CRANFIELD UNIVERSITY

MARTIN WHITEHEAD

THE EFFECT OF A CORRUPTION SCANDAL, RECESSION AND LEGISLATION ON VOLUNTARY DISCLOSURE, REPORTING QUALITY, AND GOVERNANCE, COMPLIANCE AND CONTROL: THE CASE OF BRAZIL

SCHOOL OF MANAGEMENT
Part-time PhD Programme 2013 -2019

PhD
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The Effect of a Corruption Scandal, Recession and Legislation on Voluntary Disclosure, Reporting Quality, and Governance, Compliance and Control: The Case Of Brazil

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ABSTRACT

This thesis sets out the results of a mixed methods research project comprising three separate studies that look to address the overarching research question: how do trigger events in the form of crises and legislation affect (i) corporate reporting, i.e. through voluntary disclosure and earnings management, and (ii) governance, compliance and internal controls? This important topic, which sits at the intersection of three research domains - crisis management; corporate control and governance; and financial reporting quality - has not been targeted in a holistic way in prior studies. This thesis aims to shed new light on the topic by addressing this gap.

Paper 1 comprises a systematic literature review (SLR) which is motivated by the research question: - how do crisis trigger events (corruption scandal, transparency legislation, and recession) impact corporate responses in the form of management actions, and their reporting choices around voluntary disclosure and earnings management? Adopting established SLR methodology, the review identifies 91 articles from research domains across management, accounting and finance. The study synthesizes key findings from the sample, identifies emergent themes, and constructs a conceptual crisis response framework centred on dynamic stakeholder management for determining action and reporting choices, which must be navigated within a control and regulatory environment that chiefly influences reporting response options. The paper also sets out implications for practitioners and policy makers, makes the case for Brazil as a fruitful location for relevant and interesting studies, and presents a tangible research agenda which is used to inform Papers 2 and 3.

Paper 2 is a case study which examines how Petrobras responded to a major corruption scandal in the period 2010-2017 through (i) disclosures in its annual report (AR), sustainability report (SR), and press releases; and (ii) organizational restructuring changes made to strengthen governance and controls in response to the crisis. We find evidence in support a legitimacy theory explanation of a strategy to repair trust with key stakeholders through (i) enhanced disclosure and (ii) an evolving sequence of actions to regain control and restructure the organization, pursuant to trust repair models. In addition, we obtained new insights into how a company uses the AR and SR to target different stakeholder groups and communicate differently with them to manage their respective legitimacy concerns, findings which support stakeholder theory and organizational façade theory explanations. Finally, our review of actions taken by management shows that these align well with models of trust repair and legitimacy management, and appear to have resulted in Petrobras successfully regaining legitimacy by 2017.

Paper 3 is a quantitative study which assesses how three major external events influenced earnings management in Brazil during the period 2000 – 2017. We consider the effect of the Petrobras corruption crisis, recession, and the introduction of a new transparency law (the Brazil Clean Company Act (BCCA)). We find that the corruption crisis affecting Petrobras in 2014 and 2015 (and the resulting external scrutiny from regulators, media and the public associated with it), was of such an intensity that it had an impact similar to that of legislation elsewhere, such as Sarbanes-Oxley: - i.e. in Brazil during the corruption crisis the level of accruals-based earnings management (AEM) decreased and real earnings management (REM) increased as the two were used as substitutes. During recession, firms reduced the level of REM they use, which is consistent with an interpretation that this costly form of manipulation is not required when all firms are facing unfavourable reporting. BCCA, which was introduced in 2014 to improve transparency and reduce corruption, has had the effect of reducing real earnings management, which we interpret as being due to an increased focus on compliance and governance with improved tone at the top. This study is the first to consider the impact of both a corruption crisis and transparency legislation on earnings management behaviour, and adds to extant knowledge on what influences REM usage, the results of which widen our understanding of how

management weighs the costs and benefits of its manipulation options, dependent on external scrutiny and the quality of internal governance mechanisms

Overall, the results from the three papers enable us to contribute to the research literature in a number of ways in respect of the influence specific crisis and exogenous shock events have on management decision making related to (i) its responsive actions to ensure the adequacy of its governance and controls environment, and (ii) in the reporting and communication choices it makes around earnings management and voluntary disclosure; findings which have relevance beyond the Brazilian environment.

Keywords:

Anti-corruption, crisis management, earnings management, Lava Jato, legitimacy, organizational façades, trust repair, stakeholder analysis, voluntary disclosure

Dedicated to my Mother, and the memory of my late Father.

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LIST OF ABBREVIATIONS

AAER	accounting and audit enforcement release
ACC	anti-corruption and compliance
ACFE	Association of Certified Fraud Examiners
AEM	accruals-based earnings management
AR	annual report
B3	Brazilian stock exchange (previously known as BOVESPA)
BCCA	Brazil Clean Company Act 2014
COSO	Committee of Sponsoring Organizations
CVM	Brazilian Securities and Exchange Commission
GAAP	generally accepted accounting principles
GRC	governance, risk and compliance
GRI	Global Reporting Initiative
IFRS	International Financial Accounting Standards
IIRC	International Integrated Reporting Council
Lava Jato	Name given to the police investigation of the corruption scandal centred on Petrobras
MW	material weakness
Petrobras	Petroleo Brasileiro S.A
REM	real activities-based earnings management
REM_{DISX}	Real earnings management through manipulation of discretionary expenses
REM_{CFO}	Real earnings management through manipulation of revenues
REM_{PROD}	Real earnings management through manipulation of production
SLR	systematic literature review
SOE	state-owned entity
SOX	Sarbanes-Oxley legislation 2002
SR	Sustainability report
TI	Transparency International
UNGC	United Nations Global Compact

1 Introduction

1.1 Research Background and Rationale

Corporate crisis situations are an unfortunate but ever present business risk. The rapid acceleration of connectivity affecting business and growth of social media, allied to the increased reach of regulatory and enforcement bodies such as the SEC and DOJ, have amplified both the risk of a crisis occurring and the resulting damage caused (Alpaslan, Green and Mitroff, 2009). Indeed the stakes can be very high, both in terms of reputation and financial loss. Oftentimes a corporate scandal or crisis situation involves corruption linked to governance failure or a deliberate breach of controls which is played out in the public domain, such that the affected company cannot recover from the crisis – examples include Enron, BCCI and Worldcom (Ball, 2009); or otherwise the affected firm only regains trust after a lengthy and costly period of crisis management, as seen for example at Siemens (Blanc et al., 2019). Moreover, the inherent dangers go well beyond losses at any single entity hit by control failure and/or wrongdoing: - how we understand, prevent and deal with these situations, and maintain the integrity of financial reporting quality, are fundamental to the efficient functioning of capital markets (Dechow et al., 2011).

Not surprising, regulators take a keen interest in these risks. Most notably, following the series of corporate scandals in the period 2000-2001, in 2002 the US introduced the Sarbanes-Oxley Act (SOX) which instituted various corporate governance reforms including the requirement for formal attestation on the adequacy of internal controls, as well as ramping up the severity of criminal penalties for control breaches (Kalbers, 2009). In recent years other countries have sought to introduce similar forms of legislation (Tobolowsky, 2016). At the same time, academic interest in matters that affect the quality of financial reporting and control, which encompasses fraud, corruption and the related fields of earnings management and impression management, has grown rapidly (Brennan and Merkl-Davies, 2013), which in part is due to the global financial crisis of 2008/9 and the increased activity of enforcement bodies such as the SEC (DeFond, 2010). Notwithstanding these developments and renewed interest, the frequency and cost of corporate crises which are associated with pervasive weaknesses in internal controls and governance, continues to rise (PricewaterhouseCoopers, 2016a).

A major challenge facing researchers in this field relates to the multi-faceted nature of the topic. As a result, the extant body of knowledge is fragmented and resides across a number of disciplines (including management, accounting and finance), and involves some specialisms which are highly developed (such as earnings management), and others which are at a more embryonic stage of scholarly enquiry (such as crisis management and voluntary disclosure studies). We believe that this diversity of expertise and academic perspective has probably served to restrict development of the field, as it makes it more difficult for scholars to be aware of related prior studies. It also constrains dissemination of research findings and interactions with practitioners and policy makers.

Our particular area of interest sits in this gap at the intersection of three research domains i.e. crisis management; corporate control and governance; and financial reporting quality. Our desire is to address the business risk outlined above, and shed light on how companies react to key "trigger" events that have the effect of creating a crisis or exogenous shock situation which severely challenges a firm's control, governance, and reporting regime: - namely (i) when a fraud or corruption scandal happens; (ii) when firms are faced with new legislation that requires them to boost controls to prevent corporate abuse; and (iii) during an economic recession. As we illuminate in more detail in the next section, such an endeavour should, inter alia, help bridge the subject matter fragmentation gap, and help disseminate extant knowledge amongst researchers, practitioners and policy makers.

1.2 Research Aims and Objectives

Against this backdrop, the overarching aim of this thesis is to generate original insights to help us understand how firms react to crisis and exogenous shock events through their actions, and financial and narrative reporting.

Research shows that managing a crisis situation is underpinned by the need to take substantive and symbolic actions to restore legitimacy and regain trust (Suchman, 1995). There is a deep reservoir of scholarly work on earnings management which demonstrates that managers routinely distort financial reports to influence users of accounts through accruals-based earnings management techniques (AEM), as well as by amending "real" operational decisions (REM) (e.g. Kalbers, 2009). Neither practice is illegal or improper, albeit the extent of each in a company is reflective of the level of internal control, governance and reporting quality (Jarvinen and Myllymaki, 2016). Firms can also legitimately influence the users of accounts by engaging in "impression management" through voluntary disclosure (Brennan and Merkl-Davies, 2013). Indeed recent studies report that firms use voluntary disclosure to deal with problematic crisis situations, including fraud, through enhanced narratives in annual statements and sustainability reports, as well as with press releases (e.g. Blanc et al., 2019). Returning to our overarching aim, we can state our thesis goal more precisely in the form of a research question which informs this study:

RQ *How do crisis and exogenous shock events (which are caused by, or severely challenge, a firm's internal control, governance and reporting regime), impact management behaviour in terms of their (i) crisis management action responses, and (ii) reporting choices in relation to earnings management practices and voluntary disclosure.*

As we will demonstrate in this thesis, the bulk of scholarly work that has addressed one or more elements of our research question deals with developed economic environments in US, UK and EU. This makes sense, as most researchers are based in these territories, where corporate data is most readily available. However, we believe that important contributions to knowledge can be made by building on such studies and applying extant knowledge to crisis situations that occur in different economic settings which face diverse legal, cultural and business practice challenges. We argue that one such country is Brazil, which has been under-researched and which is facing various drivers of change that represent crisis and exogenous shock events which, informed by our research question, could present researchers with interesting opportunities to contribute to knowledge. More specifically, over the last decade companies in Brazil have had to weather three crisis or exogenous shock events: - (i) a corruption crisis; (ii) new transparency legislation; and (iii) recession. It is instructive at this juncture to briefly comment on each.

First, the largest and most iconic company in Brazil is Petroleo Brasileiro S.A (Petrobras), which has multiple listings including in Brazil, US and Spain, but is controlled by the Brazilian government. In 2014 Petrobras was caught up in a major corruption scandal ("Lava Jato"), which is the largest ever corporate bribery case (Watts, 2017). Individuals from three different stakeholder groups have been implicated in the scandal, i.e. leadership, employees and suppliers. Lava Jato has had a profound impact not only on Petrobras, but across the entire business landscape in Brazil as it resulted in intense interest and scrutiny from regulators, the public and the media in respect of how Brazilian companies operate and the state of their governance and controls. We therefore argue that Lava Jato represents a 'corruption shock' affecting not only Petrobras, but the entire business community in Brazil. Second, in 2014 Brazil enacted the Brazil Clean Company Act (BCCA). BCCA is 'transparency legislation' which requires firms, for the first time, to adopt appropriate internal control and compliance systems. This development involves a major upheaval for many Brazilian companies in how they conduct and control business activities, which we argue constitutes an exogenous event shock or crisis akin to the introduction of SOX in the US. Third, in recent years Brazil has suffered three years of recession (2009, 2015 and 2016) which provides researchers with the chance to test how this form of exogenous shock impacts action and reporting outcomes as outlined above.

Having set out the research question and location of where this will be pursued – i.e. Brazil – we now specify the three primary research objectives underlying this thesis, and outline our associated motivations.

Research objective 1*: to systematically review the literature on how crises impact management actions and reporting behaviour.* As indicated above, a key challenge facing researchers in this field relates to the disparate and fragmented nature of the field, and the lack of frameworks that consolidate current knowledge. We are motivated to pursue this first research objective for three reasons. First, no systematic literature review (SLR) studies have previously been attempted. Consequently an SLR will be a useful addition as it will enable us to synthesis current knowledge and identify common themes. Second, the exercise will provide the opportunity to develop a conceptual framework that will aid researchers and practitioners in the field. Third, by adopting rigorous SLR methodology, the study will enable us to devise a concrete research agenda that will inform future scholarly work, and focus the empirical studies that comprise this thesis.

Research objective 2**:** *to analyse how Petroleo Brasileiro, S.A ("Petrobras"), responded to a major corruption scandal arising in 2014.* There is a paucity of case study research that has considered corruption scandals. Moreover, we have only been able to identify four corporate cases that have focused on anti-corruption and compliance (ACC) disclosure: - these relate to scandals at Siemens, Alcatel-Lucent, ZTE and China Mobile (Blanc et al., 2019; Dissanayake, Islam and Dellaportas, 2011; Islam et al., 2015). To the best of our knowledge there are no studies which have focused on Lava Jato from the perspective of our research question. This second research objective is fuelled by three primary motivations that address important research gaps. First, by determining how Petrobras responded to the legitimacy threat it faced from the Lava Jato scandal in terms of remedial actions taken and the firm's ACC disclosures, this study will provide novel research being the first study of this corruption event, and augment the sparse body of extant research in the areas of ACC disclosure and crisis management response. Second, a small number of studies exist that apply stakeholder theory to consider how firms use the annual report (AR) and sustainability report (SR) to communicate differently with target stakeholders. The case study will allow us to contribute to this debate by assessing how Petrobras dealt with the three implicated stakeholder groups (leadership, employees, suppliers) through (i) communication in the AR and SR; and (ii) via targeted remedial actions. Third, prior research has revealed a disconnect between real-world crisis management actions and theoretical models based on legitimacy and trust repair perspectives. This study at Petrobras will allow us to add further case study data to what is known, and thereby help clarify the inconsistencies seen in prior studies.

Research objective 3: *to assess how crisis and/or exogenous events (corruption crisis; new transparency legislation; recession) impacted the level and type of earnings management for a sample of Brazilian listed firms.* The body of literature on earnings management is extensive. However, there are a number of corporate situations in which empirical evidence is ambiguous: - e.g. regarding the relationship between financial crisis and earnings management (Franceschetti, 2018). Moreover, no prior studies have looked at the association between a corruption crisis and the level and type of earnings management. Three motivations underlie our desire to pursue this third research objective. First, by considering how an economic crisis and a corruption crisis impact the type and level of earnings management adopted by management, we can help clarify prior ambiguous findings in respect of recession; and in respect of corruption our study will constitute the first such study that links this type of crisis phenomenon to earnings management. It will also allow us to shed light on the effect that external scrutiny can have on the quality of internal controls and governance. Second, by looking at how transparency legislation impacts earnings management, this study will expand the scope of prior work which has mostly been limited to assessing how SOX affects earnings management behaviour (e.g. Cohen, Dey and Lys, 2008). Finally, as we will be considering both types of earnings management – i.e. accruals-based (AEM) and real activities-based (REM) - this study will allow us to build on prior studies that have considered the nature of the AEM/REM relationship.

Given their scope and focus, our research objectives will need to be pursued by applying three different forms of research enquiry: - i.e. systematic review, case study, and regression analysis methodology – and thus this research project comprises a 'mixed methods' piece of research.

1.3 Summary and Contributions

The pursuit of the three research objectives enables this thesis to make a number of important contributions which we now summarise sequentially.

First, the SLR study consolidates our understanding of how various disparate elements of management behaviour mesh during a corporate crisis or exogenous shock situation. The study is the first to synthesize extant knowledge of the field, identify emergent themes and conceptualize key elements within a crisis response framework. Findings demonstrate that crisis management is a complex aspect of business that requires a stakeholder management and systems-based approach to the task of regaining legitimacy through responsive action and communication via published disclosures, but which has the potential to preserve and create value if done well and within the constraints of the prevailing control and governance environment. This framework and findings will help researchers appreciate the range of theoretical lenses through which the field can be viewed (including legitimacy theory, stakeholder theory, agency theory and organizational hypocrisy theory), and thereby serve to stimulate collaborative research that encompasses both theory development and empirical studies. Finally, the findings of the study can help guide management during times of corporate stress to (i) consider the wider picture and the need to manage multiple concerns and relationships when time is short, and (ii) alert them to the risks and opportunities that reporting choices bring in relation to their earnings management and voluntary disclosure activities.

Second, the case study at Petrobras, following its major corruption scandal, advances knowledge in this field in four primary respects. Petrobras was found to respond to the crisis by voluntarily increasing its disclosures in relation to ACC so as to "regain" legitimacy, a finding which augments previous studies and supports legitimacy theory and trust repair interpretations (Deegan and Rankin, 1996). We also found support for stakeholder theory and organizational façade model explanations in the way Petrobras used its published ARs and SRs to communicate differently with diverse stakeholder groups, most notably in respect of the stakeholder groups who are associated with the Lava Jato scandal (i.e. primarily leadership and suppliers, and to a lesser extent employees). These findings add to the somewhat limited body of knowledge in this nascent field (Blanc et al., 2019), and represent novel research regarding the findings on leadership as an implicated stakeholder group. Thirdly, the study catalogues Petrobras's remedial actions constituting its crisis management response. Although it is premature to make a final determination, evidence suggests these efforts have successfully restored legitimacy at Petrobras, adding to extant knowledge in this area which has previously indicated inconsistent findings, and providing support for trust repair model interpretations which focus on sequenced actions mapped to the underlying need to gain, maintain or repair trust (e.g. Pfarrer et al., 2008; Bachmann, Gillespie and Priem, 2015). Finally, the study makes a methodological contribution in its construction of a 97-component ACC Breadth Index which incorporates the most recent guidance from a number of independent bodies including UNGC and GRI, which will help steer companies to develop more holistic ACC policies and procedures.

Third, the quantitative study on earnings management in Brazil contributes to knowledge in four ways. This is the first study that probes the relationship between a corruption shock and earnings management. A major finding from this novel research is that intense external scrutiny on corporate financial reporting and control, - i.e. from regulators, the public and the media - can influence earnings management behaviour in the same way as legislation such as SOX. This study finds that during the most intense part of the crisis, firms in Brazil curtailed their use of AEM and switched to REM as a substitute, a result which widens our understanding of how management weighs the costs and benefits of its manipulation options dependent on external scrutiny and the quality of internal governance mechanisms. Secondly, this study is also the first to consider the relationship between earnings management and new transparency legislation. The finding of a negative association with REM represents novel research and provides support that transparency legislation, which is focused on compliance controls that primarily target bribery and corruption risks, can stimulate improvements across the wider financial reporting and control environment. Thirdly, our study increases our understanding of REM in a number of other areas. In normal (i.e. non-crisis) conditions, results show that AEM and REM have been used by managers in Brazil in a complementary way, a finding which aligns with previous studies and supports a view of Brazil as suffering from a weak enforcement climate and inadequate corporate governance. Our finding that in recession REM levels in Brazil reduce augments previous work which suggests this form of manipulation is relatively expensive. Lastly, by focusing on Brazil, which is under-served in accounting research, our study has allowed us to extend the literature by testing, in this rapidly developing market, the relevance of current thinking on earnings management developed in more mature markets. The results suggest how crisis and exogenous events, in combination with the quality of a firm's reporting, internal control and governance regime, might serve to change attitudes on the extent to which earnings management is practiced and tolerated, and by extension to wider concerns around ethical business conduct. Our findings have relevance in other environments which, like Brazil, suffer from historic systemic challenges in respect of corruption and transparency around financial reporting, consequently we call on researchers to take up the challenge of locating future studies on the effect of crises and exogenous shocks in more diverse business settings.

1.4 Thesis Structure

The structure of this thesis conforms to the Cranfield University guidelines for PhD theses and constitutes a 'paper format' manuscript. The thesis comprises studies that were undertaken as a single programme of scholarship, but are presented herein as distinct stand-alone chapters, a format which more readily facilitates for the submission of chapters to journals for publication. The rest of the thesis is set our as follows.

Chapter 2 takes up the first research objective, the results of which serve to orient the empirical studies in Chapters 3 and 4. The chapter commences with a brief introduction which outlines the fragmented nature of studies in the field and lays out the research question. The SLR methodology applied is then explained. The bulk of the chapter thereafter is concerned with presenting the findings. Results are reported in the form of (i) descriptive overview; (ii) conceptual framework based on the synthesized findings; and (iii) detailed thematic analysis. The chapter rounds off with a discussion of the findings which introduces Brazil as a fruitful market in which to locate research, sets out a research agenda based on the review findings, and discusses potential implications of the findings and conceptual framework for practitioners and policy makers.

Chapter 3 deals with the second research objective. It comprises a case study based on Petrobras's published ARs, SRs and press releases in the eight–year period 2010 -2017 surrounding the public revelation of the 2014 Lava Jato scandal. In the first part of the chapter the corruption crisis that befell Petrobras is briefly outlined, and the motivations and research question underlying this study are then set out in the context of prior scholarly work. An overview of the relevant theoretical perspectives and literature review are then presented, followed by a more detailed background to the case study. The chapter proceeds to explain the research methodology applied, which details how data was collected and how content analysis was performed. Results are then presented in relation to voluntary ACC disclosure extensiveness and breadth; media attention and press release volume; stakeholder façade statistics; and an assessment of crisis response actions taken. The last part of the chapter discusses the significance of the findings, illustrates the contribution of the study, and identifies areas for further research.

Chapter 4 is a quantitative study which follows on from chapter 3, and pursues the third research objective by looking at the effect of crises on earnings management behaviour in Brazil, including the wider implications of the Petrobras scandal which is treated as an exogenous corruption shock affecting Brazilian corporates. The chapter commences with a short introduction and overview. This is followed by a section which, informed by the findings in chapter 2, summarises the research gaps in relation to how crisis and exogenous shock events influence earnings management, including studies on Brazilian companies, and sets out research questions that direct the study. A summary of the theoretical background and literature review is then presented which leads in to the hypothesis development part of the chapter in which five hypotheses are constructed aligned with the stipulated research questions. Subsequently the research design and methodology applied are described involving data obtained from 186 listed companies in Brazil over the period 2000-2017; established models are used to estimate measures for AEM and REM; and the hypotheses are tested in regression models informed by prior research. The results are then presented as a series of regression outputs and summary statistics, and conclusions are reached regarding the hypotheses. The chapter rounds off by emphasizing its contribution to knowledge, highlighting implications for policy and practice, and setting out areas for fruitful future studies.

Chapter 5 consolidates the findings from all preceding chapters. First, the key conclusions emanating from this research project are summarised. Second, the main contributions to knowledge are spelt out. The potential implications of the study for management and policy makers are then detailed. The subsequent part of the chapter comprises a short section which describes how the author has sought to disseminate the ideas and findings in this thesis. The chapter rounds off with a discussion of the key limitations underlying the thesis, and proposes some avenues where researchers can build on the work undertaken in this thesis.

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2 Responding to a Corporate Crisis Through Actions and Disclosure: A Systematic Literature Review and Future Directions

Abstract

Crises and endogenous shocks are an unfortunate reality of modern business which can cause immense financial and reputational damage. Management must restore trust and legitimacy through remedial actions and disclosures. Despite widespread appreciation of the underlying risks associated with corporate crises, scholarly attention has not previously looked at this topic in a holistic way. This paper looks to address this gap. The study comprises a systematic literature review (SLR) which is motivated by the research question: - how do crisis trigger events (corruption scandal, transparency legislation, and recession) impact corporate responses in the form of management actions, and their reporting choices around voluntary disclosure and earnings management? Adopting established SLR methodology, the review identifies 91 articles published in the period 1991-2019, of which more than 80% date from 2008, spanning several established research domains across management, accounting and finance. After synthesizing key findings from the sample and identifying emergent themes, this study constructs a conceptual crisis response framework centred on dynamic stakeholder management for determining action and reporting choices, and within a control and regulatory environment that chiefly influences reporting response options. We also set out the implications of our findings for practitioners and policy makers, and present a tangible research agenda. The association of crises with real earnings management and voluntary disclosure of anti-corruption policies and controls are amongst the topics identified as being ripe for further study, and Brazil is suggested as being a particularly interesting laboratory for fruitful exploration of the identified research gaps. Finally, we call for scholars to take up the challenge of this nascent but growing topic which provides exciting opportunities for theory development, and empirical studies that apply both quantitative and qualitative research methods across all geographic and business settings.

Keywords: corruption; crisis management; earnings management; legitimacy; systematic literature review; trust repair; voluntary disclosure.

2.1 Introduction

Almost a week does not go by without some major corporate scandal or crisis situation reaching the public domain arising from control or governance failures (Jarvinen and Myllymaki, 2016). In many recent cases some form of fraud or deliberate breach of controls has been involved, for example at the likes of BCCI, Enron and Parmalat (Ball, 2009), and more recently at Lehman Brothers, Olympus and Siemens, amongst many others. The stakes go beyond losses at any single entity hit by control failure and wrongdoing - how we understand, prevent and deal with these situations and maintain the integrity of financial reporting quality are matters that are fundamental to the efficient functioning of capital markets (Dechow et al., 2011).

Regulators have not sat on their hands: - during this period the legislative and regulatory landscapes have tightened and evolved - primarily in the US and UK - as public policy has sought to deal with the issues and restore public confidence. The most notable recent legislation is the Sarbanes-Oxley Act (SOX), which was introduced in the US in 2002. SOX instituted various corporate governance reforms including formal attestation on the adequacy of internal controls, and also established additional and more severe criminal penalties for fraudulent financial reporting (Kalbers, 2009). In 2012 the UK introduced ground-breaking anti-bribery legislation (Trompeter et al., 2013), and other countries have introduced similar measures focused on "transparency" and the requirement for enhanced compliance procedures to reduce corruption (Tobolowsky, 2016).

This notwithstanding, the incidence of governance failure leading to fraud continues to "stubbornly persist" (PricewaterhouseCoopers, 2016a), and indeed is on the rise (Association of Fraud Examiners (ACFE), 2016). Not surprisingly, concern around this risk has become an agenda item for CEOs around the world - viz a viz how should a firm organize its controls and business culture to minimize the risk of a corruption scandal or other type of governance crisis from happening; and how should a firm crisis-manage a scandal (PricewaterhouseCoopers, 2016b).

Moreover, in recent years matters affecting the quality of financial reporting and control, including fraud, corruption and the related fields of earnings management and impression management, have become the subject of enhanced academic attention (e.g. Brennan and Merkl-Davies, 2013; Trompeter et al., 2013). Indeed there is a rich vein of research that has considered the negative impact on reporting quality of fraud and earnings management, and many scholars consider the latter as a proxy for potential corporate wrongdoing (e.g. Jones, Krishnan and Melendrez, 2008; Dechow et al., 2011). Corporate abuse is classified into three types by the ACFE, i.e. (i) corruption, (ii) asset misappropriation and (iii) financial statement fraud (ACFE, 2016), each of which negatively impacts earnings quality and occurs because of inadequate internal controls and procedures (Hogan et al., 2008). The same can be said of earnings management, albeit this practice is legitimate and does not violate Generally Accepted Accounting Principles (GAAP) (DeFond, 2010). The two most important earnings management techniques involve management (i) using abnormal levels of discretionary accruals, and (ii) taking abnormal operational (i.e. "real") decisions. Another option open to firms who wish to legitimately influence the users of accounts is to engage in "impression management" through voluntary disclosure (Brennan and Merkl-Davies, 2013). Recent studies have shown that firms have used voluntary disclosure to deal with problematic crisis situations, including fraud, through enhanced narratives in annual statements and sustainability reports, as well as with press releases (e.g. Blanc et al., 2019).

Our particular area of interest is in understanding how companies react to key "trigger" events that have the effect of creating a crisis or exogenous shock situation which severely challenges a firm's control, governance, and reporting regime: - namely (i) when a fraud or corruption scandal happens; (ii) when firms are faced with new legislation that requires them to boost controls to prevent corporate abuse; and (iii) during an economic recession. Moreover, our desire is to discover how these trigger events impact behaviour affecting both corporate reporting (in terms of earnings management as seen in published accounts, and impression management through voluntary disclosure), and corporate actions (in terms of restructuring and control strengthening). In order to investigate this important and relevant area of study, we initially conducted a positioning study review, which drew us into three primary literature domains affecting organizations comprising (i) crisis management; (ii) corporate reporting; and (iii) governance, compliance and internal controls.

As indicated above, a key challenge facing researchers in this field relates to the fragmented nature of studies which span several research domains, and the lack of frameworks that consolidate current knowledge. Moreover, no prior systematic literature review (SLR) of the topic has been published. Given this backdrop, our first research objective, which we introduced in chapter 1, represents the logical starting point i.e.: - to systematically review the literature on how crises impact management actions and reporting behaviour. A SLR study involves a rigorous and time-consuming process which enables the reviewer to become immersed in the field such that a concrete research agenda can be constructed. This is a key motivation for this research project, as the SLR will direct the empirical studies to be undertaken in chapters 3 and 4. Based on the positioning study, and our first research objective, we developed the following overarching review question and sub-questions, which together form the basis of our SLR: -

"What does the literature tell us about how trigger events in the form of crises and legislation impact (i) corporate reporting (i.e. through voluntary disclosure and earnings management) and (ii) corporate restructuring (i.e. affecting governance, compliance and internal controls)?"

Sub-questions

1. What does theory and practice tell us about crisis management in organizations?
2. What is known about the different types of earnings management: - when and why is each used by management and to what extent are these used in composite or as substitutes?
3. Why, when and how do firms make voluntary disclosures?
4. How and why does corruption, bribery and accounting fraud happen, and how do firms respond to transparency legislation or otherwise mitigate the associated risks with

This paper sets out the results of the SLR. Three primary motivations underpin this paper. First, we synthesize the current landscape and state of knowledge in Anglo-American settings related to corporate reporting and restructuring associated with corruption/financial control crises and related legislation. By identifying the primary theoretical bases and drawing out conceptual themes, we make a useful contribution to the extant literature in what is a rapidly evolving and diversified field of academic study. Second, we aim to suggest areas that are ripe for future research in situations and environments facing challenges linked to corruption, financial control and reporting quality. Third, we argue that the insights from the systematic review could be fruitfully applied to non-Anglo American settings, and specifically Brazil which has been under-researched and which is facing various drivers of change, including a massive corruption scandal affecting its largest company Petrobras, a situation which we argue could have interesting ramifications for corporate reporting and restructuring not only at Petrobras, but also in relation to the wider business environment in Brazil.

The remainder of the paper is structured as follows. Section 2 describes the methodology adopted in conducting the SLR and sets out the key steps undertaken. Section 3 provides a descriptive overview of the studies reviewed through a thematic analysis and synthesis of findings. In section 4, we discuss the findings and outline directions for future research. We then turn to consider Brazil as a laboratory for future research and summarise recent research studies there. The paper concludes with some comments on implications for practice, limitations of the study, and provides a short conclusion reflecting on the objectives and outcome of the study.

2.2 Methodology

2.2.1 Introduction

We have applied SLR methodology in this study. The systematic review method of conducting a literate review is relatively new and is not yet widely adopted within the management and social sciences. Rather, literature reviews are typically narrative-based descriptive reviews which do not lend themselves to replication or a full appreciation of selection criteria.

Two primary reasons are often cited to argue why the systematic review method offers a more robust alternative (Denyer and Neely, 2004). Firstly, because a systematic review must be conducted pursuant to a precise review protocol, and make its methods of selecting and evaluating literature explicit, it provides a ready “audit trail” for any review to assess the author’s “decisions, procedures, and conclusions” (Tranfield, Denyer and Smart, 2003). The SLR method is routed in the values of rigour, transparency and replicability (Tranfield, Denyer and Smart, 2003). Consequently, the systematic review approach mitigates the risk of bias and subjectivity that traditional narrative reviews suffer from (Tranfield, Denyer and Smart, 2003), and can be viewed as constituting “good scientific practice” (Rousseau, Manning, and Denyer, 2008)

Secondly, by its nature the process of undertaking an SLR provides the researcher with the opportunity to gain a more holistic view of the subject areas under review as it is designed to select, appraise and synthesise all relevant existing studies, irrespective of the disciplinary area and place of publication. By contrast, the traditional narrative review is often considered a "singular" account (Tranfield, Denyer and Smart, 2003). As a result, the researcher is better positioned to bring new and interesting insights into the debate to challenge existing knowledge (Petticrew and Roberts, 2008), and to defend the position advanced because subjectivity around where the "balance of evidence" may lie is lessened (Petticrew and Roberts, 2008).

For these reasons, and given the volume of papers within the relevant dominant literature domains which inform the subject area of review, we believe that the SLR methodology is particularly well suited to addressing the review question and sub-questions.

2.2.2 Review Strategy

We conducted the SLR adopting a standard 3-stage strategy comprising (i) devising a review plan; (ii) selecting, analysing and synthesising studies; and (iii) reporting the results (following Tranfield, Denyer and Smart, 2003).

The first step of the planning exercise involved the formation of a review panel comprising three scholars with relevant expertise in the subject matter, plus a librarian, all of which are skilled in SLR methodology. The purpose of this step was to (i) "*direct the process… and resolve any disputes over the inclusion and exclusion of studies*" (Tranfield, Denyer and Smart, 2003 p.214); and (ii) ensure quality, reliability and validity of the SLR process and outcome. The review panel provided valuable guidance throughout the process.

In devising the search strategy we found it insightful to re-configure the review question and sub-questions drawing on the CIMO (Context, Intervention, Mechanism and Outcome) logic developed by Denyer and Tranfield (2009) as follows:-

- How are earnings management and/or voluntary disclosure (M) impacted by (i) a corruption crisis and (ii) an economic recession (C)?

- How has recent transparency and control regulation (I) impacted the type and extent of earnings management and (ii) voluntary disclosure (M), and to what effect (O)?
- What crisis management actions (I) are applied to respond to a corruption scandal (C) and how effective are they in repairing trust and legitimacy (O)?

Next, following the SLR methodology (Tranfield, Denyer and Smart, 2003), we formalised these questions into a review protocol comprising search strategy, inclusion and exclusion criteria, quality appraisal standards, and plan for data extraction and synthesis. The aim was to be as inclusive as possible to capture as many key citations as possible.

The subsequent step was to develop our search criteria and search terms. This involved identifying keywords, terms and phrases based on a careful examination of the literature reviewed within the positioning study, and the CIMO-informed questions as above. The task proved to be more involved than would be the case for better-defined areas of study because there is relatively limited consensus on terminology covering some aspects of the field, and different researchers use a variety of words, even within the same study, many of which are similar or near similar. In addition, we found that it was necessary to follow an iterative approach in developing and refining the final list of keywords and concept/theme strings to ensure the process remained suitably manageable. In total, we settled on seven strings, which are shown at Appendix A-1.

As additional search tools to locate all relevant important papers, we used cross-referencing, 'snowballing', citation tracking and review panel recommendations. The papers identified through this method were deemed to be of high-relevance to the review question and were subjected to the same selection criteria as applied to papers identified from the database searches.

The screening process subjected the papers identified by the literature searches and cross-referencing to a four-stage process of screening based on pre-determined criteria, i.e.: 1 title; 2 abstract; 3 full text; 4 quality.

This process involved two primary forms of screening: -

(i) Stages 1-3 screened on the basis of relevance parameters (see below)

(ii) Stage 4 screened based on an assessment of quality.

In developing the relevance criteria for the SLR, it was necessary to make some robust choices given the sheer volume of studies within the field. The inclusion and exclusion bases are summarised at Appendix A-2. We limited the study to peer-reviewed journals to ensure impact and academic credibility. In addition, we chose to restrict the geographical coverage to cover only the Anglo-American (i.e. US, UK, Canada and Australasia) and EU business environments for which the bulk of studies relate. In any event, the primary screening parameter proved to be the researcher's assessment of the relevance of a paper to the overarching review question and sub-questions, which is a practical reality of any SLR as reported by, for example Carcello, Hermanson, and Ye (2011) who stated in their literature review of earnings management "…given the voluminous nature of recent literature, we had to make many difficult judgments about specific papers and research insights to include."

The papers selected which met the relevance criteria, were next subjected to a quality appraisal, albeit that as all screened papers had been peer-reviewed and most had been published in high impact journals, this process resulted in only four eliminations.

The final two steps of the review strategy involved (i) extracting and collating relevant data from each paper using a data extraction form, and then (ii) synthesising the results and integrating findings across studies so as to reflect back on the review questions.

2.2.3 Data Collection

Following the methodology of Pittaway et al. (2004) we searched on the ABI/Inform Global and EBSCO Business Source Complete databases. Both are comprehensive and each covers around 3,800 scholarly business publications. Although there is a high degree of overlap between the two databases, there are interesting nuances in coverage that make using both worthwhile, and at the same time provide additional safeguards against the risk of omission of an important publication from either. Given the extensive coverage provided by the two databases in combination, we did not consider it worthwhile to source additional databases such as Emerald, ScienceDirect etc.

To illustrate the volume of papers captured by the individual strings, for string [1] alone, prior to applying our inclusion/exclusion criteria specified at Appendix A-2, we obtained hits of approximately 39,000 and 23,000 articles from the ABI/Inform Global and EBSCO Business Source Complete databases respectively. The number of hits reduced substantially (to 2,285 and 1,776 respectively) when the key delimiting parameters were applied – i.e. a restriction to peer-reviewed journals published post 1980 and with a geographic focus on Anglo-American and EU markets.

After a process of iteration, and as summarised below in Table 2.1, we ran four different string combinations applied to titles and abstracts using the Boolean operators "AND" and "OR" to capture: - (i) the association of outcome measures (reporting quality, trust, control) separately with a crisis situation, earnings management, and impression management; (ii) the relationship between earnings management and each of the three trigger events of interest (corruption crisis, transparency legislation and controls, and recession); (iii) the association of impression management with each of the trigger events; and (iv) the linkage of crisis management to the specific case of a corruption situation. After the elimination of duplicates, the database review process resulted in 693 articles advancing to the next phase i.e. the screening process, a sizeable but manageable number.

Table 2-1 Search string results

Search string theme	Search string / combination (Appendix A-1)	ABI/ Inform Global	EBSCO Business Source Complete	Total selected for screening phase after elimination of duplicates per string
Crisis management	[1]	2,285	1,776	n/a
Earnings management (EM)	[2]	930	398	n/a
Impression management (IM)	[3]	336	242	n/a
Corruption/ fraud	[4]	2,680	2,480	n/a
Recession	[5]	6,948	5,858	n/a
Legislation	[6]	1,469	1,685	n/a
Outcome measures (reporting quality, trust, control) linked to crisis, EM or IM	[1 OR 2 OR 3 OR 4] AND [7]	474	461	559
EM linked to trigger events (crisis, recession, legislation)	[2] AND [1 OR 4 OR 5 OR 6]	144	69	168
IM linked to trigger events	[3] AND [1 OR 4 OR 5 OR 6]	14	8	15
Crisis management linked to a corruption/fraud situation	[1] AND [4]	52	28	63
Total after elimination of all duplicates				**693**

The screening process commenced with all 693 database-identified articles being exported into the Mendeley reference system, and ended with a final selection of 91 papers for inclusion in the SLR. The various intervening steps in the elimination and retention process and the associated reconciling numbers are detailed at Appendix A-3. The bulk of eliminations occurred at the title screening stage which resulted in 429 eliminations which was substantially based on our judgment of the perceived proximity of the respective study to the overarching review question and sub-questions as set out in the inclusion/exclusion criteria shown at Appendix A-2, and the restriction to peer reviewed papers appearing in journals ranking at level 3* or 4* pursuant to the ABS (2018) journal quality ranking system. Many articles were not deemed directly relevant to the review question and sub-questions because they did not consider the aspect of corporate behaviour under review to relate with sufficient proximity to either a crisis or exogenous shock event, or to be associated with weaknesses in relation to control, governance or reporting quality. A further 190 eliminations were made at the abstract screening stage following the same reasoning, leaving 74 articles retained from the data-base selection process for full-text screening. To these were added a further 19 from cross-referencing ("snowballing"), citation tracking and journal website searches, and 2 recommended by the review panel, some of which were deemed to be sufficiently influential (based on citations in Web of Science being above mean annual values) that they needed to be included even though they fall outside our proscribed exclusion criteria – i.e.: - involving studies from outside the US/UK/EU economic area or because they constitute book chapters, working papers, or conference proceedings which are not peer reviewed.

In total therefore 95 papers were reviewed at the full-text level. Of these 91 were retained in the SLR after the quality review assessment, and form the basis of the claims made in this paper.

2.3 Results

2.3.1 Descriptive Analysis

Table 2.2 sets out the distribution by source journal of the 91 articles making up the final sample. Around 32% of all articles in the sample derive from just four highly ranked journals (Journal of Accounting and Economics, Contemporary Accounting Research, Journal of Business Ethics and Accounting Review). In total 66 papers (73%) appear in 3* or 4* journals pursuant to the ABS ranking system (ABS, 2018), with a further nine (10%) published in 2* or 1* publications, and the remaining 16 studies (17%) made up of book chapters, working papers, conference proceedings and non-ranked journals which we deemed of sufficient quality and relevance for inclusion in the final sample as outlined above. Overall, we believe this represents a healthy distribution of source titles, which helps to guard against any suggestion of editorial thematic bias, which could be a risk in a situation of over-concentration in one or more journals.

Table 2-2 Distribution of articles by source title

Source Title	No. of articles	% of sample
Journal of Accounting and Economics	8	9%
Contemporary Accounting Research	7	8%
Journal of Business Ethics	7	8%
Accounting Review	6	7%
Accounting Horizons	3	3%
Academy of Management Review	3	3%
Accounting, Organizations and Society	3	3%
Auditing: A Journal of Practice & Theory	3	3%
Journal of Accounting Auditing & Finance	3	3%
Accounting, Auditing and Accountability Journal; British Accounting Review; Review of Quantitative Finance & Accounting; Organization Studies;	2	2%
Accounting and Business Research; Accounting and the Public Interest; Advances in Developing Human Resources; Asian Review of Accounting; Australian Accounting Review; Australian Conference (10th) on Social and Environmental Accounting Research (Conference Proceedings); Business Ethics Quarterly; Corporate Governance: An International Review; European Accounting Review; European Management Journal; Evidence From China (Working Paper); Financial Crises and Earnings Management Behaviour (book); Harvard Business School (Working Paper); Industrial Marketing Management; International Journal of Emerging Markets; International Review of Financial Analysis; Journal of Accounting and Public Policy; Journal of Accounting Research; Journal of Applied Economic Research; Journal of Cleaner Production; Journal of Contemporary Accounting and Economics; Journal of Contingencies and Crisis Management; Journal of Corporate Finance; Journal of Corporate Law; Journal of Financial Crime; Journal of Financial and Economic Practice; Journal of Health Economics; Journal of Management & Organization; Journal of Public Affairs; Journal of Promotion Management; Journal of Theoretical Accounting Research; Managerial Auditing Journal; Managerial Finance; OBEFG on Fraud and Corruption (Working Paper); Oxford Handbook of Organization Decision Making (book); Procedia Economics and Finance; Research in International Business and Finance; Routledge Companion to Accounting Communication (book); ; Review of Accounting & Finance; Strategic Management Journal; Universidad Carlos III de Madrid (Working Paper)	1	1%

Notes: The table shows the distribution of articles by source title. The number of articles and the corresp percentage of sample are calculated on a per title basis.

Figure 2.1 shows a classification of the sample by year of publication from 1991 (the oldest article in this review) to 2019 (the most recent). This demonstrates that the field is active and topical, with 82% of papers appearing since 2008, which we suggest may reflect enhanced interest in earnings quality and control following the 2008/9 global financial crisis.

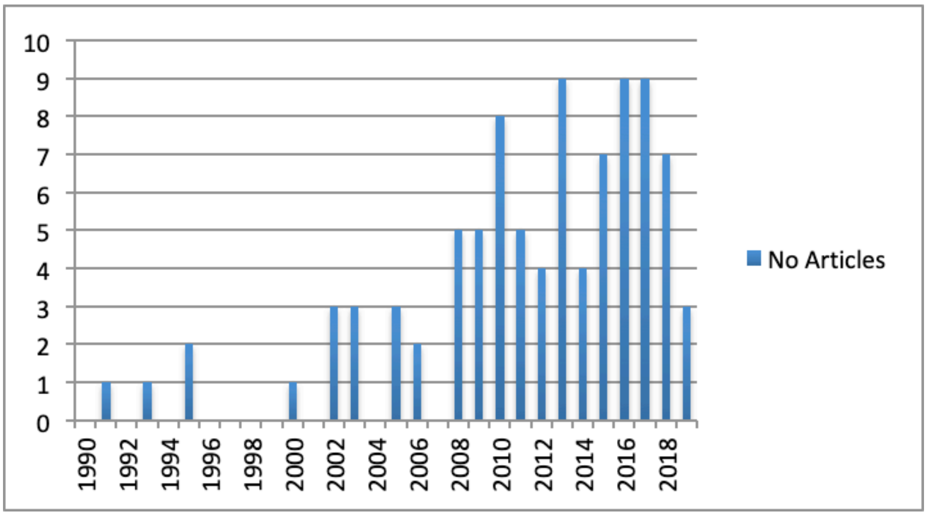

Figure 2-1 Number of articles per year of publication

Figure 2.2 shows a breakdown of articles by paper type. Clearly, the emphasis has been on empirical papers, which comprise around 70% of the sample, most of which represent studies which test theory (70%) rather than build theory. The next largest grouping is conceptual studies (19%), with limited representation from literature review (6%) and theoretical (4%) articles. The articles can be broadly grouped by the three domains outlined above: - (i) internal control and governance (18 papers); (ii) crisis management (17 papers); and (iii) reporting, comprising earnings management (39 papers) and (ii) disclosure (17 papers). The large volume of empirical studies compared to theory-based papers primarily reflects the relatively mature theoretical underpinnings of the earnings management, trust repair and control fields, albeit the conceptual studies in our sample are spread broadly evenly across each domain.

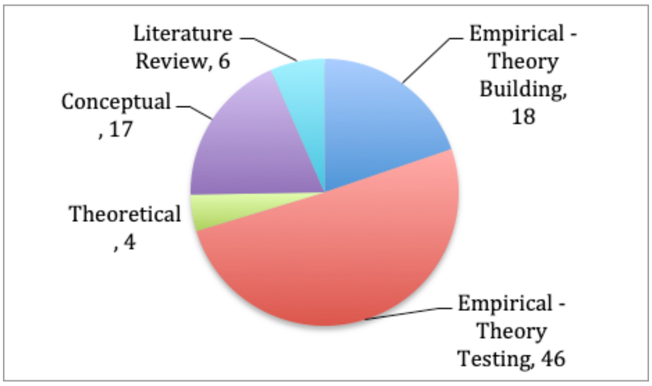

Figure 2-2 Breakdown of articles per paper type

2.3.2 Conceptual Framework and Thematic Analysis

We followed the methodology known as "realist synthesis" (Pawson, 2002) to integrate findings across studies through the use of coding applied to all 91 articles. After extracting the relevant data, we identified emergent themes and sub-themes and grouped the studies according to their overarching themes to search for higher order concepts.

This process of theme identification enabled us to develop an overarching conceptual framework, which we term the 'crisis response framework' which is shown schematically in Fig 2.3.

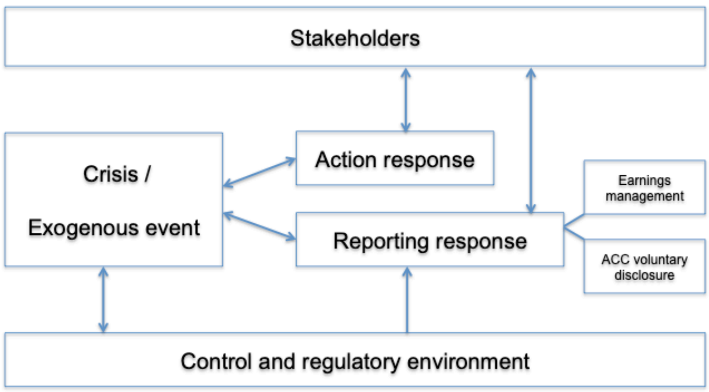

Figure 2-3 Crisis response framework

As outlined above we are primarily interested in how firms respond to three types of crisis or material exogenous event: - a corruption scandal; a recession; and new transparency legislation. Our crisis response framework depicts a crisis (or exogenous event) as the trigger leading to the two corporate outcomes of interest - i.e. corporate *action* in terms of managerial decision-making, and corporate *reporting* (manifested in (i) earnings management and (ii) voluntary disclosure behaviour) – both of which are constrained or directed by the firm's dynamic interactions with key stakeholders. Moreover, a firm's reporting response is subject to, and heavily influenced by, oversight and guidance within the pervading control and regulatory environment. We adopt the crisis response framework as we summarise the key findings from the literature and identify research gaps by considering crisis events as dynamic situations within the context of the primary components of this framework, i.e.

(i) Control and regulatory environment
(ii) Crisis – action response
(iii) Crisis – reporting response

In Fig. 2.3 the two-way arrow linking the control and regulatory environment to the crisis event represents the reality that legislation may be an exogenous event that can trigger a crisis-like situation, and equally that a crisis that is sizeable can result in increased regulation – an example being the Sarbanes-Oxley regulation that was enacted in 2002, primarily following a series of corruption crises at Enron and other entities in 2001/2002. The regulatory environment also dictates how a firm should report its results and communicate with the public, in the form of accounting standards and corporate regulation, which is depicted in our diagram with a unidirectional arrow linking the control environment to the reporting response. Also in Fig. 2.3 each of the responses (action and reporting) is linked by two-way arrows to (i) the crisis event, which reflects the dynamic relationship that exists between crisis and crisis response – i.e. depending on the choices made each could serve to stabilise matters and help regain legitimacy, or deepen the impact of the crisis; and (ii) the stakeholder group, reflecting the dynamic and on-going nature of this interaction in a crisis situation which provides for feedback and the ability to amend responses to optimise trust repair and legitimisation in the eyes of this critical participant group.

2.3.3 Control and Regulatory Environment

18 of the final 91 papers that make up this SLR cover control and regulatory issues affecting companies, In addition, the impact of key legislation (IFRS and SOX) on earnings management specifically are covered in several papers in the relevant section on corporate reporting.

The studies fall into three sub-groupings comprising (i) fraud and corruption; (ii) internal controls; and (iii) external regulation, which we review sequentially.

Fraud and corruption

There have been many well-known fraud or corruption scandals that have beset companies in recent years (Soltani, 2013). Perhaps not surprisingly therefore, there is a deep and rich research literature that covers fraud and corruption. Consequently the seven papers comprised within this review that deal with fraud and corruption necessarily represent a snapshot of this vast research domain and primarily represent literature reviews or conceptual summaries of the field covering: - financial statement fraud (Hogan et al., 2008; Kalbers, 2009; Trompeter et al., 2013); ethics in business (Rockness and Rockness, 2005); corporate culture (Hess, 2009; Soltani, 2013); and management behaviour (Cohen et al., 2011). In the section on internal controls we consider the specific case of procurement fraud (Rendon and Rendon, 2016) and the associated implications on the effectiveness of internal controls.

Three key themes emerge from these studies. First, the most commonly studied form of economic crime causes the most financial damage but is the least prevalent in actual companies – i.e. financial statement fraud (Kalbers, 2009). As outlined above, according to ACFE (2016), the other two main types of corporate abuse are corruption and asset misappropriation: - however, as our primary interest is in corporate wrongdoing and any ensuing crisis, we are less interested in the definitional difference between fraud, corruption and asset misappropriation, and will henceforth use these terms interchangeably. The key point to note though is that research on corruption per se is somewhat limited compared to studies on both financial statement fraud and on the related area of earnings management, being a management practice which is not illegal but which is often used as a proxy for fraudulent behaviour (Jones, Krishnan, and Melendrez, 2008; Dechow et al., 2011), and can give important insights into the prevailing culture around ethical behaviour and control (Bauer, 2016). Second, most studies look at corruption from a behavioural perspective through the theoretical lens of Cressey's (1950) fraud triangle model (pressure, opportunity, rationalization), focussing on "pressure" or incentive (Trompeter et al., 2013); Hogan et al., 2008), and stressing how weak corporate governance generally contributes to opening up the "opportunity" side of the fraud triangle (Kalbers, 2009; Trompeter et al., 2013). Third, there is a broad consensus amongst scholars of the importance of the corporate ethical and cultural environment in an organization as a key preventative tool, and in particular having the right 'tone at the top' to set and communicate the appropriate ethical culture (Cohen et al., 2011; Hess, 2009; Rockness and Rockness, 2005). Indeed Soltani (2013) made a comparative analysis of six financial scandals in the US and Europe through the lens of ethical climate theory - a multi-dimensional construct incorporating ethical culture, tone at the top, and ethical leadership – finding significant similarities across very different corporate and regulatory situations.

Internal controls

Internal controls are a critical part of the internal governance structure of an organization (Bauer, 2016). What started out in the early 19th century as a mechanism to achieve a positive goal – i.e. help a company meet its objectives – internal control has since become a complex aspect of governance focused on the negative pursuit of preventing errors and fraud, and the audit of these controls (Cunningham, 2003). This review encapsulates six studies that focus on internal controls and their effectiveness in dealing with attendant risks facing a business relating to (i) fraud generally (Donelson, Ege, and McInnis, 2017; Ge et al., 2018; Cunningham, 2003); (ii) procurement fraud (Rendon and Rendon, 2016); (iii) tax errors (Bauer, 2016); and (iv) earnings management (Katmon and Al Farooque, 2017).

Before we consider the emergent themes from these studies, it is important to clarify our terminology. There are three principal forms of internal control: - (i) operational controls, were the first type to emerge and deal with assuring the achievement of some corporate objective, including for example, segregation of duties; (ii) accounting controls, which first appeared in the 1920s and focus on financial accounting and safeguarding assets; and (iii) compliance controls, which appeared during the 1970s and deal with various protocols and systems to prevent for example bribery (Cunningham, 2003). During the 1990s the Committee of Sponsoring Organizations (COSO) collapsed all categories into a single heading called "internal controls". It is also important to point out that SOX uses a slightly different terminology – this legislation refers to "*internal controls over financial reporting*", being "mechanisms intended to safeguard assets and assure that transactions are properly authorized, recorded and reported to enable preparing fairly-presented financial statements" (Cunningham, 2003) – which are distinct from operational and compliance controls. For ease of reference, in this review we will adopt the COSO terminology and refer to "internal controls" to cover all relevant forms of corporate control (financial, accounting, compliance and operational).

Four primary themes emerge from the studies in our sample. First, empirical evidence in support of internal controls reducing fraud is surprisingly limited and mixed (Donelson, Ege, and McInnis, 2017; Bauer, 2016), albeit Ge at al. (2018) found that strong controls do curb extraction of assets by managers and shareholders in China. Second, there seems to be general agreement amongst scholars that we are expecting too much from internal controls (Rendon and Rendon, 2016; Bauer, 2016) – for example Cunningham (2003) argues that often internal controls are designed according to whether they are "auditable" rather than being likely to be effective. Moreover, Katmon and Al Farooque (2017) report that whilst corporate governance controls such as board oversight can help reduce overly aggressive or harmful earnings management practices, disclosure plays a more effective monitoring role. Third, several scholars point out that despite what is disclosed about internal controls in financial statements, in reality oftentimes management is "going through the motions" and engaging in window-dressing by only partially or inadequately implementing reported controls, or worse still overriding controls for opportunistic purposes (Ge et al., 2018; Rendon and Rendon, 2016; Bauer, 2016). Lastly, it seems that weak internal controls do contribute to negative outcomes for companies: – for example, inefficient and costly tax accounting (Bauer, 2016); increased risk of some specific types of fraud such as procurement fraud which involve collusion and overriding the most basic controls (Rendon and Rendon, 2016); and costly spill-overs beyond financial reporting that negatively affect operations and which signal pervasive problems with weak risk management and tone at the top (Bauer, 2016).

External regulation

The final piece of the "governance mosaic" affecting companies (Cohen, Krishnamoorthy and Wright, 2004) relates to the influence of external regulation and legislation which dictate how firms should act and report.

Five papers make up this component of the SLR and deal with the impact on corporate behaviour following two regulatory changes that have materially affected organisations over the last 20 years or so: - (i) the introduction of SOX (Jarvinen and Myllymaki, 2016; Ge, Koester & McVay, 2017; Carter, 2013) and (ii) the adoption of IFRS in many countries since 2005 (Oz and Yelkenci, 2018; Doukakis, 2014).

SOX was enacted as a direct response to the well-publicised failures of corporate governance around the turn of the millennium affecting the likes of Enron and WorldCom, with the primary objectives of (i) deterring fraud, and (ii) increasing reporting transparency through the maintenance of strong internal controls (Carter, 2013). Despite the intervening period since SOX was introduced, empirical evidence suggests that success around both objectives is mixed (Jarvinen and Myllymaki, 2016; Ge, Koester & McVay, 2017). The most revolutionary aspects of SOX relate to the mandatory requirement for (i) CEOs to confirm the validity of their firm's financial reports; and (ii) external auditors to report on the strength of internal controls (Carter, 2013). More specifically, SOX Section 404 requires management to report annually on its assessment of controls, and to disclose any "material weaknesses" (MWs) (Jarvinen and Myllymaki, 2016).

From the studies under review we identify three important themes. First, on balance it seems that managers do not fully appreciate the cost of having weak internal controls (versus the incremental cost of hiring external auditors), despite evidence showing that overall the cost/benefit trade-off arising from SOX is positive (Ge, Koester & McVay, 2017). Second, SOX seems to have had other unintended consequences that affect the capital structure around debt – i.e. (i) although SOX reduces information asymmetry, overall debt ratios are higher post-SOX as equity remains pricier; (ii) firms loaded up on debt immediately pre-SOX in the expectation that increased disclosures would increase the cost of debt; and (iii) those firms which practiced high levels of earnings management pre-SOX ended up with less debt post-SOX, as they were forced to reveal weaker earnings which affected their ability to obtain debt

(Carter, 2013). Lastly, SOX seems to be associated with higher quality earnings as proxied by accruals-based measures – we defer the discussion of the impact on real earnings management to the section dealing specifically with this type of earnings management below – with a clear association between weak internal controls and poor tone at the top (Jarvinen and Myllymaki, 2016).

The adoption of IFRS is the most significant regulatory change to affect global financial reporting in the last 30 years, with all EU registered companies being mandated to use this since 2005 (Doukakis, 2014). However, the impact of the regulation on earnings management is mixed. Doukakis (2014) found that IFRS had no impact on either accruals-based (AEM) or real earnings management (REM). Conversely, Oz and Yelkenci (2018) report that IFRS had the effect of reducing the level of AEM – however this was only the case in code-law countries: - in common-law countries there was no impact, moreover legal origin was far more important in determining the type and extent of earnings management that companies engage in.

2.3.4 Crisis – Action Response

We now turn to the first type of response to a crisis or exogenous threat in our analysis which companies employ, which is often termed "crisis management" in the literature – i.e. this term denotes the strategic management decisions that are implemented as actions in response to the crisis – as opposed to what is merely communicated, reported or disclosed which we cover in the next section. Our SLR incorporates 17 papers that deal with crisis management action responses, all of which draw primarily from four theoretical perspectives: - legitimacy theory; agency theory; stakeholder theory and trust repair theory (Sun et al., 2010; Suchman 1995; Deegan, 2002; Bachmann, Gillespie and Priem, 2015). Moreover, it is evident that our sample of articles centred on actionable responses can be grouped into broad sub-themes: - corporate governance; legitimacy; and trust repair. We will discuss the key learnings from each of the sub-themes in turn.

Corporate governance

Three papers deal with the linkage of corporate governance and crisis management: - Alpaslan, Green and Mitroff (2009) draw on stakeholder theory to argue that crisis management should involve stakeholder management as its dominant approach, as opposed to looking to maximise shareholder welfare; and both Perrault and McHugh (2015) and Marcel and Cowen (2013) demonstrate the importance of the board of directors at this specific and critical point in a firm's tenure. The Alpaslan, Green and Mitroff (2009) paper adopts the Mitchell, Agle and Wood (1997) model which emphasises the dynamic nature of stakeholder salience based on the three elements of salience - i.e. power, legitimacy and urgency - a dynamic and feedback loop we have incorporated into our conceptual model. Moreover, pursuant to Alpaslan, Green and Mitroff (2009), the success of a crisis management response depends on (i) a firm's relationship with its stakeholders; and (ii) management's understanding of how stakeholders will behave in a crisis situation, aspects which we will see below are relevant to trust repair models. Dynamic change is also a feature of the Perrault and McHugh (2015) study regarding the influence of boards to gain legitimacy – where in this case the loss of legitimacy in the late stage of the corporate life cycle mirrors corporate legitimacy needs in a crisis situation – the solution being to (i) appoint independent directors; (ii) increase board size; and (iii) increase diversity on the board. In a similar vein, Marcel and Cowen (2013) argue that a crisis requires change at board level – i.e. there is need to "clean house" - to repair trust so as to demonstrate there is an understanding that governance has failed, and by jettisoning low-capital directors, the firm signals that it is upgrading the monitoring capabilities of the board.

Legitimacy

Four papers in our sample are focused on the linkage between legitimacy and crisis management (Deegan, 2002; Sun et al., 2010; Suchman, 1995; and Aerts and Cormier, 2000). Of the four theories that scholars most often draw on to explain crisis management referred to above, legitimacy theory is the dominant theoretical perspective that underlies the field, as detailed in the seminal study by Suchman (1995) which sets out types of legitimacy and strategies for gaining, maintaining and repairing legitimacy. The Deegan (2002), Sun et al.

(2010) and Aerts and Cormier (2000) papers primarily deal with how disclosure is linked to legitimacy.

Legitimacy theory is a systems-oriented theory which posits that organizations are part of a broader social system that “licenses” them to operate based on their perceived legitimacy, an idea which is related to the concept of “social contract” (Deegan, 2002). Consequently, legitimacy is a resource needed for survival, and which can be manipulated (Woodward, Edwards, and Birkin, 2001) or revoked if the organization fails to meet expectations (Deegan and Rankin, 1996). Loss of legitimacy oftentimes constitutes a crisis situation, meaning that a firm must take action to restore legitimacy (Deegan, 2002). Suchman (1995) describes three types of legitimacy that are relevant to a company; - (i) pragmatic, which deals with the self-interested concerns of the firm’s immediate audiences such as controlling shareholders; (ii) moral, which is concerned with demonstrating a positive image of the organization; and (iii) cognitive, which derives from a common understanding of norms and frames of reference affecting the organization (Wang, 2010). Suchman (1995) then goes on to outline strategies for gaining, maintaining and repairing legitimacy, mapped to the three forms of legitimacy that are of primary interest to managers at any specific time, which as we outline below are insights that have been developed and built upon by scholars of trust repair.

The use of voluntary disclosures to gain or restore legitimacy show conflicting results: - Deegan (2002) found support for a legitimacy theory explanation underpinning sustainability report narratives about environmental issues, whereas no such association was seen in the Sun et al. (2010) study. Finally, mixed results were also reported by Aerts and Cormier (2000), in this case in the use of press releases and environmental disclosure as legitimization tools in annual reports: – negative media attention resulted in higher press release activity by companies as a means of restoring legitimacy, but there was no association with annual report narratives.

Trust repair

Ten papers in the sample deal primarily with trust repair, comprising trust repair models (Pfarrer et al., 2008; Wang, 2010; Gillespie and Dietz, 2009; Bachmann, Gillespie and Priem, 2015; Coombs, 2006); case studies (Eberl, Geiger, and Aslander, 2015; Gillespie, Dietz &

Lockey, 2014; Guo et al., 2018); and literature reviews (Bozic, 2017; Hutchins and Wang, 2008).

A number of themes emerge from the five studies which present trust repair models. The models presented by Pfarrer et al. (2008), Gillespie and Dietz (2009) and Bachmann, Gillespie and Priem (2015) all set out broad plans of action for responding to a crisis which comprise sequential stages with the goal of repairing trust with key stakeholders as soon as possible, which are thereby in line with the Alpaslan, Green and Mitroff (2009) model for stakeholder management discussed above. The Pfarrer et al. (2008) model comprises four stages (discovery, explanation, penance, rehabilitation); as does the Gillespie and Dietz (2009) model for which there is some level of overlap of stages (immediate, diagnosis, reforming interventions, evaluation). Bachmann, Gillespie and Priem (2015) set out a 6-stage comprehensive model which incorporates elements from both the earlier models, with stages focused on: - sense-making; relational; regulation and formal control; ethical culture and informal control; transparency and accountability; and trust transference. All three models can be seen to specify the need for three distinct sequential phases devoted to (i) information gathering, (ii) taking control, and (iii) changing culture. The Wang (2010) and Coombs (2006) models take different approaches to the goal of repairing trust. Wang (2010) adopts a contingency perspective and argues that the effectiveness of a crisis response strategy depends on the antecedent conditions, consequently it will be necessary to look at restructuring at two levels: - (i) organizational; and (ii) business structure, whereas most trust repair models only consider the former. As a result, firms must look to take dissociative actions at both levels (e.g. dismissing the CEO and selling or closing a dysfunctional unit), as well as creative actions (e.g. creating monitors at board level and forming or buying respected business units). Lastly, Coombs (2006) applies the Situational Crisis Communication Theory (SCCT) to crisis response whereby management actions are carefully matched to the nature of the crisis in terms of (i) responsibility for the crisis; and (ii) the level of reputational damage inflicted, an approach which is similar to the contingency perspective taken by Wang (2010). Moreover, the Coombs (2006) model establishes the need to examine stakeholder perceptions of crisis response strategies, which further emphasises the dynamic and on-going nature of interactions necessary within a stakeholder management strategy to repair trust in a crisis situation (Alpaslan, Green and Mitroff, 2009). Finally, it is apparent that all five models draw heavily on the early work of Suchman (1995), and build on the gain-maintain-repair framework for matching responsive action to the primary legitimacy management need.

We can also draw some interesting themes from the three papers which deal with case studies from three very different parts of the world: - (i) Eberl, Geiger, and Aslander (2015) look at the aftermath of the Siemens AG bribery scandal (which is also covered in papers in our sample from a voluntary disclosure perspective below – i.e. Blanc et al., 2019; Islam et al., 2015; and Dissanayake, Islam and Dellaportas, 2011); (ii) Gillespie, Dietz and Lockey (2014) study the scandal affecting Severn Trent Water in the UK; and (iii) Guo et al. (2018) assess the response to trust violation in China. First, there is conflicting evidence around the trust vs. control debate – viz a viz whether it is preferable to strive to restore control as a primary early goal, or to allow more flexibility – Eberl, Geiger, and Aslander (2015) report that too much control and monitoring of staff can actually diminish trust, and that a preferable strategy is to develop both formal and informal controls even in the early stages of trust repair, ideas that are mirrored in the Gillespie, Dietz and Lockey (2014) case findings which argue for early attempts to re-establish trust and connectivity with staff through culture change, and forging a positive organizational identity, i.e. a combination of formal and informal controls. Second, a related aspect of trust repair strategies relates to the trade-off between speed of action vs. the comprehensiveness of the action. Guo et al. (2018) argue that the first three stages of the Gillespie and Dietz (2009) model (immediate, diagnosis, reforming interventions) should comprise timely, comprehensive, and comprehensive interventions respectively, in other words, beyond the immediate response stakeholders desire to see sufficiently persuasive, detailed and compelling responsive actions if trust is to be regained, which includes actions to change senior management ("changing of the guard" - Gillespie, Dietz & Lockey (2014), and which cut across leadership, cultural and structural levels (Eberl, Geiger, and Aslander, 2015). Third, all three case studies stress the dynamic nature of stakeholder interaction in a real-world crisis situation, i.e. in support of the various trust repair models discussed above and the theoretical work on the stakeholder crisis management model posited by Alpaslan, Green and Mitroff (2009).

The two literature review papers in this sample provide useful background and context for understanding trust repair from two different perspectives: - Hutchins and Wang (2008) present an internal view from the perspective of the human resource department; whereas the

Bozic (2017) study summarises literature from the external viewpoint of a consumer impacted by trust violation. Both papers endorse extant repair models summarised above, albeit Hutchins and Wang (2008) argue for the closer involvement of human resource professionals in implementing response strategies, and Bozic (2017) questions when trust repair actually happens, and indeed whether complete consumer trust repair is feasible in the real world.

2.3.5 Crisis – Reporting Response

Overview

The second type of crisis management response constitutes communication with affected stakeholders and publicly – i.e. corporate reporting and disclosure. Firms have two primary choices in how they go about disclosing information: - (i) they are mandated to make certain non-voluntary disclosures in the form of published annual (and maybe quarterly) financial statements; and (ii) they are free to voluntarily disclose information (as they deem appropriate) in the form of narratives in published accounts (and in other non-mandated documents such as a sustainability report), as well as through press releases. In respect of the former, firms can influence financial reporting, including in relation to a crisis or exogenous shock situation, by engaging in earnings management, an area of research that has been studied extensively over the last 30 years. On the other hand, voluntary disclosure is a less studied area of corporate communication but has seen a rapid rise in scholarly attention over the last five years or so, most notably in relation to anti-corruption narratives in a crisis situation and how these can be interpreted from a legitimacy perspective.

This sub-grouping of studies in our sample, which deals with management's reporting response to a crisis, constitutes one of the three broad literature domains identified within the SLR, however it accounts for more than half of all papers in our sample (i.e. a total of 56 articles). This relative weighting primarily reflects the extent of academic focus on earnings management in recent years (39 papers), with 17 papers covering voluntary disclosure studies.

Within the earnings management domain there has been theory and conceptual development and a shift in academic focus from accruals-based earnings management (AEM) – for which extant models are reasonably well established – to real earnings management (REM) which involves the manipulation of operational decisions, a development which is highly relevant to our interest in crisis situations. In our sample, seven papers comprise purely AEM studies; eight cover purely REM studies; 14 incorporate both AEM and REM measures; and a further 10 papers deal with the relationship between earnings management and the specific situation of a financial crisis. Within the area of voluntary disclosure, two broad sub-themes emerge: - (i) impression management (eight papers); and (ii) ACC-related disclosure (nine papers). We will first cover non-voluntary disclosure relating to earnings management, and then discuss voluntary disclosure, adopting the sub-theme groupings as above.

(i) Non-Voluntary Disclosure - Earnings Management

Background and theoretical underpinnings

Earnings management is not illegal, nor does it breach any accounting standards (Gunny, 2010). Rather, it comprises management practices which extensive research over a number of years has shown to be real and commonplace in how financial information is chosen to presented, and which is perhaps best captured in the definition provided by Schipper (1989):

"A purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain [as opposed to, say, merely facilitating the neutral operation of the process]…. A minor extension of this definition would encompass "real" earnings management, accomplished by timing investment or financing decisions to alter reported earnings…"

This definition is useful as it sets out the motivational driver ("for private gain") as well as implicitly delineating the two best known forms of earnings management – accruals-based earnings management (AEM) which does not impact cash flow, and real activities-based earnings management (REM), which does impact cash flow and involves the distortion of operational decisions.

From a theoretical perspective, agency theory is the dominant theory that underpins most studies on earnings management (e.g. Dechow et al., 2011; Jones, Krishnan and Melendrez, 2008). Broadly speaking, the theoretical side of earnings management is reasonably well established, which perhaps explains why none of the papers in our sample are theoretical in nature. For purposes of this SLR, it is noted that the bulk of studies in our sample are centred on agency theory based on the seminal work of Berle and Means (1932) which outlines the basic struggle for corporate control between shareholders and managers (Xie, Davidson and DaDalt, 2003). Relevant to this perspective is the monitoring role of the board and audit committee who play a pivotal role in preventing moral hazard and self-seeking opportunistic behaviour, including through earnings management (Dechow et al., 2011; Jensen and Meckling, 1976). More recently, agency theory has been augmented by a number of related theories which primarily deal with the influence of governance and control mechanisms on earnings management: - for example (i) institutional theory, which suggests that the board monitoring role can be undermined by "ritualistic" role-taking behaviour (Cohen et al., 2010); and (ii) managerial hegemony theory, which is based on the assumption that effectively management selects the key governance members who therefore operate in symbolic roles under management control (Beasley et al., 2009). Other related theories consider alternative incentives to manage earnings – for example linked to bank monitoring in respect of the cost of debt, and other transaction costs (Rosner, 2003). Finally, for completeness we note that more recently behavioural theories based on the Cressey (1950) fraud triangle are being increasingly explored (Trompeter et al., 2013; Hogan et al., 2008; Mayhew and Murphy, 2014).

AEM

Seven of our sample of 39 earnings management-related studies deal solely with AEM, and include three of the "classic" studies in the field (Jones, 1991; Dechow, Sloan and Sweeney, 1995); Kothari, Leone and Wasley, 2005). The three others include summaries of the current state of the fields affecting (i) earnings quality (Dechow, Ge and Schrand, 2010; DeFond, 2010); (ii) the predictive power of AEM models (Jones, Krishnan and Melendrez, 2008); and (iii) the association between EM and corporate governance (Xie, Davidson and DaDalt, 2003). It is clear from these papers that the study of AEM took off from the late 1980s and has since expanded rapidly, which DeFond (2010) explains came about in part due to increased interest in earnings quality. Jones (1991) was the first scholar to apply an empirical test of 'abnormal' discretionary accruals based on the residual between estimates for total accruals and changes in revenues and fixed assets, using data which can be found in published financial statements. Subsequent models have built on the Jones (1991) model, most notably Dechow, Sloan and Sweeney (1995) who created the 'modified Jones model' which backs out credit sales from the change in revenues, and controls for financial performance. The Kothari, Leone and Wasley (2005) model also controls for performance by calculating performance-matched discretionary accruals. Since 2005 other AEM models have appeared which are primarily based on the these "classic" models: - as Jones, Krishnan and Melendrez (2008) show, although there is no outright "winner" amongst the AEM models, the most adopted and cited amongst scholars is the modified Jones model. Dechow, Ge and Schrand (2010) question whether in fact AEM serves to reduce earnings quality in practice, on the basis that investors typically discern such practices and 'undo' the effects of earnings management. Finally, Xie, Davidson and DaDalt (2003) conclude that the board and audit commit are important constraints on the level of AEM, particularly when they meet more frequently and comprise more financially informed members, a finding which is only partially in line with that reported above by Katmon and Al Farooque (2017) regarding the effectiveness of board oversight to curb harmful earnings management practices.

REM

Our sample contains eight papers that focus exclusively on REM as a form of earnings management, and includes the seminal study by Roychowdhury (2006) which first introduced models to compute REM. The other seven papers all confirm the presence of REM practices in studies which consider various motivations (Gunny, 2010; Paredes and Wheatley, 2017; Amoah et al., 2017; Eldenburg et al., 2011; Bereskin, Hsu and Rotenberg, 2018; Pappas, Walsh & Xu, 2019; and Li (2019).

Pursuant to Roychowdhury (2006), managers are incentivised to improve reported earnings by distorting operational decisions through three methods: - (i) the abnormal use of price discounts to increase sales (REM_{CFO}); (ii) manipulation of production to distort COGS (REM_{PROD}); and (iii) abnormal use of discretionary expenditures (REM_{DISX}). As we show below, more recent studies of REM have shown that firms also use these REM techniques to reduce earnings for various reasons, including to avoid scrutiny (Eldenburg et al., 2011) and to reduce tax (Zeng, 2014). Gunny (2010) adds a fourth type of REM based on asset disposals as a means of inflating earnings, and finds evidence that managers use this method as well as REM_{DISX} and REM_{CFO} to distort reported results. Three studies focus specifically on REM_{DISX} as the selected measure of REM manipulation, on the basis that this is the preferred method based on (i) survey data from managers (Li, 2019) as it includes R&D which is associated with high information asymmetry due to its complexity and uncertainty (Bereskin, Hsu and Rotenberg, 2018); and (ii) because it includes sundry expenditure which is relatively easy to manipulate for purposes of overspending (Eldenburg et al., 2011). However, REM_{DISX} is associated with negative consequences in the form of reduced innovation when used to curtail expenditure on R&D (Bereskin, Hsu and Rotenberg, 2018), and is linked to weakened earnings quality (Li, 2019). Another cost associated with REM usage cited amongst the papers under review includes increased borrowing costs (Pappas, Walsh and Xu, 2019), as lenders are able to detect this form of manipulation and punish it. Finally, the Paredes and Wheatley (2017) study considers the impact of national culture on the prevalence of REM, finding that (i) emerging countries are not more prone to high REM usage, possibly because high growth obviates the need; and (ii) that countries with high levels of individualism engage in reduced levels of REM; and the Amoah et al. (2017) study reports managerial use of both REM_{PROD} and REM_{DISX} for purposes of option backdating to manipulate stock prices. In summary, the studies on REM provide strong support for this form of earnings management manipulation as measured using the Roychwodhury (2006) models.

AEM and REM in combination

The 14 papers in the sample that consider both AEM and REM mostly confirm the respective findings of the single method AEM/REM studies reviewed above. However, when AEM and REM are studied in combination the findings offer deeper insights into the situations in which management resort to earnings management, the extent to which both techniques are used, and if so the nature of the AEM/REM relationship. A number of broad sub-themes emerge from these studies affecting AEM and REM as related phenomena which can be grouped as: - (i) substitution/ complementary relationship; (ii) events involving external scrutiny or regulation; (iii) events involving internal scrutiny; (iv) REM and AEM as income reducing strategies; and (v) earnings management linked to language. We briefing summarise the findings for each sub-theme.

First, there has been a great deal of work that has considered the nature of the relationship between AEM and REM which commenced with the pivotal work by Cohen, Dey and Lys, (2008). This study looked at earnings management practices before and after SOX, finding that the relationship post SOX became one of substitution. A similar substitute relationship was also reported in seven other studies in our sample, i.e.: - Zang (2012); Chan et al. (2014); Kothari, Mizik and Roychowdhury, (2012); Francis, Hasan and Li (2016a); Francis, Hasan, and Li (2016b); Enomoto, Kimura and Yamaguchi, (2015); Garg (2018). By contrast, three studies reported that AEM and REM interacted as complements (Wongsunwai, 2013; Leone & van Horn, 2005; and Zeng, 2014); and one study found evidence for both forms of relationship depending on the specific type of REM considered (Hamza and Korta, 2018). Most studies argue that firms prefer AEM to REM when (i) they face heightened scrutiny because the latter is more difficult to detect, albeit costlier (e.g. Cohen, Dey and Lys, 2008; Kothari, Mizik and Roychowdhury, 2012); and (ii) where investor protection is generally weaker (Enomoto, Kimura and Yamaguchi, 2015), with weaker protective locations seeing AEM and REM being used as complements (Hamza and Korta, 2018).

Second, several studies consider the impact on earnings management practices of specific corporate events which attract regulation or external scrutiny. As indicated above, SOX falls into this category (Cohen, Dey and Lys, 2008), as does seasoned equity offerings (SEOs) which is the subject of two studies in the sample (Cohen and Zarowin, 2010; Kothari, Mizik and Roychowdhury, 2012); and Garg's (2018) assessment of the effect of changes to the rules around internal control certification. All these studies show consistent results in that enhanced resulting scrutiny led to reduced levels of AEM and increased incidence of REM, as first seen in the SOX study (Cohen, Dey and Lys, 2008). We note one exception from the papers in the sample which relates to the impact of an impending tax rate reduction in China, where the magnitudes of *both* AEM and REM increased to deflate earnings, a finding which may reflect the relatively reduced level of regulatory scrutiny in that specific market.

Third, two papers deal with the effect on earnings management of corporate events that attract scrutiny primarily from inside the company or from connected parties: - Chan et al. (2014) looks at clawbacks, and Wongsunwai (2013) considers IPO lock-ups in start-up situations. Chan et al. (2014) find that clawbacks have a similar effect as does regulation, i.e. REM increases and AEM falls as these are substituted as a result of the heightened internal scrutiny. Interestingly, Wongsunwai (2013) finds that the impact on earnings management is dependent on the quality of oversight provided by the VC backers – if this is high quality then both AEM and REM fall because the scrutiny is sufficiently detailed and insightful that both forms of manipulation will be uncovered, a finding which raises questions about the quality of oversight elsewhere where REM rises as AEM is curtailed by enhanced scrutiny or prevailing investor protection safeguards.

Fourth, three studies deal with situations in which REM methods are used to deflate earnings (Leone and van Horn, 2005; Francis, Hasan, and Li, 2016b; Francis, Hasan and Li, 2016a), which is a subject that is under-studied in the literature as the bulk of work on REM (and AEM) has looked at income-increasing motivations. The Leone and van Horn (2005) study was performed in the not-for-profit sector and found that REM_{DISX} and AEM were both used as complements to reduce profits to target levels, whereas the Francis, Hasan, and Li (2016b) study reported the use of AEM and REM as substitutes to reduce earnings in three situations: - (i) share repurchases; (ii) management buy-outs, and (iii) CEO option awards. The Francis, Hasan and Li (2016a) study also reported a substitution relationship between AEM and REM and noted an association between the level of REM (income increasing or decreasing) with crash risk. We suggest that (i) the increased crash risk linked to REM emphasizes the relative cost of REM, and (ii) the conflicting findings regarding the nature of the AEM/REM relationship in these studies may reflect differences in quality of the respective oversight functions in the private and public sectors.

Lastly, it is interesting to comment on the Kim, Kim and Zhou (2017) paper which deals with the standalone subject of earnings management linked to language, as this gives us some insight into how managers view the world in the context of earnings management. This study finds that in countries where language has weak future time reference (FTR) - such as Germany, i.e. where the present and future are referred to as the same construct - both REM and AEM are reduced compared to strong FTR countries (such as UK), which is explained on the basis that in countries with weak FTR language, the future is consider closer and therefore will concern managers more, such that they engage less in actions that defer consequences to the near-future in the form of earnings management.

Earnings management and economic crisis

The final sub-theme relating to earnings management concerns how earnings management is impacted by the specific situation of an economic crisis or recession. Overall, ten papers in the sample deal with this sub-theme, which can be further grouped into three distinct but related areas of study linking a firm's financial situation to earnings management: - (i) recession / financial crisis; (ii) financial distress; and (iii) leverage, from which emerge some common themes.

First, three studies relate specifically to recession (or financial crisis) which are terms scholars seem to use interchangeably (Habib, Bhuiyan and Islam, 2013; Jahmani, Niranjan and Toney, 2016; Franceschetti, 2018). All three papers limit their study to AEM. Indeed we are not aware of any study that has considered how REM is impacted in a recession. The results are ambiguous. Habib, Bhuiyan and Islam (2013) found that in a recession, financially distressed firms engage more in income decreasing AEM than do healthy firms, whereas Jahmani, Niranjan and Toney (2016) found that in a recession firms engage in income-increasing AEM to avoid reporting losses. The Franceshetti (2018) paper is a literature review study that argues that it is not possible to predict whether firms will use income decreasing or increasing AEM in a recession, as the former would fit a 'big bath' perspective and help firms negotiate better borrowing terms or more government support, whereas the latter could be motivated based on transaction cost theory grounds.

Second, three papers in the sample look at the relationship between financial distress and earnings management, and as for the recession studies above, all three solely consider AEM as the form of earnings management under review (Jaggi and Lee, 2002; Rosner, 2003; and Ghazali, Shafie and Sanusi, 2015). Reported results are contradictory: - Rosner (2003) finds a clear link between financial distress and heightened levels of AEM to conceal the situation; Ghazali, Shafie and Sanusi (2015) find no association (which may reflect the risk of enhanced monitoring by lenders or other stakeholders); and Jaggi and Lee (2002) find that AEM activity depends on the severity of distress, with income-increasing AEM seen where debt waivers have been granted, and income-decreasing AEM identified in situations of debt restructuring or waiver denial, which could be motivated by efforts to secure more lenient terms.

Third, our sample contains four papers which assess the relationship between leverage and earnings management (Anagnostopoulou and Tsekrekos, 2017; Zamri, Rahman and Isa, 2013; Lazzem and Jilani, 2018; and Alsharairi and Salama, 2011). There is only limited consistency in the findings across these studies. Both the Lazzem and Jilani (2018) and Alsharairi and Salama (2011) studies consider AEM incidence in relation to leverage, but obtain contradictory results - Lazzem and Jilani (2018) find a positive relationship which argues for a debt covenant explanation, whereas Alsharairi and Salama (2011) report a negative association between AEM and leverage in support of the control hypothesis and creditor monitoring perspectives. Zamri, Rahman and Isa (2013) consider REM incidence, and find a negative relationship with leverage which is interpreted to reflect heightened monitoring, which seems to be the first study we have come across which suggests that banks are positioned to uncover REM manipulation. Finally, the Anagnostopoulou and Tsekrekos (2017) paper, which is the only study in this sub-sample to assess both AEM and REM incidence, finds that (i) increased leverage is associated with a trade-off i.e. reduced AEM and increased REM (which would argue for the monitoring explanation, and a lack of capacity by banks to detect REM as we queried above); and (ii) at very high leverage levels the AEM/REM relationship become complementary which the authors argue is necessitated by the high level of bank scrutiny such that both forms of earnings manipulation must be utilised.

As a final point we note that taken together, the papers on earnings management provide mixed results regarding the relative preference for REM or AEM in relation to a firm's financial position and quality of governance. Bereskin, Hsu and Rotenberg, (2018) argue that because REM involves management decisions that are unplanned and reactive which may destroy value over the long term, REM is indicative of inadequate internal governance and agency issues. Moreover, as Roychowdhury (2006) reports, REM tends to reduce with better board governance and when investors are more sophisticated. Conversely, Zang (2012) finds that firms in good financial health are more likely to use REM techniques than are those in financial distress, which is rationalised on the basis that only financially strong firms have the flexibility to deviate from optimal business decisions, (which is particularly important in highly competitive industries), whereas firms in poor financial health simply do not have the financial leeway to engage in costly REM practices and so must make do solely with AEM.

(ii) Voluntary Disclosure

The second type of disclosure that is available to management is termed voluntary disclosure to distinguish it from the filings that a firm is required by law or regulation to make in some prescribed form. Such freedom in disclosure has been cited by some as contributing to the gradual erosion in the quality of financial information through the use of impression management. This can be particularly useful in times of corporate crisis (Brennan and Merkl-Davies, 2013), for example during an adverse corporate scandal situation (Lindsley and Kajuter, 2008; O'Donovan, 2002). In recent years the use of voluntary or discretionary corporate disclosure (and other communication channels such as press releases) has attracted the attention of scholars as a means of addressing legitimacy concerns, a field which initially focused on disclosures in the annual report (AR) following an environmental disaster (Patten, 1992), and which over the last ten years or so has begun to consider anti-corruption (ACC) related disclosures within ARs and sustainability reports (SRs) (Blanc et al., 2019). Indeed within this nascent field a small number of studies have considered the effect that a corruption scandal has on disclosure practices (e.g. Blanc et al., 2019), a subject which is of direct relevance to our overarching research question.

In total, 17 papers from our sample deal with voluntary disclosure in a crisis related context, which can be further grouped into two sub-categories which deal broadly with (i) impression management and disclosure (eight papers); and (ii) ACC disclosure (nine papers). We summarise the key findings and themes from these sub-groupings which we will see draw on insights primarily from six theoretical perspectives: - legitimacy theory; agency theory; stakeholder theory; signalling theory; organizational hypocrisy and façade theory; and media agenda setting theory.

Impression management and voluntary disclosure

Six of the eight papers in our sample dealing with impression management are primarily concerned with theory development, and locate voluntary disclosure within the theoretical perspectives of (i) legitimacy theory, stakeholder theory, agency theory, and signalling theory (Cotter, Lokman and Njah, 2011; Guillamon-Saorin and Garcia Osma, 2010; Brennan and Merkl-Davies, 2013); and (ii) organizational hypocrisy and organizational façade theory (Abrahamson and Baumard, 2009; Cho et al., 2015; Brunsson, 1993). Two papers are based on empirical research: - Lo, Ramos and Rogo (2017) is an empirical study which seeks to link impression management and earnings management; and O'Donvan (2002) is a qualitative study based on survey responses from senior managerial personnel. A number of themes can be drawn from these papers.

First, it is clear that to fully understand the purpose and effect of voluntary disclosure it is necessarily for the researcher to view the subject through several theoretical lenses. For example, as Brennan and Merkl-Davies (2013) argue, a narrow agency theory based approach leads to impression management being conceptualised as management manipulating shareholder perceptions of financial performance, whereas a systems-oriented perspective focuses on the manipulation of the wider stakeholder group on broader measures of performance and corporate behaviour. In so doing, the researcher needs to be aware of the very different motivations and cost/benefit considerations that may be relevant across the different theories. Indeed Cotter, Lokman and Njah (2011) suggest that the relevant theories around voluntary disclosure can be classified as either 'economic' (agency and signalling theories), or 'socio-political' (legitimacy and stakeholder theories), with the former concerned with shareholder welfare and wealth maximization, and the latter with the interests of wider stakeholders and corporate image, in which the primary motivational driver of both is to reduce information asymmetry with regards to the respective target audiences. Moreover, pursuant to both Cotter, Lokman and Njah (2011) and O'Donovan (2002), another key incentive to disclose derives from cost/benefit considerations which reflect the theoretical perspective one takes, i.e. an agency theory based view suggests that the threat of price protection and increased government taxes drives voluntary disclosure behaviour, whereas socio-political theories point to the need to be seen to operate consistently and within expectations as the driver.

Second, empirical evidence suggests that impression management and earnings management are oftentimes used in combination in published reports, being two related dimensions of opportunistic disclosure behaviour (Guillamon-Saorin and Garcia Osma, 2010), albeit there is limited research on the nature of this relationship (Lo, Ramos and Rogo, 2017). For example, managers deliberately use complex language and obfuscation in the AR to deflect attention from high usage of earnings management practices (Lo, Ramos and Rogo, 2017), or manipulate graphs, the content and positioning of narratives, and even the type of referent performance benchmarks (Guillamon-Saorin and Garcia Osma, 2010). Consequently, scholars and users of accounts should consider the likelihood that when they suspect management is engaging in either earnings or impression management, both forms of behaviour may be present.

Third, when considering how and why companies voluntarily communicate information, it is necessary to keep in mind the precarious position managers are in and the complex situation they face in seeking to balance conflicting and changing stakeholder demands (Cho et al., 2015). In such an environment managers are likely to face irreconcilable demands from different stakeholders, with the attendant risks around internal consistency and even integrity. As a result, scholars argue that it is a strategic imperative for firms to adopt a strategy of 'organizational hypocrisy' as a response to deal with a world in which values, ideas or people are in conflict (Brunsson, 1993; Abrahamson and Baumard, 2009; Cho et al., 2015). One way to practice organized hypocrisy whilst maintaining legitimacy and the continued support of stakeholders is through 'organizational façades', which are symbolic fronts designed to reassure stakeholders of the legitimacy of the organization and its managers (Abrahamson and Baumard, 2009). Pursuant to the theorising of Abrahamson and Baumard (2009), there are three forms of façade – rational (which focuses on cost/benefit considerations); progressive (which speaks to modern management practices and ideas); and reputation (which is concerned with corporate image). The different façades relate differently depending on the stakeholder and the document of dissemination (AR or SR) (Lo, Ramos and Rogo, 2017). Consequently, the findings of the studies within our sample on organizational hypocrisy and façades suggest that when analysing corporate statements (AR and SR) we should be cognisant of the potential for contradictory, nuanced and layered narrative communications with different stakeholder groups as part of a firm's impression management strategy.

ACC disclosure

The nine papers in the sample which cover voluntary disclosure specifically dedicated to ACC polices and procedures comprise: - (i) four corruption case studies (Blanc et al., 2019; Blanc et al., 2013; Islam et al., 2015; Dissanayake, Islam and Dellaportas, 2011); (ii) four comparative studies (Joseph et al., 2016; Healy and Serafeim, 2012; Blanc, Patten and Branco, 2016; Branco and Matos, 2016); and (iii) one review study (Branco and Delgado, 2012).

According to Transparency International (TI - an independent research group and consultancy that promotes ethical business practice), the degree of reporting on anti-corruption is a strong indictor of the quality and completeness of an organization's efforts to address bribery and corruption (Joseph et al., 2016). Moreover, ACC disclosure helps firms internally by providing accountability and facilitating implementation of ACC pledges, and externally by holding leaders accountable in the wider public domain (Branco and Delgado, 2012; Hess, 2009). Given this, we would expect firms to seek to enhance their legitimacy claims by making comprehensive voluntary ACC disclosures. Prior to summarising the findings and emergent themes within the selected studies, it is therefore useful to briefly remind ourselves of the regulatory and guidance framework that is available to companies regarding ACC disclosure. In short, this is a relatively new aspect of reporting which is substantially voluntary in nature and for which there is surprisingly limited guidance (Branco and Delgado, 2012). The three most well known bodies associated with ACC disclosure and transparency in reporting are (i) the United Nations Global Compact (UNGC) which launched in 2000; (ii) the Global Reporting Initiative (GRI) which periodically issues guidelines, and (iii) TI, which is more established in the fight against corruption, but came to prominence regarding ACC disclosure following its publication on the ACC disclosures and practices of leading companies which first appeared in 2009 (Branco and Matos, 2016). As an indication of the "newness" of this field, we note that guidance on how to deal with corruption was first issued by UNGC and TI in 2009, and GRI's Anti-corruption Guideline was issued as recently as 2016.

The four case studies under review all deal with the aftermath of corporate bribery scandals which threatened the legitimacy of the affected company. Siemens AG is the subject of three studies following its major scandal in 2006 (Blanc et al., 2019; Blanc et al., 2013; Dissanayake, Islam and Dellaportas, 2011); with one study devoted to each of Alcatel-Lucent (Dissanayake, Islam and Dellaportas, 2011); and China Telcom, and ZTE (Islam et al., 2015). All studies apply content analysis to assess disclosures. There are a number of broad similarities in the findings. First, all confirm that subsequent to the respective corruption crisis, ACC disclosure was substantially enhanced in line with legitimacy theory and the need to restore trust. Second, all four studies look at media coverage following the crisis and find strong support for a media agenda setting theory explanation for the association between the level of ACC disclosure increase and press attention. In addition, the Blanc et al., (2019) and Blanc et al., (2013) studies at Siemens provide support for both (i) a stakeholder theory interpretation in how the AR and SR are used to target different stakeholders (i.e. internal vs. external stakeholders respectively), and (ii) how organizational façades can be used to emphasize different aspects of ACC policy to the same stakeholder, in accordance with organizational hypocrisy and organizational façade theory.

The four comparative studies also provide consistent findings. Each study assesses published financial reports and applies guidance criteria from TI (Joseph et al., 2016; Healy and Serafeim, 2012; Blanc, Patten and Branco, 2016); or UNGC (Branco and Matos, 2016) to determine a measure of the level of compliance with the respective guidelines. Broadly, the level of ACC disclosure is poor, lacks detail, and there is a high level of non-disclosure. However, results also indicate that (i) firms in higher risk industries are starting to respond to the legitimacy threat by increasing their ACC disclosure (Branco and Matos, 2016); (ii) those firms which are exemplars in terms of ACC disclosure face fewer subsequent corruption-related media allegations, which suggests that communicated policies are being met with real action (Healy and Serafeim, 2012), and (iii) the efforts of TI to publicise corporate ACC disclosure performance seem to be creating stakeholder pressure to improve disclosure (Blanc, Patten and Branco, 2016). These findings support the view that ACC disclosure is related to potential exposure to corruption, however, notwithstanding the results of the Healy and Serafeim (2012) study, we caution that there is sparse evidence that enhanced ACC disclosure translates into enhanced ACC performance - a disconnect previously reported in relation to environmental disclosure and actions (Patten, 2002) - i.e. there is risk that increased legitimization may not result in increased transparency and accountability (Blanc, Patten and Branco, 2016), particularly in view of the reported content and quality shortcomings in ACC disclosures (Branco and Matos, 2016).

2.3.6 Synthesis of Review Findings

The body of literature reviewed in this SLR combines three broad areas of research which in composite illuminate and guide future studies on what is a complex, multi-faceted, and under-researched aspect of business risk: - a corporate crisis event. This review has shown that in a crisis situation disparate activities and behaviours, which scholars typically study in isolation – namely corporate control and regulation, crisis management, earnings management, and voluntary disclosure – can be conceptualised within a crisis response framework centred on dynamic stakeholder management. In this depiction, a crisis is the trigger for (i) remedial corrective actions to repair trust, and (ii) reporting activity to regain legitimacy through voluntary ACC disclosures and earnings management practices. These responses are primarily influenced by the permitting and constraining activities of key stakeholders, and within a control and regulatory environment that chiefly influences reporting response options.

As we discuss below when considering the research agenda, the review sheds light on a number of areas where there are gaps in our knowledge or where research findings are ambiguous. We highlight the key research gaps that motivate the research underlying this thesis in the next section. In our view, the findings suggest that the three crisis events of interest could be fruitfully explored within the crisis response framework: - i.e. a corruption crisis, new regulation that mandates enhanced internal controls, and a recession. We saw how findings from the earnings management literature are mixed in terms of how each of these events impacts AEM and REM behaviours. Moreover, although only a handful of studies have so far been conducted in the nascent field of voluntary disclosure research, particularly in respect of ACC disclosures, research points to earnings management and impression management activities as being complementary corporate behaviours. How these play out within the context of crisis management strategies, and how such strategies can be effective in restoring trust and ultimately shareholder value, in our view represent highly relevant avenues of research that taken together have relevance to companies, investors and policy makers.

2.4 Discussion

This SLR vividly demonstrates that the body of literature dealing with crisis response through actions and disclosure is relatively fragmented and incorporates highly influential scholarly work across a number of specialist disciplines spanning accounting, governance and management. Moreover, it is a dynamic and evolving field, evidenced by the fact that the bulk of articles making up this review date from 2008 onwards. Recently research on earnings management has gravitated from a focus on AEM, to looking at REM in combination with AEM. Disclosure research is moving beyond CSR and environmental concerns and starting the see the relevance of voluntary disclosure affecting ACC policies. In the same vein, academic interest in crisis management has been rekindled in light of the increased risk of a crisis hitting a company and the enhanced damage that can ensue in a world of heightened connectivity and social media influence.

It is clear from the findings that crises are decidedly complex situations. If legitimacy is to be restored in a crisis, leadership should adopt a systems-based approach comprising stakeholder management policies that are highly interactive. This must be achieved within a control and governance environment that may have been inadequate in setting cultural expectations and defining norms for appropriate earnings management and impression management behaviours. Our hope is that by exploring management behaviour in crisis situations through the crisis response framework, we can develop a more coherent understanding of what drives crisis response behaviour, and how this is shaped by stakeholders and the control environment. This will be of interest to both practitioners and policy makers. The main contribution of this review is to (i) integrate the fragmented body of research into a simplified conceptual framework; and (ii) structure the vast body of relevant research into key themes which allow us to identify interesting and important research gaps. This study represents the first attempt to consolidate and conceptualise current thinking in this way which we hope will stimulate future research that can benefit companies, practitioners and policy makers.

As indicated at the outset, this SLR has focused on studies and knowledge gained predominantly from scholarly research centred on business conducted in Anglo-American and EU settings. This exclusion criteria enabled us to access findings from the most current and highest quality research activity. We believe that important contributions to knowledge can be made in future research by taking these insights and applying them to crisis situations that occur in different economic settings which face diverse legal, cultural and business practice challenges. On such country is Brazil, which in the next section we argue is an under-researched market that has unique characteristics which will allow us to test a number of extant theories and build upon prior empirical studies undertaken in more developed markets.

2.4.1 Brazil as a Laboratory for Research

Governance and control environment

According to the World Bank (2019), Brazil has the world's 9th largest economy. On the downside, Brazil has a reputation for corruption and corporate scandals (Durnev and Kim, 2005). Prior to 2000, the economy was characterised by high protection, inefficiency and the long reach of the public sector. However, the corporate environment changed rapidly in the period 2000-2010, during which there was rapid growth as the government opened up the economy and led a privatization drive. During this period much needed corporate governance regulations and listing rules were introduced (Black et al., 2010). Empirical evidence suggests that these reforms have succeeding in improving governance and control practices, albeit from a very low base (Nenova, 2003). The most important developments affecting regulation and control in Brazil in the last decade relate to: - (i) the introduction of IFRS for listed companies in 2010; and (ii) the enactment of the Brazil Clean Company Act (BCCA) in 2014. The BCCA represents 'transparency legislation' which a number of countries have introduced as part of the global wave to combat corruption. It requires firms, for the first time, to introduce controls primarily geared to prevent bribery and related abuses affecting financial control, and to curb Brazil's "preference–seeking business culture" (Tobolowsky, 2016). Notwithstanding these developments, Leal et al, (2015) argue that the risk of weakness in the governance and control regimes in Brazil remain high due to the high concentrations of ownership and relatively low standards in measures of (i) board independence, (ii) financial disclosure and (iii) the use of audit committees (Black, De Carvalho, and Gorga, 2010).

Earnings management in Brazil

There are relatively few scholarly studies which have focused on earnings management in Brazil. Most have looked at the prevalence and drivers of AEM, for example in relation to various corporate governance factors (e.g. Black, De Carvalho, and Gorga, 2010); and the effect of IFRS which was seen to have had a similar impact as had SOX in reducing AEM and increasing the level of REM (Pelucio-Grecco et al., 2014). Indeed some scholars have started to consider REM practices, for example: - Cupertino, Martinez, and da Costa (2015) who confirmed the occurrence of REM in Brazilian companies and its association with information asymmetry between management and investors; and Martinez and Cardoso (2009) who reported that REM and AEM are used as complements in Brazil.

The Petrobras corruption scandal

The largest and most iconic company in Brazil is Petroleo Brasileiro S.A ("Petrobras"), which is a large oil and gas producer with multiple listings including in Brazil and the US. In 2014 Petrobras was caught up in a major corruption scandal ("Lava Jato") which is the largest ever corporate bribery case (Watts, 2017). Lava Jato is on-going, and has had a profound impact not only on Petrobras, but across the entire business landscape in Brazil as it resulted in intense and unprecedented interest from regulators, the public and the media in relation to corporate governance and control, and how Brazilian companies engage in business. For Petrobras itself, Lava Jato constituted an extreme form of legitimacy threat with existential risks, which necessitated management to adopt critical crisis management strategies.

Brazil as the focus of research on crisis management response framework

Taken together, we argue that the above synopsis on the situation in Brazil and the results of prior studies, suggests that Brazil represents an interesting environment in which to focus our research agenda, informed by the results of this SLR. Indeed there is a rare conflation of several unique and relevant environmental factors in Brazil that can help us understand influences that have relevance to both theory development and practice in other markets. These comprise: - (i) the Petrobras corruption scandal; (ii) the introduction of the BCCA; and (iii) the deep recession of 2015 and 2016 which saw the economy shrink by more than 7% (Yuk, 2017). Consequently, we believe that the Brazil environment represents a relevant and interesting laboratory which is overdue for scholarly attention focused on our primary research question which addresses how management deal with crisis situations through action and disclosure.

2.4.2 Research Agenda

This SLR suggests five main areas where research can be impactful.

(i) Crisis event 1 – a corruption scandal

A corruption scandal can be catastrophic for a company, both in terms of lost economic value and reputational damage. By focusing on Brazil, researchers have the opportunity to test the crisis response framework at two levels.

First, the Lava Jato scandal, which hit Petrobras in 2014, provides the opportunity to undertake a case study assessment of how the company responded to the crisis from the perspective of (i) its action response; and (ii) its ACC disclosure response. This will allow scholars to assess the relevance of a number of extant theories including trust repair, legitimacy, stakeholder management, media agenda setting, and organizational hypocrisy perspectives. Research on voluntary ACC disclosure is in its infancy: - this type of study will enable researchers to add to current knowledge regarding the value of such disclosure (i.e. specificity vs. vagueness) (Blanc, Patten and Branco, 2016), the extent to which there is a gap between what is reported and what seems to have been implemented (Branco and Matos, 2016), and the extent to which such disclosure is successful as a tool for regaining legitimacy (Blanc et al., 2019).

Second, as we outlined above, the position and influence of Petrobras in the Brazilian economy and business community is such that the Lava Jato scandal had the effect of being a 'corruption shock' which impacted the entire business community in Brazil, resulting in intense regulatory, media and public attention on business norms and controls. This provides researchers with the opportunity to test how this exogenous shock impacted the earnings management behaviour of listed companies in Brazil to assess whether there are any similarities with the impact of other events which caused increased scrutiny of reporting and controls – e.g. external influences such as SOX; and internal events such as SOEs. This would constitute novel research as no previous studies have considered the effect of a corruption shock on earnings management.

(ii) Crisis event 2 – new transparency legislation

Legislation and regulation such as SOX and IFRS guide and constrain the extent to which a firm can engage in earnings management, and to a lesser extent impression management through voluntary disclosure. Findings from developed economies are broadly consistent in demonstrating that the effect of both SOX and IFRS has been to reduce the level of AEM at the cost of more REM activity, supposedly because the ensuing increased level of attention constrains the more salient AEM actions. As mentioned above, Brazil enacted the BCCA transparency legislation in 2014 after a long period of debate and interest in the public domain around the prevalence of corruption and corporate wrongdoing in Brazil. This legislation requires firms for the first time to adopt appropriate internal control and compliance systems (or 'integrity programs'), something which involves a major upheaval for many firms in how they conduct and control business activities, which we argue constitutes an exogenous event shock or crisis akin to the introduction of SOX in the US.

Consequently, the introduction of the BCCA provides researchers with the chance to test the impact of this legislation on earnings management behaviour. No prior studies have looked at how transparency legislation affects earnings management. It is important to keep in mind how BCCA differs from SOX in three important aspects – i.e.: - (i) it has the objective of curbing bribery and corruption rather than enhancing financial control over reporting; (ii) it does not mandate leadership to formally attest to the adequacy of controls; and (iii) it does not require firms to obtain external validation of controls from independent auditors. In this sense BCCA can be seen as being 'softer' legislation. Previous research has shown that managers do not appreciate the cost of having weak internal controls (Jarvinen and Myllymaki, 2016). Research will illuminate whether managers take the legislation seriously and introduce meaningful improvements in controls as proxied by the magnitude and type of earnings management behaviour seen post enactment.

(iii) Crisis event 3 – a recession

Findings from the SLR show that scholarly research linking earnings management to recession and financial health are ambiguous. Indeed some studies support 'big bath' interpretations; others can be explained from transaction cost and debt covenant interpretations; and others find no association (Franceschetti, 2018). Since 2000 Brazil has suffered three years of recession (2009, 2015 and 2016) which provides researchers with the chance to test how this form of exogenous shock impacts earnings management behaviour in this market in which (i) there has been high growth in the period 2000 -2010; (ii) companies have relatively high levels of leverage; and (iii) bankruptcy and enforcement activity are rare.

(iv) Crisis action response – effecting dynamic interaction with stakeholders and repairing trust

Prior studies clearly show that crisis management requires a stakeholder focus rather than a policy centred on the welfare of shareholders. But how is this dynamic interaction with stakeholders actually achieved in practice? By using a case study approach, scholars can apply the crisis response framework to shed light on the interplay with and between stakeholders to assess the role of stakeholder salience and the shifting influences of power, legitimacy and urgency (Alpaslan, Green and Mitroff, 2009).

Moreover, by focusing on the Brazil corruption crisis that befell Petrobras, scholars can test how and the extent to which trust repair models are workable, and if successful when and how trust was regained (Bozic, 2017). This will allow researchers to assess (i) how both symbolic and substantive actions are implemented (Perrault and McHugh, 2015); (ii) what stages comprise a crisis management strategy (e.g. Bachmann, Gillespie and Priem, 2015); and (iii) how actions are tailored depending on the overriding gain-maintain-repair trust objective (Suchman, 1995). Another fruitful avenue that this type of study opens up relates to investigating the trade-off dilemmas that managers invariably face in such situations, viz a viz speed vs. comprehensiveness of the initial crisis response (Gillespie and Dietz, 2009); and trust vs. control as a key early strategic imperative (Eberl, Geiger and Aslander, 2015). The latter will also allow researchers to touch upon the themes of organizational identity and how culture change might be implemented following a crisis.

Finally, the case study method will permit scholars to assess whether and how organized hypocrisy and organizational facades are used by management as part of an overall stakeholder management plan (Cho et al., 2015).

(v) Internal controls as a safeguard on opportunistic behaviour and tool for regaining trust

Empirical research findings are ambiguous regarding the question of how effective internal controls are in keeping wrongdoing, earnings management and impression management in check (e.g. Cunningham, 2003; Brennan and Merkl-Davies, 2013). Further study is required to address this gap. For example, there is ambiguity relating to the ability of the prevailing governance, control and compliance environment to curb AEM and REM behaviour. Research broadly shows that enhanced internal scrutiny around financial reporting and control tends to deter AEM, whereas REM is more difficult to detect and prevent yet its prevalence indicates (i) inadequate internal governance (Bereskin, Hsu and Rotenberg, 2018); (ii) internal control weaknesses, and (iii) poor tone at the top which can impact operational efficiency (Jarvinen and Myllymaki, 2016). It will be interesting to test the usage of AEM and REM in combination to see what this relationship reveals about the effectiveness of internal controls on each, which will identify where and which controls need to be strengthened.

The Board of Directors is a key part of the governance mosaic (Cohen, Krishnamoorthy and Wright, 2004), yet it has only limited influence on reducing earnings management behaviour (Xie, Davidson and DaDalt, 2003). Conversely it is cited as being crucial in effecting crisis management responses (Marcel and Cowen, 2013). A fruitful line of enquiry for researchers would be to test the effectiveness of board interactions post-crisis in terms of "cleaning house" and signalling the new way of doing business by hiring new board members to regain trust, and assessing the extent to which the new regime does in fact bring more and better monitoring oversight (Marcel and Cowen, 2013).

2.4.3 Managerial Implications

We believe that there are a number of potential implications for practitioners emanating from this review. First, the business risk presented by some form of crisis is one that has increasing currency for managers for which the potential response options are many but where time is constrained (Coombs, 2006). Consequently, our crisis response framework focused on stakeholder management provides a useful way for practitioners to conceptualize the situation which will help them to devise preliminary strategic plans. Second, management will be interested in the findings which suggest that internal controls are oftentimes limited for purposes of preventing a crisis, as well as during a crisis situation where regaining legitimacy is crucial and trust must be regained both externally and internally with key staff. Therefore forward thinking managers should take heed of the findings which suggest building the right culture and demonstrating organizational trust with staff may be more optimal than a policy of imposing inflexible basic controls. Third, management practitioners may be surprised to learn of the findings which suggest that earnings management is not a costless behaviour – rather, empirical findings suggest that REM can be costly because it involves the distortion of operational decisions which can create inefficiencies and loss of value in the longer term. Moreover, research suggests that the governance and control weaknesses that permit such activities are often pervasive and lead to spill-overs affecting other operational matters (Bauer, 2016). Consequently, management should look for evidence of earnings management and treat this practice with caution. Lastly, managers should take on board the findings relating to the benefits that are to be obtained from adopting a progressive and diligent approach to voluntary ACC disclosure. This suggests that by reporting policies clearly, and in detail, companies gain by achieving their ACC goals due to the enhanced accountability disclosure provides (Hess, 2009), as well as from the benefits of increased legitimization (Healy and Serafeim, 2011).

2.4.4 Policy Implications

There are a number of features of the conceptual framework developed in this review which are relevant to regulators and policy makers. First, the poor quality of ACC disclosures should be a matter of concern because it suggests that firm may be "going through the motions" around ACC processes and procedures, which summarised or vague disclosure may disguise. Some companies complain that they have insufficient guidance on how to report ACC activities. One option that might be considered is for accounting standards setting bodies to include ACC disclosure within the standard (mandatory) reporting template such that this stops being a voluntary disclosure, and we also suggest that entities such as TI and UNGC should look to improve their guidance documentation. Second, and in a similar vein, available empirical evidence suggests that SOX has been successful in reducing the extent of earning management, at least in respect of AEM, which some scholars claim arises because of the harsh legal ramifications associated with adverse situations around the attestation process. Transparency controls do not require confirmatory attestation by leadership - for example in the case of the BCAA in Brazil – which might limit its effectiveness. Consequently, regulators and accounting standards setters will be interested in monitoring the effectiveness of transparency legislation to assess whether more intrusive reporting is required in the future. Third, evidence indicates that internal controls are not as effective as is generally believed for preventing improper or opportunistic behaviour. Moreover evidence suggests that the quality of boards to perform effective monitoring mechanisms is open to question. This could open up firms to increased risk of enhanced and damaging REM activity, as well as other adverse outcomes affecting operational decisions where there is inadequate oversight of senior management and poor tone at the top (Jarvinen and Myllymaki, 2016; Bereskin, Hsu and Rotenberg, 2018). We suggest that auditing standards regulators should be concerned where there is evidence of high levels of earnings management generally, and might look to mandate more specific audit procedures for identifying such activity as a means of revealing potential internal and governance control weaknesses.

2.4.5 Limitations

This study represents the first systematic review of the literature relating to how firms respond to crises through their actions and reporting behaviours, an ambitious endeavour which involved consolidation of studies from several rich research domains and the formulation of a simplified conceptual framework. It is appreciated that as for any SLR, this study has some limitations. First, although we followed established best practice methodology for conducting a systematic review of this type, the need to set inclusion/exclusion criteria invariably introduces the risk that we have missed some important papers. For example, inclusion criteria stipulated articles from peer reviewed journals that rank at the 3* or 4* ABS level. This is notwithstanding the fact that we applied 'snowballing' and citation tracking steps as part of our procedures, and consulted at various times with the review panel. Overall, because of the process followed, we believe the risk we have missed important papers is small. Second, our goal in this review was to consolidate and synthesis key findings so that we could identify emergent common themes. Consequently, this necessitated a holistic approach which could have resulted in some important detailed findings not having been captured. Whilst we acknowledge this risk, because of the time afforded to the full text screening component phase of the SLR, we believe the risk to be small. Finally, as for any study in the social sciences, we must question the generalizability of the findings. In this case a key element of the inclusion criteria was to limit studies to those that dealt with North America, UK and EU. We are aware of the importance of local business culture, legal system (i.e. code law or common law), and relative strength of investor protection regulation in relation to the crisis response outcomes examined in this study, and to the importance of context generally in business situations, including corporate crises. Consequently we caution that these factors must be carefully borne in mind before the findings of this study are applied in other economic settings.

2.5 Conclusions

This paper constitutes the first SLR dedicated to a topic and research question that spans several established scholarly domains across management, accounting and finance, namely: - how do crisis trigger events impact corporate responses in the form of management actions and their reporting choices around voluntary disclosure and earnings management? The study was motivated by the desire to use the principles of SLR methodology to bring together what is a large body of disparate scholarly work and identify key themes that will help stimulate further research and help direct and influence practitioners and policy makers. Crises and exogenous shocks are a real and present danger in the business world. This paper focuses on three types: - a corruption scandal; new regulation around transparency and controls; and an economic downturn.

Studies are shown to draw on numerous theoretical perspectives (including legitimacy theory, stakeholder theory, agency theory and organizational hypocrisy theory), and encompass specialist research domains which are well established, such as earnings management, and others such as voluntary ACC disclosure where scholarly interest is at an embryonic stage. The findings demonstrate that crisis management is a complex aspect of business that requires a stakeholder management and systems-based approach to the task of regaining legitimacy through responsive action and communication via published disclosures, but which has the potential to preserve and create value if done well and within the constraints of the prevailing control and governance environment.

The primary contribution of this SLR lies in its consolidation and synthesis of the current state of knowledge of the field, which has enabled us to construct a simplified conceptual framework and identify a specific research agenda. We have suggested Brazil could be a particularly interesting laboratory for fruitful exploration of the identified research gaps. We hope that scholars will be motivated to take up this agenda in what is a nascent but growing topic, and one that provides exciting opportunities for theory development and conceptualization, and where empirical studies using both quantitative and qualitative research methods can make important contributions in diverse geographic and business settings.

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Appendix A

Appendix A-1 Themes and search strings

Theme/ Area of Coverage	Search String
[1] Crisis management (intervention) related words in a corporate context	(“crisis management”) OR (“governance failure”) OR (“legitimacy”) OR (“response strategy”)
[2] Earnings management (mechanism) related words for both accruals-based and real earnings management	(“earnings management”) OR (“earnings manipulation”) OR (“abnormal accrual*”) OR (“discretionary accrual*”) OR (“real earnings management”) OR (“real activit*”) OR (“real operation*”)
[3] Impression management (mechanism) related words referring specifically to voluntary disclosure	(“impression management”) OR (“voluntary disclosure*”) OR (“organizational hypocrisy”) OR (“organizational façade*”)
[4] Crisis situation (context) related words in relation to a financial or corruption scandal	(bribe*) OR (corruption) OR (scandal) OR (kick-back) OR (scam) OR (collusion) OR (unethical) OR (anti-corruption) OR (anticorruption)
[5] Economic recession (context) related words	(recession) OR (“economic downturn”) OR (“financial crisis”) OR (“economic crisis”) OR (distress)
[6] Legislation and regulation (intervention) related words in relation to reporting, compliance and control	(Sarbanes*) OR (SOX) OR (Sarbox) OR (“transparency regulation”) OR (“transparency legislation”) OR (FCPA) OR (“internal control regulation”) OR (“compliance regulation”) OR (“compliance legislation”)
[7] Words relating to reporting quality, and restoring legitimacy, trust and control (outcome)	(“reporting quality”) OR (“disclosure quality”) OR (“restore legitimacy”) OR (“repair trust”) OR (“restore trust”) OR (“repair image”) OR (“restore reputation”) OR (“compliance program*”) OR (“integrity program*”) OR (“internal control*”)

Appendix A-2 Relevance criteria

Criteria	Inclusion	Exclusion	Rationale
Publication Type	Peer-reviewed, scholarly and academic papers including Harvard Business Review and Sloan Management Review	Non-scholarly articles. Press articles. Conference papers.	The subjects of crisis management, earnings management and corporate fraud frequently feature in press and practitioner journals. However, much that is written is often sensationalised and/or is not sufficiently grounded in theory or supported by data because of the inherent challenge of obtaining data.
Publication Date	From 1980	Before 1980	The vast bulk of academic work in the domains of interest all started from the mid-1980s onwards
Language	English	Non-English	Rational is based on consideration of efficient usage of time given that the bulk of academic research is published in English.
Economic Region	North America, UK, Australasia, EU	Other	Primary interest is developed markets in Anglo-American and EU settings which increasingly have harmonised accounting and regulatory environments.
Unit of Analysis	Firm-level	Individual person level, industry level, country level	The review question and sub-questions focus on the firm.
Sector	Private	Public, other	Public sector bodies face different corporate governance and regulatory regimes compared to private sector players.
Industry	All except regulated industries	Regulated industries – e.g. banking, insurance, pensions	Excluded regulated industries face very different rules and regulations to, for example, prevent earnings management compared to the unit of study i.e. non-regulated industries.
Relevance to review question	Main phenomena of interest are how firms react to trigger events (corruption crisis, transparency legislation and recession) via their reporting activities and restructuring actions.	Non-corruption related crises; and non-trigger event situational causes of earnings management and impression management.	The review question and sub-questions specifically identify the drivers of interest. Other situations and causes of earnings management, impression management or crisis response / control enhancement activities are not of primary interest unless they contribute to underlying theoretical understanding.

Appendix A-3 Summary of the screening selection process

Title screening

- Started with 693 papers after removal of all duplicates
- 28 related to entirely different research areas (e.g. sociology)
- 145 related to specific industries – mostly regulated industries including banking and pensions
- 41 were eliminated because they dealt with the public sector
- 21 were eliminated because they were not published in English
- 35 were eliminated because they did not relate to the markets of interest – i.e. North America, UK or EU
- 159 were eliminated because they were not directly relevant to the review question and sub-questions, viz a viz they did not consider the aspect of corporate behaviour under review to relate with sufficient proximity to either a crisis or exogenous shock event, or to be associated weaknesses in relation to control, governance or reporting quality.
-
    - ✓ In total 429 papers were eliminated because they did not address the review question, leaving 264 to undergo abstract screening.

Abstract screening

- Started with 264 articles for abstract screening
- 7 were eliminated because they relate to a different research area
- 10 were eliminated because they relate to specific industries
- 21 were eliminated because they did not relate to the markets of interest – i.e. North America, UK or EU
- 152 were eliminated as above – i.e. because they were not directly relevant to the review question and sub-questions, viz a viz they did not consider the aspect of corporate behaviour under review to relate with sufficient proximity to either a crisis or exogenous shock event, or to be associated weaknesses in relation to control, governance or reporting quality.

    - ✓ In total 190 papers were eliminated because they did not address the review question, with 74 retained for full text screening

Full text screening

- 74 articles were retained after abstract screening. To these were added 19 from cross-referencing and 2 from review panel recommendations. Consequently a total of 95 articles proceeded to the full text screening stage

Quality screening

- Of the 95 articles reviewed, the final number retained was 91

3 Responding to a Corruption Crisis Through Disclosure and Responsive Action: The Case of Petrobras

Abstract

This case study examines how Petroleo Brasileiro S.A ("Petrobras"), a high profile company in its native Brazil with multiple listings including in Brazil and the US, responded to a major corruption scandal arising in 2014 through two means :- (i) its annual disclosures related to anticorruption and compliance (ACC) in its annual report (AR) and sustainability report (SR); and (ii) the actual remedial actions it took. We conducted a content analysis of ACC disclosures in the eight-year period 2010 – 2017, and assessed in detail Petrobras's related activities in this period. The study makes a number of contributions to this under-researched area of accounting research. We had expected the company to deal with the ensuing legitimacy crisis by adopting strategies that sought to repair trust with key stakeholders by increasing ACC disclosure pursuant to legitimacy theory, and via an evolving sequence of actions to regain control and restructure the organization pursuant to trust repair models. We found evidence in support of both. In addition, we obtained new insights into how a company uses the AR and SR to (i) target different stakeholder groups who are culpable in the scandal; and (ii) communicate differently with them to manage their respective legitimacy concerns: - findings which support stakeholder theory and organizational façade theory explanations. We believe this is the first study of its kind to look at leadership as an implicated stakeholder through these lenses. In keeping with prior studies, and based on an analysis of press attention, we also found support for a media agenda setting theory explanation underlying the rise in ACC disclosure following an unprecedented increase in the level of media interest, particularly in respect of Brazilian media coverage. Finally, our review of remedial actions taken by the company in its crisis management response shows that these align well with models of trust repair and legitimacy management, and appear to have resulted in Petrobras successfully regaining legitimacy by 2017. To the best of our knowledge this is the first study of its kind that looks in detail at a package of actions to demonstrate an evolution through the repair – maintain – gain sequence of strategies for legitimacy management following a corruption crisis. The paper concludes by setting out several areas where follow-up research could prove fruitful.

Keywords: anti-corruption, compliance, hypocrisy, legitimacy, organizational façades, trust repair, stakeholder theory, voluntary disclosure

3.1 Introduction

The cost of corruption and wrongdoing in organizations is high and shows no sign of abating, with a recent study by the Association of Certified Fraud Examiners putting the cost globally at around 5% of corporate turnover each year (ACFE, 2016). There are various means of committing economic crime including bribery, embezzlement, procurement fraud, asset misappropriation, and false accounting. Of these, only financial statement fraud has been studied in any depth at the academic level, (most likely because this makes use of publicly available data, i.e. published financial information), primarily using earnings management as a proxy for wrongdoing (Kalbers, 2009). How a company chooses to deal with a corruption or fraud crisis once discovered is less well studied, yet it can have an enormous bearing on how and when a company can repair trust and regain legitimacy, as well as on the associated financial and legal outcomes.

The limited academic research that has been undertaken on management's response to a corruption scandal has typically involved either (i) analysis of corporate disclosures in relation to anti-corruption and compliance ("ACC") (Blanc et al, 2019; Dissanayake, Islam and Dellaportas, 2011; Islam et al., 2015); or (ii) theoretical work looking at trust repair or legitimacy management models as a way of dealing with crisis management (Pfarrer et al., 2008; Bachmann, Gillespie & Priem, 2015; Gillespie and Dietz, 2009). In addition there is a small body of relevant work focused on internal controls relating to ACC, but to the best of our knowledge none of these studies has focused on controls and policies in a situation following the discovery of a corruption scandal.

The extent of disclosure related to ACC is considered by some to be a good proxy for an entity's commitment to combat corruption, and the quality of its policies, procedures and controls relating to ACC (Transparency International, 2009). In recent years, as well as publishing the annual report (AR), which is typically a legal obligation and primarily directed at shareholders, most large public organizations have chosen to also publish a less financially-based report for the wider body of stakeholders which is typically called a 'sustainability report' (SR), or some variant thereof. Although there are some general guidelines on best practice regarding the extent of disclosure of ACC policies and procedures in the AR and SR, these are not mandatory and so the choice of what and how much to disclose is essentially down to management and amounts to "voluntary" ACC disclosure. Consequently, despite the growing awareness of the need for publicly listed companies to maintain adequate controls and compliance procedures to prevent corruption and wrongdoing, and the associated risks of failure, the only source of information available to an external researcher wanting to assess the type and effectiveness of ACC policies a firm has adopted, is its voluntary ACC disclosures published in the yearly AR and SR, plus any relevant press releases.

Petroleo Brasileiro S.A ("Petrobras") is a Brazilian national oil and gas company and a key player in the Brazilian economy, with listings in Brazil and globally including in the US. In 2014 Petrobras became embroiled in a major corruption scandal termed "Lava Jato" (car wash). In order to understand how the company responded to this threat, we have examined Petrobras's ARs and SRs covering the 8-year period 2010 – 2017 to investigate: - (i) how the company disclosed information related to its ACC policies and practices; and (ii) the nature and effectiveness of management's reported responsive actions. We have interpreted our findings through various theoretical lenses including legitimacy theory, trust repair theory, crisis management theory, stakeholder analysis, organizational façades, and media agenda setting theory. We present three primary findings.

First, we find that the company responded to the crisis by dramatically increasing the level of ACC disclosure in what we term the crisis period (i.e. the year of discovery 2014 and the subsequent year 2015), and into the post-crisis period (2016 -2017), with the disclosure level falling back substantially in 2017, albeit to a level well above that in the pre-crisis period (2010 - 2013). These results are in line with legitimacy theory which posits that a company can only exist in society by virtue of it being licensed by that society, and this license can be withdrawn in the event of a challenge to the organization's legitimacy. In this case, the Lava Jato corruption scandal constituted a major challenge to Petrobras's legitimacy involving intense and sustained interest from regulators, the public and the media, and we find that Petrobras responded as predicted by legitimacy theory by voluntarily increasing its disclosure in relation to ACC so as to "regain" legitimacy (Deegan and Rankin, 1996).

Second, we also find support that the AR and SR are used to communicate differently with different stakeholder groups, particularly when the stakeholder groups in question have been associated with corruption (i.e. primarily leadership and suppliers), a finding which is in line with stakeholder theory and organizational façade models. Across the period of review we find that the AR became the primary communication channel to help repair legitimacy: - this document contains more detail but less breadth than does the SR, the latter being a document which serves a wider, less demanding audience.

Third, although we caution that the process of repairing trust and restoring legitimacy is incomplete and remains on-going, we find from a detailed assessment of the remedial actions taken by management that Petrobras has been successful in its crisis management response - which can be categorised into four components: - (i) investigate the crisis; (ii) restructure governance; (iii) dissociate from illegitimate operations and personnel; and (iv) start to change culture – actions which can be seen to align well with extant trust repair and legitimacy models. That said, we also argue that given Petrobras's position and the recent history of systemic corruption in Brazil, the company must remain vigilant to environmental risks that could yet stall the progress made so far in restoring legitimacy and strengthening anti-corruption and compliance procedures.

The rest of this paper is set out as follows. First, we outline the theoretical framework underlying this study and introduce the main theories and models we will draw upon for our analysis. Second, we provide a summary of the background to the case study and the crisis that has enveloped Petrobras. Third, we describe the research methodology used in this study. Fourth, we present in detail our results and analysis. We then discuss the results and our conclusions, and the paper rounds off with a section on the contribution made by this study and areas for further research.

3.2 Motivation and Research Questions

Crises are an unfortunate fact of corporate life. As Coombs (2006) points out, crisis management has emerged in recent years as a growing area of scholarly interest which has focused on what organizations say and do following a crisis and how management follows a crisis response strategy so as to repair organizational legitimacy and restore trust (Wang, 2010; Gillespie and Dietz, 2009). Most work has looked at environmental disaster as the form of crisis, and focused on communication and disclosure responses (Blanc et al., 2019). Other work has looked at actual management decisions taken to repair legitimacy and sought to apply legitimacy theory models to explain crisis management initiatives: - however empirical results are inconsistent (Wang, 2010).

This study looks to fill a number of gaps by considering a corruption scandal as the crisis driver (i.e. the Lava Jato scandal at Petrobras), and assessing management's crisis response in terms of both (i) ACC disclosure; and (ii) remedial actions that constitute the crisis management plan. First, by selecting a corruption crisis we are focusing on a form of crisis that is substantially under-researched – to the best of our knowledge only three previous studies have considered the impact of a corruption crisis on ACC disclosure affecting four companies:- Siemens, Alcatel-Lucent, China Mobil and ZTE (Blanc et al., 2019; Dissanayake, Islam and Dellaportas, 2011; and Islam et al., 2015). Second, unlike in the situation of a massive environmental disaster (e.g. Patten, 1992), no studies have looked at the impact of a corruption-related incident on an entire industry or geography – we argue that because of the role that Petrobras plays in the Brazilian economy, the corruption scandal that enveloped the company in 2014 represents a corruption crisis that is relevant to the entire business community in Brazil. Consequently this study is both unique and will inform related research on disclosure and the management of internal control and reporting quality in Brazil. Moreover, we believe that as Petrobras shares a number of features with similar "national champions" in developing countries (by virtue of, for example its industry, size, association with government and mixed capital structure), our findings will allow a level of extrapolation beyond Brazil. Third, very little is known about the way companies use ACC disclosure via the AR and SR to communicate with stakeholders who are implicated in a corruption crisis, so as to best manage their respective legitimacy concerns and retain support going forward (Blanc et al., 2019) – we look to add to this nascent area of study by considering how the three culpable stakeholder groups were targeted in ACC disclosure, ie leadership, employees and suppliers. Finally, this study seeks to help clarify the inconsistencies seen in prior studies linking crisis management responses actually implemented to legitimacy management and trust repair theoretical models.

Consequently, this study seeks to address the following research questions: -

1. How did Petrbras respond to the legitimacy threat caused by the Lava Jato scandal in terms of (i) ACC disclosure; and (ii) remedial actions taken?
2. In respect of the three implicated stakeholder groups (leadership, employees, suppliers) how did Petrobras (i) communicate in the AR and SR; and (ii) target remedial actions?
3. To what extent can Petrobras's crisis management responses be interpreted and understood by applying extant legitimacy management and trust repair models?

3.3 Theoretical Background and Literature Review

As indicated above, this study builds on prior work from several areas of accounting research and requires us to draw from a number of extant theories. We summarise below the most relevant theories comprising: - legitimacy theory; stakeholder theory; agency theory; signalling theory; organized hypocrisy and organizational façade theory; and media agenda setting theory.

3.3.1 Legitimacy Theory, Crisis Response and Trust Repair

Legitimacy theory is based on the central tenet that organizations are players in a wider environment or system that licenses their participation in that system through a social contract conditioned on their legitimacy. If an organization fails to meet legitimacy expectations, the licence can be revoked (Deegan, 2002; Deegan and Rankin, 1996). A loss of legitimacy oftentimes constitutes some form of crisis and can arise in several ways, with threats coming both from (i) outside the organization, such as a change in a society's demands or values (O'Donovan, 2002), or from a specific external event (Patten, 1992); or from inside the organization in the form of an internal incident (Cho, 2009). Deegan and Rankin (1996) demonstrate the type of damage that can befall an organization suffering a legitimacy loss which can seriously damage its reputation, financial standing, and even threaten its viability through: - (i) the loss of consumer, employee and capital support, or (ii) the targeted actions of lobby groups, government, or regulatory bodies. Companies will therefore seek to limit, or ideally eliminate, any legitimacy threat once identified through a crisis management response plan.

Forms of legitimacy

The research literature suggests that there are separate forms of organizational legitimacy that are relevant in a crisis management setting. Scott (1995) posits that there are three forms of legitimacy: - regulative, normative, and cognitive. Regulative legitimacy flows from compliance with relevant laws, rules and regulations. Normative legitimacy reflects the "morality" of the organization and its adherence to norms of appropriateness and "best practice" corporate behaviour. Cognitive legitimacy originates when an organization displays clarity and consistency in what it does, and thereby achieves cultural acceptance of its activities and actions which can be "taken for granted". Suchman (1995) also dissects legitimacy into three categories which are related to, or partially overlap those posited by Scott (1995), comprising:- pragmatic; moral; and cognitive legitimacy. Pragmatic legitimacy is centred on stakeholder self-interest in the on-going value of the organizational asset. Moral legitimacy reflects normative views on what the entity stands for and what is "right". Cognitive legitimacy derives from a common understanding of norms, frames of reference and definitions (Wang, 2010). By combining Scott (1995) and Suchman (1995), four major distinct forms of organizational legitimacy emerge, three which are market–driven (pragmatic, moral and cognitive legitimacy), and one which is governed by legal or regulatory authorities (regulative legitimacy) (Wang, 2010).

Developing legitimacy and repairing trust

Scholars have looked at which actions can be taken to develop legitimacy, which range from:- *symbolic*, such as merely identifying with respected institutions and displaying ceremonial conformity to best practice norms (and which thereby involve no real change or effort); to *substantive*, which involves initiating robust and transformative strategic and organizational changes (Dowling and Pfeffer, 1975; Savage, Cataldo and Rowlands, 2000).

Suchman (1995) outlined different strategies to gain, maintain and repair legitimacy. A new organization must first gain legitimacy which can be achieved in three ways:- conforming to some pre-existing model of a respected organization; proactively selecting a position within an established framework; or more innovatively manipulating a respected framework and tailoring the cultural environment in order to develop bases of support to create the required level of legitimacy. An organization maintains legitimacy by developing strategies that enable it to both perceive future changes and protect past accomplishments. Finally, there are two primary ways in which a company can regain legitimacy, i.e. by: - (i) normalizing its accounts; or (ii) initialising a restructuring process (Suchman, 1995). Account normalization is suitable when the situation involves piecemeal disclosure of, and incomplete transparency around, the scandal. In this case, robust communication is key (Wang, 2010). In situations where there has been public revelation of the scandal, the better alternative is to engage in substantive actions through a robust organizational restructuring: - Suchman (1995) argues that there are two possible forms of restructuring that best facilitate legitimacy repair :- (i) creating a monitoring mechanism; and (ii) dissociating from key leaders or persons associated with the organization.

Gillespie and Dietz (2009) proposed a 4-stage process to achieve organization-level "trust repair" comprising (i) *immediate responses* (involving verbal acknowledgment of the matter; announcement of an investigation; and commitment of resources): (ii) *diagnosis* (comprising a systematic and multilevel review that is timely and transparent); (iii) *reforming interventions* (involving making apologies where appropriate and implementing mechanisms targeted at the failings); and (iv) *evaluation* (which involves a timely, accurate and multilevel assessment of the effectiveness of actions taken). Wang (2010) argues that restructuring should not be restricted to organization*al* structure restructuring per se, but should include *operational* restructuring where a business operation is clearly culpable. Moreover, Wang (2010) shows that the form of restructuring should fit the nature of the fraud – for example; - in cases of fraudulent financial reporting, restoring pragmatic legitimacy is the primary concern of affected shareholders, in which case business dissociation is preferable; whereas in a situation of embezzlement, restoration of moral legitimacy is the primary concern and is best achieved through organizational dissociation and creation of more robust organizational structures.

Addressing legitimacy threats through disclosure

One way to address a legitimacy threat is through disclosure. Initial studies on disclosure as a strategy to combat a challenge to a firm's legitimacy were focused on environmental disasters and disclosure in the annual statement. Patten (1992) looked at the impact on corporate environmental practices and reporting following the Exxon Valdez oil spill in Alaska in 1989, and found that Exxon Valdez significantly increased its environmental disclosure post-accident, consistent with legitimacy theory. In addition, and more importantly, the Patten study found that post-accident the oil industry *as a whole* significantly increased environmental disclosure in annual reports. This finding supports legitimacy theory in that corporate perceptions (and reactions) related not just to Exxon, or to the oil spill itself, but rather to the general impact of the spill on public attitudes towards *firms in the petroleum industry* (O'Donovan, 2002). More recently, disclosure of ACC policies and procedures have been studied as a response to a possible but non-specific legitimacy threat (Barkemeyer, Preuss and Lee, 2015); Joseph et al., 2016; Healey and Serafeim 2011). Moreover, three recent studies have considered the impact on ACC disclosure resulting from a specific corruption crisis affecting the entity under study: - Blanc et al., (2019) looked at Siemens before and after their 2006 scandal; Dissanayake, Islam and Dellaportas (2011) also looked at Siemens, in addition to Alcatel-Lucent following its 2004 scandal; and Islam et al., (2015) considered the disclosure impact on two Chinese firms (China Mobile and ZTE), following corruption scandals. In each case, studies were made of disclosures in the ARs and SRs. Given the focus of our underlying research questions presented earlier, as we consider other relevant theories that can be drawn upon as lenses through which to assess organizational responses to address a legitimacy threat, we will maintain a focus on the association with disclosure in ARs and SRs.

3.3.2 Stakeholder Theory

Freeman (1994) summarised stakeholder theory in terms of its importance in addressing two questions:- (i) what is the purpose of the firm?; and (ii) what responsibility does management have to stakeholders?. The first question enables managers to consider the values underpinning why and how the various stakeholders come together and interact with the firm to create sustainable value. The second question directs managers to consider the type and nature of relationships they will foster with stakeholders to propel the organization to achieve the desired value creation. In this sense stakeholder theory paints a picture of a community of players in business where values matter, involving participants who voluntarily come together and co-operate in a mutually beneficial arrangement where financial gain is an important, but consequential, output of a stable system that persists over time. This contrasts with, for example, the shareholder value model, which posits that the measure of organizational success is the extent to which it enriches a single stakeholder group – i.e. shareholders - potentially to the detriment of others stakeholders such as employees, customers, and suppliers.

It is instructive to remind ourselves what we mean by the term “stakeholder”. Various definitions and distinctions have been suggested by scholars. Freeman (1984) defined a stakeholder broadly in terms of its ability as a firm or individual to affect or be affected by an organization in pursuit of its objectives. This covers management, employees, interest groups, regulators, suppliers, customers and even competitors (Waddock and Graves (1997); Etzion (2007); Cox (1999); Harrison and John (1996). Several researchers stress the importance of distinguishing between “internal” and “external” stakeholders:- the former comprising leadership, management and employees; and all other participants comprising the latter (Savage et al., 1991; Waddock and Graves, 1997).

The community support mechanism that underpins stakeholder theory is maintained both by the way an organization goes about doing business, and how it communicates within the group. Disclosure through the AR and SR is an effective form of communication with different stakeholders (Gray et al, 1995). A number of studies have shown that different documents primarily target certain stakeholders. For example the AR is seen as being directed at shareholders (Blanc et al., 2019), whereas the SR is concerned with other external stakeholders (Thorne, Mahoney and Manetti, 2014). As indicated above in the research motivation section, it is intriguing to ponder how companies use the AR and SR to communicate with stakeholder groups who are implicated in a corruption crisis. Indeed there have only been a handful of studies that have looked at differential ACC disclosure between the AR and SR following a corruption crisis (Blanc et al., 2019; Dissanayake, Islam and Dellaportas, 2011; Islam et al., 2015), and none of these has considered all three stakeholder groups that are culpable in the Petrobras scandal (i.e. leadership, employees and suppliers), hence we believe this aspect of stakeholder theory research is ripe for further study.

3.3.3 Agency Theory

Agency theory is relevant to stakeholder theory as it deals with the respective relationships between certain stakeholders groups – primarily the relationship between managers and shareholders, but also that between shareholders and debt holders (Watts and Zimmerman, 1978; Jensen and Meckling, 1976). An agency problem exists because of the separation of ownership and control between shareholders and management, which is compounded by information asymmetry which results in management having a better idea of the true future value of an organization than do the shareholders. Without safeguards, management could use this asymmetry to act in their own self-interest. The risk is reduced through the use of bonding and monitoring devices (Jensen and Meckling, 1976). A bonding device is some form of contractual arrangement that ties the interest of management to that of the organization. Monitoring devices ensure that management provides complete and accurate information to shareholders through the use of, for example, a Board of Directors and Audit Committee, and through the requirement for externally and internally audited financial statements. Voluntary disclosures in the AR and SR, including those dealing with ACC, also comprise important monitoring devises (Cotter, Lokman and Njah, 2011; Hossain, Perera and Rahman, 1995).

3.3.4 Signalling theory

Information asymmetry problems are also addressed in signalling theory (Akerlof, 1970), which posits that the asymmetry problem can be overcome by the party with superior information communicating or "signalling" such information to the other party by some means. Voluntary disclosure is one such way. This is intuitive when we are considering "good" news, such as improved market demand, but this is not the case concerning "bad" news, such as that surrounding a corruption crisis, which management might prefer to under-report or delay reporting (Kothari, Shu, and Wysocki, 2009). Conversely, according to Skinner (1994), in cases where bad news is or will soon be in the public domain (or where there are litigation or regulatory risks for failing to disclose relevant information in a timely manner, for example in the case of a serious corruption matter), managers will seek to use voluntary disclosure to "pre-empt" bad news to avoid litigation and/or reputational risks, and in so-doing will in fact disclose *more* information than is demanded pursuant to signalling theory (Cotter, Lokman and Njah, 2011).

3.3.5 Organized Hypocrisy and Organizational Façade Theory

It is clear from stakeholder theory, agency theory and signalling theory that an organization exists in a complex environment where multiple relationships and competing interests must be navigated at various levels of the firm. Given the different perspectives and objectives of the different players, it is inevitable that conflicts will arise that could impact a firm's legitimacy in the eyes of one or more constituent stakeholder. Management must therefore be skilled in managing such relationships which will oftentimes mean maintaining internally inconsistent narratives so as to maintain harmony between stakeholder groups, a task which could readily result in a negative assessment of a firm's integrity (Cho et al., 2015). Brunsson (2007 p.115) refers to such behaviour as *organized hypocrisy*, a practical necessity which comprises "a way of handling conflicts by reflecting them in inconsistencies among talk, decisions, and actions". Clearly, engaging in organized hypocrisy can be a risky strategy, as done badly it can raise doubts about authenticity and cause a resulting legitimacy threat (Simons, 2002) when the hypocrisy becomes salient (La Cour and Kromann, 2011), or when actions fail to deliver on the narrative (Lipson, 2007).

Given that deploying an organized hypocrisy strategy is a necessary evil for modern organizations, how can a firm skilfully pull this off? This question was posed by Cho et al., (2015) who conclude that a firm must respond as though it is a *political* entity comprising multiple sub-structures that respond to different stakeholders, as would independent or autonomous groups. The result will be some level of inconsistent messages and actions, which management is tasked with "orchestrating" into a legitimate aggregate, sufficient to satisfy the various stakeholders without revealing the underlying inconsistencies.

One lens we can use to assess such inconsistent messages and actions is organizational façade theory (Abrahamson and Baumard, 2008). An organizational façade is a "symbolic front erected by organizational participants designed to reassure their organizational stakeholders of the legitimacy of the organization and its management" (Abrahamson and Baumard, 2008, p.437). Three types of façade are identified by Abrahamson and Baumard (2008) as being particularly relevant:- rational, progressive and reputation. Each can be thought of as constituting an organizational substructure responsible for its own "talk, decisions and actions" necessary to manage conflicting demands (Cho et al, 2015). A *rational* façade has the purpose of meeting market demands and is based on logic, commerciality, legality, and cost/benefit thinking in the here and now. A *progressive* façade, as the name implies, is more about ideas, tools, processes and new ways of doing things, for example a new management system, with an eye on the future. A *reputation* façade is more holistic and relates to image, values, symbols and reputational status as espoused in a mission statement or code of business. We are aware of just two studies that have applied the principles of organized hypocrisy and organizational façade theory to assess the voluntary disclosure responses of an organization to a crisis: - Cho et al (2015) looked at environmental disclosure at Chevron and ConocoPhillips in the period 2004 to 2006; and Blanc et al. (2019), in the only study of its kind so far, looked at ACC disclosure at Siemens following its 2006 corruption scandal. In both cases, the research found evidence to support the use by these entities of organized hypocrisy strategies.

3.3.6 Media Agenda Setting theory

Media agenda setting theory (McCombs and Shaw, 1972), as the name implies, posits that the media creates, drives and shapes the public's awareness and concern for news. The theory was initially developed following a study of news coverage of the 1968 US Presidential election, since which time the power, form and range of the media have expanded enormously. This theory might serve to complement legitimacy theory affecting voluntary disclosure, based on prior studies which have shown that public pressure results in increased disclosure (Patten, 1992; Cho, Roberts and Patten, 2010). Media pressure might be expected to have the same effect as public pressure (Blanc et al., 2013). There have been several studies which confirm that the media plays a highly influential role in setting community expectations which then drives enhanced and tailored corporate communications (Islam and Deegan, 2010; O'Donovan, 2002). Recent studies looking at ACC disclosure and media attention have found similar positive correlations and support for media agenda setting theory (Blanc et al., 2013; Dissanayake, Islam and Dellaportas, 2011).

Having laid out the main theoretical perspectives we will draw upon, we now turn to the case study and company in question, Petrobras, and set out the relevant aspects of this entity and details of the case study.

3.4 Case Background

Petrobras is no ordinary company in Brazil. It is a state-owned entity (SOE) that occupies a place in the national psyche as a "national champion": - it is the largest company and employer in Brazil (and within Latin America), with a base in Rio de Janeiro and operations throughout the country and across the globe, and is generally revered as a bastion of excellence (Almeida and Zagaris, 2015). The company operates in the oil and gas sector, an industry which is particularly prone to corruption (McPherson and MacSearraigh, 2007). Petrobras is a mixed-capital company – the Brazilian government is the controlling shareholder and owns more than half of the company's common stock, but shares are also listed on the Brazilian bourse (B3, formally BOVESPA), with cross listings on a number of external exchanges including the NYSE[1].

Corporate governance at Petroras has some important and relevant peculiarities. The Brazilian government, as the controlling shareholder, holds most voting rights, and consequently at the time the Lava Jato crisis broke in 2014, it had the right to elect the majority of directors to the Board of Directors (BOD), which body appointed the Executive Board (EB) (Santos, 2017). According to Brecci and de Oliveira (2016), it was common practice for members of the BOD to be serving government ministers and for appointments to be made to the BOD and EB with no regards for technical competence. However, despite these apparent corporate governance and control risks, prior to 2014, other than a tax related scandal in 2009 (Barros, 2014), the company was not associated with corruption and enjoyed a good corporate reputation, with jobs commanding high prestige and intense competition. Moreover, as a listed entity in Brazil, US, Spain and Argentina, it was mandated to have appropriate controls in place and appropriately skilled staff.

The crisis that hit Petrobras in April 2014 has its genesis as far back as 2009. A timeline of key events is tabulated at Appendix B-1. In 2009, the Brazilian federal police commenced an investigation which it termed "Lava Jato" – which is a Portuguese phrase meaning "car wash", a name that originates from the early police focus on small car wash operations which were suspected of laundering money initially unconnected with Petrobras. The investigation proceeded for the next five years to 2014 with no publicity or association with Petrobras. In 2014, part of the investigation moved to the Brazilian Federal Prosecutor's Office, which was looking at irregularities involving some major Petrobras contractors. On 20 March 2014 the first association between Lava Jato and Petrobras appeared in the press following the arrest of Paulo Roberto Costa, a former senior executive at Petrobras. Following this arrest there was a subsequent spate of media attention and rumours connecting Petrobras to Lava Jato, culminating on 14 April 2014 in President Rouseff commenting publicly about "malicious rumours" involving Petrobras, a company at which she had previously held the CEO position.

[1] Source: Petrobras Annual Statement 2017

Following Rouseff's public comments, media attention increased steadily. In our study we therefore consider that as regards Petrobras, the Lava Jato scandal can be said to have "commenced" in April 2014.

The Lava Jato investigation is on-going (as at August 2019) and has since become the largest corruption scandal in the history of Latin America, spreading to at least 11 other countries[2]. There have been scores of arrests of well-known business leaders and politicians, and several well-known national and international businesses have been adversely linked to the scandal. For Petrobras, Lava Jato has had a significantly negative impact both on the company's reputation, and its financial standing. Before the end of 2014 the company was faced with both a US class action and an investigation by the SEC. As a result of management's efforts to deal with the crisis, Petrobras was forced to delay the release of its third and fourth quarter 2014 financial statements (third quarter results were finally released on 28 January 2015, and then only on an unaudited basis – Appendix B-1). The highly anticipated full year audited financial results for 2014 were released in April 2015 which demonstrated the scale of the financial burden of the scandal on a company which had historically been highly profitable: - i.e. a trading loss of $2bn plus an impairment charge linked to the corruption scheme of R$44bn (approx. $13bn). Ultimately, the ensuing political pressure associated with Lava Jato forced President Rousseff from office in August 2016, albeit she has not been formally charged in relation to any wrongdoing associated with Lava Jato. In August 2018, Rousseff's predecessor President Lula was sentenced to 12 years in jail for his part in the corruption scheme[3].

The above summary gives some sense of the impact the scandal has had in Brazil. The corruption scheme itself was relatively simple, and amounts to procurement fraud against the company by senior executives at Petrobras who colluded with a small group of suppliers to bypass controls and overcharge on contracts, with the bulk of excess payments used by the suppliers to make political payments to the ruling parties. Overall

[2] Source: Guardian newspaper (UK), 1 June 2017
[3] Source: Financial Times newspaper (UK), 26 June 2017

27 supplier companies were involved in a scheme which lasted from 2004 to April 2012[4].

Given this backdrop, we now discuss our research methodology underlying the case study.

3.5 Research Methodology

3.5.1 Periods of Analysis Relating to the Crisis

This study assesses Petrobras's disclosure activity, media attention and management restructuring activities covering the 8-year period enveloping the Lava Jato corruption crisis which, as we outlined above, commenced in April 2014. Our primary source of data is published financial statements which cover full calendar years and which are typically prepared in the first quarter after year-end, and are issued during April of that subsequent year. The four-year period 2010 to 2013 represents the "pre-crisis" period, prior to which there was no association in the public domain between Petrobras and the Lavo Jato scandal. As we will show, the approximate 2-year period following the April 2014 public announcement of the Lavo Jato scandal and its connection to Petrobras - i.e. financial years 2014 and 2015 - involved intense media scrutiny of Petrobras, during which a series of critical actions were taken and disclosures made by the company as a crisis management response. We refer to this period as the "crisis" period. Similarly, the data will demonstrate that in the subsequent two-year period – i.e. financial years 2016 and 2017 - media attention remained relatively high but dropped significantly from the crisis period as management engaged in various actions and disclosures to stabilize the situation. We refer to this period as the "post-crisis" period. The three time periods we have delineated to focus our data analysis in this study are summarised below in Table 3.1

[4] Source: Economist newspaper (UK), 11 April 2019

Table 3-1 Time periods

Period	Financial Years	Period in Relation to the Crisis
Period 1	2010 to 2013	Pre-Crisis
Period 2	2014 & 2015	Crisis
Period 3	2016 & 2017	Post-Crisis

3.5.2 Overview – Data Collection and Methodology

In this study we applied three forms of data analysis on data obtained from two sources across the three periods spanning 2010 to 2017. First, following Blanc et al., (2019), we used content analysis to review Petrobras's disclosures in its (i) published ARs and SRs; and (ii) press releases. All ARs, SRs and press releases were obtained from Petrobras's website. Second, we undertook media attention analysis using external data obtained from media searches as detailed below. Third, we critically assessed the various actions taken by management as specified in the ARs and SRs comprising the company's crisis response strategy.

3.5.3 Content Analysis

Coding procedure for ACC extensiveness and breadth

Content analysis is a robust and commonly used research method for analysing CSR disclosure (Blanc et al., 2019; Coetzee and Van Staden, 2011). More recently, scholars have also started to apply this method to assess ACC disclosure (Blanc et al., 2019; Islam et al., 2015; Dissanayake, Islam and Dellaportas, 2011). In line with previous studies, we assessed in the ARs and SRs both (i) extensiveness of ACC disclosure ("ACC extensiveness"); and (ii) breath of ACC disclosure ("ACC breadth"), using the number of sentences as our unit of measure (following Blanc et al., 2019; Islam et al., 2015; Dissanayake, Islam and Dellaportas, 2011; Branco, Eugénio and Ribeiro, 2008). We note that other units of measure have been applied previously by some scholars in disclosure research – for example the number of words or pages – but as Milne and Adler (1999) argue, and which we follow, the number of sentences is the most reliable and meaningful measure of the disclosure extensiveness construct. We also follow accepted practice in disclosure extensiveness research by not applying a ranking measure to the various items disclosed, i.e. we treated all as of equal relevance and importance in obtaining a simple aggregate disclosure score for each AR and SR reviewed (Blanc et al., 2019; Islam et al., 2015; Branco and Rodrigues, 2008).

There is no generally accepted disclosure index for assessing ACC breadth. As a result, several scholars have come up with personalised versions which have broadly similar components (Blanc et al., 2013; Dissanayake, Islam and Dellaportas, 2011). Because no prior studies have incorporated the most recent guidelines relating to ACC disclosure published by GRI (i.e. G4 Sustainability Reporting Guidelines (GRI, 2015); and GRI 205: Anti-corruption (GRI, 2016)), for this study we constructed a novel disclosure index based on these new guidelines, and which also incorporates three other recent guidelines and updates (i.e. (i) Reporting Guidance on the 10th Principle Against Corruption (UNGC & TI, 2009); (ii) Hallmarks of Effective Compliance Programs (US DOJ & SEC, 2012); and (iii) Evaluation of Corporate Compliance Programs (US DOJ, 2019).

Our constructed ACC disclosure breadth index ("ACC Breadth Index') is attached at Appendix B-2. This contains 97 individual components within 14 policy categories based on the three broad themes used by the UNGC, i.e. (i) commitment & policy (Appendix B2-1); (ii) implementation (Appendix B2-2), and (iii) monitoring (Appendix B2-3). In applying this method, the inclusion of a reference to a component is marked with a score of "1", and "0" if there is no reference to that component, a method that is seen as suitable to gauge disclosure breadth (see for example Prado-Lorenzo et al., (2009)). Consequently, a breadth index (BI) score of 97 represents the maximum measure of ACC coverage a company can achieve in our ACC Breadth Index.

Coding façades for different stakeholder groups

Beyond understanding the extent and breadth of disclosures and how these may have changed across the three periods, we are interested in assessing firstly whether and how stakeholders may have been targeted differently by Petrobras between its two primary published documents the AR and SR; and secondly the extent to which different façades (rational, progressive, and reputation) may have been used by Petrobras in communicating with the stakeholder groups.

For this analysis we selected the three stakeholder groups who were most implicated or affected by the Lava Jato scandal: - (i) leadership (who devised the scheme); (ii) employees (some of whom were part of transacting the scheme, in most cases unwittingly); and (iii) suppliers (several of which have been directly implicated in transacting the scheme). This level of data analysis requires detailed coding which is a time-consuming process that is preferably done manually so as to optimize the process of capturing the nuanced references to the stakeholder groups and themes within the façade categories (Blanc et al., 2019). Indeed we found that Petrobras's ARs and SRs used a range of words and word combinations for each of the three constructs "leadership", "employee", and "supplier". For example: - (i) leadership terms used included: - CEO, Chairman, Executive Board, Board of Directors, senior management, management, key position, executive, Audit Committee, and Ombudsman; (ii) employee related terms included: - workforce, employee, staff professional, and personnel; and (iii) words related to suppliers included: - supplier; counterpart, cartel member, company, and contractor.

Our coding for the different façade categories was based on a familiarity with prior studies and a broad understanding of the key themes underlying each of the rational, progressive and reputation façades as laid out by Suchman (1995). First, the rational façade comprises the legal, logical and results-based domain, which in the case of Petrobras's ACC disclosures includes and encompasses for example:- the investigation details; the corporate governance structure and bye-laws; details about the Ombudsman role; and actual statistics regarding ACC training completed and sanctions imposed etc. Second, the progressive façade captures the tools and methods used to improve the way ACC risks are being dealt with, which for Petrobras includes references to: - training programmes that exist; codes of conduct and ethics; details of how the reporting channel works; and efforts to change culture around ACC. Third, the reputation façade encapsulates the values of the company and what it stands for – in the case of Petrobras this includes for example reference to ACC disclosure covering: - transparency;

adherence to local and global rules and regulation; and the fact that guidelines are binding on all.

Clearly, in using content analysis and a detailed coding methodology it is important to ensure stability, reliability, and reproducibility (Milne and Adler, 1999), which we achieved by conducting the extensiveness, breadth and coding exercises on three separate occasions on each of Petrobras's 16 published reports (i.e. the ARs and SRs for the eight-year period 2010 to 2017).

3.5.4 Media Attention Analysis

We researched media attention through the use of the media frequency analysis tool in FACTIVA. This tool allows the researcher to search a global database of media outlets using key words. As we are interested in coverage in Brazil and globally, we searched for press article statistics in relation to Petrobras for the period 2010 – 2017 in the regions USA, UK, Europe (all languages) and Brazil (Portuguese), using the following key words (and their Portuguese equivalents): - corruption; bribe; bribery; fraud; money laundering; allegation; car wash; scandal. In keeping with previous studies which have used press articles to assess media attention following a corruption or environmental disaster, we awarded a score of "1" to each article hit (Islam et al., 2015; Islam and Deegan, 2010; Deegan, Rankin, and Tobin, 2002)

In addition, we collated all press releases issued by Petrobras during the period. The company maintains historic press releases on its corporate website and has a policy of issuing all press releases in both English and Portuguese. We performed a similar coding exercise on the press releases as described above in relation media attention.

3.6 Findings

We present below the results and analysis for each period in the following order

1. ACC extensiveness
2. ACC breadth
3. Media attention and press release volume
4. ACC organizational façade extensiveness by key stakeholder
5. Detailed review of key actions in the crisis management response

3.6.1 ACC Extensiveness

The extensiveness results are shown in Table 3.2 and Figure 3.1 below

Table 3-2 ACC extensiveness

	Period 1 Pre-crisis				Period 2 Crisis		Period 3 Post-crisis	
Document / Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Annual Report (AR)	25	26	26	21	231	245	451	181
Sustainability Report (SR)	73	126	137	78	138	269	210	109

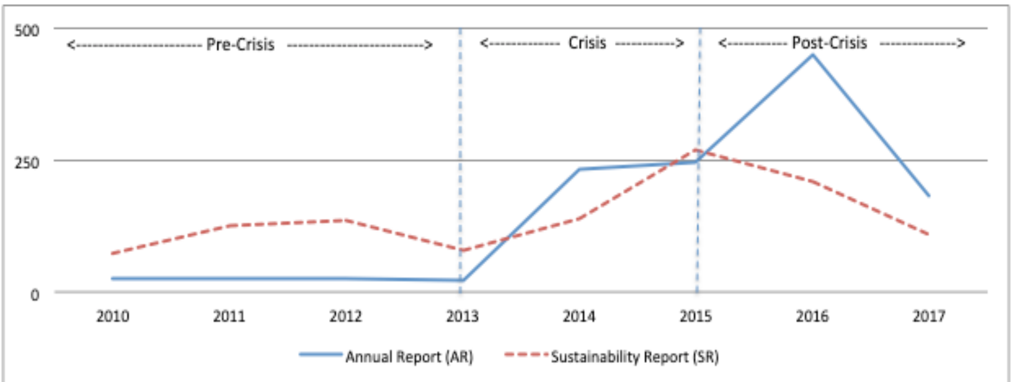

Figure 3-1 ACC extensiveness results

3.6.1.1 Pre-Crisis Period

Content analysis demonstrates that Petrobras's ARs and SRs both exhibit the lowest level of ACC disclosure extensiveness in this four-year period 2010 – 2013. AR volume is flat across the period, and with an average sentence count of 24 is significantly lower than SR volume which fluctuates from a base of 73 sentences in 2010 and almost doubles in volume by 2012 to reach 137 sentences, before falling back close to the 2010 level in 2013.

The consistently higher level of ACC extensiveness in the SR compared to the AR is as expected, and is consistent with previous studies (e.g. Blanc et al., 2019; Islam et al., 2015), reflecting the differing functions of the documents and their primary target audiences (AR – financial information for shareholders; SR – value creation for the wider stakeholder group). The low level of ACC volume prior to the crisis erupting, and particularly in 2010, is in line with expectations and we conjecture demonstrates the relatively low importance Petrobras attached to ACC disclosure during this period. The growth in SR volume from 2010 – 2012 might be explained by the vibrant public discourse throughout this period attached to the impending introduction of the Brazil Clean Company Act (BCCA) which became law in 2014 after some delay, and so could be evidence of efforts by Petrobras to enhance its legitimacy as regards the impending legislation. In this vein the subsequent volume drop in 2013 is surprising but we posit this might be explained by Petrobras considering that by then it had "done enough" in terms of legitimacy maintenance to cover the BCCA threat, and so it subsequently reverted to its prior stance of relatively low level disclosure in its 2013 publications.

3.6.1.2 Crisis Period

There is a dramatic change in Petrobras's disclosure pattern in the two-year crisis period as listed below:

- ACC extensiveness rose sharply in both the AR and SR in the year the crisis broke in 2014, and rose further in the following year 2015;

- AR volume grew by a factor of almost 10 in 2014 to reach a sentence count of 231, most of which comprises (non-voluntary disclosure) notes to the financial statements, albeit the main commentary narrative more than doubled in volume to reach a sentence count of 51. In 2015 AR volume increased further to reach 245 sentences, with a notable increase in the relative extensiveness of the main commentary section, as compared to the section comprising the notes to the financial statements, (i.e. the main commentary narrative volume doubled to 103 sentences);
- SR volume almost doubled in the year of detection 2014 (from 78 to 138 sentences, i.e. slightly above the 2011 and 2012 levels), and then nearly doubled again the following year 2015 to reach 269 sentences;
- AR extensiveness topped that in the SR in 2014 the year the scandal broke (a finding which mirrors that seen following the Siemens corruption scandal (Blanc et al., 2019). In the following year 2015 AR volume dropped back marginally below SR volume;
- Peaks in extensiveness occur at different times for the AR and SR. After the dramatic volume increase in the AR in 2014 when the scandal reached the public domain, the level was maintained in 2015, after which the AR reached peak extensiveness in 2016 (as described below). This contrasts with the findings for peak extensiveness seen in the SR: - whilst there was only a relatively modest volume increase in the crisis year 2014, SR volume then ramped up dramatically to reach its peak in 2015, i.e. a year before the AR peak. This finding matches that seen by Frost et al. (2005) in respect of various Australian companies, but is opposite to the findings of Blanc et al. (2019) in respect of Siemens where the SR disclosure peak was found to occur one year later than the AR peak.

The above results suggest that, in line with legitimacy theory, and as seen in other companies struck by a corruption scandal (e.g. at Siemens, Blanc et al., (2019)), during the crisis period Petrobras sought to repair its threatened legitimacy by significantly increasing the volume of its ACC disclosures in both the AR and SR. In this two-year window, the AR took on a more important role for ACC disclosure in respect of both the immediacy and extent of disclosure. The same tactic of focusing on the AR as a primary tool of disclosure in the crisis period was seen at Siemens (Blanc et al., 2019).

A review of the make-up of the additional content in the AR reveals several sections that appear either for the first time, or which contain substantive details for the first time, comprising the following four themes: - (i) status of the investigation; (ii) governance procedures involving the new executive role of Governance, Risk and Compliance (GRC); (iii) risk management and compliance; and (iv) ethics and integrity. By way of comparison, since the start of our review period Petrobras's SR had consistently incorporated narrative sections covering risk management, compliance, ethics and integrity. We suggest that during this crisis period Petrobras deemed it necessary to act swiftly and with authority to include such details in the AR given the nature of the legitimacy threat facing the AR target audience. During this period, there was still considerable uncertainty regarding the financial risks affecting the company, primarily as regards potential claims from the US class action law suit. Moreover, the company was carrying a significant debt burden and its relationships with many of its closest suppliers were tarnished. In addition, there were continuing doubts about leadership at the company. In our view it follows that the AR is the appropriate document to deal with such issues so as to reach the primary target audience of shareholders, financiers and employees.

3.6.1.3 Post-Crisis Period

From Figure 3.1 it is evident that in 2016 the extensiveness of ACC disclosure in the AR continued to grow, reaching its peak in this year at 451 sentences, a figure which is almost 20 times higher than the sentence count in 2010. By contrast, in 2016, ACC extensiveness in the SR dropped by around 20% on prior year. As a result, in 2016 the AR had more than double the extensiveness of the SR (with a sentence count of 451 vs. 210). In the subsequent year 2017, the extensiveness of both documents dropped significantly, i.e. by approximately half for both documents, albeit with the AR remaining well above its pre-crisis level at 181 sentences, and with the SR returning to its pre-crisis average level of 109 sentences, thereby maintaining the AR's sizable lead in ACC extensiveness over the SR, and representing a complete reversal of the situation pre-crisis.

Our findings on ACC extensiveness post-crisis are partially consistent with those obtained from prior studies. The significant drop-off in extensiveness in both the AR and SR in 2017, i.e. around 3 years after the scandal had first reached the public domain, mirrors that seen elsewhere (e.g. Cho, 2009). This could signify that by 2017 Petrobras's strategy had shifted from one of legitimacy repair mode to legitimacy maintenance (De Villiers and van Staden, 2006), a matter we discuss in more detail below. Alternatively, it could indicate that by 2017 management believed that overriding suspicions or concerns from stakeholders had fallen away, a situation which we consider to be unlikely given the apparent depth of feeling in Brazil and extent of the scandal (Almeida and Zagaris, 2015). We conjecture that this perhaps explains why in 2016 Petrobras's AR showed a steep rise in ACC extensiveness (from an already high relative base in 2015), which may suggest a perceived need amongst Petrobras leadership to maintain its legitimacy repairing strategy via the AR as the primary communication tool, at a time when the class action was still undecided.

3.6.2 ACC Breadth

We assessed ACC disclosure breadth for Petrobras's ARs and SRs over the period of review based on our constructed ACC Breadth Index (Appendices B2-1, B2-2, and B2-3), the summarised results of which are presented below in Table 3.3 and in Figure 3.2, and more detailed listings for each of the 14 policy categories within the ACC Breadth Index are shown in Table 3.4 for the AR, and in Table 3.5 for the SR. For purposes of our narrative flow we will limit our commentary herein primarily to the summarised ACC Breadth Index scores, and we will delay a more detailed discussion of Petrobras's specific disclosures captured within the ACC Breadth Index's 14 policy categories and 97 individual components until sections 3.6.5 and 3.6.6 below, where review in detail Petrobras's key pronouncements and actions in the period that constitute its crisis management response.

Table 3-3 ACC breadth - summary results

		Period 1			Period 2		Period 3	
		Pre-crisis			Crisis		Post-crisis	
Document / Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Annual Report (AR)	5	5	6	6	20	28	33	27
Sustainability Report (SR)	10	11	11	11	56	69	79	48

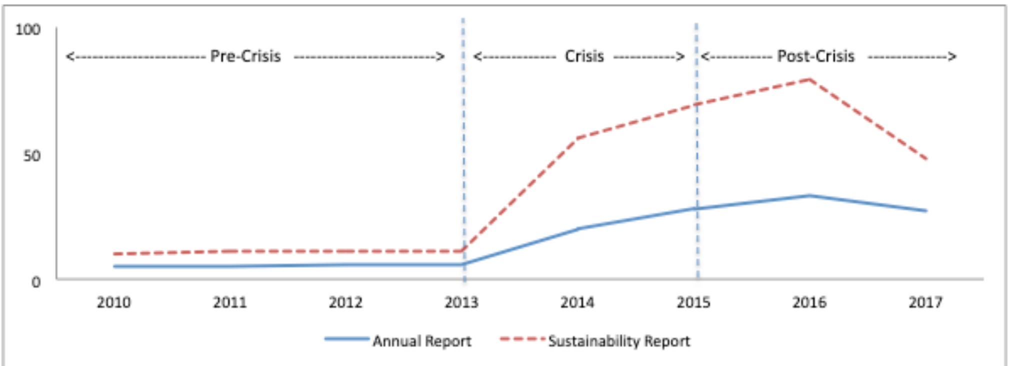

Figure 3-2 ACC breadth results

Table 3-4 ACC breadth for annual report by category

			Period 1				Period 2		Period 3	
			Pre-crisis				Crisis		Post-crisis	
Theme	**Policy Category**	***Max***	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Commitment & Policy	Ethics, values, Integrity	***6***	2	2	3	3	6	6	5	6
	Governance	***7***	3	3	3	3	4	4	5	3
	Procedures, autonomy, resources	***14***	0	0	0	0	4	6	8	5
	Risk assessment and management	***3***	0	0	0	0	1	1	1	2
Implementation	Governance	***4***	0	0	0	0	0	0	1	1
	Executives and Management	***7***	0	0	0	0	2	2	2	2
	Employees	***6***	0	0	0	0	0	2	2	1
	Business Partners	***12***	0	0	0	0	0	1	2	1
	Other implementation procedures	***5***	0	0	0	0	1	2	1	1
Monitoring	Reporting incidents	***2***	0	0	0	0	0	0	2	1
	Investigation	***6***	0	0	0	0	2	2	2	1
	Remediation and discipline	***5***	0	0	0	0	0	0	0	0
	Continuous improvement	***5***	0	0	0	0	0	0	0	0
	Findings, Results, and KPIs	***15***	0	0	0	0	0	2	2	3

Table 3-5 ACC breadth for sustainability report by category

			Period 1 Pre-crisis				Period 2 Crisis		Period 3 Post-crisis	
Theme	**Policy Category**	***Max***	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Commitment & Policy	Ethics, values, Integrity	***6***	3	3	3	3	6	6	6	5
	Governance	***7***	4	4	3	4	6	9	7	2
	Procedures, autonomy, resources	***14***	0	0	0	0	9	12	12	5
	Risk assessment and management	***3***	0	0	0	0	2	2	3	2
Implementation	Governance	***4***	0	0	0	0	2	2	4	1
	Executives and Management	***7***	1	1	1	1	3	4	6	6
	Employees	***6***	1	2	1	1	3	3	5	4
	Business Partners	***12***	0	0	0	0	6	8	7	6
	Other implementation procedures	***5***	1	1	1	1	4	3	4	2
Monitoring	Reporting incidents	***2***	0	0	1	0	1	2	2	1
	Investigation	***6***	0	0	0	1	3	3	4	0
	Remediation and discipline	***5***	0	0	0	0	4	5	4	0
	Continuous improvement	***5***	0	0	0	0	2	4	3	2
	Findings, Results, and KPIs	***15***	0	0	1	0	5	9	12	12

3.6.2.1 Pre-Crisis Period

In this period we see a similar pattern for ACC breadth as we saw for ACC extensiveness between the AR and SR – i.e. a very low and consistent baseline in both documents, with the SR attaining a Breadth Index (BI) of 11 by 2013, a score that is almost double that of the AR (BI = 6 in 2013). More specifically:-

- In the AR, we see from Table 3.4 that ACC breadth is limited solely to the commitment/policy theme – i.e. there is no coverage of either the implementation or monitoring themes. Within the commitment/policy theme, two of the four policy components are covered, i.e. ethics and governance.
- By contrast, in the SR we see from Table 3.5 that this document has some coverage throughout the period of both (i) the commitment/policy theme (i.e. ethics and governance); and (ii) the implementation theme (i.e. executives, employees and other procedures). In respect of the third theme (monitoring), the SR has some limited and inconsistent coverage in the period.

3.6.2.2 Crisis Period

The crisis period (2014 and 2015) shows a dramatic increase in the breadth of disclosure in both the AR and SR, a rise which is maintained across both years, during which the gap in ACC breadth between the SR and AR increases from a ratio of around 2 to nearly 2.5. More specifically:-

- The AR shows a BI score increase from 6 to 20 between 2013 and 2014, and a further rise to a BI score of 28 in 2015. This is achieved through: - (i) increased coverage of the commitment/policy theme (i.e. in 2015 all 4 policy categories are covered for the first time:- ethics, governance, procedures, and risk assessment); and (ii) some policy categories within the implementation and monitoring themes are included for the first time, most notably in 2015, i.e. employees and business partners within the implementation theme, and KPIs within the monitoring theme.
- The SR BI score rise in this period is even more marked than for the AR, with the BI score increasing fivefold from a score of 11 in 2013 to 56 in 2014, and increasing further to 69 in 2015. We can see from Table 3.5 that this shift comes about as a result of a major revision in the coverage of the SR to encapsulate: - (i) expansion of coverage pre-crisis to encapsulate for the first time all 14 policy categories of the ACC Breadth Index across all three themes (commitments/policy, implementation, monitoring); and (ii) wider coverage in 2015 of policy categories previously referenced in 2014. We note that by 2015 the SR was displaying some particularly high incremental coverage of some specific policy categories for each of the three ACC themes:- i.e. – (i) ethics, governance, procedures and risk management within the commitment/policy theme; (ii) governance and business partner procedures within the implementation theme; and (iii) remediation and KPIs within the monitoring theme.

3.6.2.3 Post-Crisis Period

In the post-crisis period we see that BI scores reach a peak for both the AR and SR in 2016, with BI scores falling in 2017. The 2017 drop in ACC breadth affects the AR and SR differently:- for the AR the BI score remains relatively high in 2017, whereas for the SR it falls below the crisis level. More specifically:-

- The AR shows broadly increased coverage in 2016 across most of the 14 policy categories within the ACC Breadth index as compared to 2015, with the BI score increasing from 28 to 33, albeit there is still no coverage relating to remediation measures and continuous improvement. In 2017 the BI score drops back to 27, due primarily to reduced coverage of the procedures and governance categories within the commitment/policy theme.
- The SR shows a similar trend in 2016, with incremental coverage spread evenly across the 14 policy categories and the BI score increasing from 69 to a peak of 79, with the most notable breadth increases relating to governance and employees (within the implementation theme), and results (within the monitoring theme). In 2017, SR breadth reduced dramatically to a BI score of 48, the lowest since 2013. The main breadth reductions relate to investigation and remediation policy categories (within the monitoring theme), and in respect of the governance and procedures categories (within the commitment/policy theme).
- For both the AR and SR, the reduced 2017 breadth levels are nonetheless significantly higher than the respective pre-crisis levels.

3.6.3 Implications of ACC Extensiveness and Breadth Findings

The ACC extensiveness and breadth results present some interesting findings. Our expectation, based on prior studies and theory around ACC disclosure breadth, mirrored that for disclosure extensiveness: – i.e. that a company faced with a legitimacy threat would respond through legitimacy regaining strategies including increased ACC disclosure across *both* disclosure dimensions of (i) extensiveness (volume); and (ii) breadth (coverage of relevant issues). This is indeed what the data shows, albeit with some interesting nuances.

It is evident just how sparse Petrobras's coverage of ACC matters was during the pre-crisis period 2010 - 2013, in respect of both the AR and SR. We suggest that this is surprising given the prevalence of the "compliance agenda" in business generally by 2010; the prior corruption-related problem Petrobras had suffered in 2009; and the imminent arrival of, and public debate around, the new transparency legislation BCCA. We conjecture that Petrobras's dearth of ACC disclosure may reflect the privileged position and elevated trust that the company enjoyed at that time by virtue of its "national champion" status, a situation that resulted in management seemingly not taking ACC disclosure "seriously", and at a time when financial results were strong.

This situation changed rapidly once the Lava Jato corruption crisis was publicly linked to Petrobras in April 2014, after which Petrobras dramatically increased the ACC disclosure in its ARs and SRs in both dimensions (extensiveness and breadth) in its ARs and SRs, most notably in respect of breadth. We conjecture that this strategic disclosure response represents an attempt to repair legitimacy. We will consider in more detail below the specific actions taken that underlie the disclosures which appear to be a mix of symbolic and substantive actions. During the crisis period the increase in AR ACC disclosure breadth was more limited than that seen in the SR, albeit from an extremely low base, but the corresponding extensiveness was higher, with the AR displaying a narrower focus primarily in respect of policy categories within the commitments/policy theme. In short, the AR contains more specific detail about fewer ACC related topics relative to the SR, with particular emphasis on the status of the investigation and the financial, accounting and legal impact of the scandal, and some coverage of key changes in governance and procedures. These findings are in line with stakeholder theory which posits that the AR is primarily a document targeted at shareholders (and to a lesser extent leadership and employees) (Islam et al., 2015), who primarily need to be assured that proper and decisive action is being taken to safeguard the value of their investment and to protect its ability to create value into the future. Consequently this audience needs detailed financial, legal and governance related information from the ACC disclosure in the AR, which is what we see from 2014 onwards. By contrast, stakeholder theory tells us that the SR is a document that is primarily targeted at the wider stakeholder group (Blanc et al., 2019), a constituency which is more interested in wider issues around values, polices and practices. We find that the SR seems to deliver a very broad coverage around ACC disclosure from 2014 onwards, but with limited coverage of detail in comparison to the AR.

Finally, we note that the breadth of both the AR and SR continued to grow in 2016. We conjecture that this suggests that by 2016 Petrobras considered that its efforts to regain legitimacy through more expansive ACC disclosure were not yet complete. Moreover, we suggest that the subsequent drop-off in disclosure breadth in 2017 in both the AR and SR (both of which had peaked in terms of extensiveness by then), suggests that by 2017 management perceived that Petrobras had sufficiently regained legitimacy in the eyes of its key stakeholders. It will be instructive to review future AR and SR documentation to assess whether the 2017 level of ACC disclosure is maintained, which would suggest a perceived need for legitimacy maintenance strategies around corruption and compliance disclosure, or indeed whether the level of ACC disclosure reduces, which might point to management's view that the firm's reputation and legitimacy had been fully restored and did not require maintenance through this form of disclosure.

3.6.4 Media Attention and Press Release Volume

As outlined above in the theoretical framework discussion, media agenda setting theory predicts that with increased public attention in the form of media scrutiny following some form of crisis, a company responds with enhanced disclosure (Blanc et al, 2013).

The results of our FACTIVA search of press article statistics (i.e. number of articles) in the Brazilian and global media are presented in Table 3.6 below, together with (i) the article counts for Petrobras press releases (both general and specifically related to the scandal or remediation efforts); and (ii) the AR and SR ACC extensiveness results presented earlier. The results are also presented graphically in Figures 3.3 and 3.4 below.

Table 3-6 Media attention and press reports

	Period 1 Pre-crisis				Period 2 Crisis		Period 3 Post-crisis	
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Press articles - global	31	44	33	65	4,381	14,278	8,692	5,988
Press articles - Brazil	18	35	22	40	2,956	9,574	4,818	4,369
Press releases - total	164	96	81	76	110	245	208	234
Press releases - ACC	0	4	2	0	16	49	26	8
AR extensiveness	25	26	26	21	231	245	451	181
SR extensiveness	73	126	137	78	138	269	210	109

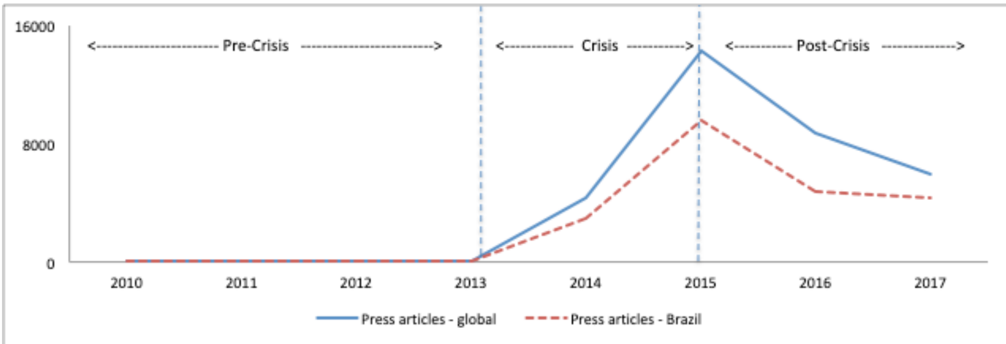

Figure 3-3 Press attention - number of articles per year

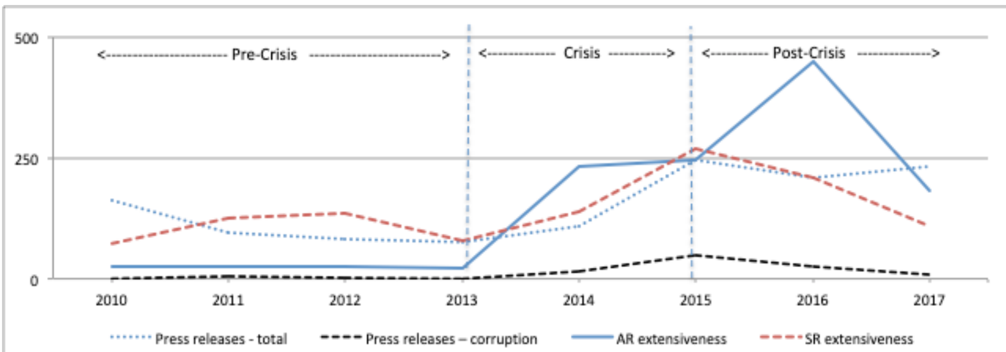

Figure 3-4 Petrobras press release totals per year compared to the AR/SR extensiveness results

3.6.4.1 Media Attention

It is evident from Table 3.6 and Figure 3.3 that in the pre-crisis period, press attention linking Petrobras to bribery or related illegal conduct was very low, with Brazilian press interest comprising more than half of all global coverage. This lack of media interest is perhaps surprising given: - the size and importance of Petrobras; its involvement in the 2009 scandal; the well-known prevalence of procurement fraud and bribery in Brazil; and the then public debate around the proposed transparency law BCCA (which would ultimately be enacted in January 2014).

However the situation changed dramatically once Lava Jato reached the public domain. In the crisis period, media attention rose spectacularly. In 2014 global press reports rose from a prior year total of 65 to more than 4,300, of which almost 3,000 appeared the Brazilian press. The following year 2015 saw an even larger increase in media attention, as the global press coverage exceeded 14,000 articles, of which in excess of 9,500 appeared in Brazil. This level of press attention in Brazil, and globally, dwarfs that seen in other recent corruption-related scandals at Siemens, Alcatel-Lucent, ZTE and China Mobile (Blanc et al., 2013; Dissanayake, Islam and Dellaportas, 2011; Islam et al., 2015), and we suggest this reflects the unique position that Petrobras plays in the Brazilian business and cultural environment, and societal concern with corruption following years of scandals in Brazil (Almeida and Zagaris, 2015). A further point to note is that the peak year for press attention was not the year of discovery 2014, but the following year 2015, a finding which represents a real and dramatic growth in media interest in 2015 over 2014 of more than 100% on a pro-rata basis (i.e. taking account of the fact that the scandal only reached the public domain part–way through the year in April 2014). In line with expectations, press attention decreased steadily in the post-crisis period: - albeit by 2017 global press attention of almost 6,000 articles was still higher than the 2014 figure, with Brazilian press interest tailing off at an even slower rate.

We argue that in line with media agenda setting theory, the results above show that in the crisis period Petrobras's ACC disclosure in both the AR and SR mirrors the evolution in press attention (i.e. our proxy for public attention), suggesting that increased media attention has a causal link to increased disclosure. We note that peak disclosure in the SR coincides with peak press attention in 2015, as was seen at Siemens (Blanc et al., 2013), although in contrast with the findings for Siemens, peak disclosure in Petrobras's AR occurred in 2016, a year after peak media attention was reached, which we posit reflects management's view that despite the drop in public interest, legitimacy had still to be regained by then in the eyes of key financial and internal stakeholders.

3.6.4.2 Press Releases

Petrobras's strategy as regards its press releases also argues in favour of a media agenda setting explanation, and mirrors its policy as regards AR and SR ACC disclosure. The volume of press releases rose by more than 40% between 2013 and 2014 to 110 releases, of which 16 specifically related to the scandal, its impact on compliance or governance actions, or corruption generally (which compares to a prior year count of zero). Press release activity more than doubled the following year 2015, reaching a peak of 245 releases, i.e. the same year that press attention peaked, during which the number and fraction of Lava Jato related press releases grew substantially to a peak of 49 releases, i.e. around 20% of the total for the year. In 2016 and 2017 Petrobras continued to maintain a high level of press releases not much below the 2015 peak, but the number of Lava Jato-related releases dropped substantially to a figure of just 8 by 2017, mirroring the trend we found in the substantial reduction in ACC extensiveness seen in the AR and SR in the same year 2017.

Media agenda setting theory does not explain the disconnect between the growth in ACC extensiveness seen in the AR and the reduced level of press attention in 2016, however, as above we suggest that this can be explained from a legitimacy theory perspective and reflects the overriding priority for Petrobras to maintain a drive to regain legitimacy with the key stakeholder groups, rather than the need to respond to more general public pressure. As a final point, we conjecture that the "new normal" level of press releases seen in 2017, comprising a vastly reduced level of press releases that relate to Lava Jato or corruption matters, provides further support to our view that by 2017 Petrobras considered that it had achieved its goal of regaining legitimacy, and had by then moved on from Lava Jato and was seeking to gain and maintain legitimacy

(Suchman, 1995) through a more open policy of engaging with the public via press releases.

3.6.5 Organized Hypocrisy and Organizational Façade Analysis for Implicated Stakeholder Groups

We saw above from both the ACC extensiveness and breadth findings, the different ways in which Petrobras has used its two primary corporate documents (i.e. AR and SR) to communicate about its crisis management response to the Lava Jato scandal. We conjecture that this represents a means of regaining legitimacy immediately following the crisis, and a means of maintaining and gaining additional legitimacy subsequent to the crisis. We argue above that this is in line with both legitimacy theory and stakeholder theory. We now deepen our analysis by drawing on the ideas of organizational hypocrisy (Brunsson, 2007), and organizational façade theory (Abrahamson & Baumard, 2008), to assess whether these theoretical perspectives help us interpret how the company dealt with the thorny issue of communicating with the three stakeholder groups who are implicated in the scandal, i.e. primarily (i) leadership and (ii) suppliers; and to a lesser extent (iii) employees. Although façade analysis is seen as an important theoretical perspective, we are aware of only one prior study where this form of analysis has been applied previously in a corruption setting (Blanc et al., 2019). It will enable us to assess whether Petrobras targeted these groups differently so as get the right messages to them to deal with the legitimacy threat, and in so-doing potentially sending inconsistent messages to assuage the different needs of these groups.

We present below in Table 3.7 (for the AR) and Table 3.8 (for the SR) the results of content analysis and coding for the three implicated stakeholder groups mapped to the three organizational façades discussed above (rational, progressive and reputation).

Table 3-7 Façades by stakeholder in annual reports (ARs)

		Period 1				Period 2		Period 3	
		Pre-crisis				Crisis		Post-crisis	
Stakeholder	**Façade**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Leadership	Rational	5	6	6	7	64	49	126	37
	Progressive	2	2	2	1	2	7	8	7
	Reputation	0	0	0	1	0	4	8	13
Employees	Rational	1	1	0	2	10	10	3	1
	Progressive	0	0	1	0	3	5	13	4
	Reputation	1	0	0	1	0	1	2	3
Suppliers	Rational	0	0	0	0	26	23	12	4
	Progressive	0	0	0	0	0	2	2	4
	Reputation	1	0	0	0	0	0	0	3

Table 3-8 Façades by stakeholder in sustainability reports (SRs)

		Period 1				Period 2		Period 3	
		Pre-crisis				Crisis		Post-crisis	
Stakeholder	**Façade**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Leadership	Rational	20	39	44	30	38	49	49	17
	Progressive	13	4	2	9	9	9	17	12
	Reputation	3	0	1	4	4	6	8	3
Employees	Rational	4	3	4	0	8	9	6	2
	Progressive	5	9	2	0	3	6	4	9
	Reputation	0	1	0	0	0	1	3	1
Suppliers	Rational	2	0	0	0	8	22	17	14
	Progressive	0	1	0	5	7	20	3	2
	Reputation	0	0	0	1	0	4	2	2

The data shows some inconsistent evolution across the period and between the stakeholder groups, however some salient features emerge which we highlight and comment upon: -

3.6.5.1 Pre-Crisis Period

- The AR is primarily focussed on leadership via the rational façade. As we saw in the ACC extensiveness results presented above, the level of ACC extensiveness in the AR in this pre-crisis period is extremely low. Employees are barely referenced, and suppliers are addressed only once during the four year period. This is consistent with (i) stakeholder theory, which posits that the AR primarily caters to certain internal groups (i.e. leadership and employees, as well as financially interested outsiders); and (ii) organizational façade theory, as these groups need to receive factual information with a rational façade focus.
- The SR is also mostly concerned with leadership in this period via the rational façade, although there is some limited presence of narrative within the progressive and reputation façades. Suppliers are also addressed via the progressive façade, although again this is limited in extensiveness and occurs only in 2013, at a time when the impending BCCA was topical, and is concerned primarily with supplier integrity. We are not aware of any prior studies that have reported evidence of the SR focusing on leadership in its ACC disclosure, which we suggest may be because no prior studies have specifically considered leadership as a stakeholder group of interest. In sum, the SR coverage of ACC matters in general was relatively low in this period.

3.6.5.2 Crisis Period

- In the AR there is a dramatic change in the coverage of stakeholder groups in this period whereby all three stakeholder groups are targeted, albeit leadership still dominates, and narrative is again focused on the rational façade. Suppliers are the second most referenced group (with roughly half the coverage given to leadership), followed by employees (with around half as much again). In our view this finding is consistent with explanations based on legitimacy theory and stakeholder theory following the threat to Petrobras's legitimacy caused by the onset of the scandal, and reflects the fact that within a short period after the scandal had reached the public domain individuals and companies from all three stakeholder groups had been named as being allegedly involved.

- The SR also shows an increase in extensiveness across all three stakeholder groups during the crisis period, although the growth is more moderate relative to that seen in the AR from a higher base. The rational façade still dominates for leadership, but we now see inclusion of ACC disclosure comprising both the progressive and reputation façades, which mostly reflects narrative dedicated to Petrobras's implementation of procedural changes and tools introduced to improve decision making by leadership (e.g. assessment of executive performance; and the move to more team based decision making). A similar pattern in narrative is seen for employees. In respect of suppliers, coverage in the SR grew to around half of that for leadership in 2015, with a near equal split in the narrative between the rational and progressive façades. We suggest that this finding reflects management's perceived need to communicate to suppliers the fundamental nature of the change required to overhaul the procurement function and instil discipline (rational façade), combined with a detailed explanation of the new procedures for so-doing (progressive façade).

3.6.5.3 Post-Crisis Period

- In 2016 the trends in façade coverage and growth by stakeholder in the AR and SR are broadly maintained. However, in the AR there is a notable ramp up in the rationale façade coverage of leadership, which is not mirrored in the SR. It is not clear why this was deemed necessary, but we suggest that this could reflect concerns about the potential fate of the Lava Jato investigation which at that time was still deeply embroiled in political uncertainty, and reportedly there were political moves to reign in the investigation: - something that would pose a threat to Petrobras's on-going remedial actions to impose more appropriate corporate governance structures.[5] Consequently this enhanced coverage in the

[5] We note that in 2018 government 's alleged interference at Petrobras led to the Petrobras CEO resigning in June 2018.

AR in 2016 (which more than doubled the sentence count over 2015) may signal that the company considered that it had not yet completed its legitimacy repair exercise, and represents a way of seeking to demonstrate the firm was serious in its attempts to regain and/or maintain legitimacy with the leadership stakeholder group.

- In 2017, both the AR and SR show a drastic reduction in ACC extensiveness as we saw above, which manifests as a broadly balanced reduction in the total volume of narrative by stakeholder in both documents, although we see some rebalancing between the façades in this year: - (i) in the AR in 2017, within leadership the rational façade remains most prominent, the progressive façade level is maintained and the reputation façade is more pronounced than previously. For employees and suppliers, the progressive and reputation façades are now equally weighted with (or exceed) coverage of the rational façade; (ii) in the SR in 2017, within leadership the progressive façade almost matches the rational façade coverage; for employees the progressive façade dominates; and for suppliers the rational façade is once again the most prominent. The overall reduction in ACC coverage in 2017 could signal that Petrobras was now moving from a legitimacy regain phase to one of legitimacy maintenance/gain. This conjecture is supported by the relative shift from a rational façade focus to a focus on progressive and reputation façades in relation to leadership - a feature that is even more pronounced in the narrative relating to the employee group – and replicates a trend seen in some prior studies following the maturing of a crisis and settlement of legal actions [6] Finally, we posit that the shift to a rational focus in relation to suppliers within the SR reflects Petrobras's desire to demonstrate to suppliers a new regime of being tough on suppliers given the fundamental role some large suppliers played in the corruption scheme, and that henceforth Petrobras has in place a professional and disciplined approach to supplier management.

In summary, we conclude that applying an organizational façade lens to an assessment of ACC disclosure at Petrobras in the period provides a useful complement to our

[6] An example is Siemens (Blanc et al., 2019)

understanding of the firm’s reaction to the corruption crisis centred on legitimacy theory, stakeholder theory and media agenda setting theory, and allows us to draw comparisons with prior crisis events.

3.6.6 Detailed Review of Key Actions in the Crisis Management Response

3.6.6.1 Key Actions Implemented

Following a detailed review of Petrobras’s disclosures in its ARs, SRs and press releases over the period, we have compiled a summary of what we consider to be the critical actions that have reportedly been implemented (or which are pending implementation) in response to the Lava Jato scandal. The results are presented in Table 3.9 below.

As would be expected, the bulk of activities relating to crisis management and corruption prevention and transparency occurred during the crisis and post-crisis periods. For ease of analysis we have grouped the activities into five policy categories, which as we will illustrate broadly occur sequentially across three stages within the four-year period 2014 to 2017, as shown in Table 3.10. The five policy categories are: - (i) investigation; (ii) restructuring and governance; (iii) monitoring and control; (iv) dealing with the problem unit; and (v) culture, training and recognition. The three time stages comprise: - (i) immediate post-crisis; (ii) early stage post-crisis; and (iii) mid-term post-crisis.

Table 3-9 Stages of Petrobras’s crisis management response activities

Stage	Policy category	Timing (initiation)	Current status
1	Investigation	Immediate - crisis period	On-going - advanced
2	Restructuring & governance Monitoring & control Dealing with problematic unit	Crisis period, and early post-crisis period	On-going - advanced
3	Culture, training & recognition	Mid post-crisis period	On-going – early stage

As we outlined above, from the perspective of Petrobras, the Lava Jato scandal ”commenced” in April 2014. Despite the media frenzy that rapidly ensued and the spike in media attention in Brazil and globally as detailed above, Petrobras was slow to make any public disclosure concerning the police investigation. As indicated in the timeline of events presented at Appendix B-1, it did so for the first time almost six months later on 5 September 2014 in a short press release, which simply confirmed that the company was aware of the media stories. By contrast, it is clear from a review of the 2014 AR (which was published in April 2015), management had undertaken a number of significant internal crisis management response measures by this stage. We briefly describe the main aspects for each of the three response stages.

Stage 1 response

The AR makes clear that Petrobras’s primary regulators, CVM in Brazil and SEC in the US, were in touch with the company early in the process once the scandal was in the public domain, as is standard practice for listed companies facing this kind of allegation linked to corruption and bribery.

Consequently Petrobras and its legal advisors would have been well aware of their duty to be seen to respond in a sufficiently robust and appropriate way to the crisis. Petrobras’s immediate response, apart from co-operating with the police, was to commence an internal investigation and remediation process. It would appear that this was undertaken in a highly professional way through the appointment of a Special Committee of independent directors to oversee the investigation, and the hiring of an international law firm to conduct the investigation. Petrobras signalled its intent in the choice of individuals it was now associated with, i.e.:

“The Special Committee is composed of Ellen Grace Northfleet, retired Chief Justice of the Brazilian Supreme Court…. and Andreas Pohlmann, Chief Compliance Officer at Siemens AG from 2007 to 2010…”

Table 3-10 Petrobras's ACC responsive actions pre-, during and post- crisis

	Period 1 Pre-Crisis				**Period 2** Crisis		**Period 3** Post-Crisis	
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
1. Investigation								
Independent Internal Investigation Committee					x			
Settlement of class action in US – paid $2.9bn								x
Crisis management guide								x
Committee to sanction suppliers established					x			
Special Committee					x			
2. Governance – organizational restructuring								
CEO								
New CEO appointed - Silva			x					
New CEO appointed - Bendine					x			
New CEO appointed - Parente							x	
Chairman								
New Chairman appointed - Ferreira then Carvalho						x		
BOD								
BOD composition						x		
BOD – reduced exec membership to one, i.e. CEO						x		
BOD – no-one from Government							x	
BOD, EB - external evaluation							x	
New Advisory Committees						x		
Executive Role – Governance, Risk & Compliance (GRC)								
GRC created					x			
GRC operational						x		
Audit Committee								
Audit Committee – more people/ more frequent meetings						x		
Audit Committee – becomes statutory							x	
Audit Committee published annual report							x	
Audit Committee – new Chairman appointed							x	
Other governance related actions								
Publication – Annual letter of policies & governance								x
Review of Governance Model						x		
3. Monitoring and control measures								
General Ombudsman								
Restructured						x		
New leader						x		
Single channel for complaints						x		
Outside company WB						x		
Compliance								
Integrity DD started on BP						x		
Correction Committee						x		
Code of Best Practice updated							x	
Code of Conduct – new rules					x			
Related party transactions – new rules					x			
Decision making								
Collective vs. individual – 2 managers acting jointly						x		
Prevention								
Corruption Prevention Program				x				
Risk Assessment								
Risk matrix on suppliers – includes compliance						x		
Risk management roles between BOD /EB clarified							x	
4. Dealing with problem area -Procurement								
Seg duties between demanding of goods, hirer, approver						x		
Program for improving the management of the database of suppliers of goods and services (PGBF)						x		
Partial centralisation of procurement function							x	
5. Culture, training & recognition								
Management Processes								
Evolution Project – new management system							x	
"Simplify Petrobras" Program								x
Culture change								
Cultural Management Project								x
Training								
Petrobras in Compliance						x		
Compliance Agents						x		
Staff to declare formal awareness of Code Ethics						x		
Qualification Programme in corporate governance								
Directors/ EB specific training, periodically							x	
Awards / recognition								
Transparency award	x	x	x					x
BOD award for corporate governance								x
Training								x
Governance Indicator – 10/10								x
Reporting changes								
Integrated reporting for AR								x

Such a move to associate with highly experienced and respected individuals is a common tactic in crisis management which, pursuant to legitimacy theory, equates to building a "fire-wall" against the contaminated part of the business (Suchman, 1995).

Other key measures included the establishment of a board committee to look at what could be done to sanction culpable suppliers, and a second committee to handle any other internal investigations that might arise. We term these initial activities as the firm's stage 1 response, which we consider constitutes a substantive, decisive and timely action to repair legitimacy (Ashford and Gibbs, 1990), and which we conjecture would have had a suitably persuasive effect on key stakeholders targeted in the AR. As at 2017, the investigation remained on-going but was close to completion following settlement of the US class action during 2017.

Stage 2 response

In this next stage of response, management engaged in a range of activities early in the crisis period which we group into three policy categories: (i) restructuring and governance; (ii) monitoring and control; (iii) dealing with the problematic unit.

(i) Restructuring and governance

We see from Wang (2010) that organizational restructuring is a common response to repair legitimacy. The challenge in this response is that it is oftentimes neither quick nor easy to make the kinds of changes in leadership that are needed, more so in a company such at Petrobras which is a mixed capital company with a close relationship with its primary shareholder, the government of Brazil. We suggest that it is for this reason that most of the organizational restructuring took place in the year after the scandal had reached the public domain i.e. in 2015, rather than in the scandal year 2014. Nonetheless, in our view the extent and scale of the restructuring Petrobras has reported is impressive, and represent additional substantive changes in pursuit of the legitimacy repairment goal. In 2015 Petrobras was able to appoint a new Chairman and substantially change the composition of the BOD. This followed a change in CEO in

2014 to Aldemir Bendine (which was effective from February 2015) – although this change must be seen as symbolic as it simply represented the exit of the previous governmental nominee in favour of the appointee of the newly installed regime. Management did undertake a substantive restructuring action in 2014 however, with the creation of a new executive role of Governance, Risk and Control (GRC) officer. The AR stipulates that

"*the [GRC] Officer participates in the decisions of the Executive Board, and any matter submitted to the Executive Board for approval must previously be approved by this Officer as they relate to governance, risk and compliance".*

In our view this part of the restructuring process represents a significant clawing back of power and control from the Executive Board. The EB is the senior executive body within the firm and thereby bears primary responsibility for the corporate governance failures that led to Lava Jato. The relevance of the appointment of the GRC cannot be overemphasized in respect its power over the decision-making process at board level - the effect was that subsequently all key decisions must obtain the prior consent of the GRC Officer who would therefore see everything and had veto power.

Other additional important restructuring initiatives were also implemented early in the post-crisis period, and particularly in 2016, affecting the CEO, BOD and the Audit Committee. The CEO position was taken up by Pedro Parente, who for the first time in the company's history, was a person who was both (i) widely respected in the business community; and (ii) seen as independent of government. It is not clear how this appointment came about, but we conjecture that it must have been the result of high level lobbying and discussions involving some influential stakeholders including regulators and financiers. Also in 2016, in a move that further lessened the influence of government, the board of directors resolved to remove all government representation on the board. Lastly, toward the end of 2016 Petrobras appointed a new Audit Committee chairman and resolved to elevate the status of the Audit Committee to that of a statutory committee – in effect significantly enhancing the executive powers of this body and adding an additional influential and independent player to the corporate governance mosaic at Petrobras.

(ii) Monitoring and control;

During this second stage period, Petrobras succeeded in introducing a raft of monitoring and control measures which had the effect of increasing the span of control of the new leadership. Most of this activity was implemented in the second year of the crisis period in 2015. The first activity within this policy category was actually introduced in the pre-crisis period in 2013, in the form of the "Petrobras Corruption Prevention Program", ("PCPP") an initiative which was not mentioned at all in the AR, but which the SR described briefly thus:

"Petrobras introduced its Corruption Prevention Program in order to prevent, detect and correct fraud and corruption…. benefits include reduced exposure to legal, image and reputational risk, strengthened corporate governance, centralized efforts for the shared aim of combating fraud and corruption…"

We conjecture that the PCPP initiative represents the company's response to the impending arrival of BCCA, albeit there is no reference to this legislation in the SR narrative. Given the subsequent ACC initiatives that Petrobras took, in our view the announcement of the PCPP represents a relatively underpowered response to the challenge and constitutes a symbolic attempt to gain legitimacy pre-crisis.

Two other monitoring and control related initiatives were also introduced in 2014 following the onset of the crisis period: - (i) the rules around related party transactions were clarified; and (ii) the firm's code of conduct was revised. We consider that both initiatives also represent symbolic actions to regain legitimacy following the onset of the crisis.

More tangible were the control changes applied from 2015 to the office of General Ombudsman and to suppliers: - two players who had a role in the control breaches and weaknesses that led to Lava Jato.

The General Ombudsman is Petrobras's version of a confidential reporting channel, but in view of the allegations around Lava Jato and absence of prior tip-offs from whistle blowers, it appears to have been highly ineffective in meeting the objectives of the role.

In 2015 Petrobras completely restructured and simplified the facility, appointed a new leader, and outsourced the whistle blower function.

At its core the Lava Jato scandal constitutes procurement fraud in a conspiracy involving a small group of suppliers. Any serious attempt to repair legitimacy therefore had to deal with the supplier risks. In 2015 Petrobras introduced its new compliance policy which mandated all future suppliers to undergo a compulsory "integrity due diligence" review, in addition to a general risk matrix assessment.

In our view the initiatives to restructure the office of General Ombudsman and revamp supplier due diligence represent highly visible and meaningful steps that we categorise as substantive legitimacy repairing actions as envisaged by Suchman (1995).

(iii) Dealing with the problematic unit.

Third, we consider the policy category of dealing specifically and decisively with an illegitimate business operation. As indicated above, within Petrobras the business function that was most culpable in terms of internal control weaknesses that allowed Lava Jato to happen was procurement. In many large organizations this function is fully centralised. At Petrobras numerous internal functions were indeed centralised: - however procurement was mostly decentralised, with different units operating independently using non-standardised procedures and controls. As a result, we conjecture that it was not difficult to by-pass procurement rules in place for illicit purposes. As Wang (2010) points out, one form of restructuring that can be effective in a crisis management situation is to dissociate from an illegitimate business operation (as opposed to a dissociative organizational restructuring). In our view this strategy was used to gain control of the procurement operation as detailed in Petrobras's 2015 and 2016 SRs. In effect, the former devolved procurement operation was dismantled and a new more centralised operation was created under the control of the GRC Officer. The new procurement function was reported to have simplified, standardised rules and basic, common sense controls which, for the first time :

" segregates duties of employees who demand goods or services from those employees who conduct the hiring process and from the process approvers"

We posit that the fact such a statement had to be included in the 2015 SR narrative demonstrates the firm's appreciation of the size of its task to restore trust and repair legitimacy amongst the supplier stakeholder group in particular. Moreover, we consider that the strategy of "dealing" with the problem operation of procurement in the way it did, through operational dissociation and creating a new centralised dedicated function, represents another example of a substantive policy undertaken by management to repair legitimacy.

Stage 3 response

From Table 3.10 it is clear that Petrobras took a number of varied actions starting primarily in the post-crisis period, all of which are forward looking and deal in some way with the culture and way of doing business at the company. We have grouped these activities under the policy category of "culture, training and recognition" which comprises five broad components.

First, in 2017 Petrobras formally announced its "Culture Management Project", in respect of which the SR claims:

"aims at adapting our organizational culture, based on the leadership, in order to align workforce behaviour with the new strategic challenges"

"the first phase named A Culture for the Turning Point, involved our senior management with the objective of obtaining feedback from the leadership on the individual and collective performance focusing on meritocracy, elimination of privileges, and the symbolic recognition of individual and collective results of employees..."

As at the end of 2017, Petrobras was looking to implement the second and third stages of the Cultural Management Project which it termed “Culture for Prosperity” and “Culture for Permanence” respectively.

Second, in 2016, Petrobras unveiled in the AR a new management system called “Evolution Project” to inject more transparency and accountability into its operations. The AR narrative claims that this:

“….ensures the appropriate disclosure of the information and any course corrections, with the structured involvement of the entire corporation”

We interpret the Culture Management Project and Evolution Project strategies as legitimacy maintaining policies geared to enable personnel to “perceive change” as envisaged by Suchman (1995).

The third component relates to training. Petrobras committed early to a raft of new training initiatives for all staff starting in 2015, which extended to the Executive Board in 2016. These initiatives focused on compliance and controls, and staff were required for the fist time from 2015 to formally declare their awareness of the firm’s Code of Ethics. We regard these training initiatives as a means to gain legitimacy, as training followed the codification of what were previously informal compliance and control procedures (Suchman, 1995).

The fourth component comprises various awards and means of recognition. Table 3.10 shows that the firm reported receiving awards in the pre-crisis period for three consecutive years 2010 – 2012. However, in the subsequent four years which envelope the crisis, all ARs and SRs are silent regarding awards. It was not until 2017 when awards were again referred to in the published documents, when four awards were mentioned in the AR and SR relating to transparency, corporate governance (two awards) and training. We interpret the disclosure of such information regarding reward and recognition as being illustrative of the firm’s desire to seek certification and demonstrate success, both of which are indicative of a desire to gain legitimacy (Wang, 2010)

Fifth, we note that from 2017 Petrobras adopted an integrated reporting format for its AR and SR publications, in conjunction with guidelines issued by the International

Integrated Reporting Council (IIRC). In our view this action represents a clear case of the company seeking to be seen to conform to ideals as regards reporting and to be associated with a trusted and respected body (i.e. the IIRC), which is a standard tactic to gain legitimacy (Suchman, 1995).

Having discussed the main strategies used by management in responding to the crisis, it is informative to next consider and map how these actions (i) relate to theoretical models for restoring trust; and (ii) align to legitimacy management strategies.

3.6.6.2 Mapping Management's Responsive Actions to Trust Repair and Legitimacy Management Models

We have identified three trust repair models in the literature which deal with a crisis management situation such as that faced by Petrobras (Pfarrer et al., 2008; Bachmann, Gillespie and Priem, 2015; and Gillespie and Dietz, 2009). There are a number of similarities across these models, each of which sets out a broad plan of action and sequential activities that will permit a firm to respond appropriately to a crisis, with the goal of repairing trust amongst key stakeholders as soon as possible. The Pfarrer et al. (2008) model comprises four stages (discovery; explanation; penance; and rehabilitation), as does the Gillespie and Dietz (2009) model (immediate response; diagnosis; reforming interventions; and evaluation). The Bachmann, Gillespie and Priem (2015) model describes six stages (sense-making; relational; regulation and formal control; ethical culture and informal control; transparency and accountability; and trust transference). In Table 3.11 below, for each of the three trust repair models we have mapped their stages onto our 3-stage, 5-policy themed analysis. Following Suchman (1995), we also map the corresponding legitimacy management focus (i.e. to repair, maintain, or gain legitimacy), and the broad type of legitimacy or behavioural dynamic targeted (i.e. pragmatic, moral, or cognitive legitimacy).

Table 3-11 Mapping Petrobras's crisis response to trust repair and legitimacy models

Stage	Petrobras Policy	Mapping to trust repair models			Mapping to legitimacy theory model (Suchman,1995)	
		Pfarrer et al, (2008)	*Bachmann et al, (2015)*	*Gillespie & Dietz (2009)*	**Focus**	**Strategy**
1	**Investigation**	Discovery Explanation	Sense-making Relational Trust transference	Immediate Diagnosis Reforming	Repair	Pragmatic (create monitors) Deny
2	**Restructuring & governance**	Explanation Penance	Regulation & formal control	Diagnosis Reforming	Repair	Moral (dissociation) General (restructure)
					Maintain	Moral (protect accomplishments)
	Monitoring & control	Explanation Penance	Regulation & formal control	Diagnosis Reforming	Repair	Moral (dissociation) General (restructure)
					Maintain	Moral (monitor ethics)
	Dealing with problematic unit	Rehabilitation	Regulation & formal control	Reforming	Repair	Moral (dissociation) General (restructure)
3	**Culture, training & recognition**	Rehabilitation	Ethical culture & informal control Transparency	Evaluation	Maintain	Pragmatic (communicate honestly)
					Gain	Moral (persuade, conform to ideals) Cognitive (institutionalize)

We can see some, albeit not complete, overlap and common features across the models. First, all the models start with some form of immediate, decisive response that has the goal of diagnosing the problem that has befallen the stricken company. In the case of Petrobras, this involved an independent investigation conducted by a team that reported to a Special Committee that was also independent of leadership. This "firewall" approach (Suchman, 1995), which enabled Petrobras to: - engage in "discovery and explanation" (Pfarrer et al, 2008); "diagnose" the issues (Gillespie and Dietz, 2009); and undertake "sense-making" (Bachmann, Gillespie and Priem, 2015), was necessary as the critical focus at this initial stage was one of immediate legitimacy repair given the concerns of key stakeholders facing a serious financial and legal threat. In our view the investigation as devised and implemented by Petrobras meets the need for a strategy which addresses pragmatic legitimacy through the creation of monitors (Suchman, 1995).

Second, the strategies we classified in stage 2 above, comprising the three themes of (i) restructuring and governance; (ii) monitoring and control; and (iii) dealing with the problematic unit, align reasonably well to the mid stages for each of the three models under review. These incorporate:- 'explanation, penance and rehabilitation' (Pfarrer et al., 2008); 'regulation and formal control' (Bachmann, Gillespie and Priem, 2015); and 'diagnosis and reforming' (Gillespie and Dietz, 2009). In this stage 2 of crisis management, the focus remains on repairing legitimacy, but we also see a shift to incorporate some legitimacy maintenance measures within the (i) restructuring and governance; and (ii) monitoring and control components. For both, the primary concern remains moral legitimacy at this still-early juncture post-crisis. For example, the restructuring of Petrobras's board of directors, and introduction of the GRC Officer role are legitimacy repair measures targeting moral legitimacy through (i) dissociation of illegitimate personnel, and (ii) reconfiguration of governance practices. Similarly, the revamping of the Audit Committee translates as a legitimacy maintenance action which exemplifies responsibility, and thereby serves to protect accomplishments at the moral level within the Suchman (1995) framework.

Third, all three trust repair models accommodate a late phase which accords reasonably well to our stage 3 which is centred on culture, training and recognition: - viz a viz rehabilitation (Pfarrer et al., 2008); ethical culture & informal control, and transparency (Bachmann, Gillespie and Priem, 2015); and evaluation (Gillespie and Dietz, 2009). The emphasis at this stage is on activities which serve to maintain legitimacy, although by now there are some strategies which are more inspirational and forward-looking that serve to actually gain and expand legitimacy. For example, in this stage Petrobras was active in regularly and openly communicating with staff, which translates as a means of protecting exchanges (being a pragmatic strategy to maintain legitimacy within the Suchman (1995) model); whereas Petrobras's efforts to adopt the new IIRC reporting framework and incorporate the new Evolution Project management system can be seen as efforts to gain both moral legitimacy (by conforming to ideals), and pragmatic legitimacy (by professionalising operations) respectively.

3.7 Discussion and Conclusions

This study sought to examine and understand how Petrobras, a high profile company in its native Brazil with multiple listings including in Brazil and the US, responded to a major corruption scandal arising in 2014, through two means: - (i) its disclosures, and (ii) the actual remedial actions it took within its crisis management response. We had expected the company to deal with the legitimacy crisis by adopting strategies that sought to repair trust with key stakeholders by increasing disclosure pursuant to legitimacy theory, and via an evolving sequence of actions to regain control and restructure the organization pursuant to trust repair models. We found evidence in support of both. In addition, we obtained new insights into how a company uses the AR and SR to (i) target different stakeholder groups who are culpable in the scandal; and (ii) communicate differently with them to manage their respective legitimacy concerns, findings which support stakeholder theory and organizational façade theory explanations. In keeping with prior studies, we also found support for a media agenda setting theory explanation for the increased level of ACC disclosure following an unprecedented level of media interest, particularly in Brazil. Finally, our review of actions taken by management across the crisis and post-crisis periods shows that these align well with models of trust repair, legitimacy management, and crisis management.

Content analysis of ARs and SRs shows clear support for legitimacy theory explanations in how Petrobras changed it disclosure policy across the three periods of study enveloping the 2014 crisis - i.e. pre-crisis (2010 – 2013), crisis (2014 and 2015), and post-crisis (2016 and 2017). The data shows consistent patterns for both measures used to assess the level of ACC disclosure (i.e. ACC extensiveness and ACC breadth). In the pre-crisis period, it appears that Petrobras placed minimal importance in disclosing its ACC policies. This is surprising given the company's previous difficulties with corruption which were in the public domain, and its status as a listed company. Moreover, by 2013 there was a high level of public debate in Brazil concerning the anticipated new anti-corruption law BCCA. We posit that this may reflect 'wilful blindness' by Petrobras leadership regarding corruption. Alternatively, the explanation of Branco and Delgado (2012) may apply in that companies will seek to discuss the fight against corruption as little as possible, as to do so might raise suspicions that there is a corruption issue. The situation around Petrobras's voluntary disclosures changed dramatically in the crisis period, consistent with prior studies (e.g. Blanc et al., 2019; Dissanayake, Islam and Dellaportas, 2011; Islam et al., 2015), with a significant rise in the level of disclosure. In the post-crisis period we saw a departure from the results of previous studies with the ACC breadth disclosure level continuing to increase into the post-crisis period, and reaching peaks in both the AR and SR in 2016, at a time when media attention had dropped off significantly from its 2015 peak. ACC disclosure extensiveness in the AR also reached its peak post-crisis in 2016. In 2017, the level of ACC disclosure dropped significantly in both the AR and SR, consistent with previous findings in the post-crisis period (Cho, 2009; Blanc et al., 2019).

Across the period we see a change in emphasis in ACC disclosure between the AR and SR: - pre-crisis the SR was more extensive (and had more breadth, albeit from a very low base); post-crisis the AR is more extensive whilst the SR maintains its lead in breadth, with both documents displaying significantly more breadth than pre-crisis. In short, the AR now covers more detail but less breadth than does the SR. This is as expected given the wider target audience of stakeholders for the SR (Islam et al., 2015), and the needs of the primary AR audience for facts concerning the corruption incident that threatens the legitimacy and financial status of the company (Blanc et al., 2019). Beyond this, we conjecture that the emergence of the AR as the primary tool for disclosing ACC matters in detail, and the extended period in which extensiveness in this document peaked (i.e. into the post-crisis period), reflects the extent of management's view of the seriousness, depth, and on-going nature of the legitimacy threat it was facing to convince the AR target audience (comprising shareholders, financiers, regulators, leadership and staff), that the firm had in fact turned the corner and could now be trusted. It seems that management believes this goal was achieved from 2017 when ACC disclosure levels dropped sharply.

Lava Jato was made possible by the actions of a small number of individuals from three stakeholder groups: - leadership, who devised the scam and allowed it to continue; employees, some of whom knowingly conducted improper transactions; and suppliers, who conspired to improperly inflate the price of contracts and subsequently made kick-back payments. All three stakeholder groups are critical to the future success of Petrobras. The content analysis study allowed us to investigate how Petrobras dealt with the challenge of communicating with these different culpable groups to regain trust whilst meeting their respective concerns. In terms of targeting stakeholders, we found partial support for a stakeholder theory explanation of how the AR and SR are used. For example, the AR is primarily concerned with leadership and addresses employees and suppliers only in a limited way. The focus of the AR on an internal audience (i.e. leadership) as opposed to an external audience (e.g. suppliers), is consistent with stakeholder theory. However, the finding that the SR also focuses primarily on leadership, albeit by 2017 this level is just slightly more than the coverage of suppliers, is only partially consistent with stakeholder theory. We conjecture that the emphasis of the SR on leadership is further demonstration of Petrobras's assessment of the severity of the legitimacy threat it was facing, such that it needed to signal to the "typical" SR target audience - i.e. suppliers - that it was serious in dealing with the antecedent problems affecting both groups.

As regards the content of messages to the three stakeholder groups between the AR and SR, although there is some inconsistency across the findings, we found some support for organizational façade theory explanations. Following Suchman (1995), we coded the data considering three façades:- (i) the rational façade, which is concerned with issues of fact relating to the scandal and the legal, financial and culpability aspects; (ii) the progressive façade, which focuses on what the company is doing to improve operations and systems to prevent a repetition and grow the business; and (iii) the reputation façade, which in concerned with how Petrobras deals with ethics, culture and how it is perceived. Throughout the period the AR is focused on the rational façade, in line with stakeholder theory for the target audience as outlined above, although we see a small but clear growth in the relative importance of progressive façade narratives through the post-crisis period. This pattern is broadly mirrored in the SR. Previous studies at other companies have found the AR to be focused on the rational façade (with more limited importance of the progressive façade), which is essentially consistent with our findings; whereas the SR is more concerned with the progressive and reputation façades (Cho et al., 2015; Blanc at al., 2019), which is not consistent with our results. We suggest that the partial inconsistencies between our results for Petrobras and the small number of prior studies on corruption scandals at other crisis-hit companies can be explained as suggested above, viz a viz the relative severity of the situation at Petrobras as perceived by leadership. We argue that management may have considered the legitimacy threat to have been of sufficient risk that messages to the culpable groups to restore legitimacy were still required to be mostly of a rational façade nature (e.g. concerning governance issues, responsibilities around procurement, and KPIs); with the progressive façade slowing emerging in the form of messages about future direction and tools to prevent a repetition of the crisis (e.g. regarding the new compliance procedures and training initiatives); and the time not yet being right for anything other than minimal representation of reputation façade narratives. It will be interesting to see whether the progressive and reputation façades becomes more prevalent in the SR as the firm finally moves on from the crisis.

The results of our assessment of media attention and Petrobras's press release activity, in conjunction with AR and SR ACC disclosure in the period, provide broad support for a media agenda setting theory interpretation of the firm's disclosure response. In the pre-crisis period there was minimal press attention around ACC, and similarly Petrobras's press releases were close to zero in number. This changed markedly in the crisis period, with both media attention and press release activity reaching peaks in 2015. Both global and Portuguese press attention in 2015 dwarfed that seen in studies of other companies hit by a corruption scandal, reflecting the position that Petrobras plays, particularly in Brazil. As expected, press attention dropped considerably post-crisis, but remained high. The trend in AR and SR ACC extensiveness, and press release volume, mirrors that of media attention, suggesting that ACC disclosure is influenced by press attention as proposed by media agenda setting theory. We explain the anomaly of the 2016 growth in AR ACC extensiveness when press attention fell, as being a function of management's overriding concern at that time being to repair legitimacy with key stakeholders rather than with press attention.

Following our study of the nature of disclosure through content analysis, we moved on to look in more detail at the type and effectiveness of the actual actions taken by management to restore trust and repair legitimacy in the four-year period 2014 – 2017.

We detect three stages of crisis management response activities which are broadly sequential in time and involve activities that are on-going. In the first stage, Petrobras took the decisive step of immediately commencing an independent internal investigation of the matter, which was dealt with by a Special Committee which was independent of the Executive Board, and made up of highly respected professionals. In our view this was the single most important decision taken by Petrobras as a response to the crisis, as it created a "firewall" with past actions and leadership (Suchman, 1995), and set a precedence for a new period of corporate governance through organizational restructuring and enhanced controls. This action also aligns with theories of trust repair (Pfarrer et al., 2008; Bachmann, Gillespie and Priem, 2015; and Gillespie and Dietz, 2009), all of which incorporate some form of initial discovery and explanation process that is swiftly enacted. The second stage of activity follows in short order and in parallel, which we group into three policy categories:- restructuring and governance; monitoring and control; and dealing with the problem unit. Organizational restructuring is a common strategy to repair legitimacy (Wang, 2010). Petrobras acted quickly to appoint a GRC Officer as part of the Executive Board and who effectively had the power of veto on any relevant matter. We believe this represents the second critical change that Petrobras introduced as it immediately placed controls on key decisions. In many organizations changing key personnel is a challenge, and we posit that this is more acute in a situation like that at Petrobras where the main shareholder is government who nominates the CEO. We believe this explains why most of the substantive restructuring was achieved in 2015 rather than in 2014; nonetheless, the type and scale of restructuring is impressive with the key revisions implemented at the Board, Chairman, and Audit Committee level all enacted in 2015. A CEO independent of government was finally appointed in 2016. In our view various actions within the monitoring and control policy component had the effect of further extending the span of control of the new leadership to aid the legitimacy repair goal. The "problem" function at Petrobras, with primary culpability for control lapses that led to the Lava Jato scandal was procurement, which was a mostly decentralised operation. Petrobras centralised and professionalised this function as a specialised unit, in effect dismantling what was in place previously, which we posit was akin to dissociating from an illegitimate business operation, a common form of organizational restructuring (Wang, 2010). The third stage of activity was initiated mostly in the post-crisis period, comprising a raft of actions related in some way to future aspirations and progression, involving culture change, training and recognition, and signalling a shift from legitimacy repair, to legitimacy maintenance and gain. We find that the stage 2 and stage 3 activities align reasonably well with the mid and late stage actions proposed in trust repair models.

We found it instructive to map the activities which we identified and grouped in our 3-stage framework, onto Suchman's (1995) legitimacy management model along two axes i.e. (i) focus or goal (i.e. to repair, maintain, or gain legitimacy); and (ii) the broad type of legitimacy or behavioural dynamic targeted (pragmatic, moral, or cognitive legitimacy). This highlights that in stage 1 Petrobras was focused solely on repairing legitimacy through a strategy of pragmatic legitimacy management, viz a viz the investigation, which is in line with expectations given the concerns of primary stakeholders facing a serious financial and legal threat. In stage 2, Petrobras's activities represent a continued focus on repairing legitimacy, but with the emphasis shifting to moral legitimacy strategies (e.g. restructuring the board and dissociating from illegitimate personnel). However, we also see for the first time in stage 2 some activities that indicate initial attempts to maintain (rather than repair) legitimacy through moral legitimacy means, such as the initiative to revamp the status of the Audit Committee. In stage 3, activities undertaken suggest a continued focus on maintaining legitimacy, but also further evolution to embrace aspirational strategies with the goal of gaining legitimacy, for example the firm's adoption of the new IIRC reporting framework shows Petrobras's desire to conform to ideals, which is a moral legitimacy play to gain legitimacy (Suchman, 1995). To the best of our knowledge this is the first study of a corporate response to an ACC crisis that demonstrates an evolution through the repair – maintain – gain sequence of strategies for legitimacy management as proposed by Suchman. The results in composite suggest that Petrobras considered that by 2017 it had achieved its primary goal of repairing legitimacy following the crisis, and was now actively following more proactive strategies to both maintain (i.e. protect) and gain (i.e. enhance) legitimacy in the eyes of stakeholders, a process that going forward will seemingly be characterized by reduced levels of ACC disclosure as in 2017 (i.e. compared to recent peaks), but at a "new normal" level which will remain well above pre-crisis levels. We conjecture that at Petrobras, management's legitimacy repair strategy was successful because it matched the dimensions of legitimacy affected by the crisis (i.e. primarily moral) – in other words, it was (i) cognisant of antecedent conditions at the company (Meyer, Trui, and Hinings, 1993); (ii) aligned with proven trust repair and legitimacy management models; and (iii) was professionally executed.

It is reasonable to ponder whether Petrobras would be correct if it indeed does consider that it has successfully repaired its legitimacy in the eyes of key stakeholders. There is no empirical way of determining this, short of conducting a suitable survey. Possible proxies, albeit imperfect, could be the share price and the firm's credit rating. As at the date of the release of the 2017 AR and SR (April 2018), Petrobras's share price was around 25% up as compared to when the Lava Jato story first reached the public domain in April 2014. Moreover, Moody's increased its credit rating for Petrobras to "Ba2 – stable" in April 2018, which is the same level it was at when the scandal was announced. We tentatively suggest that these financial metrics may corroborate the view that Petrobras has now recovered in terms of legitimacy, and that the crisis management and trust repair measures it has taken to respond to the legitimacy threat have been successful. However, we caution that continued vigilance is required. Achieving sustained change in any organization is difficult. Petrobras remains vulnerable to political influence. We highlight two matters by way of illustration. First, the policy announced in 2017 termed the "Simplify Petrobras Program" which is geared to remove red tape in various business processes including procurement. Whilst we accept that bureaucracy can stifle innovation, and indeed as Bachmann, Gillespie and Priem (2015) point out, too much control could "suffocate" an operation, we would caution a rush to reduce control in this area which will always be vulnerable to manipulation. Second, we note with some concern that the respected CEO Pedro Parente resigned on 1 June 2018, reportedly because of undue interference by government.

As for any study, this research is subject to a number of limitations. First, this is a case study, and as such the research is based on a unique situation (Lava Jato) which befell a unique company (Petrobras). Major corruption incidents are highly unusual. Consequently it raises credible doubts as to the generalizability of the findings. Moreover, as indicated above, to the best of our knowledge this is the first study that demonstrates, for a corruption shock event, successful management of legitimacy via evolution through the repair – maintain – gain sequence of crisis response strategies pursuant to Suchman (1995). However, we believe that these insights may be important because (i) they allow a reasonably coherent interpretation through several theoretical lenses (including legitimacy theory, stakeholder theory, organizational façade theory, and trust repair models); and (ii) Petrobras has many features shared by a number of mixed capital national champion companies around the world which face similar challenges and constraints.

Second, we have relied almost entirely on the data published by the entity under study, i.e. Petrobras, through its corporate disclosures, which provides no meaningful opportunity of data verification through triangulation from other sources.

Third, it might be argued that as the corruption event occurred relatively recently – in April 2014 – insufficient time has passed to enable us to make some conclusions regarding, for example, the success of management efforts to regain and restore legitimacy.

3.8 Contribution and Areas for Further Research

Notwithstanding the limitations outlined above, we believe that that this study makes several important contributions to current research in relation to crisis management, responding the corruption and control weaknesses, voluntary disclosure around ACC, trust repair, and legitimacy management.

First, this study adds to the very limited body of research on ACC disclosure following a corruption scandal. Only four other companies have been studied previously (Siemens, Alcatel-Lucent, ZTE and China Mobile (Blanc et al., 2019; Dissanayake, Islam and Dellaportas, 2011; Islam et al., 2015). This is the first time a study has been undertaken on a national champion, mixed capital company such as Petrobras, a type of entity that is not uncommon and which has the ability to influence ACC disclosure and ACC policies and practices widely amongst other organizations in its country of origin.

Second, to the best of our knowledge, this study is the first to look at leadership as an implicated stakeholder group through the lenses of stakeholder theory and organizational façade theory. This suggests that when there are suspicions of a systemic culture of patronage at the top, the appropriate response to repair legitimacy is to target this implicated stakeholder group through (i) organizational restructuring actions that serve to rapidly regain control and restore governance; and (ii) using the AR as a primary tool of disclosure, augmented by the SR, substantially focused on leadership through narratives based on the rational façade.

Third, we show that when faced with an extreme legitimacy threat where one of the implicated stakeholder groups is an important audience for the SR - such as suppliers in this case study - the appropriate disclosure response to repair legitimacy is to target the implicated group (as well as all implicated groups), with narratives that emphasise a rational façade, rather than through progressive and/or reputation façades as was seen in the Siemens case (Blanc et al., 2019), where we believe the legitimacy risk concerning leadership, although high, was not severe, as was the case at Petrobras given its position within Brazil.

Fourth, as indicated above, we believe that this is the first study of a corporate response to a corruption crisis that looks in detail at a package of actions to demonstrate an evolution through the repair – maintain – gain sequence of strategies for legitimacy management as proposed by Suchman (1995). Consequently, we believe that these findings add to our knowledge of how companies in the real world deal with such issues, thereby helping to bridge theory and practice regarding trust repair, legitimacy theory and disclosure research.

Finally, the study suggests several issues that warrant further research. We set out six areas that could provide important and interesting areas for further investigation. First, given that Petrobras shares several features with listed, national champions in other countries which are at risk of political capture and corruption, we posit that some of these have probably experienced one or more well-publicised corruption incidents in recent years. We believe it would be useful to examine these to see whether our findings are transferrable. Second, as we are still relatively close in time to the date when the Petrobras scandal first erupted in the public domain (i.e. April 2014), our tentative conclusion concerning the apparent success of management's response to repair legitimacy may be premature. Consequently, we suggest that Petrobras should continue to be monitored so as to determine whether there are any signs of rollback or persistence regarding ACC policies and disclosure practice. Moreover, strategies for maintaining and gaining legitimacy are under-researched, so if Petrobras continues to pursue such policies, further scholarly study would add greatly to our understanding thereof.

Third, following Petrobras's announcement to adopt integrated reporting from 2018, it would be informative to determine if this was being used as a "ruse" to limit ACC disclosure extensiveness and to assess how this might impact both disclosure policies and practices going forward.

Fourth, as an extension of this case study, we believe that it would be instructive to conduct some form of "cost/benefit" analysis regarding the process that Petrobras has gone through. Petrobras committed substantial cash and people resources in its crisis management response. Siemens did something similar. Not all companies are so diligent, yet most survive a corruption or fraud scandal. Although data will necessarily be case-specific, it would add to our contextual understanding to have some sense of the relative costs involved, including those imposed by regulators, and to compare these across cases, accepting that obtaining a counterfactual in terms of overall financial outcome would not be attainable.

Fifth, given that studies show that companies (including Petrobras) devote time and effort to engage differently with different stakeholders – for example through rational or progressive façades, and using either the AR or SR - we believe it would be useful to gauge how effective this discourse is, so as to understand whether Petrobras is right to believe, as we propose, that it has succeeded in regaining legitimacy in the eyes of key stakeholders. Survey data could provide data to assess this.

Sixth, and lastly, any case study would benefit from qualitative data obtained from interviews of key staff who were present during the period of study. We know almost nothing about the process of determining what should appear in ACC disclosures, and the role of corporate governance in this activity. In suggesting this line of research, we appreciate that access to sources may not readily be forthcoming given the highly sensitive nature of the matter.

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Appendix B

Appendix B-1 Timeline of key events in the Petrobras corruption crisis

Year(s)	Day, Month	Event	Source
2003 - 2010	n/a	Dilma Rousseff serves as Petrobras Chairman prior to election President of Brazil	FT [7]4 Feb 2015
2010	Sep	Petrobras raises $70bn in world's largest share offering	FT 4 Feb 2015
2011	Jan	Rouseff inaugurated as president	FT 4 Feb 2015
2012	Jan	Maria das Gracas Foster appointed as Petrobras CEO	FT, 4 Feb 2015
2012	Aug	Petrobras posts its first quarterly loss in 13 years, partly as a result of government's refusal to allow it to raise fuel prices aligned to global markets	FT4 Feb 2015
2013	Sep	Petrobras reports gross debts of $135bn, becoming the most indebted oil producer in the world and one of the highest indebted companies in the world.	FT 4 Feb 2015
2014	20-Mar	Paulo Roberto Costa, former head of Petrobras refining and supply department, arrested by Federal Police in connection with an investigation into alleged corruption that took place from 2004 to 2012	Reuters, 22 Feb 2016; FT 4 Feb 2015
2014	14-Apr	President Rouseff says that Petrobras has become a target of a malicious political campaign	FT 4 Feb 2015
		Congressional enquiry	FT
2014	22-Aug	Costa signs a plea bargain deal, agreeing to explain the corruption scheme and name names.	Reuters, 22 Feb 2016
2014	14-Nov	Police arrest 18 people, including Renato Duque, former Petrobras Director of engineering and service, in what was the first broad raid in the investigation.	Reuters, 22 Feb 2016
2014	11-Dec	Prosecutors in Curitiba formally charge 36 people, 22 of them from seven large Brazilian engineering firms.	Reuters, 22 Feb 2016
2014	29-Dec	Petrobras bans 23 suppliers cited in the investigation from bidding on tenders	Reuters, 22 Feb 2016
2015	28-Jan	Petrobras finally releases 3rd quarter 2014 results which are unaudited	Petrobras website
2015	06-Feb	Aldemir Bendine appointed CEO of Petrobras after abrupt resignation of Maria Foster (plus several other senior executives)	Reuters, 22 Feb 2016
2015	06-Mar	Brazil's Supreme Court says it will investigate the speakers of both houses of Congress in addition to 32 other sitting politicians relating to the Petrobras scandal	Reuters, 22 Feb 2016
2015	15- Apr	Police arrest Joa Vaccari, treasurer of the ruling party (Worker's Party), thereby moving the investigation closer to President Rouseff	Reuters, 22 Feb 2016
2015	22-Apr	Petrobras releases 2014 audited results. Show losses of $2bn and an impairment charge of R$44.6bn	FT, 22 Feb 2015

[7] FT refers to the Financial Times newspaper (London)

Appendix B2-1 ACC Breadth Index - Theme 1 Commitment & Policy

Component # (1-97) and reference[8]		Policy component
		Ethics, values, Integrity
1	D1	Publicly stated formal policy of zero tolerance
2	G4-56	Values, principles, norms, Code of Conduct, Code of Ethics, applies to all
3	CP	Shared commitment made clear
4	CP	Conduct / tone at the top
5	D2	Support for international and regional legal frameworks
6	CP	Oversight by Governance body
		Governance
7	GRI-205-2 2.1.1.1	Governance bodies that exist - BOD, Management Committee etc.
8	G4-34	Governance structure
9	G4-35	Process for delegating authority from main Governance body to Executive
10	G4-36	Executive reports directly to main Governance body
11	G4-42	Governance and Executive involvement in creating values
12	G4-45	Governance role in identifying and managing risk and due diligence
13	G4-46	Governance role in assessing effectiveness of risk management
		Procedures, autonomy, resources
14	GRI-205 1.1, GRI-103	Management approach to anti-corruption - how it identifies / manages conflicts etc.
15	H	Code of conduct, compliance polices and guides, readily available
16	G4-57	Internal and external mechanisms for seeking advice on unethical/ unlawful concerns
17	G4-58	Internal and external mechanisms for reporting ethical / unlawful concerns
18	CP	Compliance role and function explained
19	CP	Stature of compliance, importance to the organization
20	CP	Experience and qualifications of the key compliance personnel
21	CP	Autonomy of compliance function
22	CP	Funding and resources of compliance function
23	CP	Designing compliance policies and procedures - process
24	CP	Gatekeepers and responsibilities made clear
25	CP	Responsibilities for integration made clear
26	CP	Approval and certification process in place
27	D4	Detailed compliance policies in place for higher risk areas
		Risk assessment and management
28	D3	Risk assessments undertaken in higher risk areas
29	CP	Risk management process and methodology to identify, analyse and address risks faced
30	CP	Manifested risks included

[8] D= Reporting Guidance on the 10th Principle against corruption (UNGC & TI, 2009); H = Hallmarks of effective compliance programs (DOJ) ; CP = Evaluation of Corporate Compliance Program (DOJ); GRI G4= G4 Sustainability Reporting Guidelines (GRI, 2015); GRI = GRI 205: Anti-corruption (GRI, 2016)

Appendix B2-2 ACC Breadth Index - Theme 2 Implementation

Component # (1-97) and reference		Policy component
		Governance
31	CP	Risk based training provided
32	CP	Form, content, effectiveness of training detailed
33	GRI-205 1.2.4	How training is tailored is detailed
34	GRI-205 1.2.5	Stage training is given is explained
		Executives and Management
35	D7	Management responsibility and accountability for implementation of compliance policy made explicit
36	CP	Form, content, effectiveness of training detailed
37	CP	Risk based training provided
38	GRI-205 1.2.4	How training is tailored is detailed
39	GRI-205 1.2.5	Stage training is given is explained
40	CP	Incentive system in place
41	D9	Communication channel / whistleblowing process in place for reporting concerns
42		**Employees**
43	CP	Risk based training provided
44	CP	Form, content, effectiveness of training detailed
45	GRI-205 1.2.4	How training is tailored is detailed
46	GRI-205 1.2.5	Stage training is given is explained
47	CP	Incentive system in place
48	D9	Communication channel / whistleblowing process in place for reporting concerns
		Business Partners
49	D5; CP	Risk-based and integrated processes in place across procurement cycle
50	CP	Procedures explained for management of relationships
51	CP	Appropriate controls in place
52	n/a	Process of integrity due diligence in place
53	CP	Approval/ certification process detailed
54	H; CP	Payment process and controls outlined
55	CP	Risk based training provided
56	CP	Form, content, effectiveness of training detailed
57	GRI-205 1.2.4	How training is tailored is detailed
58	GRI-205 1.2.5	Stage training is given is explained
59	D6	Actions taken to encourage BPs to implement AC policies
60	D9	Communication channel / whistleblowing process in place for reporting concerns
		Other implementation procedures
61	D8	HR procedures in place supporting AC policy
62	CP	Availability of guidance on compliance polices
63	D10	Internal accounting and auditing procedures relating to anti-corruption and compliance mentioned
64	D11	Participation in voluntary anti-corruption initiatives demonstrated

Appendix B2-3 ACC Breadth Index - Theme 3 Monitoring

Component # (1-97) and reference		Policy component
		Reporting incidents
65	CP	Effectiveness of the reporting mechanism outlined
66	D14	Public legal cases referenced
		Investigation
67	D13	Dealing with incidents - process explained
68	CP	Properly schooled investigation undertaken by qualified personnel
69	CP	Root cause analysis detailed
70	CP	Prior indications referenced
71	n/a	Consistent application of investigation process made salient
72	CP	Response to investigation explained
		Remediation and discipline
73	CP	Remediation process explained
74	CP	Consistent application - staff
75	CP	Consistent application - business partners
76	CP	Real actions and consequences - employees
77	CP	Real actions and consequences - business partners
		Continuous improvement
78	D15	Use of independent external assurance on AC programmes
79	CP	Effective use of internal audit
80	CP	Control testing of procedures outlined
81	CP	Evolving updates prepared & circulated to management and Governance
82	D12	Leadership review of monitoring and improvement results
		Findings, Results, and KPIs
		1. Communication of policies
83	GRI-205 2a; G4-S04	Communicated to who in Governance, how many, how
84	GRI-205 2b; G4-S04	Communicated to which employees, how many, how
85	GRI-205 2c; G4-S04	Communicated to which Business Partners, how many, how
		2. Training provided
86	GRI-205 2d	Training provided to who in Governance, how many, how
87	GRI-205 2e	Training provided to which employees, how many, how
88	n/a	Training provided to which Business Partners, how many, how
		3. Corruption identified
89	GRI-205 3a; G4-S05	Number of confirmed cases
90	GRI-205 3b; G4-S05	Employees involved
91	GRI-205 3c; G4-S05	BPs terminated
92	GRI-205 3d; G4-S05	Public cases commenced in the period
		4. Risk management
93	GRI-205 1a; G4-S03	Number of operations assessed for risk
94	GRI-205 1b; G4-S03	Significant risks identified
		5. Gifts, political contributions, cases
95	G4-S06	Value of contributions, how he value was estimated
96	G4-S07	Number of actions re anti-competitive, anti-trust, monopoly actions
97	G4-S08	Value of fines for non-compliance with legislation

4 The Impact of a Corruption Crisis, Recession and Transparency Legislation on Earnings Management in Brazil

Abstract

We document how three major external events influenced the earnings management practices of firms in Brazil during the period 2000 – 2017, a period which saw a major corruption crisis, a deep economic crisis, and the introduction of a new transparency law in Brazil. We find that the corruption crisis affecting Petrobras in 2014 and 2015 ("Lava Jato"), and the resulting external scrutiny from regulators, media and the public associated with it, was of such an intensity and coverage that it had an impact which mirrors that of legislation elsewhere, such as Sarbanes-Oxley: - i.e. in Brazil during the corruption crisis the level of accruals-based earnings management decreased and the extent of real earnings management increased as the two were used by managers as substitutes. During recessionary periods firms were found to respond by reducing the level of real earnings management they use, which is consistent with an interpretation that this costly form of manipulation is not required when all firms are facing unfavourable reporting. Prior studies have shown that the level of real earnings management increased in Brazil following the adoption of IFRS in 2010. Our findings show that the Brazil Clean Company Act, which was introduced in 2014 to improve transparency and reduce corruption, has had the effect of reducing the extent of real earnings management which we interpret as being due to an increased focus on compliance and governance with improved tone at the top. This study is the first to consider the impact of both a corruption crisis and non-mandatory transparency legislation on earnings management behaviour. The results enable us to make important contributions to the accounting literature in respect of the influence specific external events and internal contextual factors have on management decision making related to the manipulation of financial reporting which have relevance beyond the Brazilian environment.

Keywords anti-corruption, compliance, crisis, discretionary accruals, earnings management, internal controls, real earnings management, recession.

4.1 Introduction

In recent years there have been a number of highly publicised corporate corruption scandals and accounting frauds such as Enron, WoldCom and Lehman Brothers, which have had a damaging effect on investor confidence in the quality of corporate controls and the integrity of accounting information (Jain, Kim, and Rezaee, 2003). In the US this led to the passage of the Sarbanes-Oxley Act (SOX) in 2002 which, inter alia, requires management to formally attest to the quality of internal controls (Cohen, Dey and Lys, 2008). A spate of other countries have also introduced legislation aimed at preventing corruption and increasing the quality of (i) internal controls; and (ii) the transparency of reporting; for example the UK, Russia, Argentina and Brazil (Farhang, 2018).

Corporate fraud takes many forms. According to the Association of Certified Fraud Examiners (ACFE, 2016), by far the most damaging to companies and investors is financial statement fraud which costs the average firm the equivalent of 5% of turnover per year (ACFE, 2016). In accounting research, unethical or low quality reporting as well as financial statement fraud risk, are most often studied by looking at earnings management. Earnings management is legal and does not violate Generally Accepted Accounting Principles (GAAP). However, there is a fine line between earnings management and fraudulent financial reporting, which the US Panel on Audit Effectiveness refers to as the "the continuum from legitimacy to fraud" (Public Oversight Board, POB, 2000): - indeed, numerous researchers use earnings management as a proxy for possible fraud, low quality financial reporting, and weak internal controls (e.g. Jones, Krishnan and Melendrez, 2008; Dechow et al., 2011). There has been a great deal of academic effort directed at earnings management. Most studies have looked at accruals-based earnings management (AEM) techniques via models that compute abnormally high accruals (e.g. Jones, Krishnan and Melendrez, 2008). More recently, a second type of earnings management has become the subject of attention, i.e. real activities-based earnings management or "real earnings management" (REM), which involves the purposeful altering of reported earnings through deliberate actions affecting the timing or structuring of operating, investing or financial activities, and which (unlike AEM), does have a direct impact on cash flows (Ewert and Wagenhofer, 2005). REM is easier for managers to apply as it involves entirely internal decisions, whereas AEM can be detected from published accounts, but REM can have severe consequences for profitability and sustained performance (Zang, 2012), and can be a signal of weak corporate governance (Bereskin, Hsu and Rotenberg, 2018). Consequently, the level and type of earnings management undertaken by companies should be a matter of high importance to key stakeholders including investors, regulators and auditors.

Research has shown that legislation and regulation can be effective in changing the level and type of earnings management that managers use. For example, Cohen, Dey and Lys (2008) report both a significant decline in the level of AEM in the US in the years following the passage of SOX, and a contemporaneous rise in REM which managers used as a substitute. A similar pattern of decline in AEM and rise in REM has been reported in countries that have adopted IFRS accounting standards (Barth, Landsman, and Lang, 2008). More recently researchers have considered the impact of other external events on earnings management such as economic recessions, and how internal factors such as corporate governance and financial metrics affect corporate manipulation decisions relating to AEM and REM usage. In most cases studies relate to developed markets in the US, UK and mainland Europe, with a focus on AEM rather than on REM, and often results have been mixed or display contradictory trends.

Consequently, despite extensive research attention directed at earnings management, many gaps and uncertainties remain in this important academic domain, which motivate us to conduct this project. We have chosen to centre this study on Brazil which is an under-researched market, primarily because of the conflation of several unique and relevant recent environmental factors that can help us understand influences that have relevance to both theory development and practice in other markets. These include the Petrobras corruption scandal ("Lava Jato") which is the largest ever corporate bribery case (Watts, 2017), the introduction in Brazil of transparency legislation, and an economic downturn which saw the economy shrink by more than 7% (Yuk, 2017): - all of which occurred over the last five years in a country that has a poor reputation in relation to investor protection, enforcement and ethical corporate behaviour (Durnev and Kim, 2005).

The primary objectives of the study are to assess whether, how and why Brazilian companies have been influenced to change behaviour in respect of the level (i.e. the magnitude) and type (i.e. AEM or REM) of earnings management they engage in following the three major external influences mentioned above, i.e. a corruption crisis, an economic crisis and a new transparency law. In conducting this research project we seek to address our overarching research question: How have recent crises and legislation impacted earnings management in Brazil, and how can this inform theory and practice in Brazil and elsewhere?

We obtained data on all non-financial Brazilian companies listed on the Sao Paulo stock exchange in the period 2000-2017, numbering 186 firms and 3,241 firm-year observations, and built on the approaches adopted in prior research (e.g. Dechow, Sloan and Sweeney, 1995; Roychowdhury, 2006; Cohen, Dey and Lys, 2008; Martinez, 2011; Francis et al., 2016a), we applied established models to compute commonly used measures of AEM and REM which were used as dependent variables in regression models.

The results obtained from this study enable us to make important contributions to the accounting literature in four main areas. First, the paper contributes to our understanding of how a corruption crisis influences management's earnings management choices. Ours is the first study to consider the impact of this type of event on earnings management, which was centred on the fall-out and intense media, regulatory and public interest in corporate behaviour following the 2014/2015 Petrobras Lava Jato scandal. We believe that the risk of this type of corruption crisis event happening elsewhere is real, particularly given the recent increase in enforcement activity by bodies such as the SEC. A key finding is that public and regulatory attention can act in the same way as formal legislation – we saw that firms responded to the outside scrutiny in the same way as evidence suggests they did when the SOX legislation was introduced in the US, and IFRS was mandated in Brazil in 2010 – i.e. firms in Brazil curtailed their use of AEM and switched to REM as a substitute. These results widen our understanding of how management weighs the costs and benefits of its manipulation options in a crisis situation in the context of the perceived strength of external scrutiny and internal governance mechanisms.

Second, this study is the first to examine the impact of transparency legislation on the incidence of earnings management. The Brazil Clean Company Act (BCCA) was in force for the final four years of our review period, having been introduced in 2014. It requires firms to adopt suitable compliance procedures and internal governance controls around financial management and reporting via an "integrity program". Our findings provide strong support to suggest that, somewhat against expectations in the Brazilian business community, the BCCA has been successful as we see a significant negative association between the BCCA and levels of REM. These findings contribute to our understanding of the influence that transparency legislation and internal controls can have on earnings management, and have relevance in other territories which have introduced similar legislation. Future work will be required to investigate whether the reduced level of REM that we identified has permanence, and to assess how firms reacted to the legislation in terms of the specific measures taken to augment governance, improve tone at the top and implement compliance controls.

Third, our study contributes in a number of ways to our understanding of REM, which is a relatively under-researched area of earnings management in comparison with AEM. Our results indicate that in normal conditions AEM and REM have been used by managers in Brazil in a complementary way, a finding which is in line with previous studies and which supports a view of Brazil as suffering from a weak enforcement climate and inadequate corporate governance. However, we also show that in aggregate REM is more prevalent than AEM, which suggests that IFRS and outside scrutiny have had some positive impact in limiting AEM, and thereby helping foster more maturity in financial control in relation to corporate reporting that is visible in the public domain. Moreover, our findings increase our understanding of how the AEM/REM relationship changes when managers face an external threat – in this case a corruption crisis which created a legitimacy threat and resulted in a shift from AEM and REM, and these being used as substitutes. Recession is another external threat which our findings indicate influences management's usage of REM in Brazil and thus provides us with a deeper understanding of the process by which management evaluate the costs and benefits of manipulation through the use of REM in the context of an economic downturn.

Finally, by focusing on Brazil, which is a large market but which is under-served in accounting research, our study allows us to test and extend our understanding of the relevance of extant theories underlying how external events impact the type and extent of earnings management in a rapidly developing market. Our study also allows us to contribute to our understanding at the national level as to how different external factors and the quality of internal controls and governance might serve to change attitudes to earnings management and the extent to which it is practiced and tolerated – and by extension, to wider concerns around ethical business conduct – in environments which suffer from historic systemic challenges in respect of corruption and transparency in financial reporting.

The remainder of this paper proceeds as follows. Section 2 provides a discussion of our motivations underlying this study and the research questions. Section 3 sets out the theoretical background and a short literature review. Section 4 presents our hypothesis development. The research design and methodology are detailed in Section 5, and the results are presented in Section 6. The paper concludes with Section 7, which discusses the results of the study, its contribution, implications, and areas for future research.

4.2 Motivation and Research Questions

As we remarked above, most studies of earnings management have considered developed markets in the US, UK and mainland Europe, and until recently have focused primarily on accruals-based earnings management practices (AEM). In Section 3 of this paper we set out a short literature review of current thinking and research trends in what continues to be an active area of accounting research. In this section of the paper, informed by current research on earnings management, we first set out below five areas where we believe important gaps remain which constitute our primary motivation to undertake this research project. Second, we briefly outline some relevant aspects of the Brazilian economic, legal and regulatory environment and recent events which render this market opportune for research. We then conclude this section by stating our overarching research question and sub-questions which will direct this study.

4.2.1 Research Gaps

First, a number of studies have shown that firms routinely manipulate reported earnings by using *both* AEM and REM earnings management techniques. However, little is known about how firms use AEM and REM in combination, and there is a debate about whether AEM and REM are used as substitutes or complements and in what situations. Cohen, Dey and Lys (2008) demonstrated that SOX legislation focused on internal controls led to reduced AEM and increased REM through substitution, which the researchers presumed was because of increased scrutiny from auditors and investors, a result confirmed by Zang (2012). Barth, Landsman, and Lang (2008) found that the introduction of IFRS, which narrows accounting choices, had a similar effect on reducing the incidence of AEM. REM is difficult to detect but can be costly if it is undertaken for opportunistic reasons (Gunny, 2010). Consequently, REM can be an inappropriate option, for example: - in highly competitive industries where R&D postponement can be disadvantageous; where there is financial distress; or where there is high institutional ownership which ensures internal scrutiny will serve to prevent such activities (Zang, 2012). A number of recent studies have considered both AEM and REM, however we know little about how different external factors and internal pressures affect the combination of, and interplay between, AEM and REM

Second, a small number of studies have considered what impact an economic crisis has on management behaviour, for which results are also contradictory. In the US Jahmani, Niranjan and Toney (2016) report that firms increased the use of AEM during the 2008 crisis, whereas Silva et al., (2014) found evidence of a moderate negative relationship between AEM use and recession for firms in Brazil during the period 1997 – 2009. Wang (2014) reports that REM usage fell during recessionary periods in a study of 31 countries in the period 1996 – 2011, which was interpreted as a reaction to the relative cost of REM. Clearly, prior results are mixed, and no study has so far considered the impact of recession on both AEM and REM.

Third, firms sometimes face other types of external "crisis" events that can affect an entire sector, industry, or market. For example, we argue that in Brazil in 2014 the immediate aftermath of the Petrobras corruption scandal led to such an intense level of regulatory, investor and public scrutiny on business practices and internal controls which affected all companies in that country over a period of around 2 years, that this should be considered as a "corruption crisis" event. We further consider that a corruption crisis of this type could have a material impact on management practices around internal control and financial reporting which will manifest in different earnings management practices. No previous study has looked at the impact a corruption crisis, afflicting a large and previously respected organisation, has on earnings management generally across a market or country. We believe that given (i) the trend for increased transparency globally; (ii) the risk of similar situations arising elsewhere; and (iii) increased enforcement by the likes of the SEC (Watts, 2017), this represents an important gap which may provide useful insights regarding the influence that heightened non-legislative pressure from outside can have on internal control, the quality of financial reporting, and management behaviour in respect of earnings management.

Fourth, there has been a recent trend around the world to introduce corporate legislation that seeks to improve transparency and ethical business practices, focused on enhanced levels of compliance and the quality of internal controls. Examples of countries which have adopted new anti-corruption legislation include Russian, China, Argentina and Brazil amongst others (Farhang, 2018). Typically such legislation is less onerous than, for example SOX, which requires management to attest to the quality of controls as well requiring as external audit of the adequacy of controls. As indicated above, SOX has been shown to have had a material impact on earnings management (Cohen, Dey and Lys, 2008): - namely it resulted in less AEM but more REM. There have been no studies as yet which have investigated the effectiveness of "softer" transparency legislation such as BCCA which does not require formal attestation, and which could therefore be effectively ignored or merely paid lip service, which could serve to give investors a false sense of security regarding the quality of internal controls, levels of earnings management, and earnings quality. Given the current global focus on anti-corruption we believe that this research gap represents an important and relevant area where research on earnings management will help expand our understanding of how external influences impact management decisions around the manipulation of reported earnings.

Lastly, we note that the bulk of research on earnings management has been conducted in major developed markets, principally the US, UK, EU and Australasia, primarily because of the ready availability of data for these markets. Studies in other markets facing different and sometimes unique challenges will help us to test and develop both theory and practice. The world has become increasingly globalized in recent years and some markets are actually leading more developed countries in respect of certain aspects of corporate governance regulation, for example the transparency legislation discussed above brought in by Brazil (2014) and Argentina (2017), has no equivalence in UK or US. Moreover, many countries around the world practice code law (rather than common law), a legal environment which been shown to suffer from relatively more corruption and poor internal controls (Durnev and Kim, 2005). Consequently, research in such countries can help us to both test and expand extant theory relating to earnings management by assessing companies facing different internal and external control environments and levels of scrutiny.

4.2.2 Brazil and Earnings Management

Brazil has the 9th largest economy in the world (World Bank, 2019). Despite its unenviable reputation for corruption and economic crime (Durnev and Kim, 2005), the Brazilian economy saw massive growth in the period 2000 – 2010, a period which coincided with rapid change in the corporate governance landscape (Black, De Carvalho, and Gorga, 2010), as listing requirements were tightened (and protective economic measures eased), as part of government policy to attract outside capital and effect much-needed privatisation measures. Research shows that results have been encouraging with corporate governance practices improving in the period 2004 -2009 (Black, de Carvalho, and Sampaio, 2014), albeit from a low base (Nenova, 2003). Two recent developments effecting regulation are of particular importance to corporate financial reporting and control in Brazil. First, in 2010 Brazil made it mandatory for public companies to publish financial reports according to IFRS, a ruling which followed a migration period from 2007 (Pelucio-Grecco et al., 2014). Second, in 2014, after a number of years of delay, Brazil finally passed transparency legislation which seeks to curb Brazil’s “preference–seeking business culture” (Tobolowsky, 2016).

As mentioned above, whilst this legislation does not require attestation by directors regarding the adequacy of internal controls as does for example SOX (Foster and Shastri, 2013), it is nonetheless a significant piece of legislation. For the first time, it makes corporations liable for the acts of individuals, and requires firms to enhance their internal controls around financial management and reporting, as firms must adopt customized compliance (or "integrity") programmes that cultivate

"mechanisms and internal procedures on integrity, auditability, and incentivized reporting of irregularities,…aimed at correcting deviations, fraudulent acts, irregularities and illicit acts .." (Tobolowsky, 2016).

Despite these recent improvements, it is likely that previously identified weaknesses in governance and regulation remain:- (i) as Leal et al, (2015) report, public firms have a high concentration of voting power due primarily to the use of dual-class structures, with insiders retaining voting common shares and outsiders holding primarily non-voting preferred shares; and (ii) Black, De Carvalho, and Gorga (2010) concluded that Brazil lags world standards in board independence, financial disclosure, and the use of audit committees.

As regards research in earnings management, the limited work performed has focused mostly on AEM and its link to corporate governance factors (e.g Black, De Carvalho, and Gorga, 2010). Pelucio-Grecco et al. (2014) found that the introduction of IFRS in Brazil in 2010 reduced the incidence of AEM but led to the increased usage of REM techniques. Recently there have been some studies specifically on REM, including Martinez and Cardoso (2009) which found that managers in Brazil routinely use both AEM and REM as complementary methods to manipulate reported results, and by Cupertino, Martinez, and da Costa (2015) who confirmed the occurrence of REM practices in Brazilian companies and its association with information asymmetry between management and investors.

We proffer that Brazil is an interesting environment to explore the above research gaps, firstly because of the lack of extant research on Brazil, and secondly because of the conflation of several unique and relevant environmental factors that can help us understand influences that have relevance to both theory development and practice in other markets. These comprise :- (i) the Petrobras corruption scandal which started in

2014 and is on-going; (ii) the introduction of the Clean Company Act in January 2014; and (iii) the deep recession of 2015 and 2016 which saw the economy shrink by more than 7% (Yuk, 2017). Consequently we believe that the Brazil environment represents a relevant and interesting laboratory which is overdue for attention in a study of this type.

4.2.3 Research Questions

Pursuant to the motivations outlines above, our study will pursue the following overarching research question and sub-questions:-

How have recent crises and legislation impacted the level and type of earnings management in Brazil, and how can this inform theory and practice?

Our research sub-questions comprise: -

1) Crises: (i) What impact do economic crises have on the type and level of earnings management adopted by management?; (ii) To what extent did the Petrobras corruption crisis in 2014 & 2015 impact earnings management practices, and what implications does this have for the quality of internal controls and the influence of external scrutiny?

2) Legislation: Prior research has shown that the adoption of IFRS in Brazil led to a reduction in AEM and an increase in REM. To what extent has the Clean Company Act succeeded in its aim of improving internal controls, compliance and governance, which would be expected to result in reduced levels of REM?

3) Relationship between AEM and REM usage in Brazil: Do firms in Brazil use AEM and REM techniques as complements or substitutes, or both at different times depending on external factors?

4.3 Theoretical Background and Literature Review

4.3.1 Introduction

It is instructive to start this short literature review by clarifying what we mean by the term "earnings management". Schipper (1989) defines earnings management as:

"A purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain [as opposed to, say, merely facilitating the neutral operation of the process]…. A minor extension of this definition would encompass "real" earnings management, accomplished by timing investment or financing decisions to alter reported earnings…"

Healy and Wahlen (1999) go further and refer to the potential to "mislead" stakeholders through earnings management. However, it is important to keep in mind that whilst earnings management may deviate from the spirit of accounting standards, it does not breach them and is legal. The Schipper (1989) definition makes reference to management being motivated to engage in earnings management to obtain private gain, and highlights the two primary forms of earnings management – accruals based manipulation (AEM) which has no effect on cash flow, and real-activities based manipulation (REM) which involves taking actions that deviate from normal operational practices and which typically do impact cash flows. In this review we will first look at the underlying theoretical perspectives for the existence of earnings management, we then consider in more detail the two forms of earnings management AEM and REM, and conclude by summarising findings on the situational and contextual influences on earnings management.

4.3.2 Theoretical Background

In the earnings management literature three distinct theoretical perspectives dominate. Most empirical papers draw on agency theory to explain the occurrence of earnings manipulation (see for example Dechow et al., 2011; Jones, Krishnan and Melendrez, 2008). Another related and commonly cited theoretical perspective is transaction cost theory (Burgstahler and Dichev, 1997). More recently a number of scholars have looked to build on the early work of Sutherland (1940) and Cressey (1950) on individual white collar crime, and apply the elements of the fraud triangle (pressure, opportunity, rationale – Cressey, 1950) to managers in organizations through a behavioural theory perspective. We briefly consider the key elements of each theoretical paradigm.

Agency theory

Agency theory dates back to the seminal work of Berle and Means (1932) and recognises the basic struggle for corporate control between shareholders, who are the suppliers of capital and who bear risk (principal), and managers who control the organization (agent). This tension revolves around a desire for personal gain (O'Connor et al., 2006). In recent years agency theory has developed several strands which are relevant to earnings manipulation. The board and audit committee are in place to monitor management, who otherwise may act in their own, rather than the principal's, best interests due to moral hazard (Beasley et al., 2009; Fama and Jensen, 1983; Jensen and Meckling, 1976). This can result in management taking steps that reduce shareholder value – an example being misstatements through earnings management that place non-management shareholders at a disadvantage (O'Connor et al., 2006). If monitoring and control measures are not effective, agency theory predicts that opportunistic behaviour by agents will happen when there is a divergence of interests between the principal and an agent (Efendi, Srivastava, and Swanson , 2007).

Corporate governance in its widest sense deals with the morale hazard problem (O'Connor et al., 2006) through a combination of four forces:- (i) legal and regulatory systems; (ii) external control mechanisms (e.g. capital markets); (iii) product and factor markets, and (iv) internal controls. A major focus of recent scholarly research relates to the impact of incentive compensation on earnings manipulation (e.g. Armstrong et al., 2013; Harris and Bromiley, 2007). As O'Connor et al., (2006) note, "outcome-based" incentive contracts for senior executives shift risk from shareholders to management, aligning managers' interests with those of shareholders and thereby reducing morale hazard (Jensen and Meckling, 1976).

A number of different theories have been developed that augment agency theory in relation to the effectiveness of corporate governance, and which have relevance to the existence of earnings management. First, institutional theory looks more closely at corporate governance and asserts that the monitoring role could be undermined because governance structures such as the audit committee simply fulfil "ritualistic" roles that serve to legitimize actions taken (Cohen et al., 2010). Second, some scholars consider corporate governance from a resource dependency perspective (Beasley et al., 2009), whereby the board's primary role is to assist, rather than monitor, management. Third, stewardship theory is based on the assumption that managers are honest and capable stewards of company resources, and so there should be a focus on the influence of inside directors to optimise shareholder value (O'Connor et al., 2006). Fourth, managerial hegemony theory posits a situation whereby the board and audit committee members are effectively selected by management, and consequently these bodies are under the control of management and are therefore merely symbolic thereby effectively providing no meaningful monitoring function (Beasley et al., 2009; O'Connor et al., 2006). Finally, as summarised by Stanley and Sharma (2011), a specific area of theory has been developed relating to corporate governance and control affecting the use of bank debt and the incidence of earnings manipulation. Contradictory predictions exist. One perspective is that banks monitor debt obligations and if manipulation through earnings management is discovered, then this will negatively affect the cost of debt and therefore stock price, so consequently debt will be negatively associated with manipulation. Alternatively, managers will want to avoid the negative consequences of violation of debt covenants which provides incentives to manipulate earnings, resulting in a positive association between debt and earnings manipulation – the so-called "debt covenant hypothesis".

Transaction cost theory

Transaction cost theory is based on two underlying assumptions that explain why firms may resort to using earnings management to avoid reporting unfavourable or unexpected results. First, earnings are a key determinant in setting transaction terms between a firm and outside parties, whereby higher earnings are seen more favourably. Second, due to informational costs, outside parties often resort to relying on basic heuristics or reference points as a basis for setting transaction terms, which typically focus on zero earnings or a zero change in earnings on prior year (Burgstahler and Dichev, 1997). As a result, firms understand that what they report will be judged against some basic reference points - such as an unfavourable "surprise", a drop in earnings, or registering a loss – which will represent a negative signal to key market participants such as analysts and credit rating agencies, and thereby result in adverse transaction costs such as an increase in the cost of debt, which ultimately works through to a drop in stock price. Indeed empirical results have shown that firms with higher earnings face lower transaction costs (Bowen et al, 1995). Moreover, there is a great deal of evidence to suggest that firms use earnings management to avoid reporting results that would cause adverse transaction costs, such as reporting a small net loss (DeAngelo, 1988).

Transaction cost theory can therefore be seen as a complement to agency theory as a basis to explain the existence of earnings management. Agency theory suggests that managers will look to exploit their position to gain advantage by favourably reporting results through the use of earnings management, whereas transaction cost theory suggests managers will resort to earnings management to avoid a negative cost situation (which may also serve to benefit them personally, depending on the form of management incentives in place).

Behavioural theory

As indicated above, most studies that take a behavioural theory perspective of earnings management start from Cressey's (1950) fraud triangle model. Most focus on the "rationalization" side of the triangle (Mayhew and Murphy, 2014; Murphy and Dacin 2011; Cohen et al., 2010; Carpenter and Reimers, 2005), or on "pressure" or incentive (Trompeter et al., 2013; Harris and Bromiley, 2007; Hogan et al., 2008). Moreover, almost all scholars incorporate ethical and cultural considerations, and stress the primary importance of having the right 'tone at the top' (Carpenter and Reimers, 2005; Dorminey et al., 2012; Murphy and Dacin, 2011; Rockness and Rockness, 2005).

In respect of rationalisation, Murphy and Dacin (2011) draw on Festinger's (1957) cognitive dissonance theory, and set out three psychological "pathways" to engaging in unethical behaviour :- (i) lack of awareness; (ii) intuition; and (iii) reasoning. Moreover, both Murphy and Dacin (2011) and Mayhew & Murphy (2014) consider ways in which individuals reduce the "negative affect" associated with unethical behaviour which builds on the theory of morale disengagement, and stresses the importance of the situation and environment (as much as the individual) that determines unethical behaviour. Carpenter and Reimers (2005) and Cohen et al., (2010) both consider the theory of planned behaviour which incorporates attitudes to unethical behaviour as well as subjective norms and morality, finding that tone at the top and an awareness of personality traits can help identify attitudinal risks that could give rise to earnings manipulation.

As regards incentive, Harris and Bromiley (2007) point out that most studies draw on agency theory as outlined above, but application of the behavioural theory of bounded rationality also suggests that if there are rewards for specific outcomes, then a person will work towards those outcomes, which could result in the use of improper levels of earnings management. Moreover, it is argued that if an organization fails to meet its "aspirations" it will turn to improper actions, whereby the extent of impropriety will be directly related to the "distance" a firm performs below some reference point, a predicted outcome which we suggest is aligned with a transaction cost perspective as outlined earlier.

Finally, we note that numerous recent studies stress the importance of ethics and culture as the primary drivers of corporate behaviour as safeguards against improper earnings management (e.g. Kalbers 2009; Rockness & Rockness, 2005). Soltani (2013) made a comparative analysis of six financial scandals in US and Europe through the lens of ethical climate theory - a multi-dimensional construct incorporating ethical culture, tone at the top, and ethical leadership – finding significant similarities across very different corporate and regulatory situations. In recent years transparency legislation has been adopted in numerous countries around the world, often with guidelines published to help firms comply - typically these stress "tone at the top" as a critical determinant in setting and communicating the right ethical culture (e.g. the 2012 UK Bribery Act and the BCCA) – something which academic research has shown to be an imperative in fostering ethical corporate behaviour (Schwartz et al., 2005).

4.3.3 Two Forms of Earnings Management – AEM and REM

AEM

The study of AEM started in the late 1980s and has built into an extensive research domain. During this period a number of models have been developed to measure abnormal discretionary accruals. DeFond (2010) comments that the rapid expansion in AEM research and growth in accrual models has come about in part due to the increased interest more generally in earnings quality. Also important is the increased enforcement activity of the SEC in recent years (Dechow, Ge and Schrand, 2010), which has resulted in "confirmed" cases of earnings manipulation being identified (and against which AEM models can be tested), the details of which are available in the public domain as documented in SEC Accounting & Auditing Enforcement Releases (AAERs). A third related reason is the increasing availability of financial databases, which facilitate access to other relevant data including restatements and class action cases (DeFond, 2010).

Healy (1985) was the first to look at accruals and potential impropriety, finding a link between accrual policies and management bonuses. The first empirical test of 'abnormal' discretionary accruals was undertaken by Jones (1991) based on an estimation of the residuals of a regression of total accruals against revenues and fixed assets using figures from published financial statements. Subsequent models have built on the Jones (1991) model. For example:- Dechow, Sloan and Sweeney (1995) created the 'modified Jones model' which backs out credit sales from the change in revenues, and controls for financial performance; and the Kothari, Leone and Wasley (2005) model which controls for performance by calculating performance-matched discretionary accruals. In their simplest form, AEM models look to detect if a manager is manipulating financial results to improve current earnings by borrowing earnings from future periods through the acceleration of revenues or deceleration of expenses (McVay, 2006). Although the proliferation of AEM models has not produced an absolute "winner" - indeed Jones, Krishnan and Melendrez (2008) ran a "horse race" of ten such models and found all had some merit and more predictive power than a simple measure of total accruals – most studies compute earnings manipulation based on the Dechow, Sloan and Sweeney (1995) modified Jones model (e.g. DeFond and Jiambalvo, 1994; Subramanyam, 1996; Cohen, Dey and Lys, 2008; Habib, Bhuiyan and Islam, 2013; and Cupertino, Martinez, and da Costa, 2017).

REM

Research interest in REM is relatively recent. Roychowdhury (2006) first reported on the practice of managers using REM polices to improve reported earnings – i.e. to avoid reporting annual losses through the use of three techniques: - (i) the abnormal use of price discounts to increase sales; (ii) deliberate over production to report lower COGS; and (iii) abnormal reduction in discretionary expenditures to improve reported margin. More recent studies have also started to consider earnings-deflating REM (e.g. Francis et al., 2016b) which could be motivated by various concerns including:- CEO option awards (Francis et al., 2016b); reducing the tax cost (Zeng, 2014) and reducing scrutiny (Eldenburg et al., 2011).

A number of prior studies provide evidence for the existence of REM by applying the Roychowdhury models (e.g. Cohen, Dey and Lys, 2008; Gunny, 2010). In a qualitative study of over 400 financial executives in the US, Graham et al., (2005) found that 78% of interviewees indicated a willingness to sacrifice economic value to manage financial reporting perceptions through REM. Research has also looked at the question of when REM, rather than AEM, occurs, and whether these different forms of earnings manipulation are used as substitutes or as complements. Results on the form of relationship between AEM and REM are mixed. Zang (2012) found that REM and AEM are used as substitutes based on the relative costs. Xu et al., (2007) also found some evidence of a substitution effect with managers preferring to use REM, and only moving to use AEM methods sequentially once REM possibilities had been exhausted. Moreover Bartov and Cohen (2009) identified a reduction in the level of AEM and a switch to REM post-SOX, a phenomenon also identified by Xu et al., (2007), Cohen, Dey and Lys (2008), and Zang (2012). On the other hand, Hamza and Kortas (2018) report that AEM and REM tend to be used complementarily in countries with weaker regulatory environments, which Joosten (2012) argues is because in such countries investor protection is insufficient to deter AEM and induce firms to switch to REM as a substitute, as happened for example with the introduction of SOX in the US in 2002 (Cohen, Dey and Lys, 2008). Managers have been found to use AEM and REM as complements in various empirical studies – e.g. in India (Das, Mishra and Rajib, 2017) and in Brazil (Martinez and Cardoso, 2009).

Findings on the characteristics of firms which engage most in REM, in respect of their financial standing and quality of governance, are mixed. For example, Bereskin, Hsu and Rotenberg (2018) report that because REM involves management undertaking reactive and unplanned decisions that may destroy value in the longer term, REM is associated with inadequate internal governance and agency issues. Such decisions can be costly if undertaken for opportunistic reasons (Gunny, 2010). Moreover, REM tends to reduce with better board governance (Ge and Kim, 2014) and when investors are more sophisticated (Roychowdhury, 2006). On the other hand, Zang (2012) finds that firms in good financial health are more likely to use REM techniques than are those in financial distress, on the basis that financially strong firms have the flexibility to deviate from optimal business decisions (which is particularly important in competitive industries), whereas firms in poor financial shape simply do not have the financial leeway to engage in costly REM activities and so can only use AEM.

4.3.4 External Events as Influences on Earnings Management

Our overarching research question developed above focuses this study on investigating how the extent and type of earnings management is influenced by three external events: - economic crisis; transparency legislation, and a corruption crisis. Whereas there is a vast literature on the underlying motivations to engage in earnings management, which primarily concerns internal influences such as equity compensation and meeting reporting benchmarks (e.g. Armstrong et al., 2010; O'Conner et al., 2006; Bartov and Cohen, 2009), there are relatively few studies that have considered the relationship between earnings management and the three types of external events that are the subject of this study. We briefly summarise what is known about each.

First, as regards the impact of an economic or financial crisis on earnings management, we found three studies that have considered this form of exogenous shock. The findings show mixed results. Jahmani, Niranjan and Toney (2016) report that in the US firms opted for increased use of AEM during the 2008 US recession period. Conversely, for Brazil in the period 1997 – 2009, Silva et al., (2014) found evidence of a moderate negative relationship between AEM use and recession. We are aware of only one study that has considered how mangers use REM in recessionary periods, with Wang (2014) reporting that REM usage fell during recessionary periods in a study of 31 countries in the period 1996 – 2011, a finding which the author interprets as a reaction to the relative cost of REM. Franceschetti (2018) argues that the directional effect of earnings management on income is difficult to predict and could be either positive (based on transaction cost theory), or negative (pursuant to a "big bath" perspective). Indeed Habib, Bhuiyan and Islam (2013) suggest that markets tolerate poor performance during an economic crisis which could result in even higher income-reducing earnings management. In considering the potential influence of a recession on earnings management, we suggest that it is informative to also consider what the literature tells us about two related situations that companies often face: - the level of debt held and the overall financial health of a company. Again, there are ambiguous findings in respect of both. Stanley and Sharma (2011) found broad support empirically for the debt covenant hypothesis whereby managers will engage in earnings management to meet bank expectations, which indicates that bank monitoring is only partially effective. Similar findings in support of the debt covenant hypothesis were reported by Efendi, Srivastava, and Swanson, (2007), Dichev and Skinner (2002), and Dechow, Sloan, and Sweeney (1996); although no such link was found by Beneish (1999). In respect of the link between financial health and the incidence of earnings management, Rosner (2003) found a clear link in relation to the use of AEM to conceal financial distress. More recent studies have also considered REM in relation to financial distress, for which results are mixed. As indicated above, Zang (2012) found that firms in good financial health are more likely to use REM than are firms in financial distress, because of the high cost of this form of manipulation. On the other hand, Garg (2018) found a moderate negative association between financial health and REM, and in relation to leverage (which is often associated with financial distress). Moreover, Anagnostopoulou and Tsekrekos (2017) report a complementary relationship exists between AEM and REM in firms that have high leverage, because such firms attract heavy outsider scrutiny forcing them to use both forms of earnings manipulation. In summary, it is clear that results linking earnings management to an economic crisis are ambiguous.

Second, we were not able to find a single study that looks at the link between transparency legislation and earnings management. As indicated above, this research gap is a key motivation behind this study. We posit that this may be because this type of legislation (i) is relatively recent, and (ii) has mostly been adopted in less developed markets which are the subject of fewer academic studies. Consequently, we suggest that it may be informative to consider the impact that other types of legislation and regulation have had on earnings management, such as SOX and IFRS, accepting that there are important differences in what these regulations seek to do and the enforcement strength they have. As indicated above, in the US SOX resulted in reduced levels of AEM and a rise in REM as a substitute (Cohen, Dey and Lys, 2008), a finding which was mirrored in Brazil following the adoption of IFRS (Pelucio-Grecco et al., 2014). Both authors argue that these results are the result of enhanced scrutiny around financial reporting and control which limits AEM but is less effective in controlling REM. We caution that the findings from studies of SOX and IFRS may not be fully relevant to the effect of transparency legislation on earnings management because (i) transparency legislation is not prescriptive, and so is generally less "auditable" (Cunningham, 2003); and (ii) it augments existing regulations which primarily target AEM, such as SOX.

Third, we note that as for transparency legislation, we are not aware of any study that has probed the link between a corruption crisis and the incidence of earnings management, a subject which constitutes an important identified research gap driving this study. Rather, there are numerous studies that have considered earnings management as a predictor of fraud (e.g. Deschow et al., 2011); and a small number of studies that have looked at the link between voluntary disclosure and a corruption crisis (e.g. Blanc et al., 2019; Islam et al., 2015). We suggest that this dearth in studies reflects the somewhat unique situation and research opportunity underlying this study. Consequently, we are not able to draw from the literature pointers as to the impact the corruption crisis may have on the type and extent of earnings management.

In sum, it is evident that in light of the ambiguous results (in respect of an economic crisis), and the lack of prior studies (in relation to transparency legislation and a corruption crisis), prior literature provides us with limited insights as to the impact on earnings management the three external events can be expected to have. We now draw on the above literature review in developing our hypotheses underlying the current study focused on Brazil.

4.4 Hypothesis Development

We develop herein five hypotheses, which follow the sequence of our research question and sub-questions presented above, i.e. in relation to the three external events that affect the level and form of earnings management in Brazil:- (i) an economic crisis (H1); (ii) a corruption crisis (H2); (iii) transparency legislation (H3); and the form of the AEM/REM relationship (i.e. composites or substitutes) (H4 & H5).

From the literature review we saw that firms engage in both forms of earnings management AEM and REM for purposes of increasing or decreasing reported earnings. Our primary interest is in the type and extent of earnings management practice (i.e. the magnitude) and what this implies for governance, internal control and reporting quality in firms, rather than the directional impact on earnings: - consequently we follow prior studies to consider absolute levels of AEM (e.g. Cohen, Dey and Lys, 2008; Francis et al., 2016a) and REM (e.g. Francis et al., 2016a; Kim, Kim & Zhou, 2017). In so-doing, we answer the call of Francis et al., (2016b) for more research that studies absolute magnitudes of both AEM and REM with no presumption regarding the direction of earnings management.

We start by considering the association between earnings management and the situation of an economic recession in Brazil. Brazil has suffered three economic recessions since 2000 :– in 2009, 2015 and 2016 (World Bank, 2019). During a recession (or "economic crisis") firms face various pressures which can influence their motivations regarding earnings management, and there are two contradicting views on how this will play out. The "big bath" perspective posits that in a downturn reduced earnings will be viewed as acceptable, and consequently firms will desist from using earnings management so as to benefit from increased government support or to strengthen debt renegotiation discussions (Saleh and Ahmed, 2005; Chia et al, 2007; Habib, Bhuiyan and Islam, 2013). Alternatively, the "reputation preservation" perspective suggests that managers may be motivated to avoid breaching debt covenants, avoid shareholder pressure or simply maintain reputation (Jaggi and Lee, 2002; DeFond and Jiambalvo, 1994), and thereby increase their usage of earnings management to maintain reported earnings.

From the literature review we saw that empirical results are mixed as to which perspective prevails, with Jahmani, Niranjan and Toney (2016) reporting increased use of AEM in a recession (for US data), and Silva et al., (2014) finding a moderate negative association with AEM for Brazilian companies. The one study we could locate that links REM and recession found that REM fell during a recession, based on a 31-country sample (Wang, 2014). Given the different perspectives and inconsistent empirical findings, we believe that a recession will impact the type and extent of earnings management in Brazil, but it is not clear what the associated changes in magnitude will be. Hence our first hypothesis is :-

H1: In Brazil, there is an association between economic crisis and the level of AEM and REM undertaken by firms.

Hypothesis 2 considers the impact of a different type of crisis, i.e. a crisis or scandal associated with corruption. The most revered company in Brazil is Petrobras which plays an important role in the Brazilian economy. Consequently, in 2014 when the company became embroiled in the largest bribery scandal ever (Watts, 2017), the scandal had a profound impact in the country. Most importantly it resulted in enormous publicity and the involvement of regulatory bodies around the world including the SEC in the US and the UK's Financial Conduct Authority, as well as regulatory bodies and the police within Brazil. The intense level of external scrutiny and discussion in the public domain maintained during the approximate 2-year period 2014 – 2015, during which it affected business governance generally in Brazil. Consequently, we argue that the Lava Jato scandal can be considered to be a "corruption crisis" event in Brazil which persisted for this 2-year period during which corporate scrutiny by regulators, investors and external business partners profoundly influenced how corporates in Brazil practiced financial control and reporting. We conjecture therefore that during the corruption crisis period 2014 - 2015, the crisis had a similar impact on earnings management as did the introduction of legislation such as SOX and IFRS, i.e. it led to reduced levels of AEM and a switch to REM. Hence our 2-part second hypothesis is:-:-

H2a During the corruption crisis the level of AEM reduced;
H2b During the corruption crisis the level of REM increased.

Hypothesis 3 considers the association between transparency legislation and earnings management. As we outlined above, unrelated to the Petrobras scandal, and following several years of planning and debate, in January 2014 Brazil belatedly introduced new corporate transparency legislation through enactment of the Brazil Clean Company Act (BCCA). This legislation is focused on reducing corruption through the strengthening of internal controls and compliance procedures, and requires firms to have in place a suitable "integrity programme". The legislation has been considered by some commentators to be inadequate as it falls short of requiring attestation on the quality of internal controls (which is an hallmark of the US SOX legislation); conversely others believe that it is fit for purpose and incentivises companies to boost the quality of internal controls (Tobolowsky, 2016).

We argue that the BCCA will have had a significant impact in reducing REM in Brazil for three underlying reasons. First, we note that following the 2010 mandatory adoption of IFRS in Brazil for all publicly traded companies, Pelucio-Grecco et al. (2014) found that it served to reduce AEM. Second, we posit that the reduction in AEM resulted in enhanced use of REM as seen in other countries where companies have faced enhanced scrutiny following tightened reporting regulation (e.g. Cohen, Dey and Lys, 2008). Third, we conjecture that in Brazil REM has typically been opportunistic and permissible as a result of inherent weak internal controls affecting governance and oversight of senior management. Consequently, we hypothesis that the BCCA, which seeks to improve the quality of internal controls around transparency and compliance procedures, will have the effect of inducing firms to improve their processes with a resulting reduction in the level of REM, hence: -

H3: The Brazil Clean Companies Act reduced the incidence of REM manipulation.

Our final two hypotheses H4 and H5 consider the joint presence of, and relationship between, the two forms of earnings management AEM and REM under different business conditions: - i.e. under “normal” conditions all else being equal (H4), and specifically during the corruption crisis (H5). Brazil has an unfortunate reputation for corruption (Tobolowsky, 2016). As we outlined above, the most recent high profile scandal involves Petrobras which reached the public domain in 2014. However, the country’s reputation for weak internal controls and heightened corruption risk is long standing, indeed Brazil has been classified as a country with poor rankings for the quality of enforcement, legal regime and transparency (e.g. Durnev and Kim, 2005). Moreover, Brazil is a code-law country. A number of studies have shown that code-law environments present weaker investor protection and provide insiders with more power to manipulate earnings (La Porta et al., 2008). Indeed research has shown that high quality internal controls and oversight push companies to switch from less costly AEM, to REM as a substitute form of manipulation. We suggest that in Brazil, the combination of historically weak external and internal oversight has led to management using both forms of earnings management: - i.e. through AEM because of weak controls around financial management and insufficient external scrutiny, and REM because of inadequate governance and oversight controls over senior management and leadership, who are able to make ad-hoc and opportunistic decisions unconstrained by governance constraints.

Thus our fourth hypothesis is,

H4: In Brazil, firms manipulate reported earnings by using both AEM and REM as complements.

Finally, H5 considers further the situation of the corruption crisis assessed in H2a and H2b and how this impacted the relationship between AEM and REM usage. We posit that the corruption crisis resulted in such a severe level of outside scrutiny that not only did managers respond by reducing the level of AEM (H2a) and increasing their reliance on REM (H2b) - a phenomenon which mirrors the impact of SOX legislation - but the corruption crisis also resulted in the relationship between AEM and REM changing from one of composites to substitutes due to the increased relative risk attached to AEM in that period, a relationship change which was also seen following the introduction of SOX (Cohen, Dey and Lys, 2008). Hence our final hypothesis is:-

H5 During the corruption crisis, managers used AEM and REM as substitutes.

4.5 Research Design and Methodology

4.5.1 Sample Data

Our sample comprises Brazilian public companies listed on the Sao Paulo stock exchange (B3, formerly BOVESPA) for the period 2000-2017. Annual data was collected from the DataStream database housed at Cranfield University. In line with other researchers (e.g. Cupertino, Martinez, and da Costa, 2015), we restrict our sample to non-financial firms. This meant excluding 55 insurance firms, banks and investment funds because these sectors have specific legislation and standards that can have an idiosyncratic effect on accounting (Gunny, 2006).

We grouped our sample by the two-digit ICB industry code, and following Rosner (2003), required each industry to have at least six observations per year for the industry-year discretionary accruals and real earnings management proxies employed in our analysis. This restriction may introduce survivorship bias in favour of larger and more successful firms, however, as Cohen, Dey and Lys (2008) point out as a justification in their analysis which was performed on the same basis, this bias will likely reduce variations in earnings management metrics, and thereby provide more conservative tests of our research questions. Moreover, the inherent risk of survivorship bias is relatively low in Brazil due to the relatively few mergers, bankruptcies and listings that have occurred traditionally and since 2000. The final sample for empirical analysis comprises 186 firms within 10 industries which provide 3,241 firm-year observations.

4.5.2 Measurement of Earnings Management Metrics

We set out below in detail the methodology we used to compute earnings management. In summary, we applied the commonly used models referenced above to estimate measures of both abnormal AEM (Dechow, Sloan and Sweeney, 1995) and abnormal REM (Roychowdhury, 2006), both of which apply weighted least squares estimation methods.

Also consistent with prior research where the primary interest is to capture the extent (magnitude) of earnings management activity rather than the directional effect on earnings which can be in either direction depending on incentive, we focus on absolute values of abnormal discretionary accruals to proxy for the extent of AEM usage (following Cohen, Dey and Lys, 2008; and Martinez, 2011), and similarly we focus on absolute values of abnormal real activity measures as REM proxies (following Francis et al., 2016a; Kim, Kim & Zhou, 2017; and Martinez, 2011). We applied panel data methodology using Stata software to run OLS regressions, and in line with previous studies (e.g. Gunny, 2010), we winsorized all continuous variables at the top and bottom 1% of their distribution to limit the influence of outliers.

4.5.2.1 Accruals Earnings Management

Consistent with previous studies, we use *discretionary* accruals as a proxy for earnings management (Lazzem and Jilani, 2018). As indicated above, several different models exist to estimate discretionary accruals but all are similar and are based on the same underlying method outlined below, consequently so as to permit comparison with prior studies, we choose to follow Cohen, Dey and Lys (2008) in using the most frequently used model, i.e. the cross-sectional Jones model (Jones, 1991) as modified by Dechow, Sloan and Sweeney (1995), which we refer to henceforth as the "modified Jones model". To do this we must first disaggregate discretionary from non-discretionary accruals. A firm's accounting earnings can be represented by the basic accounting equation, i.e.: -

$$AE = CF + TACC \qquad (4\text{-}1)$$

Where,

AE = accounting earnings on an accruals basis
CF = cash flow
TACC = total accruals

Accruals can be divided into discretionary (DACC) and non-discretionary (NDACC) components, i.e.

$$TACC = DACC + NDACC \quad (4\text{-}2)$$

The method for determining whether accrual earnings management is present relies on identifying *abnormal* levels of DACC. This is a two-step process. DACC is not observable – rather, it can only be obtained by finding the difference between TACC and an estimation of NDACC. The first step is to obtain TACC, which can be determined directly from a firm's financial statements from one of two methods using data from the balance sheet, or from the income statement and statement of cash flows as below: -

$$TACC1_t / TA_{t-1} = [\ (\Delta CA_t - \Delta Cash_t) - (\Delta CL_t - \Delta STD_t) - Dep_t\ ] / TA_{t-1} \quad (4\text{-}3)$$

$$TACC2_t / TA_{t-1} = [\ NI_t - CFO_t\ ] / TA_{t-1} \quad (4\text{-}4)$$

Where, for any firm, the above variables comprise:-

$TACC1_t$	total accruals in year *t* using the balance sheet method
ΔCA_t	change in year-end current assets between period *t* and period *t-1*
$\Delta Cash_t$	change in year-end cash and cash equivalents between period *t* and period *t-1*
ΔCL_t	change in year-end current liabilities between period *t* and period *t-1*
ΔSTD_t	change in year-end short term debt between period *t* and period *t-1*
Dep_t	depreciation and amortization expenses in year *t*
TA_{t-1}	total assets at the end of year *t-1*

and

TACC2	total accruals in year t using the income statement and cash flow statement method
NI_t	earnings before extraordinary items in year t
CFO_t	operating cash flows in year t

The computations of TACC1 and TACC2 should produce similar (but not identical) results as both apply the accounting equation, albeit using different variables for which the vagaries of data averaging and sampling will result in some difference between the two. Having two measures provides us with a way of testing the robustness of the computation. In our study, following Cohen, Dey and Lys (2008), we choose to use TACC1 and related measures for discretionary accruals as our primary measure of abnormal accruals, which for ease of reference we will refer to henceforth as "TACC", however as a robustness test we will also report measures in the results section using TACC2 (Cohen, Dey and Lys, 2008).

The second step is to use the computed TACC measure to estimate discretionary and non-discretionary accruals. Under the modified Jones model this is done for the sample of firms through application of the following regression for each year (t) and firm (i), by industry grouping (Dechow, Sloan and Sweeney, 1995; Jones, 1991): -

$$TACC_{i,t-1} / TA_{t-1} = \alpha_{1,t}(1/ TA_{t-1}) + \alpha_2(\Delta REV_{i,t} - \Delta AR_{i,t} / TA_{t-1}) + \alpha_3(\mathrm{PPE}_{,t}/ TA_{t-1}) + \varepsilon_{i,t} \quad (4\text{-}5)$$

Where for each firm *i* the variables comprise: -

$\Delta REV_{i,t}$	revenues in the period t less revenues in the period t-1
$\Delta AR_{i,t}$	change in accounts receivable in the period t
$PPE_{i,t}$	gross value of property, plant and equipment in period t
$\varepsilon_{i,t}$	regression error (residual) in period t

In Equation 4.5, the aggregate of the first three terms on the right of the equality sign measures non-discretionary (or normal) accruals. Consequently, the residual from Equation 4.5 comprises our measure of discretionary (or abnormal) accruals AEM_j.

4.5.2.2 Real Earnings Management

Consistent with our estimate of AEM proxies above, we rely on prior research to develop our proxies for REM. The seminal study of REM was undertaken by Roychowdhury (2006) whose three measures of REM manipulation techniques remain the most widely used in current research. Consequently we adopt these measures in this study.

The Roychowdhury (2006) REM models are based on real operational manipulations that target (i) sales; (ii) production levels; and (iii) discretionary expenses, and build on models developed by Dechow, Sloan and Sweeney (1995), which as a first step generate "normal" levels of CFO, production costs, and discretionary expenses respectively. The second step involves cross-sectional regression computations by industry to compute residuals that represent the respective "abnormal" proxy measure of REM, i.e. using the same technique used to determine the abnormal accruals described above. We briefly explain the basis of each REM measure, and set out the respective regression equation used in its computation.

First, firms can manipulate revenues up or down depending on their objectives. For example, sales can be increased in the current period in two primary ways: - i.e. by offering enhanced price discounts and more lenient credit terms, and the result will be increased revenues and earnings but reduced cash flow in the current period. Sales manipulation can be detected by estimating abnormal cash flows in a cross-sectional regression for each industry, i.e. this computation uses the same technique used to determine abnormal accruals above. In this case, normal CFO can be expressed as a linear function of sales and change in sales (Dechow, Sloan and Sweeney, 1995), whereby the regression equation is as follows : -

$$CFO_{i,t-1} / TA_{t-1} = \alpha_{1,t}(1/ TA_{t-1}) + \alpha_2(REV_{i,t} / TA_{t-1}) + \alpha_3(\Delta REV_{i,t} / TA_{t-1}) + \varepsilon_{i,t} \qquad (4\text{-}6)$$

In Equation 4.6, the aggregate of the first three terms on the right of the equality sign measures normal CFO. Consequently, the residual from Equation 4.6 comprises our measure of abnormal CFO (Roychowdhury, 2006) which can be positive or negative depending of type of manipulation deployed (i.e. income increasing or decreasing) (Francis et al., 2016b; Eldenberg et al., 2011). We refer to the absolute value of the residual as REM_{CFO}.

Second, firms can manipulate earnings by targeting production levels. For example, abnormally high production expenditure increases the level of work in progress or closing stock which is capitalised and therefore reduces cost of good sold (COGS), allowing firms to increase reported income. Unless this process is maintained in the subsequent year, the effect on income will reverse. Following Dechow, Sloan and Sweeney (1995), production costs comprise COGS and change in inventory, which in composite can be depicted as a linear function of current revenues, change in revenues in the current year, and the change in revenues in the prior year:-

$$PROD_{i,t-1} / TA_{t-1} = \alpha_{1,t}(1/ TA_{t-1}) + \alpha_2(REV_{i,t} / TA_{t-1}) + \alpha_3(\Delta REV_{i,t} / TA_{t-1}) + \alpha_3(\Delta REV_{i,t-1} / TA_{t-1}) + \varepsilon_{i,t} \tag{4-7}$$

In Equation 4.7, the aggregate of the first four terms on the right of the equality sign measures normal production (PROD). Therefore in Equation 4.7 the residual measures abnormal production which can be positive or negative (Roychowdhury, 2006). We refer to the absolute value of this residual as REM_{PROD}.

Third, firms can boost earnings by cutting discretionary expenses, or reduce earnings by incorporating excessive discretionary expenses. Targeted expenses could include research and development and SG&A, both of which must be expensed under IFRS (Gunny, 2006). Following Cohen, Dey and Lys (2008) and Roychowdhury (2006), normal discretionary expenses (DiscExp) can be expressed as a linear function of lagged revenues pursuant to the following regression equation: -

$$DiscExp_{i,t-1} / TA_{t-1} = \alpha_{1,t}(1/ TA_{t-1}) + \alpha_2(REV_{i,t-1} / TA_{t-1}) + \varepsilon_{i,t} \tag{4-8}$$

In Equation 4.8, the residual measures abnormal discretionary expenses as an REM manipulation technique, the absolute value of which we term REM_{DISX}.

As Cohen, Dey and Lys (2008) point out, there is no consensus amongst scholars on a single preferred measure of REM, and they argue that firms wishing to manage earnings are likely to use one or more of the REM methods. Some researchers choose to report just one measure – for example REM_{DISX} is reported by both Li (2019) and Lo, Ramos & Rogo (2017), whereas Kim, Kim and Zhou (2017) report REM_{CFO}; others report two measures which are typically REM_{DISX} and REM_{PROD} (e.g. Martinez, 2011; Zang, 2012); and some report all three measures, but focus their discussion on a single measure or a composite (e.g. Cohen, Dey and Lys, 2008). Li (2019) argues that REM_{DISX} is the best measure to use because the results of a survey of executives conducted by Graham et al., (2005) showed that this method is preferred by managers. We follow Li (2019) and Lo, Ramos & Rogo (2017) by focusing our narrative on REM_{DISX}, as our primary measure of REM, and we also follow Cohen, Dey and Lys (2008) and report our results for REM_{CFO} and REM_{PROD} which measures serve as robustness tests.

4.5.3 Estimation Models and Regression Specifications

In order to test the hypotheses for each of our two dependent variables, i.e. either AEM or REM, we estimate the following regression models:

$$\begin{aligned} AEM_j \text{ (or } REM_j) = \; & \alpha_0 + \beta_1 CRISIS + \beta_2 RECESSION + \beta_3 CLEAN\_ACT + \\ & + \beta_4 REM_j (\text{or } AEM_j) + \beta_5 SIZE_j + \beta_6 GROWTH_j + \beta_7 ROA_j \\ & + \beta_8 LEVERAGE_j + \beta_9 FIN\_HEALTH_j \\ & + \beta_{10} REM_j (\text{or } AEM_j) * CRISIS + \Sigma\beta_j (Industries) + \varepsilon \end{aligned} \quad (4\text{-}9)$$

Our regression model follows Cohen, Dey and Lys (2008), Zang (2012) and Chan et al., (2014) whereby with AEM_j (REM_j) as dependent variable, we include REM_j (AEM_j) as an independent variable to control for the fact that firms are free to choose between the two forms of earnings management which may represent an association in the form of a substitute or complementary relationship.

The interaction variable REM_j (AEM_j)*CRISIS is included so we can test whether any relationship that exists between REM and AEM changes during the crisis period (H5).

We include five control variables in the regression model representing corporate size, growth, profitability, indebtedness and financial health. These comprise the most commonly used control variables across a number of similar studies which apply AEM and REM regression models (e.g. Gunny, 2010; Habib, Bhuiyan and Islam, 2013; Paredes and Wheatley, 2017; Sun and Rath, 2012), including in respect of research on Brazilian companies (Dani, Dal Magro, and Klann, 2017). All regression computations apply fixed effects for industry and cluster at firm and year level.

Our model uses the following variable definitions:

Dependent variables		
AEM_j	=	absolute value of discretionary accruals, which measures the level of this form of earnings management (following e.g. Gonzalez & Garcia-Meca, 2014; Cohen et al., 2008); or
REM_j	=	absolute value of one of the three real earnings management proxy measures (REM_{DISX}; REM_{CFO}; REM_{PROD}) which measure the level of this form of earnings management (following e.g. Francis et al., 2016a; Kim et al., (2017); Martinez, 2011).
Variables of interest		
CRISIS	=	a dummy variable that is equal to 1 for the years of the Petrobras crisis i.e. 2014 and 2015, and 0 otherwise;
RECESSION	=	a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016, and 0 otherwise;
CLEAN_ACT	=	a dummy variable that is equal to 1 for the years post the Brazil Clean Company Act, i.e. 2014, 2015, 2016 and 2017, and 0 otherwise;
Control variables		
SIZE	=	firm size measured as the log value of total assets (following Gunny, 2010; Habib et al., 2013, Paredes & Wheatley, 2017; Sun & Rath, 2012)
GROWTH	=	the ratio of market value of equity over book value of assets (following Gunny, 2010; Habib et al., 2013)
ROA	=	return on assets, being a measure of performance i.e. income before extraordinary items divided by lagged total assets (following Gunny, 2010)
LEVERAGE	=	long term debt divided by total assets (following Paredes & Wheatley, 2017)
FIN_HEALTH	=	the Altman Z-score, a measure of financial health (following Gunny, 2010).

As outlined above, dependent variable AEM_j is computed as the residual of the regression to determine abnormal discretionary accruals pursuant to Equation 4.5. Similarly, each of the three component measures of REM_j is computed as the residual of the respective Equation 4.6, 4.7, or 4.8.

Three of our interest variables are time-based dummy variables (CRISIS, RECESSION, and CLEAN_ACT), for which we note there is some period overlap – the recession period covers the years 2009, 2015 and 2016; the BCCA period covers 2014 to 2017, and the corruption crisis covers 2014 and 2015, i.e. all three dummies cover the 2-year period 2015 and 2016. This means that any conclusions drawn from the results will need to reflect the limitation of the possibility of interaction effects that do not permit us to fully isolate causality in the 2 year crisis period. Although the BCCA and corruption crisis both commenced in the same year 2014, this co-terminality is coincidental:- the two are unconnected (indeed BCCA had been under some form of development since at least 2007 (Tobolowsky, 2016), and its enactment in January 2014 predated discovery of the Petrobras scandal by several months); consequently we suggest that there is minimal endogeneity risk between variables CLEAN_ACT and CRISIS.

4.6 Results

4.6.1 Descriptive Statistics

Table 4.1 shows descriptive statistics of our data used in the multivariate analyses comprising (i) published data variables and (ii) the estimated residuals for the proxies of AEM and REM, containing mean, median, mean (25th percentile), mean (75th percentile), standard deviation, and the number of observations. In common with previous research (e.g. Gunny, 2010), to limit the influence of outliers we winsorized all continuous variables at the top and bottom 1% of their distribution.

Table 4-1 Summary statistics for regression variables and earnings management proxies

Variable	Mean	Median	p25	p75	Standard deviation	No. of observations
AEM	0.063	0.042	0.018	0.081	0.070	2123
REM_{DISX}	0.073	0.047	0.021	0.090	0.088	2165
REM_{PROD}	0.076	0.054	0.024	0.103	0.073	2525
REM_{CFO}	0.072	0.043	0.020	0.095	0.082	2641
SIZE	6.097	6.136	5.452	6.728	0.911	2989
MTB	1.632	0.980	0.410	2.050	3.236	2681
ROA	5.823	7.270	2.740	12.170	13.989	2913
LEV	0.813	0.587	0.439	0.747	1.143	2989
ALT_Z	0.986	2.000	0.900	3.200	9.983	2534

In the academic literature there are few previously reported descriptive statistics on earnings management for Brazilian firms, and those that there are relate to earlier periods. However, it is apparent that notwithstanding differential periods of data coverage, there is reasonable consistency between our various summarised figures, both for those computed as earnings management proxies, and the selected control variables, and those published elsewhere for Brazilian firms.

We first comment on the summary measures for the various earnings management proxies.

Table 4.1 presents the data for our absolute measure of discretionary accruals obtained from the modified Jones model (AEM) for our preferred method of computing this measure as outlined above i.e. the balance sheet method (Equation 4.3). For purposes of robustness, we also conducted a comparison of our AEM statistics with those obtained for the alternate measure of discretionary accruals based on the income statement (Equation 4.4). As expected we found that the AEM measures are highly consistent which provides support for the robustness of our computations.

Our estimate of absolute AEM (mean = 0.063; median = 0.042) is similar to estimates previously reported for Brazil: - Cupertino, Martinez, and da Costa (2015) reported a mean = 0.057 and a median = 0.042 for the period 1989 - 2012; and Martinez (2011) reported an average = 0.06 for the period 1998 – 2004.

Table 4.1 also includes our results for the three specific computed absolute measures of real earnings management activity, i.e. REM_{DISX}, REM_{CFO}, and REM_{PROD}. We can locate only one study on Brazilian firms that reports equivalent measures for our different REM component measures – i.e. Martinez (2011) reports estimates covering the period 1998 – 2004 for two of the measures, both of which are reasonably in line with our results – i.e. they reported a REM_{PROD} measure of 0.086 (which is slightly higher than our estimate of 0.076), and an $REM_{\_DISX}$ measure of 0.008 (which is below our estimate of 0.073). Finally, we note from the relative levels of the mean earnings management proxies, firms have made more use of real earnings management compared to discretionary accrual methods (e.g. REM_{DISX} = 0.073; AEM = 0.063), a finding which is even more pronounced if the three REM measures are considered in aggregate

- a finding that matches that reported by Cupertino, Martinez, and da Costa (2015) in respect of Brazilian companies.

Regarding control variable data, our sample comprises firms which have a market-to-book ratio of 1.63, which is slightly higher than the 1.59 figure found by Silva et al., (2014) in their study of Brazilian firms in the period 1997- 2009, and the 1.54 figure reported by De Almeida et al. (2009) covering the period 2000 – 2006. Return on assets of 5.82 is moderately above the 4.58 figure reported by Gonzalez and Garcia-Meca (2014) in respect of firms in the 2006 – 2009 period, with our higher figure probably reflecting the economic boom experienced in the period 2008 – 2014 contained in our sample. The leverage figure mean of 0.81 is above the average for Latin American countries of 0.54 reported by Rathke et al., (2016) for the period 2011 and 2012, which appears to reflect the relatively high level of corporate debt in Brazil and the size of its economy relative to other Latin American countries.

The Pearson correlations for all variables used in the regressions are reported in Table 4.2 below. The table shows that the three forms of REM are all mutually positively correlated either moderately or weakly, (e.g. for REM_{DISX} and REM_{PROD} r=0.128, p<0.01); and REM_{CFO} and REM_{PROD} r=+ 0.448, p<0.01, findings which are broadly consistent with those reported by Martinez (2011) for Brazilian companies, and suggest that the three forms of REM may be being applied in a complementary way. We also note that our AEM and REM proxies are positively correlated, which suggests that Brazilian firms use both AEM and REM as complementary management methods, a finding which is in line with the Brazilian results reported by both Martinez (2011) and Cupertino, Martinez, and da Costa (2015). For example, AEM is moderately positively correlated with REM_{DISX} (r= +0.39, p<0.001), and is weakly positively correlated with both REM_{PROD} (r= +0.11, p<0.001) and REM_{CFO} (r= +0.05, p<0.01).

For the control variables we observe that leverage and financial health (Alt_Z) are highly negatively correlated (r= -0.79, p<0.01), which we suggest is not unexpected given the association between debt level and financial risk and the relatively high levels of debt held by Brazilian companies as we saw above. We also note that ROA and leverage are moderately negatively correlated (r= -0.39, p<0.001), a result which is similar to that reported for Brazilian firms by Silva et al., (2014) ($r=-0.31$, $p<0.0001$) covering the period 1997 – 2009.

In the next section we report our regression results. In order to assess multi-collinearity risk, we performed variance inflation factor (VIF) estimations for all regressions. High VIFs are indicative of potential collinearity problems, whereby for standardized data, VIFs in excess of 10 indicate the presence of harmful collinearity. Across all of our regressions we obtained VIFs in the range 1.7 - 2.5, and hence conclude that our regressions are free of multicollinearity problems.

Table 4-2 Pearson correlation matrix

	REM_{DISX}	REM_{PROD}	REM_{CFO}	AEM	SIZE	MTB	ROA	LEV	Alt_Z
REM_{DISX}	1								
REM_{PROD}	0.128***	1							
REM_{CFO}	0.092***	0.448***	1						
AEM	0.390***	0.107***	0.051**	1					
SIZE	-0.168***	-0.079***	-0.154***	-0.165***	1				
MTB	-0.001	0.122***	0.071**	-0.022	0.128***	1			
ROA	0.022	0.112***	-0.004	-0.154***	0.196***	0.191***	1		
LEV	0.034	-0.105***	-0.003	0.116*	-0.347***	-0.184***	-0.387***	1	
Alt_Z	0.021	0.143***	0.045*	-0.093**	0.327***	0.217***	0.416***	-0.794**	1

REM_{DISX} is the absolute value of the residual from the abnormal discretionary expenses manipulation model presented by Roychowdhury (2006). **REM_{PROD}** is the absolute value of the residual from the production manipulation model of Roychowdhury (2006). **REM_{CFO}** is the absolute value of the residual from the sales manipulation model of Roychowdhury (2006). **AEM** is estimated absolute discretionary accruals, our primary measure of accruals earnings management, based on the modified Jones Model (Dechow et al., 1995). **SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets (following e.g. Gunny, 2010).

***/**/*/# means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

4.6.2 Multivariate Analysis

For ease of narrative analysis it is informative to present the regression result tables sequentially to match the order of our hypotheses H1-H5. Similarly, consistent with regression analysis studies and to enable an assessment of relationship robustness, we first we present regression result tables whereby each interest (hypothesis) variable is isolated and separately regressed against our dependent variable estimates and control variables for (i) AEM (Table 4.3); and (ii) (i.e. REM_{DISX}, Table 4.4).

[Insert Table 4.3 and Table 4.4 here]

Second, we present the full regression model results pursuant to Equation 4.9, comprising all model variables (and incorporating the interaction term AEM/REM*CRISIS), regressed against our dependent variable estimates for: - (i) AEM (Table 4.5); and (ii) REM (i.e. REM_{DISX}, Table 4.6).

[Insert Table 4.5 and Table 4.6 here]

We also present the results of our model robustness tests. First, Appendix C-1 shows the results of the robustness test for AEM (i.e. AEM_rob which is computed using the alternative measure of AEM based on data obtained from the income statement and cash flow statement as opposed to balance sheet figures used in our computation of AEM detailed above). Second, we present the regression results for the two alternate measures of REM (REM_{CFO} and REM_{PROD}): - (i) Appendices C2-1 and C2-2 show the results for REM_{CFO} and REM_{PROD} respectively with each interest variable isolated and in combination (i.e. mirroring the format of Table 4.4 REM_{DISX}); and (ii) Table 4.7 shows the full model regression results including the interaction term for the REM_{CFO} and REM_{PROD} measures (i.e. mirroring the format of Table 4.6 for REM_{DISX}).

[Insert Table 4.7 here]

It is apparent from these results that there is a reasonably high degree of similarity between the AEM and AEM_rob regression results which provides support for the robustness of the AEM results. Similarly, we can see that regression results for the three separate REM measures are broadly similar in respect of the key relationships we are testing, most notably in respect of REM_{DISX} and $REM_{PROD.}$ This finding indicates that firms in Brazil use all three REM methods, and as composites consistent with the correlational findings presented earlier, a result which mirrors previous findings for Brazil (e.g. Cupertino, Martinez, and da Costa, 2015; Martinez, 2011).

Results for Hypothesis 1

H1 tests how an economic crisis (i.e. a recession) influences Brazilian managers' use of earnings management. In our models we incorporated the term RECESSION as an interest variable. From Table 4.3 (model 1), with AEM as DV, we see that that the coefficient for the term RECESSION is not significant, a finding which remains with the inclusion of the other interest variables (model 6), which indicates that the level of AEM is not impacted during a downturn controlling for all other variables. This finding is also seen in the full regression model for AEM (Table 4.5), as well as in the robustness test results (Appendix C-1).

There is however a significant impact of a downturn on the level of real earnings management: - from Table 4.4 with REM_{DISX} as the DV regressed against RECESSION as the single interest variable (model 1), we see a significant negative association at the 1% level (β= -0.0144, p<0.000); a finding which is maintained when all other interest variables are included (β = -0.0128, p= 0.006) (Table 4.4, model 6), and in the full regression model (Table 4.6, β= -0.0130, p=0.004). We also see from Table 4.7 that in respect of the other REM measures (i) there is a negative relationship, albeit at less significance, for REM_{PROD} (β= -0.003, p= 0.052); and (ii) no significant association between REM_{CFO} and the economic crisis (although there is a marginal negative association at the 10% level when control variables are excluded (β= -0.004, p= 0.092, i.e. model 1).

We conclude therefore that these results provide partial support for H1: - earnings management is impacted during a recession, albeit only in respect of the level of REM which reduces (an outcome which as we discuss below may be related to the high costs associated with REM), and there is no impact on the level of AEM.

Results for Hypothesis 2

Hypothesis 2 comprises two components, H2a and H2b, which investigate how the extent of AEM and REM activity respectively was affected by the Petrobras corruption crisis, via the dummy variable CRISIS which is included as an interest variable in the regression model.

We can see from Table 4.3 with AEM as the DV regressed against CRISIS as the single interest variable (model 2), that the crisis has a moderately negative association with AEM at the 10% level (β=-0.005, p=0.082). This moderate negative relationship is robust and is maintained with the inclusion of other interest variables (Table 4.3, model 6 where β=-0.01 p=0.072), as well as in the full regression model results for AEM (Table 4.5) and in the robustness check findings for AEM_rob (albeit only for the model that excludes control variables -Table 4.5). We interpret these findings as presenting moderate support for H2a that during the crisis the level of AEM fell.

How the crisis affected the extent of REM activity can be seen from the regression results presented in Tables 4.4, 4.6 and 4.7. In Table 4.4 with REM_{DISX} as the DV regressed against CRISIS as the single interest variable (model 2), we see a strong positive association (β=+0.0093, p=0.029). This finding is robust to the addition of all other interest variables (Table 4.4, model 6), and is even more significant in the full regression model which incorporates the interaction term (Table 4.6, β=+0.019 p=0.012). For the other two REM measures we see mixed results for the relationship in the crisis period: - from Table 4.7 we see that REM_{CFO} has no association, whereas REM_{PROD} also shows a strong positive relationship at an even higher level of significance (β=+0.162, p=0.003). We therefore conclude that the findings are supportive of H2b, viz a viz during the corruption crisis the level of REM increased. Consequently, overall the crisis impacted the two forms of earnings management as predicted:- i.e. there is moderate support (at the 10% level) that the crisis served to reduce AEM, and strong support (at the 5% level) that the crisis led to increased REM activity.

Results for Hypothesis 3

H3 predicts that the Brazil Clean Companies Act (BCCA) introduced in 2014 had the effect of reducing the level of earnings management in Brazil, but only in respect of REM. In our models we incorporated the term CLEAN_ACT as an interest variable. Prior studies have shown that following implementation of IFRS in 2010 the level of REM rose in tandem with a reduction in AEM (Pelucio-Grecco et al., 2014), and we posited in H3 that any heightened level of REM would reduce following the introduction of the BCCA which had the objective of improving corporate compliance, governance and internal controls.

We can see from Table 4.3 with AEM as the DV regressed against CLEAN_ACT as the single interest variable (model 3), that there is no significant association, a finding which is maintained when other interest variables are added to the model, and also in the full regression model results for AEM (Table 4.5), albeit we note a moderate positive association at the 10% level in the robustness test findings for AEM_rob (Appendix C-1, model 6). These findings indicate that on balance the new legislation has had no impact on AEM.

The impact of the new legislation on REM is markedly different. In Table 4.4 with REM_{DISX} as the DV regressed against CLEAN_ACT as the single interest variable (model 3), we see a moderate negative association at the 10% level (β=-0.007, p=0.078), however this finding is maintained and indeed becomes more significant when all interest variables are incorporated (Table 4.4, model 6) where we see a negative association at the 5% level (β= -0.0110, p=0.014), a significant result which is mirrored in the full regression model results which (Table 4.6, β=-0.0111, p=0.013). Table 4.7 shows that there is an even more significant negative association between the CLEAN_ACT and the two alternate measures of REM:- i.e. REM_{PROD} (β=-0.0225) and REM_{CFO} (β=-0.0202) are both significant at $p<0.001$.

We therefore consider the regression findings to provide strong support for H3, suggesting that the BCCA has had an important impact in reducing the level of REM in Brazil since its introduction in 2014, possible explanations for which are considered below.

Results for Hypothesis 4

H4 tests the relationship between the use of the two forms of earnings management manipulation techniques in Brazil, i.e. AEM and REM, and specifically whether this relationship is one of complementation. To test this, with AEM (REM_{DISX}) as DV we incorporated into our regression models REM_{DISX} (AEM) as an interest variable. Recall that pursuant to the model we have constructed, H4 relates to "normal" periods of activity, i.e. the corruption crisis and economic crisis are separately controlled for. How the AEM/REM relationship is impacted during the corruption crisis is considered in H5.

We can see from Table 4.3 with AEM as the DV regressed against REM_{DISX} as the single interest variable (model 4), we find a positive and highly significant coefficient for REM_{DISX} (β=+0.0983, $p<0.001$), a finding which is maintained at this significance level when other interest variables are added (model 6, β=+0.101, $p<0.001$), as well as in the full regression model results for AEM (Table 4.5, model 2, β=+0.119, $p<0.001$) and in the robustness test results using AEM_rob (Table 4.5 model 2, and Appendix C-1 model 6). This finding of a highly significant positive coefficient provides support for H4 that AEM and REM act as complements, all else being equal.

We would expect to find a similar significantly positive result when we use REM_{DISX} as the DV regressed against AEM as the single interest variable (Table 4.4, model 4). The results are indeed consistent and provide further support for the robustness of this finding (β=0.143, $p<0.001$). Moreover, the highly significant positive relationship is maintained at the same level of significance when other interest variables are added (Table 4.4, model 6) and in the full regression model (Table 4.6, β=+0.170, $p<0.001$). This significant positive association between REM and AEM is also found for each of the alternate REM measures (Table 4.7):- (i) for REM_{PROD} we see the same high significance level (β=+0.123, p< 0.000); and (ii) for REM_{CFO} the positive relationship is significant at the 10% level (β=+0.0554, p=0.059).

We therefore conclude that our results are highly supportive of H4, whereby in Brazil under normal market conditions firms use both forms of earnings management AEM and REM as complements to manipulate reported results.

Results for Hypothesis 5

Our final hypothesis H5 considers the relationship between AEM and REM during the corruption crisis period, and thereby represents an extension of H4, for which our results as outlined above provide support for the hypothesis that under normal business conditions AEM and REM are used as complements by Brazilian managers.

To test this, in our full regression model with AEM (REM_{DISX}) as DV we incorporated the additional interaction term REM_{DISX}*CRISIS (AEM*CRISIS). We see from Tables 4.5, 4.6 and 4.7 that all interaction terms are negatively associated with the respective DV measures of earnings management (including for the two alternate REM measures), albeit at different levels of significance ranging from very strong to moderate at the 10% level, which suggests that the relationship between AEM and REM changed to being one of substitution during the corruption crisis period. From Table 4.5 we note that the interaction term REM_{DISX}*CRISIS shows a moderately significant negative association with AEM (β=-0.081, p=0.086); moreover in the alternate measure of abnormal discretional accruals (AEM_rob) a more highly significant negative association is seen (β=-0.347, p=0.009). We obtain further support for this negative relationship finding from the regression results where REM is DV:- i.e. from Table 4.6 we see that the coefficient for the interaction term AEM*CRISIS is negative at the 5% level of significance (β=-0.125, p=0.040). Each of the two alternate measures of REM shows a similar negative relationship with AEM during the corruption crisis as shown in Table 4.7 for the AEM*CRISIS interaction terms: - (i) at the 1% level of significance for REM_{CFO} (β=-0.123, p=0.005); and (ii) at the 5% level in respect of $REM_{PROD.}$((β=-0.119, p=0.016).

We interpret this significant negative coefficient for the interaction term linking earnings management activity and the corruption crisis as providing support for H5, i.e. that during the corruption crisis affecting Brazilian companies, the relationship between AEM and REM changed from one of complementation (as we saw in H4), to one of substitution.

We next look to draw conclusions from these findings. As indicated above, our results are robust given the additional tests we have performed in this analysis. First, we computed alternate measures of the dependent variables: - i.e. (i) for AEM, in addition to our primary measure based on balance sheet data we also computed AEM_rob based on income and cash flow statement figures, the results of which are show in Table 4.5 and Appendix C-1; and (ii) for REM, in addition to our primary measure REM_{DISX} we also computed REM_{CFO} and REM_{PROD}, the results for which are shown at Table 4.7 and Appendix C2-1 and C2-2. As we discussed above, the alternate measures for earnings management show consistent results. Second, we added additional independent variables to the model to test for liquidity: - e.g. operating cash flow divided by total assets (following Habib, Bhuiyan and Islam, 2013), and sales growth on prior year (following Chan et al., 2014). Third we applied alternate computations for variables as used by other scholars (e.g. following Zang (2012) we used ROA based on a non-lagged denominator. None of these sensitivity tests in relation to the control variables affected the above primary regression findings.

4.7 Discussion and Conclusions

4.7.1 Key Findings

The results of this study present a number of new insights and evidence regarding each of the five hypotheses.

Results relating to the first hypothesis indicate that during recessionary periods in Brazil firms do not change the level of AEM they engage in. This is perhaps a surprising result and one that contrasts with the findings of Silva et al., (2014) who found evidence of a moderate negative relationship between AEM use and recession in the period 1997 – 2009 in Brazil, and with the findings of Jahmani, Niranjan and Toney (2016) who identified enhanced AEM activity amongst US firms in the 2008 downturn. We suggest that our finding of no relationship between AEM and recession for Brazil can be interpreted in that firms do not feel unduly pressured to manipulate earnings given that a downturn affects all firms. Moreover, our finding that REM actually falls in Brazil during a recession is in line with the results reported by Wang (2014), and further supports our interpretation in respect of AEM.

Our finding that both components of the second hypothesis are shown to be fully supported has a number of important implications. This is the first study to investigate the impact of a corruption crisis across an entire sector or market. We find that in Brazil, notwithstanding the adoption of IFRS in 2010, which studies have shown reduced the level of AEM (Pelucio-Grecco et al., 2014), the corruption crisis resulted in a further reduction in AEM (H2a). This suggests that IFRS adoption has only been partially successful in reducing AEM and raises questions about the quality of the external audit process. Moreover, the finding that REM increased in the corruption crisis period (H2b), as a substitute for AEM (H5), causes us to question the quality of corporate governance in Brazil because REM is associated with poor governance and agency issues (Bereskin, Hsu and Rotenberg, 2018). Moreover, our findings shed light on the impact that public pressure can have in such a situation, as the corruption crisis had the same effect as forceful legislation such as SOX in the US – this regulation reduced AEM, increased REM and led to the two forms of earnings management being used as substitutes following the introduction of this law in 2002 (Cohen, Dey and Lys, 2008).

This is the first study to look at the impact of transparency legislation on earnings management. Our results for H3 in relation to the Brazil Clean Company Act should be seen as encouraging to policy makers and investors. As predicted, the BCCA had no effect on AEM, which is not surprising given that, unlike SOX, it does not mandate any specific measures, nor does it require attestation by management. However, our finding that the BCCA is associated with a reduction in REM suggests that the legislation is having the desired impact on improving compliance controls, and governance including controls related to financial reporting. Prior studies have shown a negative association between the quality of internal controls and the extent of AEM (Chan, Farrell, and Lee, 2008; Wu, Liu, and Jones, 2011). No similar study has looked at the effect that higher quality internal controls have on the incidence of REM, however Bereskin, Hsu and Rotenberg (2018) report that the existence of REM suggests poor corporate governance and internal controls around financial reporting, on the basis that, for example, under-investment in R&D to boost reported short-term performance can have detrimental long-run effects. Moreover, Jarvinen and Myllymaki (2016) report that increased REM activity happens when there are material control weaknesses and poor tone at the top. Consequently, we posit that the association of reduced levels of REM during the period of the BCCA suggests that because of this legislation firms introduced better procedures focused on transparency, governance and compliance controls, a spill-over being heightened oversight of senior management decisions affecting investment and operational plans, which served as a constraint on ad-hoc opportunistic management decisions resulting in curtailed levels of REM.

The results for H4 and H5 provide interesting insights into the motivations for managers in Brazil to use one or both forms of earnings management AEM and REM. Evidence supporting H4 indicates that overall in Brazil covering the period of analysis 2000 to 2017, managers have routinely used both forms of earnings management AEM and REM as complements, controlling for the periods covered by the Brazil Clean Companies Act, economic recession, and the Petrobras scandal. Prior studies for Brazil regarding the complementary/substitution relationship between AEM/REM are mixed. Our results are in line with the findings of both Martinez and Cardoso (2009) - who reported a complementary relationship in Brazil covering the period 1998 to 2004 – and Cupertino, Martinez, and da Costa (2017) who looked at Brazilian firms in the period 1989 to 2012 and found a complementary relationship existed pre-2010 when IFRS was introduced, with evidence of substitution thereafter. We suggest that a complementary relationship can be explained from two perspectives posited in prior research. First, Hamza and Kortas (2018) report that AEM and REM tend to be used complementarily in countries with weaker regulatory environments, which Joosten (2012) argues is because in such countries investor protection is insufficient to deter AEM and induce firms to switch to REM as a substitute, as happened for example with the introduction of SOX in the US in 2002 (Cohen, Dey and Lys, 2008). We suggest that this explanation may be valid in the case of Brazil, which is a code-law country that has a reputation for poor enforcement (Durnev and Kim, 2005), albeit the situation may have improved in recent years following as a result of events affecting regulation and the quality of controls – i.e. IFRS, the Brazilian Clean Company Act and the Petrobras corruption crisis. Second, Anagnostopoulou and Tsekrekos (2017) report a complementary relationship exists between AEM and REM in firms that have high leverage because such firms attract heavy outsider scrutiny forcing them to use both forms of earnings manipulation. In Brazil the level of corporate debt is relatively high by regional standards, and increased following the economic boom of 2005 – 2012 (Fernandes and Nunes, 2014), a situation which, following the reasoning of Anagnostopoulou & Tsekrekos (2017), perhaps further explains the complementary relationship identified in our data.

Finally, as indicated above, the finding from H5 that during the corruption crisis period the level of REM increased whilst AEM reduced and the relationship between AEM and REM switched to one of substitution, calls attention to the general quality of internal governance and oversight of Brazilian firms:- conversely, and on a more positive note, the reduced level of AEM arising in this highly scrutinized period of the corruption crisis, demonstrates the potential for higher quality financial management and reporting that could arise in a business environment which is more focused on regulation and enforcement.

4.7.2 Research Contribution

This study makes four contributions to the literature domains of earnings management and internal controls as follows.

First, the paper contributes to our understanding of how managers act in relation to earnings management when faced with a specific type of crisis – i.e. a corruption crisis. This is the first study to consider the impact of this type of event, which was centred on the fall-out and intense media, regulatory and public interest in corporate behaviour following the 2014 Petrobras scandal in Brazil, an event which maintained its peak intensity during 2014 and 2015. The scandal represents the largest ever recorded case of corporate bribery (Watts, 2017). A number of countries have firms that resemble Petrobras – i.e. a large national champion which is primarily owned by government but with shares listed on international exchanges. Consequently we believe that the risk of such a corruption crisis event happening elsewhere is material, particularly given the recent increase in enforcement activity by bodies such as the SEC (Tobolowsky, 2016), and our findings have relevance beyond the Brazilian environment. We find that public and regulatory attention can act in the same way as formal legislation – we saw that firms responded to the outside scrutiny in the same way as evidence suggests they did when SOX was introduced in the US in 2002 (Cohen, Dey and Lys, 2008) and IFRS was mandated in Brazil in 2010 (Pelucio-Grecco et al., 2014) – i.e. firms curtailed their use of AEM and switched to REM as a substitute, a form of manipulation which is harder to detect but is costlier (Zang, 2012). The results of the study provide the first evidence of what happens to earnings management manipulation in a corruption scandal. Consequently the study widens our understanding of how management weighs the costs and benefits of its manipulation options in such a situation, and in the context of the perceived strength of external scrutiny and internal governance mechanisms.

Second, this study is the first to examine the impact of transparency legislation on the incidence of earnings management. This type of legislation has been adopted by a number of countries in recent years and represents an attempt to harmonise business ethics and transparency around the world focused on improving internal controls, albeit without requiring formal attestation by executives or mandating specific requirements as was the case with SOX. In our study we considered the case of the Brazil Clean Company Act which was introduced in 2014, and which requires firms to adopt suitable compliance procedures and internal controls around financial management and reporting via an "integrity program". In Brazil there was initial widespread scepticism that this type of legislation could be effective given Brazil's poor record on tackling unethical behaviour in business (Durnev and Kim, 2005). The incidence of REM indicates poor corporate governance and internal controls around financial reporting (Bereskin, Hsu and Rotenberg, 2018) as well as poor tone at the top (Jarvinen and Myllymaki, 2016). Our findings provide important support to suggest that in fact the BCCA has been successful as we see a strong negative association between the BCCA and reduced levels of REM. These findings have relevance in other territories. Further work is required to better understand how firms reacted to the legislation in terms of the specific measures taken to augment corporate governance and internal controls, and to investigate whether the impact on reduced REM is permanent. Consequently this study presents the first evidence of management decision making around earnings manipulation in response to transparency legislation.

Third, our study contributes in a number of ways to our understanding of when and to what extent REM is used as a manipulation technique. REM is a relatively under-researched area of earnings management in comparison with AEM. We show that AEM and REM have been used by managers in Brazil in a complementary way in the past, a finding which augments previous studies and which supports a view of corporate Brazil as having tolerated a weak enforcement climate and inadequate corporate governance. However, we also show that REM is more prevalent than AEM, and the reduction in the extent of AEM suggests that IFRS and outside scrutiny have been impactful in curbing AEM which may suggest enhanced maturity in financial reporting and control around financial information that gets published and audited. Moreover, our findings outlined above viz a viz (i) the nature of the AEM/ REM relationship and respective level of incidence; (ii) the changes identified during the corruption crisis (to a substitution effect, reduced AEM and increased REM); and (iii) the changes seen following the passage of the BCCA (i.e. reduced levels of REM), increase our understanding of how the AEM/REM relationship can be influenced when managers face different costs and constraints on each. Our study also contributes to our understanding of management decisions relating to REM when facing various challenges: - specifically an external threat in the form of a recession, and internal constraints in the form of leverage and financial health, all of which have been sparsely investigated and where results are mixed. Our study extends existing knowledge to provide a more comprehensive understanding of the process by which management evaluate the costs and benefits of manipulation through the use of REM.

Lastly, as this study focuses on Brazil, it adds to extant knowledge about this market which is under-served in accounting research. Most scholarly work on earnings management has been conducted in respect of developed common-law territories such as the US and UK. Consequently our study enables us to test and extend our understanding of the relevance of current knowledge and theories underlying how external events impact the type and magnitude of earnings management in this rapidly developing market. Moreover, this study also allows us to contribute to our understanding at the national level of how different external factors and the quality of internal controls and governance oversight might serve to change attitudes to the practice of earnings management – and by extension to wider concerns around ethical business conduct – in environments which suffer from historic systemic challenges in respect of corruption and transparency, a matter which has wide relevance in today's globalized business environment.

4.7.3 Implications for Policy and Practice

The results documented in this paper have important implications for regulators and investors in Brazil.

First, regulators should be encouraged by what empirical results suggest has been the impact of recent legislation and regulation – namely the introduction of IFRS in 2010 and the BCCA in 2014. Pelucio-Grecco et al. (2014) show that IFRS led to a reduction in AEM and a shift to REM, and our results show that the BCCA has led to reduced levels of REM. It is therefore important that regulators remain vigilant so that firms do not seek to either switch back to using increased levels of AEM (i.e. which might happen if REM continues to reduce due to enhanced corporate governance and internal controls), or else firms roll back on governance controls and compliance which could lead to REM levels increasing again. This risk of an AEM/REM trade-off is relevant beyond Brazil. We suggest that the respective regulators and oversight bodies (i.e. representing the accounting/audit profession, and corporate governance regulators) should look to work together in a unified way to help mitigate this risk.

Second, regulators should look to build on the positive impact that heightened scrutiny of the Petrobras corruption crisis has had on reducing further the level of AEM. Indeed, the competence and independence of the Brazilian authorities in conducting the subsequent investigation and enforcement process related to the Petrobras scandal, plus supportive media attention around the introduction of the BCCA, has further strengthened the view that Brazil now takes investor protection more seriously (Watts, 2017), something that we believe may serve to help maintain pressure to reign in the incidence of earnings management in respect of both forms AEM and REM. Therefore we recommend that the regulatory authorities in Brazil maintain their policy of objective enforcement and investigation of people and firms that have been implicated in the Petrobras scandal, and at the same time continue to publicise the objectives and requirements of the BCCA.

Third, our results suggest that investors should exercise caution in respect of firms that are engaging in high levels of earnings management. Investors should seek to understand both the type and level of earnings management that is taking place in firms they invest in. High levels of AEM can indicate poor reporting quality and auditor oversight. We note that Rathke et al., (2016) report that the level of AEM in Brazil is still relatively high post-IFRS compared to other IFRS adopters. High levels of REM can be indicative of poor internal controls and oversight over the decisions of senior executives which can jeopardise future viability.

Fourth, investors should look to understand better the commitment of management to meaningful corporate governance and compliance in light of the BCCA, so that the positive findings we report of reduced levels of REM resulting from the BCCA are not merely the result of a limited and short term response, but rather represent a commitment to better governance and control that can have a lasting impact on mitigating compliance, control and corruption risks. In order to do this investors should carefully review annual reports and monitor investment in corporate governance, financial control and the fight against corruption in firms they have an interest in.

4.7.4 Limitations and Areas for Future Research

As for any empirical study, there are limitations with the current study. First, our findings on earnings management relate solely to Brazil for which listed companies are subject to IFRS accounting rules, and a complex legal system that is based on civil law (and the legal systems of Portugal, France and Germany), incorporating local, regional and state jurisdictions. Brazil has historically had a poor reputation for enforcement and business ethics. Consequently our findings should be considered in the context of this unique setting, and so may not be fully generalizable.

Second, there is some overlap in our time-based dummy variables – the recession period covers the years 2009, 2015 and 2016; the BCCA period covers 2014 to 2017, and the corruption crisis covers 2014 and 2015, i.e. all three dummies cover the 2-year period 2015 and 2016. Consequently we cannot rule out the possibility that there are interaction effects that do not permit us to fully isolate causality in the 2 year crisis period, albeit the risk is lessened because our findings in this period primarily relate to REM which shows opposite directional trends in relation to the recession/crisis overlap, which leaves the possibility that in the crisis/BCCA overlap combination our finding of reduced REM incidence in the crisis period could in fact be being caused by the BCCA, a potential restriction which would not materially change our analysis and commentary.

Third, our analysis of REM follows the approach taken by most scholars in the field who consider and compute estimates for the three main measures of REM (REM_{DISX}, REM_{PROD}, and REM_{CFO}), whilst adopting a primary reporting focus on REM_{DISX} (e.g. Li, 2019; Cohen, Dey and Lys, 2008). Consequently, as for other studies, ours does not include all possible forms of REM – for example delayed investment or derivatives hedging – which might be important in some cases. Also consistent with other scholars, we do not include an exhaustive list of all variables that might be influential, for example variables that deal with corporate governance which future studies could take up. As a result, as for all social science regression analyses, we cannot preclude the endogenous risk of omitted variable bias in our analysis.

Based on our findings and the limitations outlined above, we suggest four areas where further research would be fruitful. First, our findings suggest that REM has fallen during the period of the BCCA which might be interpreted as being due to the impact of improved controls focused on transparency and compliance in line with BCCA requirements, with spill-over benefits affecting the wider financial reporting and control environment, including REM behaviour. Future research could test this premise through the compilation of confirmatory data – for example cost data on amounts spent on internal control or headcount numbers. Alternatively, contextual analysis could be applied to the annual reports and sustainability reports to assess the importance that leadership gives to compliance and control as a proxy for financial investment in this function. Second, our study adopts the approach of researchers such as Francis et al., (2016a) and Cohen, Dey and Lys (2008) focusing on the extent (magnitude) of earnings management via AEM and REM, either of which can be used to inflate or supress earnings. Future work could be directed at assessing the 'value' of earnings management in times of corporate stress situations such as those studied herein, by looking at (i) the directional effect of each on income (increasing or decreasing); (ii) compliance related costs; and (iii) subsequent stock prices, to assess whether firms actually gain through their earnings management choices or whether there are gains attached to enhanced reporting quality. Third, because the BCCA only came into effect in 2014 our study is limited to a 4-year post-BCCA period of analysis. Future work could take a longer horizon to test whether (i) REM continues to fall and if so if this involves a switch to increased use of AEM; or (ii) whether firms relax the current focus on control and governance that is curbing REM, which then rises as a result. Finally, future research could replicate our study of the impact of transparency legislation on earnings management in Brazil to see if similar legislation that has been recently adopted in a different territory has had the same impact on reducing REM – we suggest a good candidate may be Argentina which introduced its version of a clean company act in 2017 (Farhang, 2018).

Table 4-3 Results of regressions with discretionary accruals as dependent variable

	AEM (1)	AEM (2)	AEM (3)	AEM (4)	AEM (5)	AEM (6)
RECESSION	0.00184				0.00441	0.00327
	(0.636)				(0.263)	(0.404)
CRISIS		-0.00535#			-0.0101#	-0.0106#
		(0.082)			(0.095)	(0.072)
CLEAN_ACT			0.000253		0.00405	0.00480
			(0.948)		(0.387)	(0.338)
REM_{DISX}				0.0983***	0.124***	0.101***
				(0.000)	(0.000)	(0.000)
SIZE	-0.00840***	-0.00798***	-0.00835***	-0.00752***		-0.00765**
	(0.000)	(0.000)	(0.001)	(0.001)		(0.002)
MTB	0.000939	0.000926	0.000926	0.000818		0.000881
	(0.190)	(0.193)	(0.196)	(0.280)		(0.248)
ROA	-0.0782**	-0.0803**	-0.0784**	-0.0786**		-0.0790**
	(0.002)	(0.002)	(0.002)	(0.002)		(0.003)
LEV	-0.000547	-0.000655	-0.000566	-0.000638		-0.000790
	(0.892)	(0.871)	(0.888)	(0.876)		(0.848)
Alt_Z	0.000540	0.000537	0.000535	0.000470		0.000479
	(0.581)	(0.586)	(0.586)	(0.639)		(0.630)
_cons	0.112***	0.111***	0.112***	0.101***	0.0533***	0.101***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed industry	Y	Y	Y	Y	Y	Y
No Obs	1852	1852	1852	1752	1954	1752
adj. R-sq	0.062	0.063	0.062	0.075	0.046	0.076

Results are obtained from OLS regressions. **AEM** is estimated absolute discretionary accruals, our primary measure of accruals earnings management, based on the modified Jones Model (Dechow et al., 1995). **CRISIS** is a dummy variable that is equal to 1 for the years of the Petrobras corruption crisis i.e. 2014 and 2015; and 0 otherwise. **RECESSION** is a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016; and 0 otherwise. **CLEAN_ACT** is a dummy variable that is equal to 1 for the years post the enactment of the Brazil Clean Company Act, i.e. 2014, 2015, 2016, and 2017; and 0 otherwise. **REM_{DISX}** is the absolute value of the residual from the abnormal discretionary expenses manipulation model presented by Roychowdhury (2006). **SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets - following e.g. Gunny, 2010). Regressions apply fixed effects for industry and clustered at firm and year level. All variables winsorize at the 1% level. Figures in parentheses are significance levels based on standard errors that cluster by firm and year where ***/**/*/# means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

Table 4-4 Results of regressions with real earnings management (REM_{DISX}) as dependent variable

	REM_{DISX} (1)	REM_{DISX} (2)	REM_{DISX} (3)	REM_{DISX} (4)	REM_{DISX} (5)	REM_{DISX} (6)
RECESSION	-0.0144***				-0.0145***	-0.0128**
	(0.000)				(0.001)	(0.006)
CRISIS		0.0093*			0.0130*	0.0120#
		(0.029)			(0.031)	(0.054)
CLEAN_ACT			-0.00696#		-0.0144***	-0.0110*
			(0.078)		(0.001)	(0.014)
AEM				0.143***	0.169***	0.146***
				(0.000)	(0.000)	(0.000)
SIZE	-0.0115***	-0.0115***	-0.0113***	-0.00918**		-0.00784**
	(0.000)	(0.000)	(0.000)	(0.001)		(0.006)
MTB	0.000928	0.000105	0.000102	0.000616		0.000430
	(0.196)	(0.142)	(0.149)	(0.396)		(0.557)
ROA	-0.00156	-0.000527	-0.00217	-0.00712		-0.0110
	(0.952)	(0.984)	(0.934)	(0.806)		(0.703)
LEV	0.00139	0.00143	0.00132	0.00442		0.00443
	(0.762)	(0.757)	(0.776)	(0.464)		(0.460)
Alt_Z	0.000732#	0.000751#	0.000716#	0.00130*		0.00126*
	(0.065)	(0.057)	(0.073)	(0.031)		(0.036)
_cons	0.143***	0.144***	0.141***	0.144***	0.0685***	0.110***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed industry	Y	Y	Y	Y	Y	Y
No Obs	1914	1914	1914	1752	1954	1752
adj. R-sq	0.108	0.104	0.105	0.117	0.123	0.124

Results are obtained from OLS regressions. **REM_{DISX}** is the absolute value of the residual from the abnormal discretionary expenses manipulation model presented by Roychowdhury (2006). **CRISIS** is a dummy variable that is equal to 1 for the years of the Petrobras corruption crisis i.e. 2014 and 2015; and 0 otherwise. **RECESSION** is a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016; and 0 otherwise. **CLEAN_ACT** is a dummy variable that is equal to 1 for the years post the enactment of the Brazil Clean Company Act, i.e. 2014, 2015, 2016, and 2017; and 0 otherwise. **AEM** is estimated absolute discretionary accruals, our primary measure of accruals earnings management, based on the modified Jones Model (Dechow et al., 1995). **SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets - following e.g. Gunny, 2010). Regressions apply fixed affects for industry and clustered at firm and year level. All variables winsorize at the 1% level. Figures in parentheses are significance levels based on standard errors that cluster by firm and year where ***/**/*/# means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

Table 4-5 Results of regressions with AEM as dependent variable and with inclusion of a crisis/REM interaction term

	AEM (1)	AEM (2)	AEM_rob (1)	AEM_rob (2)
RECESSION	0.00365	0.00263	0.00462	0.00679$^{\#}$
	(0.357)	(0.504)	(0.253)	(0.096)
CRISIS	-0.00811$^{\#}$	-0.00662$^{\#}$	-0.01270$^{\#}$	-0.0129
	(0.058)	(0.077)	(0.093)	(0.131)
CLEAN_ACT	0.00477	0.00535	0.0101$^{\#}$	0.00793
	(0.309)	(0.285)	(0.093)	(0.137)
REM_{DISX}	0.146***	0.119***	0.415***	0.397***
	(0.000)	(0.000)	(0.000)	(0.000)
REM_{DISX}* CRISIS	-0.107*	-0.0814$^{\#}$	-0.368**	-0.347**
	(0.041)	(0.086)	(0.003)	(0.009)
SIZE		-0.00748**		-0.00457$^{\#}$
		(0.003)		(0.088)
MTB		0.000874		0.00165$^{\#}$
		(0.251)		(0.079)
ROA		-0.0785**		-0.0937**
		(0.003)		(0.003)
LEV		-0.000950		0.0140$^{\#}$
		(0.817)		(0.063)
Alt_Z		0.000444		0.00171$^{\#}$
		(0.654)		(0.091)
_cons	0.0517***	0.0985***	0.0425***	0.0569**
	(0.000)	(0.000)	(0.000)	(0.002)
Fixed industry	Y	Y	Y	Y
No Obs	1954	1752	1954	1752
adj. R-sq	0.048	0.077	0.204	0.263

Results are obtained from OLS regressions. **AEM** is estimated absolute discretionary accruals, our primary measure of accruals earnings management, based on the modified Jones Model (Dechow et al., 1995). The results of our robustness test using the alternate measure of AEM (**AEM_rob**) are also included in the final two columns. **CRISIS** is a dummy variable that is equal to 1 for the years of the Petrobras corruption crisis i.e. 2014 and 2015; and 0 otherwise. **RECESSION** is a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016; and 0 otherwise. **CLEAN_ACT** is a dummy variable that is equal to 1 for the years post the enactment of the Brazil Clean Company Act, i.e. 2014, 2015, 2016, and 2017; and 0 otherwise. **REM_{DISX}** is the absolute value of the residual from the abnormal discretionary expenses manipulation model presented by Roychowdhury (2006). **REM_{DISX}*CRISIS** is an interaction variable**.** **SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets - following e.g. Gunny, 2010). Regressions apply fixed affects for industry and clustered at firm and year level. All variables winsorize at the 1% level. Figures in parentheses are significance levels based on standard errors that cluster by firm and year where ***/**/*/$^{\#}$ means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

Table 4-6 Results of regressions with REM_{DISX} as dependent variable and with inclusion of a crisis/AEM interaction term

	REM_{DISX} (1)	REM_{DISX} (2)
RECESSION	-0.0148***	-0.0130**
	(0.000)	(0.004)
CRISIS	0.0198**	0.0195*
	(0.008)	(0.012)
CLEAN_ACT	-0.0144***	-0.0111*
	(0.001)	(0.013)
AEM	0.189***	0.170***
	(0.000)	(0.000)
AEM* CRISIS	-0.112#	-0.125*
	(0.051)	(0.040)
SIZE		-0.00776**
		(0.006)
MTB		0.000426
		(0.560)
ROA		-0.0134
		(0.643)
LEV		0.00467
		(0.434)
Alt_Z		0.00133*
		(0.027)
_cons	0.0673***	0.108***
	(0.000)	(0.000)
Fixed industry	Y	Y
No Obs	1954	1752
adj. R-sq	0.123	0.124

Results are obtained from OLS regressions. **REM_{DISX}** is the absolute value of the residual from the abnormal discretionary expenses manipulation model presented by Roychowdhury (2006). **CRISIS** is a dummy variable that is equal to 1 for the years of the Petrobras corruption crisis i.e. 2014 and 2015; and 0 otherwise. **RECESSION** is a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016; and 0 otherwise. **CLEAN_ACT** is a dummy variable that is equal to 1 for the years post the enactment of the Brazil Clean Company Act, i.e. 2014, 2015, 2016, and 2017; and 0 otherwise. **AEM** is estimated absolute discretionary accruals, our primary measure of accruals earnings management, based on the modified Jones Model (Dechow et al., 1995). **AEM*CRISIS** is an interaction variable**.** **SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets - following e.g. Gunny, 2010). Regressions apply fixed affects for industry and clustered at firm and year level. All variables winsorize at the 1% level. Figures in parentheses are significance levels based on standard errors that cluster by firm and year where ***/**/*/# means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

Table 4-7 Results of the regressions with REM_{CFO} and REM_{PROD} as separate dependent variables and with inclusion of a crisis/AEM interaction term

	REM_{CFO} (1)	**REM_{CFO} (2)**	**REM_{PROD} (1)**	**REM_{PROD} (2)**
RECESSION	-0.00391[#]	-0.00311	-0.00534	-0.00317
	(0.092)	(0.102)	(0.144)	(0.052)
CRISIS	0.00566	0.00876	0.0175**	0.0162**
	(0.281)	(0.168)	(0.001)	(0.003)
CLEAN_ACT	-0.0208***	-0.0202***	-0.0234***	-0.0225***
	(0.000)	(0.000)	(0.000)	(0.000)
AEM	0.0660*	0.0554[#]	0.132***	0.123***
	(0.017)	(0.059)	(0.000)	(0.000)
AEM* CRISIS	-0.0836*	-0.123**	-0.138**	-0.119*
	(0.039)	(0.005)	(0.004)	(0.016)
SIZE		-0.000647		0.00275
		(0.761)		(0.198)
MTB		0.00127[#]		0.00133[#]
		(0.058)		(0.064)
ROA		-0.0321[#]		0.00764
		(0.087)		(0.545)
LEV		0.00655[#]		0.00556*
		(0.055)		(0.023)
Alt_Z		0.000698		0.00150***
		(0.188)		(0.000)
_cons	0.0735***	0.0667***	0.0773***	0.0486***
	(0.000)	(0.000)	(0.000)	(0.001)
Fixed industry	Y	Y	Y	Y
No Obs	2074	1818	2060	1825
adj. R-sq	0.156	0.172	0.143	0.149

Results are obtained from OLS regressions. **REM_{CFO}** is the absolute value of the residual from the sales manipulation model of Roychowdhury (2006). **REM_{PROD}** is the absolute value of the residual from the abnormal production model of Roychowdhury (2006). **CRISIS** is a dummy variable that is equal to 1 for the years of the Petrobras corruption crisis i.e. 2014 and 2015; and 0 otherwise. **RECESSION** is a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016; and 0 otherwise. **CLEAN_ACT** is a dummy variable that is equal to 1 for the years post the enactment of the Brazil Clean Company Act, i.e. 2014, 2015, 2016, and 2017; and 0 otherwise. **AEM** is estimated absolute discretionary accruals, our primary measure of accruals earnings management, based on the modified Jones Model (Dechow et al., 1995). **AEM*CRISIS** is an interaction variable**. SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets - following e.g. Gunny, 2010). Regressions apply fixed affects for industry and clustered at firm and year level. All variables winsorize at the 1% level. Figures in parentheses are significance levels based on standard errors that cluster by firm and year where ***/**/*/[#] means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

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Appendix C

Appendix C-1 Results of regressions with discretionary accruals as the dependent variable - robustness test using alternate measure of AEM (i.e. AEM_rob)

	AEM_rob (1)	**AEM_rob (2)**	**AEM_rob (3)**	**AEM_rob (4)**	**AEM_rob (5)**	**AEM_rob (6)**
RECESSION	0.00505				0.00724#	0.00950
	(0.247)				(0.077)	(0.132)
CRISIS		-0.00309*			-0.0120#	-0.0104#
		(0.048)			(0.070)	(0.091)
CLEAN_ACT			0.00118		0.00961#	0.00557#
			(0.774)		(0.071)	(0.096)
REM_{DISX}				0.312***	0.340***	0.318***
				(0.000)	(0.000)	(0.000)
SIZE	-0.00822**	-0.00778**	-0.00813**	-0.00482#		-0.00530#
	(0.002)	(0.003)	(0.003)	(0.06)		(0.051)
MTB	0.00172*	0.00167*	0.00168*	0.00156*		0.00168*
	(0.024)	(0.026)	(0.026)	(0.032)		(0.022)
ROA	-0.103***	-0.105***	-0.103***	-0.0970**		-0.0956**
	(0.001)	(0.000)	(0.001)	(0.002)		(0.003)
LEV	0.0146#	0.0145#	0.0145#	0.0126		0.0147#
	(0.086)	(0.061)	(0.090)	(0.138)		(0.098)
Alt_Z	0.00212*	0.00211*	0.00214*	0.00184#		0.00186#
	(0.035)	(0.038)	(0.037)	(0.076)		(0.067)
_cons	0.108***	0.107***	0.108***	0.0664***	0.0480***	0.0663***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed industry	Y	Y	Y	Y	Y	Y
No Obs	1852	1852	1852	1752	1954	1752
adj. R-sq	0.143	0.142	0.142	0.239	0.181	0.241

Results are obtained from OLS regressions. **AEM_rob** is estimated absolute discretionary accruals computed as a robustness test of our primary measure of accruals (AEM) presented in this study, which is similarly based on the modified Jones Model (Dechow et al., 1995) but utilises the alternate measure of accruals based on balance sheet variables rather than income statement and cash flow measures. **CRISIS** is a dummy variable that is equal to 1 for the years of the Petrobras corruption crisis i.e. 2014 and 2015; and 0 otherwise. **RECESSION** is a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016; and 0 otherwise. **CLEAN_ACT** is a dummy variable that is equal to 1 for the years post the enactment of the Brazil Clean Company Act, i.e. 2014, 2015, 2016, and 2017; and 0 otherwise. **REM_{DISX}** is the absolute value of the residual from the abnormal discretionary expenses manipulation model presented by Roychowdhury (2006). **SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets - following e.g. Gunny, 2010). Regressions apply fixed affects for industry and clustered at firm and year level. All variables winsorize at the 1% level. Figures in parentheses are significance levels based on standard errors that cluster by firm and year where ***/**/*/# means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

Appendix C2-1 Results of regressions with component measure of real earnings management (REM_{CFO}) as dependent variable

	REM_{CFO} (1)	REM_{CFO} (2)	REM_{CFO} (3)	REM_{CFO} (4)	REM_{CFO} (5)	REM_{CFO} (6)
RECESSION	-0.00938**				-0.00373#	-0.00287#
	(0.005)				(0.051)	(0.067)
CRISIS		0.0014			0.000670	0.00139
		(0.333)			(0.141)	(0.288)
CLEAN_ACT			-0.0168***		-0.0208***	-0.0202***
			(0.000)		(0.000)	(0.000)
AEM				0.0319#	0.0518*	0.0321#
				(0.091)	(0.028)	(0.068)
SIZE	-0.00346#	-0.00318	-0.00194	-0.00352		-0.000702
	(0.083)	(0.106)	(0.322)	(0.108)		(0.742)
MTB	0.000712	0.000804	0.000706	0.00143*		0.00128#
	(0.179)	(0.128)	(0.178)	(0.035)		(0.057)
ROA	-0.0196	-0.0213	-0.0228	-0.0193		-0.0298
	(0.154)	(0.120)	(0.101)	(0.300)		(0.114)
LEV	0.00610*	0.00584*	0.00607*	0.00618#		0.00634#
	(0.014)	(0.019)	(0.017)	(0.072)		(0.066)
Alt_Z	0.000831**	0.000807**	0.000783**	0.000622*		0.000630#
	(0.004)	(0.002)	(0.004)	(0.017)		(0.059)
_cons	0.0831***	0.0816***	0.0769***	0.0789***	0.0744***	0.0687***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed industry	Y	Y	Y	Y	Y	Y
No Obs	2229	2229	2229	1818	2074	1818
adj. R-sq	0.125	0.128	0.133	0.139	0.154	0.171

Results are obtained from OLS regressions. **REM_{CFO}** is the absolute value of the residual from the sales manipulation model of Roychowdhury (2006). **CRISIS** is a dummy variable that is equal to 1 for the years of the Petrobras corruption crisis i.e. 2014 and 2015; and 0 otherwise. **RECESSION** is a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016; and 0 otherwise. **CLEAN_ACT** is a dummy variable that is equal to 1 for the years post the enactment of the Brazil Clean Company Act, i.e. 2014, 2015, 2016, and 2017; and 0 otherwise. **AEM** is estimated absolute discretionary accruals, our primary measure of accruals earnings management, based on the modified Jones Model (Dechow et al., 1995). **SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets - following e.g. Gunny, 2010). Regressions apply fixed affects for industry and clustered at firm and year level. All variables winsorize at the 1% level. Figures in parentheses are significance levels based on standard errors that cluster by firm and year where ***/**/*/# means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

Appendix C2-2 Results of regressions with component measure of real earnings management (REM_{PROD}) as dependent variable

	REM_{PROD} (1)	REM_{PROD} (2)	REM_{PROD} (3)	REM_{PROD} (4)	REM_{PROD} (5)	REM_{PROD} (6)
RECESSION	-0.0102***				-0.00503	-0.00293#
	(0.001)				(0.168)	(0.082)
CRISIS		0.00805*			0.00921*	0.00904*
		(0.025)			(0.043)	(0.048)
CLEAN_ACT			-0.0169***		-0.0235***	-0.0225***
			(0.000)		(0.000)	(0.000)
AEM				0.0980***	0.108***	0.0999***
				(0.000)	(0.000)	(0.000)
SIZE	0.000291	0.000197	0.00182	0.0000554		0.00270
	(0.878)	(0.917)	(0.336)	(0.979)		(0.209)
MTB	0.00136*	0.00145*	0.00135*	0.00151*		0.00134
	(0.023)	(0.015)	(0.023)	(0.038)		(0.063)
ROA	0.0138	0.0133	0.0108	0.0188		0.00985
	(0.116)	(0.132)	(0.224)	(0.133)		(0.431)
LEV	0.00270	0.00258	0.00280	0.00504*		0.00534*
	(0.126)	(0.143)	(0.122)	(0.036)		(0.029)
Alt_Z	0.000684***	0.000676***	0.000644***	0.00143***		0.00143***
	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)
_cons	0.0688***	0.0683***	0.0622***	0.0604***	0.0787***	0.0506***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Fixed industry	Y	Y	Y	Y	Y	Y
No Obs	2180	2180	2180	1825	2060	1825
adj. R-sq	0.126	0.124	0.134	0.126	0.147	0.151

Results are obtained from OLS regressions. **REM_{PROD}** is the absolute value of the residual from the abnormal production model of Roychowdhury (2006). **CRISIS** is a dummy variable that is equal to 1 for the years of the Petrobras corruption crisis i.e. 2014 and 2015; and 0 otherwise. **RECESSION** is a dummy variable that is equal to 1 if the year of observation is a year in which Brazil suffered a recession, i.e. 2009, 2015, and 2016; and 0 otherwise. **CLEAN_ACT** is a dummy variable that is equal to 1 for the years post the enactment of the Brazil Clean Company Act, i.e. 2014, 2015, 2016, and 2017; and 0 otherwise. **AEM** is estimated absolute discretionary accruals, our primary measure of accruals earnings management, based on the modified Jones Model (Dechow et al., 1995). **SIZE** is a measure of firm size calculated as the log value of total assets (following e.g. Gunny, 2010). **MTB** is a measure of growth computed as the ratio of market value of equity over book value of assets (following e.g. Habib et al., 2013). **ROA** is return on assets, a measure of performance computed as income before extraordinary items divided by lagged assets (following e.g. Gunny, 2010). **LEV** is leverage computed as long term debt divided by total assets (following e.g. Paredes & Wheatley, 2017). **Alt_Z** is the Altman Z-score, a measure of financial health (computed as 3.3*Net income + 1.0*Sales + 1.4*retained earnings + 1.2*working capital; with all terms scaled by lagged total assets - following e.g. Gunny, 2010). Regressions apply fixed affects for industry and clustered at firm and year level. All variables winsorize at the 1% level. Figures in parentheses are significance levels based on standard errors that cluster by firm and year where ***/**/*/# means significance at a 0.001/0.01/0.05 and 0.1 level respectively.

5 Conclusions

5.1 Summary of Research Findings

Overview

This thesis encapsulates the output of a research project which has sought to uncover new insights and add to the body of knowledge in an area of business risk that is increasingly salient to management: - how to deal with crisis events through action and reporting. Recent history tells us that when a crisis or exogenous shock situation arises which severely challenges a firm's control, governance and reporting regime, the financial and reputational damage can be massive, or even terminal as the case of Enron illustrates. How a firm responds to a legitimacy threat is therefore critical if it is to regain and maintain trust – i.e. (i) through actions to ensure the adequacy of its governance and controls environment; and (ii) in the reporting and communication choices it makes around earnings management and voluntary disclosure. The risk that some form crisis or exogenous shock event occurs - such as a corruption scandal, increased legislation, or economic downturn – is increasing as the business world becomes more connected, moreover the associated financial risks are becoming more severe (Alpaslan, Green and Mitroff, 2009).

This important topic, which sits at the intersection of three research domains - crisis management; corporate control and governance; and financial reporting quality - has not been targeted in a holistic way in prior studies. This thesis aims to shed new light on the topic by addressing this gap. To do this, we have pursued the research objectives laid out in chapter 1, and undertaken three distinct studies involving mixed-methods research, each of which is set out in a stand-alone chapter which in combination comprise the entirety of the research project.

The research has been undertaken from a positivist-realist perspective, which is the traditional philosophic angle taken by researchers in this field (Franceschetti, 2018). Positivism "has a prior theoretical base, seeks to establish the nature of relationships and causes and effects, and employs empirical validation and statistical analyses to test and confirm theories" (Bisman, 2010; Franceschetti, 2018). The essence of realism is that there is a reality that is independent of the mind: - it represents a branch of epistemology which is similar to positivism in that it assumes a scientific approach to knowledge based on a requirement to collect and understand data (Saunders, Lewis and Thornhill, 2012). A positivist-realist research philosophy underpins all three studies in this thesis, albeit following Yin (2017) we might use the more nuanced term "realist – post-positivist" to describe our underlying research philosophy deployed in the case study method used in chapter 3 at Petrobras, a distinction which places more stress on the belief that all data is imperfect such that triangulation with different source data should be undertaken wherever possible (Mills et al., 2017).

Study 1 – Systematic Literature Review

The first study comprises a systematic literature review (SLR) of the topic. The aim of this work is to bring together the key learnings from the contributory research domains, and by synthesizing this knowledge to identify emergent themes and research gaps. Using established SLR methodology (Tranfield, Denyer, and Smart, 2003), the review identifies 91 articles published in the period 1991-2019, which span several established research domains across management, accounting and finance. More than 80% of articles in the sample date from 2008 onwards, which indicates that the subject is attracting growing scholarly interest. Based on the findings of a detailed review of the articles, the study constructs a conceptual crisis response framework. The framework depicts crisis management as a complex aspect of business that (i) requires a stakeholder management and systems-based approach to the task of regaining legitimacy, through responsive action and communication via published disclosures; and (ii) must be managed within a control and regulatory environment that chiefly influences reporting response options.

The review identifies a number of research gaps and areas where knowledge is limited or ambiguous, notably in relation to (i) how firms hit by a corruption scandal go about regaining trust by the immediate actions they take, and their use of voluntary disclosure and stakeholder management strategies; and (ii) how earnings management behaviour is impacted when firms face threats from crisis and exogenous events relating to corruption, new legislation and financial risk. The study also points out that most scholarly studies have been conducted in developed markets in the US, UK, and EU, and suggests that studying other markets presents opportunities to test and extend current thinking. To this end, because of recent market and environmental challenges Brazil has had to face, the study argues that this territory presents a fruitful laboratory in which to undertake work to fill the identified gaps. This challenge is taken up in the second and third papers of this thesis.

Study 2 – Case Study at Petrobras

The second study comprises a case study at Brazil's largest and most well known company Petroleo Brasileiro S.A (Petrobras). Petrobras operates in the oil and gas sector which is seen as a high-risk industry in terms of corruption (Tobolowsky, 2016). In 2014 Petrobras was caught up in a major corruption scandal ("Lava Jato") which is the largest ever corporate bribery case (Watts, 2017). The purpose of this study is to assess and interpret in light of current theory how the company dealt with the crisis and threat to its legitimacy, in terms of substantive actions taken and how it communicated through its published accounts and press releases. The study is based on the narratives that appear in Petrobras's annual statements (ARs), sustainability reports (SRs), and press releases which deal with matters related to anti-corruption and compliance (ACC). For the eight-year period 2010 – 2017 we assessed AR, SR and press release transcript documentation: - (i) using content analysis methodology applied to assess Petrobras's ACC disclosures; and (ii) reviewing disclosures related to restructuring and remedial activities in this period.

The paper reports a number of findings. First, the company responded to the crisis by dramatically increasing the level of ACC disclosure in the crisis period (i.e. the year of discovery 2014 and the subsequent year 2015), and into the post-crisis period (2016-2017), with the disclosure level falling back substantially in 2017, albeit to a level well above that in the pre-crisis period (2010 - 2013). This finding, whereby voluntary disclosure is used to "regain" legitimacy, augments previous studies and supports legitimacy theory and trust repair interpretations (e.g. Deegan and Rankin, 1996; Blanc et al., 2019; Islam et al., 2015).

Second, the results of our assessment of media attention and Petrobras's press release activity, in conjunction with AR and SR ACC disclosure in the period, provide broad support for a media agenda setting theory interpretation of the firm's disclosure response. Pre-crisis there was minimal press attention attached to Petrobras's ACC policies, and Petrobras's press releases were close to zero in number. This changed markedly in the crisis period, with both media attention and press release activity reaching peaks in 2015. Indeed global and Portuguese press attention in 2015 dwarfed that seen in studies of other companies hit by a corruption scandal, reflecting the role that Petrobras occupies, particularly in Brazil. As expected, press attention dropped considerably post crisis, but remained high some three years after the crisis became public.

Third, we also find support that the AR and SR are used to communicate differently with different categories of stakeholder. This is particularly apparent in relation to stakeholder groups which have been associated with Lava Jato (i.e. primarily leadership and suppliers), and is a finding which is in line with stakeholder theory and organizational façade models. Across the period of review we find that the AR became the primary communication channel to help repair legitimacy: - this document contains more detail but less breadth than does the SR, the latter being a document which serves a wider, less demanding audience.

Lastly, although we caution that it is premature to make a final determination on the success or otherwise of Petrobras's crisis management efforts to regain legitimacy, evidence seems to point in this direction. The corporate response can be categorised broadly into four components: (i) investigate the crisis; (ii) restructure governance; (iii) dissociate from illegitimate operations and personnel; and (iv) start to change culture. Each component comprises specific actions which align well with extant trust repair and legitimacy models. This notwithstanding, the paper cautions that given Petrobras's position as a government controlled entity, and the recent history of systemic corruption in Brazil, the company must remain vigilant to environmental risks that could yet stall the progress made so far in strengthening ACC controls and restoring legitimacy.

Study 3 – Quantitative Study of Earnings Management in Brazil

The third study is a quantitative examination of earnings management in Brazil in the period 2000 – 2017. The aim of this study is to assess how earnings management activities are impacted by major external events affecting the market in this period (i.e. specifically the Petrobras corruption scandal, economic recession, and the introduction of a new transparency law), each of which is capable of severely challenging a firm's control, governance and reporting regime. The study is based on data from 186 listed companies in Brazil. Established models are used to estimate measures for accruals-based (AEM) and real activities-based (REM) earnings management activity. The study develops regression models informed by prior research, and uses the AEM and REM estimations and other interest variables based on five testable hypotheses developed to address the study's overarching research question.

The study uncovers a number of interesting results. First, we find that during recessionary periods there is no impact on AEM behaviour, whereas firms respond by reducing the level of REM they use, a result which is in line with the findings reported by Wang (2014). Previous work on the link between recession and earnings management has shown mixed results. Our findings are consistent with an interpretation that this costly form of manipulation is not required when all firms are facing unfavourable reporting.

Second, during the period 2014 and 2015 when interest in Lava Jato was at its height, and external scrutiny on the business practices and governance of businesses generally was intense from regulators, media and the public, Petrobras responded by reducing the level of AEM and increasing its use of REM. This effect of the corruption crisis on earnings management mirrors that of legislation elsewhere, such as Sarbanes-Oxley (SOX) which was introduced in the US in 2002 (Cohen, Dey and Lys, 2008).

Third, our findings show that the Brazil Clean Company Act, (BCCA), which was introduced in 2014 to improve transparency and reduce corruption, has had the effect of reducing the level of REM, but has not affected AEM. Prior studies have shown that the level of REM in Brazil increased following the adoption of IFRS in 2010. Building on the work of Bauer (2016) and Jarvinen and Myllymaki (2016), a possible interpretation of our result is that, mandated by BCCA, firms introduced better procedures focused on transparency, governance and compliance controls. Moreover, extending this interpretation, these improvements may have had the positive spill-over effect of heightened oversight of senior management decisions affecting investment and operational plans, which has constrained ad-hoc opportunistic management decisions, including REM activities. Future work will need to test this possible explanation.

Fourth, the study sheds new light on the nature of the relationship between AEM and REM, and management's associated motivations to use one or both forms of earnings management. We found that overall in Brazil managers have routinely used both forms of earnings management as complements, controlling for the periods covered by the Brazil Clean Companies Act, economic recession, and the Petrobras scandal. Prior studies for Brazil regarding the nature of the AEM/REM relationship (i.e. complementary or substitution) are mixed. Our results are in line with the findings of both Martinez and Cardoso (2009) and Cupertino et al., (2017), and support the view that a complementary relationship reflects a weak enforcement climate and inadequate corporate governance (Hamza and Kortas, 2018). Special interest should be afforded to the finding that during the corruption crisis the AEM/REM relationship switched to one of substitution, a feature also seen following the introduction of SOX (Cohen, Dey and Lys, 2008). This finding calls attention to the baseline quality of internal governance and reporting oversight at Brazilian companies: - conversely, and on a more positive note, the reduced level of AEM arising in this highly scrutinized period of the corruption crisis demonstrates the potential for higher quality financial management and reporting that could arise in a business environment which is more focused on regulation and enforcement.

Lastly, by focusing on Brazil, which is under-served in accounting research, our study has allowed us to extend the literature by testing the relevance of current thinking on earnings management developed in more mature markets, in this rapidly developing market. The results suggest how crisis and exogenous events, in combination with the quality of a firm's reporting, internal control and governance regime, might serve to change attitudes on the extent to which earnings management is practiced and tolerated, and by extension to wider concerns around ethical business conduct. Our findings have relevance in other environments which, like Brazil, suffer from historic systemic challenges in respect of corruption and transparency around financial reporting. Consequently we call on researchers to take up the challenge of locating future studies on the effect of crises and exogenous shocks in more diverse business settings.

5.2 Contribution to Knowledge

The three studies that comprise this thesis draw on different research methodologies (literature review; case study; and quantitative analysis), and units of study (prior articles; a single company Petrobras; and the group of listed companies in Brazil). In composite, the studies contribute to knowledge in a number of ways at empirical, conceptual and methodological levels.

Study 1 – Systematic Literature Review

The SLR study makes three main contributions.

1 This study is novel as it constitutes the first systematic review of the topic as a unified area of study – i.e. how management deals with crisis and stress events through its actions and reporting behaviour. By bringing together what is a large body of disparate scholarly work and identifying key themes, it is envisaged that the study will stimulate further multi-disciplinary research, which considers crisis response more holistically and from multiple theoretical perspectives.

2 By presenting a crisis response conceptual framework the study contributes to current thinking by depicting a company hit by crisis as facing a complex situation in which its choices are primarily influenced by key stakeholders and the firm's regulatory and control environment. This requires firms to adopt a stakeholder management and systems-based approach to the task of regaining legitimacy through responsive action and communication via published disclosures: - something which must be managed within a control and regulatory environment that chiefly influences reporting response options. It is hoped that this framework can be refined and built upon to inform theory development.

3 Lastly, the study makes a contribution by setting out a concrete research agenda that pinpoints specific arrears where there are gaps in knowledge or where prior results are inconsistent, which serves to direct scholars who wish to take up the challenge of pursuing this area of study as a unified topic, as well as those who are grounded in one of the topic's component domains.

Study 2 – Case Study at Petrobras

The case study at Petrobras makes five primary contributions to extant knowledge.

1 This study adds to the scant body of research on ACC disclosure following a corruption scandal. Only four other scandal-hit companies have been studied previously (Siemens, Alcatel-Lucent, ZTE and China Mobile (Blanc et al., 2019; Dissanayake, Islam and Dellaportas, 2011; Islam et al., 2015). Moreover, this is the first time a study has been undertaken on a government controlled mixed capital company such as Petrobras. This type of corporate entity is not uncommon, and introduces interesting influences that future studies may look to incorporate into expanded theoretical models of crisis management responses. Our results augment prior studies which link voluntary disclosure around commitment to transparency, governance and controls, with legitimacy-seeking behaviour (Branco and Matos, 2016).

2 To the best of our knowledge, this study comprises novel research by being the first to look at leadership as an implicated stakeholder group, through the lenses of stakeholder theory and organizational façade theory. Our findings point to the applicability of these theoretical interpretations. The results suggest that when there are suspicions of a systemic culture of patronage at the top, the appropriate response to repair legitimacy is to target this implicated stakeholder group through (i) organizational restructuring actions that serve to rapidly regain control and restore governance; and (ii) using the AR as a primary tool of

disclosure, augmented by the SR, substantially focused on leadership through narratives based on the rational façade.

3 We present novel results in that when faced with an extreme legitimacy threat where one of the implicated stakeholder groups is an important audience for the SR - such as suppliers in this case study - the appropriate disclosure response to repair legitimacy is to target the implicated group (as well as all implicated groups) with narratives that emphasise a rational façade. This finding is at odds with that reported by Blanc et al. (2019) in the Siemens case, where narratives in the SR targeted at the culpable supplier group emphasized progressive and/or reputation façades. Our finding adds to the limited body of research in organizational façade theory, and suggests that management's assessment of the extent of the legitimacy threat may be an important factor in façade choice, which is something future studies can take up. In the case of Petrobras, we suggest that the perceived legitimacy risk concerning leadership was considered to be severe, given the alleged collusion with suppliers (relative to that at Siemens), hence the need to maintain a rational façade in the SR and signal that Petrobras was serious in dealing with the antecedent problems affecting both groups.

4 We believe that this is the first study of a corporate response to a corruption crisis that looks in detail at a package of actions to demonstrate an evolution through the repair – maintain – gain sequence of strategies for legitimacy management as proposed by Suchman (1995). Consequently, we believe that these findings add to our knowledge of how companies in the real world deal with such issues with concrete actions, which our findings demonstrate accord reasonably well with crisis response models (Pfarrer et al., 2008; Gillespie and Dietz, 2009; Bachmann, Gillespie and Priem, 2015).

5 Finally, the study makes a methodological contribution in its construction of a 97-component ACC disclosure Breadth Index, which incorporates the most recent guidance from a number of independent bodies including UNGC and GRI. The index will help scholars make more informed rankings of corporate disclosures in relation to ACC matters.

Study 3 – Quantitative Study of Earnings Management in Brazil

The earnings management study of Brazilian companies presents four main contributions.

1 The paper contributes to our understanding of how managers act in relation to their earnings management behaviour when faced with a unique type of exogenous shock – i.e. a corruption crisis that affects all businesses. Our results represent novel research as this is the first study to probe this relationship. A number of countries have firms that resemble Petrobras – i.e. a large national champion which is effectively controlled by government but which has shares listed on international exchanges. Consequently we believe that the risk of this types of corruption crisis event happening elsewhere is material – i.e. one that impacts all businesses in a geography or sector - particularly given the recent increase in enforcement activity by bodies such as the SEC (Tobolowsky, 2016). Consequently our findings regarding the link between earnings management behaviour and a corruption crisis have relevance beyond the Brazilian environment.

2 Moreover, the finding that public scrutiny and regulatory attention can act in the same way as formal legislation by reducing the level of AEM has interesting theoretical implications in relation to corporate governance and the quality of financial reporting. The results show that during the corruption crisis period, firms responded to the outside scrutiny in the same way as evidence suggests they did when (i) SOX was introduced in the US in 2002 (Cohen, Dey and Lys, 2008), and (ii) IFRS was mandated in Brazil in 2010 (Pelucio-Grecco et al.,

2014). In both cases firms curtailed their use of AEM, and switched to REM as a substitute. REM is a form of manipulation which is harder to detect but is costlier (Zang, 2012). This finding therefore widens our understanding of how management weighs the costs and benefits of its manipulation options (i.e. how it manages the AEM/REM relationship), dependent on external scrutiny and the quality of internal governance mechanisms.

3 This study is the first to examine the impact of transparency legislation on the incidence of earnings management. When Brazil introduced the BCCA in 2014 there was initial widespread scepticism that this type of legislation could be effective given Brazil's poor record on tackling unethical behaviour in business (Durnev and Kim, 2005). Our findings provide important support to suggest that in fact the BCCA has been successful, as we see a strong negative association between the BCCA and reduced levels of REM. These results are relevant because the incidence of REM indicates poor corporate governance and internal controls around financial reporting (Bereskin, Hsu and Rotenberg, 2018), as well as poor tone at the top (Jarvinen and Myllymaki, 2016). Our findings suggest that a focus on transparency and compliance controls can have useful spill-overs that affect controls over financial reporting, which we consider to be an important aspect of this contribution. Further work is required to better understand how firms reacted to the legislation in terms of the specific measures taken to augment corporate governance and internal controls, and to investigate whether the impact on reduced REM is permanent. The findings are also relevant because numerous other countries have introduced similar forms of transparency legislation (Tobolowsky, 2016).

4 Lastly, our study contributes in a number of ways to our overall understanding of when and to what extent REM is used as a manipulation technique. This is significant because REM is a relatively under-researched area of earnings management in comparison with AEM. In addition to the contributions to knowledge mentioned above which show that REM is vulnerable to (i)

transparency controls, and (ii) a trade-off with AEM which is influenced by both internal control strength and outside scrutiny; we also add to the limited body of evidence which shows how REM is used during a recession. Our finding of a negative relationship supports the perspective that management desists from this expensive form of manipulation in times of financial stress, a result which augments prior research which argues that REM is used relatively more by firms in good financial standing for reasons of cost (Zang, 2012).

5.3 Implications

In addition to making a contribution to knowledge, the studies comprising this thesis have a number of relevant implications that inform both management practice and policy making.

5.3.1 Implications for Practitioners

First, the business risk presented by a crisis or exogenous shock is one that has increasing currency for managers, in which the potential response options are many but where time is of the essence (Coombs, 2006). Consequently, the crisis response framework presented in chapter 2 can assist managers caught up in this type of event to devise preliminary strategic plans. This depicts a crisis as a complex situation requiring a focus on dynamic stakeholder management. During such times of corporate stress, the framework will assist management to (i) consider the wider picture and the need to manage multiple concerns and relationships when time is short; and (ii) alert them to the risks and opportunities that reporting choices bring in relation to their earnings management and voluntary disclosure activities.

Second, management will be interested in the findings which suggest that internal controls are oftentimes limited for purposes of preventing a crisis, as well as during a crisis situation where regaining legitimacy is crucial and trust must be regained both externally, and internally in regard to staff. Therefore, forward thinking managers should take heed of the findings which suggest rebuilding the right culture and demonstrating organizational trust with staff may be more effective than instituting inflexible basic controls in the early stages of a crisis response plan.

Third, practitioners should ensure they are informed about the extent and type of earnings management present in their companies. High levels of AEM can indicate poor reporting quality and auditor oversight. We note that Rathke et al., (2016) reports that the level of AEM in Brazil is still relatively high post-IFRS compared to other IFRS adopters. Empirical findings suggest that REM can be costly because it involves the distortion of operational decisions which can create inefficiencies and loss of value in the longer term. Moreover, research suggests that the governance and control weaknesses that permit REM activities are often pervasive and lead to spill-overs affecting other operational matters (Bauer, 2016). High levels of REM can be indicative of poor internal controls and oversight over the decisions of senior executives which can jeopardise future viability (Bereskin, Hsu and Rotenberg, 2018). Consequently, management should look for evidence of earnings management and treat this practice with caution.

Fourth, managers should take on board the findings relating to the benefits that are to be obtained from adopting a progressive and diligent approach to voluntary ACC disclosure. This suggests that by reporting policies clearly and in detail, companies gain: - (i) by achieving their ACC goals due to the enhanced accountability that disclosure provides (Hess, 2009); and (ii) from the benefits of increased legitimization in the marketplace (Healy and Serafeim, 2011).

Lastly, in view of the findings which indicate the positive impact of the BCCA transparency legislation in reducing the level of REM, practitioners should ensure that the benefits of enhanced compliance controls affecting the firm's integrity program are maintained and create a lasting improvement that is not "rolled back" when a new corporate crisis or stress situation arises. This will require careful monitoring and ensuring that the internal controls and compliance function is adequately funded.

5.3.2 Implications for Policy Makers

The findings from this study highlight a number of important implications for regulators who have responsibility or oversight over corporate reporting and controls, accounting standards, and auditing standards.

First, the generally poor quality of ACC disclosures revealed in the SLR should be a matter of concern because it suggests that firm may be "going through the motions" in respect of the actual ACC processes and procedures they have implemented. Of course, firms could have good ACC policies and procedures in place, but are merely falling short in what they disclose. Indeed as the review points out, some companies complain that they have insufficient guidance on how to report ACC activities. One option that might be considered is for accounting standards setting bodies to include ACC disclosure within the standard (mandatory) reporting template, i.e. meaning that this aspect of internal controls ceases to be the subject of voluntary disclosure. In this case formal guidance on how to report would need to be published, so that firms no longer need to rely on the guidance issued by entities such as TI and UNGC.

Second, and in a similar vein, the SLR findings demonstrate that empirical evidence suggests that SOX has been successful in reducing the level of earning management, at least in respect of AEM, which some scholars claim is due to the harsh legal ramifications attached to the attestation process in the event of control failure. Transparency controls do not require confirmatory attestation by leadership - for example in the case of the BCCA in Brazil – which might serve to limit the effectiveness of such legislation. Consequently, regulators and accounting standards setters will be interested in monitoring the effectiveness of transparency legislation to assess whether more intrusive reporting and confirmation procedures are required in the future.

Third, the literature review reports that internals controls are not as effective as is generally believed for preventing improper or opportunistic behaviour, including earnings management; moreover the quality of boards to perform effective monitoring mechanisms is open to question. By implication, this could open up firms to increased risk of enhanced and damaging REM activity, as well as other adverse outcomes affecting operational decisions where there is inadequate oversight of senior management and poor tone at the top (Jarvinen and Myllymaki, 2016; Bereskin, Hsu and Rotenberg, 2018). We suggest that auditing standards regulators should be concerned that auditors are alert to clients having high levels of both forms of earnings management (i.e. AEM and REM), and might look to mandate more specific audit procedures for identifying such activity as a means of revealing potential internal and governance control weaknesses.

Fourth, regulators in Brazil should be encouraged by what empirical results suggest has been the impact of recent legislation and regulation – namely the introduction of IFRS in 2010 and the BCCA in 2014. As mentioned above, Pelucio-Grecco et al. (2014) show that IFRS led to a reduction in AEM and a shift to REM, and our results show that the BCCA led to reduced levels of REM. It is therefore important that regulators remain vigilant so that Brazilian firms do not seek to either switch back to using increased levels of AEM, or start to roll back compliance controls introduced in response to BCCA such that REM usage increases again. These implications apply equally in other territories that have introduced transparency legislation. We suggest that the relevant regulators and oversight bodies (i.e. representing the accounting/audit profession, and corporate governance regulators) should look to work together in a unified way to help mitigate this risk.

Fifth, regulators in Brazil should look to build on the positive impact that heightened scrutiny of the Petrobras corruption crisis has had on reducing further the level of AEM within Brazilian firms. Indeed, the competence and independence of the Brazilian authorities in conducting the subsequent Lava Jato investigation and enforcement process, plus supportive media attention around the introduction of the BCCA, has further strengthened the view that Brazil now takes investor protection more seriously (Watts, 2017), something that we believe may serve to help maintain pressure to reign in the incidence of earnings management in respect of both AEM and REM. This implies that the regulatory authorities in Brazil should remain steadfast in their policy of objective and diligent enforcement, and continued investigation of people and firms that have been implicated in the Petrobras scandal, and at the same time continue to publicise the objectives and requirements of the BCCA.

5.4 Research Impact and Dissemination

One of the motivations underlying this research project is the relevance of the subject matter to both the academic and business worlds. This is reflected in the preceding sections of this thesis which outline the contribution to knowledge and implications for practitioners and policy makers. During the course of his part-time PhD studies, the author has also sought opportunities to share knowledge emanating from these studies with academics and professionals who work in this field.

Thanks to the efforts of Professor Belghitar who supervised this thesis, the author was able to participate in the "Corruption in Latin America" workshop at Liverpool University on 31 May 2018. The workshop was organised by Professor Poletti-Hughes of Liverpool University, and brought together a number of academics and practitioners. At this event the preliminary findings from the Petrobras case study were presented. This provided an important opportunity to obtain feedback which was used to direct subsequent analysis in the case study.

In parallel with these studies, during the course of the 6-year part-time PhD programme the author continued his professional career at one of the Big 4 professional services firms. This has afforded the opportunity to interact with fellow professionals in various fields including fraud investigation, financial control, compliance, and auditing. We believe that by sharing knowledge acquired from the studies herein, we have helped to evangelise on the need to treat crisis response in a multi-dimensional way in which professional expertise can assist management from a number of angles.

Another activity which has allowed the author to disseminate the findings of this thesis relates to his involvement in leading a 3-day conference held in Brazil on anti-corruption. The conference was held annually over the period 2014 – 2017. As a co-organizer, the author was responsible for setting the programme agenda. Moreover he participated as a panel member each year. The conference attracted practitioners, regulators and academics from around the world, providing valuable opportunities to share knowledge.

The research findings presented in chapters 2, 3 and 4 of thesis came together during the final year of the PhD programme, during which time the focus has been on completing the thesis and PhD process. Our intention henceforth is to seek publication for each of the three studies in peer-reviewed journals.

5.5 Limitations

As for any research project in the social sciences, this study is subject to a number of limitations. We have collated the main limitations across the studies and briefly outline these grouped by theme, i.e.: - (i) generalizability; (ii) data and methodological; and (ii) time related limitations.

Generalizability limitations

Doubts can be raised regarding the generalizability of findings from each of the three studies. The SLR study primarily focuses on studies undertaken by scholars with a positivist-realist research philosophical perspective, who are based in developed markets, using data on companies that are, for the most part, located in North America, UK and the EU. A take-away from this study is the importance to crisis response options of local business culture, legal system (i.e. code law or common law), and relative strength of investor protection regulation. Consequently, we caution that these factors must be carefully borne in mind before the findings of this study are applied in other economic settings. Similarly, the case study at Petrobras, by definition, involves a unique situation and set of circumstances regarding the Lava Jato corruption scandal. However, we believe our case study findings may be important and applicable elsewhere because (i) they allow for a reasonably coherent interpretation through several theoretical lenses; and (ii) Petrobras has many features shared by a number of mixed capital national champion companies around the world which face similar, albeit different, challenges and constraints. The relevance of the uniqueness of the Brazilian business context generally as a potential constraint on the generalizability of our findings, also applies to the earnings management study. Firms in Brazil are subject to IFRS accounting rules which are common around the world, however they operate within a complex legal system that is based on civil law (derived from the legal systems of Portugal, France and Germany), and which incorporates local, regional and state jurisdictions. Moreover, Brazil has historically had a poor reputation for enforcement and business ethics. Consequently our findings from the earnings management study must also be considered in the context of this unique setting.

Data and methodological limitations

For each of the studies, issues can be raised around the completeness or suitability of data and the methodology applied. Although the SLR study follows established methodology for conducting a systematic review of this type, the need to set inclusion/exclusion criteria invariably introduces the risk that we have missed some important papers, notwithstanding the fact that we applied 'snowballing' and citation tracking steps as part of our procedure. However, because of the process followed, we believe the risk we have missed important papers is small. In respect of the Petrobras case study, it was necessary to rely almost entirely on data published by the entity under study, i.e. Petrobras, in the form of its corporate disclosures. This creates the risk of bias in the data as there is no meaningful opportunity to verify data through triangulation with independently sourced data. The earnings management quantitative study incorporates two main potential limitations related to data and data analysis. First, our analysis of REM follows the approach taken by most scholars in the field who compute estimates for the three main measures of REM (i.e. REM_{DISX}, $REMP_{ROD}$, and REM_{CFO}), and therefore does not include all possible forms of REM that may be present – for example delayed investment or derivatives hedging. Also consistent with other researchers, we do not include an exhaustive list of all variables that might be influential. Consequently, as for all social science regression analyses, we cannot preclude the endogenous risk of omitted variable bias in our analysis.

Time related limitations

It might be argued that in respect of the Petrobras case study, insufficient time has elapsed for definitive conclusions to be drawn. The Petrobras crisis was made public in April 2014. As the SLR indicates, crisis management is a highly complex and dynamic aspect of business. Moreover, there is debate amongst scholars regarding the point at which trust is regained following a legitimacy crisis, and indeed how this is determined. Consequently, it may be premature to consider that Petrobras's crisis response analysed in the case study, which was aimed at regaining and maintaining legitimacy, has fully achieved this goal. Whilst we believe this risk is low, in the study we (i) caution that the fight against corruption (and to maintain legitimacy and reputation) is an on-going one; and (ii) highlight the risk that the gains obtained from the company's efforts to enhance its control and governance regime could be rolled back. Consequently, we suggest the solution to this potential limitation is to call for further monitoring and study at Petrobras, something we pick up in the next section.

5.6 Suggestions For Future Research

This study has sought to demonstrate that the focus of our interest – crisis response through actions and words – is an aspect of business risk that is of growing relevance, and is one that should be addressed as a unified topic by scholars from a broad church of specialisms. A key output from the SLR study in chapter 2 is a concrete research agenda focused on the primary research gaps and areas of ambiguity in extant knowledge, which we used to inform and direct the studies located in Brazil which comprise chapters 3 and 4. As we conclude this research project, we are in a position to look beyond our findings from chapters 2, 3 and 4 to help direct future researchers in a field that is still in its infancy; moreover, it offers exciting opportunities to advance knowledge from a number of theoretical perspectives using research methods from both quantitative and qualitative approaches. We set out below ten suggestions for future research which we hope will stimulate further mixed-method studies and collaborations that will complement and extend the findings presented in this thesis.

Extending the research beyond Brazil

1 We have argued that Petrobras shares a number of characteristics with listed national champions based in other countries, which are also at risk of political capture and corruption. Moreover, we posit that some have probably experienced one or more well-publicised corruption incidents in recent years which have caused legitimacy threats. Consequently we suggest that a fruitful

way of taking our work forward would be to conduct similar case study analyses at impacted firms in other markets so as to test the transferability of our findings.

2 In a similar vein, future research could replicate the earnings management study in other territories, by probing the impact that new transparency legislation has on earnings management behaviour. It would be informative to see whether the extent of REM reduces as we found in Brazil, and to consider the relative influence on behaviour of regulatory oversight and business norms. We suggest a good candidate may be Argentina, which introduced its version of a clean company act in 2017 (Farhang, 2018).

Extending the research at Petrobras on crisis management, organisational hypocrisy and voluntary disclosure

3 As mentioned above, we are still relatively close in time to the date when the Petrobras scandal first erupted in the public domain, i.e. April 2014. Consequently our tentative conclusions concerning the apparent success of management's response to repair legitimacy may be premature. Alternatively, given Brazil's long association with corruption (Tobolowsky, 2016), the efforts to reinforce governance and control at the company could be at risk. Therefore we suggest that Petrobras should continue to be monitored so as to determine whether there is persistence in its governance and control set-up and ACC disclosures. Moreover, strategies for maintaining and gaining legitimacy are under-researched, so if Petrobras continues to pursue such policies, further scholarly study would add greatly to our understanding thereof.

4 An important way to move the analysis one step further would be to conduct some form of "cost/benefit" analysis regarding the process that Petrobras has gone through. Petrobras committed substantial cash and people resources in its crisis management response. Siemens did something similar (Blanc et al., 2019). Not all companies are so diligent, yet most survive a corruption or fraud scandal.

Although data will necessarily be case-specific, it would add to our contextual understanding to have some sense of the relative costs involved, including those imposed by regulators. Building on the suggestion in point 1 above, it would be informative to compare costs and perceived benefits across cases so as to take a first stab at estimating the ‘value’ of crisis management, accepting that obtaining a counterfactual in terms of overall financial outcome would not be attainable.

5 Given that studies show that companies (including Petrobras) devote time and effort to engage differently with different stakeholders – for example through rational or progressive façades, and using the AR or SR differently depending on the stakeholder group - we believe it would be useful to gauge how effective this discourse is. This will help inform the underlying organizational hypocrisy and façade theories, and more specifically it will shed light on whether Petrobras is right to believe, as we propose, that it has succeeded in regaining legitimacy in the eyes of key stakeholders. Surveys of stakeholder sentiment could provide valuable data to assess this.

6 Following Petrobras’s announcement to adopt integrated reporting from 2018 – which we show seems to stress breadth rather than detail in respect of ACC disclosures, it would be informative to determine if this was being used as a “ruse” by Petrobras to limit ACC disclosure extensiveness, and to assess how this might impact both disclosure policies and practices going forward.

7 Any case study would benefit from qualitative data obtained from interviews of key staff who were present during the period of study. We know almost nothing about the process of determining what should appear in ACC disclosures, and the role of corporate governance in this activity. In suggesting this line of research, we appreciate that access to sources may not readily be forthcoming given the highly sensitive nature of the matter. We suggest therefore that it would be necessary to motivate leadership to participate by bringing to its

attention the findings of prior research which demonstrates the value of an inclusive and proactive approach to setting and disclosing ACC policies (Branco and Delgado, 2012; Hess, 2009).

Extending earnings management

8 Our findings show that REM has fallen during the period of the BCCA which might be interpreted as being due to the impact of improved controls focused on transparency and compliance in line with BCCA requirements, with spill-over benefits affecting the wider financial reporting and control environment, including REM behaviour. Future research could test this premise through the compilation of confirmatory data – for example cost data on amounts spent on internal control or headcount numbers. Alternatively, contextual analysis could be applied to the annual reports and sustainability reports to assess the importance that leadership gives to compliance and control as a proxy for financial investment in this function.

9 Our study adopts the approach of researchers such as Francis et al., (2016a) and Cohen, Dey and Lys, (2008) focusing on the extent (magnitude) of earnings management via AEM and REM, either of which can be used to inflate or supress earnings. It would be informative to contribute to the debate regarding the ‘value’ of earnings management during times of corporate stress or crisis as probed in our study, by looking at (i) the directional effect of each on income (increasing or decreasing); (ii) compliance related costs; and (iii) subsequent stock prices, and to assess whether firms actually gain through their earnings management choices, or whether there are gains attached to the quality of financial reporting.

10 Lastly, because the BCCA only came into effect in 2014, our study is limited to a 4-year period of analysis. Future work could take a longer horizon to test whether (i) REM continues to fall and if so if this involves a switch to increased

use of AEM, or (ii) whether firms relax the current focus on transparency controls and governance that seems to be curbing REM, which may then result in increased levels of REM behaviour. Such studies will extend our understanding of management's motivations to use AEM and REM options at its disposal, and the relative influence played by transparency controls and controls over financial reporting.

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