 (retail trade including building materials, general merchandise, food stores, automotive, apparel), and 7370-7379 (computer programming, data processing, and other computer related).

Manufacturing firm ($MNU_{i,t}$) is an indicator variable coded 1 if firm *i* operates in the manufacturing industry, and 0 otherwise. Manufacturing firms are defined as SIC codes 2000-3999.

Utility industry ($UTILITY_{i,t}$) is an indicator variable coded 1 if firm *i* operates in the utility industry, and 0 otherwise. Utility industry is defined as SIC codes 4900-4949.

3.5.4 Country-level Variables

Country ($\boldsymbol{COUNTRY_{i,t}}$) is the country of headquarters for firm *i* at year *t.*

Economic development ($\boldsymbol{ECONDEV_{i,t}}$) is an ordinal variable with four levels that reflects income groups categorised based on gross national income (GNI) per capita in USD. "Low income" (1) are economies with GNI per capita lower or equal to 1,025 USD, "Lower middle income" (2) are those between 1,046 USD to 4,125 USD, "Upper middle income" (3) are those between 4,036 USD to 12,475 USD, and "High income" (4) are those greater than 12,475 USD. The income brackets are updated annually, the example provided is based on fiscal year 2017 figures.

Legal system ($\boldsymbol{LEGAL_{i,t}}$) is an indicator variable coded as 1 if firm *i* operates in a common law country, and 0 for civil law country. *Note.* Countries with mixed legal systems were classified into either common or civil law (e.g., Hong Kong is a mixed legal system of common law based on the English model and Chinese customary law, this is categorised as a common law country).

National culture ($\boldsymbol{CULTURE_{i,t}}$) is the cultural dimensions proposed by Hofstede et al. (2010). Hofstede's cultural dimensions describe the effects a society's culture has on the values of its members and how these values relate to behaviour. Each dimension is on a scale of 0 to 100:

1. **Power Distance Index (PDI) ($\boldsymbol{CULTURE\_PDI_{i,t}}$)** – the extent less powerful members of society expect and accept unequal distribution of power. A low score suggests members strive to equalise the distribution of power and demand justification for inequalities, while a high score suggests acceptance of a hierarchal order.
2. **Individualism versus Collectivism (IDV) ($\boldsymbol{CULTURE\_IDV_{i,t}}$)** - degree of interdependence amongst people in society. In contrast to collectivism, individualist societies tend to look after themselves and their family. A low score reflects collectivism and a high score reflects individualism.
3. **Masculinity versus Femininity (MAS) ($\boldsymbol{CULTURE\_MAS_{i,t}}$)** - masculinity refers to a society motivated by competition, personal success and achievements. In contrast, the values of caring for others and conforming to society are associated with femininity. A low score reflects femininity and a high score reflects masculinity.

4. **Uncertainty Avoidance Index (UAI) ($CULTURE\_UAI_{i,t}$)** - uncertainty avoidance refers to the extent members of society feel threatened by the future unknown and their actions to avoid uncertainties. A low score suggests societies rely on more informal and unstructured behaviours, while a high score suggests societies prefer formal rules and strong social norms.
5. **Long Term Orientation versus Short Term Normative Orientation (LTO) ($CULTURE\_LTO_{i,t}$)** - long-term orientation refers to how societies maintain a link to their past while handling the challenges of the present and future. Societies with long-term orientation prepare for the future by encouraging societal change, while those with short-term orientation prefer to hold on to traditions and norms. A low score reflects short-term orientation, while a high score reflects long-term orientation.
6. **Indulgence versus Restraint (IND) ($CULTURE\_IND_{i,t}$)** - the extent individuals control their impulses and desires. Indulgence refers to low control, while restraint refers to relatively strong control. A low score reflects restraint and a high score reflects indulgence.

Note. As Hofstede's cultural dimensions dataset is not periodically updated, the scores used are based on 2015 measurements. The cultural dimensions are highly correlated and principle component analysis was used for data reduction. Analysis with varimax rotation and promax rotation returned the same result. For the six cultural dimensions, the first component explained 0.4412 of the variance and has a cumulative explanation of 0.7873 with the second component. The components were labelled based on variables with loadings greater than 0.3. Component one includes **PDI, IDV and IVR ($CULTURE\_PII_{i,t}$)**. It has a negative loading for PDI (-0.604) and positive loadings for IDV (0.579) and IVR (0.451). Component two includes **MAS, UAI, and LTO ($CULTURE\_MUL_{i,t}$)**. It has positive loadings for MAS (0.705), UAI (0.468) and LTO (0.475). The Kaiser-Meyer-Olkin measure of sampling adequacy justifies the use of principle component analysis as the measure is above 0.69 for all variables.

National institution ($NATION_{i,t}$) is measured by seven proxies representing the quality of countries' institutions and its societal concerns. The measurements are as follows:

1. **Rule of law ($RULELAW_{i,t}$)** – extent to which agents have confidence in, and abide by, the rules of society. The rules relate to the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence. A higher value implies a strong law enforcement environment.

2. **Voice and accountability ($\boldsymbol{VOICE_{i,t}}$)** – extent to which a country's citizens are able to participate in selecting their government and the extent of freedom of expression, freedom of association and a free media.
3. **Government effectiveness ($\boldsymbol{GOVEFF_{i,t}}$)** – perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation and the credibility of the government's commitment to such policies.
4. **Regulatory quality ($\boldsymbol{REGQUAL_{i,t}}$)** – perceptions of the governments' ability to formulate and implement sound policies and regulations that permit and promote private sector development.
5. **Environmental performance index ($\boldsymbol{NATION\_EPI_{i,t}}$)** – measure of the environmental performance of a country.
6. **Freedom of press ($\boldsymbol{FREEPRESS_{i,t}}$)** – the degree of freedom journalists and the media have. A low score represents relatively greater freedom.
7. **Minority investor protection ($\boldsymbol{NATION\_INV_{i,t}}$)** – the strength of minority investor protection in a country. It measures the transparency of transactions, liability for directors and ability of shareholders to sue managers for misconduct. It is a measure from 0 to 10.

Note. For data collected from World Bank, the figures for 2016 and 2017 are based on 2015 data (*RULELAW, VOICE, GOVEFF, and REGQUAL*). The data available for *NATION_EPI* is not consistently updated. There are annual records for 2008 to 2010, but data for 2011 is based on 2012 figures, 2013 is based on 2014, and 2016 and 2017 is based on 2015 figures.

The World Bank measures and freedom of press are highly correlated and principle component analysis was used for data reduction. Analysis with varimax rotation and promax rotation returned the same result. For the five institutional measures, the first component explained 0.5749 of the variance and has a cumulative explanation of 0.9091 with the second component. The components were labelled based on variables with loadings greater than 0.3. Component one includes ***RULELAW, REGQUAL* and *GOVEFF* ($\boldsymbol{NATION\_RRG_{i,t}}$)**. It has positive loadings for *RULELAW* (0.568), *REGQUAL* (0.514) and *GOVEFF* (0.623). Component two includes ***VOICE* and *FREEPRESS* ($\boldsymbol{NATION\_VF_{i,t}}$)**. It has a negative loading for *VOICE* (-0.589) and positive loading for *FREEPRESS* (0.795). The Kaiser-Meyer-Olkin measure of sampling adequacy justifies the use of principle component analysis as the measure is above 0.59 for all variables.

3.6 Model Development

3.6.1 Determinants

3.6.1.1 Full Model

Equation 3.3 presents the full logistic regression model, reflective of the conceptual model developed in Chapter 2. Variables are as defined in Section 3.5. A number of variables crossover multiple constructs; for instance, firm size (*LnSIZE*) reflects resource and capabilities, business complexity, visibility and vulnerability to external pressures. Another example is subsidiaries (*LnSUBSIDIARY*), which represents exposure to social and regulatory pressure and organisational and legal complexity.

$$\begin{aligned}\log[\text{prob}(IR_{i,t})/(1-\text{prob}(IR_{i,t}))] &= \beta_0 + \beta_1 BOARDSKILL_{i,t-1} + \beta_2 OWNERSHIP_{i,t-1} + \beta_3 GRI_{i,t-1} \\ &+ \beta_4 ESP_{i,t-1} + \beta_5 MEDIA_{i,t-1} + \beta_6 BOARDCOM_{i,t-1} \\ &+ \beta_7 BOARDIND_{i,t-1} + \beta_8 BOARDMEET_{i,t-1} + \beta_9 BOARDSIZE_{i,t-1} \\ &+ \beta_{10} GENDIV_{i,t-1} + \beta_{11} IFRS_{i,t-1} + \beta_{12} COMPLEX_{i,t-1} \\ &+ \beta_{13} LnSUBSIDIARY_{i,t-1} + \beta_{14} LISTING_{i,t-1} + \beta_{15} EARNQLTY_{i,t-1} \\ &+ \beta_{16} LnSIZE_{i,t-1} + \beta_{17} LEV_{i,t-1} + \beta_{18} LOSS_{i,t-1} + \beta_{19} MTB_{i,t-1} \\ &+ \beta_{20} ROA_{i,t-1} + \beta_{21} SPP_{i,t-1} + \beta_{22} INTASSET_{i,t-1} \\ &+ \beta_{23} FOLLOW_{i,t-1} + \beta_{24} DISPERSION_{i,t-1} + \beta_{25} FERROR_{i,t-1} \\ &+ \beta_{26} BETA_{i,t-1} + \beta_{27} COE_{i,t-1} + \beta_{28} RETVOLI_{i,t-1} \\ &+ \beta_{29} EARNSURP_{i,t-1} + \beta_{30} AUDITOR_{i,t-1} + \beta_{31} SENSITIVE_{i,t-1} \\ &+ \beta_{32} CONCENTRATE_{i,t-1} + \beta_{33} LITIGATION_{i,t-1} + \beta_{34} LEGAL_{i,t-1} \\ &+ \beta_{35} ECONDEV_{i,t-1} + \beta_{36} CULTURE_{i,t-1} + \beta_{37} NATION_{i,t-1} \\ &+ \Sigma COUNTRY_{i,t-1} + \Sigma INDUSTRY_{i,t-1} + \Sigma YEAR_{i,t-1} + \varepsilon_{i,t-1} \end{aligned} \quad (3.3)$$

For firm-level characteristics, firm size (*LnSIZE*) measures a firm's level of resources and visibility. Reported loss (*LOSS*), market-to-book (*MTB*) and return on assets (*ROA*) represent economic performance and growth prospects. Share price performance (*SPP*) reflects market performance. Environmental and social performance (*ESP*) measures sustainability performance. Leverage (*LEV*) reflects financing structure. Analyst following (*FOLLOW*), analyst forecast dispersion (*DISPERSION*), analyst forecast error (*FERROR*), beta (*BETA*), cost of equity (*COE*), return volatility (*RETVOLI*) and earnings surprise (*EARNSURP*) represent the information environment and performance volatility, which may affect investor behaviour and investor demand for information. Board skills (*BOARDSKILL*), board committees (*BOARDCOM*), board independence (*BOARDIND*), board meetings (*BOARDMEET*), board size (*BOARDSIZE*) and gender diversity (*GENDIV*) are corporate governance characteristics that may affect voluntary disclosure. Institutional ownership (*OWNERSHIP*) reflects ownership structure. GRI adoption (*GRI*), IFRS adoption (*IFRS*) and earnings quality (*EARNQLTY*) relate to existing disclosure practices. Media (*MEDIA*) and

market listing (*LISTING*) reflect external pressure to comply with institutional rules or legitimacy concerns. Firm complexity (*COMPLEX*), subsidiaries (*LnSUBSIDIARY*) and intangible assets (*INTASSET*) are measures for organisational complexity. Auditor (*AUDITOR*) reflects an association with the IIRC. In addition, year dummies (*YEAR*) are included to control for time-specific effects.

For industry-level characteristics, environmentally sensitive (*SENSITIVE*), industry concentration (*CONCENTRATE*) and litigation risk (*LITIGATION*) capture industry characteristics. Industry concentration reflects market competition and is a crude proxy for proprietary costs. In addition, industry dummies (*INDUSTRY*) are included to control for industry-specific effects.

For country-level characteristics, legal system (*LEGAL*), economic development (*ECONDEV*), national culture (*CULTURE*) and national institution (*NATION*) reflect institutional norms and behaviour. Both separate and aggregated measures for national culture and national institution were tested. In addition, country dummies (*COUNTRY*) are included to control for country-specific effects.

A number of constructs in the conceptual model are not captured in Equation 3.3. First, organisational type is not applicable as the study focuses on listed firms. Second, foreign ownership potentially motivates integrated disclosures; however, data was not available for the study samples. Third, managerial behaviour and organisational culture are unobservable characteristics not directly captured in the equation. Similarly, intentions to improve internal systems, interdepartmental synergy or to deal with information overload are not measured. Fourth, the influence of networks and associations with other IR firms or the IIRC reflects exposure or institutional pressure to adopt IR, but were not assessed due to measurement difficulty. While Equation 3.3 is theoretically plausible, model building was necessary due to a limited sample size and for compliance with regression assumptions.

3.6.1.2 Initial Filter

Variables with a high proportion of missing data, near-zero variance, significant relationships with other independent variables or lack of statistical support for inclusion were removed. As excluded variables could theoretically be related to another variable in the model, an omitted variable problem is not likely to result from the model reduction process.

Variables excluded due to missing values include *COMPLEX*, which removed 170 observations. Instead of using the number of business segments as a measure of firm complexity, the number of subsidiaries and intangible assets were proxies for external complexity and internal complexity, respectively. *BOARDMEET* and *EARNQLTY* each

removed 78 observations. Although there are studies that support the relation between board meetings and voluntary disclosure (Viljoen et al., 2016), such relation was not found by prior IR studies (Fasan & Mio, 2016; Frías-Aceituno et al., 2013b). This study assesses other board characteristics, such as board skills and gender diversity, which are characteristics that influence board decision-making. *EARNQLTY* is a proxy for accounting information quality and managers' intention to manipulate disclosures. While not related to financial accounting, other variables such as *GRI* and *MEDIA* also relate to reporting practices and pressures to manipulate disclosures. Implied cost of equity calculations following Gebhardt et al. (2001), Claus and Thomas (2001) and Easton (2004) removed 172 observations; hence, cost of capital measures from Bloomberg were used instead.

AUDITOR was excluded due to near-zero variance. It has an extremely uneven split with other auditing firms accounting for 3.41% (7) of the sample, indicating that almost all sampled firms were audited by accounting firms that participates in the IIRC network. *ECONDEV* was excluded as the sample mainly comprise high income economies, with lower middle economies accounting for 0.93% (2) of the sample and upper middle economies accounting for 5.61% (12). *LOSS* was removed as 8.88% (19) of the firms reported a loss. While voluntary adoption of IFRS is a measure of disclosure quality, the frequency ratio for GAAP and IFRS is 98 to 116 with 87.76% (86/98) of the GAAP measures from Japan. Hence, *IFRS* was tested in additional analyses.

Variables strongly correlated, assessed using Pearson's correlation and Spearman's correlation, were tested as alternative measures in additional analyses. Spearman's correlation (untabulated) show a moderate to strong correlation between *BOARDIND* with *GENDIV* (r_s = 0.65, p<0.01) and *BOARDSKILL* (r_s = -0.79, p<0.01), and is used as alternative measure. Similarly, *GOV* is used as an alternative as it is moderately to strongly correlated to *BOARDIND* (r_s = 0.67, p<0.01) and *GENDIV* (r_s = 0.61, p<0.01), which is expected as *GOV* is a composite corporate governance measure. *NATION_VF* and *CULTURE_PII* are strongly correlated (r_s = -0.77, p<0.01); hence, only *NATION_VF* is included in the main model.

Chi-square test of independence was used to assess categorical variables. Results (untabulated) show a significant relation between *GRI* and audit committee ($\chi^2(1)$ = 5.001, p<0.05) and CSR committee ($\chi^2(1)$ = 22.75, p<0.01). There is significant relation between *BOARDCOM_CSR* and *BOARDCOM_AUD* (χ^2 (1) = 5.77, p<0.05). *GRI* and *BOARDCOM_CSR* are used as alternatives in the main analysis. There is a significant relation between *GRI* and *LEGAL* ($\chi^2(1)$ = 10.27, p<0.01). *LEGAL* was tested in additional analysis. As there is a significant relation between *SENSITIVE* and *LITIGATION* ($\chi^2(1)$ = 5.16, p<0.05), *LITIGATION* was used as an alternative.

3.6.1.3 Model Selection

The model selection process considered: (1) theoretical overlaps with other variables, (2) statistical significance, (3) changes to model fit, and (4) the proportion of missing values. The model selection analysis uses a sample that excludes all observations with missing values.

First, the effects of including and excluding fixed effect dummies (FE) were tested. While the non-IR group is matched on country, industry and year, two-digit SIC could be too broad to obtain a close match for industry activities. Further, industry and country variables could potentially control for confounding effects. Introduction of FE can capture any remaining variance in the dependent variable attributable to country, industry and year classifications. Regression results (untabulated) show the dummies do not account for any model variance, but their inclusion changes the estimates of other variables and improve the predictive power of the model. Industry and country dummies influence results while year dummies do not.

Tests on alternative base categories show the significant industry dummies mapped back to *SENSITIVE*. Crosstabs show 100% of firms in industries that have a significantly positive relationship relative to the base category were not operating in environmentally sensitive industries and 93.42% of firms in industries that have a significantly negative relationship relative to the base category were in environmentally sensitive industries. This pattern suggests the industry dummies reflects the same information in *SENSITIVE,* but allows for more variance in the data compared to a binary variable. Regression results (untabulated) using indicators for the utility industry (*UTILITY*) and finance industry (*FINANCE*) show these two indicators as non-significant and the results remain the same as without their inclusion.

A problem with modelling on FE is overfitting, as the ratio of observations per predictor is approximately three across the models tested. Estimates from overfitted models may result from fitting noise instead of signal, which affects the accuracy and precision of estimates. Hence, the main analysis tests specific industry and country characteristics, while FE is tested in additional analyses. Moreover, additional analyses on alternative matches test for overfitting as overfitting is evident if a model performs well on the training dataset but generalise poorly to new data.

Table 3.9 reports results following step-wise deletion of analyst and market characteristics and variables pertaining to national institution and culture. The significance level is set at $p<0.10$ for exploratory model building. Inclusion of FE was also tested to identify any possible relationships. Overall, *RETVOLI*, *WACC, COE, FERROR, FOLLOW, LISTING*, *NATION_EPI, NATION_INV* and *NATION_RRG* are non-significant across the

models and their removal does not noticeably influence the estimates of other variables or the predictive power of the model. Those variables did not improve model fit and resulted in smaller Akaike's information criterion (AIC)[13] when excluded. Removal of each variable showed a decrease in AIC between -0.3 to -2.0, suggesting no substantial changes in model fit after exclusion. Notably, a number of variables, such as *BOARDSKILL*, *OWNERSHIP* and *MTB*, switch from significant to non-significant across the models; however, the direction of the effect remained consistent.

Table 3.10 reports results following further reduction of the model, which better coincide with analyses on a small sample size. Variables removed in the model selection process are tested in additional analyses. Equation 3.4 and Equation 3.5 are the main models tested in Chapter 4. The models include the key variables of interest and exclude variables that do not statistically add to model fit. While excluded variables may be confounders, exclusion of those variables does not have much impact on the other estimates. Further, independent *t*-tests show no significant difference for firm size and performance measures between IR firms and matched non-IR firms, suggesting the match is adequate in controlling for those characteristics (see Chapter 4, Table 4.1).

$$\begin{aligned}\log[\text{prob}(IR_{i,t})/(1-\text{prob}(IR_{i,t}))] &= \beta_0 + \beta_1 ESP_{i,t-1} + \beta_2 GRI_{i,t-1} + \beta_3 OWNERSHIP_{i,t-1} \\ &+ \beta_4 MEDIA\_JFALL_{i,t-1} + \beta_5 BOARDSKILL_{i,t-1} \\ &+ \beta_6 BOARDSIZE_{i,t-1} + \beta_7 GENDIV_{i,t-1} + \beta_8 LEV_{i,t-1} \\ &+ \beta_9 LnSUBSIDIARY_{i,t-1} + \beta_{10} INTASSET_{i,t-1} \\ &+ \beta_{11} CONCENTRATE_{i,t-1} + \beta_{12} SENSITIVE_{i,t-1} \\ &+ \beta_{13} CULTURE\_MUL_{i,t-1} + \beta_{14} NATION\_VF_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (3.4)$$

$$\begin{aligned}\log[\text{prob}(IR_{i,t})/(1-\text{prob}(IR_{i,t}))] &= \beta_0 + \beta_1 BOARDCOM\_CSR_{i,t-1} + \beta_2 OWNERSHIP_{i,t-1} \\ &+ \beta_3 MEDIA\_JFALL_{i,t-1} + \beta_4 BOARDSKILL_{i,t-1} \\ &+ \beta_5 BOARDSIZE_{i,t-1} + \beta_6 GENDIV_{i,t-1} + \beta_7 LEV_{i,t-1} \\ &+ \beta_8 LnSUBSIDIARY_{i,t-1} + \beta_9 INTASSET_{i,t-1} \\ &+ \beta_{10} CONCENTRATE_{i,t-1} + \beta_{11} SENSITIVE_{i,t-1} \\ &+ \beta_{12} CULTURE\_MUL_{i,t-1} + \beta_{13} NATION\_VF_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (3.5)$$

Subscripts *i* and *t* denote firm and year, respectively. As there is a moderate to strong relationship between *BOARDCOM_CSR* and *ESP* (r_p = 0.63, p<0.01) and a relationship

[13] A lower AIC suggests the nested model is a better fit compared to the base model. A general rule of thumb for assessing model changes is that a 0-2 increase in AIC suggests there is substantial support for the base model, 4-7 considerably less support, and greater than 10 suggests essentially no support (Burnham & Anderson, 2002).

between *BOARDCOM_CSR* and *GRI* ($\chi^2(1)$ = 22.75, p<0.01), these variables are tested separately.

Table 3.11, Panel A reports the VIFs. The highest VIF for Equation 3.4 is for *CULTURE_MUL* (2.17) and the mean VIF is 1.46. This is similar for Equation 3.5. These tests show multicollinearity is not a major concern for the study. Modelling on FE inflate the VIFs (untabulated). The VIF levels are not ideal but are acceptable. The highest VIF is for *GENDIV* (3.80) and the mean VIF is 1.98. Hosmer and Lemeshow's goodness-of-fit test yielded large *p*-values, indicating the model fits the data well (p=0.58 for Equation 3.4 and p=0.78 for Equation 3.5).

3.6.2 Consequences: Information Environment

Equation 3.6 presents the full regression model for the information environment analysis. Variables are as defined in Section 3.5. The model follows Behn, Choi, and Kang (2008), Lang et al. (2003), Hope (2003) and Dhaliwal et al. (2012):

$$\begin{aligned} INFORMATION_{i,t+1} &= \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 IFRS_{i,t} + \beta_4 EARNQLTY_{i,t} \\ &+ \beta_5 LnSIZE_{i,t} + \beta_6 EARNSURP_{i,t} + \beta_7 LOSS_{i,t} + \beta_8 LnEARNVOLI_{i,t} \\ &+ \beta_9 EPS_{i,t} + \beta_{10} BIG4_{i,t} + \beta_{11} LISTING_{i,t} + \beta_{12} FOLLOW_{i,t} \\ &+ \beta_{13} HORIZON_{i,t} + \beta_{14} NATION_{i,t} + \beta_{15} CULTURE_{i,t} + \beta_{16} LEGAL_{i,t} \\ &+ \Sigma COUNTRY_{i,t} + \Sigma INDUSTRY_{i,t} + \Sigma YEAR_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (3.6)$$

The information environment (*INFORMATION*) is proxied by two analyst variables: analyst forecast accuracy (*FERROR*) and analyst forecast dispersion (*DISPERSION*).

Integrated report (*IR*) is the main variable of interest. GRI adoption (*GRI*), IFRS adoption (*IFRS*) and earnings quality (*EARNQLTY*) relates to disclosure policies and reporting quality. *GRI* reflects non-financial disclosure policies and practices. It controls for effects of sustainability reporting on the information environment. *IFRS* reflects better accounting quality as mandatory IFRS adoption has been associated with improvement in analyst forecast accuracy. *EARNQLTY* measures financial transparency, where a high magnitude of accruals could compel investors to rely on other information sources to assess financial performance. Firm size (*LnSIZE*) proxies for a firm's general information environment and various correlated factors. Prior studies have applied different measures for earnings volatility and forecast difficulty, for instance *EARNSURP, EPS* and *EARNVOLI*, as earnings level and larger changes in earnings have been associated with less accurate forecasts. Loss reported (*LOSS*) also relates to earnings volatility and is used as a crude measure of financial distress.

Big Four auditors (*BIG4*) reflects audit quality. Prestigious public accounting firms have greater incentives to provide high-quality audits to protect their reputation capital, improving the quality of accounting earnings and resulting in more accurate analyst forecasts. Market listing (*LISTING*) reflects exposure to different disclosure requirements and implicit pressure from the market and investors to provide information. Analyst following (*FOLLOW*) indicates competition among analysts. Greater competition resulting from higher following provides analysts with greater incentives to enhance forecast accuracy. Forecast horizon (*HORIZON*) reflects the amount of information available to analysts and the accuracy of forecasts. A forecast announced closer to the actual earnings announcement is expected to be more accurate than one announced in an earlier period. National level measures pertaining to institution (*NATION*), culture (*CULTURE*) and legal systems (*LEGAL*) could influence corporate transparency, information dissemination and the resulting information environment.

Variables with a high proportion of missing data, near-zero variance or significant relationships with other independent variables were removed. *EARNQLTY* was excluded as it removes 138 observations due to missing values. Exclusion of *EARNQLTY* is not concerning as theoretically earnings volitility is a similar measure for accrual quality and earnings smoothness (Francis, LaFond, Per, & Schipper, 2004). *IFRS* and *BIG4* are excluded due to near-zero variance. The frequency ratio for GAAP and IFRS is 103 to 133, with 89.32% (92/103) of firms that applied GAAP concentrated in Japan. Almost all sampled firms were audited by one of the Big Four auditors, with other auditing firms accounting for 5.51% (13) of the sample.

Variables strongly correlated with another are used as alternative measures in additional analyses. Correlation tests (untabulated) show a strong correlation between *LnEARNVOLI* and *LnEPS* for Pearson's correlation (r_p = 0.80, p<0.01), while Spearman's correlation show a moderate correlation (r_s = 0.56, p<0.01). These measures are tested as alternatives as they both relate to earnings predictability and forecast difficulty. Chi-square test of independence (untabulated) show a significant relation between *IR* and *GRI* ($\chi^2(1)$ = 18.59, p<0.01). *GRI* is included to parse out effects related to sustainability reporting. *LEGAL*, *CULTURE* and *NATION* are measures of the same construct and are used as alternatives.

Interaction tests (untabulated) show no significant interactions between *IR* or *GRI* with country-level measures. The resulting model is used to test the relation between IR and the information environment:

$$INFORMATION_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 SqEARNSURP_{i,t} + \beta_5 LOSS_{i,t} + \beta_6 LnEARNVOLI_{i,t} + \beta_7 LISTING_{i,t} + \beta_8 FOLLOW_{i,t} + \beta_9 HORIZON_{i,t} + \beta_{10} NATION\_VF_{i,t} + \beta_{11} NATION\_RRG_{i,t} + \varepsilon_{i,t} \quad (3.7)$$

Multicollinearity is not a major problem as indicated by correlation analysis and VIFs (Table 3.11, Panel B). The model is tested substituting country-level variables with country, industry and year dummies.

3.6.3 Consequences: Cost of Equity

Equation 3.8 presents the full regression model for the cost of equity analysis. Variables are as defined in Section 3.5. The model follows Dhaliwal et al. (2011), Khurana and Raman (2004), Richardson and Welker (2001) and Gebhardt et al. (2001):

$$COE_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 LnMTB_{i,t} + \beta_5 LEV_{i,t} + \beta_6 BETA_{i,t} + \beta_7 LTG_{i,t} + \beta_8 LnDISPERSION_{i,t} + \beta_9 FOLLOW_{i,t} + \beta_{10} BIG4_{i,t} + \varepsilon_{i,t} \quad (3.8)$$

The cost of equity (*COE*) is measured as the cost of equity capital estimated by Bloomberg. The implied cost of equity models by Claus and Thomas (2001), Gebhardt et al. (2001) and Easton (2004) were not used due to problems with missing values.

Integrated report (*IR*) is the main variable of interest. GRI adoption (*GRI*) reflects non-financial information provided to investors for investment appraisal. Firm size (*LnSIZE*), the market-to-book ratio (*LnMTB*) and leverage (*LEV*) are measures generally associated with risk. Beta (*BETA*) measures systematic risk, which, according to the Capital Asset Pricing Model, is positively correlated with cost of equity capital. Long-term growth (*LTG*) is argued to be positively related to growth and risk as earnings derived from growth opportunities are more uncertain than normal earnings. Analyst forecast dispersion (*DISPERSION*) reflects the information environment of a firm. Lower dispersion suggests lower information asymmetry. Analyst following (*FOLLOW*) reflects the information environment and usefulness of firm disclosures as a source of information. Big Four auditor (*BIG4*) reflects credibility of earnings. The market could perceive clients of the Big Four to have more credible earnings than those of non-Big Four clients; thereby, firms audited by the Big Four should receive a break in their cost of capital.

BIG4 was removed due to near-zero variance. Big Four auditors audited almost all sampled firms, with other auditing firms accounting for 4.67% (10) of the sample. The resulting model is used to test the relation between IR and cost of equity:

$$COE_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 LnMTB_{i,t} + \beta_5 LEV_{i,t} + \beta_6 BETA_{i,t} + \beta_7 LTG_{i,t} + \beta_8 LnDISPERSION_{i,t} + \beta_9 FOLLOW_{i,t} + \varepsilon_{i,t} \quad (3.9)$$

Multicollinearity is not a major problem as indicated by correlation analysis and VIFs (Table 3.11, Panel C). The model is also tested with country, industry and year dummies.

3.6.4 Consequences: Firm Value

Three models are tested for the firm value analysis. Variables are as defined in Section 3.5. The first two models modifies the Ohlson (1995) model. A number of studies have adopted the Ohlson (1995) model to investigate the determinants of firm value (see e.g., Hassel, Nilsson, & Nyquist, 2005; Trueman, Wong, & Zhang, 2000). The Ohlson model has three assumptions: (1) market value is determined by the present value of expected dividends, (2) the clean surplus relation is satisfied, and (3) a linear model frames the stochastic time-series behaviour of abnormal earnings. The Ohlson model defines the market value of equity as a function of book value, accounting earnings and other non-financial information. Thereby:

$$LnPRICE_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnBVPS_{i,t} + \beta_4 ABEARN_{i,t} + \varepsilon_{i,t} \quad (3.10)$$

Share price (*LnPRICE*) is the measure used for firm value. The independent variables mirrors the Ohlson (1995) model, including book value (*LnBVPS*) and accounting earnings (*ABEARN*). Integrated report (*IR*) and GRI adoption (*GRI*) are included as proxies for other non-financial information. *GRI* is included to disentangle effects related to sustainability reporting.

The second model modifies the Ohlson (1995) model according to Hassel et al. (2005). Instead of estimating a required rate of return to calculate abnormal earnings, the model is restated in terms of cum-dividend market value (*LnMVCDA*), opening book value, earnings and other information. *IR* and *GRI* are assumed independent of firm size, while other components are deflated by book value to control for size differences. The resulting model is as follows:

$$LnMVCDA_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 BVINV_{i,t} + \beta_4 NIBV_{i,t} + \varepsilon_{i,t} \quad (3.11)$$

The third model uses Tobin's Q to measure firm value. Equation 3.12 presents the full regression model for the Tobin's Q analysis. The model follows Hermalin and Weisbach (1991) and Lee and Yeo (2016):

$$TOBIN_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 ROA_{i,t} + \beta_5 LEV_{i,t} + \beta_6 INTASSET_{i,t} + \beta_7 RESEARCH_{i,t} + \beta_8 SGA_{i,t} + \beta_9 COMPLEX_{i,t} + \beta_{10} BOARDIND_{i,t} + \beta_{11} BOARDSIZE_{i,t} + \varepsilon_{i,t} \quad (3.12)$$

Tobin's Q (*TOBIN*) is a measure of market valuation, represented by the ratio of the market value of a firm's assets divided by its replacement cost. Integrated report (*IR*) is the main variable of interest. GRI adoption (*GRI*) is included to parse out effects related to sustainability reporting. Lee and Yeo (2016) used business complexity (*COMPLEX*), firm size (*LnSIZE*) and intangible assets (*INTASSET*) as measures of organisational complexity. Complex organisations face higher information processing costs, where IR could improve a firm's information environment by improving disclosure quality. Return on assets (*ROA*) controls for profitability, and leverage (*LEV*) controls for debt reliance and investment risk. Board independence (*BOARDIND*) and board size (*BOARDSIZE*) influence monitoring effectiveness and management efficiency, which is associated with higher firm value. Hermalin and Weisbach (1991) found research and development expenditure (*RESEARCH*) and advertising expenditure raise Tobin's Q. Advertising expenditure is substituted by selling, general and administrative expenditure (*SGA*) due to data limitations.

Variables with a high proportion of missing data were removed. *COMPLEX* removed 260 observations, *RESEARCH* removed 202 observations and *SGA* removed 92 observations. The resulting model is used to test the relation between IR and Tobin's Q:

$$TOBIN_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 ROA_{i,t} + \beta_5 LEV_{i,t} + \beta_6 INTASSET_{i,t} + \beta_7 BOARDIND_{i,t} + \beta_8 BOARDSIZE_{i,t} + \varepsilon_{i,t} \quad (3.13)$$

Multicollinearity is not a major problem as indicated by correlation analysis and VIFs (Table 3.11, Panel D and Panel E). The modified Ohlson models and Tobin's Q model are also tested with country, industry and year dummies.

3.6.5 Consequences: Environmental and Social Performance

Equation 3.14 presents the full regression model for the environmental and social performance analysis. Variables are as defined in Section 3.5. The model follows Maniora (2015) and de Villiers, Naiker, and van Staden (2011):

$$
\begin{aligned}
ESP_{i,t+1} = {} & \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 IFRS_{i,t} + \beta_4 LnSIZE_{i,t} \\
& + \beta_5 LnMTB_{i,t} + \beta_6 ROA_{i,t} + \beta_7 LEV_{i,t} + \beta_8 SLACK_{i,t} \\
& + \beta_9 BETA_{i,t} + \beta_{10} FOLLOW_{i,t} + \beta_{11} LISTING_{i,t} \\
& + \beta_{12} BOARDIND_{i,t} + \beta_{13} BOARDSIZE_{i,t} + \beta_{14} BIG4_{i,t} \\
& + \beta_{15} CULTURE\_MUL_{i,t} + \beta_{16} NATION\_VF_{i,t} \\
& + \Sigma COUNTRY_{i,t} + \Sigma INDUSTRY_{i,t} + \Sigma YEAR_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{3.14}
$$

Environmental and social performance (*ESP*) is provided by ASSET4.

Integrated report (*IR*) is the main variable of interest. GRI adoption (*GRI*) and IFRS adoption (*IFRS*) relates to sustainability systems and accounting quality, respectively. Firm size (*LnSIZE*) controls for size effects, market-to-book (*LnMTB*) controls for effects from growth opportunity effects and return on assets (*ROA*) controls for effects relating to profitability. Leverage (*LEV*) and financial slack (*SLACK*) controls for effects related to debt financing and available cash flow. Beta (*BETA*) measures systematic risk and reflects economic performance stability. Analyst following (*FOLLOW*) reflects information demand and subsequent changes in firm performance. Market listing (*LISTING*) reflects exposure to disclosure requirements. Board independence (*BOARDIND*) and board size (*BOARDSIZE*) have been found to influence a firm's attitude towards CSR. Big Four auditors (*BIG4*) reflects monitoring effects and access to specialist knowledge for implementation of new internal processes. Country-level variables that reflect stakeholder attitudes and demand for CSR activities are captured by national culture (*CULTURE_MUL*) and national voice and freedom (*NATION_VF*).

Variables with near-zero variance or significant relationships with other independent variables were removed. *IFRS* and *BIG4* were excluded due to near-zero variance. The frequency ratio for GAAP and IFRS is 69 to 109, with 86.96% (60/69) of firms that applied GAAP concentrated in Japan. Almost all sampled firms were audited by one of the Big Four auditors, with other auditing firms accounting for 3.37% (6) of the sample. The resulting model is used to test the relation between IR and environmental and social performance:

$$
\begin{aligned}
ESP_{i,t+1} = {} & \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 LnMTB_{i,t} + \beta_5 ROA_{i,t} \\
& + \beta_6 LEV_{i,t} + \beta_7 SLACK_{i,t} + \beta_8 BETA_{i,t} + \beta_9 FOLLOW_{i,t} \\
& + \beta_{10} LISTING_{i,t} + \beta_{11} BOARDIND_{i,t} + \beta_{12} BOARDSIZE_{i,t} \\
& + \beta_{13} CULTURE\_MUL_{i,t} + \beta_{14} NATION\_VF_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{3.15}
$$

Multicollinearity is not a major problem as indicated by correlation analysis and VIFs (Table 3.11, Panel F). The model is tested substituting country-level variables with country, industry and year dummies.

3.7 Summary

This chapter provides a detailed overview of the research design, samples, variables tested and model development process. The study investigates the determinants and consequences associated with voluntary adoption of the IIRC Framework and initiation of integrated reports. The study is careful in addressing potential endogeneity issues. By focusing on initiation year and applying lead-lag models, the study mitigates issues with reverse causality and simultaneity. A matching technique is used to address self-selection bias. In addition to the use of matching, the consequences analysis assess variables in level and change specifications for MLR and TEM estimates, and adopt a DID design.

A comprehensive search for potential IR firms indicates that IR initiation concentrate in the first two years following the release of the Framework. IR firms are largely represented by the manufacturing, financing, and transportation and utilities industries. Further, Japan has the highest number of firms voluntarily adopting IR in relation to other countries. These characteristics are reflected in each of the sample analysed. Details for the data sources and variables tested are presented, which can also be found in Appendix A. The prescribed research design and models developed are applied in the following two chapters.

Table 3.1: Sample elimination process

Sample Selection Criteria	Number
Organisations identified from the IIRC website	379
Organisations identified from the GRI database	1171
Organisations identified from Google	12
Potential IR firms	1562
Less: Non-publicly listed organisations	(627)
Less: Firms listed on the JSE	(266)
Less: Firms that do not satisfy the IR firm criteria	(427)
IR firms based on the main sources	242
Add: IR firms identified when matching	62
Total IR firms	304

Table 3.1 reports the IR firm identification and elimination process. Duplicates were removed during calculations; for instance, 'organisations identified from the GRI database' excludes overlaps with the IIRC website.

Table 3.2: Characteristics of identified IR firms

Panel A: Initiation year distribution

Year	2010	2011	2012	2013	2014	2015	2016	2017	Total
Frequency	3	11	29	55	89	84	32	1	304
Percent	0.99	3.62	9.54	18.09	29.28	27.63	10.53	0.33	100

Panel B: Industry distribution

SIC Industry Division	Frequency	Percent
0100-0999 Agriculture, Forestry and Fishing	1	0.33
1000-1499 Mining	4	1.32
1500-1799 Construction	13	4.28
2000-3999 Manufacturing	115	37.83
4000-4999 Transportation, Communications, Electric, Gas and Sanitary service	52	17.11
5000-5199 Wholesale Trade	12	3.95
5200-5999 Retail Trade	9	2.96
6000-6799 Finance, Insurance and Real Estate	69	22.70
7000-8999 Services	24	7.89
9900-9999 Non-classifiable	5	1.64
Total	304	100

Panel C: Country distribution

Country	Frequency	Percent	Country	Frequency	Percent
Argentina	1	0.33	Mauritius	1	0.33
Australia	2	0.66	Mexico	2	0.66
Austria	1	0.33	Netherlands	20	6.58
Belgium	3	0.99	New Zealand	2	0.66
Brazil	20	6.58	Pakistan	2	0.66
Canada	2	0.66	Poland	4	1.32
Chile	4	1.32	Portugal	1	0.33
China	1	0.33	Russian Federation	4	1.32
Colombia	8	2.63	Singapore	5	1.64
Costa Rica	1	0.33	South Korea	19	6.25
Denmark	1	0.33	Spain	21	6.91
Finland	6	1.97	Sri Lanka	26	8.55
France	8	2.63	Sweden	4	1.32
Germany	3	0.99	Switzerland	4	1.32
Greece	1	0.33	Taiwan	2	0.66
Hong Kong	5	1.64	Turkey	1	0.33
India	2	0.66	United Kingdom	9	2.96
Italy	10	3.29	United States	9	2.96
Japan	88	28.95	Total	304	100
Kenya	1	0.33			

Table 3.2 reports the year, industry and country distributions of all identified IR firms. Panel A reports the initiation year distribution. Panel B reports the industry distribution according to SIC industry divisions. Panel C reports the country distribution.

Table 3.3: Determinants sample composition

Panel A: Sample of IR firms

	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	107	9.12	9.02	1.09	193	7.81	8.09	2.02	<0.001	<0.001
ROA_t	107	3.59	2.80	5.12	192	3.28	2.86	4.85	0.613	0.982
LEV_t	107	0.27	0.25	0.16	192	0.27	0.26	0.18	0.977	0.988
ESP_t	107	82.55	88.38	16.65	108	82.26	88.26	15.95	0.897	0.894
$BOARDSKILL_t$	107	52.38	48.45	30.64	103	39.32	29.77	29.68	0.002	0.001

Panel B: Sample by initiation year

Year	2011	2012	2013	2014	2015	2016	2017	Total
Frequency	8	22	34	62	54	32	2	214
Percent	3.74	10.28	15.89	28.97	25.23	14.95	0.93	100

Panel C: Sample by industry

SIC Industry Division	Frequency	Percent
1000-1499 Mining	2	0.93
1500-1799 Construction	10	4.67
2000-3999 Manufacturing	100	46.73
4000-4999 Transportation, Communications, Electric, Gas and Sanitary service	38	17.76
5000-5199 Wholesale Trade	8	3.74
5200-5999 Retail Trade	8	3.74
6000-6799 Finance, Insurance and Real Estate	40	18.69
7000-8999 Services	8	3.74
Total	214	100

Panel D: Sample by country

Country	Frequency	Percent	Country	Frequency	Percent
Australia	4	1.87	Japan	100	46.73
Belgium	4	1.87	Netherland	6	2.80
Brazil	10	4.67	Portugal	2	0.93
Canada	2	0.93	Russian Federation	2	0.93
Chile	2	0.93	Singapore	4	1.87
Denmark	2	0.93	South Korea	14	6.54
Finland	4	1.87	Spain	8	3.74
France	4	1.87	Sweden	4	1.87
Germany	2	0.93	Turkey	2	0.93
Hong Kong	4	1.87	United Kingdom	12	5.61
India	2	0.93	United States	12	5.61
Italy	8	3.74	Total	214	100

Table 3.3 reports characteristics of the determinants sample. Panel A compares IR firms included in and excluded from the analysis. It presents descriptive statistics for a sample of variables and test of differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). Variables are as defined in Section 3.5. Panel B reports the initiation year distribution. Panel C reports the industry distribution according to SIC industry divisions. Panel D reports the country distribution.

Table 3.4: Information environment sample composition

Panel A: IR firms in sample

MLR	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	118	8.89	8.92	1.28	181	7.87	8.21	2.05	<0.001	<0.001
ROA_t	118	3.69	3.32	4.85	179	3.23	2.69	5.02	0.440	0.721
LEV_t	118	0.28	0.25	0.17	179	0.26	0.26	0.17	0.514	0.556
$FERROR_t$	118	407.89	3.70	2685.36	128	146.89	0.58	715.46	0.290	0.004
$FOLLOW_t$	118	16.81	15.17	9.13	131	13.16	12.67	8.74	0.001	0.003
TEM	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	95	9.21	9.13	1.08	204	7.83	8.10	1.98	<0.001	<0.001
ROA_t	95	3.86	3.45	5.20	202	3.21	2.72	4.82	0.290	0.581
LEV_t	95	0.27	0.25	0.16	202	0.27	0.26	0.18	0.787	0.669
$FERROR_t$	95	499.48	2.03	2988.48	151	129.02	1.32	660.20	0.143	0.167
$FOLLOW_t$	95	18.71	16.58	8.78	154	12.53	11.58	8.50	<0.001	<0.001

Panel B: Sample by initiation year

Year	2011	2012	2013	2014	2015	2016	Total
MLR (no.)	4	24	42	64	78	24	236
MLR (%)	1.69	10.17	17.80	27.12	33.05	10.17	100
TEM (no.)	4	22	36	52	62	14	190
TEM (%)	2.11	11.58	18.95	27.37	32.63	7.37	100

Panel C: Sample by industry

	MLR		TEM	
SIC Industry Division	No.	%	No.	%
1000-1499 Mining	4	1.69	2	1.05
1500-1799 Construction	10	4.24	8	4.21
2000-3999 Manufacturing	110	46.61	88	46.32
4000-4999 Transportation, Communications, Electric, Gas and Sanitary service	44	18.64	40	21.05
5000-5199 Wholesale Trade	8	3.39	8	4.21
5200-5999 Retail Trade	10	4.24	8	4.21
6000-6799 Finance, Insurance and Real Estate	32	13.56	30	15.79
7000-8999 Services	16	6.78	4	2.11
9900-9999 Nonclassifiable	2	0.85	2	1.05
Total	236	100	2	1.05

Panel D: Sample by country

	MLR		TEM			MLR		TEM	
Country	No.	%	No.	%	Country	No.	%	No.	%
Australia	2	0.85	2	1.05	Netherlands	8	3.39	6	3.16
Austria	2	0.85	-	-	Poland	2	0.85	-	-
Belgium	2	0.85	2	1.05	Portugal	2	0.85	2	1.05
Brazil	10	4.24	10	5.26	Russian Federation	4	1.69	4	2.11
Canada	2	0.85	2	1.05	Singapore	4	1.69	4	2.11
Chile	2	0.85	2	1.05	South Korea	16	6.78	14	7.37
Denmark	2	0.85	2	1.05	Spain	16	6.78	12	6.32
Finland	4	1.69	4	2.11	Sweden	2	0.85	2	1.05
France	8	3.39	8	4.21	Switzerland	4	1.69	2	1.05
Germany	4	1.69	4	2.11	Taiwan	2	0.85	2	1.05
Hong Kong	4	1.69	4	2.11	Turkey	2	0.85	2	1.05
India	2	0.85	2	1.05	United Kingdom	10	4.24	10	5.26
Italy	4	1.69	4	2.11	United States	8	3.39	8	4.21
Japan	106	44.92	76	40.00	Total	236	100	190	100
Mexico	2	0.85	-	-					

Table 3.4 reports characteristics of the information environment sample. Panel A compares IR firms included in and excluded from the analysis. It presents descriptive statistics for a sample of variables and test of differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). Variables are as defined in Section 3.5. Panel B reports the initiation year distribution. Panel C reports the industry distribution according to SIC industry divisions. Panel D reports the country distribution.

Table 3.5: Cost of equity sample composition

Panel A: IR firms in sample

MLR	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	107	9.18	9.12	1.09	193	7.77	8.07	2.00	<0.001	<0.001
ROA_t	107	4.01	3.57	5.34	191	3.06	2.71	4.69	0.112	0.466
LEV_t	107	0.27	0.25	0.17	191	0.26	0.26	0.17	0.631	0.695
COE_t	107	11.02	10.71	3.00	142	9.81	9.55	3.62	0.005	0.006
$FOLLOW_t$	107	18.34	16.58	8.50	143	12.26	11.08	8.66	<0.001	<0.001
TEM	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	87	9.32	9.22	1.05	213	7.85	8.10	1.94	<0.001	<0.001
ROA_t	87	4.02	3.57	5.54	211	3.15	2.71	4.67	0.169	0.504
LEV_t	87	0.26	0.24	0.16	211	0.27	0.26	0.18	0.533	0.579
COE_t	87	10.92	10.62	2.77	162	9.85	9.55	3.51	0.015	0.013
$FOLLOW_t$	87	19.22	16.73	8.49	162	12.56	11.58	8.56	<0.001	<0.001

Panel B: Sample by initiation year

Year	2011	2012	2013	2014	2015	2016	Total
MLR (no.)	8	18	38	60	60	30	214
MLR (%)	3.74	8.41	17.76	28.04	28.04	14.02	100
TEM (no.)	8	14	30	52	54	16	174
TEM (%)	4.60	8.05	17.24	29.89	31.03	9.20	100

Panel C: Sample by industry

	MLR		TEM	
SIC Industry Division	No.	%	No.	%
1000-1499 Mining	2	0.93	2	1.15
1500-1799 Construction	6	2.80	4	2.30
2000-3999 Manufacturing	108	50.47	90	51.72
4000-4999 Transportation, Communications, Electric, Gas and Sanitary service	40	18.69	30	17.24
5000-5199 Wholesale Trade	4	1.87	4	2.30
5200-5999 Retail Trade	8	3.74	8	4.60
6000-6799 Finance, Insurance and Real Estate	36	16.82	30	17.24
7000-8999 Services	10	4.67	6	3.45
Total	214	100	174	100

Panel D: Sample by country

	MLR		TEM			MLR		TEM	
Country	No.	%	No.	%	Country	No.	%	No.	%
Australia	2	0.93	2	1.15	Mexico	2	0.93	-	-
Austria	2	0.93	-	-	Netherland	8	3.74	6	3.45
Belgium	2	0.93	2	1.15	Portugal	2	0.93	2	1.15
Brazil	14	6.54	6	3.45	Russian Federation	6	2.80	4	2.30
Canada	2	0.93	2	1.15	Singapore	4	1.87	4	2.30
Chile	2	0.93	2	1.15	South Korea	18	8.41	16	9.20
Denmark	2	0.93	2	1.15	Spain	8	3.74	6	3.45
Finland	4	1.87	4	2.30	Sweden	4	1.87	2	1.15
France	6	2.80	6	3.45	Switzerland	4	1.87	2	1.15
Germany	2	0.93	2	1.15	Turkey	2	0.93	2	1.15
Hong Kong	2	0.93	2	1.15	United Kingdom	8	3.74	8	4.60
India	2	0.93	2	1.15	United States	12	5.61	8	4.60
Italy	6	2.80	6	3.45	Total	214	100	174	100
Japan	88	41.12	76	43.68					

Table 3.5 reports characteristics of the cost of equity sample. Panel A compares IR firms included in and excluded from the analysis. It presents descriptive statistics for a sample of variables and test of differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). Variables are as defined in Section 3.5. Panel B reports the initiation year distribution. Panel C reports the industry distribution according to SIC industry divisions. Panel D reports the country distribution.

Table 3.6: Ohlson models sample composition

Panel A: IR firms in sample

MLR	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	141	8.78	8.79	1.34	159	7.83	8.21	2.12	<0.001	<0.001
ROA_t	141	3.32	3.01	5.66	157	3.48	2.80	4.22	0.776	0.663
LEV_t	141	0.27	0.25	0.18	157	0.26	0.26	0.16	0.799	0.884
COE_t	141	10.80	10.56	2.84	108	9.99	9.56	3.29	0.037	0.027
TEM	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	103	9.16	9.12	1.10	197	7.81	8.09	2.00	<0.001	<0.001
ROA_t	103	3.75	3.31	5.29	195	3.22	2.80	4.75	0.386	0.860
LEV_t	103	0.26	0.24	0.16	195	0.27	0.26	0.17	0.445	0.386
COE_t	103	10.90	10.70	2.71	146	9.82	9.55	3.57	0.010	0.009

Panel B: Sample by initiation year

Year	2011	2012	2013	2014	2015	2016	Total
MLR (no.)	10	26	58	78	78	32	282
MLR (%)	3.55	9.22	20.57	27.66	27.66	11.35	100
TEM (no.)	8	20	40	56	64	18	206
TEM (%)	3.88	9.71	19.42	27.18	31.07	8.74	100

Panel C: Sample by industry

	MLR		TEM	
SIC Industry Division	No.	%	No.	%
1000-1499 Mining	2	0.71	2	0.97
1500-1799 Construction	12	4.26	6	2.91
2000-3999 Manufacturing	134	47.52	98	47.57
4000-4999 Transportation, Communications, Electric, Gas and Sanitary service	50	17.73	36	17.48
5000-5199 Wholesale Trade	8	2.84	8	3.88
5200-5999 Retail Trade	12	4.26	10	4.85
6000-6799 Finance, Insurance and Real Estate	44	15.60	38	18.45
7000-8999 Services	20	7.09	8	3.88
Total	282	100	206	100

Panel D: Sample by country

	MLR		TEM			MLR		TEM	
Country	No.	%	No.	%	Country	No.	%	No.	%
Australia	2	0.71	2	0.97	Mexico	2	0.71	-	-
Austria	2	0.71	-	-	Netherland	8	2.84	6	2.91
Belgium	4	1.42	4	1.94	Portugal	2	0.71	2	0.97
Brazil	16	5.67	8	3.88	Russian Federation	4	1.42	4	1.94
Canada	4	1.42	2	0.97	Singapore	4	1.42	4	1.94
Chile	4	1.42	2	0.97	South Korea	20	7.09	16	7.77
Denmark	2	0.71	2	0.97	Spain	12	4.26	8	3.88
Finland	4	1.42	4	1.94	Sweden	6	2.13	4	1.94
France	8	2.84	6	2.91	Switzerland	4	1.42	2	0.97
Germany	4	1.42	2	0.97	Turkey	2	0.71	2	0.97
Hong Kong	4	1.42	4	1.94	United Kingdom	14	4.96	12	5.83
India	4	1.42	2	0.97	United States	16	5.67	10	4.85
Italy	6	2.13	6	2.91	Total	282	100	206	100
Japan	124	43.97	92	44.66					

Table 3.6 reports characteristics of the firm value (Ohlson models) sample. Panel A compares IR firms included in and excluded from the analysis. It presents descriptive statistics for a sample of variables and test of differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). Variables are as defined in Section 3.5. Panel B reports the initiation year distribution. Panel C reports the industry distribution according to SIC industry divisions. Panel D reports the country distribution.

Table 3.7: Tobin's Q sample composition

Panel A: IR firms in sample

MLR	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	112	9.20	9.17	1.10	188	7.73	8.04	1.99	<0.001	<0.001
ROA_t	112	3.61	3.12	5.22	186	3.28	2.85	4.78	0.578	0.780
LEV_t	112	0.26	0.24	0.16	186	0.27	0.26	0.18	0.831	0.879
$TOBIN_t$	112	0.46	0.02	0.70	142	0.49	0.01	0.84	0.765	0.317
TEM	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	109	9.22	9.18	1.09	191	7.74	8.04	1.98	<0.001	<0.001
ROA_t	109	3.74	3.26	5.21	189	3.21	2.80	4.79	0.368	0.872
LEV_t	109	0.26	0.24	0.16	189	0.27	0.26	0.18	0.585	0.603
$TOBIN_t$	109	0.46	0.02	0.71	145	0.48	0.02	0.83	0.816	0.415

Panel B: Sample by initiation year

Year	2011	2012	2013	2014	2015	2016	Total
MLR (no.)	8	24	42	60	72	18	224
MLR (%)	3.57	10.71	18.75	26.79	32.14	8.04	100
TEM (no.)	8	24	42	56	70	18	218
TEM (%)	3.67	11.01	19.27	25.69	32.11	8.26	100

Panel C: Sample by industry

	MLR		TEM	
SIC Industry Division	No.	%	No.	%
1000-1499 Mining	2	0.89	2	0.92
1500-1799 Construction	8	3.57	8	3.67
2000-3999 Manufacturing	104	46.43	100	45.87
4000-4999 Transportation, Communications, Electric, Gas and Sanitary service	40	17.86	40	18.35
5000-5199 Wholesale Trade	8	3.57	8	3.67
5200-5999 Retail Trade	8	3.57	8	3.67
6000-6799 Finance, Insurance and Real Estate	44	19.64	42	19.27
7000-8999 Services	8	3.57	8	3.67
9900-9999 Nonclassifiable	2	0.89	2	0.92
Total	224	100	218	100

Panel D: Sample by country

	MLR		TEM			MLR		TEM	
Country	No.	%	No.	%	Country	No.	%	No.	%
Australia	2	0.89	2	0.92	Mexico	2	0.89	2	0.92
Belgium	4	1.79	4	1.83	Netherlands	6	2.68	6	2.75
Brazil	14	6.25	10	4.59	Russian Federation	4	1.79	4	1.83
Canada	4	1.79	2	0.92	Singapore	4	1.79	4	1.83
Chile	2	0.89	2	0.92	South Korea	16	7.14	16	7.34
Denmark	2	0.89	2	0.92	Spain	10	4.46	10	4.59
Finland	4	1.79	4	1.83	Sweden	4	1.79	4	1.83
France	8	3.57	8	3.67	Switzerland	2	0.89	2	0.92
Germany	4	1.79	4	1.83	Taiwan	2	0.89	2	0.92
Hong Kong	6	2.68	6	2.75	Turkey	2	0.89	2	0.92
India	2	0.89	2	0.92	United Kingdom	12	5.36	12	5.50
Italy	6	2.68	6	2.75	United States	10	4.46	10	4.59
Japan	92	41.07	92	42.20	Total	224	100	218	100

Table 3.7 reports characteristics of the firm value (Tobin's Q) sample. Panel A compares IR firms included in and excluded from the analysis. It presents descriptive statistics for a sample of variables and test of differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). Variables are as defined in Section 3.5. Panel B reports the initiation year distribution. Panel C reports the industry distribution according to SIC industry divisions. Panel D reports the country distribution.

Table 3.8: Environmental and social performance sample composition

Panel A: IR firms in sample

MLR/TEM	Included				Excluded				*t*-test	M-W
Variable	n	Mean	Median	Sd	n	Mean	Median	Sd	*p*-value	*p*-value
$LnSIZE_t$	89	9.21	9.18	1.08	209	7.87	8.15	1.97	<0.001	<0.001
ROA_t	89	3.66	3.00	5.30	207	3.33	2.87	4.81	0.595	0.731
LEV_t	89	0.27	0.25	0.17	207	0.27	0.26	0.17	0.944	0.941
ESP_t	89	84.88	88.46	11.85	120	81.14	88.44	18.38	0.095	0.716
$FOLLOW_t$	89	18.70	16.50	9.21	160	12.77	12.21	8.33	<0.001	<0.001

Panel B: Sample by initiation year

Year	2011	2012	2013	2014	2015	Total
MLR/TEM (No.)	8	26	44	56	44	178
MLR/TEM (%)	4.49	14.61	24.72	31.46	24.72	100

Panel C: Sample by industry

	MLR/TEM	
SIC Industry Division	No.	%
1000-1499 Mining	2	1.12
1500-1799 Construction	8	4.49
2000-3999 Manufacturing	74	41.57
4000-4999 Transportation, Communications, Electric, Gas and Sanitary service	30	16.85
5000-5199 Wholesale Trade	8	4.49
5200-5999 Retail Trade	8	4.49
6000-6799 Finance, Insurance and Real Estate	40	22.47
7000-8999 Services	6	3.37
9900-9999 Nonclassifiable	2	1.12
Total	178	100

Panel D: Sample by country

	MLR/TEM			MLR/TEM	
Country	No.	%	Country	No.	%
Australia	2	1.12	Netherlands	6	3.37
Belgium	4	2.25	Portugal	2	1.12
Brazil	10	5.62	Russian Federation	4	2.25
Canada	2	1.12	Singapore	2	1.12
Denmark	2	1.12	South Korea	12	6.74
Finland	4	2.25	Spain	12	6.74
France	4	2.25	Sweden	4	2.25
Germany	4	2.25	Switzerland	2	1.12
Hong Kong	6	3.37	Turkey	2	1.12
India	2	1.12	United Kingdom	10	5.62
Italy	6	3.37	United States	6	3.37
Japan	68	38.20	Total	178	100
Mexico	2	1.12			

Table 3.8 reports characteristics of the environmental and social performance sample. Panel A compares IR firms included in and excluded from the analysis. It presents descriptive statistics for a sample of variables and test of differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). Variables are as defined in Section 3.5. Panel B reports the initiation year distribution. Panel C reports the industry distribution according to SIC industry divisions. Panel D reports the country distribution.

Table 3.9: First round variable exclusion

Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$BOARDSKILL_{t-1}$	-0.0177	-0.0231	-0.0198	-0.0196	-0.0201	-0.0206	-0.0209	-0.0189
	(-1.10)	(-1.42)	(-1.30)	(-1.30)	(-1.31)	(-1.36)	(-1.39)	(-1.27)
$OWNERSHIP_{t-1}$	-0.0231*	-0.0226*	-0.0224*	-0.0229*	-0.0221*	-0.0210*	-0.0211*	-0.0226*
	(-1.81)	(-1.83)	(-1.78)	(-1.82)	(-1.76)	(-1.68)	(-1.69)	(-1.80)
GRI_{t-1}	0.241	0.583	0.231	0.231	0.191	0.300	0.291	0.262
	(0.34)	(0.82)	(0.32)	(0.32)	(0.26)	(0.43)	(0.42)	(0.38)
ESP_{t-1}	0.0708**	0.0630***	0.0656***	0.0653***	0.0645***	0.0635***	0.0631***	0.0640***
	(2.52)	(2.59)	(3.01)	(2.98)	(3.04)	(3.04)	(3.06)	(3.03)
$LnMEDIA\_ALL_{t-1}$	0.373	0.363	0.384	0.386	0.410*	0.491**	0.489**	0.495**
	(1.50)	(1.55)	(1.57)	(1.58)	(1.71)	(2.13)	(2.11)	(2.10)
$MEDIA\_JFALL_{t-1}$	-1.720	-1.453	-1.697	-1.707	-1.694	-1.990**	-2.052**	-2.030*
	(-1.48)	(-1.28)	(-1.51)	(-1.53)	(-1.53)	(-1.99)	(-2.02)	(-1.95)
$BOARDSIZE_{t-1}$	-0.167***	-0.170***	-0.158***	-0.158***	-0.157***	-0.156***	-0.154***	-0.148**
	(-2.64)	(-2.75)	(-2.67)	(-2.67)	(-2.67)	(-2.64)	(-2.63)	(-2.52)
$GENDIV_{t-1}$	0.0979*	0.0847**	0.0906*	0.0923*	0.0889*	0.0846*	0.0853*	0.0850*
	(1.75)	(2.14)	(1.73)	(1.80)	(1.79)	(1.81)	(1.84)	(1.86)
$LnSUBSIDIARY_{t-1}$	0.670*	0.494	0.633*	0.646*	0.614*	0.606**	0.601*	0.549*
	(1.91)	(1.39)	(1.84)	(1.90)	(1.79)	(1.99)	(1.94)	(1.87)
$LISTING_{t-1}$	0.136	0.215	0.153	0.149	0.134	0.123	0.112	0.113
	(0.74)	(1.19)	(0.86)	(0.85)	(0.76)	(0.69)	(0.66)	(0.68)
$LnSIZE_{t-1}$	-0.363	-0.442	-0.432	-0.430	-0.422	-0.446	-0.473	-0.441
	(-0.64)	(-0.85)	(-0.87)	(-0.87)	(-0.85)	(-0.91)	(-1.06)	(-1.01)
LEV_{t-1}	-2.369	-3.060	-2.309	-2.027	-2.225	-2.068	-2.098	-1.793
	(-0.90)	(-1.27)	(-0.90)	(-0.97)	(-1.07)	(-1.05)	(-1.07)	(-0.94)
MTB_{t-1}	0.0731*	0.0835*	0.0748*	0.0725*	0.0722*	0.0748*	0.0747*	0.0700*
	(1.65)	(1.92)	(1.75)	(1.74)	(1.74)	(1.78)	(1.80)	(1.69)
ROA_{t-1}	2.394	-0.383	1.681	1.914	1.719	0.646	0.446	0.120
	(0.30)	(-0.05)	(0.22)	(0.25)	(0.22)	(0.08)	(0.06)	(0.02)
SPP_{t-1}	-1.457	-1.130	-1.350	-1.360	-1.123	-1.113	-1.087	
	(-1.24)	(-0.95)	(-1.13)	(-1.14)	(-1.00)	(-1.03)	(-1.00)	
$INTASSET_{t-1}$	-7.340**	-6.693**	-7.091**	-7.165**	-6.769**	-6.800**	-6.710**	-6.152**
	(-2.57)	(-2.53)	(-2.49)	(-2.52)	(-2.44)	(-2.46)	(-2.38)	(-2.33)
$BETA_{t-1}$	1.905*	1.491	2.012*	2.046*	1.781*	1.862**	1.862**	1.789*
	(1.82)	(1.29)	(1.90)	(1.93)	(1.91)	(2.01)	(2.01)	(1.86)
$FOLLOW_{t-1}$	-0.00352	-0.0266	-0.00634	-0.00542	-0.00525	-0.0117		
	(-0.05)	(-0.45)	(-0.10)	(-0.08)	(-0.08)	(-0.19)		
$DISPERSION_{t-1}$	-1.387*	-1.155*	-1.241*	-1.267*	-1.337*	-1.285*	-1.289*	-1.153*
	(-1.92)	(-1.80)	(-1.80)	(-1.83)	(-1.86)	(-1.89)	(-1.90)	(-1.72)
$FERROR_{t-1}$	2.881	2.617	2.899	2.884	2.853			
	(1.46)	(1.44)	(1.50)	(1.49)	(1.48)			
COE_{t-1}	-0.0953	-0.0133	-0.0671	-0.0830				
	(-0.62)	(-0.09)	(-0.50)	(-0.71)				
$WACC_{t-1}$	-0.0302	-0.0816	-0.0293					
	(-0.24)	(-0.67)	(-0.24)					
$RETVOLI_{t-1}$	3.244	2.347						
	(0.56)	(0.44)						
$EARNSURP_{t-1}$	16.64		16.32	16.59	15.63	15.38	15.57	14.94
	(1.37)		(1.34)	(1.39)	(1.38)	(1.40)	(1.44)	(1.44)
Country dummies	Y	Y	Y	Y	Y	Y	Y	Y
Industry dummies	Y	Y	Y	Y	Y	Y	Y	Y
N	180	180	180	180	180	180	180	180
Chi-squared (Wald)	58.73	56.31	58.57	58.23	56.08	50.64	50.18	47.77
Model df	71	70	70	69	68	67	66	65
Pseudo $R^2_{Nagelkerke}$	0.447	0.423	0.444	0.444	0.442	0.437	0.437	0.433
AIC	320.1	322.9	318.6	316.6	315.0	314.1	312.1	310.9
ΔAIC (step-wise)		2.8	-1.5	-2.0	-1.6	-0.9	-2.0	-1.2
ΔAIC (base model)		2.8	-1.5	-3.5	-5.1	-6.0	-8.0	-9.2
Classified %	75.56	77.78	76.11	76.67	76.11	76.11	76.11	76.11
Area under ROC curve	0.847	0.835	0.842	0.842	0.840	0.842	0.842	0.841

Table 3.9 (continue): First round variable exclusion

Dependent variable = IR_t	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$BOARDSKILL_{t-1}$	-0.0217	-0.0171*	-0.0167	-0.0172*	-0.0173*	-0.0224**	-0.0212**
	(-1.46)	(-1.65)	(-1.63)	(-1.71)	(-1.72)	(-2.11)	(-2.08)
$OWNERSHIP_{t-1}$	-0.0199	-0.0108	-0.00959	-0.00872	-0.00847	-0.0116	-0.0117
	(-1.58)	(-1.16)	(-1.05)	(-0.97)	(-0.94)	(-1.28)	(-1.31)
GRI_{t-1}	0.207	0.435	0.445	0.464	0.459	0.356	0.512
	(0.31)	(0.92)	(0.93)	(0.98)	(0.98)	(0.76)	(1.11)
ESP_{t-1}	0.0642***	0.0274**	0.0270**	0.0270**	0.0270**	0.0306**	0.0280**
	(3.11)	(2.39)	(2.34)	(2.37)	(2.38)	(2.43)	(2.40)
$LnMEDIA\_ALL_{t-1}$	0.514**	0.199	0.193	0.187	0.180	0.236	0.248
	(2.16)	(1.22)	(1.19)	(1.14)	(1.09)	(1.45)	(1.52)
$MEDIA\_JFALL_{t-1}$	-2.193**	-0.693	-0.617	-0.602	-0.620	-1.179	-0.934
	(-2.26)	(-0.94)	(-0.87)	(-0.83)	(-0.85)	(-1.46)	(-1.25)
$BOARDSIZE_{t-1}$	-0.152**	-0.130**	-0.133**	-0.135***	-0.131**	-0.0857*	-0.109**
	(-2.56)	(-2.46)	(-2.55)	(-2.61)	(-2.55)	(-1.73)	(-2.11)
$GENDIV_{t-1}$	0.0892**	0.0233	0.0215	0.0192	0.0199	0.0320	0.0145
	(1.99)	(0.88)	(0.83)	(0.77)	(0.79)	(1.20)	(0.63)
$LnSUBSIDIARY_{t-1}$	0.605*	0.107	0.125	0.130	0.131	0.0866	0.0651
	(1.95)	(0.56)	(0.67)	(0.71)	(0.71)	(0.43)	(0.35)
$LnSIZE_{t-1}$	-0.320	-0.275	-0.257	-0.263	-0.265	-0.376	-0.341
	(-0.97)	(-1.09)	(-1.03)	(-1.06)	(-1.06)	(-1.41)	(-1.35)
LEV_{t-1}	-1.811	0.976	0.831	0.838	0.847	0.551	0.550
	(-0.95)	(0.80)	(0.70)	(0.72)	(0.73)	(0.46)	(0.47)
MTB_{t-1}	0.0688	0.0474*	0.0464*	0.0454*	0.0431*	0.0376	0.0411
	(1.63)	(1.76)	(1.73)	(1.71)	(1.67)	(1.47)	(1.57)
ROA_{t-1}	0.638	-1.474	-1.797	-1.738	-1.718	-2.432	-1.684
	(0.08)	(-0.29)	(-0.36)	(-0.35)	(-0.34)	(-0.47)	(-0.33)
SPP_{t-1}	-1.089	-0.498	-0.556	-0.610	-0.578	-0.542	-0.621
	(-1.02)	(-0.59)	(-0.66)	(-0.74)	(-0.70)	(-0.62)	(-0.75)
$INTASSET_{t-1}$	-6.811**	-2.476*	-2.554*	-2.445*	-2.435	-2.648*	-2.563*
	(-2.41)	(-1.66)	(-1.71)	(-1.65)	(-1.64)	(-1.87)	(-1.83)
$BETA_{t-1}$	1.884**	0.705	0.686	0.682	0.683	0.989*	0.914*
	(2.01)	(1.40)	(1.37)	(1.36)	(1.36)	(1.86)	(1.73)
$DISPERSION_{t-1}$	-1.324**	-0.972**	-0.959**	-0.942**	-0.923**	-1.073**	-0.984**
	(-2.00)	(-2.03)	(-2.02)	(-2.00)	(-2.02)	(-2.30)	(-2.12)
$EARNSURP_{t-1}$	16.55	5.244	5.346	5.493	5.475	5.431	5.746
	(1.54)	(0.82)	(0.84)	(0.86)	(0.86)	(0.86)	(0.93)
$SENSITIVE_{t-1}$		-0.159	-0.154	-0.166	-0.135	0.124	-0.0235
		(-0.37)	(-0.36)	(-0.39)	(-0.33)	(0.29)	(-0.06)
$CONCENTRATE_{t-1}$		9.258**	9.189**	9.151**	9.097**	11.67***	10.53***
		(2.51)	(2.48)	(2.50)	(2.51)	(2.96)	(2.58)
$CULTURE\_PDI_{t-1}$						-0.00116	
						(-0.03)	
$CULTURE\_IDV_{t-1}$						-0.0166	
						(-0.74)	
$CULTURE\_MAS_{t-1}$						0.0259*	0.0247**
						(1.92)	(2.23)
$CULTURE\_UAI_{t-1}$						-0.00365	
						(-0.26)	
$CULTURE\_LTO_{t-1}$						0.0145	
						(0.90)	
$CULTURE\_IVR_{t-1}$						0.0732**	0.0459*
						(2.24)	(1.96)
$CULTURE\_PII_{t-1}$		0.413	0.380	0.404*	0.380*		
		(1.59)	(1.53)	(1.71)	(1.65)		
$CULTURE\_MUL_{t-1}$		0.416	0.357	0.362	0.344		
		(1.63)	(1.60)	(1.62)	(1.55)		
$NATION\_RRG_{t-1}$		-0.00520	-0.0664	-0.0467			
		(-0.03)	(-0.48)	(-0.37)			
$NATION\_VF_{t-1}$		0.523*	0.480*	0.505**	0.528**	0.454	0.440**
		(1.90)	(1.94)	(2.16)	(2.29)	(1.33)	(2.33)
$NATION\_INV_{t-1}$		0.0795	0.106				
		(0.30)	(0.42)				
$NATION\_EPI_{t-1}$		-0.0158					
		(-0.50)					

Table 3.9 (continue): First round variable exclusion

	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Country dummies	Y	N	N	N	N	N	N
Industry dummies	Y	N	N	N	N	N	N
N	180	180	180	180	180	180	180
Chi-squared (Wald)	48.99	36.58	36.05	35.60	35.19	34.64	34.33
Model df	65	26	25	24	23	27	23
Pseudo $R^2_{Nagelkerke}$	0.434	0.299	0.297	0.296	0.296	0.325	0.314
AIC	310.6	257.9	256.1	254.3	252.4	255.3	249.3
ΔAIC (step-wise)	-0.3		-1.8	-1.8	-1.9		-6.0
ΔAIC (base model)	-9.5		-1.8	-3.6	-5.5		-6.0
Classified %	76.67	70.00	70.00	70.00	70.56	74.44	70.56
Area under ROC curve	0.844	0.770	0.769	0.768	0.768	0.790	0.781

Table 3.9 reports step-wise regression results for the first filter in the determinants model development process. Model 1 includes all variables. Model 2 to Model 9 exclude variables in the order of: (2) *EARNSURP*, (3) *RETVOLI*, (4) *WACC*, (5) *COE*, (6) *FERROR*, (7) *FOLLOW*, (8) *SPP* and (9) *LISTING*. Model 10 to Model 15 test industry and country characteristics. Model 10 includes all industry characteristics and aggregate national characteristics, then variables were excluded in the order of: (11) *NATION_EPI*, (12) *NATION_INV* and (13) *NATION_RRG*. Model 14 and Model 15 test national culture separately. The *t*-statistic is reported in parenthesis. Two-tailed tests of significance: * $p<0.10$ ** $p<0.05$ and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 3.10: Second round variable exclusion

Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)
$BOARDSKILL_{t-1}$	-0.0152*	-0.0153*	-0.0164*	-0.0164*	-0.0168*	-0.0160*
	(-1.71)	(-1.65)	(-1.81)	(-1.80)	(-1.83)	(-1.75)
$OWNERSHIP_{t-1}$	-0.0102	-0.00744	-0.00985	-0.00982	-0.00923	-0.00930
	(-1.19)	(-0.94)	(-1.12)	(-1.13)	(-1.08)	(-1.08)
$BOARDCOM\_CSR_{t-1}$	1.235**		1.169*	1.243**	1.240**	1.217**
	(1.97)		(1.88)	(2.07)	(2.08)	(2.04)
GRI_{t-1}		0.391				
		(0.93)				
ESP_{t-1}	0.0196*	0.0268**	0.0195*	0.0181	0.0180	0.0181
	(1.77)	(2.57)	(1.72)	(1.64)	(1.61)	(1.62)
$MEDIA\_JFALL_{t-1}$	-0.358	-0.410	-0.306	-0.279	-0.285	-0.267
	(-0.62)	(-0.65)	(-0.52)	(-0.47)	(-0.48)	(-0.46)
$LnMEDIA\_ALL_{t-1}$	0.202	0.214	0.208	0.199	0.211	0.218
	(1.37)	(1.46)	(1.41)	(1.35)	(1.45)	(1.49)
$BOARDSIZE_{t-1}$	-0.110**	-0.122***	-0.117**	-0.114**	-0.117**	-0.117**
	(-2.38)	(-2.64)	(-2.51)	(-2.45)	(-2.54)	(-2.56)
$GENDIV_{t-1}$	0.0230	0.0173	0.0232	0.0239	0.0225	0.0219
	(0.89)	(0.73)	(0.95)	(1.00)	(0.93)	(0.90)
$LnSUBSIDIARY_{t-1}$	0.182	0.204	0.175	0.169	0.205	0.196
	(1.04)	(1.19)	(0.96)	(0.92)	(1.19)	(1.14)
$LnSIZE_{t-1}$	-0.216	-0.218	-0.218	-0.187	-0.220	-0.225
	(-0.95)	(-0.93)	(-0.95)	(-0.82)	(-0.97)	(-1.00)
LEV_{t-1}	0.000829	0.192	-0.0966	-0.156	-0.220	-0.187
	(0.00)	(0.17)	(-0.08)	(-0.14)	(-0.20)	(-0.16)
MTB_{t-1}	0.0304	0.0343	0.0311	0.0277	0.0265	0.0252
	(1.32)	(1.38)	(1.37)	(1.26)	(1.21)	(1.14)
ROA_{t-1}	0.136	-1.581	-0.564	0.407	0.126	-0.170
	(0.03)	(-0.34)	(-0.13)	(0.10)	(0.03)	(-0.04)
SPP_{t-1}	-0.394	-0.406	-0.409	-0.352	-0.366	
	(-0.50)	(-0.51)	(-0.52)	(-0.45)	(-0.46)	
$INTASSET_{t-1}$	-2.642*	-2.484*	-2.646*	-2.636**	-2.834**	-2.700**
	(-1.88)	(-1.73)	(-1.96)	(-1.99)	(-2.23)	(-2.16)
$BETA_{t-1}$	0.258	0.260	0.276	0.275		
	(0.54)	(0.54)	(0.58)	(0.58)		
$DISPERSION_{t-1}$	-0.360	-0.510	-0.289			
	(-0.85)	(-1.19)	(-0.71)			
$EARNSURP_{t-1}$	5.922	4.858				
	(0.98)	(0.81)				
$SENSITIVE_{t-1}$	-0.0986	-0.156	-0.104	-0.0897	-0.129	-0.108
	(-0.25)	(-0.41)	(-0.26)	(-0.23)	(-0.34)	(-0.29)
$CONCENTRATE_{t-1}$	4.226*	3.958	4.286*	4.280**	4.393**	4.407**
	(1.85)	(1.38)	(1.96)	(2.10)	(2.24)	(2.27)
$CULTURE\_PII_{t-1}$	0.156	0.220	0.141	0.141	0.142	0.138
	(0.78)	(1.06)	(0.70)	(0.72)	(0.72)	(0.71)
$CULTURE\_MUL_{t-1}$	0.147	0.188	0.165	0.173	0.168	0.158
	(0.74)	(0.94)	(0.82)	(0.86)	(0.85)	(0.80)
$NATION\_VF_{t-1}$	0.407**	0.378*	0.389*	0.384*	0.392*	0.390*
	(2.02)	(1.87)	(1.90)	(1.90)	(1.95)	(1.95)
N	192	192	192	192	192	192
Chi-squared (Wald)	31.31	28.84	29.24	29.48	29.85	29.94
Model df	23	23	22	21	20	19
Pseudo $R^2_{Nagelkerke}$	0.270	0.252	0.261	0.258	0.256	0.255
AIC	270.8	273.9	270.4	268.8	267.2	265.4
ΔAIC (step-wise)				-1.6	-1.6	-1.8
ΔAIC (base model)		3.1	-0.4	-2.0	-3.6	-5.4
Classified %	66.67	68.75	67.19	67.19	67.71	67.71
Area under ROC curve	0.759	0.756	0.757	0.753	0.752	0.752

Table 3.10 (continue): Second round variable exclusion

Dependent variable = IR_t	(7)	(8)	(9)	(10)	(11)	(12)
$BOARDSKILL_{t-1}$	-0.0160*	-0.0158*	-0.0154*	-0.0157*	-0.0157*	-0.0140*
	(-1.73)	(-1.72)	(-1.71)	(-1.77)	(-1.75)	(-1.70)
$OWNERSHIP_{t-1}$	-0.00950	-0.00921	-0.00926	-0.0104	-0.00972	-0.00873
	(-1.10)	(-1.06)	(-1.07)	(-1.21)	(-1.13)	(-1.05)
$BOARDCOM\_CSR_{t-1}$	1.230**	1.217**	1.166**	1.211**	1.167**	1.227**
	(2.04)	(2.04)	(2.01)	(2.09)	(2.03)	(2.14)
ESP_{t-1}	0.0182	0.0183	0.0173	0.0190*	0.0170	0.0188*
	(1.62)	(1.63)	(1.58)	(1.72)	(1.56)	(1.70)
$MEDIA\_JFALL_{t-1}$	-0.262	-0.249	-0.214	-0.208		-0.201
	(-0.45)	(-0.43)	(-0.37)	(-0.36)		(-0.35)
$LnMEDIA\_ALL_{t-1}$	0.220	0.217	0.152		0.152	
	(1.52)	(1.49)	(1.10)		(1.10)	
$BOARDSIZE_{t-1}$	-0.117**	-0.117**	-0.123***	-0.117**	-0.122***	-0.118***
	(-2.52)	(-2.54)	(-2.65)	(-2.57)	(-2.66)	(-2.60)
$GENDIV_{t-1}$	0.0216	0.0203	0.0217	0.0243	0.0233	0.0283
	(0.90)	(0.85)	(0.90)	(1.05)	(1.00)	(1.28)
$LnSUBSIDIARY_{t-1}$	0.190	0.182	0.141	0.195	0.151	0.205
	(1.11)	(1.08)	(0.86)	(1.23)	(0.92)	(1.32)
$LnSIZE_{t-1}$	-0.228	-0.210				
	(-1.03)	(-1.00)				
LEV_{t-1}	-0.0600	-0.126	0.186	0.154	0.163	0.125
	(-0.05)	(-0.11)	(0.18)	(0.15)	(0.16)	(0.12)
ROA_{t-1}	1.062					
	(0.31)					
$INTASSET_{t-1}$	-2.668**	-2.623**	-2.762**	-2.703**	-2.751**	-2.674**
	(-2.14)	(-2.15)	(-2.29)	(-2.26)	(-2.26)	(-2.21)
$SENSITIVE_{t-1}$	-0.148	-0.131	-0.147	-0.0704	-0.136	-0.0526
	(-0.40)	(-0.36)	(-0.41)	(-0.20)	(-0.38)	(-0.15)
$CONCENTRATE_{t-1}$	4.436**	4.353**	4.153**	4.086**	4.220**	3.667**
	(2.33)	(2.23)	(2.25)	(2.14)	(2.28)	(2.21)
$CULTURE\_PII_{t-1}$	0.147	0.147	0.113	0.103	0.112	
	(0.75)	(0.74)	(0.60)	(0.54)	(0.59)	
$CULTURE\_MUL_{t-1}$	0.148	0.130	0.139	0.161	0.134	0.119
	(0.75)	(0.68)	(0.73)	(0.85)	(0.70)	(0.70)
$NATION\_VF_{t-1}$	0.404**	0.399*	0.340*	0.353*	0.344*	0.278**
	(1.97)	(1.93)	(1.75)	(1.81)	(1.77)	(1.97)
N	192	192	192	192	192	192
Chi-squared (Wald)	28.65	28.31	28.28	27.25	28.47	26.59
Model df	18	17	16	15	15	14
Pseudo $R^2_{Nagelkerke}$	0.252	0.252	0.245	0.240	0.245	0.238
AIC	263.9	262.0	261.1	260.1	259.2	258.4
ΔAIC (step-wise)	-1.5	-1.9	-0.9	-1.0	-0.9	
ΔAIC (base model)	-6.9	-8.8	-9.7	-10.7	-11.6	-12.4
Classified %	66.67	67.19	69.27	68.23	68.75	67.71
Area under ROC curve	0.751	0.751	0.752	0.745	0.750	0.745

Table 3.10 reports step-wise regression results for the second filter in the determinants model development process. Model 1 is the base model. Model 2 substitutes *GRI* for *BOARDCOM_CSR*. Variables are then excluded in the order of (3) *EARNSURP*, (4) *DISPERSION*, (5) *BETA*, (6) *SPP*, (7) *MTB*, (8) *ROA* and (9) *LnSIZE*. Model 10 and Model 11 test alternative media variables, *MEDIA_JFALL* and *LnMEDIA_ALL*, respectively. Model 12 excludes *CULTURE_PII*. The *t*-statistic is reported in parenthesis. Two-tailed tests of significance: * $p<0.10$, ** $p<0.5$ and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 3.11: Multicollinearity tests

Panel A: Determinants models

Dependent variable = IR_t	(1)	(2)	(3)
ESP_{t-1}	1.56		1.59
GRI_{t-1}	1.43		1.42
$BOARDCOM\_CSR_{t-1}$		1.20	
$OWNERSHIP_{t-1}$	1.17	1.15	1.16
$MEDIA\_JFALL_{t-1}$	1.28	1.26	
$LnMEDIA\_ALL_{t-1}$			1.47
$BOARDSKILL_{t-1}$	1.78	1.76	1.76
$BOARDSIZE_{t-1}$	1.21	1.18	1.23
$GENDIV_{t-1}$	2.11	2.10	2.04
LEV_{t-1}	1.09	1.08	1.09
$LnSUBSIDIARY_{t-1}$	1.50	1.50	1.61
$INTASSET_{t-1}$	1.45	1.45	1.46
$CONCENTRATE_{t-1}$	1.14	1.16	1.13
$SENSITIVE_{t-1}$	1.15	1.10	1.18
$CULTURE\_MUL_{t-1}$	2.17	2.18	2.25
$NATION\_VF_{t-1}$	1.39	1.35	1.39
Mean VIF	1.46	1.42	1.48

Panel B: Information environment models

Dependent variable = $FERROR_{t+1}$ and $DISPERSION_{t+1}$	(1)	(2)	Dependent variable = $\Delta FERROR_{t+1}$ and $\Delta DISPERSION_{t+1}$	(3)	(4)
IR_t	1.09	1.13	IR_t	1.13	1.18
GRI_t	1.27	1.66	GRI_t	1.18	1.60
$LnSIZE_t$	2.18	5.74	$\Delta SIZE_t$	1.18	2.11
$SqEARNSURP_t$	1.06	1.67	$\Delta EARNSURP_t$	1.07	1.48
$LOSS_t$	1.15	1.57	$LOSS_t$	1.09	1.58
$LnEARNVOLI_t$	1.19	3.64	$\Delta EARNVOLI_t$	1.07	1.60
$LISTING_t$	2.16	8.03	$LISTING_t$	1.33	3.60
$FOLLOW_t$	1.62	6.02	$\Delta FOLLOW_t$	1.08	1.62
$HORIZON_t$	1.07	1.87	$\Delta HORIZON_t$	1.08	1.66
$NATION\_RRG_t$	1.73		$NATION\_RRG_t$	1.72	
$NATION\_VF_t$	2.10		$NATION\_VF_t$	1.93	
Country (average)		2.17	Country (average)		1.93
Industry (average)		2.00	Industry (average)		1.98
Year (average)		2.79	Year (average)		2.82
Mean VIF	1.51	2.30	Mean VIF	1.26	1.99

Panel C: Cost of equity model

Dependent variable = COE_{t+1}	(1)	(2)	Dependent variable = ΔCOE_{t+1}	(3)	(4)
IR_t	1.12	1.19	IR_t	1.15	1.22
GRI_t	1.28	1.78	GRI_t	1.16	1.57
$LnSIZE_t$	1.43	3.24	$\Delta SIZE_t$	1.08	1.90
$LnMTB_t$	1.08	24.39	ΔMTB_t	1.02	6.02
LEV_t	1.16	2.37	ΔLEV_t	1.13	1.71
$BETA_t$	1.12	2.93	$\Delta BETA_t$	1.08	1.61
LTG_t	1.09	1.80	ΔLTG_t	1.08	1.55
$LnDISPERSION_t$	1.22	1.92	$\Delta DISPERSION_t$	1.04	1.98
$FOLLOW_t$	1.26	4.10	$\Delta FOLLOW_t$	1.04	1.73
Country (average)		3.32	Country (average)		2.13
Industry (average)		2.17	Industry (average)		2.08
Year (average)		3.72	Year (average)		3.57
Mean VIF	1.19	3.09	Mean VIF	1.09	2.22

Table 3.11 (continue): Multicollinearity tests

Panel D: Ohlson model (share price)

Dependent variable = $LnPRICE_{t+1}$	(1)	(2)	Dependent variable = $\Delta PRICE_{t+1}$	(3)	(4)
IR_t	1.12	1.15	IR_t	1.13	1.16
GRI_t	1.12	1.45	GRI_t	1.12	1.46
$LnBVPS_t$	1.59	3.22	$\Delta BVPS_t$	1.05	1.38
$ABEARN_t$	1.60	2.28	$\Delta ABEARN_t$	1.04	1.5
Country (average)		1.79	Country (average)		1.74
Industry (average)		1.72	Industry (average)		1.72
Year (average)		2.60	Year (average)		2.65
Mean VIF	1.35	1.83	Mean VIF	1.09	1.78

Panel E: Ohlson model (cum-dividend market value)

Dependent variable = $LnMVCDA_{t+1}$	(5)	(6)	Dependent variable = $\Delta MVCDA_{t+1}$	(7)	(8)
IR_t	1.13	1.16	IR_t	1.12	1.16
GRI_t	1.16	1.51	GRI_t	1.12	1.46
$BVINV_t$	1.05	1.35	$\Delta BVINV_t$	1.11	1.3
$NIBV_t$	1.02	1.32	$\Delta NIBV_t$	1.11	1.34
Country (average)		1.74	Country (average)		1.73
Industry (average)		1.71	Industry (average)		1.71
Year (average)		2.61	Year (average)		2.60
Mean VIF	1.09	1.77	Mean VIF	1.12	1.76

Panel F: Tobin's Q model

Dependent variable = $TOBIN_{t+1}$	(1)	(2)	Dependent variable = $\Delta TOBIN_{t+1}$	(3)	(4)
IR_t	1.1	1.14	IR_t	1.08	1.12
GRI_t	1.16	1.68	GRI_t	1.07	1.51
$LnSIZE_t$	1.29	2.05	$\Delta SIZE_t$	1.09	2.13
$INTASSET_t$	1.18	2.56	$\Delta INTASSET_t$	1.11	1.45
LEV_t	1.15	2.13	ΔLEV_t	1.14	1.84
ROA_t	1.21	2.13	ΔROA_t	1.15	1.65
$BOARDIND_t$	1.24	4.91	$\Delta BOARDIND_t$	1.07	1.43
$BOARDSIZE_t$	1.17	2.09	$\Delta BOARDSIZE_t$	1.03	1.45
Country (average)		2.21	Country (average)		1.93
Industry (average)		1.90	Industry (average)		1.81
Year (average)		2.80	Year (average)		2.95
Mean VIF	1.19	2.13	Mean VIF	1.09	1.91

Table 3.11 (continue): Multicollinearity tests

Panel G: Environmental and social performance model

Dependent variable = ESP_{t+1}	(1)	(2)	Dependent variable = ΔESP_{t+1}	(3)	(4)
IR_t	1.11	1.24	IR_t	1.13	1.26
GRI_t	1.27	1.99	GRI_t	1.16	1.79
$LnSIZE_t$	2.17	4.97	$\Delta SIZE_t$	1.23	3.09
$LnMTB_t$	4.37	48.80	ΔMTB_t	1.39	6.65
ROA_t	1.48	3.32	ΔROA_t	1.26	1.88
LEV_t	1.23	2.43	ΔLEV_t	1.30	2.15
$SLACK_t$	1.27	2.13	$\Delta SLACK_t$	1.09	2.02
$BETA_t$	1.18	2.96	$\Delta BETA_t$	1.10	1.82
$FOLLOW_t$	1.73	4.80	$\Delta FOLLOW_t$	1.13	1.89
$LISTING_t$	3.49	8.73	$LISTING_t$	1.69	5.98
$BOARDIND_t$	2.41	5.21	$\Delta BOARDIND_t$	1.10	1.53
$BOARDSIZE_t$	1.35	2.21	$\Delta BOARDSIZE_t$	1.07	1.70
$CULTURE\_MUL_t$	3.78		$CULTURE\_MUL_t$	1.33	
$NATION\_VF_t$	1.83		$NATION\_VF_t$	1.70	
Country (average)		6.19	Country (average)		2.95
Industry (average)		2.38	Industry (average)		2.23
Year (average)		4.28	Year (average)		4.28
Mean VIF	2.05	4.70	Mean VIF	1.26	2.67

Table 3.11 reports VIFs for the main models tested in the determinants and consequences analysis. Panel A (determinants): (1) Equation 3.4, (2) Equation 3.5, and (3) Equation 3.4 substituting *LnMEDIA_ALL* for *MEDIA_JFALL*. For Panel B to Panel G (consequences), each panel tests alternative model specifications in the order of: (1) level specification, (2) level specification with dummies, (3) change specification and (4) change specification with dummies. Panel B (information environment): Equation 3.7. Panel C (cost of equity): Equation 3.9. Panel D (Ohlson model - share price): Equation 3.10. Panel E (Ohlson model – cum-dividend market value): Equation 3.11. Panel F (Tobin's Q): Equation 3.13. Panel G (environmental and social performance): Equation 3.15. Variables are as defined in Section 3.5.

CHAPTER FOUR

DETERMINANTS OF VOLUNTARY INTEGRATED REPORTING

4.1 Introduction

Sustainability issues and an increasingly complex reporting environment have motivated firms to make disclosures that can facilitate more efficient and long-term orientated decision-making, including integrated reports. Despite initial momentum in adoption of the IIRC Framework internationally, there have been no significant increase in adoption rate amongst large firms (KPMG, 2015, 2017). Further, there is scant evidence that IR radically changes internal operations and external reporting practices, with managers viewing IR as an extension or repackaging of sustainability reporting (Chaidali & Jones, 2017; Lodhia, 2015; Stubbs & Higgins, 2014). Given the slow uptake of the IIRC Framework and uncertainty about whether IR can stimulate changes in organisational practices, examination of the rationales behind voluntary IR is of interest to regulators and academics.

While prior studies have provided valuable insights on the early stages of IR practices, there remain many areas to explore (Cheng et al., 2014; de Villiers et al., 2014; de Villiers et al., 2017b; Dumay et al., 2016; Rinaldi et al., 2018). Emerging quantitative IR studies have primarily assessed the contents of integrated reports or economic consequences of mandatory IR (e.g., Barth et al., 2017; Melloni et al., 2016). As the motivations driving voluntary IIRC Framework adoption influence reported content and associated consequences, examination of determinants supplement extant studies and provide new insights on this reporting phenomenon.

There are studies that investigated the factors influencing voluntary IR disclosures (e.g., Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Lai et al., 2016). This study extends prior studies by focusing on voluntary adoption of the IIRC Framework and investigating potentially important motivators that have not been examined. First, prior studies have not distinguished between reporters that adopted the IIRC Framework and those that compiled a single report for financial and non-financial information. Conceptually, an integrated report according to the IIRC Framework is investor-centric and requires disclosure of specific content elements, whereas a general integrated report, or One Report, is stakeholder-centric and focuses on communicating accountability to stakeholders (Eccles & Krzus, 2010; IIRC, 2013b). If in practice reports prepared in accordance with the Framework differ from One Reports, estimates on a generalised group of integrated reporters do not parse out the effects attributable to different report types. Alternatively, if the disclosure practices of firms that adopt the IIRC Framework are indistinguishable from firms that prepare One Reports, it brings into question whether adoption of the IIRC Framework adds value to

corporate reporting practices and whether it is necessary to promote adoption of the Framework. Second, as demonstrated by the study findings, models employed by prior IR studies may have omitted a range of important variables and did not address endogeneity concerns. Omission of key variables, namely environmental and social performance and corporate governance characteristics, could lead to misleading conclusions. Due to the research focus and design employed in this study, the sample size is smaller relative to prior IR studies.

Regulatory requirements drive IR disclosures in South Africa (Haji & Anifowose, 2017); however, little is known about what drives voluntary IR practices. Thereby, the purpose of this chapter is to provide empirical evidence on the determinants of voluntary IR. The study investigates why reporters adopt the IIRC Framework and initiate integrated reports. It focuses on the influence environmental and social performance, establishment of a CSR committee, institutional shareholding, media coverage and board skills have on the tendency to release an integrated report. As motivated by the IR and voluntary disclosure literatures, these five characteristics are likely key determinants of voluntary IR. An international sample of IR firms and matched non-IR firms is examined. The models use lagged independent variables to address reverse causality and to mitigate time lag effects between the decision to prepare an integrated report and the release of an integrated report.

This study is the first to investigate the factors that influence voluntary adoption of the IIRC Framework. It provides new insights on what motivates and deters engagement in IR by examining characteristics not tested by prior studies, and interpreting findings from the perspectives of resource dependence theory, signalling theory and institutional theory. Taken together, the analysis provides three important insights. First, the motivations behind adoption of the IIRC Framework vary on a country level. For most countries, IR firms tend to have superior sustainability performance and sustainability functions in place. The likelihood of IR initiation is higher for firms that have stronger environmental and social performance, a CSR committee or experience with the GRI guidelines. In Japan, there are no significant differences between IR firms and non-IR firms. The Japanese institutional environment appears to guide reporting practices, resulting in similar disclosures regardless of adopting the IIRC Framework. Second, there is weak evidence that media coverage and media sentiment influences voluntary IIRC Framework adoption. This finding suggests firm visibility and external pressures influence IR initiation. Third, early IR adopters and later IR adopters may be two distinct groups driven by different behaviours and motivations. Early IR adopters may have been invited, or have chosen, to participate in the IIRC pilot programme due to their reputation and superior sustainability performance relative to later IR adopters. Early IR

adopters may be more actively involved with the IIRC and the development of the Framework, while later IR adopters are relatively more passive in their involvement and adopt the Framework due to its compatibility with their sustainability strategy.

This study makes two main contributions to the growing IR literature. First, it enhances our understanding of the nature of IR, showing that IR is a process that builds on established sustainability management and reporting practices rather than a point-in-time change. This finding is consistent with the view that IR is an extension of sustainability reporting (Lodhia, 2015; Stubbs & Higgins, 2014), which explains why any changes in management and reporting practices are gradual rather than radical (Higgins et al., 2014). Second, the findings provide an alternative interpretation to the findings of prior studies and suggest that integrated reports are not necessarily used as a tool to legitimise poor firm performance. Melloni (2015) and Melloni et al. (2016) argue that integrated reports resembled management opportunism and impression management as they found a positive tone in integrated reports when firms face declining financial performance. However, while social and political visibility and firm reputation motivates voluntary IIRC Framework adoption, firms are adopting IR because of its connections with sustainability and its potential to integrate sustainability into business models (Guthrie et al., 2017). The results provide evidence that integrated reports are used by firms with stronger sustainability performance to signal commitment to IR values and superior performance over competitors (Clarkson et al., 2008; Lai et al., 2016), rather than to deflect or rationalise poor environmental and social performance (de Villiers & van Staden, 2011; Stacchezzini et al., 2016). Thereby, it may not be deliberate that the contents of integrated reports, especially in aspects related to sustainability performance, are positive when firms face declining or unstable financial performance.

This study also provides important considerations for standard setters and proponents of IR. While the IIRC (2010, 2013b) envisions IR as a global corporate norm that supports sustainable economic development and capital market stability, this vision may be difficult to achieve given the current trends in IR practices. Firms with weaker sustainability management are less likely to adopt IR; however, the sustainability management practices of these firms are expected to improve the most from integrating sustainability into business models and strategies. Furthermore, integrated reports may not be different from a firm's prior reporting practices or the reporting practices of non-IR firms (see also: Adams et al., 2016; Haji & Anifowose, 2016). Prior to adopting the IIRC Framework or preparing more connected disclosures, managers must improve the availability, accuracy and consistency of data and invest in updated information technology infrastructure (EY, 2014). Thereby, rather than

focusing on promoting the IIRC Framework, which concentrates on external reporting, there needs to be greater guidance and active support offered to reporting entities through the implementation process.

The remainder of the chapter is organised as follows. Section 4.2 develops the hypotheses. Section 4.3 describes the sample. Section 4.4 presents the empirical models and variable definitions. Section 4.5 reports the descriptive statistics and bivariate test results. Section 4.6 reports and discusses the results for the main analysis. Section 4.7 presents additional analyses to assess sensitivity and robustness of results. Section 4.8 concludes the chapter.

4.2 Hypothesis Development

The IR and voluntary disclosure literatures advance several firm, industry and country-level characteristics to explain why firms voluntarily provide information (see Chapter Two). Voluntary disclosure practices may be influenced by institutional, legitimacy and regulatory pressures (Brammer & Pavelin, 2006; Haji & Anifowose, 2017; Higgins et al., 2014; Lueg et al., 2016; Melloni et al., 2016), economic resources and capability, management and market performance, and financing decisions (Arguelles et al., 2016; Cahan et al., 2016; Dhaliwal et al., 2011; Serafeim, 2015). Prior studies have found environmental, social and governance (ESG) performance, corporate governance characteristics and ownership structure to influence reporting practices (Dhaliwal et al., 2011; Frías-Aceituno et al., 2013b; Lai et al., 2016; Xiao & Yuan, 2007). In addition, industry membership and environmentally sensitive classifications (de Villiers & Marques, 2016; Fasan & Mio, 2016), and cultural and institutional systems have been found to affect disclosure decisions (Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013).

As IR was introduced to improve existing reporting practices and encourages ideas such as connectivity and integrated thinking, preparation of an integrated report may be driven by a unique set of characteristics. Alternatively, IR could be a process that builds on existing reporting practices, where the decision to prepare an integrated report may be a function of factors that influence voluntary disclosure. The hypothesis development focuses on aspects considered central to IR.

4.2.1 Environmental and Social Performance and IR Initiation

The voluntary disclosure literature has established a relation between environmental and social performance and sustainability-related disclosures. There are, however, alternative arguments for the direction of the relationship. Arguments for a positive relationship suggest

reporters use voluntary disclosure to signal superior ESG performance over their competitors, leading to benefits such as lower cost of equity, higher sales and better corporate reputation (Boiral, 2013; Cahan et al., 2016). Clarkson et al. (2008) support this proposition, and found a positive association between environmental and social performance and the level of voluntary ESG disclosures. Similarly, Lai et al. (2016) found a positive association between higher ESG performance and the likelihood of preparing integrated reports.

Arguments for a negative relationship suggest managers employ voluntary disclosure as a legitimisation strategy or impression management. Legitimacy or reputational threats tend to drive sustainability reporting decisions in situations where corporate management are concerned with deflecting, obfuscating or rationalising their poor environmental and social performance (Cho, Laine, Roberts, & Rodrigue, 2015). Managers in firms with poor sustainability performance are incentivised to manipulate readers' perceptions about their performance (Stacchezzini et al., 2016). This is supported by de Villiers and van Staden (2011), which found firms with worse environmental performance are more likely to disclose information about environmental issues when compared to firms with better performance. For integrated reports, Melloni (2015) and Melloni et al. (2016) found a positive tone in intellectual capital disclosures when firms face declining financial performance, suggesting integrated reports resembled managerial opportunism and are used for impression management. As there are arguments supporting either direction, the first hypothesis is non-directional:

> *H1:* The likelihood that a firm will issue an integrated report is associated with their environmental and social performance

4.2.2 CSR Committee and IR Initiation

Board of directors serve two important functions: monitoring and resource provision. From an agency perspective, boards act as a monitoring and governance function, whereas from a resource provision perspective, boards provide essential resources or access to resources through linkages with the external environment (Hillman, Withers, & Collins, 2009; Pfeffer & Salancik, 2003). From a resource dependence perspective, board of directors benefit firms by providing advice and counsel, access to channels of information and links with external organisations, preferential access to resources, and legitimacy (Pfeffer & Salancik, 2003). The composition of a board indicates its ability to provide critical resources to a firm (Hillman et al., 2009). Thereby, firms with directors who possess knowledge, expertise and ties relevant for IR can reduce uncertainty and costs relating to the implementation of the IIRC Framework.

Establishment of a CSR committee indicates public recognition of the importance of sustainability responsibilities, and constitutes a commitment of human resources and organisational structures to CSR activities (Michelon & Parbonetti, 2012; Shaukat, Qiu, & Trojanowski, 2016). Michelon and Parbonetti (2012) found a positive association between the presence of a CSR committee and sustainability disclosures, suggesting CSR committees are an effective monitoring device for improving stakeholder engagement and sustainability disclosure policies. Similarly, Peters and Romi (2014) found that the existence of an environmental committee increased the likelihood of carbon emission disclosures. In relation to the public sector, Guthrie et al. (2017) found sustainability committees provided strategic direction and play a major role in the adoption of the IIRC Framework. The Framework was adopted to integrate sustainability into organisational activities, or because it appropriately reflects existing business activities. As there is a linkage between board characteristics and reporting strategies, and an expectation that CSR committees can support the preparation of an integrated report, the second hypothesis is stated as:

H2: The likelihood that a firm will issue an integrated report is positively associated with the presence of a CSR committee

4.2.3 Institutional Shareholding and IR Initiation

Integrated reports aim to improve information quality for capital providers by communicating a holistic view of value creation. Rerolle (2015) argued that long-term investors would be interested in integrated reports as these investors base investment decisions on long-term expectations of a firm, typically assessed by examining management quality and strength of business models. This argument is supported by Knauer and Serafeim (2014) and Serafeim (2015), which found IR practices attracted dedicated long-term investors.

Institutional investors are conceptually long-term investors as their primary goal relates to some long-term objective; however, investment decisions are influenced by assessment of shorter time horizons (Russell Investments, 2016). Investors consider both private and public information in investment appraisal, and while there is assessment of multiple aspects of business operations and performance, investment decisions are primarily financially focused and non-financial disclosures may be considered of little importance (EY, 2015b; Hsiao & Kelly, 2018; Krasodomska & Cho, 2017). Furthermore, investors may not need integrated reports as they could demand information privately or obtain information from third-party sources (Cohen, Holder-Webb, Nath, & Wood, 2011; Hsiao & Kelly, 2018; Saadouni & Simon, 2004). There are also arguments that IR's emphasis on disclosing information on value creation may not be supported by capital providers as some investors

gain a competitive advantage by being the only ones to recognise value in a stock (Stubbs et al., 2014). Additionally, integrated reports may be seen as an unnecessary reporting burden to report preparers if reporters are already engaging in similar reporting practices (Chaidali & Jones, 2017; Rowbottom & Locke, 2016).

While there is potential for integrated reports to communicate incremental information and be relevant to investment considerations, current evidence questions the usefulness of available integrated reports and the assumption that investors demand this information. Accordingly, the third hypothesis is stated in the null form:

H3: The likelihood that a firm will issue an integrated report is not associated with institutional shareholding

4.2.4 Media Coverage and IR Initiation

Disclosure strategies are shaped by the institutional environment, which is affected by media coverage (Dawkins & Fraas, 2011). A firm's vulnerability to pressure from external parties is affected by its size and media visibility (Brammer & Pavelin, 2006). Prior studies have not always identified a relationship between media coverage and voluntary disclosure. While Nikolaeva and Bicho (2011) found a firm's CSR-related media visibility were important determinants in adoption of the GRI guidelines, Brammer and Pavelin (2006) and Clarkson et al. (2008) did not identify a significant relationship between media coverage and voluntary disclosure.

As Higgins et al. (2014) and Melloni et al. (2016) suggest institutional pressure and reputation management are factors that drive managers to release an integrated report, there could be a relation between media coverage and initiation of integrated reports. Integrated reports may be issued as an ad hoc tool to alter the perceptions of relevant stakeholders and rationalise negative media sentiment. Following this argument, firms with negative media sentiment are expected to face greater pressure to issue an integrated report. Moreover, media coverage affects the level of external pressure a firm experiences as stakeholders take greater interest in visible firms (Dawkins & Fraas, 2011). Thereby, it is expected that highly visible firms experience greater social and political pressures to provide integrated reports. The reasoning above leads to the following hypotheses:

H4a: The likelihood that a firm will issue an integrated report is negatively associated with media sentiment

H4b: The likelihood that a firm will issue an integrated report is positively associated with media coverage

4.2.5 Board Skills and IR Initiation

A key function of the board is to define strategies that create value for shareholders; thereby, board of directors plays a central role in the adoption of the IIRC Framework. IR enables communication of the board's long-term vision and improves dialogue with stakeholders. The French Institute of Directors (2017) suggests board members must play a central role in implementing integrated thinking, drafting the integrated report, and participate in the management and monitoring process.

Board characteristics such as gender diversity and independence have been found to influence disclosure practices (Fasan & Mio, 2016; Frías-Aceituno et al., 2013b), suggesting individual skills and perception affects engagement in IR. Drawing on studies on investors' perspectives of non-financial information and the IIRC Framework, there was scepticism amongst financial analysts regarding the usefulness of the IIRC Framework and the potential for IR to stabilise capital markets (Perego et al., 2016; Stubbs et al., 2014). Financial analysts were typically not educated to analyse broader ESG information and their concerns regarding ESG issues are often limited to executive remuneration policy (Adams, 2017; Stubbs et al., 2014). Further, some considered non-financial information immaterial to decision-making due to difficulties in determining its relationship with financial performance, and issues with assurance and comparability (EY, 2015b; Hsiao & Kelly, 2018). These findings suggest that individuals who were not accustomed to non-financial information, or are sceptical about the benefits of the IR process, were less likely to use integrated reports.

Thereby, it is arguable that board members who have a strong finance or industry background may lack interest in IR and the Framework. Board members accustomed to a traditional financial paradigm may prioritise investment in other ideas over implementation of IR or reject the idea that investment in a diverse set of capitals adds value to the corporate bottom line. These arguments led to the fifth hypothesis:

> *H5:* The likelihood that a firm will issue an integrated report is negatively associated with financial and industry-related board skills

4.3 Sample

The sample of 214 firms comprises 107 IR firms and 107 non-IR firms. Independent *t*-tests show the IR firms excluded due to no matches were smaller and had a lower percentage of strong financial or industry specialised board members (see Section 3.4.1). Pairs excluded due to missing data were smaller and less visible in relation to media coverage and number of subsidiaries. Thereby, the sample is biased towards larger and more visible firms.

The sample spreads across 2011 to 2017, with initiation years concentrated in 2014 and 2015 (28.97% and 25.23%, respectively). According to SIC industry divisions, the sample is dominated by the manufacturing industry (46.73%), then the finance, insurance and real estate industries (18.69%) and transportation, communications, electric, gas and sanitary service industries (17.76%). The sample spreads across 23 countries with Japan accounting for the largest proportion (46.73%), followed by South Korea (6.54%). The sample attributes described above are consistent with the group of identified IR firms.

4.4 Empirical Models and Variable Definitions

To test the rationales behind voluntary IR, the models examine how characteristics in the previous year (*t*-1) motivate or deter the release of an integrated report in the current year (*t*). A focus on initiation year mitigates threats to internal validity that arises from historical events and, in conjunction with lead-lag modelling, mitigates the issue of reverse causality.

Equation 4.1 and Equation 4.2 are logistic regression models used to test the hypotheses. The model development process is described in Section 3.6.1.

$$\begin{aligned}\log[\text{prob}(IR_{i,t})/(1-\text{prob}(IR_{i,t}))] &= \beta_0 + \beta_1 ESP_{i,t-1} + \beta_2 GRI_{i,t-1} + \beta_3 OWNERSHIP_{i,t-1} \\ &+ \beta_4 MEDIA\_JFALL_{i,t-1} + \beta_5 BOARDSKILL_{i,t-1} \\ &+ \beta_6 BOARDSIZE_{i,t-1} + \beta_7 GENDIV_{i,t-1} + \beta_8 LEV_{i,t-1} \\ &+ \beta_9 LnSUBSIDIARY_{i,t-1} + \beta_{10} INTASSET_{i,t-1} \\ &+ \beta_{11} CONCENTRATE_{i,t-1} + \beta_{12} SENSITIVE_{i,t-1} \\ &+ \beta_{13} CULTURE\_MUL_{i,t-1} + \beta_{14} NATION\_VF_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (4.1)$$

$$\begin{aligned}\log[\text{prob}(IR_{i,t})/(1-\text{prob}(IR_{i,t}))] &= \beta_0 + \beta_1 BOARDCOM\_CSR_{i,t-1} + \beta_2 OWNERSHIP_{i,t-1} \\ &+ \beta_3 MEDIA\_JFALL_{i,t-1} + \beta_4 BOARDSKILL_{i,t-1} \\ &+ \beta_5 BOARDSIZE_{i,t-1} + \beta_6 GENDIV_{i,t-1} + \beta_7 LEV_{i,t-1} \\ &+ \beta_8 LnSUBSIDIARY_{i,t-1} + \beta_9 INTASSET_{i,t-1} \\ &+ \beta_{10} CONCENTRATE_{i,t-1} + \beta_{11} SENSITIVE_{i,t-1} \\ &+ \beta_{12} CULTURE\_MUL_{i,t-1} + \beta_{13} NATION\_VF_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (4.2)$$

The logistic regression model estimates the probability of issuing an integrated report based on the list of predictor variables. The dependent variable integrated report (*IR*) is an indicator variable equal to 1 for IR firms and 0 for non-IR firms.

For the main variables of interest, environmental and social performance (*ESP*) tests Hypothesis 1. *ESP* is the mean environmental score and social score from ASSET4[14]. A positive coefficient suggests that managers are incentivised to signal and communicate superior performance in order to realise its benefits. A negative coefficient suggests that poor sustainability performance incentivises managers to employ integrated reports as a legitimacy tool for reputation or impression management.

CSR committee (*BOARDCOM_CSR*) tests Hypothesis 2. *BOARDCOM_CSR* is an indicator variable equal to 1 if a firm has a CSR committee, and 0 otherwise. A positive coefficient is consistent with resource dependence theory and supports the hypothesis, suggesting firms with an established CSR committee monitors sustainability disclosure policies and have skills relevant to guide the implementation of IR.

Institutional ownership (*OWNERSHIP*) tests Hypothesis 3. *OWNERSHIP* measures the percentage of shares held by institutional shareholders. A positive coefficient supports the IIRC's assertion that sophisticated or long-term investors are a driver for IR practices. A negative coefficient suggests that institutional investors do not demand integrated reports, possibly viewing it as immaterial or an additional reporting burden. Alternatively, a non-significant result would suggest that there is no credible evidence to indicate a relationship between institutional ownership and IR initiation.

The media measures relate to Hypotheses 4. Media (*MEDIA_JFALL*) is based on the Janis-Fadner coefficient of imbalance and measures favourability of media coverage (Janis & Fadner, 1943). A negative coefficient supports Hypothesis 4a, suggesting that firms with unfavourable media coverage face greater pressure to legitimise their actions. In this situation, integrated reports were issued to justify management actions and performance. The media sentiment variable is substituted for general media coverage (*LnMEDIA_ALL*), which is the natural logarithm of the total number of articles that mentions firm *i* in the headlines during the fiscal period. A positive coefficient supports Hypothesis 4b, suggesting that firms with higher media coverage face greater political or legitimacy pressure due to visibility, and are more inclined to initiate integrated reports to mitigate external pressures.

Board skills (*BOARDSKILL*) tests Hypothesis 5. *BOARDSKILL* measures the percentage of board members who have either a strong financial background or an industry specific background. A negative coefficient supports the hypothesis that board members accustomed to a traditional financial paradigm may not support IR due to a lack of knowledge

[14] The environmental score reflects resource use, emissions and product innovation. The social score reflects working conditions, human rights, community and product responsibility. The scoring criterion does not include adoption of IR or the IIRC Framework.

regarding non-financial systems or scepticism about the idea that IR adds value to the corporate bottom line.

A number of control variables are included. *GRI* is an indicator variable equal to 1 if a firm applied GRI standards prior to year *t*, and 0 otherwise. Sustainability reporting is an essential element of IR (GRI, 2013), thereby managers may be more likely to engage in IR if the firm has established non-financial measurement and reporting practices (Guthrie et al., 2017). Board size (*BOARDSIZE*) measures the number of directors on the board of directors and gender diversity (*GENDIV*) reflects the percentage of female directors to total number of directors on the board. These corporate governance characteristics have been found to influence IR disclosure practices (Fasan & Mio, 2016; Frías-Aceituno et al., 2013b). Leverage (*LEV*) is total debt scaled by total assets. As debt reliance is commonly associated with greater risk, highly leveraged firms may disclose more information to satisfy the needs of lenders. Firms with high levels of debt are expected to incur higher monitoring costs and therefore managers will seek to reduce costs by disclosing more information (Dhaliwal et al., 2011; Xiao & Yuan, 2007).

Subsidiary (*LnSUBSIDIARY*) is the natural logarithm of the number of recorded subsidiaries and intangible assets (*INTASSET*) is intangible assets scaled by total assets. The number of subsidiaries is an indication of organisational and legal complexity (Meyer, Mudambi, & Narula, 2011). As IR is a process about managing organisational complexity, firms with a large number of subsidiaries may adopt IR to improve coordination and dissemination of knowledge. Intangible assets are a source for competitive advantages and are central to the value creation process. Integrated reports focus on communicating how non-financial and intangible assets relate to value creation over time; thereby, firms reliant on intangible assets in their operations may use IR to better understand and communicate the value of these assets. Proprietary costs can reduce disclosure incentives as competitors and external stakeholders can exploit publically disclosed information if it signals weakness or reveals competitive advantages (Clarkson et al., 2008; Graham et al., 2005). Industry concentration (*CONCENTRATE*) is based on the Herfindahl–Hirschman Index, calculated as the sum of squares of sales for firm *i* compared to other firms its respective industry and country. It is included as a proxy for market competition (Dhaliwal et al., 2011).

While non-IR firms are matched exactly on industry and country, industry and country specific characteristics are included to parse out potential confounding effects. Firms operating in environmentally sensitive industries (*SENSITIVE*) tend to disclose more non-financial information (Cahan et al., 2016; de Villiers & Marques, 2016). *SENSITIVE* is an indicator variable that equals 1 if firm *i* operates in an environmentally sensitive industry (SIC

codes of 800–899, 1000–1099, 1200–1399, 2600–2699, 2800–3099, 3300– 3399 and 4900–4999), and 0 otherwise (Cahan et al., 2016). In addition, prior studies found national culture and national institution influences disclosure practices (Cahan et al., 2016; Dhaliwal et al., 2012; García-Sánchez et al., 2013). The cultural dimensions proposed by Hofstede et al. (2010) are used as measures for national culture. As the cultural dimensions and national institution measures are highly correlated, principle component analysis was used for data reduction[15]. National culture (*CULTURE_MUL*) reflects the masculinity versus femininity, uncertainty avoidance index and long-term orientation versus short-term normative orientation dimensions. It has positive loadings for all dimensions. National institution (*NATION_VF*) reflects national voice and freedom. It has a negative loading for voice and accountability (*VOICE*) and positive loading for freedom of press (*FREEPRESS*).

4.5 Descriptive Statistics and Bivariate Tests

Table 4.1 presents descriptive statistics and bivariate test results. Consistent with resource dependence theory and signalling theory, firms that voluntarily adopt IR are significantly more likely to have a CSR committee ($\chi^2(1) = 14.34$, $p<0.01$) and better environmental and social performance (IR firms and non-IR firms, *ESP:* means = 81.03 and 68.50, $p<0.01$). Moreover, IR firms are more likely to have previously adopted the GRI guidelines ($\chi^2(1) = 7.84$, $p<0.01$). Consistent with the expectation that firms with greater social and political visibility are more likely to release integrated reports, IR firms have significantly greater media coverage and more subsidiaries (means for IR firms and non-IR firms, *LnMEDIA_ALL:* 6.76 and 6.26, $p<0.01$; *LnSUBSIDIARY:* 5.16 and 4.63; $p<0.01$). The results above are reflected in the correlation matrix reported in Table 4.2. The Mann-Whitney test shows that IR firms operate in relatively more concentrated industries compared to its matched counterpart (IR firms and non-IR firms, *CONCENTRATE:* medians = 0.01 and 0.00, $p<0.05$); however, both groups have a Herfindahl-Hirschman index below 0.15 and thereby operate in 'unconcentrated' industries (United States Department of Justice, 2015).

Multicollinearity is not a major problem in this study as indicated by the correlation analysis and the variance inflation factors (VIF). The highest VIF in both equations is for *CULTURE_MUL* (2.17), and the mean VIF is 1.46 for Equation 1 and 1.42 for Equation 2. Independent *t*-tests (see Section 3.4.1) indicate that the matching process was adequate in pairing IR firms with non-IR firms that are similar in size (*LnSIZE*), economic performance

[15] The Kaiser-Meyer-Olkin measure of sampling adequacy is above 0.7 and 0.6 for all variables included in national culture and national institution, respectively, justifying the use of principal component analysis.

(*ROA*) and growth potential (*MTB*), market and analyst-related measures (*SPP, BETA, WACC* and *COE*), and various corporate governance characteristics (*BOARDIND* and *GOV*).

Bivariate tests provide initial evidence of the characteristics that differentiate firms that engage in IR from matched non-IR firms. IR firms tend to have stronger performance in environmental and social matters, including engagement in GRI reporting and having a CSR committee. Moreover, IR firms have higher media coverage and number of foreign subsidiaries, suggesting greater social and political visibility on average.

4.6 Logistic Regression Results

4.6.1 Regression Results

Table 4.3 reports results of the regression analysis. All models have predictive power as they successfully classify 66.36% to 68.69% of observations, which is superior to a 50% accuracy by chance.

As predicted by Hypothesis 1, the likelihood of releasing an integrated report is influenced by a firm's environmental and social performance in the previous year. The results show that firms with higher environmental and social performance have a greater tendency to adopt the Framework and initiate integrated reports (Model 1: coeff. = 0.0228, $p<0.05$). A positive association suggests managers are incentivised to signal commitment to IR values and superior sustainability performance to relevant stakeholders in order to realise associated benefits. Thus, the odds of being an IR firm are 1.023 times higher for every one percentage point increase in prior year environmental and social performance score.

Model 2 shows that having a CSR committee is positively related to the tendency to issue an integrated report (coeff. = 1.607, $p<0.01$). This finding supports Hypothesis 2 and is consistent with the notion of resource dependence theory. Directors with connections, skills and expertise relevant to CSR management and reporting policies can support the preparation of an integrated report. Holding other factors constant, the odds of being an IR firm is 4.99 times higher for firms that have a CSR committee.

The analysis failed to detect any relationship between institutional shareholding and the likelihood of releasing an integrated report (Hypothesis 3). The direction of the relationship is negative; however, results are non-significant.

Similarly, the analysis suggests that there is insufficient evidence to support claims of a negative association between media sentiment and IR initiation (Hypothesis 4a) and a positive association between media coverage and IR initiation (Hypothesis 4b). However, subsample analysis on manufacturing firms and non-manufacturing firms provide support for Hypothesis 4b, showing that the effect of media coverage is dependent on industry

membership (Table 4.4, Panel A, Model 5; Panel B). An interaction plot (untabulated) shows that greater media coverage has a positive impact on the likelihood of releasing an integrated report for non-manufacturing firms, whereas it has a negative impact on manufacturing firms. Independent *t*-tests and chi-square tests show manufacturing firms have higher environmental and social performance (manufacturing and non-manufacturing, *ESP*: means = 81.46 and 68.89, $p<0.01$) and have a greater tendency to prepare sustainability reports using the GRI guidelines ($\chi^2(1) = 6.03$, $p<0.05$). Thereby, it is possible that the manufacturing firms in the sample experience less social and political pressure from media coverage due to greater engagement in sustainability-related practices. Taken together, these results show media coverage influences the decision to initiate IR for firms that have relatively weaker sustainability-related practices.

For Hypothesis 5, while there is a significant and negative relationship between board skills and IR initiation (Model 1: coeff. = -0.0144, $p<0.10$), this result is influenced by the proportion of Japanese firms in the sample (see Section 4.6.2).

For the control variables, the results show board size is negatively associated with the tendency to release an integrated report (Model 1: coeff. = -0.110, $p<0.05$). This finding contrasts resource dependence theory, which suggests that larger boards would benefit organisations through provision of different connections, skills and advice. However, this proposition is under the assumption that each extra appointment is of a resource-rich director that contributes different and relevant skills to the firm. The negative association shows increase in board size results in less effective functions. Jensen (1993) and Yermack (1996) suggest the optimal board size is seven to eight directors and eight to nine directors, respectively. The median board size of sample firms is 11. A board size beyond the optimal level is less likely to function effectively due to slower decision-making, biases against risk-taking and ease of control by the chief executive officer (Jensen, 1993; Yermack, 1996).

Furthermore, there is a positive association between the number of subsidiaries and the likelihood of releasing an integrated report (Model 1: coeff. = 0.305, $p<0.05$) and a negative association for intangible assets (Model 1: coeff. = -2.448, $p<0.05$). The subsidiary result is as expected as visible and more complex firms have greater incentives to adopt IR to mitigate legitimacy and political pressures or to manage organisational complexity. As intangible assets include innovation resources and relates to innovative capabilities of firms, detailed disclosures pertaining to technological capabilities could be sensitive information related to competitive advantages. Thereby, firms that already account for intangible assets in their financial statements may be less likely to disclose further detailed information in integrated reports due to disclosure costs. Whereas firms with less reported intangibles may

use integrated reports to communicate to capital providers about their intangibles that are not captured by traditional financial accounting.

While the significance of the association is not consistent across models, the results suggest the likelihood of IR initiation increases with higher industry concentration (Model 2: coeff. = 3.875, $p<0.05$) and decreases with greater national voice and freedom (Model 2: coeff. = 0.306, $p<0.05$). The former measure is a proxy for proprietary costs, and the results are supportive of the proprietary information argument. Firms in less competitive industries (high industry concentration) are exposed to lower risk from increased disclosure relative to firms that operate in competitive industries. Due to greater barriers of entry into the industry and lower disclosure costs, firms in industries with higher concentration are more likely to issue integrated reports. While the latter measure is included to control for confounding effects, the results show firms operating in countries with less voice and freedom use integrated reports to signal their trustworthiness and willingness to increase transparency.

4.6.2 IR in Japan

Results from the main analysis may be influenced by characteristics specific to Japanese firms, which account for 46.73% of the sample. Independent *t*-tests[16] (untabulated) comparing Japanese firms with non-Japanese firms show Japanese firms tend to have higher financial or industry-focused board skills, lower gender diversity and less board independence, which reflects lower aggregate corporate governance scores. Japanese firms are less likely to have an audit committee ($\chi^2(1) = 35.63$, $p<0.01$) and corporate governance committee ($\chi^2(1) = 43.65$, $p<0.01$). Japanese firms score lower on social score and integration of vision and strategy, which reflects the lower median score for environmental and social performance. Other differences include a relatively positive media sentiment and greater CSR-related media coverage. Japanese firms have more subsidiaries and lower firm performance, proportion of intangible assets and weighted average cost of capital. Significant differences in country-level institutions show freedom of expression is lower in Japan when compared to other countries, and Japan maintains a relatively collectivist and femininity culture. Independent *t*-tests[17] (untabulated) comparing IR firms and non-IR firms within each group show no significant

[16] Means for Japanese firms and non-Japanese firms, *BOARDSKILL*: 78.57 and 43.07, $p<0.01$; *GENDIV*: 2.24 and 14.35, $p<0.01$; *BOARDIND*: 28.31 and 79.33, $p<0.01$; *GOV*: 15.02 and 56.45, $p<0.01$; *SOC*: 67.90 and 77.18, $p<0.01$; *IVS*: 69.33 and 77.52, $p<0.05$; *MEDIA_JFALL*: 0.89 and 0.69, $p<0.01$; *MEDIA_JFCSR*: 0.90 and 0.52, $p<0.01$; *LnMEDIA_CSR*: 4.29 and 3.74; $p<0.01$; *LnSUBSIDIARY*: 5.12 and 4.71, $p<0.05$; *ROA*: 0.03 and 0.05, $p<0.05$; *INTASSET*: 0.06 and 0.16, $p<0.01$; *WACC*: 7.33 and 8.71, $p<0.01$; *NATION_VF*: 0.23 and -0.20, $p<0.05$; *CULTURE_MUL*: 1.38 and -1.21, $p<0.01$.

[17] Means for IR firms and non-IR firms, *ESP*: 84.52 and 68.90, $p<0.01$; *LnMEDIA_ALL*: 6.71 and 6.04, $p<0.01$; *LnMEDIA_CSR*: 4.19 and 3.28, $p<0.01$; *LnSUBSIDIARY*: 5.08 and 4.33, $p<0.01$.

differences for firms in Japan, while IR firms not based in Japan have significantly higher environmental and social performance, media coverage and number of subsidiaries.

Interaction analysis in Table 4.5, Panel A shows that the positive effect that environmental and social performance and CSR committee have on voluntary IR is lower for Japanese firms (Model 1 and Model 2). Further, the board skills result is driven by the Japanese sample as Japanese firms have on average a higher percentage of board members with a strong financial or an industry specific background compared to non-Japanese firms (Japan and non-Japan, *BOARDSKILL*: means = 78.57 and 43.07, $p<0.01$). Interaction analysis shows board skills loses statistical significance after interacting with the Japan dummy (Model 6). The subsample analysis on 100 Japanese firms and 114 non-Japanese firms in Table 4.5, Panel B indicate that the effects detected in the main analysis are not significant for Japanese firms, but are reflected in the non-Japanese sample. This is reflective of the bivariate results, which did not identify significant differences between characteristics of IR firms and non-IR firms in Japan. Thereby, Japanese firms may adopt the IIRC Framework for reasons not related to their observable firm characteristics.

The resource dependence perspective is applicable to the Japanese sample as both IR firms and non-IR firms tend to have a CSR committee and experience with GRI guidelines. However, this theory only partially explains the results. Adams et al. (2016) suggests integrated reports may not be radically different from a firm's prior reporting practices or the reporting practices of non-IR firms. This argument is applicable to firms in Japan, where there appears to be homogeneity in reporting practices amongst firms. Institutional theory posits that the reporting practices of firms that face the same set of environmental conditions resemble each other (DiMaggio & Powell, 1983). External social pressures and regulations reduce variations in organisational behaviour and reporting strategies (DiMaggio & Powell, 1983; Oliver, 1997). While CSR is a Western-led concept, CSR is arguably similar to values that already exist within Japanese firms, embedded in cultural mechanisms such as philosophy and corporate value (Fukukawa & Teramoto, 2008; Lewin, Sakano, Stephens, & Victor, 1995). Japanese firms have been leaders of CSR reporting (KPMG, 2011, 2017), and since 2005 there has been a growing number of firms that started to integrate their annual reports with their CSR report (Nikkei Business, 2012). There are many self-declared integrated reporters in Japan. Based on the list provided by Corporate Value Reporting Lab (2016), self-declared integrated reporters account for 48% (24/50) of non-IR firms in the Japanese sample. This suggests firms are implementing IR practices regardless of adopting the IIRC Framework and there may be little differences between IR firms and non-IR firms. Thereby, IR could be an institutionalised activity in Japan, which may not be driven by

economic or technical purposes, but are based on taken-for-granted assumptions about what constitutes appropriate behaviour (Oliver, 1997).

4.6.3 Early IR Adopters and Later IR Adopters

The IIRC launched a pilot test in 2010, inviting managers to begin putting the concepts and principles underlying the IIRC Framework into practice. The factors influencing adoption of the IIRC Framework could differ between firms that participated in the IIRC pilot programme and adopted the Framework concepts prior to the release of the Framework, and firms that initiated IR after the release of the IIRC Framework. As the Framework was released at the end of 2013, the sample is partitioned into early adopters (observations that relate to 2014 and earlier) and later adopters (observations that relate to 2015 and after).

Independent *t*-tests[18] (untabulated) comparing early adopters and later adopters show that early adopters have higher environmental and social performance, and are based in countries ranked lower in regulatory quality and higher in investor protection. Moreover, early adopters on average have a higher corporate governance score and cost of equity, and are more likely to have reported using GRI guidelines ($\chi^2(1) = 4.98$, $p<0.05$) and have an audit board committee ($\chi^2(1) = 68.55$, $p<0.01$). These results are reflected in comparisons of early IR adopters and later IR adopters (untabulated). Relative to later IR adopters, early IR adopters have higher social score, aggregate corporate governance score and cost of equity, and are based in countries ranked lower in regulatory quality. Based on a 0.10 significance level, early IR adopters also have higher environmental and social score, integrated vision and strategy score and more subsidiaries[19]. For both early adopters and later adopters, independent *t*-tests[20] (untabulated) show that IR firms have superior environmental and social performance compared to non-IR firms. For early adopters, IR firms also have higher media coverage and number of subsidiaries, and operate in relatively more concentrated industries.

Analysis using interaction terms (untabulated) did not indicate any differences between the two groups; however, regressions on subsamples indicate the characteristics driving IR initiation differs. Table 4.6 shows that the positive association for *BOARDCOM_CSR* is applicable to both groups. Apart from *ESP*, which is only statistically significant for later adopters, all other effects identified as significant in regressions based on

[18] Means for early adopters and later adopters, *ESP*: 78.50 and 69.41, $p<0.01$; *NATION_RRG*: -0.34 and 0.49, $p<0.01$; *NATION_INV*: 6.70 and 6.32, $p<0.01$; *GOV*: 42.51 and 29.32, $p<0.01$; *COE*: 12.20 and 10.22, $p<0.01$.

[19] Means for early IR adopters and later IR adopters, *ESP*: 83.66 and 77.24, $p<0.10$; *IVS*: 82.01 and 75.15, $p<0.10$; *LnSUBSIDIARY*: 5.37 and 4.86, $p<0.10$.

[20] Means for IR firms and non-IR firms: *ESP* (early adopters), 83.67 and 73.34, $p<0.01$; *ESP* (later adopters): 77.24 and 61.57, $p<0.01$; *LnMEDIA_ALL* (early adopters): 6.83 and 6.22, $p<0.01$; *LnSUBSIDIARY* (early adopters): 5.37 and 4.67, $p<0.01$; *CONCENTRATE* (early adopters): 0.06 and 0.03, $p<0.05$.

the whole sample are attributable to early adopters. Taken together, the bivariate and multivariate results show that firms with established sustainability foundations and relatively strong sustainability performance are more likely to adopt IR voluntarily. This finding supports the notion that IR builds on existing sustainability practices and is likely a process rather than a point-in-time change.

One possible explanation for the different results between early adopters and later adopters is the different sample size and statistical power of the two groups. Based on the variables tested, there are few differences between early IR adopters and later IR adopters at the 0.05 significance level. This finding suggests that, regardless of when firms adopt IR, IR firms share similar firm-level characteristics. The sample size for later adopters (88) is smaller when compared to the sample size of early adopters (126), which may have resulted in lower statistical power, where only large differences between IR firms and matched non-IR firms were detected.

Another possible explanation for the differences is that the circumstances and motives differed between early IR adopters and later IR adopters. Early IR adopters could have been invited by the IIRC to participate in their pilot programme due to their reputation or management practices, or actively chose to participate in attempt to improve management and reporting practices, differentiate from peers, or to take part in the development of the Framework (IIRC, 2011a, 2011b, 2013a). Notwithstanding the year differences, early IR adopters tend to have stronger sustainability performance relative to later IR adopters and have been acknowledged to use best management practices. Thereby, these firms may have been invited to participate in the IIRC pilot programme as they had a socially responsible reputation and their operations were reflective of IR values, or these firms may have chosen to participate in this initiative in attempt to manage organisational complexity that arise from more complex organisational structures. While these explanations are possible, the analysis does not rule out the possibility that unobservable characteristics, such as networks and associations, separate early IR adopters from later IR adopters.

4.6.4 Extension of Lagged Period

Surveys on self-declared IR firms in Japan showed that the time between implementing IR and the release of an integrated report could range from one year to 12 years (Corporate Value Reporting Lab, 2016). Based on the survey, firms commonly initiate and report within two fiscal years. Analysis of the reported survey data shows the mode is one year and median is two years. Thereby, how characteristics two years prior to the initiation year (t-2) influence the release of an integrated report in the current year (t) is examined.

The model selection process was rechecked for analysis on a two-year lag period using the same firms in the sample. Apart from share price performance (*SPP*), the other variables tested in Section 3.6.1 did not improve model fit. Table 4.7 report the regression results after setting independent variables at a two-year lag. The findings for Hypothesis 1 and Hypothesis 2 remain robust as the results show a positive association between *ESP* and *BOARDCOM_CSR* and the likelihood of releasing an integrated report. Further, there is support for Hypothesis 4a as reflected by a significant negative association between media sentiment and the tendency to release an integrated report. Firms could be influenced by poor media sentiment and decide to engage in IR to improve their legitimacy. In this instance, external media pressure driving IIRC Framework adoption may take longer to filter through to adoption than internal factors such as ESP and board characteristics.

4.7 Additional Analyses

4.7.1 Influential Observations, Winsorisation and Fixed Effect Dummies

Table 4.8 tests the sensitivity of results to influential observations and outliers. The relationships identified in the main analysis are strengthened after removal of influential observations[21]. The interpretations remain unchanged, with variables increasing in statistical significance. The results of the main analysis are robust to winsoring continuous variables on the 1st and 99th percentile.

Table 4.9 reruns the main analysis using industry and country fixed effect dummies (FE). While inclusion of FE likely overfit the models, it could allow for more variance in the data and control for confounding effects. The classification percentage increases by 3.74% to 5.61% compared to the main regression results. For the main variables of interest, institutional shareholding and media measures become statistically significant. The negative association between *OWNERSHIP* and *IR* suggests institutional shareholders may not consider integrated reports as material to decision-making and see it as unnecessary costs to report preparers (Hypothesis 3). The direction of the media variables is consistent with Hypothesis 4a and Hypothesis 4b. For the control variables, there are instances where *BOARDSIZE* becomes non-significant (Model 1 and Model 2), while *GENDIV* becomes significant with a positive association.

4.7.2 Alternative Models and Variables

Table 4.10 presents stepwise regression analysis testing alternative measures excluded during the model development process (see Section 3.6.1). For variables tested in the main analysis,

[21] Observations with a deviance residual above 2.0 or below -2.0 were removed.

the direction of the coefficients remains consistent regardless of the variables added or substituted. In comparison with alternative models, the model used in the main analysis is a relatively good fit for the data when considering the measures of model fit and predictive power. The pseudo R^2 is similar across models, ranging from 0.173 to 0.231. There are instances where substituting or adding a variable increased classified percentage; however, the change in AIC does not support the inclusion of the variable. For instance, including *LnSIZE* increases the classified percentage by 2.34%, but an increase in AIC by 4.5 does not justify its inclusion (Panel C, Model 20). Inclusion of *EARNSURP* decreases the AIC by a 7.6, but decreased classification percentage by 0.79% (Panel D, Model 27).

The results are robust to alternative measures of *ESP* and substituting general media measures with CSR-related media variables. For environmental and social performance, firms with a higher environmental score (*ENV*) and social score (*SOC*) are more likely to release an integrated report. For media measures, CSR-related media variables are non-significant. Integration vision and strategy score (*IVS*) is also tested as this measure reflects the idea of integrated thinking. It measures the level of integration of economic, environmental and social dimensions into corporate strategy and day-to-day decision-making. The results show firms with a higher *IVS* score are more likely to release an integrated report.

Additionally, *GRI* becomes significant without *ESP*, but the pseudo R^2 and classified percentage decreases by 0.040 and 3.74%, respectively. While *GRI* can partially capture the effects of *ESP*, it is a relatively poor proxy for non-financial practices. Furthermore, individual analysis of national culture shows a significant influence of masculinity on IR initiation (Panel E, Model 33).

Notably, there are instances where predictors significant in the main analysis lose significance when testing on alternative model specifications. This could indicate a failure to control for confounding effects with the exclusion of certain variables. For example, *LnSUBSIDIARY* lose significance when substituting general media sentiment with general media coverage (Panel A, Model 4), possibly because both *LnSUBSIDIARY* and *LnMEDIA_ALL* are reflective of firm size, and *INTASSET* lose significance when testing alternative corporate governance characteristics (Panel B, Model 15 and Model 16).

The results remain robust to partitioning the sample into financial firms and non-financial firms. Regression analysis (untabulated) interacting the finance industry dummy (*FINANCE*) with the main variables of interest does not alter main results and returns the dummy and any interactions as non-significant. Further, industry splits show the results for the non-financial firms remain robust. For financial firms, due to a large number of dependent

variables relative to the number of observations, there are not enough degrees of freedom and no meaningful results were returned.

4.7.3 Tests of Simultaneity

Lead-lag models may not be adequate in addressing the problem of simultaneity for the variable *ESP* if environmental and social performance is sticky within firms. As IR is incomplete without sustainability management and reporting (GRI, 2013), the variables *ESP* and *IR* could be jointly determined. Analysis on changes in *ESP* on data ranging from *t*-10 to *t*+5 relative to the IR initiation year show that, on average, there are no drastic changes in *ESP* and the score increases by approximately two points annually for both IR firms and non-IR firms (see also: Appendix C, Figure C6).

While the variable *ESP* face issues with endogeneity, the finding that IR initiation is influenced by sustainability management and reporting practices remain supported by *BOARDCOM_CSR* and *GRI*. Exclusion of *ESP* from Equation 1 decreases pseudo R^2 by 4% and classified percentage by 3.74%. *GRI* becomes significant with a positive association for all tests ($p<0.05$), suggesting *GRI* partially captures the effects of *ESP*, but is a relatively poor proxy for non-financial practices.

4.7.4 Alternative Matches

Alternative matches are tested to assess model generalisability and sensitivity of the results to the match specification. Seven alternative samples are tested, comprising matches based on ASSET4 and Worldscope, and using four industry classifications, two-digit GICS, four-digit GICS, two-digit SIC and three-digit SIC. The main analysis and additional tests were based on the two-digit SIC classification matched using the ASSET4 universe. In comparison with the main sample, for matches using ASSET4, 41.81% (97/232) of the two-digit GICS sample, 35.09% (80/228) of the four-digit GICS sample and 26.47% (45/170) of the three-digit SIC sample are different firms. For matches using Worldscope, 42.86% (90/210) of the two-digit GICS sample, 37.50% (78/208) of the four-digit GICS sample, 4.12% (8/194) of the two-digit SIC sample, and 26.62% (41/154) of the three-digit SIC sample are different firms.

Table 4.11 shows the characteristics that differ between IR firms and non-IR firms are similar regardless of the match. The main sample has the least differences between IR firms and non-IR firms when compared to other matches. Notably, matches on GICS codes have additional differences in *MEDIA_JFCSR*, *GOV*, *OWNERSHIP_INS*, *LISTING*, *MTB* and *ROA*. Moreover, matches on three-digit SIC do not match closely on *LnSIZE*, and there are significant differences in *BOARDSKILL*, *GENDIV*, *OWNERSHIP_INS* and *LISTING*.

Table 4.12 reports replications of the full sample analysis using alternative matches. The classification percentage ranges from 66.36% to 67.29%. For the key variables of interest, there remains strong support for Hypothesis 1 (environmental and social performance) and Hypothesis 2 (CSR committee). *ESP* and *BOARDCOM_CSR* are significant and positively associated predictors regardless of the match. Alternative matches (A4GICS2 and A4SIC3) provide evidence of a negative association between institutional ownership and IR initiation; however, this result is not consistent (Hypothesis 3). While the results for Hypothesis 4b (media coverage) is consistent, the results for Hypothesis 4a (media sentiment) is unstable. The direction of the coefficient for *MEDIA_JFALL* switched from negative to positive (A4GICS4, A4SIC3, WSGICS2 and WSGICS4), which is contrary to the findings of the main analysis. *BOARDSKILL* lose significance for matches on GICS classifications. For control variables, matches on GICS classifications returned non-significant results for board size, intangible assets and national institution. For matches on three-digit SIC, *INTASSET* lose significance while *GENDIV* becomes significant.

Overall, the results are not sensitive to the databases used, but are sensitive to matches on different industry classifications. While matching on GICS classifications resulted in a larger sample size, matching on SIC classifications led to fewer discrepancies between IR firms and matched non-IR firms. As the resulting control groups matched on SIC classifications are similar to the treatment group in terms of size, performance, cost of equity, media characteristics and corporate governance characteristics, it is less likely that the models assessed will produce biased and inconsistent estimates.

4.8 Summary

This chapter examines the determinants of voluntary IIRC Framework adoption, assessing characteristics that motivate and deter voluntary IR. The results provide evidence that environmental and social performance and the presence of a CSR committee are important determinants to the adoption of the IIRC Framework and release of an integrated report. While the study finds no consistent evidence to suggest a relationship between institutional shareholding and IR initiation, there is weak evidence that greater media coverage increase the likelihood of IR and media sentiment influence IR initiation.

The findings that sustainability-related factors influence voluntary IIRC Framework adoption is only applicable to firms not based in Japan. For non-Japanese firms, there are notable differences between the sustainability performance and organisational visibility of IR firms and non-IR firms. Firms without a CSR committee or have relatively lower sustainability performance are less likely to adopt the IIRC Framework and issue integrated

reports. In order to make progress towards financial stability and sustainability development, reporters that are not engaging in IR practices need to be involved in the IR movement. Hence, there needs to be greater incentives and active support for reporters with relatively weak sustainability management for them to engage in IR practices.

Unique results are obtained for Japanese firms as no statistically significant differences were found between Japanese IR firms and non-IR firms, suggesting unobservable characteristics influence voluntary IIRC Framework adoption. While the results do not show what drives voluntary IIRC Framework adoption in Japan, the study found voluntary IR firms are currently concentrated in Japan and it appears that Japanese firms are engaging in IR practices regardless of adopting the Framework. For Japanese firms, it is possible that the disclosure practices of IR firms and non-IR firms are similar. Therefore, it is important to consider whether adoption of the IIRC Framework is beneficial relative to general integrated disclosure practices.

This study contributes to the IR literature by examining the characteristics that differ between firms that voluntarily issue integrated reports and firms that do not signal adoption of the IIRC Framework. The findings show that IR initiation builds on existing sustainability practices. IR is the next step in environmental and social reporting, and established sustainability management and reporting practices enables easier transition to IR. Moreover, while social and political visibility, legitimacy pressures and firm reputation are factors that influence voluntary IIRC Framework adoption, IR is likely part of a firm's sustainability strategy rather than used as a legitimacy tool to deflect poor performance. The new insights on the factors that motivate and deter preparation of an integrated report have important implications for standard setters and future research.

A number of limitations are worth noting. First, the sample is biased towards larger and more visible firms due to data limitations. Second, it is important to note that the confidence intervals are wide and any conclusions about economic effects drawn from the data need to be replicated with a larger sample size. However, despite wide confidence intervals, the bounds of the intervals for significant variables are consistent with the direction of the estimated coefficients. Third, while results from subsample analysis extended the findings from the main analysis, it is possible that changes in significance are due to a reduced sample size. The variables that lost significance may still influence IR initiation; however, the effect is not large enough to be detected.

Notwithstanding these limitations, the findings from the study provide new insights into IR and identify avenues for future research. There are many possible determinants of voluntary IR and this study only assessed a subset of possible factors. For instance,

managerial behaviour and organisational culture influence disclosure, and intentions to improve interdepartmental synergy or to deal with information overload could incentivise managers to adopt IR. While these characteristics are difficult to measure, they are potentially important determinants and are aspects to examine for future research. Further, the characteristics that influence early adopters differ from later adopters. Therefore, studies could assess the influences of networks and associations with the GRI or members of the IIRC on early IIRC Framework adoption. As differences in disclosure practices and contents vary on a country level, it would be worthwhile to assess the impacts adoption of the IIRC Framework has on disclosure and decision-making in different countries.

Table 4.1: Descriptive statistics and bivariate test results

Panel A: Descriptive statistics and independent *t*-tests

	All (n = 214)			IR Firms (n = 107)					Matched Firms (n = 107)					*t*-test	M-W
Variable	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
$BOARDSKILL_{t-1}$	59.66	60.00	25.70	57.42	57.14	25.86	0.00	100.00	61.90	64.29	25.47	5.26	100.00	0.203	0.199
$OWNERSHIP_{t-1}$	51.29	50.67	22.06	50.03	49.07	19.64	7.08	100.00	52.55	52.01	24.27	1.10	100.00	0.405	0.358
ESP_{t-1}	74.76	86.77	23.37	81.03	88.69	18.26	8.80	95.86	68.50	79.17	26.18	8.79	94.58	0.000	0.001
$MEDIA\_JFALL_{t-1}$	0.79	0.93	0.30	0.76	0.90	0.31	-0.06	1.00	0.81	0.96	0.29	-0.07	1.00	0.267	0.219
$LnMEDIA\_ALL_{t-1}$	6.51	6.46	1.27	6.76	6.62	1.14	3.47	9.51	6.26	6.33	1.34	0.00	9.45	0.004	0.013
$BOARDSIZE_{t-1}$	11.36	11.00	3.92	11.29	11.00	3.74	5.00	25.00	11.44	11.00	4.11	3.00	26.00	0.781	0.973
$GENDIV_{t-1}$	8.69	0.00	11.33	9.49	5.26	11.75	0.00	40.00	7.89	0.00	10.89	0.00	45.45	0.305	0.338
LEV_{t-1}	0.26	0.25	0.17	0.27	0.26	0.16	0.00	0.79	0.25	0.24	0.17	0.00	0.76	0.433	0.389
$LnSUBSIDIARY_{t-1}$	4.90	4.91	1.35	5.16	5.09	1.35	1.61	8.27	4.63	4.58	1.30	1.61	7.84	0.004	0.003
$INTASSET_{t-1}$	0.12	0.04	0.15	0.11	0.06	0.13	0.00	0.54	0.12	0.03	0.18	0.00	0.77	0.494	0.707
$CONCENTRATE_{t-1}$	0.04	0.00	0.10	0.05	0.01	0.11	0.00	0.74	0.03	0.00	0.09	0.00	0.73	0.069	0.025
$CULTURE\_MUL_{t-1}$	0.00	0.10	1.44	0.00	0.10	1.44	-3.04	1.38	0.00	0.10	1.44	-3.04	1.38	1.000	1.000
$NATION\_VF_{t-1}$	0.00	0.16	1.29	0.00	0.16	1.30	-3.55	4.85	0.00	0.16	1.30	-3.55	4.85	1.000	1.000
ENV_{t-1}	76.68	88.38	23.67	82.51	89.58	17.96	13.53	94.90	70.86	84.28	27.11	8.66	94.71	0.000	0.003
SOC_{t-1}	72.84	84.63	25.85	79.54	87.51	20.63	4.06	97.43	66.14	77.13	28.76	6.52	96.40	0.000	0.003
IVS_{t-1}	73.69	84.74	23.97	79.19	86.41	19.17	9.32	93.64	68.20	79.34	26.95	9.54	94.39	0.001	0.005
$MEDIA\_JFCSR_{t-1}$	0.69	1.00	0.47	0.71	1.00	0.48	-1.00	1.00	0.68	1.00	0.46	-1.00	1.00	0.634	0.866
$LnMEDIA\_CSR_{t-1}$	3.99	4.05	1.55	4.26	4.41	1.44	0.69	7.50	3.73	3.87	1.62	0.00	7.75	0.013	0.028
$BOARDIND_{t-1}$	55.49	60.00	30.76	56.60	60.00	30.00	0.00	100.00	54.38	60.00	31.60	0.00	100.00	0.599	0.514
GOV_{t-1}	37.09	24.62	30.64	39.53	30.56	31.03	1.68	95.67	34.64	22.05	30.21	1.54	94.23	0.244	0.248
$OWNERSHIP\_INS_{t-1}$	1.25	0.07	6.46	0.82	0.05	5.21	0.00	52.70	1.67	0.07	7.51	0.00	62.46	0.341	0.156
$LISTING_{t-1}$	5.88	6.00	3.02	6.25	6.00	3.13	1.00	16.00	5.50	6.00	2.87	1.00	14.00	0.070	0.103
$LnSUBSIDIARY\_FOR_{t-1}$	3.50	3.68	1.75	3.83	4.08	1.80	0.00	7.40	3.16	3.22	1.64	0.00	7.43	0.005	0.003
$LnSIZE_{t-1}$	9.03	8.99	1.13	9.13	9.06	1.07	6.69	12.19	8.94	8.93	1.18	4.08	12.27	0.225	0.258
MTB_{t-1}	2.77	1.47	6.74	2.68	1.39	6.45	0.17	48.26	2.85	1.55	7.05	0.02	72.86	0.849	0.091
ROA_{t-1}	0.04	0.03	0.06	0.04	0.03	0.05	-0.13	0.26	0.05	0.04	0.06	-0.18	0.38	0.164	0.130
SPP_{t-1}	0.01	0.03	0.22	0.00	0.01	0.22	-0.58	0.43	0.02	0.04	0.22	-0.59	0.60	0.629	0.482
$BETA_{t-1}$	1.00	0.98	0.49	1.05	1.03	0.52	-0.18	2.69	0.95	0.95	0.45	0.17	2.37	0.148	0.146
$WACC_{t-1}$	8.07	7.79	3.23	8.02	7.76	3.12	1.30	22.38	8.12	7.83	3.34	0.77	24.96	0.827	0.772
COE_{t-1}	11.38	10.94	3.12	11.67	11.00	3.37	5.88	27.49	11.10	10.71	2.84	4.79	25.29	0.184	0.335
$CULTURE\_PDI_{t-1}$	52.94	54.00	11.46	52.94	54.00	11.49	18.00	93.00	52.94	54.00	11.49	18.00	93.00	1.000	1.000
$CULTURE\_IDV_{t-1}$	52.98	46.00	20.62	52.98	46.00	20.67	18.00	91.00	52.98	46.00	20.67	18.00	91.00	1.000	1.000
$CULTURE\_MAS_{t-1}$	69.57	70.00	26.97	69.57	70.00	27.03	5.00	95.00	69.57	70.00	27.03	5.00	95.00	1.000	1.000
$CULTURE\_UAI_{t-1}$	75.86	92.00	23.27	75.86	92.00	23.33	8.00	99.00	75.86	92.00	23.33	8.00	99.00	1.000	1.000
$CULTURE\_LTO_{t-1}$	70.88	87.91	23.08	70.88	87.91	23.14	21.16	100.00	70.88	87.91	23.14	21.16	100.00	1.000	1.000
$CULTURE\_IVR_{t-1}$	47.04	41.74	13.93	47.04	41.74	13.96	16.96	77.68	47.04	41.74	13.96	16.96	77.68	1.000	1.000

Panel A (continue): Descriptive statistics and independent *t*-tests

	All (n = 214)			IR Firms (n = 107)					Matched Firms (n = 107)					*t*-test	M-W
Variable	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
$CULTURE\_PII_{t-1}$	0.00	-0.51	1.63	0.00	-0.51	1.63	-3.83	3.48	0.00	-0.51	1.63	-3.83	3.48	1.000	1.000
$NATION\_RRG_{t-1}$	0.00	0.27	1.70	0.00	0.27	1.70	-6.39	2.35	0.00	0.27	1.70	-6.39	2.35	1.000	1.000
$NATION\_INV_{t-1}$	6.54	6.50	0.92	6.54	6.50	0.92	4.30	9.00	6.54	6.50	0.92	4.30	9.00	1.000	1.000

Panel B: Cross-tabulations and tests of independence

$SENSITIVE_{t-1}$			
IR	N	Y	Total
0	72	35	107
	(67.29)	(32.71)	(100)
1	71	36	107
	(66.36)	(33.64)	(100)
Pearson $\chi^2(1) = 0.021$, p = 0.885			
Likelihood-ratio $\chi^2(1) = 0.021$, p = 0.885			
Fisher's exact = 1.000			

$IFRS_{t-1}$			
IR	GAAP	IFRS	Total
0	52	55	107
	(48.6)	(51.4)	(100)
1	46	61	107
	(42.99)	(57.01)	(100)
Pearson $\chi^2(1) = 0.678$, p = 0.410			
Likelihood-ratio $\chi^2(1) = 0.678$, p = 0.410			
Fisher's exact = 0.493			

$BOARDCOM\_AUD_{t-1}$			
IR	N	Y	Total
0	26	81	107
	(24.3)	(75.7)	(100)
1	21	86	107
	(19.63)	(80.37)	(100)
Pearson $\chi^2(1) = 0.682$, p = 0.409			
Likelihood-ratio $\chi^2(1) = 0.683$, p = 0.409			
Fisher's exact = 0.509			

$LITIGATION_{t-1}$			
IR	N	Y	Total
0	90	17	107
	(84.11)	(15.89)	(100)
1	90	17	107
	(84.11)	(15.89)	(100)
Pearson $\chi^2(1) = 0.000$, p = 1.000			
Likelihood-ratio $\chi^2(1) = 0.000$, p = 1.000			
Fisher's exact = 1.000			

GRI_{t-1}			
IR	N	Y	Total
0	43	64	107
	(40.19)	(59.81)	(100)
1	24	83	107
	(22.43)	(77.57)	(100)
Pearson $\chi^2(1) = 7.844$, p = 0.005			
Likelihood-ratio $\chi^2(1) = 7.925$, p = 0.005			
Fisher's exact = 0.008			

$BOARDCOM\_CSR_{t-1}$			
IR	N	Y	Total
0	32	75	107
	(29.91)	(70.09)	(100)
1	10	97	107
	(9.35)	(90.65)	(100)
Pearson $\chi^2(1) = 14.338$, p = 0.000			
Likelihood-ratio $\chi^2(1) = 14.941$, p = 0.000			
Fisher's exact = 0.000			

$BOARDCOM\_CG_{t-1}$			
IR	N	Y	Total
0	83	24	107
	(83)	(22.43)	(100)
1	84	23	107
	(78.5)	(21.5)	(100)
Pearson $\chi^2(1) = 0.027$, p = 0.869			
Likelihood-ratio $\chi^2(1) = 0.027$, p = 0.869			
Fisher's exact = 1.000			

$LEGAL_{t-1}$			
IR	Civil	Common	Total
0	87	20	107
	(81.31)	(18.69)	(100)
1	87	20	107
	(81.31)	(18.69)	(100)
Pearson $\chi^2(1) = 0.000$, p = 1.000			
Likelihood-ratio $\chi^2(1) = 0.000$, p = 1.000			
Fisher's exact = 1.000			

Table 4.1 reports descriptive statistics and bivariate test results for IR firms and matched non-IR firms. Panel A reports descriptive statistics for continuous variables and associated tests for differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). Panel B reports cross-tabulations for categorical variables and tests of independence using Pearson chi-square, the likelihood-ratio chi-square and Fisher's exact test. Row percentages are reported in the parenthesis. Variables are as defined in Section 3.5.

Table 4.2: Correlation matrix

Panel A: Main variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) IR		**0.229**	**0.192**	**0.259**	-0.063	-0.084	**0.170**	-0.088	0.002	0.066	0.059	**0.203**	0.026	0.010	**0.154**	0.000	0.000
(2) ESP	**0.269**		**0.465**	**0.535**	0.041	-0.102	**0.339**	-0.184	0.252	0.131	0.093	**0.253**	0.134	0.130	**0.158**	-0.080	**-0.139**
(3) GRI	**0.192**	**0.481**		**0.326**	-0.094	-0.031	**0.273**	-0.046	**0.147**	-0.024	0.133	0.133	0.035	0.091	**0.200**	0.069	0.132
(4) BOARDCOM_CSR	**0.259**	**0.631**	**0.326**		0.124	-0.123	**0.308**	0.026	0.067	0.025	0.101	**0.312**	0.072	0.048	0.079	0.118	-0.116
(5) OWNERSHIP	-0.057	0.053	-0.117	**0.143**		0.078	-0.131	-0.059	0.029	**0.158**	0.108	0.080	**0.181**	-0.027	-0.063	**-0.181**	-0.046
(6) MEDIA_JFALL	-0.076	-0.036	0.067	0.002	0.054		**-0.295**	**0.233**	**-0.209**	**-0.354**	-0.014	**-0.249**	-0.129	-0.054	**-0.299**	**0.211**	**0.177**
(7) LnMEDIA_ALL	**0.197**	**0.345**	**0.247**	**0.291**	-0.075	-0.101		-0.010	**0.313**	0.040	0.059	**0.406**	0.106	0.116	**0.182**	**0.204**	0.016
(8) BOARDSKILL	-0.087	-0.109	-0.040	0.025	-0.031	**0.281**	-0.023		-0.106	**-0.485**	-0.109	0.017	**-0.322**	**-0.143**	**-0.153**	**0.600**	**0.273**
(9) BOARDSIZE	-0.019	**0.224**	0.132	0.076	-0.059	**-0.142**	**0.272**	-0.127		0.074	0.116	**0.285**	-0.099	-0.101	0.118	0.042	0.002
(10) GENDIV	0.071	0.066	-0.036	0.030	**0.168**	**-0.349**	0.028	**-0.464**	0.028		0.099	0.129	**0.335**	0.072	**0.142**	**-0.594**	**-0.559**
(11) LEV	0.054	0.041	0.097	0.078	0.112	-0.009	0.080	-0.094	0.120	0.034		0.086	0.040	0.100	**0.186**	**-0.159**	0.021
(12) LnSUBSIDIARY	**0.196**	**0.303**	0.106	**0.332**	0.068	**-0.193**	**0.397**	0.035	**0.253**	0.126	0.071		0.121	**-0.189**	**0.337**	0.098	**-0.270**
(13) INTASSET	-0.047	0.073	-0.001	0.073	**0.231**	**-0.165**	0.092	**-0.374**	-0.066	**0.474**	0.027	0.119		**0.157**	0.104	**-0.300**	**-0.174**
(14) SENSITIVE	0.010	**0.165**	0.091	0.048	-0.012	-0.053	0.121	**-0.150**	-0.048	0.046	0.101	**-0.176**	0.101		-0.133	**-0.165**	-0.020
(15) CONCENTRATE	0.125	0.043	-0.025	-0.066	0.028	**-0.201**	-0.015	-0.062	0.048	**0.144**	0.044	**0.195**	0.088	-0.070		**-0.239**	**-0.164**
(16) CULTURE_MUL	0.000	-0.020	0.074	0.098	**-0.189**	**0.266**	**0.178**	**0.575**	0.044	**-0.590**	**-0.139**	0.104	**-0.351**	**-0.156**	**-0.205**		**0.373**
(17) NATION_VF	0.000	-0.056	**0.148**	-0.114	-0.024	**0.164**	0.003	**0.239**	0.061	**-0.410**	0.043	**-0.251**	**-0.188**	0.000	**-0.180**	**0.249**	

Panel B: Additional variables

	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)
(1) IR	**0.202**	**0.204**	**0.194**	0.012	**0.151**	0.045	0.079	0.056	0.056	-0.011	-0.097	0.112	**0.200**	0.078	-0.116	-0.104
(2) ESP	**0.817**	**0.924**	**0.620**	0.077	**0.316**	**0.156**	**0.319**	0.107	**0.251**	0.130	**-0.179**	**0.378**	**0.332**	**0.302**	0.064	0.029
(3) GRI	**0.377**	**0.454**	**0.387**	0.047	**0.227**	0.044	0.067	0.047	**0.153**	-0.031	**-0.393**	0.095	**0.159**	**0.245**	-0.052	-0.051
(4) BOARDCOM_CSR	**0.524**	**0.472**	**0.526**	0.132	**0.333**	-0.019	**0.206**	**-0.147**	**0.164**	0.063	**-0.155**	**0.348**	**0.306**	**0.242**	-0.025	-0.021
(5) OWNERSHIP	-0.004	0.086	0.037	-0.121	-0.116	0.103	**0.303**	-0.036	0.079	**0.223**	0.088	0.007	0.034	0.066	**0.271**	**0.165**
(6) MEDIA_JFALL	-0.059	**-0.135**	-0.121	**0.274**	**-0.323**	**-0.342**	**-0.251**	**-0.174**	**-0.152**	**-0.306**	0.035	**-0.273**	**-0.193**	**-0.213**	0.096	0.106
(7) LnMEDIA_ALL	**0.350**	**0.275**	**0.322**	0.133	**0.741**	0.040	0.103	**-0.142**	0.088	0.066	**-0.311**	**0.454**	**0.427**	**0.462**	**-0.196**	-0.050
(8) BOARDSKILL	-0.014	**-0.238**	**-0.188**	**0.222**	-0.002	**-0.777**	**-0.498**	**-0.578**	**-0.349**	**-0.293**	-0.060	-0.086	0.055	-0.030	**-0.202**	-0.034
(9) BOARDSIZE	**0.209**	**0.247**	**0.211**	0.008	**0.262**	0.097	0.105	0.014	0.103	**0.259**	**-0.176**	**0.289**	**0.201**	**0.335**	-0.013	-0.078
(10) GENDIV	-0.017	**0.174**	**0.212**	**-0.276**	-0.023	**0.650**	**0.609**	**0.349**	**0.231**	**0.434**	0.062	**0.303**	0.045	0.036	**0.179**	-0.030
(11) LEV	0.046	0.115	**0.221**	-0.124	0.049	**0.161**	**0.199**	0.126	0.132	0.067	-0.014	0.060	0.040	**-0.147**	**-0.140**	**-0.225**
(12) LnSUBSIDIARY	**0.282**	**0.215**	**0.313**	0.089	**0.402**	0.026	**0.249**	**-0.179**	**0.136**	**0.163**	0.084	**0.559**	**0.780**	**0.409**	-0.133	**-0.156**
(13) INTASSET	0.049	**0.152**	0.123	-0.052	-0.022	**0.344**	**0.381**	**0.226**	0.115	**0.240**	0.121	**0.169**	**0.148**	0.103	**0.365**	**0.307**
(14) SENSITIVE	0.004	**0.212**	0.104	**-0.189**	0.055	**0.229**	0.096	0.070	0.014	-0.038	-0.083	-0.006	-0.060	0.015	0.091	**0.252**
(15) CONCENTRATE	0.078	**0.178**	**0.283**	-0.112	**0.230**	**0.192**	**0.248**	**0.215**	**0.196**	0.118	-0.052	**0.222**	**0.286**	**0.225**	-0.120	**-0.163**
(16) CULTURE_MUL	0.109	**-0.151**	**-0.156**	**0.417**	**0.231**	**-0.789**	**-0.662**	**-0.648**	**-0.336**	**-0.441**	**-0.180**	-0.006	**0.158**	0.028	**-0.278**	**-0.182**
(17) NATION_VF	-0.022	**-0.170**	**-0.250**	**0.141**	0.036	**-0.355**	**-0.454**	**-0.210**	**-0.388**	**-0.214**	**-0.140**	**-0.459**	**-0.218**	-0.020	**-0.171**	0.013

Panel B (continue): Additional variables

	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)
(1) IR	-0.048	0.100	-0.020	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(2) ESP	0.040	-0.089	0.092	0.063	0.032	0.063	-0.056	**0.165**	-0.098	-0.126	-0.124	0.017	**0.153**	-0.074	-0.055
(3) GRI	0.075	-0.091	-0.076	0.068	-0.037	**-0.219**	**0.191**	**-0.193**	-0.040	0.109	0.103	-0.122	**-0.180**	**-0.253**	-0.071
(4) BOARDCOM_CSR	0.075	0.077	-0.074	0.010	0.118	0.086	**-0.159**	**0.174**	**0.196**	0.033	-0.013	0.065	**0.170**	0.076	**0.135**
(5) OWNERSHIP	0.053	0.071	0.066	-0.096	-0.007	**0.402**	**-0.160**	**0.220**	-0.020	**-0.195**	**-0.193**	**0.273**	**0.172**	**0.162**	**0.200**
(6) MEDIA_JFALL	-0.065	0.019	0.038	-0.060	-0.024	-0.024	0.059	**-0.264**	**0.217**	0.083	**0.237**	-0.089	**-0.217**	0.066	0.131
(7) LnMEDIA_ALL	-0.034	0.072	**-0.169**	-0.015	**0.196**	-0.113	-0.022	**0.135**	**0.148**	**0.188**	0.113	**-0.170**	0.084	-0.112	-0.113
(8) BOARDSKILL	**-0.150**	0.129	-0.090	-0.055	0.067	**-0.197**	-0.005	**-0.218**	**0.654**	**0.510**	**0.407**	**-0.215**	**-0.194**	0.128	0.087
(9) BOARDSIZE	**0.146**	-0.002	-0.061	0.111	-0.073	0.024	0.128	0.096	0.018	0.036	-0.077	**-0.148**	0.039	**-0.198**	-0.055
(10) GENDIV	**0.186**	**-0.136**	-0.091	-0.111	-0.004	**0.351**	**-0.369**	**0.631**	**-0.458**	**-0.480**	**-0.648**	**0.568**	**0.625**	**0.195**	-0.052
(11) LEV	-0.048	0.042	**-0.457**	0.074	**-0.266**	0.101	0.076	0.011	-0.114	**-0.142**	**-0.180**	0.116	0.001	-0.049	0.043
(12) LnSUBSIDIARY	0.037	**0.275**	-0.110	**0.186**	-0.077	0.063	**-0.194**	**0.352**	**0.171**	0.077	-0.063	0.105	**0.314**	0.095	0.061
(13) INTASSET	0.023	**-0.275**	**0.190**	**-0.232**	**0.208**	**0.178**	-0.107	**0.235**	**-0.220**	**-0.253**	**-0.318**	**0.313**	**0.230**	0.094	0.040
(14) SENSITIVE	-0.068	**-0.269**	0.059	-0.121	**0.155**	0.019	-0.005	0.066	**-0.160**	-0.123	**-0.166**	0.012	0.031	-0.079	-0.094
(15) CONCENTRATE	-0.005	0.057	-0.068	**0.166**	**-0.183**	-0.079	0.131	0.000	**-0.327**	-0.092	**-0.144**	0.041	-0.017	-0.048	-0.125
(16) CULTURE_MUL	-0.069	**0.150**	**-0.202**	0.010	0.119	**-0.536**	0.109	**-0.328**	**0.885**	**0.832**	**0.798**	**-0.594**	**-0.317**	**-0.163**	0.025
(17) NATION_VF	-0.114	0.040	-0.002	-0.015	-0.068	**-0.247**	**0.607**	**-0.725**	**0.267**	**0.304**	**0.455**	**-0.507**	**-0.772**	**-0.333**	-0.117

Table 4.2 reports the correlation matrix for the variables tested. Panel A presents correlations between variables tested in the main analysis. Pearson's correlation (parametric test) is presented below the diagonal and Spearman's correlation (non-parametric test) is above the diagonal. Panel B presents Spearman's correlation between main variables and additional variables tested. Additional variables are numbered as follow: (18) *ENV*, (19) *SOC*, (20) *IVS*, (21) *MEDIA_JFCSR*, (22) *LnMEDIA_CSR*, (23) *BOARDIND*, (24) *GOV*, (25) *IFRS*, (26) *BOARDCOM_AUD*, (27) *BOARDCOM_CG*, (28) *OWNERSHIP_INS*, (29) *LISTING*, (30) *LnSUBSIDIARY_FOR*, (31) *LnSIZE*, (32) *MTB*, (33) *ROA*, (34) *SPP*, (35) *BETA*, (36) *WACC*, (37) *COE*, (38) *LITIGATION*, (39) *LEGAL*, (40) *CULTURE_PDI*, (41) *CULTURE_IDV*, (42) *CULTURE_MAS*, (43) *CULTURE_UA*I, (44) *CULTURE_LTO*, (45) *CULTURE_IVR*, (46) *CULTURE_PII*, (47) *NATION_RRG*, (48) *NATION_INV*. Correlation coefficients in bold are significant at $p<0.05$ based on two-tailed tests. Variables are as defined in Section 3.5.

Table 4.3: Determinants of voluntary IR initiation

		Full Sample			
Dependent variable = IR_t	Pred. Sign	(1)	(2)	(3)	(4)
ESP_{t-1}	?	0.0228**		0.0212**	
		(2.45)		(2.30)	
GRI_{t-1}	+	0.287		0.247	
		(0.73)		(0.64)	
$BOARDCOM\_CSR_{t-1}$	+		1.607***		1.519***
			(3.45)		(3.33)
$OWNERSHIP_{t-1}$	?	-0.00700	-0.0106	-0.00641	-0.00942
		(-0.98)	(-1.38)	(-0.89)	(-1.21)
$MEDIA\_JFALL_{t-1}$	-	-0.156	-0.0194		
		(-0.29)	(-0.04)		
$LnMEDIA\_ALL_{t-1}$	+			0.186	0.208
				(1.38)	(1.56)
$BOARDSKILL_{t-1}$	-	-0.0144*	-0.0175**	-0.0143*	-0.0170**
		(-1.88)	(-2.26)	(-1.89)	(-2.21)
$BOARDSIZE_{t-1}$	-	-0.110**	-0.0892**	-0.117***	-0.100**
		(-2.55)	(-2.12)	(-2.73)	(-2.34)
$GENDIV_{t-1}$	+	0.0288	0.0299	0.0280	0.0275
		(1.43)	(1.39)	(1.39)	(1.28)
LEV_{t-1}	+	0.654	0.415	0.600	0.234
		(0.68)	(0.41)	(0.63)	(1.60)
$LnSUBSIDIARY_{t-1}$	+	0.305**	0.301**	0.254*	0.373
		(2.21)	(2.11)	(1.78)	(0.38)
$INTASSET_{t-1}$	+	-2.448**	-2.651**	-2.575**	-2.770**
		(-2.12)	(-2.28)	(-2.20)	(-2.38)
$SENSITIVE_{t-1}$	+	-0.0441	0.107	-0.121	0.000410
		(-0.13)	(0.32)	(-0.36)	(0.00)
$CONCENTRATE_{t-1}$	+	2.889	3.875**	2.981*	3.927**
		(1.55)	(2.40)	(1.70)	(2.55)
$CULTURE\_MUL_{t-1}$	-	0.157	0.124	0.120	0.0819
		(1.01)	(0.77)	(0.76)	(0.50)
$NATION\_VF_{t-1}$	-	0.224*	0.306**	0.214	0.288**
		(1.73)	(2.35)	(1.62)	(2.19)
N		214	214	214	214
Chi-squared (Wald)		28.67	31.89	29.79	33.13
Pseudo $R^2_{Nagelkerke}$		0.213	0.218	0.222	0.229
Classified %		67.29	66.36	67.29	68.69

Table 4.3 reports the logistic regression results for the full sample. Model 1 reflects Equation 4.1 and Model 2 reflects Equation 4.2. Model 3 (Model 4) uses Equation 4.1 (Equation 4.2) and substitutes *MEDIA_JFALL* with *LnMEDIA_ALL*. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 4.4: Manufacturing and non-manufacturing firms

Panel A: Interaction analysis

Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)
ESP_{t-1}	0.0194*		0.0260***	0.0259***	0.0244**	0.0257***
	(1.95)		(2.71)	(2.71)	(2.53)	(2.68)
GRI_{t-1}	0.674		0.317	0.314	0.261	0.326
	(1.33)		(0.79)	(0.78)	(0.66)	(0.82)
$BOARDCOM\_CSR_{t-1}$		2.021***				
		(3.12)				
$OWNERSHIP_{t-1}$	-0.00809	-0.0103	-0.00504	-0.00708	-0.00648	-0.00705
	(-1.12)	(-1.34)	(-0.55)	(-0.99)	(-0.87)	(-0.98)
$MEDIA\_JFALL_{t-1}$	-0.286	0.0312	-0.336	-0.336		-0.315
	(-0.50)	(0.06)	(-0.60)	(-0.52)		(-0.56)
$LnMEDIA\_ALL_{t-1}$					0.411**	
					(2.24)	
$BOARDSKILL_{t-1}$	-0.0201**	-0.0201**	-0.0206**	-0.0202**	-0.0205**	-0.0224**
	(-2.16)	(-2.13)	(-2.16)	(-2.15)	(-2.10)	(-2.00)
$BOARDSIZE_{t-1}$	-0.114**	-0.0822*	-0.101**	-0.101**	-0.109**	-0.105**
	(-2.47)	(-1.89)	(-2.31)	(-2.33)	(-2.52)	(-2.33)
$GENDIV_{t-1}$	0.0288	0.0278	0.0273	0.0268	0.0265	0.0268
	(1.27)	(1.32)	(1.30)	(1.28)	(1.29)	(1.27)
LEV_{t-1}	0.631	0.442	0.411	0.446	0.0827	0.446
	(0.61)	(0.42)	(0.41)	(0.45)	(0.09)	(0.44)
$LnSUBSIDIARY_{t-1}$	0.257*	0.296*	0.255*	0.252*	0.220	0.259*
	(1.75)	(1.95)	(1.74)	(1.73)	(1.44)	(1.74)
$INTASSET_{t-1}$	-2.311*	-2.681**	-2.358*	-2.322*	-2.611**	-2.304*
	(-1.84)	(-2.31)	(-1.94)	(-1.92)	(-2.10)	(-1.92)
$SENSITIVE_{t-1}$	0.0256	0.0574	0.0777	0.0782	0.0443	0.0816
	(0.07)	(0.16)	(0.22)	(0.22)	(0.12)	(0.23)
$CONCENTRATE_{t-1}$	3.305*	4.305***	3.201	3.221	3.556*	3.268
	(1.67)	(2.60)	(1.59)	(1.61)	(1.90)	(1.60)
$CULTURE\_MUL_{t-1}$	-0.0791	-0.000480	-0.128	-0.119	-0.221	-0.113
	(-0.30)	(-0.00)	(-0.49)	(-0.46)	(-0.82)	(-0.44)
$NATION\_VF_{t-1}$	0.273**	0.290**	0.262*	0.260*	0.265**	0.263*
	(1.97)	(2.20)	(1.95)	(1.90)	(1.97)	(1.94)
JPN	1.007	0.480	1.222	1.175	1.314	1.155
	(1.07)	(0.53)	(1.29)	(1.26)	(1.38)	(1.24)
MNU	-1.867	0.937	-0.0662	-0.342	2.563	-0.575
	(-0.82)	(1.12)	(-0.08)	(-0.38)	(1.46)	(-0.71)
$MNU*ESP_{t-1}$	0.0283					
	(1.01)					
$MNU*GRI_{t-1}$	-0.937					
	(-1.19)					
$MNU*BOARDCOM\_CSR_{t-1}$		-1.022				
		(-1.17)				
$MNU*OWNERSHIP_{t-1}$			-0.00498			
			(-0.35)			
$MNU*MEDIA\_JFALL_{t-1}$				0.0311		
				(0.03)		
$MNU*LnMEDIA\_ALL_{t-1}$					-0.448*	
					(-1.70)	
$MNU*BOARDSKILL_{t-1}$						0.00425
						(0.35)
N	214	214	214	214	214	214
Chi-squared (Wald)	27.43	31.11	28.77	28.59	28.86	28.45
Pseudo $R^2_{Nagelkerke}$	0.237	0.226	0.226	0.225	0.249	0.226
Classified %	69.63	64.95	69.16	68.69	71.96	68.69

Panel B: Subsample analysis

	Manufacturing Firms				Non-manufacturing Firms			
Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESP_{t-1}	0.0481*		0.0530*		0.0198**		0.0177*	
	(1.74)		(1.85)		(2.01)		(1.77)	
GRI_{t-1}	-0.359		-0.411		0.691		0.692	
	(-0.55)		(-0.60)		(1.32)		(1.28)	
$BOARDCOM\_CSR_{t-1}$		1.135		1.187		1.949***		1.761***
		(1.53)		(1.61)		(3.04)		(2.81)
$OWNERSHIP_{t-1}$	-0.0101	-0.00855	-0.0142	-0.0114	-0.00488	-0.0117	-0.00306	-0.00882
	(-0.85)	(-0.72)	(-1.15)	(-0.91)	(-0.48)	(-1.08)	(-0.28)	(-0.77)
$MEDIA\_JFALL_{t-1}$	-0.0718	0.0251			-0.421	-0.00802		
	(-0.07)	(0.03)			(-0.61)	(-0.01)		
$LnMEDIA\_ALL_{t-1}$			-0.358	-0.267			0.462**	0.420**
			(-1.21)	(-0.92)			(2.43)	(2.17)
$BOARDSKILL_{t-1}$	-0.0169	-0.0184	-0.0177	-0.0193	-0.0253*	-0.0236	-0.0262*	-0.0236
	(-1.21)	(-1.33)	(-1.28)	(-1.40)	(-1.76)	(-1.54)	(-1.70)	(-1.50)
$BOARDSIZE_{t-1}$	-0.182**	-0.150**	-0.183**	-0.147*	-0.0992	-0.0908	-0.110	-0.102
	(-2.28)	(-1.96)	(-2.20)	(-1.87)	(-1.49)	(-1.31)	(-1.63)	(-1.46)
$GENDIV_{t-1}$	0.0241	0.0223	0.0327	0.0263	0.0242	0.0254	0.0205	0.0180
	(0.58)	(0.62)	(0.82)	(0.72)	(0.79)	(0.85)	(0.65)	(0.59)
LEV_{t-1}	-1.804	-2.270	-2.014	-2.390	1.460	1.801	0.844	1.244
	(-1.12)	(-1.39)	(-1.25)	(-1.48)	(1.11)	(1.34)	(0.66)	(0.95)
$LnSUBSIDIARY_{t-1}$	0.414	0.443	0.670*	0.643*	0.256	0.300	0.188	0.219
	(1.24)	(1.48)	(1.73)	(1.75)	(1.42)	(1.56)	(1.02)	(1.12)
$INTASSET_{t-1}$	-2.477	-2.917	-2.897	-3.199	-2.290	-2.348	-3.098*	-2.991*
	(-1.24)	(-1.59)	(-1.36)	(-1.64)	(-1.29)	(-1.42)	(-1.68)	(-1.75)
$CONCENTRATE_{t-1}$	13.70**	16.52**	15.06**	17.53**	2.313	3.275*	2.830	3.546*
	(2.37)	(2.09)	(2.21)	(2.05)	(1.01)	(1.75)	(1.39)	(1.93)
$CULTURE\_MUL_{t-1}$	0.266	0.295	0.400	0.376	-0.319	-0.100	-0.592	-0.335
	(0.59)	(0.67)	(0.85)	(0.82)	(-0.91)	(-0.29)	(-1.63)	(-0.93)
$NATION\_VF_{t-1}$	0.380*	0.386**	0.433**	0.427**	0.239	0.316	0.193	0.279
	(1.86)	(2.03)	(2.09)	(2.15)	(1.10)	(1.54)	(0.92)	(1.40)
JPN	-0.0292	-0.270	-0.327	-0.458	1.859	0.722	2.357*	1.152
	(-0.02)	(-0.18)	(-0.21)	(-0.31)	(1.38)	(0.53)	(1.65)	(0.80)
N	100	100	100	100	114	114	114	114
Chi-squared (Wald)	23.10	21.22	19.67	19.74	16.21	16.45	16.61	17.51
Pseudo $R^2_{Nagelkerke}$	0.286	0.242	0.302	0.251	0.261	0.282	0.305	0.318
Classified %	68.00	62.00	70.00	61.00	71.05	71.05	73.68	75.44

Table 4.4 reports tests for industry effects. Panel A presents interactions on key variables of interest. Independent variables are interacted with the manufacturing industry dummy (*MNU*) in the order of: (1) *ESP* and *GRI*, (2) *BOARDCOM_CSR*, (3) *OWNERSHIP*, (4) *MEDIA_JFALL*, (5) *LnMEDIA_ALL* and (6) *BOARDSKILL*. Panel B reports tests on subsamples of manufacturing firms (left) and nonmanufacturing firms (right). Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 4.5: Japanese and non-Japanese firms

Panel A: Interaction analysis

Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)
ESP_{t-1}	0.0422***		0.0243***	0.0242***	0.0216**	0.0242***
	(3.65)		(2.63)	(2.63)	(2.36)	(2.62)
GRI_{t-1}	0.427		0.317	0.294	0.256	0.298
	(0.78)		(0.79)	(0.73)	(0.65)	(0.75)
$BOARDCOM\_CSR_{t-1}$		2.195***				
		(3.99)				
$OWNERSHIP_{t-1}$	-0.00770	-0.0124	-0.00343	-0.00734	-0.00663	-0.00785
	(-1.00)	(-1.52)	(-0.43)	(-1.03)	(-0.91)	(-1.09)
$MEDIA\_JFALL_{t-1}$	-0.460	-0.100	-0.306	-0.259		-0.256
	(-0.74)	(-0.18)	(-0.55)	(-0.39)		(-0.46)
$LnMEDIA\_ALL_{t-1}$					0.302	
					(1.50)	
$BOARDSKILL_{t-1}$	-0.0192**	-0.0200**	-0.0218**	-0.0195**	-0.0198**	-0.0168
	(-2.04)	(-2.21)	(-2.29)	(-2.09)	(-2.09)	(-1.46)
$BOARDSIZE_{t-1}$	-0.103**	-0.0937**	-0.0980**	-0.0977**	-0.106**	-0.0956**
	(-2.34)	(-2.12)	(-2.27)	(-2.25)	(-2.46)	(-2.17)
$GENDIV_{t-1}$	0.0289	0.0299	0.0283	0.0288	0.0273	0.0284
	(1.29)	(1.29)	(1.38)	(1.39)	(1.27)	(1.38)
LEV_{t-1}	0.536	0.374	0.665	0.641	0.550	0.653
	(0.58)	(0.38)	(0.70)	(0.67)	(0.58)	(0.68)
$LnSUBSIDIARY_{t-1}$	0.257*	0.312**	0.264*	0.257*	0.206	0.261*
	(1.71)	(2.09)	(1.81)	(1.77)	(1.38)	(1.79)
$INTASSET_{t-1}$	-2.596**	-2.778**	-2.697**	-2.501**	-2.676**	-2.463**
	(-2.14)	(-2.30)	(-2.28)	(-2.13)	(-2.20)	(-2.10)
$SENSITIVE_{t-1}$	-0.0684	0.128	-0.0456	-0.0330	-0.140	-0.0391
	(-0.20)	(0.37)	(-0.14)	(-0.10)	(-0.41)	(-0.12)
$CONCENTRATE_{t-1}$	3.516*	4.320***	3.386*	3.307	3.422*	3.183
	(1.73)	(2.72)	(1.65)	(1.64)	(1.85)	(1.57)
$CULTURE\_MUL_{t-1}$	-0.224	0.0288	-0.113	-0.115	-0.186	-0.107
	(-0.78)	(0.11)	(-0.44)	(-0.44)	(-0.69)	(-0.41)
$NATION\_VF_{t-1}$	0.279*	0.360**	0.254*	0.252*	0.244*	0.243*
	(1.93)	(2.57)	(1.89)	(1.88)	(1.75)	(1.79)
JPN	3.799**	1.645	1.948	1.122	2.390	1.476
	(2.44)	(1.42)	(1.49)	(0.90)	(1.18)	(1.01)
$JPN*ESP_{t-1}$	-0.0301*					
	(-1.86)					
$JPN*GRI_{t-1}$	-0.168					
	(-0.21)					
$JPN*BOARDCOM\_CSR_{t-1}$		-1.489*				
		(-1.76)				
$JPN*OWNERSHIP_{t-1}$			-0.0165			
			(-0.94)			
$JPN*MEDIA\_FJALL_{t-1}$				-0.0580		
				(-0.05)		
$JPN*LnMEDIA\_ALL_{t-1}$					-0.194	
					(-0.75)	
$JPN*BOARDSKILL_{t-1}$						-0.00672
						(-0.34)
N	214	214	214	214	214	214
Chi-squared (Wald)	38.94	40.33	29.12	28.74	33.06	28.62
Pseudo $R^2_{Nagelkerke}$	0.243	0.233	0.226	0.221	0.232	0.222
Classified %	68.22	64.02	68.22	68.22	69.63	67.29

Panel B: Subsample analysis

	Japanese Firms				Non-Japanese Firms			
Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESP_{t-1}	0.0169		0.0173		0.0407***		0.0371***	
	(1.44)		(1.44)		(3.18)		(2.80)	
GRI_{t-1}	0.201		0.235		0.516		0.452	
	(0.36)		(0.42)		(0.86)		(0.77)	
$BOARDCOM\_CSR_{t-1}$		1.008		1.024		2.239***		2.060***
		(1.36)		(1.38)		(3.84)		(3.59)
$OWNERSHIP_{t-1}$	-0.0138	-0.0108	-0.0128	-0.00987	-0.00304	-0.0104	-0.00299	-0.00820
	(-0.83)	(-0.65)	(-0.77)	(-0.59)	(-0.32)	(-1.03)	(-0.32)	(-0.81)
$MEDIA\_JFALL_{t-1}$	-1.043	-1.112			-0.372	0.123		
	(-0.95)	(-1.04)			(-0.45)	(0.19)		
$LnMEDIA\_ALL_{t-1}$			0.159	0.146			0.142	0.250
			(0.83)	(0.79)			(0.63)	(1.21)
$BOARDSKILL_{t-1}$	-0.0170	-0.0141	-0.0173	-0.0145	-0.0198	-0.0207	-0.0201	-0.0216
	(-1.03)	(-0.87)	(-1.04)	(-0.88)	(-1.44)	(-1.63)	(-1.47)	(-1.63)
$BOARDSIZE_{t-1}$	-0.0769	-0.0522	-0.0929	-0.0653	-0.112	-0.113*	-0.114*	-0.124*
	(-1.18)	(-0.82)	(-1.32)	(-0.98)	(-1.60)	(-1.66)	(-1.68)	(-1.81)
$GENDIV_{t-1}$	-0.00924	-0.00621	-0.00655	-0.00289	0.0373	0.0425	0.0378	0.0374
	(-0.18)	(-0.12)	(-0.13)	(-0.06)	(1.51)	(1.59)	(1.54)	(1.37)
LEV_{t-1}	1.695	1.221	1.786	1.288	-0.0875	-0.153	-0.169	-0.251
	(1.22)	(0.92)	(1.31)	(0.99)	(-0.06)	(-0.10)	(-0.12)	(-0.16)
$LnSUBSIDIARY_{t-1}$	-0.120	-0.0804	-0.146	-0.0917	0.435**	0.470**	0.416**	0.396**
	(-0.43)	(-0.30)	(-0.49)	(-0.32)	(2.43)	(2.50)	(2.31)	(2.05)
$INTASSET_{t-1}$	3.011	3.047	2.425	2.507	-4.342***	-4.470***	-4.364***	-4.522***
	(0.88)	(0.92)	(0.72)	(0.78)	(-2.92)	(-2.88)	(-2.86)	(-2.89)
$SENSITIVE_{t-1}$	-0.218	-0.0478	-0.294	-0.110	-0.0984	0.204	-0.136	0.0224
	(-0.40)	(-0.09)	(-0.53)	(-0.21)	(-0.20)	(0.42)	(-0.27)	(0.05)
$CONCENTRATE_{t-1}$	13.90	18.43*	12.70	17.25*	3.178	4.196***	3.240*	4.153***
	(1.26)	(1.83)	(1.31)	(1.87)	(1.60)	(2.60)	(1.71)	(2.59)
$CULTURE\_MUL_{t-1}$					-0.194	0.0782	-0.209	0.00164
					(-0.61)	(0.27)	(-0.65)	(0.01)
$NATION\_VF_{t-1}$					0.325*	0.417***	0.319*	0.396**
					(1.95)	(2.67)	(1.90)	(2.49)
N	100	100	100	100	114	114	114	114
Chi-squared (Wald)	13.83	12.24	13.83	12.65	36.29	34.27	36.04	34.04
Pseudo $R^2_{Nagelkerke}$	0.189	0.171	0.187	0.167	0.369	0.365	0.370	0.375
Classified %	61.00	62.00	64.00	62.00	70.18	71.93	70.18	71.93

Table 4.5 reports tests for country effects. Panel A presents interactions on key variables of interest. Independent variables are interacted with the Japan dummy (*JPN*) in the order of: (1) *ESP* and *GRI*, (2) *BOARDCOM_CSR*, (3) *OWNERSHIP*, (4) *MEDIA_JFALL*, (5) *LnMEDIA_ALL* and (6) *BOARDSKILL*. Panel B reports tests on subsamples of Japanese firms (left) and non-Japanese firms (right). Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 4.6: Early Adopters and Later Adopters

	Early Adopters				Later Adopters			
Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESP_{t-1}	0.0230		0.0207		0.0281**		0.0265**	
	(1.41)		(1.30)		(2.31)		(2.20)	
GRI_{t-1}	0.482		0.424		0.174		0.136	
	(0.80)		(0.72)		(0.31)		(0.24)	
$BOARDCOM\_CSR_{t-1}$		1.613**		1.534*		1.742**		1.694**
		(2.08)		(1.88)		(2.39)		(2.43)
$OWNERSHIP_{t-1}$	-0.00426	-0.0133	-0.00118	-0.00854	-0.00996	-0.00492	-0.00971	-0.00498
	(-0.44)	(-1.17)	(-0.12)	(-0.74)	(-0.81)	(-0.39)	(-0.80)	(-0.40)
$MEDIA\_JFALL_{t-1}$	0.0531	0.290			-1.081	-0.736		
	(0.06)	(0.38)			(-1.24)	(-0.85)		
$LnMEDIA\_ALL_{t-1}$			0.313	0.357*			0.106	0.106
			(1.51)	(1.70)			(0.51)	(0.55)
$BOARDSKILL_{t-1}$	-0.0309**	-0.0310**	-0.0310**	-0.0315**	-0.00631	-0.00396	-0.00904	-0.00633
	(-2.24)	(-2.32)	(-2.26)	(-2.32)	(-0.40)	(-0.25)	(-0.59)	(-0.41)
$BOARDSIZE_{t-1}$	-0.133**	-0.126**	-0.145**	-0.144**	-0.0677	-0.0506	-0.0733	-0.0568
	(-2.10)	(-2.04)	(-2.34)	(-2.31)	(-0.97)	(-0.73)	(-1.05)	(-0.82)
$GENDIV_{t-1}$	0.0446	0.0490	0.0376	0.0392	0.0213	0.0161	0.0242	0.0177
	(1.34)	(1.45)	(1.10)	(1.14)	(0.61)	(0.42)	(0.69)	(0.47)
LEV_{t-1}	0.642	0.466	0.677	0.547	0.767	0.131	0.761	0.126
	(0.50)	(0.37)	(0.53)	(0.43)	(0.43)	(0.07)	(0.46)	(0.07)
$LnSUBSIDIARY_{t-1}$	0.397*	0.454**	0.318	0.342	0.0532	0.0376	0.0457	0.0105
	(1.87)	(2.17)	(1.59)	(1.64)	(0.22)	(0.16)	(0.17)	(0.04)
$INTASSET_{t-1}$	-3.195*	-3.226**	-3.277*	-3.343**	-1.232	-1.426	-1.628	-1.741
	(-1.79)	(-1.96)	(-1.80)	(-1.98)	(-0.63)	(-0.80)	(-0.80)	(-0.96)
$SENSITIVE_{t-1}$	-0.0469	0.132	-0.192	-0.0850	-0.122	0.0772	-0.0986	0.0750
	(-0.10)	(0.29)	(-0.42)	(-0.19)	(-0.22)	(0.14)	(-0.18)	(0.13)
$CONCENTRATE_{t-1}$	6.421***	6.308***	6.062***	5.986***	0.291	2.093	0.977	2.632
	(2.68)	(2.81)	(2.60)	(2.73)	(0.12)	(0.86)	(0.38)	(1.07)
$CULTURE\_MUL_{t-1}$	-0.144	-0.0358	-0.187	-0.0887	-0.0630	0.0364	-0.164	-0.0560
	(-0.38)	(-0.10)	(-0.51)	(-0.25)	(-0.15)	(0.09)	(-0.37)	(-0.13)
$NATION\_VF_{t-1}$	0.379**	0.471**	0.353*	0.436**	0.171	0.222	0.117	0.176
	(2.07)	(2.48)	(1.87)	(2.27)	(0.70)	(0.93)	(0.49)	(0.75)
JPN	1.347	0.719	1.320	0.746	0.884	0.0965	1.024	0.277
	(0.93)	(0.53)	(0.98)	(0.56)	(0.61)	(0.07)	(0.70)	(0.20)
N	126	126	126	126	88	88	88	88
Chi-squared (Wald)	22.39	21.60	22.30	20.58	11.52	10.18	10.89	11.35
Pseudo $R^2_{Nagelkerke}$	0.309	0.311	0.324	0.329	0.174	0.157	0.162	0.153
Classified %	69.84	70.63	71.43	74.60	64.77	63.64	64.77	63.64

Table 4.6 reports tests on subsamples of early IR adopters (left) and later IR adopters (right). Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 4.7: Independent variables on a two-year lag

		Full Sample			
Dependent variable = IR_t	Pred. Sign	(1)	(2)	(3)	(4)
ESP_{t-2}	?	0.0300***		0.0254***	
		(2.95)		(2.66)	
GRI_{t-2}	+	0.296		0.264	
		(0.69)		(0.62)	
$BOARDCOM\_CSR_{t-2}$	+		2.211***		2.050***
			(3.46)		(3.39)
$OWNERSHIP_{t-2}$	?	-0.00576	-0.00803	-0.00560	-0.00770
		(-0.74)	(-1.02)	(-0.72)	(-0.98)
$MEDIA\_JFALL_{t-2}$	-	-1.123**	-0.829*		
		(-2.21)	(-1.75)		
$LnMEDIA\_ALL_{t-2}$	+			0.0458	0.0981
				(0.29)	(0.64)
$BOARDSKILL_{t-2}$	-	-0.00167	-0.00526	-0.00267	-0.00541
		(-0.23)	(-0.69)	(-0.35)	(-0.69)
$BOARDSIZE_{t-2}$	-	-0.0713*	-0.0554	-0.0619	-0.0512
		(-1.69)	(-1.33)	(-1.48)	(-1.23)
$GENDIV_{t-2}$	+	0.0332	0.0256	0.0409*	0.0314
		(1.42)	(1.09)	(1.74)	(1.35)
SPP_{t-2}	+	1.391*	1.177	1.031	0.197
		(1.83)	(1.41)	(1.42)	(1.21)
LEV_{t-2}	+	1.556	1.401	1.702	1.003
		(1.40)	(1.25)	(1.61)	(1.26)
$LnSUBSIDIARY_{t-2}$	+	0.199	0.222	0.205	1.577
		(1.31)	(1.45)	(1.28)	(1.45)
$INTASSET_{t-2}$	+	-2.970**	-2.890**	-2.647**	-2.694**
		(-2.44)	(-2.27)	(-2.05)	(-2.15)
$SENSITIVE_{t-2}$	+	-0.0354	0.0522	-0.00192	0.0370
		(-0.10)	(0.14)	(-0.01)	(0.10)
$CONCENTRATE_{t-2}$	+	3.747**	4.439***	4.211**	4.722***
		(2.08)	(2.84)	(2.14)	(2.83)
$CULTURE\_MUL_{t-2}$	-	0.110	0.0518	0.107	0.0325
		(0.64)	(0.29)	(0.61)	(0.18)
$NATION\_VF_{t-2}$	-	0.177	0.147	0.157	0.126
		(1.14)	(0.96)	(1.03)	(0.83)
N		196	196	196	196
Chi-squared (Wald)		35.49	30.94	32.06	30.42
Pseudo $R^2_{Nagelkerke}$		0.252	0.265	0.234	0.257
Classified %		66.33	66.33	67.86	69.39

Table 4.7 reports results for regressions on the full sample (Table 4.3) after setting independent variables at a two-year lag (*t-2*). Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 4.8: Effects of influential observations

	Removal of Influential Observations				Winsorisation			
Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESP_{t-1}	0.0281***		0.0264***		0.0227**		0.0213**	
	(2.81)		(2.67)		(2.42)		(2.29)	
GRI_{t-1}	0.302		0.257		0.254		0.220	
	(0.73)		(0.63)		(0.65)		(0.57)	
$BOARDCOM\_CSR_{t-1}$		1.800***		1.708***		1.528***		1.450***
		(3.78)		(3.67)		(3.40)		(3.27)
$OWNERSHIP_{t-1}$	-0.00836	-0.0121	-0.00770	-0.0108	-0.00745	-0.0107	-0.00672	-0.00940
	(-1.13)	(-1.52)	(-1.03)	(-1.34)	(-1.04)	(-1.40)	(-0.93)	(-1.22)
$MEDIA\_JFALL_{t-1}$	-0.204	-0.0350			-0.0817	0.0654		
	(-0.37)	(-0.07)			(-0.15)	(0.12)		
$LnMEDIA\_ALL_{t-1}$			0.188	0.204			0.164	0.195
			(1.30)	(1.48)			(1.04)	(1.27)
$BOARDSKILL_{t-1}$	-0.0133*	-0.0182**	-0.0135*	-0.0180**	-0.0145*	-0.0174**	-0.0145*	-0.0169**
	(-1.74)	(-2.32)	(-1.79)	(-2.30)	(-1.89)	(-2.24)	(-1.90)	(-2.19)
$BOARDSIZE_{t-1}$	-0.129***	-0.0955**	-0.136***	-0.106**	-0.114***	-0.0931**	-0.120***	-0.103**
	(-2.89)	(-2.22)	(-3.08)	(-2.44)	(-2.61)	(-2.18)	(-2.76)	(-2.38)
$GENDIV_{t-1}$	0.0292	0.0303	0.0287	0.0281	0.0311	0.0319	0.0298	0.0288
	(1.37)	(1.37)	(1.34)	(1.26)	(1.51)	(1.46)	(1.46)	(1.34)
LEV_{t-1}	1.010	0.483	0.948	0.434	0.615	0.391	0.571	0.352
	(0.98)	(0.46)	(0.94)	(0.42)	(0.64)	(0.39)	(0.60)	(0.36)
$LnSUBSIDIARY_{t-1}$	0.384***	0.312**	0.338**	0.251*	0.311**	0.312**	0.263*	0.246
	(2.65)	(2.13)	(2.29)	(1.68)	(2.21)	(2.13)	(1.78)	(1.63)
$INTASSET_{t-1}$	-2.559**	-2.681**	-2.687**	-2.801**	-2.427**	-2.611**	-2.523**	-2.701**
	(-2.15)	(-2.27)	(-2.22)	(-2.37)	(-1.98)	(-2.13)	(-2.05)	(-2.23)
$SENSITIVE_{t-1}$	-0.0401	0.112	-0.112	0.0130	-0.0221	0.130	-0.0879	0.0311
	(-0.12)	(0.33)	(-0.31)	(0.04)	(-0.07)	(0.39)	(-0.26)	(0.09)
$CONCENTRATE_{t-1}$	2.746	3.981**	2.853	4.049***	4.384**	5.458***	4.438**	5.421***
	(1.49)	(2.53)	(1.64)	(2.68)	(2.10)	(2.69)	(2.21)	(2.72)
$CULTURE\_MUL_{t-1}$	0.118	0.112	0.0811	0.0711	0.171	0.138	0.138	0.0976
	(0.74)	(0.68)	(0.50)	(0.42)	(1.10)	(0.86)	(0.87)	(0.59)
$NATION\_VF_{t-1}$	0.256*	0.327**	0.249*	0.311**	0.254*	0.326**	0.245*	0.309**
	(1.88)	(2.47)	(1.79)	(2.34)	(1.89)	(2.39)	(1.81)	(2.25)
N	210	212	210	212	214	214	214	214
Chi-squared (Wald)	36.29	36.81	37.45	38.07	30.00	32.81	30.63	33.03
Pseudo $R^2_{Nagelkerke}$	0.254	0.237	0.262	0.247	0.218	0.221	0.223	0.229
Classified %	69.52	66.98	67.14	69.34	67.29	65.89	66.36	70.09

Table 4.8 reports reruns of the main analysis after removal of influential observations (left) and winsorising all continuous variables at the 1st and 99th percentile (right). Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 4.9: Fixed effect dummies

	Full Sample			
Dependent variable = IR_t	(1)	(2)	(3)	(4)
ESP_{t-1}	0.0489***		0.0431***	
	(3.21)		(3.00)	
GRI_{t-1}	0.308		0.239	
	(0.52)		(0.42)	
$BOARDCOM\_CSR_{t-1}$		1.915***		1.886***
		(3.46)		(3.46)
$OWNERSHIP_{t-1}$	-0.0189*	-0.0201*	-0.0188*	-0.0190*
	(-1.83)	(-1.91)	(-1.84)	(-1.82)
$MEDIA\_JFALL_{t-1}$	-1.413*	-0.602		
	(-1.83)	(-0.87)		
$LnMEDIA\_ALL_{t-1}$			0.347*	0.417**
			(1.70)	(1.98)
$BOARDSKILL_{t-1}$	-0.0261**	-0.0244**	-0.0252**	-0.0235*
	(-2.10)	(-2.03)	(-1.97)	(-1.88)
$BOARDSIZE_{t-1}$	-0.0836	-0.0577	-0.0998*	-0.0765
	(-1.63)	(-1.14)	(-1.90)	(-1.48)
$GENDIV_{t-1}$	0.0614*	0.0641**	0.0582*	0.0641**
	(1.90)	(2.27)	(1.78)	(2.17)
LEV_{t-1}	-0.0403	-0.326	-0.489	-0.784
	(-0.03)	(-0.25)	(-0.37)	(-0.58)
$LnSUBSIDIARY_{t-1}$	0.552**	0.589***	0.459**	0.440**
	(2.28)	(2.66)	(1.97)	(2.01)
$INTASSET_{t-1}$	-3.833**	-3.897**	-4.519***	-4.428***
	(-2.19)	(-2.41)	(-2.58)	(-2.75)
Country dummies	Y	Y	Y	Y
Industry dummies	Y	Y	Y	Y
N	214	214	214	214
Chi-squared (Wald)	43.50	42.90	49.53	48.24
Pseudo $R^2_{Nagelkerke}$	0.321	0.274	0.321	0.291
Classified %	71.03	71.50	72.90	69.63

Table 4.9 reports reruns of the main analysis with FE in place of industry and country-level characteristics. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 4.10: Alternative models and variables

Panel A: Media measures

Dependent variable = IR_t	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESP_{t-1}	0.0228**		0.0212**		0.0226**		0.0223**	
	(2.45)		(2.30)		(2.46)		(2.36)	
GRI_{t-1}	0.287		0.247		0.278		0.274	
	(0.73)		(0.64)		(0.72)		(0.71)	
$BOARDCOM\_CSR_{t-1}$		1.607***		1.519***		1.597***		1.580***
		(3.45)		(3.33)		(3.43)		(3.32)
$OWNERSHIP_{t-1}$	-0.00700	-0.0106	-0.00641	-0.00942	-0.00726	-0.0105	-0.00706	-0.0103
	(-0.98)	(-1.38)	(-0.89)	(-1.21)	(-1.03)	(-1.36)	(-1.00)	(-1.36)
$MEDIA\_JFALL_{t-1}$	-0.156	-0.0194						
	(-0.29)	(-0.04)						
$LnMEDIA\_ALL_{t-1}$			0.186	0.208				
			(1.38)	(1.56)				
$MEDIA\_JFCSR_{t-1}$					0.00831	0.0757		
					(0.02)	(0.21)		
$LnMEDIA\_CSR_{t-1}$							0.0260	0.0302
							(0.21)	(0.25)
$BOARDSKILL_{t-1}$	-0.0144*	-0.0175**	-0.0143*	-0.0170**	-0.0146*	-0.0176**	-0.0145*	-0.0173**
	(-1.88)	(-2.26)	(-1.89)	(-2.21)	(-1.94)	(-2.30)	(-1.90)	(-2.22)
$BOARDSIZE_{t-1}$	-0.110**	-0.0892**	-0.117***	-0.100**	-0.109**	-0.0894**	-0.110**	-0.0901**
	(-2.55)	(-2.12)	(-2.73)	(-2.34)	(-2.56)	(-2.12)	(-2.57)	(-2.14)
$GENDIV_{t-1}$	0.0288	0.0299	0.0280	0.0275	0.0300	0.0304	0.0296	0.0295
	(1.43)	(1.39)	(1.39)	(1.28)	(1.50)	(1.43)	(1.49)	(1.41)
LEV_{t-1}	0.654	0.415	0.600	0.373	0.651	0.421	0.632	0.398
	(0.68)	(0.41)	(0.63)	(0.38)	(0.68)	(0.42)	(0.66)	(0.40)
$LnSUBSIDIARY_{t-1}$	0.305**	0.301**	0.254*	0.234	0.312**	0.300**	0.301**	0.290**
	(2.21)	(2.11)	(1.78)	(1.60)	(2.28)	(2.12)	(2.15)	(1.96)
$INTASSET_{t-1}$	-2.448**	-2.651**	-2.575**	-2.770**	-2.461**	-2.694**	-2.453**	-2.647**
	(-2.12)	(-2.28)	(-2.20)	(-2.38)	(-2.06)	(-2.24)	(-2.11)	(-2.28)
$SENSITIVE_{t-1}$	-0.0441	0.107	-0.121	0.000410	-0.0349	0.117	-0.0462	0.0929
	(-0.13)	(0.32)	(-0.36)	(0.00)	(-0.10)	(0.34)	(-0.14)	(0.28)
$CONCENTRATE_{t-1}$	2.889	3.875**	2.981*	3.927**	2.953	3.888**	2.946	3.874**
	(1.55)	(2.40)	(1.70)	(2.55)	(1.57)	(2.39)	(1.59)	(2.41)
$CULTURE\_MUL_{t-1}$	0.157	0.124	0.120	0.0819	0.155	0.116	0.148	0.114
	(1.01)	(0.77)	(0.76)	(0.50)	(0.96)	(0.70)	(0.90)	(0.68)
$NATION\_VF_{t-1}$	0.224*	0.306**	0.214	0.288**	0.227*	0.310**	0.225*	0.303**
	(1.73)	(2.35)	(1.62)	(2.19)	(1.74)	(2.35)	(1.74)	(2.33)
N	214	214	214	214	214	214	214	214
Chi-squared (Wald)	28.67	31.89	29.79	33.13	29.14	31.84	28.79	31.95
Model df	14	13	14	13	14	13	14	13
Pseudo $R^2_{Nagelkerke}$	0.213	0.218	0.222	0.229	0.213	0.218	0.213	0.219
AIC	289.4	286.4	287.7	284.3	289.4	286.4	289.4	286.4
ΔAIC (base model)		-3.0	-1.7	-5.1	0.0	-3.0	0.0	-3.0
Classified %	67.29	66.36	67.29	68.69	67.76	66.36	67.76	66.36
Area under ROC curve	0.732	0.723	0.737	0.734	0.731	0.725	0.732	0.724

Panel B: ESG

Dependent variable = IR_t	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
ESP_{t-1}					0.0251**	0.0231**	0.0234**	0.0227**
					(2.56)	(2.46)	(2.49)	(2.37)
ENV_{t-1}	0.0192**							
	(2.35)							
SOC_{t-1}		0.0194**						
		(2.37)						
IVS_{t-1}			0.0146*					
			(1.82)					
GRI_{t-1}	0.416	0.303	0.476	0.762**	0.315	0.275	0.312	0.343
	(1.10)	(0.77)	(1.27)	(2.19)	(0.81)	(0.70)	(0.80)	(0.90)
$BOARDCOM\_AUD_{t-1}$					-0.457			
					(-1.03)			
$BOARDCOM\_CG_{t-1}$						-0.217		
						(-0.50)		
$OWNERSHIP_{t-1}$	-0.00596	-0.00721	-0.00535	-0.00450	-0.00681	-0.00668	-0.00702	-0.00769
	(-0.85)	(-1.00)	(-0.76)	(-0.64)	(-0.96)	(-0.93)	(-0.98)	(-1.08)
$MEDIA\_JFALL_{t-1}$	-0.103	-0.179	-0.164	-0.0736	-0.199	-0.181	-0.403	-0.477
	(-0.20)	(-0.33)	(-0.30)	(-0.14)	(-0.37)	(-0.34)	(-0.77)	(-0.95)
$BOARDSKILL_{t-1}$	-0.0155**	-0.0137*	-0.0144*	-0.0156**	-0.0158**	-0.0141*		
	(-2.03)	(-1.79)	(-1.90)	(-2.07)	(-2.03)	(-1.85)		
$BOARDSIZE_{t-1}$	-0.106**	-0.109**	-0.0986**	-0.0919**	-0.112**	-0.106**	-0.0933**	-0.0916**
	(-2.50)	(-2.52)	(-2.38)	(-2.27)	(-2.54)	(-2.39)	(-2.21)	(-2.15)
$GENDIV_{t-1}$	0.0296	0.0278	0.0279	0.0276	0.0275	0.0307		
	(1.47)	(1.38)	(1.41)	(1.38)	(1.36)	(1.52)		
$BOARDIND_{t-1}$							0.00470	
							(0.54)	
GOV_{t-1}								0.00309
								(0.42)
LEV_{t-1}	0.577	0.688	0.389	0.454	0.751	0.627	0.600	0.606
	(0.59)	(0.72)	(0.41)	(0.49)	(0.78)	(0.65)	(0.62)	(0.63)
$LnSUBSIDIARY_{t-1}$	0.313**	0.320**	0.323**	0.389***	0.316**	0.310**	0.283**	0.268*
	(2.27)	(2.32)	(2.36)	(2.88)	(2.23)	(2.21)	(2.08)	(1.91)
$INTASSET_{t-1}$	-2.453**	-2.470**	-2.490**	-2.514**	-2.484**	-2.322**	-1.496	-1.487
	(-2.11)	(-2.11)	(-2.19)	(-2.14)	(-2.16)	(-1.98)	(-1.46)	(-1.45)
$SENSITIVE_{t-1}$	0.0203	-0.0484	0.0544	0.145	-0.0704	-0.0586	-0.0755	-0.0493
	(0.06)	(-0.15)	(0.16)	(0.44)	(-0.21)	(-0.18)	(-0.23)	(-0.15)
$CONCENTRATE_{t-1}$	3.105*	2.712	3.103*	2.996	2.981	2.904	2.255	2.179
	(1.67)	(1.44)	(1.90)	(1.55)	(1.60)	(1.59)	(1.26)	(1.22)
$CULTURE\_MUL_{t-1}$	0.144	0.172	0.180	0.156	0.129	0.139	0.0126	-0.0180
	(0.92)	(1.11)	(1.20)	(1.02)	(0.80)	(0.86)	(0.07)	(-0.11)
$NATION\_VF_{t-1}$	0.222*	0.217*	0.205	0.195	0.216*	0.237*	0.130	0.131
	(1.70)	(1.69)	(1.58)	(1.50)	(1.68)	(1.76)	(1.06)	(1.07)
N	214	214	214	214	214	214	214	214
Chi-squared (Wald)	28.87	28.89	28.30	25.52	27.76	28.92	22.95	21.72
Model df	14	14	14	13	15	15	13	13
Pseudo $R^2_{Nagelkerke}$	0.206	0.209	0.193	0.173	0.219	0.214	0.184	0.183
AIC	290.7	290.3	293.3	295.0	290.2	291.1	293.0	293.1
ΔAIC (base model)	1.3	0.9	3.9	5.6	0.8	1.7	3.6	3.7
Classified %	67.76	68.69	66.36	63.55	67.29	66.82	66.36	67.76
Area under ROC curve	0.723	0.727	0.716	0.703	0.742	0.734	0.723	0.724

Panel C: Ownership, subsidiary, firm size, performance and growth potential measures

Dependent variable = IR_t	(17)	(18)	(19)	(20)	(21)	(22)	(23)
ESP_{t-1}	0.0217**	0.0231**	0.0246***	0.0258***	0.0227**	0.0228**	0.0227**
	(2.37)	(2.53)	(2.72)	(2.88)	(2.44)	(2.46)	(2.43)
GRI_{t-1}	0.336	0.299	0.327	0.269	0.294	0.284	0.320
	(0.87)	(0.77)	(0.84)	(0.69)	(0.75)	(0.72)	(0.81)
$OWNERSHIP_{t-1}$		-0.00589	-0.00545	-0.00560	-0.00679	-0.00735	-0.00666
		(-0.82)	(-0.75)	(-0.77)	(-0.95)	(-1.03)	(-0.94)
$OWNERSHIP\_INS_{t-1}$	-0.0113						
	(-0.47)						
$MEDIA\_JFALL_{t-1}$	-0.279	-0.278	-0.306	-0.371	-0.148	-0.170	-0.160
	(-0.51)	(-0.52)	(-0.57)	(-0.71)	(-0.28)	(-0.32)	(-0.30)
$BOARDSKILL_{t-1}$	-0.0146*	-0.0129*	-0.0130*	-0.0124*	-0.0141*	-0.0148*	-0.0149*
	(-1.92)	(-1.70)	(-1.70)	(-1.65)	(-1.83)	(-1.92)	(-1.95)
$BOARDSIZE_{t-1}$	-0.107**	-0.0941**	-0.0998**	-0.0958**	-0.110**	-0.111**	-0.109**
	(-2.53)	(-2.25)	(-2.34)	(-2.22)	(-2.54)	(-2.56)	(-2.50)
$GENDIV_{t-1}$	0.0273	0.0306	0.0259	0.0302	0.0281	0.0296	0.0293
	(1.38)	(1.55)	(1.30)	(1.54)	(1.39)	(1.47)	(1.45)
LEV_{t-1}	0.564	0.758	0.824	0.994	0.594	0.644	0.562
	(0.60)	(0.79)	(0.87)	(1.00)	(0.59)	(0.67)	(0.59)
$LnSUBSIDIARY_{t-1}$	0.287**				0.303**	0.312**	0.310**
	(2.07)				(2.19)	(2.24)	(2.26)
$LnSUBSIDIARY\_FOR_{t-1}$		0.142					
		(1.33)					
$LISTING_{t-1}$			0.0588				
			(0.95)				
$LnSIZE_{t-1}$				0.0898			
				(0.57)			
$INTASSET_{t-1}$	-2.625**	-2.223*	-2.179*	-2.168*	-2.406**	-2.527**	-2.520**
	(-2.31)	(-1.88)	(-1.83)	(-1.77)	(-2.04)	(-2.15)	(-2.19)
ROA_{t-1}					-0.682		
					(-0.22)		
MTB_{t-1}						0.0164	
						(0.92)	
SPP_{t-1}							-0.494
							(-0.71)
$SENSITIVE_{t-1}$	-0.0301	-0.156	-0.205	-0.195	-0.0308	-0.0393	-0.0639
	(-0.09)	(-0.49)	(-0.65)	(-0.62)	(-0.09)	(-0.12)	(-0.19)
$CONCENTRATE_{t-1}$	2.876	2.682	3.131*	3.220*	2.854	2.958	2.778
	(1.53)	(1.43)	(1.81)	(1.77)	(1.52)	(1.58)	(1.47)
$CULTURE\_MUL_{t-1}$	0.171	0.169	0.198	0.226	0.146	0.180	0.156
	(1.12)	(1.08)	(1.33)	(1.52)	(0.90)	(1.13)	(1.00)
$NATION\_VF_{t-1}$	0.203	0.182	0.177	0.129	0.224*	0.222*	0.221*
	(1.57)	(1.41)	(1.38)	(1.05)	(1.73)	(1.73)	(1.69)
N	214	214	214	214	214	214	214
Chi-squared (Wald)	29.45	26.89	25.93	24.65	28.60	28.89	29.03
Model df	14	14	14	14	15	15	15
Pseudo $R^2_{Nagelkerke}$	0.210	0.197	0.192	0.189	0.214	0.215	0.216
AIC	290.1	292.5	293.4	293.9	291.3	291.0	290.9
ΔAIC (base model)	0.7	3.1	4.0	4.5	1.9	1.6	1.5
Classified %	65.42	65.89	67.76	69.63	67.29	66.36	68.22
Area under ROC curve	0.730	0.722	0.724	0.727	0.733	0.733	0.734

Panel D: Capital market and analyst-related measures

Dependent variable = IR_t	(24)	(25)	(26)	(27)	(28)	(29)	(30)
ESP_{t-1}	0.0233**	0.0226**	0.0221**	0.0240**	0.0231**	0.0222**	0.0230**
	(2.50)	(2.41)	(2.35)	(2.53)	(2.47)	(2.31)	(2.45)
GRI_{t-1}	0.317	0.274	0.274	0.338	0.299	0.305	0.285
	(0.81)	(0.69)	(0.69)	(0.84)	(0.76)	(0.77)	(0.72)
$OWNERSHIP_{t-1}$	-0.00793	-0.00658	-0.00654	-0.00360	-0.00707	-0.00710	-0.00718
	(-1.10)	(-0.91)	(-0.91)	(-0.48)	(-1.00)	(-1.00)	(-1.00)
$MEDIA\_JFALL_{t-1}$	-0.114	-0.201	-0.221	-0.379	-0.150	-0.164	-0.176
	(-0.21)	(-0.36)	(-0.40)	(-0.66)	(-0.28)	(-0.31)	(-0.32)
$BOARDSKILL_{t-1}$	-0.0140*	-0.0147*	-0.0149*	-0.0142*	-0.0148*	-0.0143*	-0.0147*
	(-1.82)	(-1.92)	(-1.95)	(-1.83)	(-1.84)	(-1.88)	(-1.92)
$BOARDSIZE_{t-1}$	-0.107**	-0.110**	-0.111**	-0.111**	-0.109**	-0.109**	-0.110**
	(-2.48)	(-2.55)	(-2.57)	(-2.51)	(-2.49)	(-2.52)	(-2.55)
$GENDIV_{t-1}$	0.0303	0.0273	0.0268	0.0259	0.0282	0.0314	0.0283
	(1.51)	(1.34)	(1.31)	(1.27)	(1.39)	(1.50)	(1.39)
LEV_{t-1}	0.644	0.715	0.800	0.783	0.633	0.850	0.679
	(0.66)	(0.73)	(0.81)	(0.77)	(0.65)	(0.75)	(0.70)
$LnSUBSIDIARY_{t-1}$	0.270*	0.311**	0.305**	0.220	0.307**	0.309**	0.312**
	(1.91)	(2.24)	(2.19)	(1.54)	(2.22)	(2.27)	(2.20)
$INTASSET_{t-1}$	-2.159*	-2.589**	-2.554**	-2.805**	-2.443**	-2.517**	-2.534**
	(-1.77)	(-2.13)	(-2.16)	(-2.39)	(-2.11)	(-2.15)	(-2.13)
$BETA_{t-1}$	0.322						
	(0.90)						
$PRICEVOLI_{t-1}$		-0.587					
		(-0.45)					
$RETVOLI_{t-1}$			-0.872				
			(-0.61)				
$EARNSURP_{t-1}$				-0.670			
				(-1.18)			
$FOLLOW_{t-1}$					-0.00461		
					(-0.22)		
$WACC_{t-1}$						0.0263	
						(0.42)	
COE_{t-1}							-0.0155
							(-0.29)
$SENSITIVE_{t-1}$	0.00730	-0.0557	-0.0657	-0.103	-0.0500	-0.0437	-0.0563
	(0.02)	(-0.17)	(-0.20)	(-0.31)	(-0.15)	(-0.13)	(-0.17)
$CONCENTRATE_{t-1}$	2.831	2.966	2.970	3.098	2.947	2.916	2.921
	(1.40)	(1.60)	(1.60)	(1.62)	(1.55)	(1.56)	(1.57)
$CULTURE\_MUL_{t-1}$	0.155	0.157	0.170	0.169	0.155	0.184	0.155
	(0.98)	(1.01)	(1.08)	(1.06)	(0.99)	(1.08)	(0.99)
$NATION\_VF_{t-1}$	0.230*	0.214	0.210	0.183	0.224*	0.220*	0.224*
	(1.75)	(1.61)	(1.58)	(1.32)	(1.72)	(1.70)	(1.72)
N	214	214	214	206	214	214	214
Chi-squared (Wald)	27.88	29.46	29.43	27.13	29.00	29.62	28.71
Model df	15	15	15	15	15	15	15
Pseudo $R^2_{Nagelkerke}$	0.217	0.214	0.215	0.212	0.214	0.215	0.214
AIC	290.6	291.2	291.0	281.8	291.3	291.1	291.3
ΔAIC (base model)	1.2	1.8	1.6	-7.6	1.9	1.7	1.9
Classified %	67.29	67.76	67.76	66.50	67.29	67.29	66.36
Area under ROC curve	0.736	0.733	0.734	0.734	0.730	0.734	0.732

Panel E: Industry and country-level characteristics

Dependent variable = IR_t	(31)	(32)	(33)	(34)	(35)	(36)
ESP_{t-1}	0.0223**	0.0221**	0.0255**	0.0228**	0.0220**	0.0235**
	(2.43)	(2.34)	(2.55)	(2.43)	(2.38)	(2.45)
GRI_{t-1}	0.290	0.373	0.319	0.341	0.364	0.318
	(0.74)	(0.91)	(0.76)	(0.81)	(0.91)	(0.80)
$OWNERSHIP_{t-1}$	-0.00706	-0.00907	-0.00895	-0.00524	-0.00521	-0.00848
	(-0.99)	(-1.20)	(-1.21)	(-0.74)	(-0.73)	(-1.19)
$MEDIA\_JFALL_{t-1}$	-0.165	-0.234	-0.618	-0.404	-0.212	-0.201
	(-0.31)	(-0.44)	(-1.07)	(-0.76)	(-0.40)	(-0.37)
$BOARDSKILL_{t-1}$	-0.0144*	-0.0154**	-0.0193**	-0.0161*	-0.0122	-0.0129*
	(-1.89)	(-1.97)	(-2.18)	(-1.91)	(-1.55)	(-1.77)
$BOARDSIZE_{t-1}$	-0.110**	-0.111**	-0.0779*	-0.100**	-0.0994**	-0.102**
	(-2.55)	(-2.55)	(-1.75)	(-2.37)	(-2.33)	(-2.32)
$GENDIV_{t-1}$	0.0287	0.0268	0.0315	0.0326	0.0223	0.0202
	(1.41)	(1.31)	(1.38)	(1.42)	(1.05)	(1.14)
LEV_{t-1}	0.770	0.671	0.426	0.671	0.707	0.605
	(0.76)	(0.70)	(0.43)	(0.71)	(0.75)	(0.64)
$LnSUBSIDIARY_{t-1}$	0.315**	0.291**	0.246*	0.248*	0.251*	0.323**
	(2.33)	(2.09)	(1.70)	(1.73)	(1.80)	(2.40)
$INTASSET_{t-1}$	-2.544**	-2.463**	-2.694**	-2.355**	-2.306**	-2.428**
	(-2.19)	(-2.15)	(-2.34)	(-2.04)	(-2.00)	(-2.15)
$SENSITIVE_{t-1}$		-0.0437	0.0514	-0.00795	-0.0562	-0.0285
		(-0.13)	(0.15)	(-0.02)	(-0.17)	(-0.09)
$LITIGATION_{t-1}$	0.244					
	(0.55)					
$CONCENTRATE_{t-1}$	2.894	3.154*	3.752*	2.897*	2.412	2.530
	(1.58)	(1.75)	(1.84)	(1.65)	(1.29)	(1.47)
$LEGAL_{t-1}$		0.440				
		(0.86)				
$CULTURE\_MUL_{t-1}$	0.152	0.228			0.143	
	(0.97)	(1.30)			(0.84)	
$CULTURE\_PII_{t-1}$					-0.0378	
					(-0.28)	
$CULTURE\_PDI_{t-1}$			0.0131			
			(0.61)			
$CULTURE\_IDV_{t-1}$			-0.0238	-0.0124		
			(-1.38)	(-1.06)		
$CULTURE\_MAS_{t-1}$			0.0239**	0.0146*		
			(2.22)	(1.67)		
$CULTURE\_UAI_{t-1}$			-0.00989			
			(-1.10)			
$CULTURE\_LTO_{t-1}$			0.00576			
			(0.50)			
$CULTURE\_IVR_{t-1}$			0.0342*			
			(1.67)			
$NATION\_RRG_{t-1}$						0.109
						(0.95)
$NATION\_VF_{t-1}$	0.229*	0.212				0.314**
	(1.75)	(1.62)				(1.96)
N	214	214	214	214	214	214
Chi-squared (Wald)	28.58	29.22	29.68	29.60	27.81	26.35
Model df	14	15	18	14	14	14
Pseudo $R^2_{Nagelkerke}$	0.215	0.217	0.231	0.214	0.200	0.212
AIC	289.1	290.7	294.0	289.3	291.9	289.6
ΔAIC (base model)	-0.3	1.3	4.6	-0.1	2.5	0.2
Classified %	66.36	67.29	71.50	68.22	66.36	68.22
Area under ROC curve	0.736	0.739	0.749	0.736	0.723	0.741

Table 4.10 reports results for alternative model specifications. Model 1 in Panel A is the base model. Panel A presents tests on alternative media measures in the order of: (3, 4) *LnMEDIA_ALL*, (5, 6) *MEDIA_JFCSR* and (7, 8) *LnMEDIA_CSR*. Panel B presents tests on alternative ESG measures in the order of: (9) *ENV*, (10) *SOC*, (11) *IVS*, (12) *GRI*, (13) *BOARDCOM_AUD*, (14) *BOARDCOM_CG*, (15) *BOARDIND* and (16) *GOV*. Panel C presents tests on alternative ownership, subsidiary, firm size, performance and growth potential measures in the order of: (17) *OWNERSHIP_INS*, (18) *LnSUBSIDIARY_FOR*, (19) *LISTING*, (20) *LnSIZE*, (21) *ROA*, (22) *MTB* and (23) *SPP*. Panel D presents tests on alternative capital market and analyst-related measures in the order of: (24) *BETA*, (25) *PRICEVOLI*, (26) *RETVOLI*, (27) *EARNSURP*, (28) *FOLLOW*, (29) *WACC* and (30) *COE*. Panel E presents tests on alternative industry and country-level characteristics in the order of: (31) *LITIGATION*, (32) *LEGAL*, (33) individual *CULTURE* measures, (34) *CULTURE_IDV* and *CULTURE_MAS*, (35) principal components for *CULTURE*, and (36) principal components for *NATION*. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Table 4.11 Independent *t*-tests for alternative matches

Panel A: Matches based on ASSET4

	A4GICS2 All (n = 232)			A4GICS4 All (n = 228)			A4SIC2 (Main) All (n = 214)			A4SIC3 All (n = 170)		
		t-test	M-W		*t*-test	M-W		*t*-test	M-W		*t*-test	M-W
Variable	diff	*p*-value	*p*-value	diff	*p*-value	*p*-value	diff	*p*-value	*p*-value	diff	*p*-value	*p*-value
ESP_{t-1}	-16.590	0.000	0.000	-16.000	0.000	0.000	-12.520	0.000	0.001	-14.730	0.000	0.001
$OWNERSHIP_{t-1}$	1.892	0.519	0.646	1.517	0.606	0.779	2.517	0.405	0.358	3.032	0.387	0.433
$MEDIA\_JFALL_{t-1}$	0.006	0.878	0.127	-0.002	0.965	0.261	0.045	0.267	0.219	0.012	0.806	0.560
$LnMEDIA\_ALL_{t-1}$	-0.636	0.000	0.002	-0.598	0.001	0.000	-0.497	0.004	0.013	-0.586	0.007	0.021
$BOARDSKILL_{t-1}$	3.225	0.342	0.393	3.112	0.356	0.413	4.477	0.203	0.199	5.308	0.174	0.162
$BOARDSIZE_{t-1}$	0.121	0.821	0.875	-0.079	0.866	0.995	0.150	0.781	0.973	0.129	0.812	0.926
$GENDIV_{t-1}$	-1.939	0.184	0.260	-1.850	0.247	0.291	-1.594	0.305	0.338	-2.401	0.170	0.042
LEV_{t-1}	-0.039	0.076	0.069	-0.042	0.074	0.031	-0.018	0.433	0.389	-0.018	0.495	0.353
$LnSUBSIDIARY_{t-1}$	-0.539	0.001	0.001	-0.540	0.002	0.002	-0.527	0.004	0.003	-0.680	0.001	0.002
$INTASSET_{t-1}$	-0.010	0.648	0.507	-0.023	0.252	0.304	0.015	0.494	0.707	-0.009	0.625	0.652
$CONCENTRATE_{t-1}$	-0.006	0.798	0.003	-0.014	0.387	0.012	-0.024	0.069	0.025	-0.010	0.425	0.048
ENV_{t-1}	-14.670	0.000	0.000	-14.410	0.000	0.000	-11.650	0.000	0.003	-14.750	0.000	0.004
SOC_{t-1}	-18.500	0.000	0.000	-17.590	0.000	0.000	-13.400	0.000	0.003	-14.700	0.000	0.003
IVS_{t-1}	-15.890	0.000	0.000	-14.730	0.000	0.004	-10.990	0.001	0.005	-10.650	0.003	0.007
$MEDIA\_JFCSR_{t-1}$	-0.123	0.052	0.127	-0.129	0.043	0.083	-0.031	0.634	0.866	-0.079	0.289	0.463
$LnMEDIA\_CSR_{t-1}$	-0.633	0.003	0.002	-0.593	0.006	0.007	-0.527	0.013	0.028	-0.445	0.073	0.110
$BOARDIND_{t-1}$	-2.281	0.576	0.446	-1.595	0.698	0.525	-2.220	0.599	0.514	-1.533	0.742	0.700
GOV_{t-1}	-6.420	0.109	0.049	-6.252	0.128	0.048	-4.894	0.244	0.248	-7.640	0.102	0.071
$OWNERSHIP\_INS_{t-1}$	0.913	0.328	0.032	0.893	0.294	0.021	0.843	0.341	0.156	2.473	0.081	0.049
$LISTING_{t-1}$	-0.836	0.036	0.071	-0.833	0.041	0.049	-0.748	0.070	0.103	-1.059	0.027	0.044
$LnSUBSIDIARY\_FOR_{t-1}$	-0.646	0.003	0.003	-0.632	0.006	0.007	-0.667	0.005	0.003	-0.712	0.008	0.013
$LnSIZE_{t-1}$	-0.061	0.659	0.611	-0.156	0.298	0.310	-0.187	0.225	0.258	-0.378	0.039	0.028
MTB_{t-1}	1.098	0.310	0.057	1.189	0.271	0.007	0.177	0.849	0.091	1.420	0.281	0.506
ROA_{t-1}	0.022	0.027	0.065	0.014	0.078	0.079	0.011	0.164	0.130	0.014	0.122	0.248
SPP_{t-1}	0.003	0.922	0.760	0.012	0.708	0.430	0.015	0.629	0.482	-0.004	0.910	0.841
$BETA_{t-1}$	-0.109	0.086	0.076	-0.089	0.166	0.149	-0.096	0.148	0.146	-0.081	0.299	0.238
$WACC_{t-1}$	0.413	0.281	0.258	0.665	0.120	0.103	0.097	0.827	0.772	0.056	0.906	0.754
COE_{t-1}	-0.351	0.420	0.422	-0.308	0.475	0.500	-0.568	0.184	0.335	-0.286	0.583	0.764

Panel B: Matches based on Worldscope

	WSGICS2 All (n = 210)			WSGICS4 All (n = 208)			WSSIC2 All (n = 192)			WSSIC3 All (n = 154)		
Variable	diff	*t*-test *p*-value	M-W *p*-value	diff	*t*-test *p*-value	M-W *p*-value	diff	*t*-test *p*-value	M-W *p*-value	diff	*t*-test *p*-value	M-W *p*-value
ESP_{t-1}	-16.760	0.000	0.000	-18.300	0.000	0.000	-14.060	0.000	0.000	-14.740	0.000	0.002
$OWNERSHIP_{t-1}$	0.068	0.983	0.872	0.344	0.912	0.915	0.715	0.819	0.771	1.617	0.658	0.757
$MEDIA\_JFALL_{t-1}$	-0.012	0.774	0.246	-0.012	0.784	0.362	0.034	0.438	0.296	0.050	0.298	0.359
$LnMEDIA\_ALL_{t-1}$	-0.574	0.002	0.005	-0.690	0.000	0.000	-0.525	0.004	0.019	-0.675	0.007	0.033
$BOARDSKILL_{t-1}$	3.874	0.259	0.308	3.182	0.351	0.419	5.108	0.162	0.154	8.014	0.043	0.058
$BOARDSIZE_{t-1}$	-0.086	0.870	0.650	-0.096	0.844	0.866	0.146	0.796	0.998	0.065	0.906	0.991
$GENDIV_{t-1}$	-1.553	0.318	0.411	-1.888	0.246	0.294	-1.582	0.313	0.362	-3.302	0.051	0.032
LEV_{t-1}	-0.035	0.139	0.110	-0.042	0.085	0.041	-0.032	0.179	0.136	-0.021	0.449	0.319
$LnSUBSIDIARY_{t-1}$	-0.513	0.003	0.005	-0.575	0.001	0.003	-0.653	0.000	0.001	-0.628	0.003	0.007
$INTASSET_{t-1}$	-0.027	0.212	0.201	-0.024	0.275	0.200	0.011	0.626	0.585	-0.004	0.842	0.813
$CONCENTRATE_{t-1}$	-0.007	0.769	0.004	-0.011	0.533	0.009	-0.032	0.000	0.006	-0.013	0.316	0.040
ENV_{t-1}	-13.900	0.000	0.000	-16.300	0.000	0.000	-13.820	0.000	0.002	-14.470	0.000	0.009
SOC_{t-1}	-19.620	0.000	0.000	-20.300	0.000	0.000	-14.300	0.000	0.002	-15.010	0.000	0.002
IVS_{t-1}	-17.080	0.000	0.000	-18.470	0.000	0.000	-11.960	0.000	0.006	-10.170	0.004	0.011
$MEDIA\_JFCSR_{t-1}$	-0.136	0.030	0.089	-0.152	0.016	0.042	-0.069	0.312	0.473	-0.054	0.474	0.568
$LnMEDIA\_CSR_{t-1}$	-0.644	0.004	0.004	-0.734	0.001	0.002	-0.656	0.002	0.007	-0.476	0.076	0.113
$BOARDIND_{t-1}$	-2.440	0.567	0.454	-1.741	0.686	0.522	-2.754	0.541	0.418	-1.154	0.815	0.784
GOV_{t-1}	-6.923	0.095	0.041	-7.968	0.061	0.021	-5.114	0.238	0.193	-7.295	0.125	0.084
$OWNERSHIP\_INS_{t-1}$	1.338	0.135	0.031	0.791	0.391	0.024	1.760	0.045	0.300	2.399	0.029	0.067
$LISTING_{t-1}$	-0.819	0.046	0.105	-0.788	0.058	0.085	-0.708	0.109	0.153	-1.143	0.024	0.034
$LnSUBSIDIARY\_FOR_{t-1}$	-0.642	0.004	0.006	-0.696	0.003	0.005	-0.771	0.001	0.001	-0.761	0.005	0.009
$LnSIZE_{t-1}$	-0.086	0.544	0.476	-0.164	0.289	0.259	-0.203	0.189	0.136	-0.305	0.093	0.040
MTB_{t-1}	0.499	0.608	0.153	1.216	0.304	0.022	0.109	0.915	0.213	1.474	0.310	0.810
ROA_{t-1}	0.022	0.045	0.170	0.014	0.092	0.083	0.010	0.215	0.177	0.013	0.164	0.334
SPP_{t-1}	0.016	0.638	0.461	0.018	0.612	0.354	0.011	0.726	0.747	-0.003	0.930	0.987
$BETA_{t-1}$	-0.096	0.134	0.132	-0.077	0.231	0.220	-0.117	0.071	0.083	-0.033	0.700	0.392
$WACC_{t-1}$	0.517	0.201	0.161	0.766	0.062	0.044	0.091	0.828	0.530	0.204	0.691	0.650
COE_{t-1}	-0.066	0.879	0.741	-0.046	0.914	0.830	-0.512	0.237	0.322	-0.073	0.901	0.901

Table 4.11 reports tests of differences between IR firms and matched non-IR firms for alternative matches, as based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). Four industry classifications were tested: two-digit GICS, four-digit GICS, two-digit SIC and three-digit SIC. Panel A presents results for matches on the ASSET4 universe. Panel B reports results for matches on the Worldscope universe. Variables are as defined in Section 3.5.

Table 4.12: Regressions on alternative matches

Panel A: ASSET4 matches

Dependent variable = IR_t	A4GICS2			A4GICS4			A4SIC2 (Main)			A4SIC3		
ESP_{t-1}	0.0309***		0.0306***	0.0250***		0.0243***	0.0228**		0.0212**	0.0232**		0.0233**
	(3.84)		(3.87)	(3.35)		(3.25)	(2.45)		(2.30)	(2.01)		(2.05)
GRI_{t-1}	0.399		0.317	0.322		0.319	0.287		0.247	0.284		0.298
	(1.12)		(0.90)	(0.91)		(0.91)	(0.73)		(0.64)	(0.55)		(0.58)
$BOARDCOM\_CSR_{t-1}$		1.788***			1.583***			1.607***			1.846***	
		(4.02)			(3.82)			(3.45)			(3.21)	
$OWNERSHIP_{t-1}$	-0.00799	-0.0122*	-0.00680	-0.00760	-0.0102	-0.00687	-0.00700	-0.0106	-0.00641	-0.0150**	-0.0173**	-0.0132*
	(-1.10)	(-1.70)	(-0.93)	(-1.08)	(-1.47)	(-0.96)	(-0.98)	(-1.38)	(-0.89)	(-1.96)	(-2.13)	(-1.73)
$MEDIA\_JFALL_{t-1}$	0.405	0.804		0.620	0.940*		-0.156	-0.0194		0.870	1.128*	
	(0.71)	(1.44)		(1.25)	(1.88)		(-0.29)	(-0.04)		(1.45)	(1.73)	
$LnMEDIA\_ALL_{t-1}$			0.186			0.140			0.186			0.0629
			(1.40)			(0.92)			(1.38)			(0.44)
$BOARDSKILL_{t-1}$	-0.00353	-0.00799	-0.00166	-0.00568	-0.0101	-0.00305	-0.0144*	-0.0175**	-0.0143*	-0.0131	-0.0173*	-0.0101
	(-0.47)	(-1.01)	(-0.22)	(-0.77)	(-1.32)	(-0.42)	(-1.88)	(-2.26)	(-1.89)	(-1.48)	(-1.82)	(-1.16)
$BOARDSIZE_{t-1}$	-0.0652	-0.0458	-0.0745*	-0.0370	-0.0263	-0.0440	-0.110**	-0.0892**	-0.117***	-0.128**	-0.110**	-0.126**
	(-1.62)	(-1.15)	(-1.88)	(-0.87)	(-0.62)	(-1.03)	(-2.55)	(-2.12)	(-2.73)	(-2.46)	(-2.02)	(-2.41)
$GENDIV_{t-1}$	0.0232	0.0266	0.0201	0.0195	0.0264	0.0156	0.0288	0.0299	0.0280	0.0393*	0.0360	0.0309
	(1.21)	(1.47)	(1.08)	(1.07)	(1.40)	(0.86)	(1.43)	(1.39)	(1.39)	(1.84)	(1.63)	(1.46)
LEV_{t-1}	0.906	0.696	0.866	1.265	1.242	1.116	0.654	0.415	0.600	0.474	0.329	0.505
	(0.97)	(0.72)	(0.94)	(1.49)	(1.42)	(1.27)	(0.68)	(0.41)	(0.63)	(0.43)	(0.29)	(0.47)
$LnSUBSIDIARY_{t-1}$	0.351***	0.394***	0.246*	0.278**	0.321**	0.169	0.305**	0.301**	0.254*	0.413**	0.506***	0.320**
	(2.67)	(2.96)	(1.75)	(2.13)	(2.47)	(1.16)	(2.21)	(2.11)	(1.78)	(2.56)	(2.93)	(2.04)
$INTASSET_{t-1}$	0.478	0.140	0.556	0.470	0.136	0.560	-2.448**	-2.651**	-2.575**	-1.531	-2.152	-1.335
	(0.50)	(0.15)	(0.58)	(0.45)	(0.13)	(0.53)	(-2.12)	(-2.28)	(-2.20)	(-0.97)	(-1.41)	(-0.80)
$SENSITIVE_{t-1}$	-0.0946	0.0696	-0.186	-0.101	0.0364	-0.177	-0.0441	0.107	-0.121	0.0673	0.260	-0.00335
	(-0.30)	(0.22)	(-0.57)	(-0.32)	(0.11)	(-0.55)	(-0.13)	(0.32)	(-0.36)	(0.17)	(0.67)	(-0.01)
$CONCENTRATE_{t-1}$	-0.452	0.104	-0.439	0.283	0.788	0.119	2.889	3.875**	2.981*	-0.438	-0.114	-0.626
	(-0.47)	(0.10)	(-0.48)	(0.20)	(0.53)	(0.09)	(1.55)	(2.40)	(1.70)	(-0.19)	(-0.04)	(-0.29)
$CULTURE\_MUL_{t-1}$	-0.0163	-0.0148	-0.0276	0.0413	0.0523	0.0270	0.157	0.124	0.120	0.0538	-0.0434	0.0688
	(-0.11)	(-0.10)	(-0.19)	(0.26)	(0.33)	(0.18)	(1.01)	(0.77)	(0.76)	(0.29)	(-0.21)	(0.37)
$NATION\_VF_{t-1}$	0.232*	0.330**	0.191	0.190	0.302**	0.143	0.224*	0.306**	0.214	0.241	0.357**	0.192
	(1.81)	(2.55)	(1.47)	(1.52)	(2.34)	(1.15)	(1.73)	(2.35)	(1.62)	(1.61)	(2.14)	(1.32)
N	232	232	232	228	228	228	214	214	214	170	170	170
Chi-squared (Wald)	39.52	34.51	38.08	33.09	31.95	30.47	28.67	31.89	29.79	28.09	24.42	26.36
Pseudo $R^2_{Nagelkerke}$	0.238	0.201	0.246	0.207	0.191	0.204	0.213	0.218	0.222	0.238	0.251	0.228
Classified %	67.24	65.95	70.69	65.79	64.47	67.98	67.29	66.36	67.29	63.53	65.88	65.29

Panel B: Worldscope matches

Dependent variable = IR_t	WSGICS2			WSGICS4			WSSIC2			WSSIC3		
ESP_{t-1}	0.0305***		0.0301***	0.0310***		0.0303***	0.0224**		0.0220**	0.0258**		0.0255**
	(3.47)		(3.47)	(3.66)		(3.58)	(2.21)		(2.20)	(2.00)		(1.99)
GRI_{t-1}	0.478		0.428	0.543		0.519	0.152		0.153	0.134		0.125
	(1.27)		(1.15)	(1.39)		(1.34)	(0.35)		(0.36)	(0.25)		(0.23)
$BOARDCOM\_CSR_{t-1}$		1.717***			2.083***			1.683***			1.852***	
		(3.67)			(4.32)			(3.19)			(2.92)	
$OWNERSHIP_{t-1}$	-0.00366	-0.00869	-0.00142	-0.00436	-0.00870	-0.00290	-0.00298	-0.00604	-0.00242	-0.0106	-0.0129	-0.00883
	(-0.49)	(-1.17)	(-0.19)	(-0.59)	(-1.19)	(-0.38)	(-0.37)	(-0.68)	(-0.30)	(-1.29)	(-1.43)	(-1.08)
$MEDIA\_JFALL_{t-1}$	0.726	1.172*		0.559	1.000*		0.222	0.297		0.552	0.834	
	(1.19)	(1.84)		(1.03)	(1.80)		(0.37)	(0.49)		(0.85)	(1.15)	
$LnMEDIA\_ALL_{t-1}$			0.150			0.154			0.131			0.0678
			(0.99)			(0.98)			(0.86)			(0.51)
$BOARDSKILL_{t-1}$	-0.00622	-0.0106	-0.00363	-0.00533	-0.0109	-0.00274	-0.0181**	-0.0214**	-0.0175**	-0.0208**	-0.0248**	-0.0192**
	(-0.78)	(-1.26)	(-0.46)	(-0.68)	(-1.28)	(-0.36)	(-2.18)	(-2.44)	(-2.10)	(-2.18)	(-2.49)	(-2.06)
$BOARDSIZE_{t-1}$	-0.0549	-0.0354	-0.0650	-0.0416	-0.0231	-0.0494	-0.136***	-0.111**	-0.143***	-0.143**	-0.120*	-0.145**
	(-1.29)	(-0.87)	(-1.55)	(-0.90)	(-0.51)	(-1.08)	(-2.90)	(-2.35)	(-2.95)	(-2.42)	(-1.92)	(-2.44)
$GENDIV_{t-1}$	0.0159	0.0196	0.0111	0.0149	0.0212	0.0113	0.0358	0.0309	0.0307	0.0590**	0.0546**	0.0526**
	(0.78)	(1.00)	(0.57)	(0.73)	(1.06)	(0.57)	(1.45)	(1.23)	(1.26)	(2.30)	(2.15)	(2.12)
LEV_{t-1}	0.739	0.618	0.669	1.501	1.568	1.318	1.587	1.280	1.565	0.529	0.135	0.593
	(0.74)	(0.62)	(0.67)	(1.55)	(1.58)	(1.33)	(1.52)	(1.12)	(1.50)	(0.45)	(0.11)	(0.50)
$LnSUBSIDIARY_{t-1}$	0.323**	0.350***	0.226	0.319**	0.348***	0.216	0.427***	0.415**	0.366**	0.388**	0.485**	0.314*
	(2.41)	(2.62)	(1.54)	(2.37)	(2.59)	(1.47)	(2.59)	(2.46)	(2.15)	(2.14)	(2.49)	(1.72)
$INTASSET_{t-1}$	0.899	0.530	0.952	0.435	-0.0272	0.537	-2.335*	-2.548**	-2.389*	-2.491	-2.700	-2.466
	(0.86)	(0.52)	(0.90)	(0.39)	(-0.03)	(0.47)	(-1.82)	(-1.98)	(-1.87)	(-1.51)	(-1.64)	(-1.46)
$SENSITIVE_{t-1}$	-0.0936	-0.000502	-0.169	-0.116	-0.0259	-0.166	0.0407	0.162	-0.0420	0.171	0.341	0.109
	(-0.27)	(-0.00)	(-0.49)	(-0.33)	(-0.07)	(-0.47)	(0.11)	(0.44)	(-0.12)	(0.41)	(0.83)	(0.27)
$CONCENTRATE_{t-1}$	-0.330	0.242	-0.427	-0.582	-0.0773	-0.745	10.64***	13.60***	10.07***	-0.192	0.0756	-0.304
	(-0.34)	(0.24)	(-0.45)	(-0.42)	(-0.06)	(-0.57)	(2.76)	(3.24)	(2.71)	(-0.07)	(0.03)	(-0.12)
$CULTURE\_MUL_{t-1}$	0.00231	0.00861	-0.00712	0.0103	0.0186	-0.00955	0.237	0.196	0.205	0.153	0.0440	0.162
	(0.01)	(0.05)	(-0.05)	(0.06)	(0.11)	(-0.06)	(1.37)	(1.08)	(1.18)	(0.71)	(0.18)	(0.76)
$NATION\_VF_{t-1}$	0.207	0.253*	0.168	0.176	0.248*	0.138	0.306**	0.382***	0.281*	0.309*	0.418**	0.267
	(1.49)	(1.84)	(1.24)	(1.25)	(1.77)	(1.01)	(2.14)	(2.58)	(1.93)	(1.74)	(2.12)	(1.50)
N	210	210	210	208	208	208	192	192	192	154	154	154
Chi-squared (Wald)	35.51	28.60	31.98	39.76	36.41	36.97	39.47	39.74	38.20	24.24	23.04	22.84
Pseudo $R^2_{Nagelkerke}$	0.236	0.186	0.235	0.263	0.239	0.263	0.295	0.311	0.298	0.262	0.275	0.259
Classified %	66.19	66.19	70.00	67.31	65.87	69.23	68.75	67.71	69.27	68.18	68.18	69.48

Table 4.12 reports reruns of the full sample analysis using alternative matches. Panel A and Panel B present results for matches on the ASSET4 universe and Worldscope universe, respectively. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

CHAPTER FIVE

CONSEQUENCES OF VOLUNTARY INTEGRATED REPORTING

5.1 Introduction

Improvements in internal management systems and information quality are promoted benefits of IR (Black Sun, 2014; IIRC, 2013b); however, emerging evidence on the consequences of IR has been mixed. Case studies on voluntary IR suggest it has not led to transformative changes in disclosure practices and managers had conflicting opinions on whether it affects internal communication (Dumay & Dai, 2017; Stubbs & Higgins, 2014). While investors are the primary target audience of integrated reports, such reports are not necessarily considered a relevant information source for investment decision-making (Abhayawansa et al., 2018; Hsiao & Kelly, 2018). Further, integrated reports have been criticised for lacking disclosure of quantitative capital-specific information and forward-looking information about risks and opportunities (IIRC, 2013c; Kılıç & Kuzey, 2018; Pistoni et al., 2018).

There is international interest in the Framework and IR is anticipated as a future reporting norm (IIRC, 2017a; KPMG, 2017); thereby, empirical evidence is needed to substantiate the proposed benefits of IR. Extant archival studies concentrate on the economic consequences of IR in the mandatory setting of South Africa. However, IR is a voluntary practice elsewhere. While criticisms of reporting content and quality are applicable to IR in South Africa (Atkins & Maroun, 2015; Haji & Anifowose, 2016; Solomon & Maroun, 2012), studies examining mandatory IR found reports aligned with the IIRC Framework improve the information environment and firm value. Prior studies have deemed reports more aligned with the Framework as higher quality reports, and have found associations between higher quality integrated reports and increased Tobin's Q (Barth et al., 2017; Lee & Yeo, 2016), lower analyst forecast error and lower forecast dispersion (Bernardi & Stark, 2018; Zhou et al., 2017). While these studies provide important insights on the consequences of IR, generalisability of findings is possibly limited as findings may reflect country-specific characteristics or regulatory effects. Therefore, the purpose of this chapter is to provide empirical evidence on the external and internal consequences of voluntary IR. Understanding whether voluntary IR influences capital market participants and management practices are of interest to regulators, managers and investors.

This study examines whether voluntary adoption of the IIRC Framework and initiation of integrated reports influence the information environment, cost of equity, firm value and environmental and social performance. An international sample of IR firms and matched non-IR firms is examined. Multiple linear regressions (MLR), treatment effect models (TEM) and difference-in-differences (DID) estimates are tested to address potential endogeneity problems

related to self-selection bias and omitted variables. For MLR and TEM estimates, in addition to using leading dependent variables to mitigate time lag effects and reverse causality, both level and change specifications are examined. As any effects of IR could emerge in later stages of adoption, two-year leads are tested for all models. Taken together, the study finds no consistent evidence that voluntary IR changes the information environment, cost of equity, firm value or environmental and social performance. The results show no statistically significant changes in the investigated consequences when comparing pre- and post-IR initiation, and any changes are not statistically different relative to non-IR firms. The results are robust to a number of sensitivity analyses.

The study contributes to the IR literature and practice in several ways. It is the first to investigate external and internal consequences associated with voluntary adoption of the IIRC Framework quantitatively. While the results are not supportive of the benefits proposed by IR proponents nor the findings on mandatory IR, the results are consistent with the broader voluntary IR literature. Prior case studies suggest IR does not substantially change internal management practices or improve external reporting practices and investors may lack interest in integrated reports. Thereby, IR does not substantially change sustainability management or provide incremental and material information that influences capital market behaviour. The focus on initiation of integrated reports provides some insights on the economic and non-financial impacts of voluntary IR in its early stages of adoption. However, the concept and process of IR is still developing and any effects could be gradual or more prominent in mature stages of adoption.

The findings of this study enable further interpretation of prior studies' results. Barth et al. (2017) and Zhou et al. (2017) found disclosures more aligned with the IIRC Framework are associated with higher quality disclosures, and higher quality integrated reports improved analyst forecast and firm value in the South African context. However, it is possible that these results are reflective of better reporting practices in general rather than driven by application of specific IR concepts or adoption of the IIRC Framework. In South Africa, IR is a part of ongoing corporate reforms intended to appeal to international investors, increase competitiveness in global financial markets, and reduce corruption and societal inequalities (Haji & Anifowose, 2016). Studies have documented substantial changes in the reporting practices of South African firms following introduction of IR requirements, such as increases in the extent and detail of information disclosed over time on stakeholder relationships, risk management practices and non-financial information (Haji & Anifowose, 2016; Solomon & Maroun, 2012). Thereby, mandatory IR has been accompanied by substantial changes in reporting practices in the context of South Africa.

The benefits detected in mandatory IR studies may not be applicable to countries where integrated disclosure or disclosures incorporating IR concepts are common. Assessments of a matched group of non-IR firms found no statistically significant differences in the investigated consequences between firms that adopt the IIRC Framework and those that do not. This suggests that corporate reports could reflect the concept of IR without being signalled as an integrated report and the disclosure practices of IR firms are not substantially different from prior year practices (Adams et al., 2016; Haji & Anifowose, 2016). Thereby, while IR has potential to bring about changes in reporting practices, this potential could be limited to countries where non-financial disclosures or IR concepts are not already present in existing reporting practices.

The remainder of the chapter is organised as follows. Section 5.2 develops the hypotheses. Section 5.3 describes the samples. Section 5.4, Section 5.5, Section 5.6 and Section 5.7 examine the effects IR has on the information environment, cost of equity, firm value, and environmental and social performance, respectively. Each of those sections details the models, results and additional analyses. Section 5.8 concludes the chapter.

5.2 Hypothesis Development

5.2.1 IR Initiation and the Information Environment

The information environment is affected by corporate disclosures, private information acquisition and information dissemination (Lang et al., 2003). From the perspective of economics-based voluntary disclosure theory, discretionary information reduces information asymmetry (Verrecchia, 1983, 1990), and the quality of information serves as a signal investors use to appraise investment targets (Merton, 1987). These assertions hold to the extent that the information disclosed affects firm value and analysts can infer useful information from the disclosures (Dhaliwal et al., 2012). While it is not possible to directly measure the information environment, greater forecast accuracy and lower forecast dispersion are common proxies of a better information environment (Lang et al., 2003).

According to the IIRC (2013b), integrated reports aim to improve the quality of information available to capital providers by providing a clearer view of organisational value creation. Current reporting systems arguably produce disconnected, static and increasingly complex communications, and integrated reports are meant to address these deficiencies (Eccles & Krzus, 2010; EY, 2014; IIRC, 2013b). Integrated reports are concise communications that explain the interrelationships between financial and non-financial information and detail how an organisation's strategy, governance, performance and prospects lead to value creation over time (IIRC, 2013b). Theoretically, integrated reports would

improve the information environment if it provides value relevant information and capital providers are able to extract this information to make more accurate valuations.

Empirical evidence on mandatory IR supports a significant association between increased disclosure quality and analyst forecast accuracy and lower forecast dispersion. Zhou et al. (2017) found integrated reports more aligned with the IIRC Framework reduce analyst forecast error and there is marginal evidence that the level of alignment is negatively associated with analyst forecast dispersion. These findings suggest investors are willing to accept lower rates of return when there is less information risk. Further, the quality of connectivity results in less analyst forecast error, indicating the emphasis in integrated reports are useful for analysts in assessing firms' future profitability. Similarly, Bernardi and Stark (2018) suggest integrated reports provide useful information for investors to assess the links between ESG and financial performance. They found ESG scores were not associated with analyst forecast accuracy prior to the IR regime in South Africa, but are significantly associated with increased forecast accuracy once the Framework was introduced.

However, studies on voluntary IR suggest the process does not lead to radical changes in internal and external communication (Dumay & Dai, 2017; Stubbs & Higgins, 2014), and integrated reports have been criticised for lacking disclosure of quantitative information and forward-looking information about risks and opportunities (IIRC, 2013c; Kılıç & Kuzey, 2018; Pistoni et al., 2018). Further, investors are reliant on multiple information sources and do not consider integrated reports relevant for investment decision-making (Abhayawansa et al., 2018; Hsiao & Kelly, 2018). Accordingly, the first hypothesis is stated in null form:

H6a: Initiation of integrated reports prepared according to the IIRC Framework is not associated with analyst forecast error

H6b: Initiation of integrated reports prepared according to the IIRC Framework is not associated with analyst forecast dispersion

5.2.2 IR Initiation and Cost of Equity

The information environment and information quality of a firm can have both direct and indirect influences on cost of equity. Direct effects arise when higher quality information affects market participants' assessment of future cash flow distribution, such as through risk sharing and reduction of estimation risk (Lambert et al., 2007; Lang et al., 2003; Merton, 1987). Indirect effects arise when higher quality information affects a firm's real decisions or affects market liquidity, which influences the expected value of a firm and covariance of cash flows (Lambert et al., 2007; Verrecchia, 2001).

Integrated reports can potentially influence cost of equity directly and indirectly. Under the assumption that integrated reports are credible and provide value relevant information, IR could reduce uncertainty when assessing a firm's performance and future prospects. Further, non-financial disclosures could directly influence cost of equity capital through investor preference effects (Richardson & Welker, 2001). Investors are willing to accept a lower rate of return for firms with which they have an affinity. Integrated reports could indirectly reduce cost of equity if it reduces information asymmetry. Investors are more willing to trade in situations with low information asymmetry as it reduces uncertainty and information costs associated with following a firm (Dhaliwal et al., 2011; Merton, 1987). Market liquidity decreases bid-ask spread and transaction costs, and leads to lower required rate of returns (Dhaliwal et al., 2011).

In a mandatory setting, Barth et al. (2017) did not find a relation between integrated report quality and cost of capital, whereas Zhou et al. (2017) found that higher integrated report quality leads to a lower cost of equity capital following an improved information environment. Following from the first hypothesis, the second hypothesis is stated in null form:

H7: Initiation of integrated reports prepared according to the IIRC Framework is not associated with cost of equity

5.2.3 IR Initiation and Firm Value

Equity valuation using a discounted cash flow model or a residual income model have underlying assumptions that share price is the present value of expected future net dividends, discounted at the cost of equity capital. Thus, for voluntary disclosure to influence firm valuation, disclosures need to provide incremental information that is useful for investors in assessing future cash flows and investment risk (Cahan et al., 2016; Lee & Yeo, 2016). While informative and credible information could lead to increases in firm value, incremental information that is perceived as opportunistic or biased would decrease firm value or leave it unchanged (Cahan et al., 2016).

Empirical evidence generally supports a positive association between sustainability performance and financial performance (van Beurden & Gössling, 2008); however, there are conflicting evidence on whether and to what extent non-financial disclosures affect firm value. Traditionally, it is assumed that investors are only interested in maximising risk-adjusted returns from investment. Thereby, investors are interested in social and environmental information only to the extent that it indicate potential investment risk or provide signals about management competency (Murray, Sinclair, Power, & Gray, 2006). Some studies found

that non-financial information could be considered immaterial to investors (EY, 2015b; Murray et al., 2006), while other studies found a positive relation between ESG disclosure and firm value (Cahan et al., 2016; de Klerk et al., 2015). Integrated reports would be value relevant if they have the ability to capture or summarise information that affects equity value. However, there are investors who consider integrated reports to be irrelevant to investing due to unawareness or unfamiliarity with the concept of IR and reliance on other information sources, such as third-party reports and conference calls, for investment decision-making (Abhayawansa et al., 2018; Hsiao & Kelly, 2018).

Empirical evidence on mandatory IR is consistent in the conclusion that integrated report quality is positively associated with firm value. Lee and Yeo (2016) found a significant and positive association between reporting quality and Tobin's Q, with this association stronger for firms with higher organisational complexity and external financing needs. Barth et al. (2017) found the same association and further indicate that increases in firm value resulted from capital market and cash flow effects. Capital market effects are reflected in a positive association between reporting quality and market liquidity. Cash flow effects are reflected in a positive association between reporting quality and expected future cash flows. Additionally, Barth et al. (2017) did not identify any significant associations when substituting Tobin's Q with share price and returns, suggesting the result is associated with the excess of market value over assets.

As there is no evidence that benefits identified for mandatory IR are extendable to voluntary IR, the third hypothesis follows the previous hypotheses and are stated in null form:

H8: Initiation of integrated reports prepared according to the IIRC Framework is not associated with firm value

5.2.4 IR Initiation and Environmental and Social Performance

IR emerged as a decision-making and reporting mechanism intended to support the development of more sustainable economies (IIRC, 2010). Integrated thinking is at the core of IR, which entails the balancing of financial performance and ESG concerns (IIRC, 2013b). Thereby, implementation of IR should stimulate greater attention to the management of environmental and social issues. However, there are concerns surrounding the IIRC's promotion of IR as a business case and the Framework's tendency towards business needs. The level of discretion left to management in preparing an integrated report and the Framework's narrow emphasis on capital providers reinforce business-as-usual practices rather than encourage critical reflection, leading to doubts on its potential to improve sustainable business practices (Brown & Dillard, 2014; Milne & Gray, 2013).

Emerging evidence suggests adoption of IR does not result in any significant changes in corporate operations. IR was considered an extension to sustainability reporting, especially for firms who thought their values were already aligned with sustainability (Lodhia, 2015; Stubbs & Higgins, 2014). Dumay and Dai (2017) found that while a number of managers thought IR helped offset the lack of direction about the purpose of reporting and improved communication across departments, there were also managers who thought IR did not have a real impact on how the teams worked together. Better resource allocation decisions and cost reductions were not indicated as significant outcomes of IR in Steyn (2014), nor were there any anticipated benefits for a firm to reconsider its business model and encourage sustainable product development. However, Mio et al. (2016) suggest that 'internal IR' improved internal operations as it clarified shared value and the value creation path to each function.

As documented by Chaidali and Jones (2017), reporters who adopted the Framework were focused on their business model and financial aspects rather than on social and environmental issues. However, there is potential for IR to improve the management of ESG issues if firms have not previously been engaging in such practices (Churet & Eccles, 2014; Maniora, 2015). As prior research shows mixed results, the fourth hypothesis is stated in null form:

H9: Initiation of integrated reports prepared according to the IIRC Framework is not associated with environmental and social performance

5.3 Samples

The sample size varies across analyses in order to maximise statistical power. While sample size differs, the samples share similar characteristics with each other and with all identified IR firms. The samples used in MLR composed of 236 firms for the information environment analysis, 214 firms for the cost of equity analysis, 282 firms for the firm value analysis, and 178 firms for the environmental and social performance analysis. Independent *t*-tests show that IR firms excluded from the analyses due to missing data or inadequate matches were significantly smaller and have lower cost of equity and lower analyst following (see Section 3.4.2). Thereby, the samples are biased towards larger and relatively higher risk firms.

For the information environment, cost of equity and firm value samples, the initiation years spread across 2011 to 2016 and are concentrated in 2014 and 2015 (varying from 27.12% to 33.05%). According to SIC industry divisions, the samples are dominated by manufacturing (46.61% to 50.47%), transportation and utilities (17.73% to 18.69%), and financial (13.56% to 16.82%). For the environmental and social performance sample, the initiation years spread across 2011 to 2015, with initiation years concentrated across 2013 to

2015 (24.72%, 31.46% and 24.72%, respectively). The industry composition is similar with the other samples, except financial account for a higher proportion compared to transportation and utilities (22.47% and 16.85%, respectively). The samples spread across 24 to 28 countries. For all samples, firms in Japan account for the largest proportion of the sample (38.20% to 44.92%), followed by firms in South Korea (6.78% to 8.41%).

Observations were lost in the TEM and the DID analyses due to missing data for ESG variables or multiple periods. The samples for TEM (DID) composed of 190 (380) observations for the information environment analysis, 174 (310) observations for the cost of equity analysis, 206 (440) observations for the firm value analysis, and 178 (296) observations for the environmental and social performance analysis. The attributes of the TEM and DID samples are consistent with the attributes described above (untabulated).

5.4 Information Environment

5.4.1 Model and Variable Definitions

Equation 5.1 is the MLR model used to examine the effect releasing an integrated report in the current year (*t*) has on the information environment in the following year (*t*+1). The model is based on Behn et al. (2008), Lang et al. (2003), Hope (2003) and Dhaliwal et al. (2012). Details on the model development process is described in Section 3.6.2. The model is also tested substituting country-level variables with country, industry and year dummies.

$$\begin{aligned} INFORMATION_{i,t+1} &= \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 SqEARNSURP_{i,t} \\ &+ \beta_5 LOSS_{i,t} + \beta_6 LnEARNVOLI_{i,t} + \beta_7 LISTING_{i,t} + \beta_8 FOLLOW_{i,t} \\ &+ \beta_9 HORIZON_{i,t} + \beta_{10} NATION\_VF_{i,t} + \beta_{11} NATION\_RRG_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (5.1)$$

The dependent variable information environment (*INFORMATION*) takes the form of two measures: analyst forecast accuracy (*FERROR*) and analyst forecast dispersion (*DISPERSION*). *FERROR* is the mean absolute forecast error scaled by year-end share price. Three forecast error horizons are separately estimated, current-year earnings (*FERROR(0)*), one-year-ahead earnings (*FERROR(1)*) and two-year ahead earnings (*FERROR(2)*). *DISPERSION* is the standard deviation of one-year ahead analyst EPS forecast, scaled by the absolute value of the median consensus EPS forecast for a firm.

The variable of interest is integrated report (*IR*), an indicator variable equal to 1 for IR firms and 0 for non-IR firms. A number of control variables are included. GRI adoption (*GRI*) is an indicator variable equal to 1 for firms that applied GRI standards prior to year *t*, and 0 otherwise. Dhaliwal et al. (2012) found standalone CSR disclosures improve earnings forecast accuracy, suggesting sustainability disclosures provide analysts with more and better quality

non-financial information. GRI adoption is included to separate the effects of applying GRI and the effects attributable to initiating integrated reports.

Firm size (*LnSIZE*) is the natural logarithm of market capitalisation. It is included as a proxy for a firm's general information environment and various correlated factors, such as information availability and managers' incentives (Dhaliwal et al., 2012; Hope, 2003). Earnings surprise (*SqEARNSURP*) is the square root transformation of the absolute value of the difference between a firm's EPS this year and prior year, scaled by year-end share price. Loss reported (*LOSS*) is an indicator variable coded 1 for firms that reported a loss, and 0 otherwise. Earnings volatility (*LnEARNVOLI*) is the natural logarithm of the standard deviation of EPS for a firm over the past ten years (past five years for DID estimations). These three measures reflect information uncertainty and forecast difficulty. It is more difficult to predict the earnings of firms that have volatile earnings, resulting in less accurate earnings forecast (Behn et al., 2008; Hope, 2003; Lang et al., 2003). Loss reported is used as a crude measure of financial distress.

Market listing (*LISTING*) is the number of stock exchanges a firm is listed on. Lang et al. (2003) argue that firms listed on multiple exchanges face explicit disclosure requirements and implicit pressure from investors to provide more information, which in turn improves the information environment for these firms. Analyst following (*FOLLOW*) is the number of analysts following a firm. Following Dhaliwal et al. (2012), analyst following indicates competition among analysts, where greater competition as a result of higher following provides analysts with incentives to enhance forcast accuracy. Forecast horizon (*HORIZON*) is the median number of days between earnings announcement and forecast date. It is expected that forecasts announced closer to the actual earnings announcement is more accurate than one that is announced in an earlier period (Behn et al., 2008).

National freedom and voice (*NATION_VF*) has a negative loading for voice and accountability (*VOICE*) and positive loading for freedom of press (*FREEPRESS*). National freedom and voice is reflective of media freedom. The media plays an important role in financial markets by disseminating and creating information, and greater press coverage has been found to reduce information asymmetry (Bushee et al., 2010; Fang & Peress, 2009). National regulatory environment (*NATION_RRG*) has positive loadings for all components of rule of law (*RULELAW*), regulatory quality (*REGQUAL*), and government effectiveness (*GOVEFF*). Hope (2003) argues that regulatory enforcement and prosecution of standard violation is as important as the accounting standards themselves. The study found a positive association between regulatory enforcement and analyst forecast accuracy, suggesting greater enforcement reduces accounting uncertainty and instances of reporting-related fraud.

5.4.2 Results

Table 5.1 presents the descriptive statistics for the MLR sample. The matching technique appears effective in forming a balanced sample of IR firms and non-IR firms as there are no statistically significant differences between the two groups for the continuous explanatory variables. IR firms and non-IR firms are similar in analyst forecast characteristics, analyst following, firm size, earnings predictability and market listing. For categorical variables, chi-square tests show firms that voluntarily adopt IR are statistically more likely to have adopted GRI guidelines ($\chi^2(1)$ = 18.59, p<0.01). The DID sample is similar to the above, while IR firms in the TEM sample have positive changes in current-year forecast error (means for IR firms and non-IR firms, Δ*FERROR(0)*: 0.01 and -0.02, p<0.05).

Reflective of the descriptive statistics, correlation analysis in Table 5.2 shows no statistically significant relations between the initiation of integrated reports and measures of the information environment or other continuous variables. For the control variables, GRI adoption has significant and positive relations with forecast errors and dispersion. This initial result contrasts Dhaliwal et al. (2012), which found non-financial disclosures improve the information environment. The directions of the relationship for other variables are consistent with prior literature. Firm size, market listing and a stronger regulatory environment have inverse relationships with forecast error and dispersion, whereas measures of earnings volatility and predictability have a positive relationship. Multicollinearity is not a major problem in this study as indicated by the correlation analysis and the VIF. The highest VIF in Equation 5.1 is for *LnSIZE* (2.18 without fixed effect dummies (FE) and 5.74 with FE), and the mean VIF is 1.51 and 2.30 when modelling without and with FE, respectively. Models on change specification (DID[22]) are similar but with lower (higher) individual and mean VIFs.

Table 5.3 reports the regression results for Hypothesis 6, testing the effect initiating integrated reports have on analyst forecast characteristics. There is no evidence of a selection bias as *lambda* is not statistically significant in any specification[23]. While there are instances where there is weak evidence that *IR* has negative associations with the level of *DISPERSION* (Panel A, Model 19: coeff. = -0.379, p<0.10) and change in *FERROR(0)* (Panel B, Model 1: coeff. = -0.0591, p<0.10), the results are not consistent with estimations using FE. Further, *IR* does not improve the model as, in terms of changes in adjusted R-squared, *IR* only accounts

[22] The post-treatment period (*POST*) equals 1 for post-treatment periods (*t*+1 and after), and 0 for pre-treatment periods (*t*-1 and before). The interaction (*IR*POST*) captures the DID effect.

[23] A two-equation model is estimated (see Section 3.2.4). *lambda*, the inverse Mills ratio, is the generalised probit residual obtained from the first equation (probit model). It is included in the second equation (consequences models) to account for self-selection. Appendix B reports the probit regression (selection model) results. The model includes statistically significant predictors of IR initiation and valid exclusion restrictions.

for 0.000 to 0.019 of the variation of *FERROR* and *DISPERSION* in both level and change forms.

Overall, the results failed to provide evidence of a consistent statistical relation between *IR* and analyst forecast characteristics. The results suggest adoption of the IIRC Framework and initiation of integrated reports are not relevant predictors of analyst forecast error or forecast dispersion, and any changes in analyst forecast characteristics do not differ between IR firms and similar non-IR firms[24].

For the control variables, the results for *GRI* are contrary to Dhaliwal et al. (2012), which found sustainability-related disclosures improve analyst forecasts. However, Dhaliwal et al. (2012) focused on initiation of stand-alone non-financial disclosures, while this study defines *GRI* as prior experience with GRI guidelines. It is possible that initiation of stand-alone non-financial disclosures provide incremental and material disclosures for investors, but there is little or no incremental information contained in such disclosures on an ongoing basis. Firm size, earnings volatility and loss have direction effects consistent with those documented by previous studies.

Similar results (untabulated) are obtained after removal of influential observations, winsorising continuous firm-level variables at the 5th and 95th percentile, analysis of dependent variables on a two-year lead, using the TEM sample for all analyses, and using full maximum likelihood estimator (MLE) for TEM analysis. There are no consistent evidence of an association between IR initiation and analyst forecast characteristics in analyses on subsamples and alternative samples, leaving the inferences unchanged.

5.5 Cost of Equity

5.5.1 Model and Variable Definitions

Equation 5.2 is the MLR model used to examine the effect releasing an integrated report in the current year (*t*) has on a firm's cost of equity in the following year (*t*+1). The model is based on Dhaliwal et al. (2011), Khurana and Raman (2004), Richardson and Welker (2001) and Gebhardt et al. (2001). Details on the model development process are described in Section 3.6.3. The model is also tested with country, industry and year dummies.

$$COE_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 LnMTB_{i,t} + \beta_5 LEV_{i,t} + \beta_6 BETA_{i,t} + \beta_7 LTG_{i,t} + \beta_8 LnDISPERSION_{i,t} + \beta_9 FOLLOW_{i,t} + \varepsilon_{i,t} \quad (5.2)$$

[24] While DID estimates also indicate no evidence of a relation, DID estimates are not appropriate for the information environment analysis. Analyst forecast variables do not satisfy the common trend assumption (Appendix C, Figure C1 and Figure C2) and are not robust to tests on pre-event years (untabulated).

The dependent variable cost of equity (*COE*) takes the estimates of cost of equity capital estimated by Bloomberg.

The variable of interest is integrated report (*IR*), as previously defined. A number of control variables are included, hereinafter defined variables are not repeated and can be found in Appendix A. For GRI adoption (*GRI*), Dhaliwal et al. (2011) found CSR disclosures reduce cost of equity capital, suggesting voluntary non-financial disclosures contain incremental information relevant to investors.

Firm size (*LnSIZE*), the market-to-book ratio (*LnMTB*), calculated as the natural logarithm of market capitalisation over book value of shareholders' equity, and leverage (*LEV*), total debt scaled by total assets, are three measures associated with risk in general. Market value is inversely associated, while market-to-book and leverage is positively associated (Khurana & Raman, 2004).

Beta (*BETA*) compares the monthly price movements of a firm's share price over a five-year period with its respective market index. It is a measure of systematic risk and is positively correlated with the cost of equity capital according to the Capital Asset Pricing Model. Long-term growth (*LTG*) is the median consensus long-term growth forecast. It is positively associated with growth and risk as earnings derived from growth opportunities are more uncertain than normal earnings (Khurana & Raman, 2004). Gebhardt et al. (2001) found the direction of analyst forecast dispersion (*LnDISPERSION*) alternates with different model specifications. In the absence of information from analysts, firm disclosures are a key source of information. Thereby, the benefits of firm disclosures could be greater for firms with lower analyst following (*FOLLOW*) (Richardson & Welker, 2001).

5.5.2 Results

Table 5.4 presents the descriptive statistics for the MLR sample. IR firms and non-IR firms are similar in investors' perspective of risk, firm size and performance, leverage and analyst forecast characteristics. Chi-square tests show firms that voluntarily adopt IR are statistically more likely to have adopted GRI guidelines ($\chi^2(1) = 21.77$, $p<0.01$). The TEM sample is similar to the above, while IR firms in the DID sample have significantly more analyst following (means for IR firms and non-IR firms, *FOLLOW*: 18.43 and 16.35, $p<0.05$).

Reflective of the descriptive statistics, correlation analysis in Table 5.5 shows no statistically significant relations between the initiation of integrated reports and cost of equity or other continuous variables. For the control variables, the direction for market-to-book ratio, leverage, beta and analyst forecast dispersion are consistent with prior literature. The prediction for firm size is inconsistent. Multicollinearity is not a major problem for Equation

5.2, estimations without FE, as the highest VIF is for *LnSIZE* (1.43) and the mean VIF is 1.19. However, for estimations with FE, the highest VIF is *LnMTB* (24.39) and the mean VIF is 3.09. Models on change specification (DID) are similar but with lower (higher) individual and mean VIFs.

Table 5.6 reports the regression results for Hypothesis 7, testing the effect initiating integrated reports have on cost of equity. The results across models are not consistent, with variations in statistical significance and direction of the coefficients. With the exception of Model 1, *IR* is not statistically significant in other level and change models. The statistically significant *lambda* indicates it is important to adjust for selection when estimating cost of equity. While the results show that *IR* is a statistically significant predictor of the level of cost of equity, it is not an important predictor. In terms of changes in adjusted R-squared, *IR* only accounts for 0.000 to 0.020 of the variation of *COE* in both level and change forms. Further, Model 1 explains relatively little variance when compared to inclusion of FE or DID models. Regardless, the change specification and DID results provide no evidence that there is a relative difference between changes in cost of equity for firms that adopt the IIRC Framework and initiate integrated reports and similar firms that do not.

For the control variables, the results for *GRI* is consistent with Dhaliwal et al. (2011), suggesting sustainability-related disclosures reduce cost of equity. Firm size, leverage and beta have direction effects consistent with those documented by previous studies. The sign for analyst forecast dispersion switches when comparing change specification and DID estimates, this is similar to the results of Gebhardt et al. (2001), which also observes a sign reversion. Long-term growth is found to have an inverse relationship, which is inconsistent with Khurana and Raman (2004). However, alternatively Gebhardt et al. (2001) suggests that firms with high long-term growth prospects earn lower subsequent returns due to analyst over-optimism in such high growth firms. Under the assumption that firms with strong long-term growth tend to have optimistic earnings forecasts and over priced stocks, those firms are expected to have abnormally low implied risk premium.

Similar results (untabulated) are obtained after removal of influential observations, winsorising continuous firm-level variables at the 5th and 95th percentile, analysis of dependent variables on a two-year lead, using the TEM sample for all analyses, and using MLE for TEM analysis. Analysis removing *LnMTB*, due to problems with multicollinearity, for estimations with FE shows *IR* as statistically significant for the level of *COE* (similar to the results for Table 5.6, Model 1), and had no impact on the change in *COE*. Hence, the conclusions drawn from the main analysis remain robust. Analysis of subsamples indicates *IR* could have different influences on the level of *COE* for different countries, industries and

years. Subsample analysis (untabulated) show a negative and statistically significant relation between *IR* and *COE* for Japanese firms and early adopters, estimated without FE. While other subsample analysis show a positive and statistically significant relation for non-manufacturing firms. The main results are robust to alternative sample specifications, where *IR* has a significant and negative relation with the level of *COE*, but no evidence that *IR* changes *COE*.

5.6 Firm Value

5.6.1 Model and Variable Definitions

Equation 5.3 and Equation 5.4 are the MLR models used to examine the effect releasing an integrated report in the current year (*t*) has on firm value in the following year (*t*+1). The models are also tested with country, industry and year dummies. Equation 5.3 is a modified Ohlson (1995) model:

$$LnPRICE_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnBVPS_{i,t} + \beta_4 ABEARN_{i,t} + \varepsilon_{i,t} \quad (5.3)$$

The Ohlson (1995) model defines the market value of equity as a function of book value, accounting earnings and other non-financial information. The dependent variable share price (*LnPRICE*) is the natural logarithm of the closing price of a firm. The variable of interest is integrated report (*IR*), included as a proxy for other non-financial information. GRI adoption (*GRI*) is included to parse out effects related to sustainability reporting. Book value per share (*LnBVPS*) is the natural logarithm of the book value per share of common shareholders' equity. Abnormal earnings (*ABEARN*) is calculated on a per share basis as net income before extraordinary expenses, less cost of equity multiplied by opening book value of equity.

Equation 5.4 follows Hassel et al. (2005), restating the Ohlson model in terms of cum-dividend market value, opening book value, earnings and other information, and scaling by book value to control for size difference:

$$LnMVCDA_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 BVINV_{i,t} + \beta_4 NIBV_{i,t} + \varepsilon_{i,t} \quad (5.4)$$

The dependent variable cum-dividend market value (*LnMVCDA*) is the sum of market value and dividends distributed of a firm, scaled by its opening book value. The variable of interest is *IR* and it is included as a proxy for other non-financial information along with *GRI*. *BVINV* represents the inverse of opening book value. *NIBV* represents net income after interest and tax, scaled by opening book value.

5.6.2 Results

Table 5.7 presents the descriptive statistics for the MLR sample. IR firms and non-IR firms are similar in market value, book value and abnormal earnings. Chi-square tests show firms

that voluntarily adopt IR are statistically more likely to have adopted GRI guidelines ($\chi^2(1)$ = 28.45, p<0.01). The TEM and DID samples are similar to the above.

Consistent with the descriptive statistics, correlation analysis in Table 5.8 shows no statistically significant relations between the initiation of integrated reports and firm value measures or other continuous variables. Multicollinearity is not a major problem in this study as indicated by the correlation analysis and the VIF. The highest VIF for Equation 5.3 is *ABEARN* (1.60) for estimations without FE and *LnBVPS* (3.22) for estimations with FE, and the mean VIF is 1.35 and 1.83, respectively. Models on change specification and cum-dividend market value (DID) are similar but with lower (higher) individual and mean VIFs.

Table 5.9 reports the regression results for Hypothesis 8, testing the effect initiating integrated reports have on firm value. There is no evidence of a selection bias as *lambda* is not statistically significant in any specification. The results provide no evidence that *IR* is an important predictor for firm value. Further, any relative changes in firm value do not differ between firms that adopt the IIRC Framework and initiate integrated reports and similar firms that do not. In terms of changes in adjusted R-squared, *IR* only accounts for 0.000 to 0.002 of the variation of *LnPRICE* and *MVCDA* in both level and change forms. The direction of the control variables are consistent with prior literature.

These results are robust to removal of influential observations, to winsorising continuous firm-level variables at the 5th and 95th percentile, to analysis of dependent variables on a two-year lead, to using the TEM sample for all analyses, and to using MLE for TEM (untabulated). Further, these results hold for analyses on subsamples and alternative matches (untabulated). Additional analysis using Tobin's Q (*TOBIN*) as a proxy for firm value found no statistically significant relation between *IR* and *TOBIN*[25].

[25] Equation 5.5 is based on Lee and Yeo (2016). Details on the model development process are described in Section 3.6.4. The model is also tested with country, industry and year dummies.

$$TOBIN_{i,t+1} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 ROA_{i,t} + \beta_5 LEV_{i,t} + \beta_6 INTASSET_{i,t} + \beta_7 BOARDIND_{i,t} + \beta_8 BOARDSIZE_{i,t} + \varepsilon_{i,t} \quad (5.5)$$

The dependent variable *TOBIN* is the summation of market capital, preferred shares and total debt, divided by total assets. The variable of interest is integrated report (*IR*). Controls are included for GRI adoption (*GRI*), firm size (*LnSIZE*) and leverage (*LEV*). For previously undefined variables, profitability (*ROA*) is calculated as net income before extraordinary items, scaled by average total assets, and intangible assets (*INTASSET*) is intangible assets scaled by total assets. Board independence (*BOARDIND*) is defined as the percentage of independent and non-executive directors to total number of directors. Board size (*BOARDSIZE*) is the number of board of directors.

5.7 Environmental and Social Performance

5.7.1 Model and Variable Definitions

Equation 5.6 is the MLR regression model used to examine the effect releasing an integrated report in the current year (*t*) has on a firm's environmental and social performance in the following year (*t*+1). The model is based on Maniora (2015) and de Villiers et al. (2011). Details on the model development process are described in Section 3.6.5. The model is also tested substituting country-level variables with country, industry and year dummies.

$$\begin{aligned} ESP_{i,t+1} = {} & \beta_0 + \beta_1 IR_{i,t} + \beta_2 GRI_{i,t} + \beta_3 LnSIZE_{i,t} + \beta_4 LnMTB_{i,t} + \beta_5 ROA_{i,t} \\ & + \beta_6 LEV_{i,t} + \beta_7 SLACK_{i,t} + \beta_8 BETA_{i,t} + \beta_9 FOLLOW_{i,t} \\ & + \beta_{10} LISTING_{i,t} + \beta_{11} BOARDIND_{i,t} + \beta_{12} BOARDSIZE_{i,t} \\ & + \beta_{13} CULTURE\_MUL_{i,t} + \beta_{14} NATION\_VF_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (5.6)$$

The dependent variable environmental and social performance (*ESP*) is the mean of the environmental score and social score from the ASSET4 database. Environmental score encompasses resource reduction, emissions reduction and product innovation, while social score relates to aspects such as employment quality, health and safety, and product responsibility.

The variable of interest is integrated report (*IR*). A number of control variables are included. For GRI adoption (*GRI*), Maniora (2015) found IR only has internal and external transformation effects for firms that have not previously reported ESG information or do not have a stand-alone ESG report. GRI adoption is included to separate the effects of applying GRI and the effects attributable to initiating integrated reports.

Firm size (*LnSIZE*) controls for size effects relating to social and political pressure that arise from stakeholders to manage businesses in an ethical manner (Maniora, 2015). For market-to-book ratio (*LnMTB*), fast growing firms are less able to monitor internal developments; thereby, such firms are less likely to implement an integrated strategy effectively (Maniora, 2015). Return on assets (*ROA*) measures profitability. Managers working in firms with low profitability face limitations in investing in internal management tools. Thereby, it is more difficult to allocate resources efficiently to manage financial and non-financial issues effectively (Maniora, 2015). Leverage (*LEV*) and financial slack (*SLACK*), measured as cash and cash equivalents scaled by total assets, are two measures that relate to the ability to invest in ESG performance. Firms facing high leverage are less able to afford additional investments in long-term ESG performance (Maniora, 2015). Similarly, firms with smaller financial slack are less likely to divert resources towards environmental management (de Villiers et al., 2011).

Beta (*BETA*) is a measure of systematic risk, where low systematic risk represents more stable economic performance, which enhances a firm's ability to pursue CSR endeavours (de Villiers et al., 2011). Analyst following (*FOLLOW*) reflects information demand. Maniora (2015) argues analyst demand for information places pressure on managers to meet the needs of investors, leading to better financial and sustainability performance. For market listing (*LISTING*), firms listed on more markets face greater disclosure requirements, which influences internal information processes and external reporting practices (Maniora, 2015). Board independence (*BOARDIND)* and board size (*BOARDSIZE*) are board characteristics de Villiers et al. (2011) found to influence environmental performance. Independent directors are arguably more effective at monitoring the long-term interests of shareholders, and larger boards are more likely to possess diverse and rich expertise required to enhance environmental performance.

Country-level variables pertaining to stakeholder attitudes and interests in CSR activities are included. Culture (*CULTURE_MUL*) has positive loadings on masculinity (*MAS*), uncertainty avoidance (*UAI*) and long-term orientation (*LTO*). National freedom and voice (*NATION_VF*) has a negative loading for voice and accountability (*VOICE*) and positive loading for freedom of press (*FREEPRESS*). Cultural and social norms are likely to influence corporate sustainability performance. Countries with a higher level of stakeholder orientation are more focused on social wellbeing and more likely to have a greater influence on a firm's operations and demand CSR practices.

5.7.2 Results

Table 5.10 presents the descriptive statistics for the MLR sample. Independent *t*-tests show that IR firms have superior level of sustainability performance scores in relation to matched non-IR firms and greater analyst following (means for IR firms and non-IR firms, *ESP*: 86.25 and 71.70, $p<0.01$; *FOLLOW*: 18.53 and 15.67, $p<0.05$). There are no statistically significant differences for measures of change. For categorical variables, chi-square tests show IR firms are statistically more likely to have adopted GRI guidelines ($\chi^2(1) = 10.44$, $p<0.01$). IR firms and non-IR firms are similar in firm size and performance, market measures, analyst forecast characteristics and corporate governance characteristics. The same sample is used for TEM, while the DID sample is similar to the above (untabulated).

Similar to the descriptive statistics, correlation analysis in Table 5.11 shows statistically significant relations between the initiation of integrated reports and measures of sustainability performance. The direction of the relationship for other significant variables are consistent with prior literature, with prior adoption of GRI guidelines, firm size, analyst

following and market listing having a positive relationship with sustainability performance. Multicollinearity is not a major problem in this study as indicated by the correlation analysis and the VIF. The highest VIF for Equation 5.6, for estimations without FE, is *LnMTB* (4.37) and the mean VIF is 2.05. However, for estimations with FE, the highest VIF is *LnMTB* (48.80) and the mean VIF is 4.70. Models on change specification (DID) are similar but with lower (higher) individual and mean VIFs.

Table 5.12 reports the regression results for Hypothesis 9, testing the effect initiating integrated reports have on environmental and social performance. As indicated by the statistically significant and negative *lambda*, it is important to control for unobservable variables that predict selection into voluntary IR. The presence of self-selection indicates that there are specific unobserved characteristics of IR firms that affect environmental and social performance. The results show a positive and significant association between *IR* and *ESP* for all models. The positive and statistically significant relation in the level analysis shows that IR firms have, on average, better sustainability performance compared to non-IR firms. However, there is no consistent evidence that *IR* influences the change in environmental and social performance. The non-significant interaction term in the DID estimate shows that the change in *ESP* pre- and post-IR initiation is no different relative to the change for non-IR firms (Panel A, Model 5 and Model 6). However, TEM estimates with FE indicate a positive and statistically significant relation between *IR* and *ESP* (Panel B, Model 2: coeff. = 6.553, $p<0.05$). In terms of changes in adjusted R-squared, *IR* account for 0.000 to 0.073 of the variation of *ESP* in both level and change forms.

For the control variables, GRI adoption, beta and analyst following have directional effects consistent with those documented by previous studies. In contrast to prior studies, a negative association between board independence and environmental and social performance is found instead of a positive association. While this may be contrary to prior studies, it is possible that independent directors are a cost-efficient substitute for the preparation of integrated reports. Thereby, higher proportion of board independence is adequate to addressing agency problems and there are fewer incentives to initiate integrated reports.

Additional analysis on alternative matches show that the statistically significant result for change in environmental and social performance is sensitive to the matched sample. Alternative samples based on four-digit GICS, two-digit GICS and three-digit SIC returned no statistically significant results for regressions on the change specification. Similarly, subsample analysis return *IR* as statistically significant for level specifications, while non-significant results for change specifications. Otherwise, these results are robust to removal of influential observations, to winsorising continuous firm-level variables at the 5th and 95th

percentile, to analysis of dependent variables on a two-year lead, to using the TEM sample for all analyses, to using full MLE for TEM, and to the removal of *LnMTB* in estimates with FE (untabulated). Similar results are obtained for analyses of environmental performance (*ENV*), social performance (*SOC*) and integrated vision and strategy score (*IVS*), and the results for these variables are robust to the additional analyses presented for *ESP*.

5.8 Summary

This chapter examines the consequences of IR, assessing the effects voluntary adoption of the IIRC Framework and initiation of integrated reports has on the information environment, cost of equity, firm value and environmental and social performance. The results provide no consistent evidence that voluntary IR results in significant changes in the investigated consequences.

Taken together with the findings of prior voluntary IR studies and that of the previous chapter, the results suggest that the adoption of the IIRC Framework and initiation of integrated reports has not resulted in substantial changes in reporting practices and sustainability performance. The findings support the view that IR is a gradual progression from sustainability reporting. There may be no clear differences between the information content, connectivity of information, and communication of financial value creation in integrated reports when compared to the information content of other disclosures combined, such as annual reports and sustainability reports. Hence, integrated reports do not reduce disclosure complexity or include incremental and material information for capital markets, and has not stimulated changes in environmental and social management.

However, as the study has not examined changes in disclosure content, it is not possible to rule out the possibility that integrated reports do include relevant information for capital providers. Under this possibility, an alternative interpretation of the results is that the market is ignorant of IR or does not consider integrated reports in their current investment decision-making processes (Abhayawansa et al., 2018; Hsiao & Kelly, 2018). Regardless of the interpretation, the study findings present novel evidence that is consistent with prior interview and case studies, suggesting integrated reports do not have a clear influence on capital markets and sustainability management practices.

In relation to reporting, there are many barriers to implementing IR. Incremental information in integrated reports are possibly limited as reporters face difficulties in measuring the impacts of changes in capitals and establishing direct relationships between sustainability performance and financial performance (Adams et al., 2016; Haji & Anifowose, 2016). These measurement problems are reflected in available integrated reports, which have

been criticised to lack connectivity, comparability and disclosure of material information (IIRC, 2013c; Kılıç & Kuzey, 2018; Pistoni et al., 2018). Given difficulties in connecting information and possibly disclosure of sensitive and forward-looking information, it is possible that integrated reports contain no incremental and material information that can be used to estimate risk or future cash flows. The reporting practices of IR firms may not differ from prior year practices, and further, it may not differ from non-IR firms with similar characteristics. Thereby, it would not be possible to detect a difference, or relative difference, in changes for the information environment, cost of equity and firm value.

In relation to sustainability management, the results show IR firms have significantly stronger levels of environmental and social performance relative to non-IR firms. This is the nature of IR firms, as consistent with the determinants findings in the prior chapter. While there is a significant difference in the level of environmental and social performance, adoption of the IIRC Framework and initiation of integrated reports does not lead to subsequent improvements in sustainability performance. As found by prior studies, IR is perceived as an extension of sustainability reporting and management (Guthrie et al., 2017; Lodhia, 2015; Stubbs & Higgins, 2014). Thereby, implementation of IR may not result in any clear changes in internal measurement and management practices.

In addition, the study findings provide further insights into the results of studies on mandatory IR. Studies on the economic consequences of mandatory IR have found a positive association between higher quality reports, often defined as reports more aligned with the IIRC Framework, and improved analyst forecasts and firm value (Arguelles et al., 2016; Barth et al., 2017; Bernardi & Stark, 2018; Lee & Yeo, 2016; Zhou et al., 2017). These results are possibly attributed to greater disclosure transparency in general instead of specific application of the Framework concepts. Following mandatory IR, firms in South Africa are disclosing more detailed and diverse information (Haji & Anifowose, 2016; Solomon & Maroun, 2012). Hence, in countries where it is not common for firms to disclose non-financial information or apply IR concepts, application of the Framework can result in greater disclosure levels and subsequently improve the information environment. However, this effect may not be detectable in environments where integrated disclosure or IR concepts are already common. In such environments, adoption of the IIRC Framework may not substantially change firms' reporting practices relative to prior years or relative to non-IR firms with similar firm characteristics.

The results must be interpreted with regard to their limitations. First, the sample size is limited and is biased towards larger firms that are perceived to be of higher risk by investors. Hence, the results are possibly restricted to firms with similar characteristics. Second, it is not

possible to rule out the possibility that there are factors not controlled for that could influence the relation between IR and the investigated consequences. However, given the extensive set of control variables included and use of different research designs, the possibility of omitted variables is not considered a serious threat to the conclusions.

While the results show that there are no significant changes in the investigated consequences after voluntary adoption of the IIRC Framework and initiation of integrated reports, it is possible that any consequences are gradual and more prevalent towards the long-term. In addition, adoption of IR could have other impacts, such as improvements in internal communication or stakeholder engagement. The study findings do not discourage voluntary adoption of the Framework, but rather questions its usefulness relative to application of IR concepts in general. The findings reiterate the fact that there needs to be further developments in accounting systems and information technology to support integrated thinking and connectivity of information.

Table 5.1: Information environment - Descriptive statistics and independent *t*-tests

	All (n = 236)			IR Firms (n = 118)					Matched Firms (n = 118)					*t*-test	M-W
Variable (levels)	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
$FERROR(0)_{t+1}$	0.04	0.01	0.20	0.04	0.01	0.17	0.00	1.77	0.05	0.01	0.23	0.00	1.77	0.733	0.347
$FERROR(1)_{t+1}$	0.05	0.01	0.12	0.05	0.01	0.13	0.00	0.77	0.04	0.01	0.10	0.00	0.77	0.650	0.929
$FERROR(2)_{t+1}$	0.06	0.02	0.16	0.06	0.02	0.16	0.00	1.18	0.07	0.02	0.17	0.00	1.18	0.892	0.682
$DISPERSION_{t+1}$	0.27	0.10	0.54	0.30	0.12	0.58	0.01	3.86	0.25	0.09	0.49	0.01	3.86	0.528	0.418
$LnSIZE_t$	8.85	8.77	1.24	8.88	8.88	1.27	6.01	11.90	8.81	8.66	1.22	6.01	11.90	0.663	0.565
$SqEARNSURP_t$	0.14	0.12	0.10	0.14	0.12	0.10	0.00	0.50	0.13	0.12	0.10	0.00	0.50	0.434	0.542
$LnEARNVOLI_t$	0.66	0.39	0.76	0.67	0.44	0.72	0.01	3.77	0.65	0.35	0.80	0.01	3.91	0.883	0.309
$LISTING_t$	5.82	6.00	3.49	5.95	6.00	3.55	1.00	16.00	5.69	6.00	3.45	1.00	16.00	0.564	0.585
$FOLLOW_t$	16.40	15.00	8.68	16.99	15.25	9.13	2.00	43.00	15.81	14.75	8.19	2.00	43.00	0.295	0.427
$HORIZON_t$	198.92	195.25	28.75	199.38	197.25	28.91	131.00	292.50	198.47	194.00	28.71	132.00	292.50	0.808	0.367
$NATION\_VF_t$	0.00	0.14	1.34	0.00	0.14	1.34	-3.62	4.57	0.00	0.14	1.34	-3.62	4.57	1.000	1.000
$NATION\_RRG_t$	0.00	0.57	1.69	0.00	0.57	1.70	-6.06	2.44	0.00	0.57	1.70	-6.06	2.44	1.000	1.000
$LnEPS_t$	0.87	0.58	1.01	0.81	0.55	0.95	0.00	5.14	0.93	0.63	1.07	0.00	5.14	0.375	0.324
$CULTURE\_PDI_t$	53.85	54.00	12.58	53.85	54.00	12.61	11.00	93.00	53.85	54.00	12.61	11.00	93.00	1.000	1.000
$CULTURE\_IDV_t$	50.81	46.00	19.08	50.81	46.00	19.12	17.00	91.00	50.81	46.00	19.12	17.00	91.00	1.000	1.000
$CULTURE\_MAS_t$	68.52	67.50	26.90	68.52	67.50	26.95	5.00	95.00	68.52	67.50	26.95	5.00	95.00	1.000	1.000
$CULTURE\_UAI_t$	77.85	86.00	21.47	77.85	86.00	21.52	8.00	99.00	77.85	86.00	21.52	8.00	99.00	1.000	1.000
$CULTURE\_LTO_t$	71.84	87.91	22.07	71.84	87.91	22.11	21.16	100.00	71.84	87.91	22.11	21.16	100.00	1.000	1.000
$CULTURE\_IVR_t$	46.49	41.74	13.84	46.49	41.74	13.87	16.96	97.32	46.49	41.74	13.87	16.96	97.32	1.000	1.000
$CULTURE\_PII_t$	0.00	-0.33	1.54	0.00	-0.33	1.54	-3.60	3.55	0.00	-0.33	1.54	-3.60	3.55	1.000	1.000
$CULTURE\_MUL_t$	0.00	0.28	1.44	0.00	0.28	1.45	-3.14	1.41	0.00	0.28	1.45	-3.14	1.41	1.000	1.000
	All (n = 236)			IR Firms (n = 118)					Matched Firms (n = 118)					*t*-test	M-W
Variable (changes)	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
$\Delta FERROR(0)_{t+1}$	0.00	0.00	0.07	0.00	0.00	0.08	-0.30	0.41	0.01	0.00	0.06	-0.12	0.41	0.300	0.441
$\Delta FERROR(1)_{t+1}$	0.00	0.00	0.12	0.00	0.00	0.14	-0.67	0.61	0.01	0.00	0.10	-0.67	0.61	0.712	0.412
$\Delta FERROR(2)_{t+1}$	0.00	0.00	0.16	0.00	0.00	0.17	-0.90	0.75	0.00	0.00	0.15	-0.90	0.75	0.869	0.589
$\Delta DISPERSION_{t+1}$	0.01	0.00	0.44	-0.02	0.00	0.47	-1.78	2.14	0.04	0.00	0.40	-1.78	2.14	0.331	0.867
$\Delta SIZE_t$	84.63	-1.70	4627.49	593.51	69.86	4740.25	-12552.56	20313.31	-424.26	-17.44	4474.15	-13661.45	20313.31	0.091	0.349
$\Delta EARNSURP_t$	0.00	0.00	0.04	0.00	0.00	0.05	-0.12	0.17	0.00	0.00	0.04	-0.12	0.17	0.637	0.276
$\Delta EARNVOLI_t$	0.06	0.00	0.49	0.02	0.00	0.35	-1.16	3.47	0.10	0.00	0.59	-1.16	3.47	0.164	0.419
$\Delta FOLLOW_t$	-0.22	0.00	2.06	-0.06	0.00	1.94	-5.50	5.00	-0.38	-0.25	2.16	-5.50	5.00	0.243	0.395
$\Delta HORIZON_t$	-0.31	1.00	36.29	3.35	1.50	36.40	-77.00	97.50	-3.97	0.00	35.96	-108.00	96.50	0.122	0.292
ΔEPS_t	-0.22	0.00	3.68	-0.18	-0.01	3.32	-24.85	16.57	-0.27	0.00	4.02	-24.85	16.57	0.843	0.235

Table 5.1 reports descriptive statistics for continuous variables and tests for differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). All firm-level variables are winsorised at the 1st and 99th percentiles. Variables are as defined in Section 3.5.

Table 5.2: Information environment - Correlation matrix

Panel A: Levels

Variable (main)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) FERROR(0)$_{t+1}$		**0.887**	**0.816**	**0.740**	0.061	0.115	**-0.204**	**0.329**	**0.365**	0.102	-0.069	0.067	-0.103	**0.246**	**-0.135**
(2) FERROR(1)$_{t+1}$	**0.672**		**0.925**	**0.674**	-0.006	**0.128**	**-0.201**	**0.360**	**0.340**	0.126	-0.038	0.109	-0.075	**0.205**	-0.125
(3) FERROR(2)$_{t+1}$	**0.743**	**0.961**		**0.645**	-0.027	**0.138**	**-0.190**	**0.350**	**0.360**	**0.191**	-0.033	0.125	-0.060	**0.168**	-0.098
(4) DISPERSION$_{t+1}$	**0.605**	**0.622**	**0.584**		0.053	**0.166**	**-0.143**	**0.335**	**0.411**	0.090	-0.047	-0.004	-0.122	**0.175**	**-0.228**
(5) IR$_t$	-0.022	0.030	-0.009	0.041		**0.281**	0.038	0.040	0.029	0.066	0.036	0.052	0.059	0.000	0.000
(6) GRI$_t$	0.095	**0.140**	**0.135**	**0.154**	**0.281**		**0.278**	0.113	**0.140**	**0.130**	**0.154**	**0.331**	-0.001	0.013	-0.113
(7) LnSIZE$_t$	**-0.221**	**-0.244**	**-0.258**	**-0.195**	0.029	**0.252**		0.071	-0.098	**0.177**	**0.537**	**0.589**	-0.049	-0.112	0.035
(8) SqEARNSURP$_t$	-0.024	**0.216**	**0.167**	**0.164**	0.051	0.115	0.023		0.066	**0.145**	0.116	0.062	-0.019	0.109	-0.056
(9) LOSS$_t$	**0.266**	**0.295**	**0.336**	**0.353**	0.029	**0.140**	-0.114	**0.167**		**0.152**	0.023	0.029	-0.098	-0.016	-0.093
(10) LnEARNVOLI$_t$	**0.181**	0.087	**0.135**	**0.163**	0.010	0.081	0.102	-0.016	0.113		**0.202**	**0.266**	0.077	**-0.320**	0.108
(11) LISTING$_t$	**-0.131**	**-0.154**	**-0.149**	-0.123	0.038	**0.141**	**0.561**	0.078	0.017	0.072		**0.410**	0.059	**-0.570**	**0.302**
(12) FOLLOW$_t$	0.009	0.064	0.067	0.038	0.069	**0.324**	**0.520**	0.079	0.057	**0.279**	**0.327**		0.087	-0.106	-0.070
(13) HORIZON$_t$	-0.096	-0.037	-0.043	-0.104	0.016	-0.073	-0.062	-0.052	**-0.135**	0.060	0.051	0.029		-0.119	0.093
(14) NATION_VF$_t$	0.106	0.082	0.074	0.050	0.000	0.031	-0.017	0.059	0.013	**-0.242**	**-0.448**	-0.106	**-0.132**		**-0.409**
(15) NATION_RRG$_t$	**-0.152**	**-0.176**	**-0.189**	-0.118	0.000	-0.119	0.038	-0.091	-0.125	0.119	**0.327**	-0.036	**0.175**	**-0.612**	

Variable (additional)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
(1) FERROR(0)$_{t+1}$	**-0.270**	**-0.180**	**0.220**	**-0.251**	0.033	0.061	**0.178**	**-0.259**	**-0.274**	0.115
(2) FERROR(1)$_{t+1}$	**-0.223**	**-0.188**	**0.174**	**-0.206**	0.000	0.027	**0.143**	**-0.210**	**-0.230**	0.077
(3) FERROR(2)$_{t+1}$	**-0.214**	**-0.208**	**0.170**	**-0.183**	-0.029	0.029	**0.159**	**-0.179**	**-0.222**	0.067
(4) DISPERSION$_{t+1}$	**-0.348**	**-0.235**	**0.309**	**-0.255**	**-0.154**	0.058	0.054	**-0.213**	**-0.336**	-0.020
(5) IR$_t$	-0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(6) GRI$_t$	-0.066	-0.076	0.104	-0.023	**-0.151**	-0.030	-0.028	-0.028	-0.110	-0.066
(7) LnSIZE$_t$	**0.266**	**0.158**	-0.062	**0.156**	-0.064	-0.105	-0.057	0.050	**0.146**	-0.070
(8) SqEARNSURP$_t$	-0.078	**-0.142**	0.081	-0.058	-0.010	0.093	0.114	**-0.176**	-0.115	0.092
(9) LOSS$_t$	**-0.316**	-0.042	0.076	0.039	-0.058	-0.027	-0.071	-0.012	-0.076	-0.056
(10) LnEARNVOLI$_t$	**0.563**	**0.132**	**-0.274**	**0.395**	-0.123	**-0.191**	-0.001	0.058	**0.299**	-0.072
(11) LISTING$_t$	0.080	0.109	**-0.352**	**0.586**	-0.014	**-0.158**	**-0.318**	**0.281**	**0.486**	**-0.133**
(12) FOLLOW$_t$	0.127	0.087	0.032	0.108	**-0.340**	**-0.321**	0.024	-0.021	-0.024	**-0.208**
(13) HORIZON$_t$	0.038	0.081	-0.048	0.119	-0.060	**-0.163**	-0.063	0.097	**0.133**	-0.095
(14) NATION_VF$_t$	**-0.215**	**-0.151**	**0.597**	**-0.805**	**0.230**	**0.294**	**0.450**	**-0.503**	**-0.674**	**0.329**
(15) NATION_RRG$_t$	**0.209**	**0.280**	**-0.684**	**0.337**	**0.227**	**-0.208**	0.066	**0.268**	**0.577**	0.043

Panel B: Changes

Variable (main)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) $\Delta FERROR(0)_{t+1}$		**0.622**	**0.384**	**0.547**	-0.050	-0.099	-0.024	-0.038	**-0.139**	-0.011	-0.097	0.085	-0.035	**0.152**	0.009
(2) $\Delta FERROR(1)_{t+1}$	**0.747**		**0.692**	**0.446**	-0.054	-0.047	-0.070	0.027	-0.014	-0.040	-0.011	0.112	0.033	0.090	0.018
(3) $\Delta FERROR(2)_{t+1}$	**0.644**	**0.904**		**0.302**	-0.035	-0.038	-0.046	0.039	-0.050	-0.008	0.006	0.017	0.018	0.026	0.093
(4) $\Delta DISPERSION_{t+1}$	**0.691**	**0.435**	**0.380**		0.011	0.091	-0.024	-0.048	-0.023	0.028	-0.084	0.070	-0.047	0.090	0.014
(5) IR_t	-0.068	-0.024	-0.011	-0.064		**0.281**	0.061	-0.071	0.029	-0.053	0.036	0.056	0.069	0.000	0.000
(6) GRI_t	0.015	0.014	-0.007	0.058	**0.281**		-0.041	-0.053	**0.140**	0.103	**0.154**	0.009	0.037	0.013	-0.113
(7) $\Delta SIZE_t$	-0.022	-0.024	-0.030	-0.018	0.110	-0.001		**-0.159**	-0.057	-0.009	**0.278**	-0.011	**0.138**	**-0.314**	0.121
(8) $\Delta EARNSURP_t$	-0.067	-0.047	0.015	-0.054	-0.031	-0.037	-0.111		0.110	0.121	0.031	0.039	-0.020	0.119	-0.006
(9) $LOSS_t$	-0.045	-0.124	**-0.133**	-0.069	0.029	**0.140**	-0.025	**0.185**		**0.181**	0.023	0.015	-0.094	-0.016	-0.093
(10) $\Delta EARNVOLI_t$	0.027	-0.015	-0.010	0.021	-0.091	0.095	-0.124	0.085	0.078		0.024	0.003	-0.010	-0.040	0.006
(11) $LISTING_t$	-0.122	-0.090	-0.037	-0.099	0.038	**0.141**	**0.234**	0.014	0.017	0.057		-0.025	0.087	**-0.570**	**0.302**
(12) $\Delta FOLLOW_t$	-0.004	0.066	-0.023	0.031	0.076	0.014	-0.045	-0.010	0.003	-0.024	-0.084		0.102	**0.231**	0.031
(13) $\Delta HORIZON_t$	**-0.147**	-0.046	-0.046	-0.069	0.101	-0.004	0.118	0.007	-0.094	-0.058	0.084	**0.128**		-0.125	0.015
(14) $NATION\_VF_t$	0.089	0.072	0.039	0.081	0.000	0.031	**-0.280**	0.058	0.013	-0.083	**-0.448**	**0.195**	**-0.151**		**-0.409**
(15) $NATION\_RRG_t$	-0.111	-0.082	-0.038	-0.053	0.000	-0.119	**0.291**	-0.072	-0.125	0.049	**0.327**	-0.071	0.087	**-0.612**	

Variable (additional)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
(1) $\Delta FERROR(0)_{t+1}$	0.012	0.088	0.080	**-0.142**	0.047	-0.034	0.029	-0.032	-0.049	-0.011
(2) $\Delta FERROR(1)_{t+1}$	0.042	0.062	0.038	-0.030	0.039	-0.044	-0.051	0.042	0.033	-0.047
(3) $\Delta FERROR(2)_{t+1}$	-0.043	0.035	-0.015	0.026	0.037	-0.061	-0.060	**0.160**	0.103	-0.071
(4) $\Delta DISPERSION_{t+1}$	0.110	0.016	0.032	-0.058	0.008	-0.020	0.037	0.018	0.007	-0.004
(5) IR_t	-0.078	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(6) GRI_t	-0.035	-0.076	0.104	-0.023	**-0.151**	-0.030	-0.028	-0.028	-0.110	-0.066
(7) $\Delta SIZE_t$	**0.208**	-0.042	**-0.188**	**0.240**	**0.131**	0.036	0.030	0.079	**0.288**	0.111
(8) $\Delta EARNSURP_t$	0.071	0.022	0.090	-0.034	-0.085	-0.045	-0.079	0.054	-0.062	-0.096
(9) $LOSS_t$	**-0.132**	-0.042	0.076	0.039	-0.058	-0.027	-0.071	-0.012	-0.076	-0.056
(10) $\Delta EARNVOLI_t$	**0.224**	-0.009	-0.082	0.079	-0.065	-0.036	-0.025	0.093	0.084	-0.064
(11) $LISTING_t$	0.050	0.109	**-0.352**	**0.586**	-0.014	**-0.158**	**-0.318**	**0.281**	**0.486**	**-0.133**
(12) $\Delta FOLLOW_t$	0.070	0.000	0.075	**-0.198**	**0.160**	0.100	0.085	-0.114	-0.100	0.104
(13) $\Delta HORIZON_t$	-0.053	-0.025	-0.042	0.099	-0.042	-0.042	-0.050	0.118	0.103	-0.032
(14) $NATION\_VF_t$	**-0.130**	**-0.151**	**0.597**	**-0.805**	**0.230**	**0.294**	**0.450**	**-0.503**	**-0.674**	**0.329**
(15) $NATION\_RRG_t$	**0.163**	**0.280**	**-0.684**	**0.337**	**0.227**	**-0.208**	0.066	**0.268**	**0.577**	0.043

Table 5.2 reports the correlation matrix for the variables tested. Panel A and Panel B present correlations between variables in levels specification and change specification, respectively. For the main variables, Pearson's correlation (parametric test) is presented below the diagonal and Spearman's correlation (non-parametric test) is above the diagonal. For the additional variables, Spearman's correlation between main variables and additional variables are presented. Additional variables are numbered as follow: (16) *LnEPS*, (17) *LEGAL*, (18) *CULTURE_PDI*, (19) *CULTURE_IDV*, (20) *CULTURE_MAS*, (21) *CULTURE_UAI*, (22) *CULTURE_LTO*, (23) *CULTURE_IVR*, (24) *CULTURE_PII*, (25) *CULTURE_MUL*. Correlation coefficients in bold are significant at $p<0.05$ based on two-tailed tests. Variables are as defined in Section 3.5.

Table 5.3: Information environment and IR

Panel A: Level specification

		FERROR(0)$_{t+1}$ [(*t*) in DID]						FERROR(1)$_{t+1}$ [(*t*) in DID]					
		TEM		MLR		DID		TEM		MLR		DID	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
IR_t	-	-0.172	-0.0751	-0.0218	-0.0208	0.000869	0.000945	-0.0680	-0.0820	-0.00434	-0.00579	-0.0132	-0.0134
		(-1.56)	(-0.66)	(-0.78)	(-0.81)	(0.21)	(0.23)	(-1.23)	(-1.64)	(-0.30)	(-0.51)	(-1.50)	(-1.52)
$POST_t$	-					0.00175	-0.000573					-0.00270	-0.00760
						(0.37)	(-0.09)					(-0.29)	(-0.57)
IR_t*$POST_t$	-					0.00586	0.00426					0.0241	0.0216
						(0.76)	(0.57)					(1.63)	(1.53)
GRI_t	-	0.0557	0.0382	0.0480**	0.0396	0.00193	0.00618	0.0210	0.0364*	0.0301**	0.0290**	0.00884	0.0209**
		(1.60)	(0.87)	(1.99)	(1.46)	(0.61)	(1.39)	(1.45)	(1.90)	(2.39)	(2.31)	(1.38)	(2.37)
$LnSIZE_t$	-	-0.0468*	-0.0482	-0.0569**	-0.0663*	-0.0106***	-0.0125***	-0.0203***	-0.0123	-0.0320***	-0.0193*	-0.0206***	-0.0282***
		(-1.77)	(-1.47)	(-2.37)	(-1.96)	(-3.17)	(-2.78)	(-2.78)	(-0.99)	(-3.21)	(-1.72)	(-3.36)	(-3.41)
$SqEARNSURP_t$	+	-0.0174	-0.0974	-0.173	-0.127	0.0902**	0.0471	0.305**	0.325**	0.187	0.243*	0.212***	0.168**
		(-0.09)	(-0.44)	(-0.85)	(-0.70)	(2.33)	(1.25)	(2.20)	(2.33)	(1.44)	(1.88)	(3.05)	(2.25)
$LOSS_t$	+	0.0743	0.0311	0.124	0.0851	0.119***	0.109***	0.0366	0.0114	0.0743*	0.0383	0.254***	0.233***
		(1.00)	(0.41)	(1.43)	(1.04)	(5.14)	(5.32)	(0.97)	(0.29)	(1.68)	(1.04)	(5.66)	(5.83)
$LnEARNVOLI_t$	+	0.0599	0.128	0.0556	0.128	0.00459	0.00782	0.00893	0.00352	0.0105	0.00670	0.00652	0.00516
		(1.57)	(1.66)	(1.56)	(1.61)	(1.49)	(0.92)	(0.88)	(0.16)	(1.04)	(0.31)	(1.05)	(0.29)
$LISTING_t$	-	0.00265	0.00980	0.00633	0.0111	0.000741	0.00309*	-0.00342	0.00441	-0.000294	0.00267	0.000266	0.00764***
		(0.45)	(1.19)	(0.97)	(1.34)	(0.72)	(1.83)	(-1.27)	(1.03)	(-0.09)	(0.68)	(0.13)	(2.66)
$FOLLOW_t$	-	0.00167	-0.00266	0.00186	0.00142	0.000874**	0.000364	0.00248*	0.000563	0.00225	0.00209	0.00236***	0.000799
		(0.68)	(-0.83)	(0.76)	(0.58)	(2.57)	(0.75)	(1.71)	(0.27)	(1.49)	(1.37)	(3.53)	(0.95)
$HORIZON_t$	+	-0.000982	-0.000530	-0.000554	-0.000252	0.0000217	0.0000867	-0.000185	0.000186	-0.0000168	0.000330	0.0000275	0.000123
		(-1.40)	(-0.79)	(-1.05)	(-0.46)	(0.41)	(1.08)	(-1.10)	(0.78)	(-0.08)	(1.54)	(0.26)	(0.76)
$NATION\_RRG_t$	-	0.000379		-0.00669		-0.00142		0.00325		-0.00595		-0.00236	
		(0.06)		(-0.98)		(-0.94)		(0.66)		(-1.09)		(-0.85)	
$NATION\_VF_t$	-	0.0123		0.0247		0.00360*		0.00401		0.00333		0.00615	
		(1.39)		(1.50)		(1.80)		(0.98)		(0.43)		(1.64)	
lambda		0.0907	0.0285					0.0385	0.0445				
		(1.51)	(0.43)					(1.13)	(1.44)				
Country dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Industry dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Year dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
N		190	190	236	236	380	380	190	190	236	236	380	380
R^2		0.204	0.404	0.195	0.419	0.511	0.611	0.241	0.574	0.224	0.600	0.578	0.674
Adj. R^2		0.150	0.092	0.155	0.173	0.493	0.524	0.189	0.351	0.186	0.430	0.563	0.602

Panel A (continue): Level specification

		FERROR(2)$_{t+1}$ [(t) in DID]						DISPERSION$_{t+1}$ [(t) in DID]					
		TEM		MLR		DID		TEM		MLR		DID	
	Pred. Sign	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
IR_t	-	-0.0882	-0.0978	-0.000311	-0.00329	-0.0121	-0.0120	-0.379*	-0.208	-0.0735	-0.0446	0.0751	0.0793
		(-1.37)	(-1.61)	(-0.01)	(-0.16)	(-0.98)	(-0.95)	(-1.91)	(-0.98)	(-1.17)	(-0.82)	(0.90)	(1.19)
$POST_t$	-					-0.00336	-0.0114					-0.0483	-0.0815
						(-0.25)	(-0.66)					(-1.22)	(-1.19)
IR_t*$POST_t$	-					0.0163	0.0128					0.0253	0.00547
						(0.86)	(0.70)					(0.22)	(0.05)
GRI_t	-	0.0271	0.0414*	0.00497	0.0225	0.0174*	0.0250**	0.158**	0.125	0.0956*	0.0506	0.0896*	0.161***
		(1.55)	(1.84)	(0.27)	(1.22)	(1.96)	(2.35)	(2.13)	(1.32)	(1.66)	(0.75)	(1.67)	(2.72)
$LnSIZE_t$	-	-0.0286***	-0.0191	-0.000000283	6.18e-08	-0.0188*	-0.0241*	-0.0929*	-0.0660	0.00000269	-0.00000890	-0.0761***	-0.0615*
		(-3.06)	(-1.17)	(-0.25)	(0.03)	(-1.77)	(-1.93)	(-1.76)	(-0.73)	(0.85)	(-1.43)	(-2.66)	(-1.75)
$SqEARNSURP_t$	+	0.337**	0.339*	0.156	0.525	0.148*	0.0452	0.937	0.865	-0.390	0.526	0.927**	0.620
		(2.13)	(1.93)	(0.26)	(0.83)	(1.68)	(0.51)	(1.25)	(0.94)	(-0.29)	(0.33)	(2.37)	(1.41)
$LOSS_t$	+	0.0533	0.0224	-0.0839	-0.166*	0.295***	0.269***	0.393**	0.286	-0.120	-0.334	0.743***	0.734***
		(1.27)	(0.48)	(-1.05)	(-1.96)	(5.56)	(5.93)	(1.99)	(1.39)	(-0.55)	(-1.21)	(4.22)	(4.21)
$LnEARNVOLI_t$	+	0.0194	0.0256	-0.00138	0.0157	0.0176**	0.0347	0.111	0.154	0.0199	0.0141	0.0246	0.00647
		(1.46)	(0.79)	(-0.14)	(1.13)	(2.08)	(1.59)	(1.64)	(0.79)	(0.48)	(0.25)	(0.78)	(0.08)
$LISTING_t$	-	-0.00343	0.00486	-0.000927	0.00478	0.00159	0.00798**	-0.00432	0.00945	-0.0115	-0.0169	-0.00504	0.0240
		(-1.04)	(0.96)	(-0.27)	(0.93)	(0.62)	(2.16)	(-0.26)	(0.44)	(-1.19)	(-1.02)	(-0.54)	(1.64)
$FOLLOW_t$	-	0.00323*	0.000142	-0.00162	-0.000277	0.00156	0.000296	0.00233	-0.0146	0.00658	0.0215	0.00457	-0.0107
		(1.92)	(0.06)	(-0.21)	(-0.03)	(1.64)	(0.29)	(0.36)	(-1.60)	(0.46)	(1.23)	(1.16)	(-1.64)
$HORIZON_t$	+	-0.000342	0.000120	-0.000229	-0.000215	0.0000732	0.000230	-0.00239	-0.000973	-0.000728	-0.00119	-0.000334	0.000705
		(-1.46)	(0.38)	(-0.52)	(-0.39)	(0.62)	(1.23)	(-1.50)	(-0.58)	(-0.73)	(-0.96)	(-0.26)	(0.91)
$NATION\_RRG_t$	-	0.00252		-0.00404		-0.00944**		-0.00174		-0.00206		0.00257	
		(0.47)		(-0.63)		(-2.21)		(-0.08)		(-0.11)		(0.17)	
$NATION\_VF_t$	-	0.00480		-0.000337		0.00878*		0.0177		0.00973		-0.000475	
		(1.00)		(-0.03)		(1.96)		(0.80)		(0.43)		(-0.02)	
lambda		0.0465	0.0509					0.227	0.126				
		(1.17)	(1.34)					(1.64)	(0.81)				
Country dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Industry dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Year dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
N		190	190	236	236	380	380	190	190	236	236	380	380
R^2		0.283	0.561	0.026	0.358	0.509	0.620	0.259	0.474	0.036	0.314	0.198	0.481
Adj. R^2		0.234	0.331	-0.022	0.086	0.491	0.536	0.209	0.199	-0.012	0.023	0.170	0.365

Panel B: Change specification

		$\Delta FERROR(0)_{t+1}$				$\Delta FERROR(1)_{t+1}$			
		TEM		MLR		TEM		MLR	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IR_t	-	-0.0591*	-0.0421	-0.00917	-0.00633	0.0146	-0.0791	-0.00766	-0.00899
		(-1.66)	(-1.12)	(-0.94)	(-0.73)	(0.16)	(-1.02)	(-0.48)	(-0.65)
GRI_t	-	-0.00256	-0.00805	0.00614	0.00608	-0.0157	0.0132	0.0111	0.0224
		(-0.17)	(-0.43)	(0.64)	(0.57)	(-0.53)	(0.39)	(0.78)	(1.53)
$\Delta SIZE_t$	-	0.000000792	-0.000000227	0.000000699	-0.000000324	0.000000291	-0.00000304	0.000000426	-0.000000974
		(1.02)	(-0.18)	(1.36)	(-0.38)	(0.23)	(-0.97)	(0.49)	(-0.64)
$\Delta EARNSURP_t$	+	-0.260	-0.260	-0.1000	0.107	-0.380	-0.383	-0.0620	0.262
		(-0.70)	(-0.61)	(-0.43)	(0.41)	(-0.43)	(-0.42)	(-0.15)	(0.61)
$LOSS_t$	+	-0.0425	-0.0694	-0.0158	-0.0564	-0.194	-0.244**	-0.0586	-0.139**
		(-1.15)	(-1.31)	(-0.49)	(-1.26)	(-1.63)	(-2.15)	(-1.00)	(-2.03)
$\Delta EARNVOLI_t$	+	0.00345	0.00852	0.00506	0.00779	0.000359	0.00595	-0.000766	0.00727
		(0.96)	(1.37)	(1.04)	(1.06)	(0.06)	(0.37)	(-0.09)	(0.52)
$LISTING_t$	-	-0.00226	-0.000637	-0.00208	-0.00222	-0.00158	0.0193	-0.00244	0.00421
		(-1.31)	(-0.18)	(-1.33)	(-0.96)	(-0.48)	(1.64)	(-0.97)	(1.07)
$\Delta FOLLOW_t$	-	0.00233	0.00507	0.000302	0.00197	0.0136	0.0159	0.00413	0.00764
		(0.60)	(1.28)	(0.12)	(0.77)	(1.36)	(1.66)	(0.90)	(1.60)
$\Delta HORIZON_t$	+	-0.000603*	-0.000902*	-0.000272	-0.000381*	-0.000166	-0.000322	-0.000195	-0.000206
		(-1.73)	(-1.89)	(-1.60)	(-1.75)	(-0.21)	(-0.38)	(-0.55)	(-0.44)
$NATION\_RRG_t$	-	-0.00108		-0.00434		0.00122		-0.00614	
		(-0.32)		(-1.29)		(0.18)		(-1.13)	
$NATION\_VF_t$	-	-0.00206		-0.00117		0.00247		-0.00248	
		(-0.52)		(-0.23)		(0.33)		(-0.32)	
lambda		0.0250	0.0150			-0.0247	0.0330		
		(1.02)	(0.63)			(-0.42)	(0.62)		
Country dummies		N	Y	N	Y	N	Y	N	Y
Industry dummies		N	Y	N	Y	N	Y	N	Y
Year dummies		N	Y	N	Y	N	Y	N	Y
N		190	190	236	236	190	190	236	236
R^2		0.135	0.365	0.053	0.352	0.129	0.394	0.037	0.370
Adj. R^2		0.076	0.032	0.007	0.078	0.070	0.077	-0.010	0.103

Panel B (continue): Change specification

		ΔFERROR(2)$_{t+1}$				ΔDISPERSION$_{t+1}$			
		TEM		MLR		TEM		MLR	
	Pred. Sign	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
IR_t	-	0.0201	-0.0915	-0.000311	-0.00329	-0.209	-0.162	-0.0735	-0.0446
		(0.21)	(-1.06)	(-0.01)	(-0.16)	(-1.16)	(-0.77)	(-1.17)	(-0.82)
GRI_t	-	-0.0202	0.0131	0.00497	0.0225	0.122	0.0483	0.0956*	0.0506
		(-0.59)	(0.34)	(0.27)	(1.22)	(1.59)	(0.46)	(1.66)	(0.75)
$\Delta SIZE_t$	-	-0.000000457	-0.00000310	-0.000000283	6.18e-08	0.000000392	-0.00000539	0.00000269	-0.00000890
		(-0.30)	(-0.97)	(-0.25)	(0.03)	(0.11)	(-0.66)	(0.85)	(-1.43)
$\Delta EARNSURP_t$	+	0.0155	-0.0307	0.156	0.525	-0.476	0.575	-0.390	0.526
		(0.02)	(-0.03)	(0.26)	(0.83)	(-0.30)	(0.29)	(-0.29)	(0.33)
$LOSS_t$	+	-0.239*	-0.276**	-0.0839	-0.166*	-0.225	-0.501	-0.120	-0.334
		(-1.87)	(-2.26)	(-1.05)	(-1.96)	(-0.82)	(-1.49)	(-0.55)	(-1.21)
$\Delta EARNVOLI_t$	+	0.00154	0.00958	-0.00138	0.0157	-0.00275	0.00944	0.0199	0.0141
		(0.24)	(0.58)	(-0.14)	(1.13)	(-0.13)	(0.24)	(0.48)	(0.25)
$LISTING_t$	-	-0.000187	0.0177	-0.000927	0.00478	-0.0173	-0.0173	-0.0115	-0.0169
		(-0.04)	(1.47)	(-0.27)	(0.93)	(-1.52)	(-0.71)	(-1.19)	(-1.02)
$\Delta FOLLOW_t$	-	0.00607	0.00545	-0.00162	-0.000277	-0.00382	0.0202	0.00658	0.0215
		(0.49)	(0.38)	(-0.21)	(-0.03)	(-0.20)	(0.96)	(0.46)	(1.23)
$\Delta HORIZON_t$	+	-0.000209	-0.000439	-0.000229	-0.000215	-0.00142	-0.00199	-0.000728	-0.00119
		(-0.25)	(-0.48)	(-0.52)	(-0.39)	(-1.11)	(-1.27)	(-0.73)	(-0.96)
$NATION\_RRG_t$	-	0.00519		-0.00404		0.00525		-0.00206	
		(0.66)		(-0.63)		(0.24)		(-0.11)	
$NATION\_VF_t$	-	0.00464		-0.000337		-0.0185		0.00973	
		(0.54)		(-0.03)		(-0.83)		(0.43)	
lambda		-0.0225	0.0489			0.0894	0.0689		
		(-0.34)	(0.82)			(0.68)	(0.49)		
Country dummies		N	Y	N	Y	N	Y	N	Y
Industry dummies		N	Y	N	Y	N	Y	N	Y
Year dummies		N	Y	N	Y	N	Y	N	Y
N		190	190	236	236	190	190	236	236
R^2		0.106	0.359	0.026	0.358	0.066	0.347	0.036	0.314
Adj. R^2		0.045	0.022	-0.022	0.086	0.002	0.004	-0.012	0.023

Table 5.3 reports regression results for the information environment analysis (Equation 5.1). Panel A and Panel B present results for level specification and change specification, respectively. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. All continuous firm-level variables are winsorised at the 1st and 99th percentiles. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5. Selection model estimates for TEM is in Appendix B.

Table 5.4: Cost of equity - Descriptive statistics and independent *t*-tests

	All (n = 214)			IR Firms (n = 107)					Matched Firms (n = 107)					*t*-test	M-W
Variable (levels)	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
COE_{t+1}	11.10	10.46	3.26	11.26	10.86	3.38	5.86	21.36	10.94	10.37	3.14	5.86	21.36	0.472	0.464
$LnSIZE_t$	9.05	8.92	1.12	9.15	9.06	1.13	6.61	11.90	8.96	8.81	1.11	6.61	11.90	0.219	0.173
$LnMTB_t$	1.04	0.91	0.54	1.00	0.86	0.56	0.30	3.56	1.07	0.95	0.52	0.30	3.56	0.368	0.179
LEV_t	0.26	0.25	0.17	0.27	0.25	0.17	0.00	0.68	0.25	0.25	0.17	0.00	0.68	0.328	0.336
$BETA_t$	0.97	0.92	0.42	1.00	0.98	0.46	0.15	1.89	0.94	0.91	0.38	0.19	1.88	0.361	0.344
LTG_t	12.35	10.13	15.15	10.92	8.58	14.38	-25.50	69.22	13.77	11.63	15.83	-12.82	69.22	0.168	0.185
$LnDISPERSION_t$	-2.06	-2.24	1.10	-2.00	-2.23	1.17	-4.09	0.89	-2.11	-2.24	1.02	-4.09	0.89	0.474	0.725
$FOLLOW_t$	17.59	16.00	8.16	18.55	17.00	8.50	4.50	43.00	16.63	16.00	7.73	4.50	43.00	0.084	0.158
	All (n = 214)			IR Firms (n = 107)					Matched Firms (n = 107)					*t*-test	M-W
Variable (changes)	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
ΔCOE_{t+1}	0.19	0.00	2.09	0.30	-0.01	2.04	-3.96	8.24	0.08	0.00	2.14	-3.96	8.48	0.452	0.499
$\Delta SIZE_t$	-35.41	11.13	4213.99	472.85	78.21	4379.06	-12528.57	16551.06	-543.67	-11.56	3998.15	-12789.39	16551.06	0.078	0.383
ΔMTB_t	-0.10	-0.02	0.72	-0.08	-0.01	0.77	-3.79	1.44	-0.12	-0.03	0.67	-3.20	1.44	0.707	0.547
ΔLEV_t	0.00	0.00	0.04	0.00	0.00	0.04	-0.15	0.15	0.00	0.00	0.05	-0.15	0.15	0.328	0.115
$\Delta BETA_t$	0.00	-0.01	0.19	0.00	-0.02	0.19	-0.57	0.47	0.01	0.01	0.18	-0.57	0.47	0.642	0.543
ΔLTG_t	-0.39	-0.14	19.14	0.10	0.15	16.52	-83.10	83.80	-0.88	-0.47	21.51	-83.10	83.80	0.709	0.668
$\Delta DISPERSION_t$	-0.06	0.00	0.50	-0.05	0.00	0.59	-3.10	0.98	-0.07	-0.01	0.40	-2.20	0.79	0.794	0.463
$\Delta FOLLOW_t$	-0.07	0.00	2.25	0.06	0.00	2.19	-5.50	5.00	-0.21	0.00	2.31	-5.50	5.00	0.379	0.472

Table 5.4 reports descriptive statistics for continuous variables and tests for differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). All firm-level variables are winsorised at the 1st and 99th percentiles. Variables are as defined in Section 3.5.

Table 5.5: Cost of equity - Correlation matrix

Panel A: Levels

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) COE_{t+1}		0.050	0.113	**-0.135**	**-0.388**	**0.207**	**0.483**	0.024	**0.363**	0.028
(2) IR_t	0.049		**0.319**	0.093	-0.092	0.066	0.065	-0.091	0.024	0.097
(3) GRI_t	0.098	**0.319**		**0.251**	-0.104	**0.181**	**0.148**	-0.058	0.124	**0.230**
(4) $LnSIZE_t$	-0.130	0.084	**0.239**		**0.199**	**-0.144**	0.032	**-0.142**	**-0.235**	**0.453**
(5) $LnMTB_t$	**-0.311**	-0.062	-0.050	0.134		**-0.143**	**-0.434**	0.057	**-0.424**	-0.019
(6) LEV_t	**0.213**	0.067	0.131	**-0.196**	0.010		0.056	0.000	0.130	-0.005
(7) $BETA_t$	**0.452**	0.063	0.124	0.009	**-0.419**	0.043		0.122	**0.235**	**0.186**
(8) LTG_t	0.015	-0.095	-0.096	**-0.199**	-0.007	0.046	0.090		**0.150**	0.017
(9) $LnDISPERSION_t$	**0.366**	0.049	0.110	**-0.273**	**-0.389**	**0.136**	**0.246**	**0.195**		-0.076
(10) $FOLLOW_t$	0.059	0.118	**0.239**	**0.382**	-0.037	-0.042	**0.195**	-0.022	-0.008	

Panel B: Changes

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) ΔCOE_{t+1}		0.046	-0.019	**-0.153**	-0.092	0.117	-0.084	0.065	0.020	-0.081
(2) IR_t	0.052		**0.319**	0.060	0.041	-0.108	-0.042	0.029	0.050	0.049
(3) GRI_t	-0.031	**0.319**		-0.006	0.045	0.000	0.012	-0.085	-0.069	0.045
(4) $\Delta SIZE_t$	**-0.187**	0.121	0.015		**0.643**	**-0.268**	-0.018	0.043	**-0.242**	-0.062
(5) ΔMTB_t	-0.059	0.026	0.064	**0.264**		-0.081	-0.023	**0.190**	-0.126	-0.060
(6) ΔLEV_t	0.126	-0.067	0.020	**-0.222**	0.054		**0.158**	0.025	**0.177**	-0.092
(7) $\Delta BETA_t$	-0.043	-0.032	0.008	-0.022	-0.022	**0.173**		0.083	0.013	-0.036
(8) ΔLTG_t	0.075	0.026	-0.127	0.023	0.071	0.082	**0.187**		-0.091	-0.066
(9) $\Delta DISPERSION_t$	-0.032	0.018	-0.069	-0.084	0.001	0.127	0.108	0.002		**-0.170**
(10) $\Delta FOLLOW_t$	-0.018	0.060	0.058	-0.049	-0.079	-0.126	-0.004	0.050	-0.056	

Table 5.5 reports the correlation matrix for the variables tested. Panel A and Panel B present correlations between variables in levels specification and change specification, respectively. Pearson's correlation (parametric test) is presented below the diagonal and Spearman's correlation (non-parametric test) is above the diagonal. Correlation coefficients in bold are significant at $p<0.05$ based on two-tailed tests. Variables are as defined in Section 3.5.

Table 5.6: Cost of equity and IR

		COE_{t+1} [(*t*) in DID]							ΔCOE_{t+1}			
		TEM		MLR		DID			TEM		MLR	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)
IR_t	-	-3.171**	-0.724	-0.0412	0.0963	0.100	0.142	IR_t	-0.225	-0.208	0.399	0.269
		(-2.01)	(-0.71)	(-0.11)	(0.42)	(0.23)	(0.44)		(-0.20)	(-0.25)	(1.50)	(1.31)
$POST_t$	-					-0.153	0.539	GRI_t	-0.0416	0.0782	-0.245	-0.0734
						(-0.35)	(1.12)		(-0.11)	(0.23)	(-0.75)	(-0.25)
IR_t*$POST_t$	-					-0.112	-0.0686	$\Delta SIZE_t$	-0.000106*	-0.0000248	-0.0000880*	-0.0000300
						(-0.18)	(-0.15)		(-1.90)	(-0.54)	(-1.85)	(-0.68)
GRI_t	-	0.642	0.143	0.0534	-0.0511	-0.128	-0.567*	ΔMTB_t	0.0000305	0.000375	-0.0759	-0.284
		(1.18)	(0.34)	(0.12)	(-0.15)	(-0.34)	(-1.76)		(0.12)	(1.24)	(-0.44)	(-1.39)
$LnSIZE_t$	-	0.161	-0.578*	-0.152	-0.187	-0.0572	-0.0237	ΔLEV_t	4.288	0.770	5.164	-0.790
		(0.65)	(-1.77)	(-0.73)	(-0.94)	(-0.37)	(-0.11)		(1.17)	(0.19)	(1.48)	(-0.22)
$LnMTB_t$	+	-0.174	0.384	-0.369	-0.167	-0.0742	-0.198	$\Delta BETA_t$	0.0416	0.267	-0.796	-0.650
		(-1.51)	(1.04)	(-0.86)	(-0.50)	(-0.96)	(-0.69)		(0.06)	(0.32)	(-1.17)	(-0.92)
LEV_t	+	0.655	0.717	3.067**	2.445**	2.322*	2.537**	ΔLTG_t	0.00372	0.00463	0.00851	0.00760
		(0.36)	(0.43)	(2.42)	(2.05)	(1.88)	(2.23)		(1.07)	(1.09)	(1.40)	(1.12)
$BETA_t$	+	2.939***	2.471***	2.840***	2.821***	4.008***	3.165***	$\Delta DISPERSION_t$	-0.0129***	-0.000721	-0.250	0.187
		(7.66)	(4.60)	(6.27)	(6.11)	(9.95)	(7.91)		(-12.07)	(-0.41)	(-0.76)	(0.87)
LTG_t	+	-0.00768	-0.000471	-0.0175	-0.0112	-0.00105	-0.0177**	$\Delta FOLLOW_t$	-0.0320	-0.171**	-0.0239	-0.0540
		(-0.64)	(-0.05)	(-1.29)	(-1.14)	(-0.07)	(-2.06)		(-0.49)	(-2.01)	(-0.37)	(-0.68)
$LnDISPERSION_t$	-/+	0.909***	0.540**	0.688***	0.200	0.337*	0.218	lambda	0.483	0.458		
		(3.18)	(2.10)	(3.65)	(1.35)	(1.91)	(1.43)		(0.57)	(0.76)		
$FOLLOW_t$	-	0.0113	0.0629	0.00415	0.00293	0.00566	0.0140	Country dummies	N	Y	N	Y
		(0.37)	(1.29)	(0.14)	(0.07)	(0.26)	(0.47)	Industry dummies	N	Y	N	Y
lambda		2.145*	0.630					Year dummies	N	Y	N	Y
		(1.88)	(0.88)					N	174	174	214	214
Country dummies		N	Y	N	Y	N	Y	R2	0.091	0.676	0.066	0.595
Industry dummies		N	Y	N	Y	N	Y	Adj. R2	0.035	0.495	0.025	0.413
Year dummies		N	Y	N	Y	N	Y					
N		174	174	214	214	310	310					
R^2		0.291	0.819	0.310	0.821	0.334	0.723					
Adj. R^2		0.247	0.718	0.280	0.740	0.309	0.654					

Table 5.6 reports regression results for the cost of equity analysis (Equation 5.2). Panel A and Panel B present results for level specification and change specification, respectively. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. All continuous firm-level variables are winsorised at the 1st and 99th percentiles. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5. Selection model estimates for TEM is in Appendix B.

Table 5.7: Firm value - Descriptive statistics and independent *t*-tests

	All (n = 282)			IR Firms (n = 141)					Matched Firms (n = 141)					*t*-test	M-W
Variable (levels)	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
$LnPRICE_{t+1}$	3.01	2.88	1.47	2.97	2.87	1.45	0.19	8.03	3.06	2.90	1.49	0.31	8.03	0.607	0.717
$LnBVPS_t$	2.39	2.40	1.06	2.37	2.40	1.04	0.00	5.45	2.42	2.38	1.09	0.00	5.48	0.718	0.926
$ABEARN_t$	-2.29	-0.98	5.68	-2.05	-1.02	4.83	-46.79	0.00	-2.53	-0.94	6.43	-46.79	0.00	0.478	0.921
$LnMVCDA_{t+1}$	0.99	0.91	0.53	0.97	0.87	0.50	-1.21	2.63	1.00	0.94	0.56	-1.21	2.40	0.717	0.431
$BVINV_t$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.933	0.083
$NIBV_t$	0.12	0.09	0.43	0.09	0.09	0.52	-4.24	3.19	0.15	0.10	0.31	-0.34	3.03	0.223	0.133
	All (n = 282)			IR Firms (n = 141)					Matched Firms (n = 141)					*t*-test	M-W
Variable (changes)	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
$\Delta PRICE_{t+1}$	1.29	-0.01	42.77	-0.41	-0.02	39.12	-188.99	237.89	2.99	0.02	46.21	-188.99	237.89	0.506	0.504
$\Delta BVPS_t$	0.17	-0.01	4.73	-0.35	-0.08	3.08	-16.91	6.95	0.68	0.10	5.90	-16.91	31.58	0.065	0.274
$\Delta ABEARN_t$	0.22	0.02	1.02	0.27	0.02	1.03	-0.99	7.34	0.17	0.01	1.02	-1.95	7.34	0.398	0.378
$\Delta MVCDA_{t+1}$	-0.02	0.00	0.94	-0.03	0.00	0.99	-6.06	2.30	-0.01	-0.02	0.90	-6.06	2.30	0.856	0.888
$\Delta BVINV_t$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.395	0.974
$\Delta NIBV_t$	0.04	0.00	0.53	0.03	0.00	0.64	-1.98	6.78	0.04	0.00	0.38	-0.23	4.07	0.902	0.924

Table 5.7 reports descriptive statistics for continuous variables and tests for differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). All firm-level variables are winsorised at the 1st and 99th percentiles. Variables are as defined in Section 3.5.

Table 5.8: Firm value - Correlation matrix

Panel A: Levels

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) $LnPRICE_{t+1}$		-0.022	-0.031	**0.635**	**-0.572**	**0.449**	-0.074	**0.187**
(2) IR_t	-0.031		**0.318**	-0.006	0.006	-0.047	-0.103	-0.090
(3) GRI_t	-0.027	**0.318**		0.021	-0.060	0.009	**-0.356**	0.022
(4) $LnBVPS_t$	**0.496**	-0.022	0.024		**-0.966**	-0.102	**-0.283**	**-0.139**
(5) $ABEARN_t$	**-0.258**	0.042	-0.039	**-0.610**		**0.153**	**0.296**	**0.191**
(6) $LnMVCDA_{t+1}$	**0.401**	-0.022	0.010	-0.126	**0.174**		**0.219**	**0.405**
(7) $BVINV_t$	-0.077	0.005	**-0.172**	**-0.289**	0.099	**0.170**		0.105
(8) $NIBV_t$	0.063	-0.073	0.015	**-0.127**	0.060	-0.007	0.117	

Panel B: Changes

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) $\Delta LnPRICE_{t+1}$		-0.040	-0.108	**0.211**	-0.017	0.033	0.003	**0.177**
(2) IR_t	-0.040		**0.318**	-0.065	0.053	0.008	0.002	-0.006
(3) GRI_t	-0.102	**0.318**		-0.071	-0.041	0.043	-0.008	0.005
(4) $\Delta LnBVPS_t$	-0.035	-0.110	-0.094		**-0.156**	-0.021	-0.039	**0.180**
(5) $\Delta ABEARN_t$	**-0.137**	0.051	-0.020	**0.185**		0.099	**0.286**	**0.227**
(6) $\Delta LnMVCDA_{t+1}$	0.082	-0.011	0.037	0.012	0.009		0.103	0.000
(7) $\Delta BVINV_t$	-0.041	0.051	-0.048	0.071	0.022	**-0.155**		**0.351**
(8) $\Delta NIBV_t$	-0.017	-0.007	0.041	0.015	0.072	0.104	**0.305**	

Table 5.8 reports the correlation matrix for the variables tested. Panel A and Panel B present correlations between variables in levels specification and change specification, respectively. Pearson's correlation (parametric test) is presented below the diagonal and Spearman's correlation (non-parametric test) is above the diagonal. Correlation coefficients in bold are significant at $p<0.05$ based on two-tailed tests. Variables are as defined in Section 3.5.

Table 5.9: Firm value and IR

Panel A: Level specification

		$LnPRICE_{t+1}$ [(*t*) in DID]						$LnMVCDA_{t+1}$ [(*t*) in DID]					
		TEM		MLR		DID		TEM		MLR		DID	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
IR_t	+	0.613	-0.0406	-0.0338	-0.0829	-0.00384	-0.0323	-0.220	-0.199	-0.0446	-0.0566	-0.250	-0.127
		(1.14)	(-0.11)	(-0.20)	(-1.09)	(-0.02)	(-0.44)	(-1.05)	(-0.89)	(-0.72)	(-1.01)	(-0.93)	(-1.50)
$POST_t$	+					-0.00782	0.0936					0.0990	0.102
						(-0.04)	(0.90)					(0.39)	(0.84)
IR_t*$POST_t$	+					-0.0485	-0.0356					-0.0163	-0.00557
						(-0.20)	(-0.34)					(-0.04)	(-0.05)
GRI_t	+	-0.272	0.0907	-0.104	0.0841	-0.0631	0.0407	0.104	0.164**	0.0617	0.104*	0.408**	0.0846
		(-1.00)	(0.69)	(-0.56)	(0.93)	(-0.42)	(0.61)	(1.40)	(2.19)	(0.95)	(1.67)	(2.00)	(1.23)
$LnBVPS_t$	+	0.686***	0.826***	0.746***	0.820***	0.697***	0.783***						
		(6.11)	(8.94)	(8.23)	(10.00)	(12.44)	(13.97)						
$ABEARN_t$	+	0.0139	0.0126	0.0182	0.0110	30.22***	20.64**						
		(0.65)	(0.58)	(0.84)	(0.52)	(2.92)	(2.14)						
$BVINV_t$	+							50616.8	97730.8	61372.3**	52004.5**	3640.2***	537.2**
								(0.63)	(1.19)	(2.04)	(2.08)	(7.75)	(2.03)
$NIBV_t$	+							0.438**	0.369*	-0.0395	-0.0337	0.00641**	0.00251***
								(2.60)	(1.96)	(-0.21)	(-0.22)	(2.12)	(7.80)
lambda		-0.447	-0.0252					0.133	0.117				
		(-1.27)	(-0.10)					(0.94)	(0.80)				
Country dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Industry dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Year dummies		N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
N		206	206	282	282	440	440	206	206	282	282	440	440
R^2		0.213	0.873	0.251	0.858	0.263	0.890	0.139	0.580	0.033	0.413	0.223	0.930
Adj. R^2		0.194	0.819	0.240	0.815	0.253	0.871	0.118	0.402	0.019	0.236	0.212	0.918

Panel B: Change specification

		$\Delta PRICE_{t+1}$				$\Delta MVCDA_{t+1}$			
		TEM		MLR		TEM		MLR	
	Pred. Sign	(1)	(2)	(3)	(4)	(7)	(8)	(9)	(10)
IR_t	+	14.92	-6.606	-0.127	0.834	-0.0804	-0.0621	-0.0122	-0.00809
		(0.72)	(-0.29)	(-0.02)	(0.12)	(-0.30)	(-0.19)	(-0.12)	(-0.08)
GRI_t	+	-12.83	-6.938	-9.655	-10.84	0.108	0.151	0.0457	0.0611
		(-1.05)	(-0.44)	(-1.28)	(-1.15)	(0.83)	(1.11)	(0.41)	(0.50)
$\Delta BVPS_t$	+	-0.304	-0.282	-0.182	-0.0567				
		(-0.42)	(-0.36)	(-0.26)	(-0.07)				
$\Delta ABEARN_t$	+	-4.677	-7.816*	-5.645*	-10.28**				
		(-1.35)	(-1.86)	(-1.89)	(-2.04)				
$\Delta BVINV_t$	+					-375846.0	-359423.3	-389542.9	-552667.8
						(-0.32)	(-0.37)	(-1.09)	(-1.45)
$\Delta NIBV_t$	+					0.106	0.0428	0.296	0.358
						(0.55)	(0.26)	(1.16)	(1.50)
lambda		-9.999	4.693			0.135	0.118		
		(-0.84)	(0.37)			(0.69)	(0.52)		
Country dummies		N	Y	N	Y	N	Y	N	Y
Industry dummies		N	Y	N	Y	N	Y	N	Y
Year dummies		N	Y	N	Y	N	Y	N	Y
N		206	206	282	282	206	206	282	282
R^2		0.025	0.182	0.030	0.189	0.017	0.347	0.050	0.350
Adj. R^2		0.000	-0.164	0.016	-0.055	-0.008	0.071	0.036	0.155

Table 5.9 reports regression results for the firm value analysis (Equation 5.3 and Equation 5.4). Panel A and Panel B present results for level specification and change specification, respectively. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. All continuous firm-level variables are winsorised at the 1st and 99th percentiles. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5. Selection model estimates for TEM is in Appendix B.

Table 5.10: Environmental and social performance - Descriptive statistics and independent *t*-tests

	All (n = 178)			IR Firms (n = 89)					Matched Firms (n = 89)					*t*-test	M-W
Variable (levels)	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
ESP_{t+1}	78.97	87.41	20.09	86.25	89.86	9.90	39.37	95.06	71.70	81.91	24.63	10.12	94.96	0.000	0.000
$LnSIZE_t$	9.08	9.04	1.08	9.23	9.15	1.05	6.87	11.37	8.92	8.89	1.10	6.01	11.51	0.057	0.052
$LnMTB_t$	3.23	3.47	2.15	3.19	3.47	2.18	0.33	7.93	3.28	3.47	2.14	0.13	7.93	0.779	0.526
ROA_t	0.04	0.03	0.06	0.04	0.03	0.05	-0.11	0.28	0.05	0.03	0.06	-0.11	0.32	0.311	0.309
LEV_t	0.26	0.25	0.17	0.27	0.25	0.17	0.00	0.69	0.26	0.25	0.17	0.00	0.66	0.633	0.709
$SLACK_t$	0.11	0.07	0.09	0.11	0.07	0.09	0.01	0.46	0.11	0.07	0.10	0.00	0.46	0.725	0.956
$BETA_t$	1.02	0.96	0.45	1.04	1.04	0.49	0.02	2.23	0.99	0.93	0.41	0.02	2.17	0.431	0.434
$FOLLOW_t$	17.10	16.00	9.15	18.53	16.50	9.44	0.00	43.00	15.67	15.00	8.68	0.00	43.00	0.037	0.096
$LISTING_t$	6.12	6.00	3.38	6.55	7.00	3.37	1.00	16.00	5.70	6.00	3.34	1.00	17.00	0.092	0.109
$BOARDIND_t$	61.01	67.95	28.88	63.56	66.67	27.31	12.50	100.00	58.45	69.23	30.31	0.00	100.00	0.239	0.230
$BOARDSIZE_t$	11.60	11.00	3.82	11.30	11.00	3.30	4.00	20.00	11.89	11.00	4.27	4.00	25.00	0.309	0.674
$CULTURE\_MUL_t$	0.00	0.16	1.43	0.00	0.16	1.43	-2.89	1.57	0.00	0.16	1.43	-2.89	1.57	1.000	1.000
$NATION\_VF_t$	0.00	0.20	1.36	0.00	0.20	1.36	-3.31	4.35	0.00	0.20	1.36	-3.31	4.35	1.000	1.000
ENV_{t+1}	79.69	88.95	21.20	86.96	91.11	10.11	42.61	95.08	72.42	82.86	26.36	9.12	94.98	0.000	0.001
SOC_{t+1}	78.26	87.69	21.78	85.54	90.14	12.36	26.23	96.81	70.98	81.25	26.35	8.66	96.41	0.000	0.000
IVS_{t+1}	76.93	87.36	22.90	83.17	89.68	15.82	11.85	94.33	70.69	82.98	26.93	8.92	94.02	0.000	0.004
	All (n = 178)			IR Firms (n = 89)					Matched Firms (n = 89)					*t*-test	M-W
Variable (changes)	Mean	Median	Sd	Mean	Median	Sd	Min	Max	Mean	Median	Sd	Min	Max	*p*-value	*p*-value
ΔESP_{t+1}	1.57	0.79	6.10	1.40	0.99	5.12	-14.53	22.57	1.75	0.78	6.96	-14.53	22.57	0.697	0.904
$\Delta SIZE_t$	10.09	157.15	4617.08	380.93	267.57	4750.56	-12552.56	22391.81	-360.74	84.66	4475.61	-13661.45	22391.81	0.285	0.376
ΔMTB_t	165.79	24.35	410.75	160.47	26.75	400.38	-1.21	2765.85	171.12	23.05	423.06	-4.48	2765.85	0.863	0.896
ΔROA_t	0.00	0.00	0.04	0.00	0.00	0.03	-0.12	0.14	0.00	0.00	0.04	-0.07	0.21	0.276	0.735
ΔLEV_t	0.00	0.00	0.04	0.00	0.00	0.04	-0.13	0.15	0.01	0.00	0.05	-0.13	0.15	0.357	0.276
$\Delta SLACK_t$	0.00	0.00	0.04	0.00	0.00	0.04	-0.10	0.11	0.00	0.00	0.03	-0.12	0.11	0.492	0.578
$\Delta BETA_t$	-0.01	-0.03	0.17	-0.04	-0.04	0.17	-0.59	0.46	0.01	0.00	0.17	-0.59	0.47	0.081	0.043
$\Delta FOLLOW_t$	-0.15	0.00	2.18	0.00	0.00	2.21	-7.50	5.00	-0.30	0.00	2.15	-7.50	5.00	0.363	0.531
$\Delta BOARDIND_t$	1.30	0.00	8.65	1.85	0.00	8.66	-33.33	36.36	0.76	0.00	8.66	-33.33	36.36	0.401	0.171
$\Delta BOARDSIZE_t$	-0.14	0.00	1.86	-0.15	0.00	2.04	-9.00	4.00	-0.13	0.00	1.67	-5.00	4.00	0.968	0.810
ΔENV_{t+1}	1.70	0.65	6.36	1.36	0.68	5.79	-15.72	29.89	2.04	0.54	6.90	-15.72	29.89	0.476	0.792
ΔSOC_{t+1}	1.38	1.00	7.92	1.44	1.17	6.41	-21.62	28.70	1.31	0.85	9.23	-22.47	29.96	0.914	0.882
ΔIVS_{t+1}	0.28	0.55	7.75	1.21	0.54	7.87	-29.60	30.56	-0.66	0.55	7.55	-29.60	19.29	0.107	0.754

Table 5.10 reports descriptive statistics for continuous variables and tests for differences based on two-tailed independent *t*-test (parametric) and Mann-Whitney *U*-test (non-parametric). All firm-level variables are winsorised at the 1st and 99th percentiles. Variables are as defined in Section 3.5.

Table 5.11: Environmental and social performance - Correlation matrix

Panel A: Levels

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) ESP_{t+1}		**0.831**	**0.883**	**0.565**	**0.293**	**0.516**	**0.328**	-0.086	-0.001
(2) ENV_{t+1}	**0.933**		**0.533**	**0.485**	**0.251**	**0.468**	**0.285**	0.088	-0.100
(3) SOC_{t+1}	**0.937**	**0.748**		**0.539**	**0.276**	**0.483**	**0.268**	**-0.215**	0.069
(4) IVS_{t+1}	**0.790**	**0.683**	**0.792**		**0.214**	**0.530**	**0.315**	**-0.223**	0.017
(5) IR_t	**0.363**	**0.344**	**0.335**	**0.273**		**0.242**	0.146	-0.048	-0.077
(6) GRI_t	**0.594**	**0.546**	**0.564**	**0.591**	**0.242**		**0.298**	0.068	-0.067
(7) $LnSIZE_t$	**0.249**	**0.250**	**0.217**	**0.230**	0.143	**0.290**		0.064	0.138
(8) $LnMTB_t$	0.004	0.101	-0.092	-0.083	-0.021	0.103	0.099		**0.155**
(9) ROA_t	-0.115	**-0.171**	-0.047	-0.088	-0.076	-0.034	**0.178**	**0.179**	
(10) LEV_t	0.035	-0.001	0.064	0.101	0.036	0.023	**-0.173**	**-0.252**	**-0.242**
(11) $SLACK_t$	-0.102	-0.060	-0.131	-0.141	-0.027	-0.048	0.048	**0.297**	**0.191**
(12) $BETA_t$	0.047	0.119	-0.029	0.030	0.059	0.068	0.021	-0.117	**-0.310**
(13) $FOLLOW_t$	**0.372**	**0.371**	**0.326**	**0.330**	**0.156**	**0.297**	**0.466**	0.023	-0.006
(14) $LISTING_t$	**0.250**	**0.215**	**0.252**	**0.203**	0.127	0.109	**0.459**	**-0.402**	-0.034
(15) $BOARDIND_t$	0.009	-0.093	0.108	0.100	0.089	0.090	0.077	**-0.588**	0.089
(16) $BOARDSIZE_t$	0.037	0.042	0.027	0.079	-0.077	0.003	**0.208**	**-0.167**	**-0.223**
(17) $CULTURE\_MUL_t$	0.124	**0.222**	0.012	-0.024	0.000	0.137	0.112	**0.687**	-0.113
(18) $NATION\_VF_t$	-0.042	-0.010	-0.069	-0.046	0.000	0.078	0.069	**0.275**	-0.121

Variable	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) ESP_{t+1}	0.082	0.018	0.014	**0.412**	**0.317**	0.094	0.067	0.065	-0.139
(2) ENV_{t+1}	0.002	0.052	**0.167**	**0.401**	**0.247**	-0.064	0.027	**0.214**	-0.061
(3) SOC_{t+1}	0.118	-0.020	-0.128	**0.327**	**0.303**	**0.211**	0.097	-0.059	**-0.161**
(4) IVS_{t+1}	0.118	-0.078	0.107	**0.339**	**0.269**	**0.162**	0.106	-0.088	**-0.165**
(5) IR_t	0.028	-0.004	0.059	0.125	0.120	0.090	-0.032	0.000	0.000
(6) GRI_t	0.064	0.062	0.098	**0.282**	0.118	0.096	0.043	**0.149**	0.086
(7) $LnSIZE_t$	-0.107	0.008	0.045	**0.481**	**0.460**	0.113	**0.275**	0.110	-0.003
(8) $LnMTB_t$	**-0.273**	**0.311**	-0.137	-0.073	**-0.393**	**-0.601**	**-0.183**	**0.649**	**0.501**
(9) ROA_t	**-0.209**	0.113	**-0.398**	-0.031	-0.050	0.040	**-0.256**	**-0.149**	-0.104
(10) LEV_t		**-0.271**	0.099	-0.030	0.007	**0.152**	0.122	**-0.227**	0.045
(11) $SLACK_t$	**-0.288**		-0.024	-0.072	0.065	**-0.185**	**-0.163**	**0.272**	0.141
(12) $BETA_t$	0.091	-0.050		**0.217**	0.127	-0.048	**0.216**	0.048	0.029
(13) $FOLLOW_t$	-0.059	-0.057	**0.177**		**0.385**	**0.275**	**0.197**	-0.057	-0.115
(14) $LISTING_t$	-0.019	0.036	0.126	**0.331**		**0.231**	**0.251**	-0.013	**-0.540**
(15) $BOARDIND_t$	0.128	**-0.227**	-0.016	**0.276**	**0.202**		0.042	**-0.664**	**-0.335**
(16) $BOARDSIZE_t$	0.111	**-0.167**	**0.183**	**0.154**	**0.261**	0.011		0.114	0.084
(17) $CULTURE\_MUL_t$	**-0.209**	**0.264**	0.035	-0.074	-0.036	**-0.688**	0.096		**0.340**
(18) $NATION\_VF_t$	0.047	-0.005	0.010	-0.086	**-0.482**	**-0.171**	0.106	**0.223**	

Panel B: Changes

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) ΔESP_{t+1}		**0.697**	**0.860**	**0.271**	-0.009	-0.034	0.022	0.056	-0.104
(2) ΔENV_{t+1}	**0.800**		**0.354**	**0.216**	-0.020	-0.067	-0.063	-0.036	-0.144
(3) ΔSOC_{t+1}	**0.863**	**0.393**		**0.280**	0.011	-0.038	-0.002	0.070	-0.033
(4) ΔIVS_{t+1}	**0.339**	**0.225**	**0.337**		0.024	0.067	-0.109	0.076	-0.002
(5) IR_t	-0.029	-0.054	0.008	0.121		**0.242**	0.067	0.010	-0.026
(6) GRI_t	-0.112	-0.133	-0.047	**0.148**	**0.242**		0.018	0.135	-0.039
(7) $\Delta SIZE_t$	-0.001	-0.016	0.011	-0.025	0.081	0.017		0.088	**0.201**
(8) ΔMTB_t	-0.017	0.000	-0.023	-0.011	-0.013	0.134	-0.020		0.036
(9) ΔROA_t	0.041	-0.086	0.117	-0.007	-0.082	-0.022	0.117	-0.006	
(10) ΔLEV_t	-0.007	0.006	-0.006	0.101	-0.070	-0.028	-0.120	-0.120	**-0.368**
(11) $\Delta SLACK_t$	-0.009	-0.087	0.059	0.002	0.052	0.105	0.145	0.056	0.006
(12) $\Delta BETA_t$	0.054	0.062	0.039	-0.055	-0.131	0.034	-0.009	0.067	0.073
(13) $\Delta FOLLOW_t$	-0.025	0.088	-0.118	0.077	0.069	0.038	-0.106	**0.185**	-0.023
(14) $LISTING_t$	-0.123	**-0.180**	-0.042	-0.053	0.127	0.109	**0.284**	**-0.375**	0.028
(15) $\Delta BOARDIND_t$	0.050	-0.035	0.107	0.114	0.063	0.080	0.037	-0.048	0.135
(16) $\Delta BOARDSIZE_t$	-0.115	**-0.235**	0.007	-0.083	-0.003	-0.004	0.044	-0.072	0.040
(17) $CULTURE\_MUL_t$	0.002	-0.113	0.102	0.003	0.000	0.137	0.140	**0.234**	0.136
(18) $NATION\_VF_t$	0.077	0.113	0.034	0.105	0.000	0.078	**-0.321**	0.126	-0.129

Variable	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) ΔESP_{t+1}	0.033	-0.035	0.001	-0.050	**-0.177**	0.054	0.026	0.069	0.103
(2) ΔENV_{t+1}	0.042	-0.075	-0.024	-0.022	**-0.218**	0.007	-0.053	-0.108	0.097
(3) ΔSOC_{t+1}	0.027	0.004	0.038	-0.086	-0.095	0.095	0.051	0.134	0.075
(4) ΔIVS_{t+1}	0.082	0.052	-0.104	0.025	-0.141	**0.156**	0.022	0.075	0.133
(5) IR_t	-0.082	0.042	**-0.152**	0.047	0.120	0.103	0.018	0.000	0.000
(6) GRI_t	0.013	0.095	0.014	0.009	0.118	0.076	0.040	**0.149**	0.086
(7) $\Delta SIZE_t$	-0.144	0.121	-0.001	-0.056	**0.257**	0.054	0.063	**0.170**	**-0.237**
(8) ΔMTB_t	**-0.170**	0.099	-0.014	**0.181**	**-0.370**	0.075	0.104	**0.672**	**0.565**
(9) ΔROA_t	**-0.261**	-0.054	-0.047	-0.001	0.094	0.107	0.023	**0.153**	**-0.169**
(10) ΔLEV_t		-0.016	0.109	-0.039	-0.015	-0.012	-0.013	**-0.220**	-0.056
(11) $\Delta SLACK_t$	-0.009		-0.128	0.044	0.082	0.061	0.043	0.037	-0.054
(12) $\Delta BETA_t$	0.145	-0.139		-0.070	-0.043	-0.010	0.029	-0.073	0.033
(13) $\Delta FOLLOW_t$	-0.078	0.047	-0.068		-0.039	-0.052	**0.156**	0.037	**0.225**
(14) $LISTING_t$	0.014	0.077	-0.053	-0.092		-0.042	-0.019	-0.013	**-0.540**
(15) $\Delta BOARDIND_t$	-0.048	-0.021	-0.044	-0.031	-0.038		**0.150**	**0.162**	0.075
(16) $\Delta BOARDSIZE_t$	-0.015	0.027	-0.080	0.099	0.058	0.116		0.122	0.034
(17) $CULTURE\_MUL_t$	**-0.265**	0.089	-0.058	0.038	-0.036	**0.158**	0.095		**0.340**
(18) $NATION\_VF_t$	-0.012	-0.134	-0.001	**0.197**	**-0.482**	0.127	-0.083	**0.223**	

Table 5.11 reports the correlation matrix for the variables tested. Panel A and Panel B present correlations between variables in levels specification and change specification, respectively. Pearson's correlation (parametric test) is presented below the diagonal and Spearman's correlation (non-parametric test) is above the diagonal. Correlation coefficients in bold are significant at $p<0.05$ based on two-tailed tests. Variables are as defined in Section 3.5.

Table 5.12: Environmental and social performance and IR

Panel A: Level specification

		ESP_{t+1} [(*t*) in DID]					
		TEM		MLR		DID	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)
IR_t	+	33.98***	35.68***	8.319***	9.835***	9.819***	11.21***
		(3.56)	(3.02)	(3.91)	(4.42)	(3.71)	(4.96)
$POST_t$	+					4.898	1.656
						(1.50)	(0.42)
IR_t*$POST_t$	+					-1.642	-1.835
						(-0.46)	(-0.59)
GRI_t	+	18.97***	13.04***	22.32***	16.36***	24.08***	19.79***
		(5.48)	(3.26)	(6.13)	(4.15)	(8.36)	(7.39)
$LnSIZE_t$	+	-2.816	-1.767	-0.867	0.636	-0.224	1.302
		(-1.65)	(-0.67)	(-0.59)	(0.28)	(-0.19)	(0.76)
$LnMTB_t$	+	-1.165	6.522*	-1.540	6.021	-1.824**	3.914
		(-1.08)	(1.71)	(-1.41)	(1.59)	(-2.28)	(1.23)
ROA_t	+	2.639	-79.92**	-11.41	-103.8***	43.76**	7.938
		(0.10)	(-2.01)	(-0.48)	(-2.98)	(2.08)	(0.29)
LEV_t	-	-2.286	-7.263	1.251	-3.442	-1.732	-10.63
		(-0.35)	(-0.70)	(0.19)	(-0.34)	(-0.28)	(-1.27)
$SLACK_t$	+	-17.71	-22.64	-17.78	-24.74	-40.74***	-45.71***
		(-1.27)	(-1.25)	(-1.11)	(-1.23)	(-3.35)	(-3.35)
$BETA_t$	-	-5.369**	0.0356	-4.002*	1.163	-1.056	5.589**
		(-2.30)	(0.01)	(-1.71)	(0.25)	(-0.58)	(2.08)
$FOLLOW_t$	+	0.612***	0.328	0.583***	0.338	0.503***	0.241
		(3.80)	(1.37)	(3.58)	(1.49)	(3.20)	(1.16)
$LISTING_t$	+	0.420	-0.260	0.575	-0.215	0.662	0.157
		(0.71)	(-0.32)	(0.94)	(-0.25)	(1.40)	(0.23)
$BOARDIND_t$	+	-0.120*	-0.100	-0.136**	-0.0942	-0.0758	0.0257
		(-1.95)	(-1.07)	(-2.14)	(-1.03)	(-1.35)	(0.42)
$BOARDSIZE_t$	?	0.301	0.191	-0.233	-0.334	-0.490*	-0.403
		(0.72)	(0.36)	(-0.67)	(-0.73)	(-1.68)	(-1.14)
$CULTURE\_MUL_t$	+	1.357		1.334		1.584	
		(0.91)		(0.90)		(1.33)	
$NATION\_VF_t$	-	-0.396		-0.246		-0.510	
		(-0.40)		(-0.24)		(-0.60)	
lambda		-16.97***	-16.85**				
		(-2.90)	(-2.35)				
Country dummies		N	Y	N	Y	N	Y
Industry dummies		N	Y	N	Y	N	Y
Year dummies		N	Y	N	Y	N	Y
N		178	178	178	178	296	296
R^2		0.532	0.707	0.495	0.684	0.527	0.709
Adj. R^2		0.488	0.524	0.452	0.492	0.500	0.624

Panel B: Change specification

		ΔESP_{t+1}			
		TEM		MLR	
	Pred. Sign	(1)	(2)	(3)	(4)
IR_t	+	4.695	6.553**	0.158	0.814
		(1.59)	(2.17)	(0.16)	(0.83)
GRI_t	+	-2.216	-3.180**	-1.469	-1.969
		(-1.60)	(-2.08)	(-1.06)	(-1.29)
$\Delta SIZE_t$	+	0.0000719	-0.00000576	0.0000512	-0.0000517
		(0.95)	(-0.04)	(0.66)	(-0.38)
ΔMTB_t	+	-0.000871	-0.0000306	-0.000955	-0.0000809
		(-1.11)	(-0.01)	(-1.17)	(-0.04)
ΔROA_t	+	6.820	28.54**	5.774	27.40**
		(0.49)	(2.30)	(0.42)	(2.23)
ΔLEV_t	-	-1.040	9.578	-0.194	10.32
		(-0.10)	(0.81)	(-0.02)	(0.85)
$\Delta SLACK_t$	+	2.540	-2.386	4.166	-0.912
		(0.20)	(-0.13)	(0.32)	(-0.05)
$\Delta BETA_t$	-	1.839	1.175	1.823	1.299
		(0.71)	(0.36)	(0.68)	(0.39)
$\Delta FOLLOW_t$	+	-0.0303	0.219	-0.0229	0.194
		(-0.15)	(0.77)	(-0.11)	(0.68)
$LISTING_t$	+	-0.287*	-0.826***	-0.219	-0.650**
		(-1.69)	(-2.69)	(-1.34)	(-2.21)
$\Delta BOARDIND_t$	+	0.0391	0.0474	0.0375	0.0576
		(0.72)	(0.78)	(0.69)	(0.95)
$\Delta BOARDSIZE_t$	?	-0.400	-0.614*	-0.381	-0.584
		(-1.17)	(-1.67)	(-1.09)	(-1.50)
$CULTURE\_MUL_t$	+	0.0677		0.0516	
		(0.17)		(0.13)	
$NATION\_VF_t$	-	0.119		0.169	
		(0.28)		(0.39)	
lambda		-3.089*	-3.824*		
		(-1.71)	(-1.97)		
Country dummies		N	Y	N	Y
Industry dummies		N	Y	N	Y
Year dummies		N	Y	N	Y
N		178	178	178	178
R^2		0.068	0.480	0.051	0.463
Adj. R^2		-0.018	0.155	-0.031	0.136

Table 5.12 reports regression results for the environmental and social performance analysis (Equation 5.5). Panel A and Panel B present results for level specification and change specification, respectively. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. All continuous firm-level variables are winsorised at the 1st and 99th percentiles. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5. Selection model estimates for TEM is in Appendix B.

CHAPTER SIX
CONCLUSION

6.1 Summary

IR is a novel reporting practice that has been promoted as a future reporting trend. In recent years, the IIRC Framework has gained international attention and momentum as the first official guideline for the preparation of integrated reports. Despite international promotion of the IIRC Framework and its intention to address inadequacies with current reporting practices, there is scant evidence on why firms voluntarily adopt IR and whether its proposed benefits can be substantiated. Accordingly, this thesis provides empirical evidence on the rationale behind voluntary adoption of the IIRC Framework and initiation of integrated reports, and the subsequent capital market and sustainability outcomes of this action.

The analyses are based on an international sample of IR firms and matched non-IR firms. IR firms are defined as those that specified adoption of the IIRC Framework or participated in the IIRC pilot program. Arguably, the initial group of IR firms captures substantially all, if not all, firms that voluntarily adopted the IIRC Framework at the specified point of time. The study focuses on the first time a firm issues an integrated report. The research design is careful in addressing endogeneity concerns. In addition to forming a matched sample to artificially replicate a natural experiment, lead-lag models are employed to mitigate the possibility of time-lags and reverse causality. The logistic regression model employed for the determinants analysis is derived from extensive review of the IR and voluntary disclosure literatures and assessments of many possible determinants. The models employed for the investigated consequences are based on established models employed by prior studies. For each investigated consequence, the main analysis is based on both level and change specifications, and estimated using treatment effect models and a difference-in-differences design.

Results from the determinants analysis showed that the rationales of voluntary IR differ on a country level. For most countries, the determinants of voluntary IR can be attributable to having experience in, and leaders that support, sustainability management and reporting practices. Consistent with the resource dependence perspective, firms that have a CSR committee, experience with GRI reporting and stronger sustainability performance are more likely to adopt the IIRC Framework and initiate integrated reports. The positive association between environmental and social performance and voluntary IIRC Framework adoption is also consistent with signalling theory. This theory suggests that firms use integrated reports to convey commitment to IR values and superior sustainability performance relative to competitors, which potentially leads to reputational and economic benefits. These

results provide evidence that IR builds on existing sustainability reporting and management practices; thereby, IR is part of a gradual change in sustainability practices rather than a point-in-time change.

In addition, the results show that media coverage and sentiment influence IR initiation, suggesting integrated reports could be a response to visibility and legitimacy pressures caused by the media. Moreover, in comparison with later IR adopters, early IR adopters tend to have stronger social performance and follows best practices for corporate governance. Hence, participants of the IIRC pilot programme may have been invited by the IIRC to trial IR concepts due to their strong sustainability performance and management practices. These findings suggest social and political visibility, legitimacy pressures and firm reputation are factors that influence voluntary IIRC Framework adoption. Furthermore, it is possible that early IR adopters have chosen to trial IR in attempt to improve management and reporting practices, differentiate from peers, or to partake in the development of the Framework. Firms that voluntarily adopted IR prior to the release of the Framework could be more actively involved with the IIRC and the Framework's development. Thereby, early IR adopters could have greater understanding and better implementation of the IR concept, and the Framework could be more suitable for firms at a similar stage for sustainability management as early IR firms.

For Japanese firms, the analysis detected no differences between IR firms and matched non-IR firms. This result is not unexpected given the history and culture of CSR management and reporting in Japan, and the high number of self-declared integrated reporters. An applicable theoretical explanation for these observations and results is institutional theory. The theory suggest that the reporting practices of Japanese firms reflect the concept of IR given their institutional environment, hence, there is no real differences between the reporting practices of firms that adopt the IIRC Framework and those that do not. This finding suggests that firms are implementing, or trending towards, IR concepts regardless of the IIRC Framework. Furthermore, disclosures prepared according to the Framework may not provide more information or be of higher quality compared to disclosures not based on the Framework.

Results from the consequences analysis reflect the findings of prior studies on voluntary IR and the findings of the determinants analysis. Overall, the results provide no consistent evidence that voluntary adoption of the IIRC Framework and initiation of integrated reports influences analyst forecast error, analyst forecast dispersion, cost of equity, firm value or environmental and social performance. Analyses on external capital market consequences generally show no relation between IR and the tested measures in both level and change specifications. Analysis of internal changes show that IR is statistically and

positively associated with the level of environmental and social performance, but its adoption does not influence the change in sustainability performance. These conclusions are justified by a number of sensitivity and robustness tests.

Overall, the results of this study improves our understanding of the nature and determinants of IR, and provides explanations on why voluntary IIRC Framework adoption does not result in substantial changes in capital market behaviour and sustainability management practices. The study shows that IR builds on a foundation of sustainability management and reporting, and firms with established sustainability practices tend to be the ones that voluntarily adopt the Framework. Voluntary IIRC Framework adoption is therefore a part of the sustainability management and reporting process rather than a point-in-time change. This finding explains why there are no substantial changes in capital market consequences and management practices upon voluntary IIRC Framework adoption. There may be no clear differences between the information content, connectivity of information, and communication of financial value creation in integrated reports when compared to other forms of integrated disclosures. As the information environment does not improve following voluntary IIRC Framework adoption, integrated reports do not reduce the uncertainties investors face when assessing a firm's performance and future prospects. Another possible explanation for capital markets not reacting to voluntary IIRC Framework adoption is that market participants are ignorant of integrated reports or do not consider IR concepts, or integrated reports, important to their current investment decision-making processes.

6.2 Contributions and Implications

This study contributes to the IR literature in a number of ways and provides important considerations for policy makers and practitioners. The study is the first to investigate the determinants and consequences associated with voluntary adoption of the IIRC Framework. The specific focus on the IIRC Framework is of interest to policy makers and managers who are interested in the effects of adopting the Framework. While the IIRC Framework has been promoted internationally, prior to this study, there is a lack of understanding regarding the reasons firms voluntarily adopt the Framework and whether the claimed tangible and intangible benefits in fact accrue to firms adopting IR.

The study makes six main contributions. First, the study enhances our understanding of the nature of IR. It suggests that IR is not a point-in-time change or a stand-alone process, but is a process that builds on established sustainability management and reporting practices. This study is the first to provide archival evidence that establishment of a CSR committee is an important determinant of voluntary IR. This result is consistent with a case study by

Guthrie et al. (2017), which found members of sustainability committees drive the adoption of the IIRC Framework. In addition, consistent with Arguelles et al. (2016), Lai et al. (2016) and Mervelskemper and Streit (2017), the results show that firms with higher sustainability performance tend to adopt IR. This finding suggests that integrated reports are used by firms with stronger sustainability performance to signal commitment to IR values and superior performance over competitors (Clarkson et al., 2008; Lai et al., 2016), rather than to deflect or rationalise poor environmental and social performance (de Villiers & van Staden, 2011; Stacchezzini et al., 2016). Altogether, the results support the view that IR is an extension of sustainability reporting (Lodhia, 2015; Stubbs & Higgins, 2014), which explains why any changes in management and reporting practices are gradual rather than radical (Higgins et al., 2014).

Moreover, this finding provides another perspective on the use of integrated reports for short-term impression management purposes. Melloni (2015), Melloni et al. (2016) and Zappettini and Unerman (2016) suggest integrated reports resembled managerial opportunism and could be used by managers as a tool to legitimise business activities. These studies found a positive tone in integrated reports when firms face declining financial performance and the use of sustainability discourses to support commercial objectives. The results of this study shows that firms that are able to communicate positive non-financial practices or performance release integrated reports, which corresponds with signalling their values and good performance rather than using integrated reports to deflect poor performance. Thereby, it may not be deliberate that the contents of integrated reports, especially in aspects related to sustainability performance, are positive when firms face declining or unstable financial performance.

Second, while integrated reports may not be a short-term ad hoc solution to rationalising poor performance, firms could voluntarily adopt the Framework due to visibility, reputational or legitimacy reasons. The results provide evidence that IR initiation could be a response to greater media visibility, suggesting more socially and politically visible firms tend to adopt the Framework voluntarily. Further, early IR adopters may have a reputation to uphold as a socially responsible firm, as suggested by their relatively strong social and corporate governance performance over later IR adopters. Such firms would thereby be inclined to accept the IIRC's invitation to pilot test IR, or choose to participate in the initiative, and become publically acknowledged as a firm that supports IR. In addition, the results show that firms may adopt IR as a long-term strategy to address negative news or publicity.

It is important to document whether firms initiate integrated reports due to external pressures or internal strategic reasons. If firms initiate integrated reports solely as a tool to

mitigate external pressures, firms may not have engaged in integrated thinking or made an effort to align operations with long-term value creation. Firms may have disregarded a main purpose of IR, which is to encourage internal changes, and the resulting report may support business-as-usual practices and fail to provide incremental information (Adams et al., 2016; Perego et al., 2016). Altogether, the determinants results show that both external and internal factors influence the decision to adopt IR voluntarily. While there is a reputational motive behind its adoption, firms are adopting IR because of its connections with sustainability and its potential to integrate sustainability into business models (Guthrie et al., 2017). Hence, managers that voluntarily adopt IR likely did so as a meaningful act that relates to a firm's sustainability strategy.

Third, the results contribute to the ongoing debate on whether the IIRC Framework can support sustainable development. Flower (2015) argues that the IIRC Framework has abandoned the idea of sustainability and reinforces business-as-usual practices, whereas Adams (2015) argues that the potential remains for IR to shift the thinking of managers and better align notions of profit maximisation with the wellbeing of society and the environment. The results of this study provides evidence that firms with established sustainability practices are more likely to adopt the Framework voluntarily and this action does not result in any greater improvements in sustainability performance relative to matched non-IR firms. Hence, while voluntary IIRC Framework adoption is unlikely to stimulate significant changes towards sustainability practices, the evidence is in support of the idea that IR is the next step in social and environmental reporting.

The emphasis of IR on long-term thinking and encouragement of a broader view of value makes a case for its implementation. However, IR as a voluntary practice and the current focus on external reporting, as guided by the Framework, has limited impact on business environments and managerial mindsets. Firms weaker in sustainability performance generally do not voluntarily adopt the Framework even though the operations and strategies of these firms are expected to change the most from implementing IR. Thereby, there needs to be greater and active support for firms weaker in sustainability management for them to adopt IR practices. Further, there needs to be more focus on how to implement integrated thinking rather than how to prepare an integrated report. For preparation of connected disclosures, there needs to be further accounting developments that can measure and account for different capitals and changes in capitals (Adams, 2015). The priority should be in developing information technology and updating reporting infrastructures (EY, 2014), as without these accounting systems, voluntary IIRC Framework adoption does not appear to be influencing management and reporting practices.

Fourth, the results show that in environments that encourage a culture of CSR and non-financial disclosure, even without the IIRC Framework, IR concepts are widely implemented by firms. This is most noticeable when examining firms in Japan, where there are no substantial differences between IR firms and matched non-IR firms. In this instance, the disclosure practices of self-declared integrated reporters are similar to that of IR firms, meaning reports are similar regardless of the adoption of the Framework. This finding is reflective of Adams et al. (2016), which found that firms not signalling involvement in IR are producing more concise and connected disclosures, and are showing relations between financial performance and value. This finding implies that in environments where non-financial disclosures or IR concepts are common, there may be little or no difference between integrated reports and a firm's prior year disclosures or the disclosures of peers.

Fifth, the results contribute to our understanding of the consequences of voluntary IR. The study has not detected any associations between voluntary IIRC Framework adoption and changes in capital market consequences. There are no statistically significant differences in the changes in analyst forecast error, analyst forecast dispersion, cost of equity and firm value between firms that adopt the IIRC Framework and matched firms that do not. These results are consistent with concerns regarding the current underdevelopment of accounting techniques in supporting IR (Adams, 2015), criticisms of available integrated reports (IIRC, 2013c; Kılıç & Kuzey, 2018; Pistoni et al., 2018), and irrelevance of integrated reports to investment decision-making processes (Abhayawansa et al., 2018; Hsiao & Kelly, 2018). Such results are also consistent with the findings that disclosure practices of IR firms are not substantially different from prior year practices and that disclosure practices of IR firms may be similar to firms that do not signal engagement in IR (Adams et al., 2016; Haji & Anifowose, 2016). It is arguable that integrated reports do not contain incremental and material information that reduces information asymmetry, and capital providers do not consider integrated reports an important information source. These arguments explain why voluntary adoption of the IIRC Framework and initiation of an integrated report do not affect the information environment, cost of equity or firm value.

Sixth, the results provide further explanations for the findings of mandatory IR studies and suggest that disclosures prepared in accordance with the IIRC Framework, or disclosures more aligned with the Framework, do not necessarily equate to higher quality disclosures. In contrast with the results found for voluntary IR, studies on the mandatory setting of South Africa found IR to benefit capital markets and firms. Bernardi and Stark (2018), Zhou et al. (2017), Lee and Yeo (2016) and Arguelles et al. (2016) found reports aligned with the Framework reduces analyst forecast error and forecast dispersion, lowers cost of equity, and

increases firm value. These studies argue that reports more aligned with the Framework are higher quality disclosures and suggests that reports more aligned with the Framework mitigates information asymmetry by providing incremental information to capital markets over existing reporting mechanisms. Similarly, Barth et al. (2017) found higher quality integrated reports are associated with firm value through increased stock liquidity and expected future cash flows. Instead of finding that integrated reports improve the information environment, Barth et al. (2017) found positive associations between higher quality integrated reports and operating cash flows and investment efficiency. Thereby, concluding that the increase in firm value is attributed to more efficient internal decision-making and capital allocation decisions following from integrated thinking and reporting.

The focus of this thesis differs from prior IR studies. This study assesses voluntary adoption of the Framework and does not assess reporting quality, whereas mandatory IR studies attempted to measure IR quality and have variability in their IR measure. Mandatory IR studies suggest that there is an advantage to better quality IR in settings where all firms are required to adopt IR. This study suggests that the benefits of adopting the IIRC Framework is possibly dependent on the disclosure norms of the setting. In countries where integrated disclosure or IR concepts are common, there may be no advantages to adopting the Framework. IR was mandated in South Africa as a part of ongoing corporate reforms intended to appeal to international investors and improve poor CSR practices (Haji & Anifowose, 2016). Studies have documented substantial changes in the reporting practices of South African firms following introduction of IR requirements. South African firms have increased the extent and details of information disclosed over time on stakeholder relationships, risk management practices and non-financial information (Haji & Anifowose, 2016; Solomon & Maroun, 2012). While the amount of information disclosed increased, IR in South Africa is more ceremonial than substantive and the practice has not brought about major changes in how firms connect information (Haji & Anifowose, 2016). These content analysis studies on South African integrated reports suggest that mandating IR has resulted in an increase in transparency and non-financial disclosures over time. These improvements are reflective of better disclosures in general and not necessarily application of fundamental IR concepts, such as integrated thinking, holistic value creation and connectivity of information. Hence, it is possible that the advantages detected in South Africa are due to improved information disclosure by certain firms over time and not necessarily driven by application of the Framework or specific IR concepts. While it is apparent that mandating IR has led to substantial improvements in reporting practices in South Africa, it is improper to assume that adoption of the IIRC Framework or IR concepts substantially improves a firm's disclosure

practices relative to prior years or signals higher quality disclosure relative to similar non-IR firms.

Taken together, these findings suggest that requiring firms to adopt IR concepts or the Framework is more effective in jurisdictions or countries where integrated disclosure or application of IR concepts is less common. In countries where such practices are rare, guidance provided by the Framework could encourage more detailed disclosures that covers more diverse topics. Incremental and material information disclosures would subsequently improve the information environment. Whereas in environments where integrated disclosures or IR concepts have been established, such as Japan, there may be no differences in the disclosure practices of IR firms and non-IR firms. Firms could be trending towards providing the type of information promoted by IR regardless of whether they are adopting the IIRC Framework. Hence, adoption of the IIRC Framework does not necessarily symbolise or result in higher quality disclosures, and there may be no substantial differences between voluntary adoption of the Framework and application of general IR concepts.

6.3 Limitations of the Study

A number of limitations are worth noting. First, the sample size is relatively small, which reduces the statistical power of the study and increases margin of error. While a small sample reduces the ability to detect a statistical relation when one is present, the results and research design applied brings confidence that the variables identified as statistically significant are reliable and important predictors.

Second, generalisability of the results is limited to firms that are reflective of the sample specifications. While the initial group of identified IR firms closely reflects the population of IR firms at a point in time, a number of observations were removed due to missing data or failure to find a non-IR match. The end samples are biased towards larger firms and the findings may not be generalisable to smaller firms. Further, as firms are matched based on country and industry, there are instances where IR firm failed to match with a non-IR firm because all firms in that particular industry code are all classified as IR firms. Thereby, there could be other forms of missing data patterns and this could bias the results.

Third, while the study carefully addresses endogeneity concerns, there is a possibility that such concerns are not completely addressed. Underlying unobservable characteristics cannot be measured directly, which may introduce noise to the tests conducted. Given the research design, potential problems with omitted variables are not of major concern and estimates adjust for this potential issue. However, as noted in the conceptual model developed,

there are likely to be other key determinants to voluntary IR not captured in the determinants models tested.

6.4 Directions for Future Research

The study process and results identify many avenues for future research. While this study examines IR initiation, assessment of reporting quality and content could provide further insights into this reporting phenomenon and its associated consequences. As IR could be more about the quality of disclosures and application of principles rather than a simple adoption status, the results and speculations can be strengthened by testing the before and after differences in disclosure content following voluntary adoption of the IIRC Framework.

Relative to other countries, Japan appears to be an anomaly when considering what drives voluntary adoption of the IIRC Framework. Whilst institutional theory is a reasonable explanation for the results, it remains unclear why some firms signal adoption of the Framework while others does not. There is potential for research into IR in Japan as it is a trending concept amongst Japanese firms. Further, qualitative evidence on the motivations of managers in IR firms and non-IR firms could supplement and provide greater insights into the determinants of voluntary IR. In addition, the results indicate different rationales behind early IR adopters and later IR adopters. These differences may be attributable to unobserved characteristics, such as associations with the IIRC or other networks. Thereby, future studies that employ a qualitative methodology can further advance our understanding of the rationales behind voluntary IR.

From the sample collection process, it is notable that there is potential for IR research focused on the public sector and not-for-profits sector. Approximately 40 percent of potential IR firms are not-for-profits, governmental departments or small and medium enterprises. Relatively little is known about the implementation process, determinants and consequences of IR in these organisational forms when compared to listed firms. As these organisational types typically focus on accountability and resource provision rather than financial returns, it will be interesting to understand their perspectives on the Framework, and their views and experiences with IR.

IR is an ambiguous management practice and there needs to be accounting developments to support its proposed concepts. There needs to be advancements in the measurement and accounting of non-financial information and developments in how to measure it against financial information. Further, it is of interest to understand how firms are implementing the IR process and whether it leads to changes in internal systems and management practices in the short, medium and long-term.

APPENDICIES

Appendix A – Variable Definitions and Data Source

Code	Label	Definition	Source	Hypothesis[26]
$ABEARN_{i,t}$	Abnormal earnings	Firm *i*'s net income before extraordinary expenses at year-end *t*, less its cost of equity at year-end *t* multiplied by book value of equity at *t*-1	Worldscope, Bloomberg	4
$AUDITOR_{i,t}$	Auditor	Indicator variable coded 1 if firm *i* is audited by an accounting firm involved with the IIRC at year *t*, and 0 otherwise	OSIRIS	1
$BETA_{i,t}$	Beta	Comparison of the monthly price movements of firm *i*'s share price over a five year period with the total market index for the respective country	Datastream	1 / 3 / 6
$BIG4_{i,t}$	Big Four auditor	Indicator variable coded 1 if firm *i* is audited by a Big Four auditor at year *t*, and 0 otherwise.	OSIRIS	2 / 3 / 6
$BOARDCOM\_AUD_{i,t}$	Board committee (audit)	Indicator variable coded 1 if firm *i* has an audit committee in year *t*, and 0 otherwise	ASSET4	1
$BOARDCOM\_CG_{i,t}$	Board committee (corporate governance)	Indicator variable coded 1 if firm *i* has a corporate governance committee in year *t*, and 0 otherwise	ASSET4	1
$BOARDCOM\_CSR_{i,t}$	Board committee (CSR)	Indicator variable coded 1 if firm *i* has a CSR committee in year *t*, and 0 otherwise	ASSET4	1
$BOARDIND_{i,t}$	Board independence	Percentage of independent and non-executive directors to total number of directors on the board of firm *i* in year *t*	ASSET4	1 / 5 / 6
$BOARDMEET_{i,t}$	Board meetings	Number of board meetings held by firm *i* during year *t*	ASSET4	1
$BOARDSIZE_{i,t}$	Board size	Number of directors on the board of directors of firm *i* at year-end *t*	ASSET4	1 / 5 / 6
$BOARDSKILL_{i,t}$	Board skills	Percentage of board members in firm *i* with either an industry specific background or a strong financial background for the year *t*	ASSET4	1
$BVPS_{i,t}$	Book value per share	Book value per share of common shareholders' equity for firm *i* at year-end *t*	Worldscope	4

[26] Hypothesis: Determinants (1), Information environment (2), Cost of capital (3), Firm value – Market value (4), Firm value – Tobin's Q (5), and Environmental and social performance (6).

Code	Label	Definition	Source	Hypothesis
$COE_{i,t}$	Cost of equity	Derived by the Capital Asset Pricing Model	Bloomberg	1 / 3
$COMPLEX_{i,t}$	Firm complexity	Number of business segments firm *i* has at year-end *t*	OSIRIS	1 / 5
$CONCENTRATE_{i,t}$	Industry concentration	Based on the Herfindahl–Hirschman index, calculated as the sum of squares of market shares for firm *i* in industry *j*, based on two-digit SIC	Compustat	1
$COUNTRY_{i,t}$	Country	Country of headquarters for firm *i* at year *t*	Compustat	1 / 2 / 3 / 4 / 5 / 6
$CULTURE\_IDV_{i,t}$	National culture (IDV)	Individualism versus Collectivism (one of Hofstede's six cultural dimensions)	geerthofstede.com (Official website)	1 / 2
$CULTURE\_IND_{i,t}$	National culture (IND)	Indulgence versus Restraint (one of Hofstede's six cultural dimensions)	geerthofstede.com (Official website)	1 / 2
$CULTURE\_LTO_{i,t}$	National culture (LTO)	Long Term Orientation versus Short Term Normative Orientation (one of Hofstede's six cultural dimensions)	geerthofstede.com (Official website)	1 / 2 / 6
$CULTURE\_MAS_{i,t}$	National culture (MAS)	Masculinity versus Femininity (one of Hofstede's six cultural dimensions)	geerthofstede.com (Official website)	1 / 2 / 6
$CULTURE\_MUL_{i,t}$	National culture (MUL)	Second principle component from the principle component analysis of national culture. It is viewed as a composite measure of the MAS, UAI, and LTO	geerthofstede.com (Official website)	1 / 2 / 6
$CULTURE\_PDI_{i,t}$	National culture (PDI)	Power Distance Index (one of Hofstede's six cultural dimensions)	geerthofstede.com (Official website)	1 / 2
$CULTURE\_PII_{i,t}$	National culture (PII)	First principle component from the principle component analysis of national culture. It is viewed as a composite measure of the PDI, IDV, and IND	geerthofstede.com (Official website)	1 / 2
$CULTURE\_UAI_{i,t}$	National culture (UAI)	Uncertainty Avoidance Index (one of Hofstede's six cultural dimensions)	geerthofstede.com (Official website)	1 / 2 / 6
$DISPERSION_{i,t}$	Analyst forecast dispersion	Standard deviation of firm *i*'s one-year ahead analyst EPS forecast, scaled by its absolute value of the median consensus EPS forecast for the forecast year *t*	I/B/E/S	1 / 2 / 3

Code	Label	Definition	Source	Hypothesis
$EARNQLTY_{i,t}$	Earnings quality	Absolute value of discretional accruals from the modified Jones model. The modified Jones model is a cross-sectional estimation by country, industry and year, based on two-digit SIC	Compustat	1 / 2
$EARNSURP_{i,t}$	Earnings surprise	Absolute value of the difference between firm *i*'s EPS at year *t* and EPS at year *t*-1, scaled by year-end *t* share price	Datastream	1 / 2
$ECONDEV_{i,t}$	Economic development	Ordinal variable with four levels that reflects income groups categorised based on GNI per capita	World Bank	1
$ENV_{i,t}$	Environmental score	Environmental score	ASSET4	1 / 6
$EPS_{i,t}$	Earnings per share	Annualised rate of EPS for firm *i* at year-end *t*	Datastream	2
$ESP_{i,t}$	Environmental and social performance	Mean environmental score and social score	ASSET4	1 / 6
$FERROR_{i,t}$	Analyst forecast error	Mean absolute forecast errors made in year *t* for firm *i*, scaled by firm *i*'s year-end price	I/B/E/S Datastream	1 / 2
$FINANCE_{i,t}$	Finance industry	Indicator variable coded 1 if firm *i* operates in the finance industry, and 0 otherwise	Compustat (main), OSIRIS (missing data)	1 / 2 / 3 / 4 / 5 / 6
$FOLLOW_{i,t}$	Analyst following	Number of analyst following firm *i* throughout year *t*	I/B/E/S	1 / 2 / 3 / 6
$FREEPRESS_{i,t}$	National institution (freedom of press)	The degree of freedom journalists and the media have	Reporters Without Borders	1 / 2 / 6
$GENDIV_{i,t}$	Gender diversity	Percentage of female directors to total number of directors on the board of firm *i* at year-end *t*	ASSET4	1
$GOVEFF_{i,t}$	National institution (government effectiveness)	Perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies	World Bank	1 / 2
$GOV_{i,t}$	Governance score	Corporate governance score	ASSET4	1
$GRI_{i,t}$	GRI adoption	Indicator variable coded 1 if firm *i* applied GRI standards prior to year *t*, and 0 otherwise	GRI website/dataset	1 / 2 / 3 / 6
$HORIZON_{i,t}$	Forecast horizon	Median number of days between earnings announcement and forecast date for firm *i* in year *t*	I/B/E/S	2
$IFRS_{i,t}$	IFRS adoption	Indicator variable coded 1 if firm *i* applies IFRS in year *t*, and 0 otherwise	OSIRIS	1 / 2 / 6

Code	Label	Definition	Source	Hypothesis
$INDUSTRY_{i,t}$	Industry	Industry membership for firm *i* at year *t* based on 2-digit SIC	Compustat (main), OSIRIS (missing data)	1 / 2 / 3 / 4 / 5 / 6
$INTASSET_{i,t}$	Intangible assets	Intangible assets scaled by total assets for firm *i* at year-end *t*	Worldscope	1 / 5
$IR_{i,t}$	Integrated report	Indicator variable coded 1 if firm *i* issues an integrated report for the first time in year *t*, and 0 otherwise	Corporate websites, Mergent Online	1 / 2 / 3 / 4 / 5 / 6
$IVS_{i,t}$	Integration vision and strategy	Integration vision and strategy score	ASSET4	1 / 6
$JPN_{i,t}$	Japan firm	Indicator variable coded 1 if a firm is based in Japan, and 0 otherwise	Compustat	N/A
$LEGAL_{i,t}$	Legal system	Indicator variable coded as 1 if firm *i* operates in a common law country, and 0 for civil law country	Central Intelligence Agency	1 / 2
$LEV_{i,t}$	Leverage	Total debt scaled by total assets for firm *i* at year-end *t*	Worldscope	1 / 3 / 5 / 6
$LISTING_{i,t}$	Market listing	Number of stock exchanges firm *i* is listed on at year-end *t*	OSIRIS	1 / 2 / 6
$LITIGATION_{i,t}$	Litigation risk	Indicator variable coded 1 if firm *i* operates in a high-litigation industry, and 0 otherwise	Compustat (main), OSIRIS (missing data)	1
$LOSS_{i,t}$	Loss reported	Indicator variable coded 1 if firm *i* reports negative earnings for year *t*, and 0 otherwise	Worldscope	1 / 2
$LTG_{i,t}$	Long-term growth	Consensus (median) long-term growth forecast for firm *i* at year-end *t*	I/B/E/S	3
$LnEARNVOLI_{i,t}$	Earnings volatility	Natural logarithm of the standard deviation of annual EPS for firm *i* over the previous ten years ending at year *t*	Datastream	2
$LnMEDIA\_ALL_{i,t}$	Media (general coverage)	Natural logarithm of the total number of articles released in year *t* with firm *i* mentioned in the headlines	Factiva	1
$LnMEDIA\_CSR_{i,t}$	Media (CSR related)	Natural logarithm of the number of CSR-related articles released in year *t* with firm *i* indexed	Factiva	1
$LnMVCDA_{i,t}$	Cum-dividend market value	Natural logarithm of the cum-dividend adjusted market value, scaled by opening book value, for firm *i* at year-end *t*	Datastream, Worldscope	4
$LnPRICE_{i,t}$	Share price	Natural logarithm of the closing share price for firm *i* at year-end *t*	Datastream	4
$LnSIZE_{i,t}$	Firm size	Natural logarithm of market capitalisation for firm *i* at year-end *t*	Datastream	1 / 2 / 3 / 5 / 6
$LnSUBSIDIARY\_FOR_{i,t}$	Subsidiaries (foreign)	Natural logarithm of the number of recorded foreign subsidiaries of firm *i*	OSIRIS	1

Code	Label	Definition	Source	Hypothesis
$LnSUBSIDIARY_{i,t}$	Subsidiaries (all)	Natural logarithm of the number of recorded subsidiaries of firm *i*	OSIRIS	1
$MNU_{i,t}$	Manufacturing firm	Indicator variable coded 1 if firm *i* operates in the manufacturing industry, and 0 otherwise	Compustat	1 / 2 / 3 / 4 / 5 / 6
$MEDIA\_JFALL_{i,t}$	Media (sentiment all)	Media sentiment for firm *i* during year *t*, based on the Janis-Fadner coefficient	Factiva	1
$MEDIA\_JFCSR_{i,t}$	Media (sentiment CSR related)	Media sentiment of CSR-related news for firm *i* during year *t*, based on the Janis-Fadner coefficient	Factiva	1
$MTB_{i,t}$	Market-to-book	Market capitalisation over book value of shareholders' equity for firm *i* at year-end *t*	Worldscope, Datastream	1 / 3 / 6
$NATION\_EPI_{i,t}$	National institution (environmental performance index)	Environmental performance index	Yale Center for Environmental Law and Policy	1 / 2
$NATION\_INV_{i,t}$	National institution (minority investor protection)	Strength of minority investor protection in a country. It measures the transparency of transactions, liability for directors, and ability of shareholders to sue managers for misconduct	World Bank	1 / 2
$NATION\_RRG_{i,t}$	National institution (RRG)	First principle component from the principle component analysis of national institution. It is viewed as a composite measure of rule of law, regulatory quality, and government effectiveness	World Bank, Reporters Without Borders	1 / 2
$NATION\_VF_{i,t}$	National institution (VF)	Second principle component from the principle component analysis of national institution. It is viewed as a composite measure of voice and accountability, and freedom of press	World Bank, Reporters Without Borders	1 / 2 / 6
$OWNERSHIP\_INS_{i,t}$	Ownership (insider)	Percentage of outstanding shares held by insiders for firm *i* at year-end *t*	Bloomberg	1
$OWNERSHIP_{i,t}$	Ownership (institutional)	Percentage of outstanding shares held by institutional holders for firm *i* at year-end *t*	Bloomberg	1
$PRE_{i,t}$	Pre-release firm	Indicator variable coded 1 if the firm observation relates to 2014 and before, and 0 otherwise	Corporate websites, Mergent Online	1 / 2 / 3 / 4 / 5 / 6
$POST_{i,t}$	Post-treatment period	Indicator variable coded 1 if the firm observation relates to post-treatment periods (*t*+1 and after), and 0 for pre-treatment periods (*t*-1 and before).	Corporate websites, Mergent Online (missing data)	2 / 3 / 4 / 5 / 6
$PRICEVOLI_{i,t}$	Price volatility	Annualised volatility of firm *i*'s weekly share price over a historical three year period, ending at year-end *t*	Datastream	1

Code	Label	Definition	Source	Hypothesis
$REGQUAL_{i,t}$	National institution (regulatory quality)	Perceptions of the governments' ability to formulate and implement sound policies and regulations that permit and promote private sector development	World Bank	1 / 2
$RESEARCH_{i,t}$	Research and development	Research and development expenditure scaled by total assets for firm *i* at year-end *t.*	Worldscope	5
$RETVOLI_{i,t}$	Return volatility	Annualised standard deviation of daily share returns for firm *i* over year *t*	Datastream	1
$ROA_{i,t}$	Return on assets	Net income before extraordinary items scaled by the average total assets for firm *i* at year-end *t*	Worldscope	1 / 5 / 6
$RULELAW_{i,t}$	National institution (rule of law)	Extent to which agents have confidence in, and abide by, the rules of society	World Bank	1 / 2
$SENSITIVE_{i,t}$	Environmentally sensitive	Indicator variable coded 1 if firm *i* operates in an environmentally sensitive industry, and 0 otherwise	Compustat (main), OSIRIS (missing data)	1
$SGA_{i,t}$	Selling, general and administrative	Selling, general and administrative expenditure scaled by total assets for firm *i* at year-end *t.*	Worldscope	5
$SLACK_{i,t}$	Financial slack	Cash and cash equivalents scaled by total assets for firm *i* at year-end *t*.	Worldscope	6
$SOC_{i,t}$	Social score	Social score	ASSET4	1 / 6
$SPP_{i,t}$	Share price performance	Abnormal share price performance of firm *i* compared to the performance of its respective market at year-end *t*	Datastream	1
$TOBIN_{i,t}$	Tobin's Q	Sum of firm *i*"s market capital, preferred shares and total debt, scaled by total assets in year-end *t*	Worldscope, Datastream	5
$UTILITY_{i,t}$	Utility industry	Indicator variable coded 1 if firm *i* operates in the utility industry, and 0 otherwise	Compustat (main), OSIRIS (missing data)	1 / 2 / 3 / 4 / 5 / 6
$VOICE_{i,t}$	National institution (voice and accountability)	Extent to which a country's citizens are able to participate in selecting their government and the extent of freedom of expression, freedom of association, and a free media	World Bank	1 / 2 / 6
$WACC_{i,t}$	Cost of capital (WACC)	Weighted average cost of capital	Bloomberg	1
$YEAR_{i,t}$	Year	The calendar year firm *i* released its first integrated report	Corporate websites, Mergent Online (missing data)	1 / 2 / 3 / 4 / 5 / 6

Appendix B – Treatment effect models

Table B1: First stage estimates

	Information environment										
	All (inc. Δ)	$FERROR(0)_{t+1}$		$FERROR(1)_{t+1}$		$FERROR(2)_{t+1}$		$DISPERSION_{t+1}$		$\Delta FERROR(0)_{t+1}$	
Dependent variable = IR_t	TS	MLE		MLE		MLE		MLE		MLE	
$BOARDCOM\_CSR_{t-1}$	0.941***	1.034***	0.976***	1.055***	1.094***	1.052***	1.060***	0.804**	0.624**	0.951***	0.937***
	(3.09)	(3.13)	(3.08)	(3.20)	(3.62)	(3.12)	(3.52)	(2.33)	(2.03)	(3.27)	(3.17)
$BOARDSIZE_{t-1}$	-0.0656**	-0.0693***	-0.0678***	-0.0452*	-0.0684***	-0.0443*	-0.0675***	-0.0694***	-0.0697***	-0.0708***	-0.0698**
	(-2.39)	(-2.77)	(-2.67)	(-1.66)	(-2.88)	(-1.69)	(-2.80)	(-2.73)	(-3.05)	(-2.77)	(-2.57)
$GENDIV_{t-1}$	0.0262**	0.0268**	0.0253**	0.0183	0.0206*	0.0192	0.0213*	0.0241*	0.0195	0.0231*	0.0241*
	(2.11)	(2.27)	(2.06)	(1.47)	(1.80)	(1.61)	(1.84)	(1.87)	(1.57)	(1.75)	(1.78)
LEV_{t-1}	0.267	-0.0999	0.0529	-0.460	-0.0996	-0.582	-0.233	-0.384	-0.688	0.206	0.262
	(0.42)	(-0.13)	(0.07)	(-0.75)	(-0.17)	(-0.94)	(-0.36)	(-0.53)	(-0.92)	(0.31)	(0.40)
$LnSUBSIDIARY_{t-1}$	0.117	0.121	0.117	0.126*	0.111	0.115*	0.106	0.105	0.0499	0.136	0.130
	(1.45)	(1.53)	(1.43)	(1.83)	(1.50)	(1.65)	(1.39)	(1.33)	(0.64)	(1.60)	(1.45)
$INTASSET_{t-1}$	-0.598	-0.796	-0.679	-0.492	-0.571	-0.637	-0.708	-0.896	-1.107**	-0.649	-0.583
	(-0.90)	(-1.20)	(-1.04)	(-1.01)	(-1.02)	(-1.29)	(-1.24)	(-1.46)	(-1.99)	(-1.02)	(-0.91)
$CONCENTRATE_{t-1}$	0.822	0.693	0.827	0.227	0.227	0.0911	0.203	0.500	0.150	0.713	0.777
	(0.62)	(0.56)	(0.64)	(0.22)	(0.20)	(0.09)	(0.18)	(0.46)	(0.14)	(0.55)	(0.59)
$SENSITIVE_{t-1}$	0.0894	0.147	0.0978	-0.0132	0.0631	0.0256	0.0750	0.0771	0.0502	0.0637	0.0861
	(0.43)	(0.68)	(0.47)	(-0.07)	(0.32)	(0.13)	(0.38)	(0.38)	(0.27)	(0.31)	(0.41)
$CULTURE\_MUL_{t-1}$	0.0550	0.0349	0.0412	-0.0493	0.00213	-0.0439	0.000374	0.0197	0.00282	0.0332	0.0436
	(0.57)	(0.38)	(0.42)	(-0.57)	(0.02)	(-0.53)	(0.00)	(0.24)	(0.03)	(0.34)	(0.44)
$NATION\_VF_{t-1}$	0.145*	0.149*	0.142	0.156*	0.143*	0.146*	0.136	0.133	0.0853	0.142	0.144*
	(1.79)	(1.68)	(1.63)	(1.87)	(1.74)	(1.73)	(1.61)	(1.51)	(0.96)	(1.63)	(1.65)
Ind. eqns. (p)		0.066	0.299	0.047	0.004	0.039	0.009	0.214	0.027	0.219	0.441
Fixed effect dummies	N/Y	N	Y	N	Y	N	Y	N	Y	N	Y
N	190	190	190	190	190	190	190	190	190	190	190

Table B1 (continue): First stage estimates

	Information environment						Cost of equity				
	$\Delta FERROR(1)_{t+1}$		$\Delta FERROR(2)_{t+1}$		$\Delta DISPERSION_{t+1}$		All (inc. Δ)	COE_{t+1}		ΔCOE_{t+1}	
Dependent variable = IR_t	MLE		MLE		MLE		TS	MLE		MLE	
$BOARDCOM\_CSR_{t-1}$	0.912***	0.853***	0.913***	0.815***	0.887***	0.924***	0.887***	0.727***	0.697*	-0.948	-1.324
	(2.70)	(2.71)	(2.64)	(2.61)	(2.84)	(3.05)	(2.84)	(2.87)	(1.71)	(-0.67)	(-0.84)
$BOARDSIZE_{t-1}$	-0.0663***	-0.0704***	-0.0660***	-0.0635**	-0.0655**	-0.0703**	-0.0655**	-0.0878***	-0.0874***	0.0409	0.106
	(-2.60)	(-3.19)	(-2.61)	(-2.49)	(-2.23)	(-2.39)	(-2.23)	(-2.80)	(-3.14)	(0.12)	(0.35)
$GENDIV_{t-1}$	0.0290**	0.0150	0.0285**	0.0123	0.0295**	0.0261**	0.0295**	0.0203**	0.0355***	-0.000101*	-0.0000280
	(2.01)	(0.84)	(1.97)	(0.67)	(2.21)	(2.17)	(2.21)	(2.23)	(2.82)	(-1.84)	(-0.78)
LEV_{t-1}	0.205	0.719	0.178	0.859	0.372	0.228	0.372	0.890	0.563	0.0000306	0.000445*
	(0.29)	(1.06)	(0.23)	(1.26)	(0.53)	(0.34)	(0.53)	(1.36)	(0.84)	(0.13)	(1.84)
$LnSUBSIDIARY_{t-1}$	0.105	0.156**	0.112	0.158**	0.176**	0.119	0.176**	0.188***	0.169**	4.665	1.142
	(1.18)	(1.96)	(1.33)	(2.13)	(2.04)	(1.48)	(2.04)	(2.79)	(2.03)	(1.36)	(0.41)
$INTASSET_{t-1}$	-0.713	-0.393	-0.707	-0.385	-1.211	-0.648	-1.211	-0.0860	-1.147	-0.0184	0.245
	(-0.88)	(-0.64)	(-0.85)	(-0.65)	(-1.60)	(-0.97)	(-1.60)	(-0.17)	(-1.61)	(-0.03)	(0.38)
$CONCENTRATE_{t-1}$	0.941	0.398	0.933	0.0815	1.574	0.690	1.574	0.639	1.592	0.00325	0.00234
	(0.69)	(0.32)	(0.68)	(0.07)	(1.10)	(0.51)	(1.10)	(0.55)	(1.16)	(0.95)	(0.50)
$SENSITIVE_{t-1}$	0.126	0.0564	0.128	0.0415	0.134	0.0895	0.134	-0.117	0.131	-0.0128***	-0.00148
	(0.51)	(0.26)	(0.47)	(0.20)	(0.62)	(0.43)	(0.62)	(-0.68)	(0.61)	(-10.36)	(-0.55)
$CULTURE\_MUL_{t-1}$	0.0735	0.0246	0.0694	0.0132	0.0717	0.0501	0.0717	0.156**	0.118	-0.0379	-0.196**
	(0.68)	(0.26)	(0.65)	(0.14)	(0.69)	(0.54)	(0.69)	(2.01)	(1.21)	(-0.61)	(-2.09)
$NATION\_VF_{t-1}$	0.143	0.130	0.143*	0.116	0.152*	0.145*	0.152*	-0.0321	0.157*		
	(1.63)	(1.50)	(1.65)	(1.30)	(1.78)	(1.67)	(1.78)	(-0.35)	(1.65)	0.874***	0.356
Ind. eqns. (p)	0.714	0.232	0.763	0.161		0.589		>0.001	0.189	0.318	0.340
Fixed effect dummies	N	Y	N	Y	N/Y	Y	N/Y	N	Y	N	Y
N	190	190	190	190	174	190	174	174	174	174	174

Table B1 (continue): First stage estimates

	Firm value – Ohlson models					Environmental and social performance				
	All (inc. Δ)	$LnPRICE_{t+1}$		$\Delta PRICE_{t+1}$		All (inc. Δ)	ESP_{t+1}		ΔESP_{t+1}	
Dependent variable = IR_t	TS	MLE		MLE		TS	MLE		MLE	
$BOARDCOM\_CSR_{t-1}$	0.853***	0.707***	0.841***	0.669**	0.850***	0.818***	1.203***	1.293***	0.574**	0.721***
	(3.13)	(3.57)	(2.69)	(2.21)	(3.20)	(2.77)	(4.62)	(5.40)	(2.48)	(3.27)
$BOARDSIZE_{t-1}$	-0.0536**	-0.0493***	-0.0536**	-0.0360	-0.0529**	-0.0562**	-0.0668**	-0.0774*	-0.0676***	-0.0611***
	(-2.01)	(-2.87)	(-2.02)	(-1.31)	(-2.06)	(-1.99)	(-2.23)	(-1.89)	(-3.36)	(-3.16)
$GENDIV_{t-1}$	0.0267**	0.0184**	0.0270**	0.0235*	0.0272**	0.0239*	0.0128	0.0111	0.00922	0.00362
	(2.17)	(2.01)	(2.26)	(1.92)	(2.23)	(1.87)	(1.26)	(0.60)	(0.97)	(0.31)
LEV_{t-1}	0.302	-0.197	0.191	0.398	0.274	0.398	0.555	0.747	1.244**	0.925*
	(0.52)	(-0.47)	(0.13)	(0.69)	(0.42)	(0.64)	(0.87)	(1.08)	(2.54)	(1.88)
$LnSUBSIDIARY_{t-1}$	0.177**	0.101*	0.168	0.132	0.178**	0.191**	0.237***	0.252**	0.209***	0.260***
	(2.23)	(1.79)	(1.33)	(1.51)	(2.23)	(2.31)	(3.58)	(2.23)	(3.11)	(3.80)
$INTASSET_{t-1}$	-0.750	0.305	-0.808	-0.228	-0.790	-0.499	-0.953*	-0.788	0.251	0.484
	(-1.12)	(0.64)	(-0.80)	(-0.35)	(-1.14)	(-0.74)	(-1.84)	(-1.58)	(0.51)	(0.80)
$CONCENTRATE_{t-1}$	1.631	-0.0415	1.803	0.852	1.635	1.362	0.129	1.101	0.788	1.152
	(1.43)	(-0.06)	(0.91)	(0.80)	(1.48)	(1.17)	(0.14)	(1.15)	(1.12)	(1.43)
$SENSITIVE_{t-1}$	0.111	0.0976	0.121	0.127	0.115	0.146	0.274*	0.0787	-0.00980	0.130
	(0.56)	(0.70)	(0.53)	(0.82)	(0.58)	(0.69)	(1.76)	(0.40)	(-0.06)	(0.71)
$CULTURE\_MUL_{t-1}$	0.0622	-0.0662	0.0584	0.0739	0.0628	0.0453	-0.0162	-0.0163	0.0712	0.0104
	(0.67)	(-1.09)	(0.56)	(0.89)	(0.71)	(0.48)	(-0.20)	(-0.16)	(0.87)	(0.13)
$NATION\_VF_{t-1}$	0.142*	-0.0572	0.142*	0.0979	0.142*	0.151*	0.131	0.119	0.0948	0.137*
	(1.82)	(-1.01)	(1.69)	(1.35)	(1.68)	(1.78)	(1.59)	(1.43)	(1.12)	(1.75)
Ind. eqns. (p)		>0.001	0.924	0.104	0.685		>0.001	0.075	>0.001	>0.001
Fixed effect dummies	N/Y	N	Y	N	Y	N/Y	N	Y	N	Y
N	206	206	206	206	206	178	178	178	178	178

Table B1 reports the first stage estimates for treatment effect models. Coefficients and *t*-statistics (in parentheses) are estimated using robust standard errors. All continuous firm-level variables are winsorised at the 1st and 99th percentiles. Two-tailed tests of significance: * $p<0.10$, ** $p<0.05$, and *** $p<0.01$. Variables are as defined in Section 3.5.

Appendix C – Difference-in-differences: Common trend tests

Figure C1: Information environment - analyst forecast error (*FERROR(0)*)

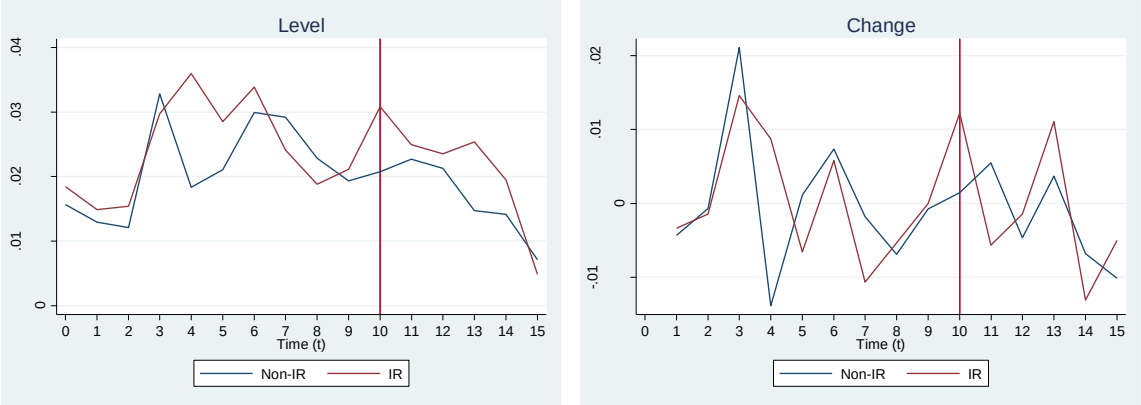


Figure C2: Information environment – analyst forecast dispersion (*DISPERSION*)

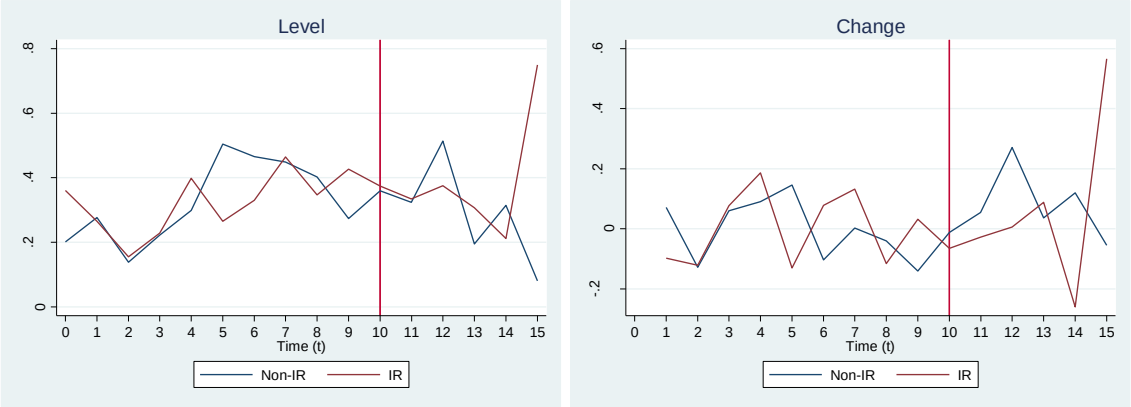


Figure C3: Cost of equity (*COE*)

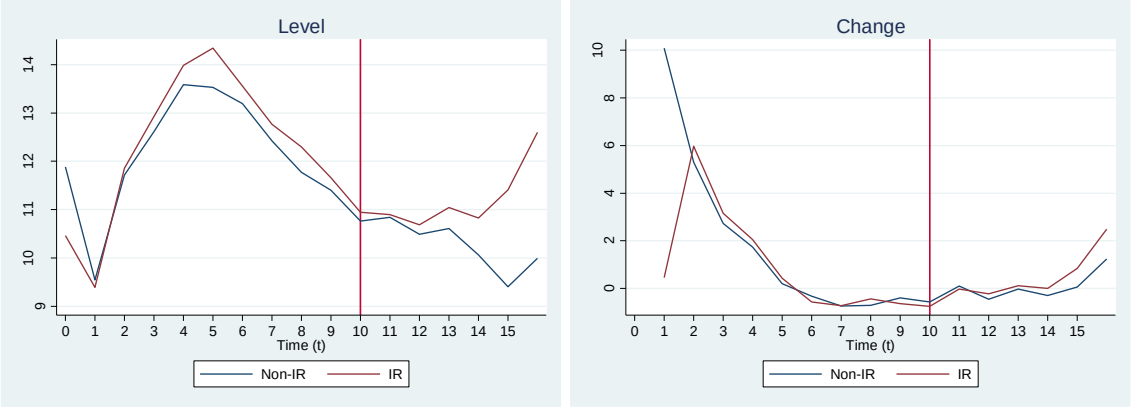


Figure C4: Firm value – share price (*PRICE*)

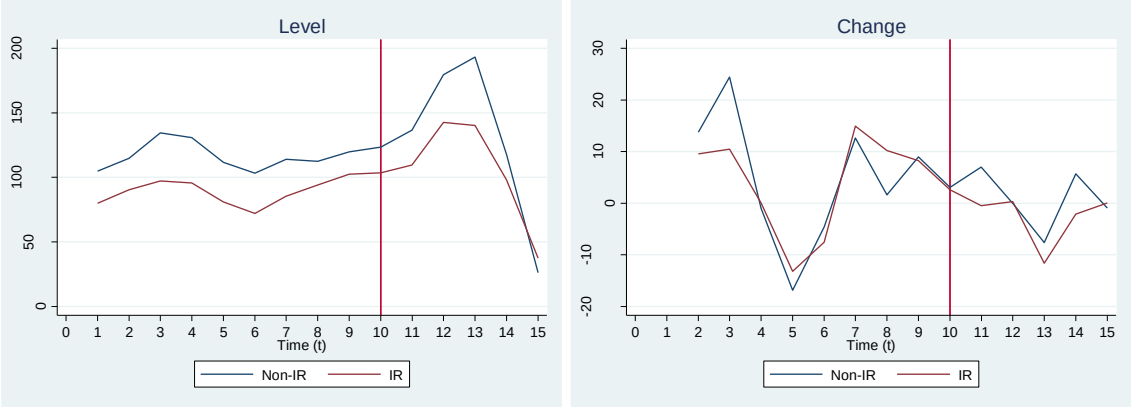


Figure C5: Firm value – cum-dividend market value (*MVCDA*)

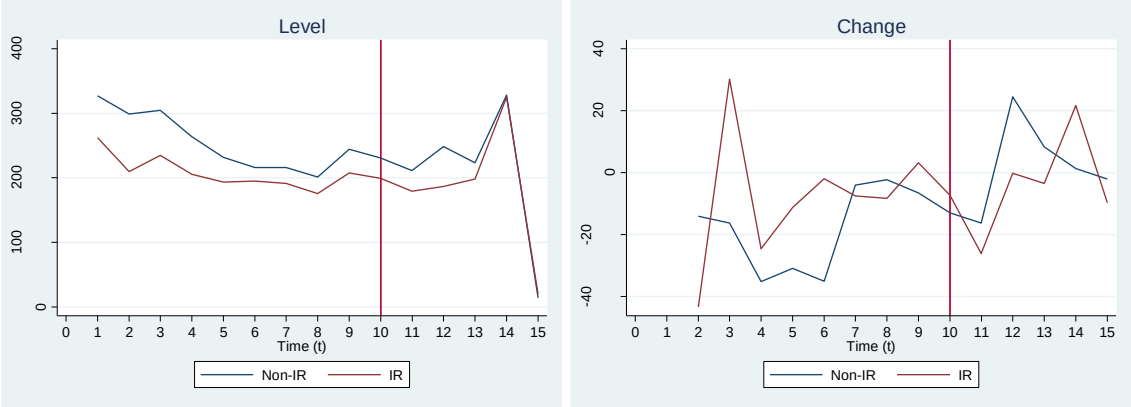
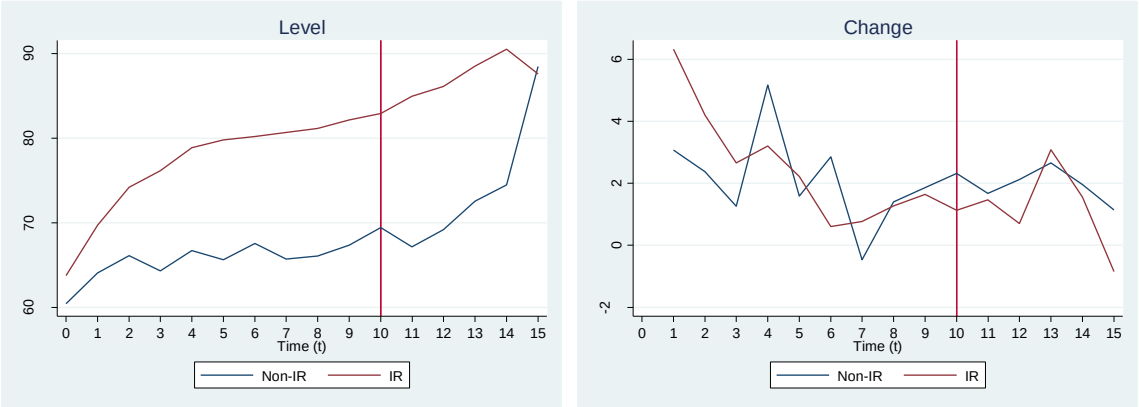


Figure C6: Environmental and social performance (*ESP*)



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