University of Southampton

Faculty of Social Science

Department of Accounting, Southampton Business School

The impact of corporate governance on sustainability reporting

by

Mohammad Ibrahim Fadel Alta'any

Thesis for the degree of Doctor of Philosophy

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Abstract

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The current thesis seeks to enhance our understanding and the existing knowledge of the impact of corporate governance (CG) on sustainability reporting (SR) around the world. This is achieved by carrying out three distinctive, but intimately connected papers. These are: (i) an up-to-date systematic review of the current empirical research investigating the relationship between CG and SR; (ii) an examination of the influence of CG on total SR and separately on its three dimensions, and whether the influence differs between developed and developing countries; and (iii) whether the efficacy of the CG-SR nexus depends on sampling decision, and whether this relationship is significantly different between the financial and non-financial sectors.

The first paper conducts a systematic literature review (SLR) of the relationship between CG and SR. The final sample includes 117 empirical studies conducted in over 50 countries from 2000 to 2019 and published in 72 scholarly journals. The paper finds that very few articles examine all three dimensions of SR (economic, environmental and social). The paper also shows that most previous studies are based on developing countries and exclude the financial sector from the investigation. Additionally, the majority of prior studies focus on the quantity of SR and apply single rather than multiple theoretical frameworks, with agency theory being the dominant theoretical lens. Moreover, the findings of the influence of board attributes frequently examined

(size, independence, gender diversity, and CEO duality) are conflicting. Thus, this paper provides suggestions for future research on the CG-SR nexus.

The second paper investigates the impact of CG, with a particular reference to board characteristics (i.e. board size, board independence, CEO duality, board gender diversity, and the existence of sustainability committee (SC)) on total SR practices and separately on each dimension (economic, environmental and social) based on stakeholder-agency theory. Using a sample of 370 firms from 50 countries (22 developed countries and 28 developing countries) in 2017 and a Global Reporting Initiative (GRI) standards-based disclosure index to measure the level of SR across various reporting mediums, the paper shows that the impact of several board characteristics differs by dimension. Then, the paper conducts further analysis by dividing the sample into developed and developing countries. The findings show that the relationship between some board attributes and total SR differs between developed and developing countries.

Following similar analysis, and drawing on agency and resource dependence theories, the third paper conducts sector-based research of the CG-SR nexus. Specifically, this paper, first, explores whether the efficacy of several board mechanisms (i.e. board size, board independence, CEO duality, board gender diversity, board age, board tenure, and the presence of SC) on SR practices differs depending on sampling decision. Second, the paper examines the differences in the effect of these governance mechanisms on SR practices between financial and non-financial firms. Using data relating to 370 companies (104 from the financial sector and 266 from the non-financial sector) belonging to 50 countries in 2017 and a disclosure index based on GRI standards to quantify the SR activities, the paper finds that the chosen sample influences the relationship between some board characteristics and SR. Furthermore, the paper suggests that several board attributes affect SR practices in financial and non-financial sectors differently.

Keywords: Corporate governance; sustainability reporting; systematic literature review; further research, triple bottom line reporting, financial sector, international evidence, stakeholder-agency theory, agency theory, resource dependence theory, sustainability committee

UNIVERSITY OF Southampton

Table of Contents

List of Figures

List of Tables

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Research Thesis: Declaration of Authorship

Print name:	Mohammad Ibrahim Fadel Alta'any

Title of thesis:	The impact of corporate governance on sustainability reporting

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission.

Signature: Date: 27/01/2022

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Mohammad Ibrahim Alta'any
24/11/2021 7:00 pm, Southampton, SO17 1BJ.

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To my parents, I dedicate this thesis

Abbreviations

BoD	Board of Directors
CS	Cross-sectional Studies
CG	Corporate Governance
CSR	Corporate Social Responsibility
DBL	Double Bottom Line
GRI	Global Reporting Initiative
GS	Google Scholar
IR	Integrated Reporting
LS	Longitudinal Studies
SBL	Single Bottom Line
SC	Sustainability Committee
SDG	Sustainable Development Goals
SLR	Systematic Literature Review
SME	Small and Medium-sized Enterprises
SR	Sustainability Reporting
SS	Short-observation Studies
TBL	Triple Bottom Line
UN	United Nations
WoS	Web of Science

Chapter 1: Introduction and Background

1.1 Preamble

This PhD thesis investigates the interaction between firms and society and focuses, specifically, on the impact of corporate governance (CG) and sustainability reporting (SR). Nowadays, the way organisations are governed, and which governance mechanisms affect the disclosure of sustainability information are important issues practically and academically. To this end, and through three interconnected papers, the core aim of this thesis is to gain knowledge and understanding of, and provide new insights into, the CG-SR nexus. The introduction chapter is organised as follows. Section 1.2 outlines the background of research with the research motivation presented in Section 1.3. In Section 1.4, the aim and the main objectives of the research are provided, while Section 1.5 outlines the research methodology. Section 1.6 summarises each of the three studies conducted. Finally, the whole structure of the current thesis is presented in Section 1.7.

1.2 Research background

Recently, corporate commitment towards sustainability issues has changed considerably, where sustainability activities have become substantially pertinent to societies worldwide (Bansal, 2005; Burritt and Schaltegger, 2010; Dienes, Sassen and Fischer, 2016). Moreover, and both in public sector organisations and corporations (Adams, 2013; Cebrián, Grace and Humphris, 2013; Dienes *et al.*, 2016), sustainability concerns are growingly being involved in accounting practices (Gray, 2010), disclosure activities (Guidry and Patten, 2010), and management's decision-making process (Windolph, Schaltegger and Herzig, 2014). According to Dyllick and Hockerts (2002), sustainability aims to meet the expectations and needs of the company's present direct and indirect stakeholder groups, while preserving its ability to fulfil future stakeholders' needs.[1] To achieve this aim, firms have, firstly, to consider the impact of their economic, environmental, and social practices on societies by linking social and environmental management with competitive strategy,

[1] According to Dienes *et al.* (2016), corporate social responsibility (CSR) is defined as organisations' responsibilities for their influences on societies and incorporate the environmental, social and ethical issues along with human rights and consumer concerns into the firm's activities and strategies.

management, and business (Herzig and Schaltegger, 2006; Schaltegger and Wagner, 2006), and, secondly, to integrate economic business information with social and environmental information in their reporting cycle (Dienes *et al.*, 2016). This is directly linked to Elkington's (1997) ''triple-bottom-line'' concept, which is based on the simultaneous pursuit of economic prosperity (profit), environmental quality (planet), and social equity (people).

Given the growing public awareness about economic, environmental, and social issues (Kolk, 2008), there is an increasing interest from both internal and external stakeholders regarding sustainability activities (Adel *et al.*, 2019). Therefore, the way business is conducted in organisations – particularly regarding external reporting systems – has transformed (Kolk and Van Tulder, 2010). Nowadays satisfying these various stakeholders' interests is one of the significant determinants of a company's success (Laplume, Sonpar and Litz, 2008; Hahn and Kühnen, 2013). Against this background, SR is a significant channel through which companies fulfil these demands (Hahn and Kühnen, 2013). According to Yadava and Sinha (2016), SR is a way to report, assess, and be accountable to the internal and external stakeholder groups on companies' practices and performance towards sustainability and sustainable development issues. This definition is based on the notion that firms have responsibilities to communities beyond those of maximising profits (Shepard, Betz and O'connell, 1997).

Basically, there are two common purposes of SR: first, to assess the current situation of companies' activities on economic, environmental and social pillars of sustainability (Hamann, 2003; Perrini, 2005; Lozano and Huisingh, 2011); second, to communicate the efforts and progress on sustainability issues to the companies' various stakeholder groups (Dalal-Clayton, Bass and Swingland, 2002; Morsing and Schultz, 2006; Lozano, 2013). Thus, SR can be used for measuring firms' sustainability performance over the years (Schaltegger and Wagner, 2006), demonstrating how organisations affect, and are affected by, expectations towards sustainable development (Daub, 2007), and informing stakeholder groups about the influence of business activities on global sustainability issues (Gray, 2006). Moreover, it can be considered as a benchmark against other firms (Lozano and Huisingh, 2011), a way to enhance organisations' transparency within communities (Lehman, 1995), a basis for sustainability's planning changes (Lozano, 2013), a tool that can affect manager's decision-making process on sustainability issues (Burritt and

Schaltegger, 2010), and a means by which firms can account for their practices to communities (Comyns *et al.*, 2013).

Generally speaking, SR activities remain voluntary, for the most part, with few regulations governing the disclosing procedures. Nevertheless, many organisations already disclose an increasing amount of sustainability information, particularly, to satisfy the growing interests of their various stakeholder groups, including shareholders (Dienes *et al.*, 2016). This information could be included in the annual reports, integrated reports, websites, and (or) disclosed in standalone sustainability or sustainability-related reports using various terms and labels such as, "Corporate Responsibility Report" (e.g., Commonwealth Bank of Australia, 2017), "Corporate Citizenship Report" (e.g., Accenture, 2019), "Corporate Social Responsibility Report" (e.g., KONČAR, 2020), "Environmental, Social, and Governance Report" (e.g., Wells Fargo & Company, 2021), "Sustainable Development Report" (e.g., ACC Limited, 2018), "Sustainability Report" (e.g., ADVA Optical Networking, 2018; Co-operative Group Limited, 2021). In fact, the number of firms disclosing sustainability-related information has seen an upsurge in recent years. For instance, the findings of a recent survey on SR practices, which has been published by KPMG, reveal that 80% of N100 companies and 96% of G250 companies worldwide report on sustainability in 2021, compared with 75% and 93% in 2017, and 64% and 83% in 2011, respectively (KPMG, 2020).

From a historic viewpoint, there have been several shifts in the concentration and development of sustainability-related reporting (Fifka, 2012; Hahn and Kühnen, 2013). During the 1970s, the focus of organisations was to offer information about the social influences of their business operations, along with traditional financial reporting. The next decade (i.e. 1980) was the decade when the organisations shifted their concentrations and began to disclose information about the environmental impacts (e.g., waste generation and emissions), where the first standalone environmental report was published in 1991 by Shell Canada (Maharaj and Herremans, 2008). One decade later, and specifically in the late 1990s, reporting practices growingly began to complement traditional financial reports with joint reports that simultaneously cover environmental and social dimensions. These practices could be connected with the development

of reporting frameworks and standards issued by the Global Reporting Initiative (GRI) (Vormedal and Ruud, 2009; Kolk and Van Tulder, 2010; Hahn and Kühnen, 2013).

In fact, no meaningfully robust discussion of research on SR practices could be carried out without referring to the GRI. The GRI is an international non-governmental independent standards organisation founded in 1997 and headquartered in Amsterdam, Netherlands. Nowadays, the GRI is the main driver of SR practices and the most recognised and accepted initiative (Fonseca, McAllister and Fitzpatrick, 2014; Vigneau, Humphreys and Moon, 2015; Lambrechts *et al.*, 2019). One of the main aims of the GRI is to enhance corporations' accountability (transparency) and stakeholders' engagement (Vigneau *et al.*, 2015). For this purpose, and through guidance on how and what to disclose, the GRI challenges firms to report information on the three dimensions (economic, environmental and social) of sustainability (Hussain, Rigoni and Orij, 2018). Therefore, and aiming at standardising the SR process, the GRI launched its standards in 2016 to be the most recent version for the SR framework to be used nowadays with a modular structure compared to earlier versions (e.g., G3, G3.1, G4), making them easier to adapt and update. A recent KPMG survey on SR practices already shows that the use of GRI standards by companies in the N100 group and G250 has significantly increased compared with GRI G4 and G3 guidelines (KPMG, 2020).

Although several guidelines have been developed by several international institutions to inform stakeholders regarding firms' commitment toward sustainability activities (e.g., AA1000 standards, SA8000 standard, ISO series), GRI has the most broadly applied framework worldwide (Lozano and Huisingh, 2011; Yadava and Sinha, 2016; Al Farooque and Ahulu, 2017; Junior *et al.*, 2017). Even though the GRI framework remains voluntary with firms deciding whether to apply the GRI standards, recently, there has been a large uptake in applying them to disclose sustainability information. According to KPMG (2020), GRI remains the dominant global standards for SR practices, applied by 67% of N100 and 73% of G250 reporters. Under these standards, there are several sub-dimensions and a set of performance indicators for each dimension that cover a variety of sustainability issues. In greater detail, (i) economic dimension includes economic performance, market presence, indirect economic impacts, procurement practices, anti-corruption, anti-competitive behaviour, and tax, (ii) environmental dimension includes materials,

energy, water and effluents, biodiversity, emissions, waste, environmental compliance, and supplier environmental assessment, and (iii) social dimension includes labour practices and decent work, human rights, societies, and products responsibility.

Within the international community, the United Nations (UN) is an influential organisation that often comes to the minds as well. The UN has played and plays a crucial role in fostering the concept of sustainable development globally. Specifically, and in 2015, a significant contribution was made by the UN towards this regard by developing and issuing its document "Sustainable Development Goals (SDGs) for the year 2030" that has been adopted by 193 countries and includes 17 goals that implicitly encompass 169 targets (United Nations, 2015). These SDGs are considered as a global action agenda by the UN to reach sustainable development, where the included goals and associated targets embrace a variety of sustainability issues that face the globe ranging from eradicating extreme poverty to involving in partnerships for reaching these goals (Rosati and Faria, 2019). Specifically, and in terms of SR, target 12.6 "encourages companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle" (Tauringana, 2021). In this regard, it is worth mentioning that the GRI is important in the area of SR because also the information on its database evaluates the progress made by countries in achieving this target (Tauringana, 2021).

Furthermore, the GRI standards for SR (i.e. GRI 200 for the economic dimension, GRI 300 for the environmental dimension, and GRI 400 for the social dimension) are closely related to several SDGs. For instance, GRI economic dimension – standard 204 (procurement practices) are linked with SDG target 12.7 (promote public procurement practices that are sustainable, in accordance with national policies and priorities), GRI environmental dimension – standard 307 (environmental compliance) are linked with SDG target 16.6 (develop effective, accountable and transparent institutions at all levels), and GRI social dimension - standard 418 (customer privacy) are linked with SDG target 16.10 (ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements). Thus, SR has an important role to play in achieving sustainable development.

In addition to the moral motivation and pressure from stakeholders behind SR practices, and in terms of the economic consequences, organisations can gain business advantage by adopting SR practices. For instance, and by engaging in SR, private organisations aim to enhance transparency and accountability, strengthen control process and corporate information policy, improve the business's reputation, brand value and image, minimise operating costs, raise financial performance, encourage workforce, and enable competitiveness (Herzig and Schaltegger, 2006; Said, Zainuddin and Haron, 2009; Hahn and Kühnen, 2013). Thus, many organisations nowadays recognise the significance of SR (Cho *et al.*, 2015; Higgins, Milne and Van Gramberg, 2015). Empirically, several studies find a positive impact of SR on financial performance (e.g., Matuszak and Różańska, 2017; Beck, Frost and Jones, 2018; Ta and Bui, 2018; Kalai and Sbais, 2019), firms' market value (e.g., Carnevale, Mazzuca and Venturini, 2012; Loh, Thomas and Wang, 2017; Sampong *et al.*, 2018; Emeka-Nwokeji and Osisioma, 2019; Swarnapali, 2020), competitive advantage (e.g., Nyuur, Ofori and Amponsah, 2019), minimising costs of capital (e.g., El Ghoul *et al.*, 2011; Plumlee *et al.*, 2015; Matsumura, Prakash and Vera-Muñoz, 2017), and reducing several types of risk, such as crash risk (e.g., Kim, Li and Li, 2014), systematic risk (e.g., Albuquerque, Koskinen and Zhang, 2019), the risk of future stakeholders' conflicts, and idiosyncratic risk (e.g., Becchetti, Ciciretti and Hasan, 2015). Hence, it is a "win-win relationship" between SR practices and companies' financial success.

Overall, SR contributes to the achievement of sustainability (Schneider and Meins, 2012) and sustainable development agenda, fulfils legitimacy requirements (Bent, 2006; Lodhia and Jacobs, 2013), satisfies various stakeholders' needs and demands about economic, environmental, and social issues (Hahn and Kühnen, 2013; Dienes *et al.*, 2016), plays a significant role in the societal-organisation relationship (Gray, 2007; Comyns *et al.*, 2013), and can bring many economic benefits to organisations. As a result, SR, unsurprisingly, receives greater attention in the business arena and academic community.

In this regard, several studies have examined the determinants of SR and sustainability-related reporting, such as financial performance (e.g., Cormier, Gordon and Magnan, 2004; Reverte, 2009; Fernando and Pandey, 2012; Andrikopoulos, Samitas and Bekiaris, 2014; Sial *et al.*, 2018), corporate size (e.g., Parsa and Kouhy, 2008; Khasharmeh and Suwaidan, 2010; Gallo and

Christensen, 2011; Haji, 2013; Nawaiseh, Boa and El-shohnah, 2015), sector-affiliation (e.g., Haniffa and Cooke, 2005; Clarkson *et al.*, 2008; Morhardt, 2010; Amran and Haniffa, 2011; Gamerschlag, Möller and Verbeeten, 2011), governance structure (e.g., Said *et al.*, 2009; Jizi *et al.*, 2014; Helfaya and Moussa, 2017; Hoang, Abeysekera and Ma, 2018; Giannarakis, Andronikidis and Sariannidis, 2020), media visibility (e.g., Brammer and Pavelin, 2006; Kent and Monem, 2008; Nikolaeva and Bicho, 2011; Wang, Song and Yao, 2013; Chiu and Wang, 2015), stakeholder pressure (e.g., De Villiers, 1999; Liu and Anbumozhi, 2009; Liesen *et al.*, 2015; Ramadhini, Adhariani and Djakman, 2020), and capital structure (e.g., Jennifer Ho and Taylor, 2007; Christopher and Filipovic, 2008; Dilling, 2010; Andrikopoulos *et al.*, 2014; Sharif and Rashid, 2014).

Among these determinants, and for a number of reasons, CG mechanisms are considered a significant driver to affect SR practices and interesting area to investigate. First, there have been increasing calls in existing literature (e.g., Windsor, 2006; Gill, 2008), including OECD (2004) revised principles, on shifting the narrow and traditional perspective of CG mechanisms, which focuses on maximising shareholder's wealth (Shleifer and Vishny, 1997), to encompass the non-financial stakeholders' interests. Traditionally, CG is defined as a system that includes rules and regulations that direct and control the relations among management, board members, and shareholders to address presumed agency issues (Berle and Means, 1932) and maximise the firm's value to the stockholders (Denis and McConnell, 2003). However, other accounting literature suggests a more comprehensive definition as a set of relations within companies among their managers, board members, shareholders, and stakeholders as well (Aoki, 2001; Maier, 2005) that influence both the financial and social outcomes (Aguilera *et al.*, 2008; Aguilera *et al.*, 2015). Some of the explanations behind this are that (i) stakeholders' engagement could improve the firm's value (Brown, Helland and Smith, 2006; Ntim and Soobaroyen, 2013), (ii) there are no expressed requirements by company law to maximise shareholders' wealth (Stout, 2012; Jain and Jamali, 2016), hence raising questions on the priorities of shareholders' interests as the companies' default aim, and (iii) the world has witnessed increasing events of corporate scandals and fraud (Elkington, 2006; Hussain *et al.*, 2018). In fact, several studies have adopted this broader perspective of CG mechanisms (e.g., Michelon and Parbonetti, 2012; Chan, Watson and Woodliff,

2014; Mahmood and Orazalin, 2017; Pucheta-Martínez and Chiva-Ortells, 2018; Adel *et al.*, 2019).

Second, the relationship between CG and sustainability-related activities has echoed worldwide and is more interesting than ever due to the increasingly visible scandalous environmental and social excesses and organisations' governance breaches (Ryan, Buchholtz and Kolb, 2010; Walls, Berrone and Phan, 2012; Jain and Jamali, 2016). In a provocative claim, Serwer (2009) describes the first decade in this millennium (i.e. from 2000 to 2010) as the "Decade from Hell", due to the economic disaster, which since the Great Depression is considered the worst. Furthermore, Rodin (2010) expected the last decade (i.e. from 2010 to 2020) to be the "Doom Decade", characterised by environmental and social catastrophes. In fact, the world has witnessed several disasters in the last decade (e.g., BP Deepwater Horizon oil spill in 2010, Foxconn suicides in 2010, Libor scandal in 2012, Volkswagen emissions scandal in 2015, Facebook-Cambridge Analytica data scandal in 2018, Boeing crisis in 2019, and acid rain in Eastern Europe … etc.), along with other catastrophes in the previous decades (e.g., the Exxon Valdez oil spill in 1989, Brent Spar's long saga in 1998, the Enron scandal in 2002, Nike shoes and child labour in Pakistan in 2002, and the financial crisis in 2008… etc.).

Third, CG mechanisms and SR practices can be seen as complementary mechanisms used by firms to enhance their relationships with their stakeholders (Michelon and Parbonetti, 2012). The awareness of the importance of CG has not only been grown but has also been extended to encompass new ranges that are regularly perceived as being part of SR activities (Khan, 2010). Moreover, and from an accountability perspective, CG mechanisms can be responsible for SR practices since accountability is considered as a fundamental element of the governance system (Donnelly and Mulcahy, 2008) and that sustainability, as previously stated, extends companies' accountability to broader sets of stakeholders by disclosing their sustainability activities. Furthermore, Sundarasen, Je-Yen and Rajangam (2016) state that CG mechanisms and SR practices are concepts aimed to support businesses to reach a balance between profitable and ethical practices. By doing so, companies show a commitment to environmental and social issues, besides achieving the expectations of the investors and stakeholders. Therefore, the concepts of

CG mechanisms and SR practices, as a part of the organisation system, can be used to achieve more desirable outcomes.

So overall, the relationship between CG mechanisms and SR practices is more interesting than ever and nowadays has been considered as one of the most relevant topics in the academic community and business.

1.3 Research motivation

The purpose of this thesis is to examine the impact of CG mechanisms on SR practices. Generally speaking, the basic motivation behind this topic is its importance to firms, researchers, regulators and policymakers, particularly those currently pursuing reforms on CG mechanisms, with the aim to achieve effective outcomes regarding SR activities. As mentioned before, scholars, regulatory authorities and firms are increasingly aware of this nexus.

Consequently, academic research on the relationship between CG mechanisms and SR practices has recently been published (e.g., Amran, Lee and Devi, 2014; Barakat, Pérez and Ariza, 2015; Kiliç, Kuzey and Uyar, 2015; Lone, Ali and Khan, 2016; Sundarasen *et al.*, 2016; Helfaya and Moussa, 2017; Jizi, 2017; Cabeza-García, Fernández-Gago and Nieto, 2018; Hoang *et al.*, 2018; Muttakin, Khan and Mihret, 2018; Giannarakis *et al.*, 2020; Moses, 2021; Stone, 2021). Given that, it was difficult for me to know the trends of prior studies and the current landscape on the CG-SR nexus. Although several well-known literature reviews have investigated the determinants of SR practices, these reviews are either non-systematic (Belal and Momin, 2009; Fifka, 2013; Ali, Frynas and Mahmood, 2017) or systematic but not focusing on CG mechanisms, along with other limitations (Hahn and Kühnen, 2013; Dienes *et al.*, 2016).[2] Moreover, the results on the reviewed CG variables on SR practices of these literature reviews are mixed and inconsistent.[3] Thus, there is a need to carry out an up-to-date systematic literature review (SLR) to address the prior literature reviews' limitations and offer an extensive overview of the influence of CG mechanisms on SR

[2] According to Roberts, Stewart and Pullin (2006), the non-systematic review, compared to the systematic review, can cause unintentional bias by researchers, and often lacks thoroughness resulting in misinterpretation or inaccuracy of the gathered studies and their results.
[3] For instance, Dienes *et al.* (2016) find that most studies report an insignificant impact of board independence on SR, while Ali *et al.* (2017) document only a significant and positive relationship between these two variables.

practices. Therefore, the lack of systematic review papers on this given nexus motived me to review the current literature comprehensively and systematically, aiming at identifying what is known about this relationship and what further research is needed. To the best of the knowledge, there is no SLR on the impact of CG mechanisms on SR practices.

As stated above, many studies have investigated this relationship. However, only limited studies (e.g., Michelon and Parbonetti, 2012; Adnan, Hay and van Staden, 2018) have addressed the three dimensions of SR (i.e. economic, environmental and social).[4] Despite that the economic dimension is an essential pillar of sustainability (Lozano, 2008; Schneider and Meins, 2012; Hussain *et al.*, 2018), prior studies, in fact, largely neglect the economic dimension and concentrates on the environmental and social dimensions. In the same regard, previous literature largely ignores the importance of unpacking the dimensions of SR practices (e.g., Haniffa and Cooke, 2005; Esa and Ghazali, 2012; Jizi *et al.*, 2014; Dias, Rodrigues and Craig, 2017; Katmon *et al.*, 2019), although CG mechanisms might be restricted in their ability to impact all dimensions.[5] In other words, CG mechanisms may affect the dimensions of SR differently. Still, thus far, no study has proposed such examination as a stimulus before.

Moreover, several studies argue that the relationship between CG mechanisms and SR practices between developed and developing countries may differ (e.g., Khan, Muttakin and Siddiqui, 2013; Abu Qa'dan and Suwaidan, 2019; Katmon *et al.*, 2019) since the effectiveness of CG mechanisms and credibility of SR in developing countries is relatively weak compared to developed countries. Prior literature conducted in developing countries (e.g., Bae, Masud and Kim, 2018) and developed countries (e.g., Adel *et al.*, 2019), in fact, finds inconsistent findings on the CG-SR nexus. However, to the best of the knowledge, no single empirical study has conducted a comparative research about whether, and to what extent, the influence may differ.

[4] Several studies have suggested various definitions for sustainability, e.g., Lozano's (2008) integrational perspective of sustainability and Kleine and Von Hauff's (2009) integrative sustainability triangle; however, their commonality is the indication of the three dimensions of sustainability that should be satisfied simultaneously and equitably.
[5] For example, a recent meta-analysis conducted by Endrikat *et al.* (2020) shows that the environmental versus social dimension moderates the relationship between board characteristics and CSR.

Likewise, the agency costs are probably prominent in the financial sector compared to the non-financial sector due to the former's unique features (Laeven, 2013; John, De Masi and Paci, 2016), leading to different roles of CG mechanisms toward disclosing sustainability-related information between these two sectors. However, there is no clear evidence of whether this is the case within the CG-SR nexus. That is, no single empirical study has examined whether the efficacy of CG mechanisms on SR practices differs depending on the sampling decision (i.e. combining the financial and non-financial sectors, focusing on the financial or the non-financial sector) and whether this association differs between these two sectors.

All in all, these research gaps and suggestions motivated me to investigate the impact of CG mechanisms on SR practices, considering its three dimensions and the country development, and to conduct a sector-based research of this relationship.

1.4 Research aim and objectives

The current thesis aims to support the academic community, policymakers, standard setters, and practitioners to make relevant decisions and take a comprehensive overview of the CG-SR nexus. For instance, academic researchers may research this association to address the research gaps in the existing literature. Likewise, policymakers and regulators may carry out reforms and set regulations to ensure the effectiveness of CG mechanisms towards addressing sustainability issues around the world.

Thus, the objective of the current thesis is to conduct a systematic and comprehensive review of the prior research examining the CG-SR nexus and provide international empirical evidence of the effect of CG mechanisms on SR practices, taking into account its three dimensions (i.e. economic, environmental and social), the country development (i.e. developed vs developing countries), and the sampling decision (i.e. combining the financial and non-financial sectors, focusing on the financial sector or the non-financial sector).

To this end, three self-contained papers addressing different specific objectives have been used. In greater detail, the first paper systematically reviews existing studies on the CG-SR nexus to

enhance our knowledge and understanding of empirical evidence on the impact of multi-level CG mechanisms, i.e. group-level (board attributes and audit attributes), firm-level (ownership attributes) and individual-level (CEO attributes) on SR measurements (i.e. adoption, quantity and quality) and its three dimensions. The second paper examines the influence of CG mechanisms on total SR and separately on each dimension. Moreover, this paper identifies whether CG may affect SR in developed and developing countries differently. The third paper conducts sector-based research on the CG-SR nexus, aiming at investigating (i) whether the sampling decisions affect the efficacy of CG mechanisms on SR practices, and (ii) whether the results of this nexus differ between the financial sector and the non-financial one.

1.5 Research methodology

Bell, Bryman and Harley (2018) posit that a research paradigm can be defined as a cluster of philosophies and prescriptions that helps the researchers on what should be studied and how the studies should be done, consequently, how the results should be realised. Thus, a research paradigm helps to define a research philosophy (Collis and Hussey, 2013). According to Saunders, Lewis and Thornhill (2009), a research philosophy refers to a system of assumptions and beliefs regarding knowledge and development, and any researcher needs these assumptions in terms of completing the study. Based on that, a researcher will select the appropriate philosophy and research strategy. The current thesis consists of three self-contained papers: one reviewed paper and two empirical papers.

Concerning the first study, which is a systematic review of the relationship between CG mechanisms and SR practices, a content analysis method is followed in the current thesis. Methodologically, Brewerton and Millward (2001) state that a literature review can be deemed as content analysis, which can be employed qualitatively (i.e. to assess content criteria) and quantitatively (i.e. to evaluate descriptive aspects). Indeed, content analysis is a well-known method for conducting a narrative review or a systematic review (Seuring and Gold, 2012; Hahn and Kühnen, 2013; Leung *et al.*, 2013; Xu *et al.*, 2018a).

According to Bryman (2016), a researcher who uses a positivism philosophy tends to believe that what is being analysed in the research has to be understood in the frame of presumptions and rules, and these measurements could be dependent and generalisable to the others at large. In this regard, the data gathered and analysed may either confirm or contradict the hypotheses that have been tested (Saunders *et al.*, 2009). In a deductive approach, the researchers present typically theoretical frameworks and subject these theories for testing processes (Ali and Birley, 1999), which include investigating several observations. After obtaining the findings from these processes, the hypotheses that have been implemented could be accepted d or rejected (Saunders *et al.*, 2009). The second and third papers use a number of theories (e.g., stakeholder-agency theory, legitimacy theory, signalling theory, agency theory, and resource dependence theory) to explain the relationship between CG mechanisms and SR practices or explain the motivations behind disclosing sustainability information. Thus, both the positivism philosophy and the deductive approach have been used, as they are the best suited to achieve the current thesis's overall objectives.

Saunders *et al.* (2009) posit that a research strategy can be defined as guidance for researchers to address research questions and achieve its objectives. According to Denzin and Lincoln (2011), a research strategy is a link between the implemented methods and choices for collecting the data and the researcher philosophy. These strategies are archival research, experiment, case study, grounded theory, survey, ethnography, and action research (Saunders *et al.*, 2009). Based on research questions and objectives, and after comparing these strategies, the archival documentary research strategy is used in this thesis.

According to Bell *et al.* (2018), this strategy includes using the administrative documents and records as the primary source of collecting the data, where the term archival refers to historical and current documents. Thus, the research questions that concentrate on the past or the present changes can be answered using this strategy (Saunders *et al.*, 2009). A quantitative research approach is adopted in the current thesis, where virtually all the prior studies investigating the relationship between CG mechanisms and SR practices have employed this approach (e.g., Haniffa and Cooke, 2005; Khan *et al.*, 2013; Chan *et al.*, 2014; Jizi, 2017; Hoang *et al.*, 2018; Giannarakis *et al.*, 2020). The quantitative approach confirms the quantifications of collected data, where the

quantitative researchers focus on mathematical models investigating a cause-effect relationship and test the hypotheses developed based on theoretical frameworks (Saunders *et al.*, 2009). Therefore, this approach is inclined to the positivist assumptions (Crotty and Crotty, 1998) and equivalent to the deductive approach.

1.6 Conducted studies

As stated before, this thesis consists of three distinctive papers. This part summarises the research objectives and questions, data and sample, and the expected results and contributions of each paper.

1.6.1 First paper

This paper aims to undertake a systematic and comprehensive review of the current studies examining the relationship between CG mechanisms and SR practices. Specifically, this paper seeks to assess and evaluate the existing literature in terms of the distribution of articles across several aspects, such as publication outlets, investigated country, sector affiliations, sample size, dimensions of SR, measurements of SR practices, types of mediums analysed, and theoretical frameworks applied to investigate the CG-SR nexus. Furthermore, the paper reviews the influence of multiple levels of CG mechanisms, i.e., group-level (board attributes and audit attributes), firm-level (ownership structure attributes), and individual-level (CEO attributes) on SR practices, considering its three dimensions (i.e. economic, environmental and social) and its different measurements (i.e. adoption, quantity and quality). Moreover, this paper seeks to offer several suggestions and opportunities for future studies to fill the research gaps in the current literature and, consequently, enhance our understanding and knowledge about this interesting relationship. Thus, the first paper endeavours to answer the following main research question:

- What is known about the relationship between corporate governance mechanisms and sustainability reporting practices, and what further research is needed?

Data and sample: Aiming at ensuring access to a broad range of journals and minimising the risk of missing relevant studies, this paper has relied on two main databases (i.e. Google Scholar and

Web of Science), along with three other databases (i.e. ScienceDirect, SSRN, and EBSCO). To search for and collect the relevant studies from the above-mentioned databases, the paper has drawn on two sets of keywords (i.e. the first set is related to multi-level CG mechanisms and the second one is related to SR practices) that have been combined using Boolean search (i.e. connector AND) and different wildcards, aiming at covering the field of research extensively. The paper also identified a time span to systemise the search over the last 20 years from 2000 to 2019. Then the next step was to conduct two stages of reading for each document, taking into account five sets of inclusion and exclusion criteria to select and include the relevant studies in the systematic review. By conducting a structured and detailed research process, this paper ensures objectivity, transparency and inclusivity (Denyer and Tranfield, 2009). After excluding the irrelevant papers, the final sample for the systematic review comprises 117 empirical articles published in 72 journals from several disciplines (e.g., accounting, finance, business, ethics, management, economics, and governance) and conducted in over 50 countries.

Expected results: This paper indicates what has been done by the previous studies regarding collecting knowledge of the relationship between CG mechanisms and SR practices. Most importantly, the findings of this paper are likely to support research gaps in the existing literature, offering suggestions and impetuses to broaden the avenues for future studies and my second and third papers.

Expected contributions: For the first time, the first paper offers an overview of the current landscape of the impact of CG mechanisms on SR practices and evidence of the research gaps in the existing literature. In particular, this paper sheds light on the research gaps that previous studies have not considered, such as the three dimensions of SR, types of mediums analysed, sector-based research (i.e. sampling decision), an analysis of country development (i.e. a comparison of developed and developing countries), and the influence of other less investigated CG mechanisms (e.g., board diversity, audit committee attributes, and CEO characteristics) on SR practices. Thus, future studies can fill these research gaps in the existing literature to improve our understanding and knowledge of this critical relationship.

1.6.2 Second paper

The second paper seeks to examine the impact of a specific bundle of CG mechanisms (i.e. board size, board independence, CEO duality, board gender diversity, and the presence of the sustainability committee (SC)) on total SR. In the same regard, this paper also investigates the influence of these governance mechanisms on each dimension of sustainability (i.e. economic, environmental and social) to identify whether the impact will differ by dimension and from the total SR practices. Moreover, the paper examines whether and to what extent the impact of the CG mechanisms on total SR may differ between developed and developing countries. Therefore, this paper has to answer three sub-questions as follow:

- What is the impact of corporate governance mechanisms on total sustainability reporting?
- Do corporate governance mechanisms affect the dimensions of sustainability reporting differently?
- Whether, and to what extent, the influence of corporate governance mechanisms on sustainability reporting is based on country development (developed and developed countries)?

Data and sample: The data for the second paper was collected manually and from various electronic databases. In greater detail, sustainability information has been collected from sustainability reports and other related sustainability reports, annual reports and integrated reports, and websites, using a disclosure index based on the GRI standards. The data for CG variables has been gathered from annual and sustainability reports and DataStream. Various sources (namely, annual reports, DataStream, World Bank database, World Economic Forum's Global Gender Gap Report, and Worldwide Governance Indicators) have been used to collect the data for control variables. The initial sample for this paper was taken from a list of reporting firms from the GRI database. After applying three criteria, the final sample includes 370 firms belonging to 50 countries (i.e. 22 developed countries and 28 developing countries) in 2017 (i.e. a year after issuing the GRI standards).

Expected results: This paper is expected to present international empirical evidence of the influence of CG mechanisms on total SR and separately on its three dimensions (i.e. economic, environmental and social). Moreover, the paper is expected to show whether the relationship between CG mechanisms and total SR practices in developed countries differs from developing countries.

Expected contributions: Empirically, the findings of the second paper fill the research gap in the existing literature regarding the relationship between CG mechanisms and total SR, acknowledging the equitable and simultaneous fulfilling of its three dimensions. Moreover, this paper bridges the research gap in the current literature by examining the influence of CG mechanisms on the economic, environmental, and social dimensions separately, acknowledging the significance of unpacking the dimensions of SR. Thus, the results may identify critical aspects of this given nexus, explain the inconsistent findings in the previous literature, contribute to theory development, and provide companies and policymakers with important implications. Furthermore, the empirical evidence of this paper can present whether CG mechanisms have different effects on SR practices in developed and developing countries, thus providing implications for CG reforms internationally. The paper's theoretical contribution is the adoption of the stakeholder-agency theoretical perspective (Hill and Jones, 1992), to explain the relationship between CG mechanisms and SR practices for the first time to the best of the knowledge. The paper concentrates on using data to test the above-mentioned theoretical perspective. Hence, the results from this paper are likely to fill the void in the current literature by providing empirical evidence that may support the stakeholder-agency theory. Methodologically, this paper examines a unique sample covering datasets from both developed and developing countries, relies on various sustainability information sources (namely, annual reports and integrated reports, sustainability reports and other related sustainability reports, and websites), and uses GRI standards requirements to build the disclosure index. This disclosure index has 77 items in total; 13 items are related to the economic dimension, 30 items to the environmental dimension, and 34 items to the social dimension. Moreover, this paper deals with the problem of endogeneity and conducts several robustness checks to confirm the baseline results.

1.6.3 Third paper

The primary research criterion of the third paper is to conduct sector-based research of the relationship between CG mechanisms, with particular reference to the board characteristics (i.e. board size, board independence, CEO duality, board gender diversity, board age, board tenure, and the existence of SC) and SR practices. Specifically, this paper has two-fold objectives. First, to investigate the effect of CG mechanisms on SR practices with a combined sample of financial and non-financial companies and then separately with subsamples of financial and non-financial companies. Second, to examine the differences in the influence of these CG mechanisms on SR practices among the financial and non-financial companies. Hence, the third paper addresses the following two sub-questions:

- Whether, and to what extent, the efficacy of corporate governance mechanisms on sustainability reporting practices depends on sampling decisions (i.e. combining the financial and non-financial sectors, focusing on the financial sector or the non-financial sector)?
- Whether, and to what extent, corporate governance mechanisms may affect sustainability reporting practices differently in the financial and non-financial sectors?

Data and sample: Relying on GRI standards, a disclosure index was constructed and used to quantify the level of SR across various information sources (e.g., sustainability reports, annual reports, integrated reports, and websites). For CG mechanisms, DataStream and annual and sustainability reports have been used to collect the data. The data for control variables have been gathered from several sources, namely, annual reports, DataStream, World Bank database, and Hofstede Insights website. Based on the GRI database and applying three criteria to the initial sample, this paper ended up examining 370 companies (104 financial companies and 266 non-financial companies) located in 50 countries over one year (2017).

Expected results: This paper is expected to offer international evidence on whether the sampling decision affects the relationship between CG mechanisms and SR practices. Furthermore, this paper is supposed to show whether, and to what extent, the results may differ between the financial

and non-financial sectors. Also, it is expected to provide empirical results on this given nexus in the financial sector.

Expected contributions: Empirically, the results of the third paper bridge the research gaps in the existing literature by addressing specific questions concerning what we know, from a global perspective, about the financial and non-financial sectors when examining the relationship between CG mechanisms and SR practices. Specifically, the findings can reveal whether sampling decision (i.e. combining the financial and non-financial sectors, focusing on the financial sector or the non-financial sector) matters when studying the CG-SR nexus. Furthermore, the results can show if the role of CG mechanisms in the non-financial sector is different from the financial sector regarding disclosing sustainability information. Consequently, the regulators and policymakers can identify the effective means to enhance SR practices in both sectors. Theoretically, this paper contributes by applying the agency theory (Jensen and Meckling, 1976) and resource dependence theory (Pfeffer and Salancik, 1978) to explain the CG-SR nexus. The paper uses secondary data to test the above-mentioned theoretical perspectives. Thus, the results from this paper are likely to offer empirical support to these two theories, acknowledging the lacuna of using a single theory and offering support for applying multiple theoretical frameworks when studying several CG mechanisms. The methodological contribution of this paper is the use of an international sample from 50 countries, applying the GRI standards to construct a disclosure index (with 77 items in total; 13 for the economic dimension, 30 for the environmental dimension, and 34 for the social dimension), and investigating several disclosure mediums (i.e. annual reports and integrated reports, sustainability reports and other related sustainability reports, and websites). Also, the paper addresses the issue of endogeneity and performs additional robustness checks to confirm the empirical findings in the original models.

1.7 Thesis outline

The current thesis includes three self-contained papers represented in chapters two, three, and four, respectively, along with an introduction chapter (chapter one) as well as a conclusion chapter (chapter five) (see Figure 1.1). This section offers an overview of the content of these five chapters.

Chapter one has introduced the research background and has provided an overview of this thesis to give the reader an introduction to its main content. More specifically, this chapter has provided an overview and the rationale regarding studying the impact of CG mechanisms on SR. It has also presented the main objective and the methodology applied in this research. Also, it summarised the research objectives and questions, data and sample, the expected results, and the predicted contributions for the three conducted papers. Lastly, it describes the overall structure of this thesis.

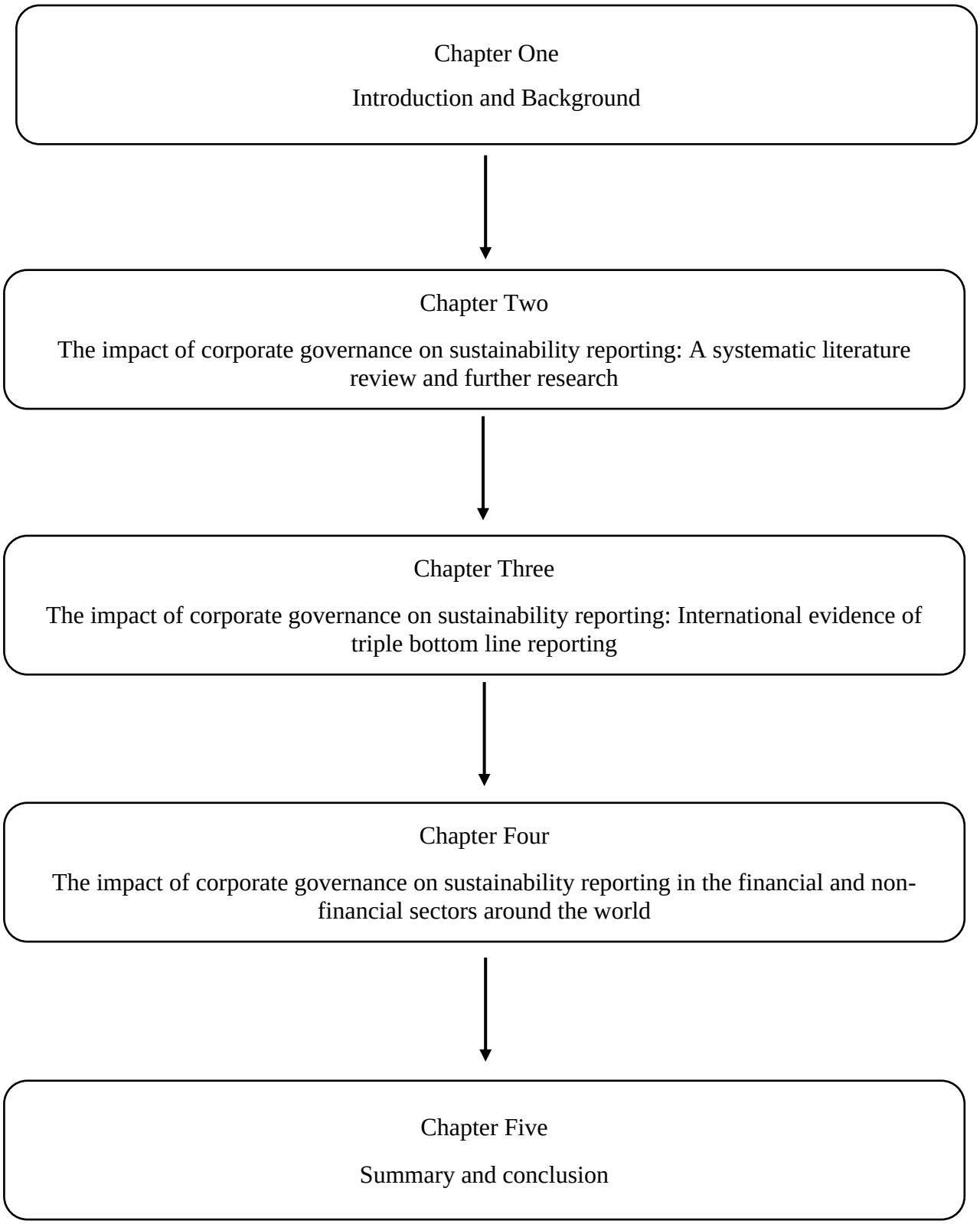
Chapter two is a systematic review paper. This chapter systematically reviews the empirical studies investigating the relationship between CG mechanisms and SR practices. This chapter also identifies the research gaps in the existing literature and offers future research opportunities and suggestions to enhance our understanding and knowledge of this given nexus.

Chapter three is the first empirical paper. This chapter demonstrates how companies with a specific bundle of board-level governance (i.e. board size, board independence, CEO duality, board gender diversity, and the existence of SC) affect total SR practices and each of its three dimensions (i.e. economic, environmental and social) in an international setting. Furthermore, this chapter examines whether, and to what extent, the influence of board characteristics on total SR practices depends on country development (i.e. developed and developing countries).

Chapter four is the second empirical paper. From a sector-based research perspective, this chapter provides international evidence on the impact of CG mechanisms, focusing on board variables (i.e. board size, board independence, CEO duality, board gender diversity, board age, board tenure, and the SC presence), on SR. More distinctively, this chapter investigates; first, whether the efficacy of CG mechanisms on SR practices depends on sampling decisions; second, whether CG mechanisms may affect SR practices differently in the financial and non-financial sectors.

Chapter five offers a summary and conclusion of the current thesis. This chapter summarises each of the three conducted studies. Moreover, the chapter sheds light on the possible implications and contributions of this thesis. It also identifies thesis limitations and offers suggestions and recommendations for future research to enhance our understanding and knowledge about this research area.

Figure 1.1: Thesis outline



Chapter 2: The impact of corporate governance on sustainability reporting: A systematic literature review and further research

Abstract

This paper reports on the results of a systematic literature review (SLR) of the impact of corporate governance (CG) mechanisms on sustainability reporting (SR). The sample for the SLR comprises 117 empirical articles published in 72 journals from 2000 to 2019. The main findings are as follows. First, very few studies investigate all three dimensions (economic, environmental and social) of SR. Second, and perhaps surprisingly, the majority of the studies are based on developing rather than developed countries. Third, most studies exclude the financial sector and focus on the quantity rather than the adoption or quality of SR. Fourth, the highest proportion of reviewed studies apply single rather than multiple theoretical frameworks, with agency theory being the dominant theoretical lens. Fifth, the results of the impact of board attributes frequently investigated (size, independence, gender diversity, and CEO duality) are conflicting. Thus, the paper suggests the need for further research on the impact of CG on all three dimensions of SR to determine whether the impact differs by dimension. In addition, examining different mediums other than annual reports (e.g., stand-alone reports and websites) is outlined as another possible area for future research. The paper also identifies the need for research into the effect of exclusion of the financial sector when investigating the influence of CG on SR. Comparative research on the efficacy of CG on SR in developed and developing countries is also identified as required. Finally, the paper recommends the need for more research on how other less researched CG attributes (board diversity, audit committee, and CEO characteristics) affect SR practices.

Keywords: Corporate governance; sustainability reporting; systematic literature review; further research.

2.1 Introduction

Sustainability reporting (SR) has gained growing importance (Lozano and Huisingh, 2011; Lozano, 2013; Dienes *et al.*, 2016) and nowadays is considered one of the most relevant topics in academia and business (Hahn and Kühnen, 2013; Calabrese *et al.*, 2016; Nobanee and Ellili, 2016). Especially after issuing the Sustainable Development Goals (SDGs) by the United Nation in 2015, which were adopted by 193 countries (United Nations, 2015). In this regard, corporate governance (CG) is a significant driver that can affect SR, where sustainability activities have climbed to the top priorities of the CG agenda (Hussain *et al.*, 2018). This is in part due two developments. First, increasing calls in the current literature to shift the traditional perspective of CG to include the non-financial interests of stakeholders (Elkington, 2006; Jain and Jamali, 2016). Second, the worldwide coverage that this nexus has received due to the social and environmental scandals and governance breaches of companies (Walls *et al.*, 2012; Liao *et al.*, 2021).[6] This, in turn, has raised ongoing issues on how companies are governed and which CG mechanisms impact SR. As a result, several studies have examined the impact of various CG mechanisms on different aspects of SR practices (e.g., Haniffa and Cooke, 2005; Khan *et al.*, 2013; Jizi, 2017; Muttakin *et al.*, 2018; Katmon *et al.*, 2019).

The purpose of this paper is to undertake a systematic literature review (SLR) of the impact of CG on SR. According to Khan *et al.* (2003), the explicit and comprehensive methodology is what differentiates a systematic review from a traditional one. Unlike SLR, the non-systematic literature review can result in unintended researcher bias, and frequently lacks thoroughness leading to misinterpretation or inaccuracy of the collected studies and their findings (Roberts *et al.*, 2006). Although Haddaway *et al.* (2015) suggest that sometimes non-systematic literature reviews are still helpful as they summarise evidence on a specific topic, they frequently fail to offer information about the way of selecting studies, reasons for applying inclusion and exclusion criteria, or the time of carrying out the review (Roberts *et al.*, 2006). Therefore, such reviews are not replicable, assessable or updatable as they may hide the researchers' subjective judgements, thus reducing readers' confidence and limiting the review's value in future use (Koricheva and Gurevitch, 2014).

[6] For example, Brent Spar's long saga in 1998, the Enron scandal in 2002, Nike shoes and child labour in Pakistan in 2002, the financial crisis in 2008, BP oil spill in 2010, Volkswagen emissions in 2015, and acid rain in Eastern Europe.

A systematic review addresses these problems through a rigorous approach that aims to mitigate bias, appraise the evidence, and increase objectivity, repeatability, transparency, and consistency (Haddaway *et al.*, 2015).[7]

Recently, several literature reviews have examined the determinants of SR. These reviews are either non-systematic (Belal and Momin, 2009; Fifka, 2013; Ali *et al.*, 2017) or systematic but not focusing on CG mechanisms (Hahn and Kühnen, 2013; Dienes *et al.*, 2016). For example, Belal and Momin (2009) undertake a non-systematic review of social reporting literature published in accounting journals in emerging economies using a three-category classification framework. The studies reviewed relate to the extent and the level of corporate social reporting and their determinants, managerial perceptions studies, and stakeholder perception studies. Fifka (2013) reviews empirical studies on social responsibility disclosures and their internal and external determinants on a geographical basis to determine whether they use different methodologies which account for conflicting results. Ali *et al.* (2017) use a classification framework of three groups (firm characteristics, internal contextual, and external contextual) to review the factors that drive corporate social responsibility (CSR) reporting and examine if there are significant differences between these determinants in developing and developed countries.

Among the studies that perform SLR is that of Hahn and Kühnen (2013) which reviews 178 articles from 1999 to 2011 to identify the factors that drive SR practices. Although they identify the impact of CG on SR as a critical research gap, they do not analyse the relevant studies.[8] Likewise, Dienes *et al.* (2016) systematically review the determinants of SR using a sample of 316 studies from 2000 to 2015; however, they only include studies that address all three SR dimensions . Still, CG issues are only a small part of their review. Unlike the two systematic reviews, this SLR focuses on the impact of CG mechanisms and their multiple levels on SR. Also, unlike Dienes *et al.* (2016), this SLR includes studies that address the economic, environmental, or social dimensions of SR or any combination thereof, and considers the different measures of SR (i.e. adoption, quantity, and quality). Although the reporting on all three dimensions is considered SR, one-dimensional

[7] For instance, systematic reviews are conducted using multiple databases to reduce the probability of missing relevant studies and defined inclusion and exclusion criteria to achieve objectivity (Haddaway *et al.*, 2015).
[8] Hahn and Kühnen (2013) only assess a few studies that examine the impact of ownership structure as their review distinguishes CG mechanisms from ownership structure.

and two-dimensional reporting remain existent (Hahn and Kühnen, 2013) and thus studies that examine one or two dimension(s) can arguably be included. Hence, this study conducts a comprehensive review of the extensive aspects of CG and SR to provide more – and new – evidence on this relationship.

To the best of the knowledge, there is no SLR on the impact of CG on SR. To bridge this research gap, and aiming at providing practical implications about this given nexus for firms, regulators, and the academic community, this study organises systematic research around the following question:

What is known about the impact of corporate governance on sustainability reporting and what further research is needed?

The SLR contributes to the extant literature in several ways. First, it offers, for the first time, a comprehensive and systematic overview of the current state of the relationship between CG and SR. Second, it contributes by assessing the literature in terms of the distribution of articles across many aspects, e.g., publication outlets, country, sector affiliation, sample size, dimensions and measurements of SR, types of mediums analysed, and theories used. Third, it reports on the multiple levels of CG variables used in the previous studies, namely group-level (board attributes and audit attributes), firm-level (ownership attributes), and individual-level (CEO attributes), and their measurements. Fourth, and drawing on these multi-level CG variables and their different measurements, it shows (in)consistent findings of their influence on the adoption, the quantity and (or) the quality of SR – i.e. economic, environmental, and (or) social dimension(s). Finally, it contributes to the literature by identifying areas for future research to enhance our understanding and knowledge of the CG and SR relationship.

This study is organised as follows. Section 2.2 provides the research method for systematic review. Section 2.3 carries out a descriptive analysis with regards to the distribution of articles across publication outcomes, country, sector affiliation, sample selection, the dimensions and measurements of SR practices, the reporting mediums, and applied theories. Section 2.4 sets out a detailed review of the measurements of the multiple levels of CG mechanisms and the impacts of

these variables on SR activities. Section 2.5 discusses the main results of this study. Finally, Section 2.6 discusses several significant gaps identified in previous empirical studies and offers useful suggestions for further research.

2.2 Research method: Systematic literature review

2.2.1 Methodology

According to Denyer and Tranfield (2009), SLR aims to locate the relevant literature, select the contributions, and analyse and synthesise the specific topic results. For this systematic review, five steps offered by Denyer and Tranfield (2009) were carried out:

1) Research question: In this step, the research question is determined (see Section 2.1).

2) Material collection: The second step is to collect the materials. In this regard, the selection of databases, search terms, and time frame is required (see Section 2.2.2).

3) Selection and evaluation: This step deals with the inclusion and exclusion criteria for selecting the relevant studies. This includes two reading stages, along with employing five sets of inclusion and exclusion criteria in this study (see Section 2.2.3).

4) Descriptive analysis and synthesis: Several aspects of the identified articles in the previous two steps are discussed for this step. This study recorded the bibliometric data of each article to describe how these articles are related. Then, these articles' content is evaluated using descriptive criteria such as distribution across publication outlets, investigated country, sample selection, dimensions, measurements, and mediums of SR practices, and the theoretical frameworks (see Section 2.3).

5) Results: In the final step, the results of the impact of CG variables on SR are discussed (see Section 2.4).

Also, this study discusses the main findings in this review (see Section 2.5). In addition, suggestions for further research are outlined (see Section 2.6).

2.2.2 Selection of databases, search terms, and time frame

In line with other SLRs, and to ensure access to an extensive range of journals to reduce the risk of excluding relevant studies, this study used two main databases of Google Scholar (GS) and Web of Science (WoS), along with three other databases which were ScienceDirect, SSRN, and EBSCO. According to Orduña-Malea *et al.* (2015), GS includes any document with a seemingly academic structure, which leads to potentially massive coverage of the scholarly literature. Also, the WoS, with more than 17,000 international journals in different research areas, is considered one of the most extensive databases (Dienes *et al.*, 2016).

The search drew on two sets of keywords related to multi-level CG variables and SR practices derived from previous literature reviews (e.g., Hahn and Kühnen, 2013; Dienes *et al.*, 2016; Velte, 2017; Velte, 2019), among others. The first set includes "corporate governance", or narrowed down by using specific terms "board composition", "board independence", "non-executive director", "board size", "CEO duality", "board diversity", "women on board", "gender diversity", "audit committee", "ownership structure", "ownership concentration", or "CEO characteristic". The second set includes "sustainability reporting", "Global Reporting Initiative reporting", "triple bottom line reporting", "corporate social responsibility reporting", "environmental reporting", "social reporting", "GRI reporting", "TBL reporting", or "CSR reporting". Moreover, the search used relevant terms such as "disclosure", "disclosures", "report", and "reports" instead of "reporting". This search combined these two sets of keywords using Boolean search (i.e. connector AND) and different wildcards, the aim being to cover the research area extensively.[9]

At the same time, this study defined a time frame to systemise the search over the last 20 years from 2000 to 2019. The starting year in this timespan was selected for several reasons. First, the

[9] For example, the combination of "corporate governance" and "sustainability reporting" will result in five search terms ("corporate governance" AND "sustainability reporting", "corporate governance" AND "sustainability report", "corporate governance" AND "sustainability reports", "corporate governance" AND "sustainability disclosure", "corporate governance" AND "sustainability disclosures").

Global Reporting Initiative (GRI), which is the main driver of SR (Hussain *et al.*, 2018), delivered its first SR guidelines in 2000. Second, this study chose the year 2000 in line with Dienes *et al.* (2016), intending to deliver a contemporary portrait of the research landscape showing the relationship between CG and SR. Third, the concept of sustainability increasingly appeared in the literature after 2000 (Khalid *et al.*, 2015). Finally, since the beginning of this century, the international community has been paying growing attention to sustainability.[10] The ending year is 2019 since this is the most recent year in which the search can be conducted.[11]

2.2.3 Applying practical screening criteria

The screening process in this study was based on two stages of reading in parallel with five sets of inclusion and exclusion criteria. The first stage of reading was restricted to the title, abstract, and keywords, while the second stage involved a more in-depth reading of each document. The inclusion and exclusion criteria are as follows.

First, like other SLRs (e.g., Hahn and Kühnen, 2013), this study is restricted to peer-reviewed articles in English-speaking journals. Thus, this study excludes working and conference papers, books, and graduate theses. This approach enhances transparency and replicability (Denyer and Tranfield, 2009) and provides a review with more homogeneity (Velte, 2019). This study also eliminates the duplicates that resulted from using multiple databases and excludes theoretical papers since this research aims to cover the empirical studies that examine the impact of CG mechanisms on SR practices.

Second, several literature reviews focus on a specific country (e.g., Indonesia`: Gunawan and SeTin, 2019), region (e.g., emerging markets`: Belal and Momin, 2009), or industry (e.g., mining industry`: Lodhia and Hess, 2014). Unlike these reviews, this research does not focus on a specific country, region or sector, as the objective is to cover a broad context of the relationship between CG mechanisms and SR practices.

[10] In 2000, for example, a Global Compact was released during the World Economic Summit to make companies worldwide voluntarily incorporate social responsibility into their activities.
[11] This study conducted its search in March 2020 to ensure that all the relevant studies published up to 2019 were captured.

Third, and to ensure inclusivity, this research takes broader perspectives by considering the impact of multi-level CG mechanisms and including studies covering the economic, environmental and (or) social dimension(s) of SR. However, consistent with Velte (2017), this research excludes studies that focus only on a sub-dimension of SR (e.g., greenhouse gas disclosure`: Chithambo and Tauringana, 2017). The reason for this is that including such studies in a single SLR risks misinterpretation of the findings.

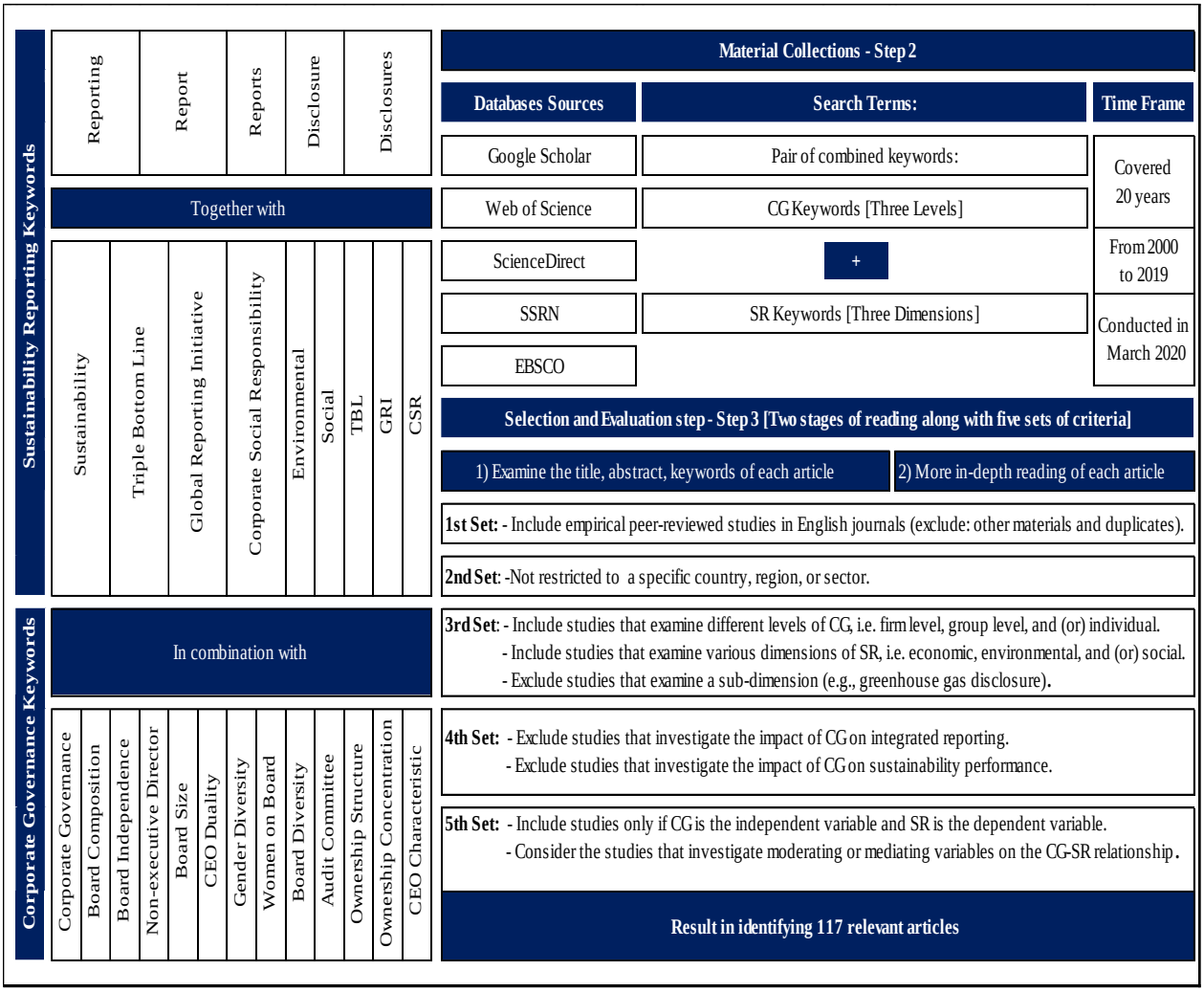
Fourth, due to its different concepts, and in line with Dienes *et al.* (2016), this research excludes the articles that deal with Integrated Reporting (IR). According to Dienes *et al.* (2016), IR represents an integrated-thinking tool rather than only a reporting instrument, and its purpose is much more extensive compared to the SR. Further, as this study focuses on reporting practices, it eliminates the articles that examine sustainability performance since the sustainability performance and reporting should not be considered the same concepts (Katmon *et al.*, 2019).

Finally, and in terms of variables, this review excludes studies that examine an inverse relationship between CG and SR (e.g., Saleh, Zulkifli and Muhamad, 2010). However, this study does not exclude the articles that examine the effect of mediating variables (e.g., Mallin, Michelon and Raggi, 2013; Musallam, 2018) or moderating variables (e.g., Ganesan *et al.*, 2017; Muttakin *et al.*, 2018) on the CG-SR nexus.[12]

By performing a detailed and structured research process by providing a systematic description of how the databases, search terms, timespan were selected and how screening criteria were performed, this study ensures transparency, inclusivity and objectivity (Denyer and Tranfield, 2009). As a result, 117 studies were identified for inclusion in the following systematic review. Figure 2.1 summarises step 2 (i.e. material collection process) and step 3 (i.e. selection and evaluation process).

[12] Following Dienes *et al.* (2016) and Hahn and Kühnen (2013), this systematic review does not report on the influence of the moderating variables or mediating variables on the CG-SR nexus since the focus in this study is on the direct relationship.

Figure 2.1: The material collection process and screening criteria



2.3 Descriptive analysis

This section discusses and describes the data obtained from the articles, where the expository power of descriptive evidence can lead to a new and useful structure of information on the previous literature by gathering the data of each study and reorganising them. Thus, the illustrative synthesising in this research could be considered as re-interpretation and conceptual innovation rather than only a description of the information in the relevant studies (Campbell, Craven and Shrives, 2003).

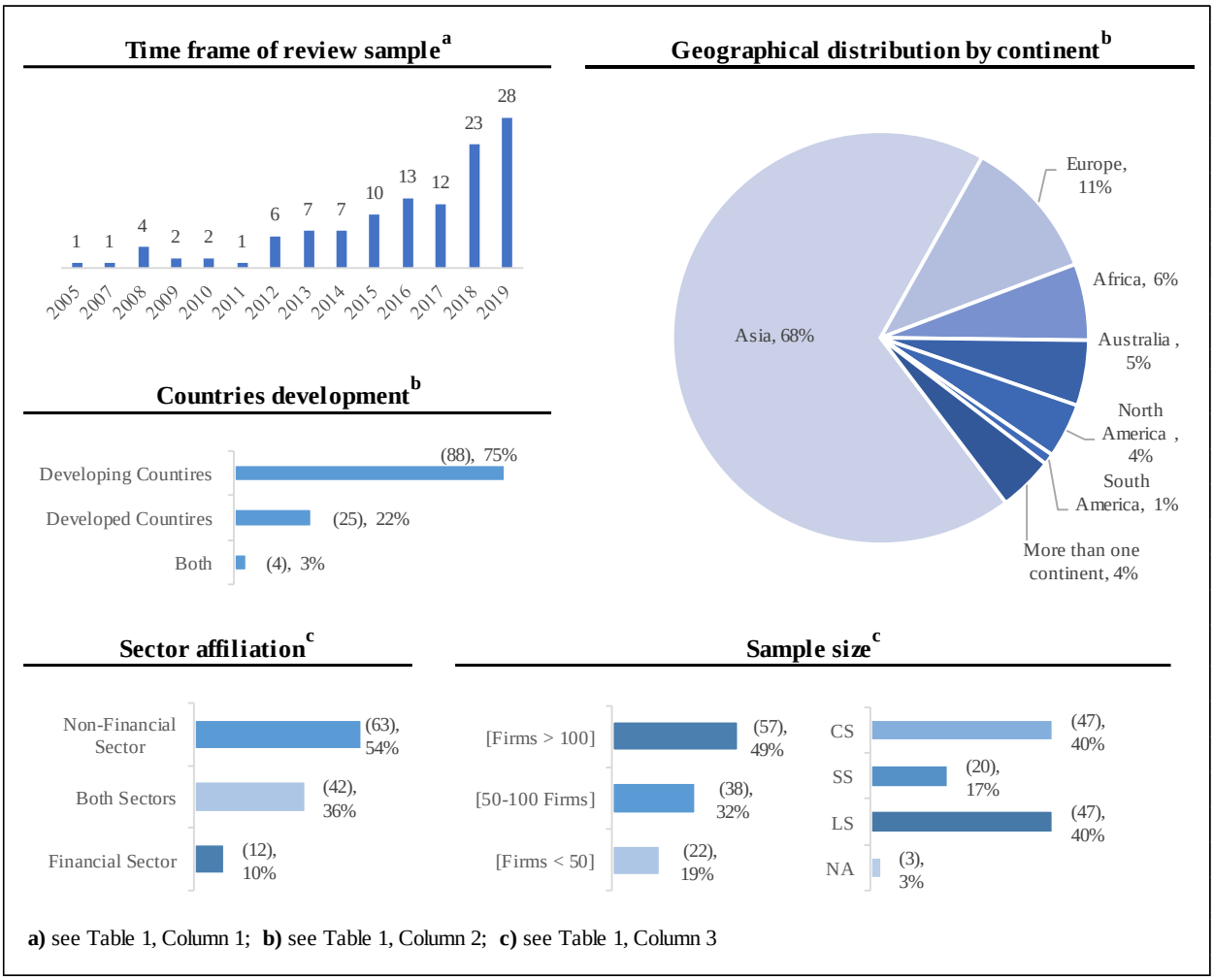
The articles included in this systematic review were published in 72 academic journals (see Appendix A). Only five journals published five articles or more: Corporate Governance: The International Journal of Business in Society (9 articles), Journal of Business Ethics (7 articles), Social Responsibility Journal (7 articles), Corporate Social Responsibility and Environmental Management (5 articles), and Sustainability (5 articles). These journals published 33 articles, accounting for about 28% of the 117 sampled articles. Furthermore, The Australasian Accounting Business and Finance Journal and Business Strategy and the Environment published three articles each. In addition, 13 different journals publish two articles each, in total, 26 articles (~ 22% of the sample), while the remaining articles are distributed over 52 academic journals (~ 44% of the sample).

2.3.1 Distribution across the period, country, sector affiliation, and sample size

The distributions across publication time, investigated country, sector affiliation, and sample size are illustrated in Figure 2.2 (see Table 2.1). Regarding the reviewed period (2000–2019), the first study was published in 2005 (Haniffa and Cooke, 2005) although the starting year of the research was 2000. Until 2011, the number of articles published in any year is lower than five. Then, a slight increase is noted in the number of publications from 2012 to 2017, followed by a sharp increase in 2018. In the last two years (i.e. 2018 and 2019), the number of publications is 51 articles (~ 44% of the sample).

Concerning country development, most studies (88 articles, ~75% of the sample) examine developing countries, while 25 studies (~22% of the sample) investigate developed countries and four studies (~3% of the sample) examine a sample that includes both developed and developing countries. In the same vein, and for the geographical distribution by continent, Asia contributes far more than other continents with 80 articles (~68% of the sample), followed by Europe (13 articles), Africa (seven articles), and Australia (six articles). In the Americas, five studies cover North America (namely in the US), and one study comes from South America (namely Brazil). Further, five articles address more than one continent.

Figure 2.2: Distribution across time, country, sector affiliation, and sample size



a) see Table 1, Column 1; **b)** see Table 1, Column 2; **c)** see Table 1, Column 3

In term of sector affiliation, most of the previous studies (63, ~ 54% of the sample) examine the non-financial sector. In comparison, only 12 studies (~ 10% of the sample) investigate the financial sector, and 42 studies (~ 36% of the sample) examine both sectors together. Regarding the sample size, 57 studies investigate over 100 firms, 22 studies examine fewer than 50 firms, and 38 studies examine (50-100) firms. In the same regard, the cross-sectional (CS) and short-observation studies (SS) that examine three years or less count for about 57% of the sample compared to 40% for longitudinal studies (LS).[13]

[13] The information for three studies (~3%) in this regard is not available (i.e. Barako and Brown, 2008; Prado-Lorenzo, Gallego-Alvarez and Garcia-Sanchez, 2009; Fernandes, Bornia and Nakamura, 2019)

Table 2.1: Review of studies that examine the impact of CG on SR

No	Study (1)	Country (2)	Sample selection (3)	Dimension-Measure (4)	Medium (*) (5)
1	Haniffa and Cooke (2005)	Malaysia	139 non-financial firms (1996 and 2002)	DBL - Qn	AR
2	Ghazali (2007)	Malaysia	87 non-financial firms (2001)	DBL - Qn	AR
3	Barako and Brown (2008)	Kenya	40 banks	DBL - Qn	AR
4	Buniamin *et al.* (2008)	Malaysia	243 non-financial firms (2005)	Adoption	AR
5	Kent and Monem (2008)	Australia (ed)	72 firms (2003)	Adoption	-
6	Lim *et al.* (2008)	Malaysia	743 non-financial firms (2003)	DBL - Qn	AR
7	Prado-Lorenzo *et al.* (2009)	Spain (ed)	99 non-financial firms	Adoption	-
8	Said *et al.* (2009)	Malaysia	150 non-financial firms (2006)	DBL - Qn	AR, Web
9	Khan (2010)	Bangladesh	30 banks (2007/2008)	DBL - Qn	AR
10	Siregar and Bachtiar (2010)	Indonesia	87 firms (2003)	DBL - Qn	AR
11	Rouf (2011)	Bangladesh	93 non-financial firms (2007)	DBL - Qn	AR
12	Esa and Ghazali (2012)	Malaysia	27 government-linked companies (2005 and 2007)	DBL - Qn	AR
13	Haji (2012)	Malaysia	76 firms (2006 and 2009)	DBL - Qn & Ql	AR
14	Herda, Taylor and Winterbotham (2012)	US (ed)	500 firms (2008-2009)	Adoption	-
15	Michelon and Parbonetti (2012)	US and European countries (ed)	114 non-financial firms (2003)	TBL - Qn	AR, SRt

No	Study (1)	Country (2)	Sample selection (3)	Dimension-Measure (4)	Medium (*) (5)
16	Rao, Tilt and Lester (2012)	Australia (ed)	96 firms (2008)	Env - Qn	AR
17	Rupley, Brown and Marshall (2012)	US (ed)	127 non-financial firms (2000, 2003, 2005)	Env - Ql	SRt, AR, 10-k
18	Ali and Atan (2013)	Malaysia and Global firms (x)	120 non-financial firms (2009)	DBL - Qn	AR
19	Haji (2013)	Malaysia	85 non-financial firms (2006 and 2009)	DBL- Qn & Ql	AR
20	Khan *et al.* (2013)	Bangladesh	116 manufacturing firms (2005-2009)	DBL - Qn	AR
21	Mallin *et al.* (2013)	US (ed)	135 firms (2005-2007)	DBL - Qn & Ql	SRt
22	Raman and Bukair (2013)	GCC	53 Islamic banks (2008)	DBL - Qn	AR
23	Sufian and Zahan (2013)	Bangladesh	70 non-financial firms (2010)	DBL - Qn	AR
24	Uwuigbe and Ajibolade (2013)	Nigeria	40 firms (2006-2010)	DBL - Qn	AR
25	Amran *et al.* (2014)	12 countries (x)	113 firms (2010)	Adoption	SRt
26	Chan *et al.* (2014)	Australia (ed)	222 firms (2004)	DBL - Qn	AR
27	Handajani *et al.* (2014)	Indonesia	152 non-financial firms (2010-2012)	TBL - Qn	AR, SRt
28	Janggu *et al.* (2014)	Malaysia	100 firms (2010)	TBL - Qn & Ql	AR
29	Jizi *et al.* (2014)	US (ed)	107 banks (2009-2011)	DBL - Ql	AR
30	Shamil *et al.* (2014)	Sri Lanka	148 firms (2012)	Adoption	-
31	Sharif and Rashid (2014)	Pakistan	22 commercial banks (2005-2010)	DBL - Qn	AR

No	Study (1)	Country (2)	Sample selection (3)	Dimension-Measure (4)	Medium (*) (5)
32	Barakat *et al.* (2015)	Jordan and Palestine	101 firms (2011)	DBL - Qn	AR, Web
33	Benomran *et al.* (2015)	Libya	42 firms (2006-2012)	DBL - Qn	AR
34	Bukair and Rahman (2015)	GCC	53 Islamic bank (2008)	DBL - Qn	AR
35	Kiliç *et al.* (2015)	Turkey	25 banks (2008-2012)	DBL - Qn	AR, SRt
36	Majeed, Aziz and Saleem (2015)	Pakistan	100 firms (2007-2011)	DBL - Qn	AR
37	Muttakin and Subramaniam (2015)	India	100 firms (2007-2011)	DBL - Qn	AR
38	Muttakin, Khan and Subramaniam (2015)	Bangladesh	116 non-financial firms (2005-2009)	DBL - Qn	AR
39	Supriyono *et al.* (2015)	Indonesia, Malaysia, Thailand	181 firms (2009)	Soc - Qn	AR
40	Suttipun and Saelee (2015)	Thailand	72 firms (2011-2013)	TBL - Qn	AR
41	Yusoff, Darus and Rahman (2015)	Malaysia	100 firms (2009-2011)	Env - Ql	AR
42	Akbas (2016)	Turkey	62 non-financial firms (2011)	Env - Qn	AR
43	Akrout and Othman (2016)	10 countries in MENA	143 polluting firms (2010-2012)	Env - Ql	AR
44	Alotaibi and Hussainey (2016)	Saudi Arabia	171 non-financial firms (2013-14)	DBL - Qn & Ql	AR
45	Al-Shaer and Zaman (2016)	UK (ed)	333 firms (2012)	Adoption	-
46	Dienes and Velte (2016)	Germany (ed)	34 firms (2011)	DBL - Qn	AR
47	Esa and Zahari (2016)	Malaysia	87 non-financial firms (2011)	DBL - Qn	AR

No	Study (1)	Country (2)	Sample selection (3)	Dimension-Measure (4)	Medium (*) (5)
48	Habbash (2016)	Saudi Arabia	267 non-financial firms (2007-2011)	DBL - Qn	AR
49	Ibrahim and Hanefah (2016)	Jordan	117 firms (2007-2011 [without 2009])	DBL - Qn	AR
50	Lone *et al.* (2016)	Pakistan	50 firms (2010-2014)	DBL - Qn	AR, SRt
51	Rao and Tilt (2016b)	Australia (ed)	115 firms (2009-2011)	DBL - Qn	AR
52	Sundarasen *et al.* (2016)	Malaysia	450 non-financial firms (2011-2012)	DBL - Qn	AR
53	Trireksani and Djajadikerta (2016)	Indonesia	38 mining firms (2012)	Adoption	AR
54	Zulkiflee (2016)	Malaysia	74 non-financial firms (2010)	DBL - Qn	AR
55	Appuhami and Tashakor (2017)	Australia (ed)	300 non-financial firms (July 2012 - June 2013)	DBL - Qn	AR
56	Dias *et al.* (2017)	Portugal (ed)	48 firms (2011)	TBL - Qn	AR, SRt, Web
57	Ezhilarasi and Kabra (2017)	India	177 polluting firms (2010-2015)	Env - Ql	AR
58	Ganesan *et al.* (2017)	Malaysia	120 manufacturing firms (2015)	DBL - Qn	AR
59	Helfaya and Moussa (2017)	UK (ed)	94 firms (2010)	Env - Qn & Ql	AR, SRt
60	Jizi (2017)	UK (ed)	350 firms (2007-2012)	DBL - Qn	Bloomberg
61	Mahmood and Orazalin (2017)	Kazakhstan	30 oil, gas, and mining sector (2010-2013)	TBL - Qn	SRt
62	Naseem *et al.* (2017)	Pakistan	179 firms (2009-2015)	Adoption	-
63	Prabowo *et al.* (2017a)	Indonesia	86 banks (2009-2014)	DBL - Qn	AR

No	Study (1)	Country (2)	Sample selection (3)	Dimension-Measure (4)	Medium (*) (5)
64	Prabowo *et al.* (2017b)	Indonesia	88 banks (2009-2015)	DBL - Qn	AR, SRt
65	Roy and Ghosh (2017)	India	84 non-financial firms (2008-2012)	Env - Ql	AR, SRt
66	Sadou, Alom and Laluddin (2017)	Malaysia	71 non-financial firms (2011 and 2014)	DBL - Qn & Ql	AR
67	Abd Rahman and Ismail (2018)	Malaysia	300 non-financial firms (2013)	DBL - Ql	AR
68	Adnan *et al.* (2018)	China, Malaysia, India, UK (x)	203 non-financial firms (one year)	TBL - Qn & Ql	AR, SRt, Web
69	Bae *et al.* (2018)	Bangladesh, India, Pakistan	88 firms (2009-2016)	TBL - Qn	SRt
70	Cabeza-García *et al.* (2018)	Spain (ed)	104 non-financial firms (2009-2013)	Adoption	-
71	Coffie, Aboagye-Otchere and Musah (2018)	Ghana	33 firms (2008-2013)	DBL - Qn & Ql	AR
72	Fernández-Gago, Cabeza-García and Nieto (2018)	Spain (ed)	83 non-financial firms (2009-2014)	Adoption	-
73	Hoang *et al.* (2018)	Vietnam	133 non-financial firms (2010)	Soc -Qn & Ql	AR
74	Hu and Loh (2018)	Singapore	462 firms (2015)	TBL - Adoption & Ql	External scores
75	Hu *et al.* (2018)	China	1,839 non-financial firms (2010)	Adoption	-
76	Mahmood *et al.* (2018)	Pakistan	85 firms (2012-2015)	TBL - Qn	AR, SRt
77	Masud, Nurunnabi and Bae (2018)	Bangladesh, India, Pakistan	88 firms (2009-2016)	Env - Qn	SRt
78	Mohd-Said *et al.* (2018)	Malaysia	150 firms (2012)	DBL - Qn	AR
79	Mudiyanselage (2018)	Sri Lanka	100 firms (2012-2016)	Adoption	-

No	Study (1)	Country (2)	Sample selection (3)	Dimension-Measure (4)	Medium (*) (5)
80	Musallam (2018)	Palestine	31 non-financial firms (2010-2016)	DBL - Qn	AR, Web
81	Muttakin *et al.* (2018)	Bangladesh	155 non-financial firms (2005-2013)	DBL - Qn	AR
82	Odoemelam and Okafor (2018)	Nigeria	86 non-financial firms (2015)	Env - Qn	AR
83	Ofoegbu, Odoemelam and Okafor (2018)	South Africa and Nigeria	303 firms (2015)	Env - Qn	AR
84	Ong and Djajadikerta (2018)	Australia (ed)	133 resource industry firms (30-06-2012)	TBL - Qn	AR, SRt
85	Pucheta-Martínez and Chiva-Ortells (2018)	Spain (ed)	864 observations non-financial firms (2007-2014)	TBL - Adoption & Qn	SRt
86	Pucheta-Martínez and López-Zamora (2018a)	Spain (ed)	1,018 observations non-financial firms (2004-2013)	DBL - Qn	SRt
87	Pucheta-Martínez and López-Zamora (2018b)	Spain (ed)	1,092 observations non-financial firms (2004-2013)	Env - Adoption & Qn	SRt
88	Shahab and Ye (2018)	China	1116 non-financial firms (2008-2015)	DBL - Ql	SRt
89	Suhardjanto *et al.* (2018)	Indonesia,Malaysia, Thailand	38 hospitality firms (2012-2014)	Soc - Qn	AR
90	Adel *et al.* (2019)	16 European countries (ed)	336 firms (one year)	TBL - Ql	AR, SRt, Web
91	Al Fadli *et al.* (2019)	Jordan	80 non-financial firms (2006-2015)	DBL - Qn	AR
92	Alazzani, Wan-Hussin and Jones (2019)	Malaysia	133 firms (2009)	DBL - Qn	AR
93	Aliyu (2019)	Nigeria	24 non-financial firms (2011-2015)	Env - Ql	AR
94	Alshbili, Elamer and Beddewela (2019)	Libya	28 oil and gas firms (2009-2013 [without 2011])	DBL - Qn	AR
95	Ashfaq and Rui (2019)	Pakistan	120 firms (2013-2015)	DBL - Qn	AR

No	Study (1)	Country (2)	Sample selection (3)	Dimension-Measure (4)	Medium (*) (5)
96	Bakar, Ghazali and Ahmad (2019)	Malaysia	98 firms (2016)	TBL - Qn & Ql	AR
97	Biswas, Roberts and Whiting (2019)	Bangladesh	2,637 observations non-financial firms (1996-2011)	DBL - Qn	AR
98	Dizar, Alifia and Alvionita (2019)	Indonesia	51 manufacturing firms (2015-2017)	TBL - Qn	SRt
99	Fallah and Mojarrad (2019)	Iran	64 non-financial firms (2014-2015)	DBL - Qn	AR, Web
100	Fernandes *et al.* (2019)	Brazil	152 non-financial firms	Env - Qn	SRt, Web
101	Ganesan, Poongan and Haron (2019)	Malaysia	120 property and construction firms (2016)	DBL - Qn	AR
102	Giannarakis, Andronikidis and Sariannidis (2019)	US (ed)	278 firms (one year)	Env - Qn	Bloomberg
103	Gulzar *et al.* (2019)	China	Non-financial firms (2008-2015)	DBL - Qn	SRt
104	Issa and Fang (2019)	GCC	244 non-financial firms (2012-2014)	DBL - Qn	AR, SRt, Web
105	Iwiyisi Inua and Anita Emeni (2019)	Nigeria	35 firms (2016)	Adoption	AR
106	Katmon *et al.* (2019)	Malaysia	200 non-financial firms (2009-2013)	DBL - Ql	AR
107	Kengatharan and Sivakaran (2019)	Sri Lanka	20 financial firms (2013-2017)	TBL - Qn	AR
108	Khan, Khan and Saeed (2019a)	Pakistan	86 non-financial firms (2010-2017)	DBL - Ql	AR, SRt
109	Khan, Khan and Senturk (2019b)	Pakistan	57 firms (2010-2017)	DBL - Ql	SRt
110	Orazalin (2019)	Kazakhstan	38 banks (2010-2016)	DBL - Qn	AR
111	Pareek, Pandey and Sahu (2019)	India	38 non-financial firms (2013-2017)	Env - Ql	SRt

No	Study (1)	Country (2)	Sample selection (3)	Dimension-Measure (4)	Medium (*) (5)
112	Pucheta-Martínez, Bel-Oms and Olcina-Sempere (2019)	Spain (ed)	152 non-financial firms (2004-2014)	Adoption	-
113	Pucheta-Martínez and Gallego-Álvarez (2019)	39 Countries (x)	13,178 observations from non-financial firms (2004-2015)	DBL - Qn	Thomson Reuters Eikon
114	Abu Qa'dan and Suwaidan (2019)	Jordan	51 manufacturing firms (2013-2015)	DBL - Qn	AR
115	Ullah, Muttakin and Khan (2019)	Bangladesh	46 insurance firms (2008-2014)	DBL - Qn	AR
116	Zaid, Wang and Abuhijleh (2019)	Palestine	33 non-financial firms (2013-2016)	DBL - Qn	AR
117	Zhou (2019)	China	1,779 manufacturing firms (2010-2016)	Adoption	-

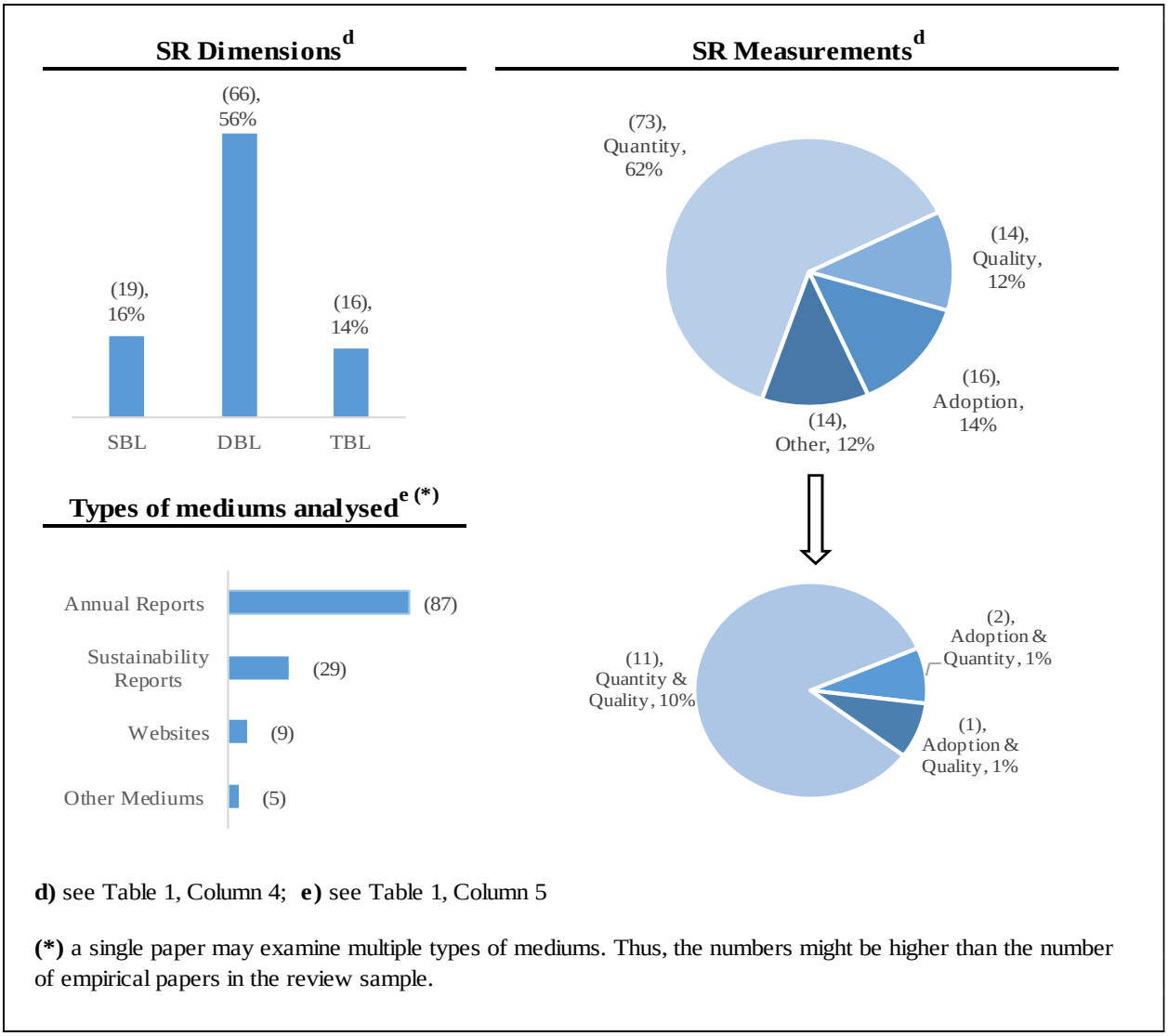
Notes: **In column 2: ed:** Developed countries, **x:** Both developed and developing countries. The classification of countries into "developed" and "developing" countries is based on the World Economic Situation and Prospects Report (2020). Available at: https://www.un.org/development/desa/dpad/wpcontent/uploads/sites/45/publication/WESP2020_FullReport_web.pdf **GCC:** Gulf Cooperation Council. **In Column 4: TBL:** Three dimensions (economic, environmental, and social). **DBL:** Two dimensions (environmental and social). **Env:** Environmental dimension. **Soc:** Social dimension. **Qn:** Quantity of reporting. **Ql:** Quality of reporting. **In Column 5: AR:** Annual Reports. **SRt:** Sustainability Reports (or other related-sustainability reports). **Web:** Websites.
(*): Whenever it possible, the medium for the studies that examine the adoption of disclosing sustainability-related information is reported.

2.3.2 Distribution across sustainability reporting dimensions, measurements, and mediums

Figure 2.3 shows the distribution according to dimensions and measurements of SR, and the types of examined mediums (see Table 2.1). In terms of SR dimensions, 16 studies do not investigate the level of disclosures and what type of information is disclosed. Thus, they may not be categorised according to the pillars of SR (i.e. economic, environmental, and social). On the other hand, 101 articles can be categorised under the three aspects of SR. However, no article examines economic dimension alone according to GRI guidelines or investigates it along with social or environmental dimensions. These categories are (i) single bottom line aspect (SBL, i.e. investigating environmental or social issues), (ii) double bottom line aspect (DBL, i.e. examining both the environmental and social issues), and (iii) triple bottom line aspect (TBL, i.e. integrating

economic, environmental, and social issues). Again, for comparability and consistency, this review classifies the prior studies under these categories only if they examine the level or the quality for all information disclosed. Most studies (66 studies) address issues related to integrating the social and environmental aspects, 19 studies fall in the SBL category (i.e. three studies deal with social issues and 16 studies with environmental issues), while only 16 studies investigate TBL aspects.[14]

Figure 2.3: Distribution across the dimensions and measurements of SR, and types of mediums analysed



d) see Table 1, Column 4; **e)** see Table 1, Column 5

(*) a single paper may examine multiple types of mediums. Thus, the numbers might be higher than the number of empirical papers in the review sample.

[14] Few studies may (un)intentionally address some item(s) that may be related to the economic dimension. However, they heavily focus on social and environmental dimensions rather than the three dimensions. Therefore, and following Hahn and Kühnen (2013), this SLR classifies them under the DBL category.

Regarding the SR measurements, previous studies use three main approaches (i.e. adoption, quantity and quality). Studies on the adoption of SR in this review mainly refer to whether (i) the firm issues a stand-alone report or not, (ii) the firm reports sustainability-related decision, and (iii) the reporting activities on sustainability information are in accordance with certain criteria. The commonality of these studies is that they examine neither the level (volume) nor the quality of the information itself. [15] For SR quantity, this measurement generally deals with the amount or volume of reporting. On the other hand, the quality measurement addresses the provision of information that ranges from descriptive data to the monetary and quantifiable disclosures. The majority of studies (73, ~ 62% of the sample) examine the SR quantity, while the minority investigate the SR quality (14, ~12%) and the SR adoption (16, ~14%). In addition, 11 studies focus on both quantity and quality of SR practices, two studies on the adoption and quantity, and one study on the adoption and quality. In terms of disclosure communication channels, the most widely investigated medium is annual reports (87 times), followed by sustainability or sustainability-related reports (29 times), and websites (nine times). Other mediums (e.g., Bloomberg's disclosure score) are used five times.

2.3.3 Theories applied and their usage frequency

According to Weick (1989), theories help in understanding the world and making sense of its complexities based on explanations and forecasts. Therefore, using a theoretical framework provides fundamental concepts and guide researchers to pose critical questions. Moreover, Neuman (2014) states that articles with theoretical frameworks often carry out high-quality research. Thus, studies that specify their theories and discuss their underlying assumptions usually provide more consistent and transparent views, thereby leading to more reliability and less bias. In this regard, considering a study with a theoretical framework in this review is based on whether the study explicitly refers to a theory to explain (i) the motivation behind SR activities and (or) (ii) the impact of CG mechanisms on SR practices. Table 2.2 summarises the theories used, their usage frequency, and the studies which used these theories.

[15] For example, Prado-Lorenzo *et al.* (2009) use five dummy variables to examine whether reporting practices are in line with specific criteria. Still, they examine neither the amount nor the quality of the information itself. Therefore, it is considered under the adoption category.

Table 2.2: Theories applied and their usage frequency

Theories - Single/Multiple - (No of studies)	CG-SR studies
One Theory (51 studies)	
Agency Theory (21)	e.g., Said *et al.* (2009); Jizi *et al.* (2014); Yusoff *et al.* (2015); Jizi (2017); Musallam (2018); Aliyu (2019); Giannarakis *et al.* (2019); Zaid *et al.* (2019)
Legitimacy Theory (12)	e.g., Haniffa and Cooke (2005); Kent and Monem (2008); Khan (2010); Khan *et al.* (2013); Bukair and Rahman (2015); Coffie *et al.* (2018); Ullah *et al.* (2019)
Stakeholder Theory (6)	Barako and Brown (2008); Prado-Lorenzo *et al.* (2009); Michelon and Parbonetti (2012); Suttipun and Saelee (2015); Dias *et al.* (2017); Issa and Fang (2019)
Resource Dependence Theory (3)	Handajani *et al.* (2014); Ibrahim and Hanefah (2016); Bakar *et al.* (2019)
Resource-Based View Theory (3)	Katmon *et al.* (2019); Khan *et al.* (2019a); Khan *et al.* (2019b)
Neo-institutional Theory (2)	Shahab and Ye (2018); Alshbili *et al.* (2019)
Signalling Theory (1)	Muttakin *et al.* (2015)
Socioemotional Wealth Theory (1)	Biswas *et al.* (2019)
Stakeholder Silence Theory (1)	Hu *et al.* (2018)
Upper Echelons Theory (1)	Alazzani *et al.* (2019)
Two Theories (31 studies)	
Legitimacy and Stakeholder Theory (6)	Buniamin *et al.* (2008); Chan *et al.* (2014); Ofoegbu *et al.* (2018); Pucheta-Martínez and López-Zamora (2018b); Ashfaq and Rui (2019); Kengatharan and Sivakaran (2019)
Agency and Legitimacy Theory (5)	Rupley *et al.* (2012); Shamil *et al.* (2014); Ezhilarasi and Kabra (2017); Naseem *et al.* (2017); Sadou *et al.* (2017)
Agency and Resource Dependence Theory (4)	Mallin *et al.* (2013); Mudiyanselage (2018); Hoang *et al.* (2018); Muttakin *et al.* (2018)
Agency and Stakeholder Theory (3)	Pucheta-Martínez and López-Zamora (2018a); Adel *et al.* (2019); Pucheta-Martínez and Gallego-Álvarez (2019)
Legitimacy and Political Cost Theory (2)	Ghazali (2007); Majeed *et al.* (2015)
Stakeholder and Resource Dependence Theory (2)	Rao and Tilt (2016b); Mahmood and Orazalin (2017)

Agency and Accountability Theory (1)	Mohd-Said *et al.* (2018)
Agency and Institutional Theory (1)	Muttakin and Subramaniam (2015)
Agency and Signalling Theory (1)	Bae *et al.* (2018)
Agency and Social Identity Theory (1)	Pucheta-Martínez *et al.* (2019)
Agency and Stewardship Theory (1)	Sharif and Rashid (2014)
Cultural and Transformational Leadership Theory (1)	Abd Rahman and Ismail (2018)
Gender Socialisation and Social Leadership Theory (1)	Prabowo *et al.* (2017b)
Legitimacy and Institutional Theory (1)	Barakat *et al.* (2015)
Legitimacy and Resource-Based View Theory (1)	Amran *et al.* (2014)
Three Theories (6 studies)	
Legitimacy, Stakeholder, and Resource Dependence Theory (3)	Helfaya and Moussa (2017); Iwiyisi Inua and Anita Emeni (2019); Orazalin (2019)
Agency, Legitimacy, and Stakeholder Theory (1)	Ofoegbu *et al.* (2018)
Agency, Resource Dependence, and Critical Mass Theory (1)	Cabeza-García *et al.* (2018)
Agency, Stakeholder, and Stewardship Theory (1)	Gulzar *et al.* (2019)
Four Theories (2 studies)	
Agency, Legitimacy, Stakeholder, and Resource Dependence Theory (1)	Fernández-Gago *et al.* (2018)
Agency, Legitimacy, Stakeholder, and Signalling Theory (1)	Alotaibi and Hussainey (2016)
Five Theories (2 studies)	
Agency, Legitimacy, Stakeholder, Resource Dependence and Political Cost Theory (1)	Masud *et al.* (2018)
Agency, Stakeholder, Resource Dependence, Stewardship, and Stakeholder Power Theory (1)	Pucheta-Martínez and Chiva-Ortells (2018)
No Explicit Theory (25 studies)	e.g., Esa and Ghazali (2012); Raman and Bukair (2013); Al-Shaer and Zaman (2016); Appuhami and Tashakor (2017); Pareek *et al.* (2019)

Of 117 studies, 51 studies apply a single theory, while 41 studies use a combination of theories (two theories are applied in 31 studies, three theories in six studies, four theories in two studies, and five theories in two studies). On the other hand, 25 studies in this systematic review do not apply explicitly a theoretical framework. In total, 21 different theoretical perspectives are explicitly employed. Agency theory is the most common theoretical perspective applied in the reviewed studies (used 45 times), and the second most common is legitimacy theory (used 34 times), followed by stakeholder theory (used 26 times) and resource dependence theory (used 16 times).

Other theories are applied fewer than 10 times; namely, four times for the resource-based view theory, three times each for political cost theory, signalling theory, and stewardship theory, and two times each for institutional theory and neo-institutional theory. Moreover, several studies are employed once: these are accountability theory, critical mass theory, cultural theory, gender socialisation theory, social identity theory, social leadership theory, socioemotional wealth theory, stakeholder power theory, stakeholder salience theory, transformational leadership theory, and upper echelons theory.

2.4 Findings on corporate governance and sustainability reporting

The comprehensive nature of the study means that no CG variable is excluded even if it has only appeared once in the previous studies. Still, and following Dienes *et al.* (2016), this study does not include the control variables. This section presents the results of the impact of multi-level CG mechanisms – namely, group-level (i.e. board attributes and audit attributes), firm-level (i.e. ownership attributes), and individual-level (i.e. CEO attributes) mechanisms – and their measurements on SR. [16] The studies that examine the impact of CG on SR in special circumstances are presented separately. Table 2.3 presents the results of all CG variables investigated sample on SR. Also, all these variables are summarised in Table 2.4 in terms of the number of studies that

[16] Sustainability and CSR could be considered harmonious concepts, even regarding the reporting requirements, due to this convergence (Hahn and Kühnen, 2013; Dienes *et al.*, 2016). Henceforward, the study, for consistency purpose, will use the abbreviation "SR" to express the practices of reporting sustainability information, even if the preliminary study does not examine the effect of CG on all dimensions of sustainability disclosures because the review assumes that these disclosures are part of sustainability issues.

address these variables, the number of proxies used to measure them, and their impact on SR activities.

2.4.1 Board attributes

Board independence

Independent directors, according to the agency theory, can play a vital role during board decision-making, and lead to more effective monitoring of the board's practices and behaviours (Fama and Jensen, 1983). In terms of the relationship between board independence and SR, this variable is the most investigated CG variable in the prior literature, as it has been included in 80 studies. This variable is assessed in the literature in six ways, where the majority of previous studies assess it as the percentage of independent (non-executive) directors to the total board members (e.g., Haniffa and Cooke, 2005; Said *et al.*, 2009; Kiliç *et al.*, 2015; Jizi, 2017). Using this proxy, several studies find a significant and positive impact (e.g., Khan, 2010; Ullah *et al.*, 2019), a significant but negative influence (e.g., Esa and Ghazali, 2012; Pucheta-Martínez and Gallego-Álvarez, 2019), while other studies such as Barakat *et al.* (2015) and Orazalin (2019) show no significant association.

Furthermore, three studies operationalise it as the number of independent directors among the board members, namely; Alotaibi and Hussainey (2016) who report no significant impact with SR quantity but significant and negative with SR quality, Fernandes *et al.* (2019) find a significant and positive impact, while Zhou (2019) shows insignificant effect on SR practices. Moreover, two studies report a significant and positive impact on SR practices by considering whether the chairman of the board is a non-executive director (Ashfaq and Rui, 2019), and whether the firm has an independent lead director within its board (Giannarakis *et al.*, 2019). Also, two studies measure it as the natural log of the proportion of independent (non-executive) directors to the total members on the board and observe a significant and positive effect (Bae *et al.*, 2018; Masud *et al.*, 2018). Besides, one study assesses it as whether the majority of board members are independent and finds an insignificant result with SR quantity but a significant and positive result with SR quality (Helfaya and Moussa, 2017).

Board size

Board size is also a common CG variable that has been appeared in 64 studies (e.g., Buniamin *et al.*, 2008; Ali and Atan, 2013; Dias *et al.*, 2017; Fallah and Mojarrad, 2019). This variable in the literature refers to the total number of directors on the firm's board. Using this measurement, previous studies observe a significant and positive result (e.g., Mahmood and Orazalin, 2017; Abu Qa'dan and Suwaidan, 2019) or an insignificant influence (e.g., Ganesan *et al.*, 2017; Mohd-Said *et al.*, 2018). Still, six studies measure it as the natural logarithm of the number of directors and show a significant and positive impact on disclosing sustainability-related information (Shamil *et al.*, 2014; Bae *et al.*, 2018; Masud *et al.*, 2018; Mudiyanselage, 2018; Shahab and Ye, 2018; Biswas *et al.*, 2019).

CEO duality

The impact of CEO duality on SR is examined by 36 studies (e.g., Michelon and Parbonetti, 2012; Hu and Loh, 2018; Ganesan *et al.*, 2019). Virtually all prior studies assess this variable as a dummy variable that takes a value of one when the firm's CEO occupies the post of the board's chairman and zero otherwise. Only Rupley *et al.* (2012), Shamil *et al.* (2014), and Mudiyanselage (2018) measure it inversely (i.e. equal to one when the Chairman and CEO roles are separated and zero otherwise). Empirically, prior studies show an insignificant impact (e.g., Suttipun and Saelee, 2015; Dizar *et al.*, 2019), a significant and positive effect (e.g., Jizi *et al.*, 2014; Biswas *et al.*, 2019), and a significant but negative impact (e.g., Ganesan *et al.*, 2017; Zhou, 2019).

Gender diversity

In the view of the extensive discussion of gender diversity from a global prospect, 51 studies investigate its influence on SR (e.g., Rupley *et al.*, 2012; Lone *et al.*, 2016; Katmon *et al.*, 2019) using 11 measures.[17] Nevertheless, the majority of studies operationalise this variable as the

[17] Using four measurements by Cabeza-García *et al.* (2018), and two measurements by Pucheta-Martínez *et al.* (2019), they find a significant and positive influence on SR using all measurements. Conversely, Alazzani *et al.* (2019) use three various measurements, but do not find significant results with all the three proxies. On the other hand, using five measurements by Al-Shaer and Zaman (2016) and two measurements by Katmon *et al.* (2019), they show mixed results.

proportion of female directors on the board. Several studies using this proxy report a significant and positive influence (e.g., Barako and Brown, 2008; Jizi, 2017) and an insignificant impact (e.g., Akbas, 2016; Zaid *et al.*, 2019). Interestingly, though, Majeed *et al.* (2015) and Muttakin *et al.* (2015) provide evidence of a significant and negative impact. Nine studies measure it on the basis of whether the board has at least one female director and find a significant and positive relationship (e.g., Mahmood and Orazalin, 2017; Al Fadli *et al.*, 2019), an insignificant effect (e.g., Alazzani *et al.*, 2019; Katmon *et al.*, 2019), or even a significant and negative influence (Shamil *et al.*, 2014).

Similarly, Cabeza-García *et al.* (2018) report a significant and positive influence using a dummy variable along with two measurements; whether the board has at least three independent female directors, and whether the board has at least three female directors. Also, six studies measure it as the number of female directors on the board. Abd Rahman and Ismail (2018), Alazzani *et al.* (2019) and Fernandes *et al.* (2019) report an insignificant influence. In contrast, Al-Shaer and Zaman (2016) find a significant and positive result, while Handajani *et al.* (2014) report a significant but negative influence. By comparison, Issa and Fang (2019) show mixed results as they examine more than one country (i.e. examining more than one sample).

Three studies use the Blau index of diversity and report an insignificant impact (Al-Shaer and Zaman, 2016) or a significant and positive effect (Khan *et al.*, 2019a; Khan *et al.*, 2019b). Also, three studies measure it as the proportion of independent women directors and find a significant and positive influence on disclosing sustainability-related information (Al-Shaer and Zaman, 2016; Cabeza-García *et al.*, 2018; Pucheta-Martínez *et al.*, 2019). Other studies use different proxies such as natural logarithm of the percentage of women on the board of directors, with insignificant impact (Masud *et al.*, 2018), the percentage of female executives directors of the total of executives directors serving on the board, with significant and positive influence (Prabowo *et al.*, 2017b), the proportion of institutional women directors, with significant and positive effect

(Pucheta-Martínez *et al.*, 2019), and the Shannon index of diversity, with insignificant impact (Al-Shaer and Zaman, 2016).[18]

Board nationality

Board nationality is a variable used to explain the reporting behaviours in 11 empirical works. The measurements of this variable take three forms in the reviewed studies. Seven studies measure this variable as the proportion of foreign national directors to the total number of board of directors. Khan (2010), Muttakin *et al.* (2015) and Ibrahim and Hanefah (2016) find a significant and positive effect on disclosing sustainability-related information, while the remaining four studies find no significant results (Barako and Brown, 2008; Janggu *et al.*, 2014; Sharif and Rashid, 2014; Majeed *et al.*, 2015). Also, three studies use the Blau index for the proportion of foreign board members (Katmon *et al.*, 2019; Khan *et al.*, 2019a; Khan *et al.*, 2019b), and two studies use a dummy variable equal to one if the board has at least one foreign member and zero otherwise (Ashfaq and Rui, 2019; Katmon *et al.*, 2019). Ashfaq and Rui (2019), Khan *et al.* (2019a) and Khan *et al.* (2019b) find a significant and positive influence on reporting activities, while Katmon *et al.* (2019) provide evidence of a significant and negative relationship although they use two proxies.

Board age

Ten studies investigate the effect of board age on SR, with eight proxies. When board age is operationalised as average age of board members, Fallah and Mojarrad (2019) find no significant effect, Fernandes *et al.* (2019) observe a significant and positive impact, while Abu Qa'dan and Suwaidan (2019) find a significant but negative relationship. Regarding the age of the youngest director on the company board in years, Giannarakis *et al.* (2019) show a significant and negative influence. Still, Ibrahim and Hanefah (2016) show a significant and positive link between SR and the percentage of young members on the board (younger than 40 years). Similarly, Handajani *et al.* (2014) find a significant and positive influence of the proportion of older board of commissioners to the board members. Using a dummy variable equal to one if the average age of

[18] Following Katmon *et al.* (2019), Khan *et al.* (2019a) and Khan *et al.* (2019b) use alternative measurements for gender diversity, board nationality, board age, board ethnicity, board tenure, educational level, and educational background. However, they report almost consistent results among the used measurements.

the board's members is below 60 years old and zero otherwise, Bakar *et al.* (2019) find no association. Katmon *et al.* (2019) use two measures – the coefficient of variation in directors' ages through Blau index, and the standard deviation of directors' ages – and report a significant and negative relationship. Also, by measuring it through the heterogeneity index for age with two categories (less than 50 and over 50 years old), Khan *et al.* (2019a) find no significant influence, while Khan *et al.* (2019b) show a significant and negative association on disclosing sustainability-related information.

Board ethnicity

Eight studies examine this variable using six measures. Three studies measure it as a dummy variable that takes a value of one if the board is heterogeneous and zero if it is homogenous (Shamil *et al.*, 2014; Mudiyanselage, 2018; Bakar *et al.*, 2019). Three studies measure it using the Blau index for the proportion of various ethnic backgrounds (Katmon *et al.*, 2019; Khan *et al.*, 2019a; Khan *et al.*, 2019b). Also, Katmon *et al.* (2019) use alternative proxy as the percentage of directors excluding the majority of ethnic to the number of directors. Still, these six studies do not find a significant effect using these three measures on SR. By contrast, Abd Rahman and Ismail (2018) report a significant and positive link between reporting and board ethnicity measured as a dummy variable equal to one if the company has 51% or more Malay directors on its board and zero otherwise. Moreover, Haniffa and Cooke (2005) use two proxies to measure board ethnicity and find mixed results. In this regard, there is no significant effect when the variable is measured as a dummy variable that takes a value of one if there is a Malay financial director and zero otherwise. On the other hand, when the variable is assessed as the proportion of Malay directors to total board members, a significant and positive link with SR practices is found.

Board tenure

Board tenure is examined by seven studies using seven measures. Katmon *et al.* (2019) use two proxies and report mixed results. In the first proxy, they use the percentage of the directors serving for less than three years to total board members and report no significant impact. In the second one, they use the Blau index for the coefficient of variation in years of services of the board members and report a significant and positive effect. Similarly, Khan *et al.* (2019a) and Khan *et*

al. (2019b) use the Blau index based on five categories: less than 3 years, 6, 9, 12, and 15 years or more. Khan *et al.* (2019a) find a significant and positive effect, while Khan *et al.* (2019b) do not detect a significant impact. Two studies measure it as the average tenure of board members and report a significant and negative impact (Handajani *et al.*, 2014) and a significant but positive influence (Fallah and Mojarrad, 2019), while Supriyono *et al.* (2015) measure it as the number of years the chairman served in the current firm, without significant effect. Rao and Tilt (2016b) measure it as the percentage of directors with (i) 5-10 years' tenure and (ii) tenure over 10 years, and find an insignificant effect with the first proxy but a significant and negative influence with the second one.

Board educational level

This variable is investigated by five studies and measured in four ways. Prabowo *et al.* (2017a) report a significant and positive impact on disclosing related-sustainability information using a random variable that takes a value of one if the chairperson has an undergraduate degree, two if they have a master's degree, and three if they have a PhD degree. Also, Fernandes *et al.* (2019) do not find significant influence using a dummy variable equal to one if the board has a high level of degree (a master's or doctoral degree) and zero otherwise. Moreover, Khan *et al.* (2019a) and Khan *et al.* (2019b) assess board educational level using the heterogeneity index for educational level with four categories (i.e. PhD, MS/MPhil, master's degree holder, diploma, and others) and report an insignificant influence on reporting practices. Furthermore, Katmon *et al.* (2019) use the same measurement but find a significant and positive impact. Besides, they use a second proxy (i.e. the percentage of directors holding other than a selected academic degree to total number of board members) and surprisingly report a significant and negative impact on SR.

Board educational background

This variable is examined by five studies, with three measurements. Esa and Zahari (2016) use the proportion of directors who hold a qualification in a degree of accounting. Fernández-Gago *et al.* (2018) assess it as the number of different degrees to the total of independent directors. Besides, three studies measure it using heterogeneity index with five categories: HR and accountancy, banking and finance, economics, engineering, law, and others (Katmon *et al.*, 2019; Khan *et al.*,

2019a; Khan *et al.*, 2019b). These prior studies discover an insignificant correlation between board educational background and SR practices, except for Esa and Zahari (2016) and Khan *et al.* (2019a). Interestingly, they find a significant and negative effect on disclosing sustainability-related information.

Board meeting

This variable is used in 10 studies and refers to the number of meetings held, as of the fiscal year-end, by the board members. Empirically, five studies – namely, Naseem *et al.* (2017), Aliyu (2019), Hu and Loh (2018), Odoemelam and Okafor (2018), and Alshbili *et al.* (2019) – show a significant and positive correlation between board meeting frequency and disclosing sustainability-related information. Five studies arrive at the opposite result: they observe no significant influence on reporting practices (Haji, 2012; Haji, 2013; Alotaibi and Hussainey, 2016; Dienes and Velte, 2016; Ofoegbu *et al.*, 2018).

Multiple directorships

Five studies examine the impact of this variable on SR, with two measurements. Rupley *et al.* (2012), Janggu *et al.* (2014), Rao and Tilt (2016b), and Ong and Djajadikerta (2018) measure it as the percentage of directors holding multiple directorships to the total number of board members and observe a significant and positive association. On the other hand, Haniffa and Cooke (2005) assess it as a dummy variable that takes a value of one if the chairperson has multiple directorships and zero otherwise. They use two measurements for reporting (i.e. corporate social disclosure length and corporate social disclosure index) and two time periods (i.e. 1996 and 2002). In this respect, they show a significant and positive relationship, except when they use the corporate social disclosure length as a proxy of reporting and the year 2002 in their model, where they report an insignificant impact on disclosing sustainability-related information.

Institutional directors

The impact of institutional directors is examined by three studies. Three proxies are used to measure this variable: (i) the percentage of the institutional directors to the total board members,

the percentage of institutional directors who exemplify (ii) the pressure-resistant institutional investors and (iii) the pressure-sensitive institutional investors on the board. Pucheta-Martínez and Chiva-Ortells (2018) report a significant and negative effect using the first and the second measurements, and no significant effect using the third proxy. Conversely, Pucheta-Martínez and López-Zamora (2018a); Pucheta-Martínez and López-Zamora (2018b) discover a significant but positive effect on SR practices using the first two measurements, and no significant impact using the third proxy.

The existence of sustainability committee

The impact of sustainability committee (SC) on SR practices is investigated by 17 studies (e.g., Kent and Monem, 2008; Dias *et al.*, 2017; Adel *et al.*, 2019). Previous studies assess this variable by considering whether the company has a SC. Several studies document a significant and positive influence (e.g., Mahmood *et al.*, 2018; Pucheta-Martínez and Gallego-Álvarez, 2019), or insignificant association (e.g., Michelon and Parbonetti, 2012; Giannarakis *et al.*, 2019). Likewise, Michelon and Parbonetti (2012) examine whether the existence of a person in charge of sustainability issues affects disclosing sustainability-related information, and show an insignificant impact.

Board committees

Previous studies examine the impact of a number of board committees' practices on SR. For instance, Alotaibi and Hussainey (2016) study the relationship between the number of members of the firm's remuneration committee and SR. They document a significant and negative effect on SR quantity, but an insignificant influence on SR quality. Also, Mahmood and Orazalin (2017) examine the influence of the number of board committees on SR practices and show an insignificant result. Concerning the CG committee, Barakat *et al.* (2015) measure it as a dummy variable equal to one if the company has a CG committee and zero if not, and show an insignificant relationship with SR. Similarly, Aliyu (2019) examines whether at least one non-executive director on the risk management committee affects the SR and provides evidence of an insignificant association.

Board family

The relationship between board family and SR is examined in two studies and measured as the proportion of family members on the board. Due to use of two time periods (i.e. 2006 and 2009), Haji (2012) finds an insignificant effect in 2006 on reporting activities but a significant and negative influence in 2009, while Esa and Zahari (2016) observe a significant and negative influence.

Board expertise

Two studies examine the impact of board expertise on SR and find no significant effect. Dienes and Velte (2016) measure it by considering whether or not the supervisory board contains financial, legal, or other experts. On the other hand, Ganesan *et al.* (2019) use an alternative measurement as the average within the board of accumulated director experiences from diverse backgrounds in the industry.

Other board attributes

This subsection presents the results of board variables on SR practices that appeared once in the review sample. Dienes and Velte (2016) investigate whether or not a former manager on the supervisory board affects SR practices and report an insignificant influence. Moreover, Michelon and Parbonetti (2012) examine the connection between the proportion of community influential members on the boards and SR practices and discover a significant and positive influence. Fernández-Gago *et al.* (2018) analyse the influence of the percentage of independent directors who previously occupied a political position as a measurement for board political connection and document a significant and positive influence on SR activities. Hu and Loh (2018) investigate the board incentive and find an insignificant influence of short-term incentive on disclosing sustainability-related information, while a significant and positive effect is found regarding the long-term incentive.

Table 2.3: The findings of the relationship between CG and SR

No	Study (1)	Results (2)
1	Haniffa and Cooke (2005)	BIND (-), Multiple Directorships (+/o), BETH (+/o), Local Ownership (o), FOwn (+/o)
2	Ghazali (2007)	OwnCon (o), InsideOwn (-), GovOwn (+)
3	Barako and Brown (2008)	BIND (+), GD (+), BNAT (o)
4	Buniamin *et al.* (2008)	BS (+), BIND (o), DUAL (o), InsideOwn (o)
5	Kent and Monem (2008)	SC (+), AC Size (o), AC IND (o), AC Meetings (+)
6	Lim *et al.* (2008)	BIND (+), DUAL (o), AQ (o)
7	Prado-Lorenzo *et al.* (2009)	InOwn (o), Dominant Shareholder (+), Dispersed Ownership (o)
8	Said *et al.* (2009)	BS (+), BIND (o), DUAL (o), OwnCon (+), InsideOwn (o), GovOwn (+), FOwn (o), AC IND (+)
9	Khan (2010)	BIND (+), GD (o), BNAT (+)
10	Siregar and Bachtiar (2010)	BS (+), FOwn (o)
11	Rouf (2011)	BIND (+)
12	Esa and Ghazali (2012)	BS (+), BIND (-)
13	Haji (2012)	BS (+/o), BIND (o), BM (o), Family Board (o/-), InsideOwn (o), GovOwn (+/o)
14	Herda *et al.* (2012)	BIND (+)
15	Michelon and Parbonetti (2012)	BIND (o), Community Influential Members (+), DUAL (o), SC (o), Responsible (o)
16	Rao *et al.* (2012)	BS (+), BIND (+), GD (+), InOwn (+)

No	Study (1)	Results (2)
17	Rupley *et al.* (2012)	BIND (o), GD (o), Multiple Directorships (+), DUAL (o), InOwn (o), SC (o)
18	Ali and Atan (2013)	BS (+), BIND (+), DUAL (o), OwnCon (-), AC Chair (o)
19	Haji (2013)	BS (+/o), BIND (o), BM (o), OwnCon (o), InsideOwn (-/o), GovOwn (+/o)
20	Khan *et al.* (2013)	BIND (+), DUAL (o), InsideOwn (-), Public Ownership (+), FOwn (+), AC (+)
21	Mallin *et al.* (2013)	Monitoring Governance (+/-), Stakeholder Governance (+/-)
22	Raman and Bukair (2013)	Shariah Supervisory Board Score (+)
23	Sufian and Zahan (2013)	BS (o), GovOwn (+), FOwn (o)
24	Uwuigbe and Ajibolade (2013)	BS (+), BIND (+), DUAL (-), AQ (+)
25	Amran *et al.* (2014)	BS (o), BIND (o), GD (o), SC (+)
26	Chan *et al.* (2014)	CG Quality (+)
27	Handajani *et al.* (2014)	BS (+), BIND (o), GD (-), Board Tenure (-), Board Age (+)
28	Janggu *et al.* (2014)	BS (+), BIND (o), BNAT (o), Multiple Directorships (+), InsideOwn (o)
29	Jizi *et al.* (2014)	BS (+), BIND (+), DUAL (+)
30	Shamil *et al.* (2014)	BS (+), BIND (o), GD (-), BETH (o), DUAL (-)
31	Sharif and Rashid (2014)	BIND (+), BNAT (o)
32	Barakat *et al.* (2015)	BS (+), BIND (o), Board Governance Committee (o), AC (+), AQ (+)
33	Benomran *et al.* (2015)	BS (+), BIND (o), DUAL (o),GovOwn (o)

No	Study (1)	Results (2)
34	Bukair and Rahman (2015)	BS (o), BIND (o), DUAL (o)
35	Kiliç *et al.* (2015)	BS (o), BIND (+), GD (+), Free Float (+)
36	Majeed *et al.* (2015)	BS (+), BIND (o), GD (o/-), BNAT (o), OwnCon (o/+), InOwn (+)
37	Muttakin and Subramaniam (2015)	BIND (+), DUAL (-), OwnCon (o), GovOwn (o/+), FOwn (+)
38	Muttakin *et al.* (2015)	GD (-), BNAT (+), Family Ownership (-)
39	Supriyono *et al.* (2015)	BS (+), BIND (+), Board Tenure (o), InsideOwn (o), AC Size (+), AC IND (+)
40	Suttipun and Saelee (2015)	BS (o), BIND (o), DUAL (o), InsideOwn (o), GovOwn (o), Family Ownership (-)
41	Yusoff *et al.* (2015)	BS (+), BIND (o), GD (o), OwnCon (o)
42	Akbas (2016)	BS (+), BIND (o), GD (o), AC IND (o)
43	Akrout and Othman (2016)	GovOwn (+), Family Ownership (-)
44	Alotaibi and Hussainey (2016)	BS (+), BIND (o/-), BM (o),DUAL (o), OwnCon (o/+), GovOwn (-/o), RC Size (-/o), AC Size (+/o), AQ (o)
45	Al-Shaer and Zaman (2016)	GD (+/o)
46	Dienes and Velte (2016)	Women on SSB (+), Expertise on SSB (o), Former Managers on SSB (o), SSB Meeting (o), SSB Size (o)
47	Esa and Zahari (2016)	BS (+), BIND (+), BEDUB (-), Family Board (-), OwnCon (o), GovOwn (o), FOwn (o)
48	Habbash (2016)	BIND (+), DUAL (o), GovOwn (+), InOwn (o), Family Ownership (+)
49	Ibrahim and Hanefah (2016)	BIND (+), GD (+), Board Age (+), BNAT (+)
50	Lone *et al.* (2016)	BS (+), BIND (+), GD (+)

No	Study (1)	Results (2)
51	Rao and Tilt (2016b)	BIND (o), GD (+), Multiple Directorships (+), Board Tenure (-/o)
52	Sundarasen *et al.* (2016)	BIND (o), GD (+), DUAL (-)
53	Trireksani and Djajadikerta (2016)	BS (+), BIND (o), GD (o)
54	Zulkiflee (2016)	BS (+), BIND (+), CEO Ownership (o), InsideOwn (o)
55	Appuhami and Tashakor (2017)	AC Size (+), AC Financial Experts (o), AC IND (+), AC Meetings (+), AC Chair (o), AC GD (+/o)
56	Dias *et al.* (2017)	BS (+), BIND (o), DUAL (+), OwnCon (o), AC (o), SC (o)
57	Ezhilarasi and Kabra (2017)	BS (+), DUAL (o), InOwn (o/+),
58	Ganesan *et al.* (2017)	BS (o), BIND (o), DUAL (-)
59	Helfaya and Moussa (2017)	BIND (o/+), GD (o/+), SC (+), AC Financial Experts (o/+)
60	Jizi (2017)	BS (+/o), BIND (+), GD (+), DUAL (o)
61	Mahmood and Orazalin (2017)	BS (+), BIND (o), GD (+), Board Committee (o)
62	Naseem *et al.* (2017)	BS (+), BIND (+), GD (o), BM (+)
63	Prabowo *et al.* (2017a)	BEDUL (+)
64	Prabowo *et al.* (2017b)	GD (+)
65	Roy and Ghosh (2017)	BIND (o), DUAL (o), OwnCon (o/-), Public Ownership (o/+), SC (+/o)
66	Sadou *et al.* (2017)	BS (+/o), BIND (+/o), OwnCon (-/o), InsideOwn (o/-), GovOwn (+/o)
67	Abd Rahman and Ismail (2018)	GD (o), BETH (+)

No	Study (1)	Results (2)
68	Adnan *et al.* (2018)	BS (o), BIND (o), GovOwn (o/+), SC (+)
69	Bae *et al.* (2018)	BS (+), BIND (+), InsideOwn (-), FOwn (+), InOwn (+)
70	Cabeza-García *et al.* (2018)	GD (+)
71	Coffie *et al.* (2018)	BS (+), BIND (o), OwnCon (+/o), SC (o/+)
72	Fernández-Gago *et al.* (2018)	BIND (+), BEDUB (o), Political Connection (+)
73	Hoang *et al.* (2018)	Unweighted and weighted Diversity-in-Boards (+), Unweighted and weighted Diversity-of-Boards (o)
74	Hu and Loh (2018)	BS (+), BIND (+), BM (+), Board Incentive (o/+), DUAL (o)
75	Hu *et al.* (2018)	GovOwn (o), FOwn (+), InOwn (o/-)
76	Mahmood *et al.* (2018)	BS (+), BIND (+), GD (o), SC (+)
77	Masud *et al.* (2018)	BS (+), BIND (+), GD (o), InsideOwn (-), InOwn (+), Family Ownership (o), SC (o)
78	Mohd-Said *et al.* (2018)	BS (o), BIND (o), GD (+)
79	Mudiyanselage (2018)	BS (+), BIND (+), GD (+), BETH (o), DUAL (o), InsideOwn (o)
80	Musallam (2018)	AC Size (+), AC Financial Experts (-), AC IND (o), AC Meetings (+)
81	Muttakin *et al.* (2018)	Board Capital (+), CEO Power (-)
82	Odoemelam and Okafor (2018)	BS (o), BIND (+), BM (+), SC (+), AC IND (o)
83	Ofoegbu *et al.* (2018)	BS (o/+), BIND (o/+), BM (o), SC (o/+), AC IND (o/+)
84	Ong and Djajadikerta (2018)	BIND (+), GD (+), Multiple Directorships (+)

No	Study (1)	Results (2)
85	Pucheta-Martínez and Chiva-Ortells (2018)	Institutional Director (-/o)
86	Pucheta-Martínez and López-Zamora (2018a)	Institutional Director (+/o)
87	Pucheta-Martínez and López-Zamora (2018b)	Institutional Director (+/o)
88	Shahab and Ye (2018)	BS (+), BIND (+), DUAL (o), Block Ownership (-), GovOwn (-), InOwn (+)
89	Suhardjanto *et al.* (2018)	BS (+), BIND (o), InsideOwn (+), InOwn (+)
90	Adel *et al.* (2019)	BS (o), BIND (-), GD (o), DUAL (o), OwnCon (o), InsideOwn (+), FOwn (o), SC (+), AQ (o)
91	Al Fadli *et al.* (2019)	GD (+)
92	Alazzani *et al.* (2019)	GD (o), CEO Muslim (+)
93	Aliyu (2019)	BS (o), BIND (+), BM (+), Risk Management Committee (o)
94	Alshbili *et al.* (2019)	BS (o), BM (+), Joint Venture Ownership (+), GovOwn (+), FOwn (+), SC (o)
95	Ashfaq and Rui (2019)	BIND (+), BNAT (+), DUAL (o), GovOwn (o), FOwn (o), InOwn (o), SC (+), AC Chair (+)
96	Bakar *et al.* (2019)	GD (+/o), Board Age (o), BETH (o)
97	Biswas *et al.* (2019)	BS (+), BIND (o), DUAL (+), AC (+)
98	Dizar *et al.* (2019)	GD (o), DUAL (o), AC Size (+)
99	Fallah and Mojarrad (2019)	BS (o), BIND (o), Board Age (o), Board Tenure (+), DUAL (o), OwnCon (+), AC IND (+)
100	Fernandes *et al.* (2019)	BS (o), BIND (+), GD (o), Board Age (+), BEDUL (o), DUAL (o)
101	Ganesan *et al.* (2019)	BS (+), BIND (+), GD (o), Board Experience (o), DUAL (o)
102	Giannarakis *et al.* (2019)	BIND (+), Board Age (-), SC (o), AC Meetings (o)
103	Gulzar *et al.* (2019)	GD (+), InOwn (o)

No	Study (1)	Results (2)
104	Issa and Fang (2019)	GD (o/+)
105	Iwiyisi Inua and Anita Emeni (2019)	BS (+), GD (+), CEO Compensation (o), CEO Tenure (o)
106	Katmon *et al.* (2019)	GD (+/o), Board Age (-), Board Tenure (+/o), BNAT (-), BETH (o), BEDUL (+/-), BEDUB (o)
107	Kengatharan and Sivakaran (2019)	BS (o), BIND (+), GD (o), AC Size (o)
108	Khan *et al.* (2019a)	GD (+), Board Age (o), Board Tenure (+), BNAT (+), BETH (o), BEDUL (o), BEDUB (-)
109	Khan *et al.* (2019b)	GD (+), Board Age (-), Board Tenure (o), BNAT (+), BETH (o), BEDUL (o), BEDUB (o)
110	Orazalin (2019)	BS (o), BIND (o), GD (+)
111	Pareek *et al.* (2019)	BS (+), BIND (-)
112	Pucheta-Martínez *et al.* (2019)	GD (+)
113	Pucheta-Martínez and Gallego-Álvarez (2019)	BS (+), BIND (-), GD (+), DUAL (+), SC (+)
114	Abu Qa'dan and Suwaidan (2019)	BS (+), BIND (-), GD (o), Board Age (-), DUAL (-), InsideOwn (-), FOwn (o), InOwn (-)
115	Ullah *et al.* (2019)	BIND (+), GD (+), InsideOwn (-), InOwn (o)
116	Zaid *et al.* (2019)	BS (+), BIND (+), GD (o), DUAL (-)
117	Zhou (2019)	BS (+), BIND (o), DUAL (-), InsideOwn (+), GovOwn (+), InOwn (+)

Note: **CG:** Corporate Governance. **BIND:** Board Independence. **BS:** Board Size. **DUAL:** CEO Duality. **GD:** Gender Diversity. **BNAT:** Board Nationality. **BETH:** Board Ethnicity. **BEDUB:** Board Educational Background. **BEDUL:** Board Educational Level. **BM:** Board Meeting. **SC:** Sustainability, CSR, or Environment Committee. **RC:** Remuneration Committee. **SSB:** Shariah Supervisory Board. **AC:** Audit Committee. **AQ:** Audit Quality. **OwnCon:** Ownership Concentration. **InsideOwn:** Inside Ownership. **GovOwn:** Government Ownership. **InOwn:** Institutional Ownership. **FOwn:** Foreign Ownership.
[+]: Significant and positive. **[-]:** Significant and negative. **[o]:** Insignificant. **[+/o]:** Mixed results, i.e. significant and positive / insignificant results. **[-/o]:** Mixed results, i.e. significant and negative / insignificant results. **[+/-]:** Mixed results, i.e. significant and positive / significant and negative results.

Table 2.4: Summary of examined CG variables and their impact on SR practices

Group-level

Board Attributes	S	M	+	-	o	+/o	-/o
Board Independence	80	6	39	6	31	3	1
Board Size	64	2	42	-	17	5	-
CEO Duality	36	2	4	8	24	-	-
Gender Diversity	51	11	24	3	18	5	1
Board Nationality	11	3	6	1	4	-	-
Board Age	10	7	3	4	3	-	-
Board Ethnicity	8	6	1	-	6	1	-
Board Tenure	7	7	2	1	2	1	1
Board Educational Level **(*)**	5	4	1	-	3	-	-
Board Educational Background	5	3	-	2	3	-	-
Board Meeting	10	1	5	-	5	-	-
Multiple Directorships	5	2	4	-	-	1	-
Institutional Director	3	3	-	-	-	2	1
Sustainability Committee	18	1	9	-	6	3	-
Sustainability Responsible	1	1	-	-	1	-	-
Board Committees	1	1	-	-	1	-	-
Remuneration Committee	1	1	-	-	-	-	1
CG Committee	1	1	-	-	1	-	-
Risk Management Committee	1	1	-	-	1	-	-
Family Board	2	1	-	1	-	-	1
Board Experience	2	2	-	-	2	-	-
Former Manager	1	1	-	-	1	-	-
Community Influential Members	1	1	1	-	-	-	-
Board Political Connection	1	1	1	-	-	-	-
Board Incentive	1	1	-	-	-	1	-
Audit Attributes	**S**	**M**	**+**	**-**	**o**	**+/o**	**-/o**
AC Independence	9	2	4	-	4	1	-
AC Independent Chair	3	1	1	-	2	-	-
AC Size	7	1	4	-	2	1	-
Audit Committee	4	1	3	-	1	-	-
AC Meetings	4	1	3	-	1	-	-
AC Financial Experts	3	2	-	1	1	1	-
AC Gender Diversity	1	1	-	-	-	1	-
Audit Quality	5	2	2	-	3	-	-

Firm-level

Ownership Attributes	S	M	+	-	o	+/o	-/o
Ownership Concentration	15	7	2	1	7	3	2
Inside Ownership	19	1	3	6	8	-	2
Government Ownership	19	4	7	1	5	5	1
Institutional Ownership	16	8	7	1	6	1	1
Foreign Ownership	13	3	5	-	7	1	-
Family Ownership	5	2	1	3	1	-	-
Public Ownership	2	1	1	-	-	1	-
Local Ownership	1	1	-	-	1	-	-
Free Float	1	1	1	-	-	-	-
Block Ownership	1	1	-	1	-	-	-
Joint Venture Ownership	1	1	1	-	-	-	-
Dominant Shareholder	1	1	1	-	-	-	-
Dispersed Ownership	1	1	-	-	1	-	-

Individual- level

CEO Attributes	S	M	+	-	o	+/o	-/o
CEO Compensation	1	1	-	-	1	-	-
CEO Tenure	1	1	-	-	1	-	-
CEO Religion	1	1	1	-	-	-	-
CEO Ownership	1	1	-	-	1	-	-

Special Circumstances

Specific Studies	S	M	+	-	o	+/o	-/o
Monitoring Governance **(*)**	1	1	-	-	-	-	-
Stakeholder Governance **(*)**	1	1	-	-	-	-	-
SSB Score	1	1	1	-	-	-	-
CG Quality	1	1	1	-	-	-	-
Unweighted Diversity-in-Boards	1	1	1	-	-	-	-
Weighted Diversity-in-Boards	1	1	1	-	-	-	-
Unweighted Diversity-of-Boards	1	1	-	-	1	-	-
Weighted Diversity-of-Boards	1	1	-	-	1	-	-
Board Capital	1	2	1	-	-	-	-
CEO Power	1	1	-	1	-	-	-

Note: **S:** The number of studies that examined the variable. **M:** The number of measurements of the variable. **[+]:** Significant and positive impact. **[-]:** Significant and negative impact. **[o]:** Insignificant impact. **[+/o]:** Mixed results on different sub-aspects. **[-/o]:** Mixed results on different sub-aspects. **CG:** Corporate Governance. **AC:** Audit Committee. **SSB:** "Shariah" Supervision Board.

- Studies that use, for instance, different measurements of CG variables or SR, more than one period, and (or) more than one country may result in mixed results. In such cases, the studies are classified once under (+/o) or (-/o). **(*):** positive and negative significant effects (+/-) on SR practices.

2.4.2 Audit attributes

Audit committee independence

Nine studies test the relation between audit committee independence and SR. This variable is measured as the proportion of audit committee members identified as independent to total members on the audit committee. Still, Said *et al.* (2009) use additional proxy as the percentage of audit committee members identified as independent to the total of the board of directors. The studies of Said *et al.* (2009), Supriyono *et al.* (2015), Appuhami and Tashakor (2017), and Fallah and Mojarrad (2019) document a significant and positive association. On the other hand, Kent and Monem (2008), Akbas (2016), Musallam (2018), and Odoemelam and Okafor (2018) observe no significant relationship. In their study, Ofoegbu *et al.* (2018) examine two countries (Nigeria and South Africa) and find mixed results.

Audit committee independent chair

Three studies examine the independent chair of the audit committee and its effect on SR. This variable is measured in two ways using a dummy variable. Appuhami and Tashakor (2017) measure it by taking a value of one if the audit committee chair is independent and not the same as for board chair and zero otherwise. Similarly, Ali and Atan (2013) and Ashfaq and Rui (2019) measure it by taking a value of one if the audit committee chair is independent and zero otherwise. However, Ali and Atan (2013) and Appuhami and Tashakor (2017) show an insignificant correlation, while Ashfaq and Rui (2019) provide evidence of a significant and positive association.

Audit committee size

The impact of audit committee size and SR activities is examined in seven studies, where this variable refers to the total of members on the audit committee. The studies of Supriyono *et al.* (2015), Appuhami and Tashakor (2017), Musallam (2018), and Dizar *et al.* (2019) discover a significant and positive effect, while Kent and Monem (2008) and Kengatharan and Sivakaran (2019) provide evidence of an insignificant relationship. Still, Alotaibi and Hussainey (2016)

observe a significant and positive association with SR quantity, but no significant relationship with SR quality.

The existence of audit committee

Only four studies analyse the relationship between the audit committee and SR activities (Khan *et al.*, 2013; Barakat *et al.*, 2015; Dias *et al.*, 2017; Biswas *et al.*, 2019). These studies measure this variable as a dummy variable taking a value of one if the company has an audit committee and zero otherwise. In this respect, only Dias *et al.* (2017) report an insignificant association, while the remaining three studies find a significant and positive connection between the audit committee and SR.

Audit committee meeting

Audit committee meeting is examined in four studies as a determinant of SR behaviour (Kent and Monem, 2008; Appuhami and Tashakor, 2017; Musallam, 2018; Giannarakis *et al.*, 2019). This variable, in the literature, refers to the number of audit committee meetings held in a fiscal year. Prior empirical results show that the audit committee meeting has a significant and positive influence on SR. Only Giannarakis *et al.* (2019) do not find a significant connection between both variables.

Audit committee financial experts

This variable is used in three studies to examine its effect on SR, with two ways of measurement. Appuhami and Tashakor (2017) and Musallam (2018) measure it as the number of financial experts on the audit committee, while Helfaya and Moussa (2017) assess it by considering a dummy variable equal to one if there is financial expertise on the audit committee and zero otherwise. In terms of empirical results, Appuhami and Tashakor (2017) provide evidence of an insignificant correlation with SR quantity, while Musallam (2018) reports a significant and positive association with SR adoption. In addition to this, Helfaya and Moussa (2017) document an insignificant (but significant and positive) relationship with SR quantity (quality).

Audit committee gender diversity

Only one study examines the influence of audit committee gender diversity on SR. Appuhami and Tashakor (2017) measure it by considering a dummy variable that takes a value one if the audit committee has both female and male members and zero otherwise, and provide evidence of a significant and positive relationship.

Audit quality

Five studies use the audit quality variable to investigate the SR practices. They operationalise it using a dummy variable equal to one if the firm's external auditor is one of the big four audit firms (Lim *et al.*, 2008; Uwuigbe and Ajibolade, 2013; Alotaibi and Hussainey, 2016; Adel *et al.*, 2019) or an international audit firm (Barakat *et al.*, 2015) and zero otherwise. Uwuigbe and Ajibolade (2013) and Barakat *et al.* (2015) find a significant and positive effect of audit quality on SR, on the one hand, while on the other hand, Lim *et al.* (2008), Alotaibi and Hussainey (2016), and Adel *et al.* (2019) find no significant association in this respect.

2.4.3 Ownership attributes

Ownership concentration

Ownership concentration is investigated by 15 studies with seven measurements to examine its influence on SR. Seven studies operationalise it as the percentage of shares owned by the 10 largest stockholders (e.g., Ghazali, 2007; Haji, 2013; Yusoff *et al.*, 2015; Sadou *et al.*, 2017). Empirically, a number of studies find no significant (e.g., Esa and Zahari, 2016), significant and positive (e.g., Said *et al.*, 2009), and significant but negative relationship (e.g., Ali and Atan, 2013). Furthermore, the results show insignificant effect using the proportion of shares held by the major shareholder (Dias *et al.*, 2017), or using the number of shareholders holding 5% or more (Adel *et al.*, 2019), but a significant and positive connection using the proportion of shares held by the five largest shareholders (Fallah and Mojarrad, 2019). Also, Majeed *et al.* (2015) use the sum of squares of the highest five shareholdings' percentages to measure ownership concentration and find mixed results due to the different periods examined between 2007 and 2011. Besides, Alotaibi and

Hussainey (2016) and Coffie *et al.* (2018) measure it as the aggregate percentage of shares held by major shareholders (with at least 3% ownership). In this regard, Alotaibi and Hussainey (2016) find no significant influence on quantity of SR but a significant and positive effect on quality of SR; conversely, Coffie *et al.* (2018) find a significant and positive (but insignificant) impact on quantity (quality) of SR. Also, measuring it as the percentage of shares owned by the promoters, Muttakin and Subramaniam (2015) report an insignificant association, while Roy and Ghosh (2017) find mixed results due to differences in industries investigated (i.e. cement industry, iron and steel industry, and information technology-enabled services industry).

Inside ownership

Amongst others, Ghazali (2007), Khan *et al.* (2013), and Adel *et al.* (2019) examine the impact of inside ownership on SR. This variable is used in 19 studies and assessed as the percentage of shares owned by managers/directors. Several studies such as Buniamin *et al.* (2008) and Mudiyanselage (2018) document an insignificant association. On the other hands, other empirical works observe a significant and positive relation (e.g., Suhardjanto *et al.*, 2018; Zhou, 2019), or even a significant and negative correlation (e.g., Abu Qa'dan and Suwaidan, 2019; Ullah *et al.*, 2019). Interestingly, due to the two time periods adopted (i.e. 2011 and 2014), Sadou *et al.* (2017) provide evidence of an insignificant effect in 2011, but a significant and negative effect in 2014.

Government ownership

The government ownership variable is used in 19 studies and measured in four ways. Eleven studies measure it as the percentage of shares owned by the government (e.g., Haji, 2013; Muttakin and Subramaniam, 2015; Habbash, 2016; Shahab and Ye, 2018). Using this proxy, these studies report a significant and positive (e.g., Said *et al.*, 2009), significant and negative (e.g., Akrout and Othman, 2016), and an insignificant influence (e.g., Ashfaq and Rui, 2019) on SR practices. Besides, five studies use a dummy variable that takes a value of one if the company is fully government-owned and zero otherwise (Suttipun and Saelee, 2015; Esa and Zahari, 2016; Hu *et al.*, 2018; Alshbili *et al.*, 2019; Zhou, 2019). Empirically, Esa and Zahari (2016), Suttipun and Saelee (2015), and Hu *et al.* (2018) find no significant impact, while the two remaining studies find a significant and positive effect. Ghazali (2007) reports a significant impact by considering a

dummy variable that takes a value of one if the government is a large stockholder in the firm and zero otherwise. Similarly, two studies use a dummy variable equal to one if the government ownership is greater than 50% and zero otherwise. Benomran *et al.* (2015) report no significant influence, while Adnan *et al.* (2018) report an insignificant effect on SR quantity but a significant and positive impact on SR quality.

Institutional ownership

The relationship between institutional ownership and SR is studied by 16 empirical works. This variable is measured in eight ways. The majority of the previous studies assess this variable as the percentage of shares owned by the institutional investors (e.g., Majeed *et al.*, 2015; Habbash, 2016; Hu *et al.*, 2018; Zhou, 2019). Still, they report a significant and positive impact (e.g., Rao *et al.*, 2012), significant but negative influence (e.g., Abu Qa'dan and Suwaidan, 2019), and insignificant effect (e.g., Ullah *et al.*, 2019). Along with this measurement, Hu *et al.* (2018) also use two further measurements and report mixed results. In the first measurement, they measure it as the percentage of shares held by long-horizon institutional investors, while they measure the proportion of equity held by short-horizon institutional investors in the second one. These two proxies are also used by Rupley *et al.* (2012) to measure this variable, and the results show no significant association between both variables.

In contrast, Masud *et al.* (2018) discover a significant and positive result using two proxies; namely, the percentage of share ownership by the domestic institutional investors, and the proportion of shares owned by the foreign institutional investors. Similarly, Ezhilarasi and Kabra (2017) use the same two proxies and find an insignificant (but significant and positive) influence of domestic (foreign) institutional investors. Moreover, Shahab and Ye (2018) document a significant and positive association using the natural logarithm of the percentage of share ownership by the investment fund, while Ashfaq and Rui (2019) find no significant relationship using the percentage of equity owned by the institutional financial investors. Similarly, Prado-Lorenzo *et al.* (2009) and Gulzar *et al.* (2019) also report an insignificant impact using a dummy variable that takes a value of one if at least one financial institution forms part of the ownership structure and zero otherwise.

Foreign ownership

Using three measurements, foreign ownership is investigated by 13 studies. In this vein, 10 empirical studies measure it as the percentage of shares owned by foreign investors. Siregar and Bachtiar (2010), Esa and Zahari (2016), and Ashfaq and Rui (2019) find no significant relationship, while other studies report a significant and positive impact (e.g., Khan *et al.*, 2013; Muttakin and Subramaniam, 2015; Hu *et al.*, 2018). Besides, Sufian and Zahan (2013) and Adel *et al.* (2019) report an insignificant impact by considering a dummy variable equal to one if any shareholder has a foreign nationality and zero otherwise. By comparison, Alshbili *et al.* (2019) find a significant and positive influence using a dummy variable that takes a value of one if the company is foreign-owned and zero otherwise.

Family ownership

Five empirical works examine whether family ownership affects SR practices. The literature uses two measurements to assess this variable. The studies of Muttakin *et al.* (2015), Akrout and Othman (2016), Habbash (2016), and Masud *et al.* (2018) measure it as the proportion of shares held by the family in the firm, while Suttipun and Saelee (2015) measure it by considering whether or not the company is a family business. Habbash (2016) discovers a significant and positive effect, while Masud *et al.* (2018) provide evidence of an insignificant relation between both variables. Other remaining studies show a significant and negative effect on disclosing sustainability-related information.

Public ownership

Two studies analyse the influence of public ownership measured by the percentage of shares owned by the public on SR. Khan *et al.* (2013) show a significant and positive impact. On the other hand, Roy and Ghosh (2017) find mixed results due to their use of independent samples from three different industries (i.e. cement industry, iron and steel industry, and information technology-enabled services industry).

Other ownership attributes

A number of studies use other measurements of ownership structure to examine SR, which appeared once in the reviewed sample. For example, Haniffa and Cooke (2005) test the local ownership (referred to the proportion of non-foreign shareholders to total shareholders) and do not find a significant connection. Kiliç *et al.* (2015) investigate the free float variable operationalised by the proportion of shares held by unknown shareholders and report a significant and positive influence. Shahab and Ye (2018) study the block ownership assessed by the natural logarithm of the largest shareholding rate in the firm and document a significant and negative relation. Alshbili *et al.* (2019) examine the effect of joint venture ownership (measured as a dummy variable equal to one if the company is a joint venture owned and zero otherwise) and find a significant and positive relationship. Finally, Prado-Lorenzo *et al.* (2009) investigate the dominant shareholder (a dummy variable equal to one if there is a dominant shareholder and zero otherwise) and dispersed ownership (the proportion of independent directors who represent the interests of the minority stockholders). They report a significant and positive influence of dominant shareholder and an insignificant effect of dispersed ownership.

2.4.4 CEO attributes

Only four CEO attributes are used in the prior literature to investigate SR practices. Iwiyisi Inua and Anita Emeni (2019) examine two attributes; namely, the CEO compensation measured as the annual pay of executive officers divided by the revenue of the firm and CEO tenure measured as the number of years since the nomination of the CEO to occupy this position. In this respect, they provide no significant connection between these two attributes and SR. Alazzani *et al.* (2019) study CEO religion assessed by considering whether the CEO is a Muslim and document a significant and positive association. Finally, Zulkiflee (2016) finds an insignificant influence of CEO ownership, assessing it as the percentage of shares held by the CEO.

2.4.5 Specific studies

Several studies examine the impact of CG on SR in special circumstances using certain measures. For example, Mallin *et al.* (2013) examine the impact of monitoring governance and stakeholder

governance using "people" and "product" dimensions of the corporate social performance and report mixed results. Raman and Bukair (2013) study the effect of "Shariah" supervision board (SSB) in Islamic banks. Using an overall score of the SSB index that includes SSB members, cross memberships, educational qualifications, reputable SSB members, and expertise of SSB, they document a significant and positive effect. Chan *et al.* (2014) measure CG quality using the WHK Horwath CG ranging from 1 (worst) to 222 (best) and discover a significant and positive influence. Also, Hoang *et al.* (2018) investigate the link between board diversity and social disclosure. They measure board diversity using four indices; namely, unweighted diversity-in-boards index, weighted diversity-in-boards index, unweighted diversity-of-boards index, and weighted diversity-of-boards index. They report a significant and positive impact of both unweighted and weighted diversity-in-boards indices, but an insignificant effect of both unweighted and weighted diversity-on-boards indices.

Moreover, Muttakin *et al.* (2018) investigate the impact of board capital and CEO power on SR. They use two proxies to measure board capital and find significant and positive impacts. First, they use a dummy variable equal to one if any independent director also serves as a director or CEO of another firm or educational institution professor or government officer and zero otherwise. Second, they use the percentage of such directors to the total board members. Also, using an index that includes CEO duality, CEO tenure, CEO ownership and CEO family to measure CEO power, they show a significant and negative effect.

2.5 Discussion

The descriptive analysis conducted in this paper shows that academia has paid considerable attention to the CG-SR nexus in 2018 and 2019 (51 studies, ~ 44%). This explosion in the number of published studies over the past two years indicates that the academic community, firms, and standard setters are becoming more and more aware of this given nexus. One possible reason for that may be related to the adoption of Sustainable Development Goals (SDGs) by 193 countries at the end of 2015. Also, the results show that the studies were published across 72 journals indicating a broad range of journal coverage.

Moreover, the review in this study reveals that most of the existing literature is conducted in developing countries compared to developed countries. One possible reason behind this is that several studies chose developing countries with the argument that most of the studies on this topic are conducted in developed countries. For instance, and aiming at fulfilling the gap in the current literature, Abu Qa'dan and Suwaidan (2019) state that "most of the studies have been conducted in developed nations where the influence of the boards of directors and ownership structures (as internal and external corporate governance mechanisms) on CSR may differ from those in developing nations…". Likewise, Zaid *et al.* (2019) argue that "the majority of researchers have concentrated their attention on examining the influence of board structure on CSR reporting in developed countries …. In contrast, a few studies … have been conducted in developing countries". This is, however, not in line with the findings of this study. Therefore, the argument that "most studies have been carried out in developed countries" is often without evidence, or overused.

The results also show that most studies exclude financial firms from their sample, where 63 studies focus on the non-financial sector, and only 12 studies focus on the financial sector. The standard argument for this common practice is that this sector is different. That is, financial firms are governed by different statutory requirements, and subjected to additional rules (Haniffa and Cooke, 2005), and might be subject to other disclosure requirements (Katmon *et al.*, 2019).

Regarding SR dimensions, the SLR indicates that few studies examine the triple-bottom-line orientation – i.e. all three dimensions of SR. The justification for the lack of study in this area may be due to two possible reasons. First, Lozano (2013) asserts that reporting practices usually deal with each dimension individually, leading to compartmentalising them and disregarding the synergies between them. Second, most of the previous studies do not use GRI guidelines, which directly relate to the three dimensions of SR, to build their disclosure index. According to Hussain *et al.* (2018), GRI is the most accepted and recognised organisation in the field of SR and establishes the triple-bottom-line reporting guidelines as more transparent and reliable. Although GRI guidelines have a significant impact on the field of SR, few studies rely on the GRI framework to build a disclosure index. Still, none of these studies adopts the new GRI standards to examine the CG-SR nexus, which are the first and global standards for SR.

For SR measurements, Zhou (2019) states that it is not enough to understand sustainability activities by only focusing on the quantity (level) of SR; it is also important to focus on companies' decisions to report on such activities (i.e. the adoption of SR). Furthermore, Jizi *et al.* (2014) argue that it is essential to measure the quality instead of quantity of SR. However, the results indicate that investigating the adoption and quality of SR practices is not common compared to SR quantity. One reason for the limited studies on SR quality is the lack of objectivity in measuring the quality practices and increasing the bias issues. According to Katmon *et al.* (2019), there is difficulty in defining clear and recognised measurements for disclosures quality. Indeed, previous studies use different ways and various points scales to measure the quality of SR practices.

In a similar vein, prior studies use different communication channels to examine the CG-SR nexus. Still, the results reveal that annual reports are the most used medium by reviewed articles as a source of SR data. One possible reason for this is that annual reports are institutionalised and include relatively standardised data (Hanson and White, 2003) and therefore facilitate the research. Moreover, the information disclosed in the annual reports is highly reliable and various stakeholders may utilise them as the single source of some information (Haniffa and Cooke, 2005). However, Fasan (2013) states that the annual reports do not offer sufficient non-financial information (e.g., sustainability information). Instead, stand-alone reports (e.g., environmental reports, CSR reports, or sustainability reports) are dedicated reports that disclose sustainability information (Adams, 2004). Thus, they include more quantitative and qualitative information about the relations with all stakeholders (Michelon and Parbonetti, 2012). Besides, Ong and Djajadikerta (2018) state that websites are increasingly popular, and more firms are delivering sustainability information over their webpages. Nevertheless, few studies focus on stand-alone sustainability reports and websites to examine the CG-SR nexus.

Theoretically, the results show that sample studies use 21 theories, with agency theory being the most applied theoretical framework (45 times). This is no surprise since the relationship between CG and corporate reporting emerges from agency theory (Rao and Tilt, 2016a) and that agency theory is the predominant theoretical underpinning in CG literature. However, several studies advocate multiple theories rather than a single theory. For example, Shamil *et al.* (2014) state that

"the study adopts a multi-theoretic approach … since it has been argued that the multifaceted nature of sustainability reporting requires a multi-theoretic approach instead of a single theory approach which is considered inadequate ….". However, a large number of studies (51, ~44%) use a single theory rather than a combination of theories, which indicates a lack of applying integrated theoretical perspectives in the existing literature. These findings show that the debate of efficacy of using a single theoretical framework or multiple frameworks is unresolved.

Further, the results in this review show that the majority of the reviewed body of literature investigates variables that are related to the board attributes. This is not surprising since the board of directors is the most significant component of the internal CG mechanisms (Mallin *et al.*, 2013) and the highest committee in the firm that influences the reporting decisions (Kent and Monem, 2008). According to agency theory, the board is a mechanism for controlling the management to evade agency conflicts and mitigate asymmetric information (Fama and Jensen, 1983), and represents numerous stakeholders' interests (Jain and Jamali, 2016). Despite the progress achieved toward understanding the influence of board attributes on SR, only a few variables receive considerable attention (i.e. board independence, board size, gender diversity, and CEO duality)[19], while board attributes other than the latter ones have only attracted scant attention. Importantly, variables related to a comprehensive view of board diversity (i.e. age, ethnicity, nationality, tenure, educational background, and educational level of the board) are rarely investigated. One reason for missing empirical studies on such variables may be due to difficulties in measuring them (Mallin *et al.*, 2013) or obtaining their data. Sample articles in this review already measure such attributes in different ways. Furthermore, other board attributes such as board meeting, institutional directors, multimale directorships, and family board are also rarely examined in the literature.

In term of audit attributes, according to Alotaibi and Hussainey (2016), several researchers suggest that the quality of the auditor is considered an essential aspect in term of improving the organisation's overall reporting practices. Moreover, Musallam (2018) states that several researchers argue that audit committee is considered a monitoring measurement or tool. Still, the results in this study indicate that the literature is scarce in terms of investigating such attributes.

[19] Nevertheless, these variables are less examined in studies that investigate the financial sector or the three dimensions of SR due to the scarcity of such studies in the literature, as stated before.

Likewise, the results also reveal that far less attention has been paid to the impact of CEO characteristics on SR practices although a fundamental basis of CG rests in the top management's integrity and its business acumen (Jain and Jamali, 2016).

As this SLR focuses on CG mechanisms, it covers many more articles (117) and more CG variables (64) compared to other reviews (i.e. Hahn and Kühnen, 2013; Dienes *et al.*, 2016; Ali *et al.*, 2017)[20], and thus contribute to the limited evidence in other reviews. Thus, this SLR offers further and new evidence on the results regarding the CG-SR nexus. For example, and based on 80 studies that examine board independence, the review in this study shows that the majority of studies report a significant and positive impact. This is neither in line with Dienes *et al.* (2016) who find that the majority of studies (~50% of 12 studies) report no significant impact nor with Ali *et al.* (2017) who document only a significant and positive impact based on two reviewed studies.

Regarding board size, all the reviewed studies in this SLR report either a significant and positive influence (~65% of 64 studies) or no impact at all (~27%), while about 8% of studies report mixed results (i.e. positive and no influence). That is, no single study in this review documents a significant and negative effect on SR practices. This is in line with the results of the studies by Dienes *et al.* (2016) and Ali *et al.* (2017). For board gender diversity, the results in this review show that the majority of studies find a significant and positive impact. This is in contrast to Dienes *et al.* (2016) who show that the majority (50% of four studies) find an insignificant effect. Similarly, and by analysing more articles that examine CEO duality, the results in this study shows that the majority of studies (~67% of 36 studies) find an insignificant impact, followed by about 22% for a significant and negative influence, while only about 11% provide evidence of a significant and positive relationship on SR. In contrast, and based on five reviewed studies, Dienes *et al.* (2016) show that about 40% of studies document a significant and positive influence, about 40% report no significant effect, while about 20% find a significant but negative association with disclosing sustainability-related information.

[20] Belal and Momin (2009) and Fifka (2013) review only two studies that include examining the impact of CG on SR, and generally show a significant relationship between CG structure and SR.

For audit attributes, for instance, the findings in this SLR show that most studies (~57% of seven studies) find a significant and positive relationship between audit committee size and SR. On the other hand, Dienes *et al.* (2016) show that there is no significant impact. Regarding ownership concentration, and based on 15 studies, this review presents evidence showing an insignificant influence. However, both Dienes *et al.* (2016) (based on five studies) and Ali *et al.* (2017) (based on six studies) show that the majority of studies find a significant and positive influence, while Hahn and Kühnen (2013) (based on eight studies) show that the majority of studies report a significant and negative impact.

2.6 Suggestions for further research

2.6.1 Sustainability reporting dimensions

Future studies can contribute to the existing literature by investigating the impact of CG on total SR and – separately – on its three dimensions. Although many studies examine this given nexus, one shortcoming of the current literature is the tendency to examine two dimensions (i.e. environmental and social) but not the three dimensions (i.e. economic, environmental, and social) of SR. Several studies, however, state that these dimensions should be considered equitably and simultaneously (Bansal, 2005; Kleine and Von Hauff, 2009). Moreover, Hahn and Kühnen (2013) state that only a report that includes the three aspects of sustainability can be regarded as SR. In the same vein, there is a dearth of evidence regarding the impact of CG on separate dimensions of SR, where only three studies have overcome this limitation (Mahmood and Orazalin, 2017; Mahmood *et al.*, 2018; Ong and Djajadikerta, 2018).[21] Such examination is critical because the impact of some CG mechanisms may differ by dimension, or they may have an impact on total SR but not on each dimension. According to Walls *et al.* (2012), the dominant paradigms in CG literature may fail in explaining why or how social activities of sustainability should be integrated into firms' strategic goals. Empirically, and using a sample of 30 oil, gas, and mining firms in

[21] However, the motivations for these studies are not examining the effect of CG on each dimension of SR. Thus, they do not investigate such relationship thoroughly. Moreover, Mahmood *et al.* (2018) and Ong and Djajadikerta (2018) lack a sound theoretical framework to explain SR practices and how they are affected by CG variables, while Mahmood and Orazalin (2017) build no sub-hypothesis regarding the effect of CG on each of SR dimensions. Furthermore, none of these studies examines GRI standards, which are the first and global standards for SR, especially in that the economic dimension's items have been significantly changed under these standards.

Kazakhstan from 2010 to 2013, Mahmood and Orazalin (2017), for instance, find that the impact of board attributes differs on aggregate SR, and separately, on its three dimensions.

2.6.2 Different mediums of sustainability reporting

Another possible area for future research is to examine the CG-SR nexus in different communication channels (e.g., stand-alone reports and websites) because, so far, the majority of the previous studies that investigate this given nexus are based on firms' annual reports. Unlike annual reports which focus on firms' outcomes and financials and target particular stakeholders, stand-alone sustainability reports focus on the influence of economic, environmental and social issues and include various stakeholder groups (Fasan, 2013). Likewise, websites have become a significant channel through which firms can report information of various natures and therefore they are as important as the exploration of annual reports to enhance our knowledge regarding SR activities (Branco and Rodrigues, 2008a). It is likely that the results of the impact of some CG variables on SR in sustainability reports and websites may differ from those reported based on annual reports. One possible reason for this is related to the differences in audit levels among these mediums. According to Adel *et al.* (2019), the auditing of corporate reporting aims to mitigate the asymmetric information between management and stakeholder groups. In this regard, the audit level is low in sustainability reports (Jizi *et al.*, 2014) and websites compared to annual reports. Therefore, sustainability information provided in stand-alone reports and websites is under much less control of the board of directors and CEO compared to that contained in annual reports.

2.6.3 Financial and non-financial sectors

Another direction for future work involves examining not only the relationship between CG and SR in the financial sector but further empirically investigating if there is a significant difference in results between the financial and non-financial sectors. Although the reviewed sample carries a considerable number of papers, there is only little known about the CG-SR nexus in the financial sector, because most of the previous studies exclude this sector and focus on the non-financial sector. In the same vein, there is a significant gap regarding the impact of exclusion of the financial sector. The argument for such investigations is that the nature of CG issues in the financial sector differs from that in the non-financial counterparts (Yamak and Süer, 2005; John *et al.*, 2016).

According to agency theoretical perspective, reducing information asymmetry is one way to mitigate agency problems (Donnelly and Mulcahy, 2008). That is, the higher agency costs may lead to disclosure of more information by the company (Healy and Palepu, 2001). In this regard, Laeven (2013) claims that the unique features of the financial sector, mainly the banking sector, imply that agency costs are probably more pronounced in this sector than in other sectors. Moreover, the structure of information asymmetry is more complex and multidimensional in the financial sector due to the multitude of stakeholders (Yamak and Süer, 2005; Branco and Rodrigues, 2008b) and therefore information asymmetry in the banking sector is more critical than in the non-financial sector (Laeven, 2013). Furthermore, as they address complex activities, boards in the financial sector might optimally have more independent directors, more board members, and more board committees than non-financial firms have (Adams and Mehran, 2012; John *et al.*, 2016).

2.6.4 Comparison of developing and developed countries

Thus far, it seems that no single empirical study has undertaken comparative research between developing and developed countries regarding SR practices and how they are affected by CG mechanisms. Future studies, therefore, could contribute to this promising area in the literature by, first, examining to what extent the SR practices differ and, second, empirically investigating if there are significant differences in the impact of CG variables on SR practices. One reason that may explain the differences in SR activities across nations is related to the institutional theoretical perspective that firms' practices follow institutionalised expectations of the environment (Meyer and Rowan, 1977). That is, a corporation adapts, refines, and develops its strategical plans under its institutional environment (Gjølberg, 2009). Another reason is based on stakeholder theory whereby, as they influence corporations, stakeholders in different nations have various expectations and needs regarding sustainability information (Hąbek and Wolniak, 2016). Moreover, there are two possible reasons behind the different impacts of CG mechanisms on SR practices. First, CG mechanisms in developing countries are relatively weak compared to developed ones as they often have weak standard and legal protection, high corruption levels and concentrated ownership (Katmon *et al.*, 2019). Therefore, the firm with weaker CG structure, as agency theory argues, faces more agency problems and the management of this firm gains more

private benefits (Core, Holthausen and Larcker, 1999). Second, several studies point out that the level of SR in developing countries is in its infancy compared to developed countries (Shamil *et al.*, 2014; Lone *et al.*, 2016).

2.6.5 Other corporate governance variables

Another critical gap in the literature that future research might look at is studying other less investigated CG mechanisms, such as board diversity, audit committee variables, and CEO characteristics. From the systematic review in this study, it is clear that the studies that examined the impact of such attributes on SR are scarce, where no study adopts a comprehensive view of these attributes on the three dimensions of SR. The importance of examining such attributes is due to the significant impacts that they may have on SR. Regarding board diversity variables, Katmon *et al.* (2019) state that the SR is the outcome of the board's judgements and discretions, which are mostly based on their professional contexts and personal norms. According to Gul, Srinidhi and Ng (2011), the diversity in the boardroom has a vital role in CG through offering effective controlling that would improve the board's discussions and strengthen the firm's CG quality, and guarantee that the decision-making process in the board reflects the society's expectations. From the resource-based view theoretical perspective, Khan *et al.* (2019b) also state that diverse boards in companies, through their valuable resources, can play a crucial role and enhance businesses' norms regarding SR. For audit committee, it has a fundamental role in improving the CG system (Said *et al.*, 2009) and controlling board members' practices through enhancing the reported information and its quality (Samaha, Khlif and Hussainey, 2015). This is particularly the case following growing pressure from various stakeholders due to the aftermath of several scandals, which has resulted in broadening the traditional role of the audit committee to oversee not only mandatory financial disclosures but also SR (Appuhami and Tashakor, 2017). Concerning CEO attributes, top management, as upper echelons theory argues, exerts an important impact on strategic decisions and organisational results (Hambrick and Mason, 1984; Wiersema and Bantel, 1992). As this theory posits, if the strategic decisions include a significant behavioural component, they reverse the values and the cognitive proclivities of the decision-maker(s) (Alazzani *et al.*, 2019). In this regard, the range of disclosures and amount of transparency commonly relies on the discretion of the CEO (Amran *et al.*, 2014) as the board's decisions have to be reported via the

CEO (Mudiyanselage, 2018). However, to date, no study has undertaken a comprehensive review of the CEO's personal and professional attributes on SR (see recently, Malik *et al.*, 2020, for a notable exception).

Chapter 3: The impact of corporate governance on sustainability reporting: International evidence of triple bottom line reporting

Abstract

Drawing on stakeholder-agency theory, this paper investigates the impact of board characteristics (size, independence, CEO duality, gender diversity, and sustainability committee (SC)) on sustainability reporting (SR) – and, separately, on its three dimensions (economic, environmental and social). The sample consists of 370 listed firms from 50 countries over a one-year period (2017). A disclosure index based on the Global Reporting Initiative (GRI) standards was constructed and used to quantify the extent of SR and its dimensions across various reporting media (e.g., sustainability reports, annual reports, integrated reports, and websites). The baseline findings show that the presence of SC has a positive and significant impact on SR and its three dimensions (economic, environmental and social). Board size also has a significant positive impact on SR and two of its dimensions (economic and social) but not with environmental. Similarly, board independence and CEO duality have a significant but negative association with SR and the same two dimensions (economic and social) but not environmental. Finally, the results also show that although board gender diversity has a positive relationship with SR and two of its dimensions (economic and social), and a negative relationship with environmental, the association is not significant. The study then conducts further analysis by partitioning the sample into developed and developing countries to examine whether, and to what extent, the impact of CG on SR may differ. Overall, the results which indicate that only the presence of SC has a significant influence on SR and its three dimensions and in both developed and developing countries vindicates its inclusion among the CG mechanisms dedicated to ensuring firms address sustainability issues. The findings have important implications for CG reforms internationally, particularly in countries where a SC is not yet part of the board of directors' sub-committees.

Keywords: Corporate governance, sustainability reporting, triple bottom line reporting, stakeholder-agency theory, sustainability committee

3.1 Introduction

The relationship between corporate governance (CG) and sustainability reporting (SR) is considered one of the most critical areas for firms, regulators, and academics. Sustainable Development Goal (SDG) 12.6 "encourages companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle" (United Nations [UN], , 2015). Consequently, one of the top priorities of governance agenda nowadays is SR practices. This is due, but not exclusively, to (i) growing calls to shift the CG's narrative perspective toward including stakeholders' non-financial interest and (ii) the worldwide echo that this relationship has received due to scandalous environmental and social catastrophes and organisations' governance breaches (Jain and Jamali, 2016). Hussain *et al.* (2018) state that "The debate on corporate scandals suggests the need for consideration of social goals along with profit maximisation…. Such discussion raises the questions of how effectively firms are governed and how different internal and external governance mechanisms determine corporate social behaviour".

Despite the progress made in investigating the relationship between CG mechanisms and SR practices, further research is needed to increase our understanding of the nexus, for a number of reasons. First, previous studies that examine the impact of CG mechanisms on SR dimensions largely neglect the economic dimension and focus on the environmental and social dimensions (e.g., Ghazali, 2007; Said *et al.*, 2009; Barakat *et al.*, 2015; Jizi, 2017; Muttakin *et al.*, 2018; Ashfaq and Rui, 2019). Therefore, our current understanding of the impact of CG mechanisms on SR practices is partial since SR is about the reporting on the three sustainability pillars (Hahn and Kühnen, 2013). Indeed, the economic dimension is an essential pillar of sustainability (Hussain *et al.*, 2018) and connected *per se* to the environmental and social dimensions (Lozano, 2008). The economic reporting dimension of SR is different from financial reporting as it encompasses information related to, for example, anti-competitive behaviour, market presence, procurement practices, and anti-corruption.

The reporting of the economic dimension of SR is important as it contributes to sustainability (Schneider and Meins, 2012) and withholding such information will eventually harm the welfare

and the health of the societies (Bansal, 2005).[22] For example, several UN SDGs are closely related to the Global Reporting Initiative (GRI) economic dimension SR standards - SDG target 12.7 (promote public procurement practices that are sustainable, in accordance with national policies and priorities) should be reported under GRI standard 204 (procurement practices) and SDG 16.5 (substantially reduce corruption and bribery in all their forms) should be reported under GRI standard 205 (anti-corruption). Thus, disclosure of the economic dimension contributes to the sustainable development agenda. Accordingly, the neglect of this dimension will limit our understanding and undermine the achievement of sustainability and SDGs. Therefore, this paper argues that the economic dimension is a qua non-pillar of SR and should be examined in the CG-SR nexus.[23]

Second, previous studies largely neglect the importance of unpacking the SR dimensions (e.g., Haniffa and Cooke, 2005; Khan *et al.*, 2013; Jizi *et al.*, 2014; Katmon *et al.*, 2019).[24] However, and keeping in mind that sustainability is multidimensional (Hahn and Kühnen, 2013), measuring and drawing insightful conclusions about the association with different dimensions can be challenging (Walls *et al.*, 2012) as CG mechanisms might be restricted in their ability to influence all dimensions of SR. For instance, environmental matters are more technical and systemic, and often depend on internal mechanisms compared to the other dimensions, such as the social dimension, which often rely on external stakeholders' actions (Bansal, Gao and Qureshi, 2014). In this regard, Endrikat *et al.* (2020) find that a particular aspect of corporate social responsibility (CSR) (i.e. social vs environmental dimension) moderates the board attributes-CSR nexus. Walls *et al.* (2012), for example, restrict their study to the environmental dimension, arguing that environmental activities are directed by regulation and may have specific disclosure criteria. Likewise, although economic reporting, from a sustainability viewpoint, is different from financial reporting (Al Farooque and Ahulu, 2017), in practice, firms may focus on the latter and ignore the

[22] As with the environmental and social dimensions, the economic dimension of SR is desirable in stakeholders' minds, especially in that the 2008 global economic recession, resulting from the economic collapse that started because of Wall Street financial firms' meltdown led to serious and urgent concerns from societies about the economic dimension because of the instability and financial risk to governments and fear of job losses (Choi and Ng, 2011).
[23] This is directly linked to Elkington's (1997) ''triple-bottom-line'' approach, which is based on simultaneous pursuit of economic prosperity (profit), environmental quality (planet), and social equity (people).
[24] This is also evidence by Ali *et al.* (2017) who find a scarcity of research investigating determinants of individual pillars of social responsibility disclosure.

former. Thus, and from a practical perspective, the impact of governance mechanisms is likely to differ by dimension.

Accordingly, the paper argues that a comprehensive understanding of the CG-SR nexus requires further investigation on the effect of CG variables on total SR and each of its three dimensions. Such analysis may identify critical CG-SR dimension(s) nexus, provide a possible explanation for the inconclusive results between CG and SR, and support the starting point in developing theories to explain which dimension of SR is influenced by certain CG variables. Moreover, simultaneously exploring the impact of CG on total SR and its three dimensions remains under-researched, as no study has proposed such examination as a stimulus before.

Third, current studies investigating CG-SR nexus mainly focus on a single country (e.g., Haniffa and Cooke, 2005; Rupley *et al.*, 2012; Hoang *et al.*, 2018; Giannarakis *et al.*, 2020) or regional examination (e.g., Michelon and Parbonetti, 2012; Amran *et al.*, 2014; Barakat *et al.*, 2015). Unlike prior research, this study seeks to examine the impact of CG on SR in an international context. Such international investigation can help generalise the results, ensure the reliability of the study, and raise new critical institutional issues that can be investigated around the impact of CG mechanisms on SR. In the same regard, previous studies conducted in developed (e.g., Adel *et al.*, 2019) and developing countries (e.g., Bae *et al.*, 2018) report inconsistent results regarding CG-SR nexus. However, despite the arguments that CG mechanisms may influence SR in developed and developing countries differently (Khan *et al.*, 2013; Katmon *et al.*, 2019), no single empirical study, to the best of the knowledge, has undertaken comparative research about whether, and to what extent, the impact may differ.

Fourth, although sustainability information can be disclosed in different mediums (Hahn and Kühnen, 2013), the majority of the previous studies use a single source of information (e.g., Haniffa and Cooke, 2005; Hoang *et al.*, 2018; Katmon *et al.*, 2019). However, relying on one source of information may penalise companies for not disclosing such information since there is no prescribed single media for companies to disclose sustainability information, especially when investigating an international sample. In other words, using one source may not truly reflect SR practices (Michelon and Parbonetti, 2012), which may cause subjectivity and thus reduce the

results' reliability (Haji, 2013). Moreover, Samaha *et al.* (2015) find that a specific reporting medium (i.e. annual report vs website) moderates the relationship between CEO duality and voluntary disclosure. That is, the impact of CG on SR may differ between various information sources. One possible reason for this is the differences in audit levels among these mediums. For example, the audit level is low in sustainability reports compared to annual reports (Fasan, 2013). In fact, several studies investigating different sources such as annual reports (e.g., Jizi *et al.*, 2014) and sustainability reports (e.g., Amran *et al.*, 2014) find mixed results between certain CG mechanisms and SR.

This paper aims to bridge these gaps in the literature. Specifically, and based on 370 international firms belonging to 50 countries and various information sources, the paper investigates the effect of a specific board-level governance bundle, i.e. size, independence, CEO duality, gender diversity, and sustainability committee (SC) on aggregate SR dimensions – and separately – on each dimension. To do so, this paper draws on stakeholder-agency theory (Hill and Jones, 1992) and uses GRI standards requirements to measure the extent of SR. It also uses two sets of control variables related to firm-level characteristics (i.e. firm size, profitability, assurance quality, leverage, and sector) and country-level factors (i.e. investor protection strength, legal system strength, gender parity, and GDP growth).

The key findings in this paper indicate that board size is positively and significantly associated with total SR, economic reporting, and social reporting, but insignificantly related to environmental reporting. Furthermore, board independence and CEO duality have a significant but negative influence on total SR, economic reporting, and social reporting, but an insignificant influence on environmental reporting. The results also show that board gender diversity has neither an impact on total SR, nor separately on its three dimensions. In terms of the existence of SC, the paper finds a positive and significant influence on total SR and its three dimensions. When the sample is divided into developed and developing countries, the findings show that board size has a significant and positive impact on total SR in developed countries, but insignificant influence in developing countries. In contrast, CEO duality is negatively and significantly associated with total SR in developing countries, but insignificantly in developed countries. Moreover, the results suggest that board independence and board gender diversity have an insignificant influence on

total SR in developed and developing countries. On the other hand, there is a significant and positive relationship between the presence of SC and total SR in both developed and developing countries.

This paper contributes to the literature in several ways. *First*, this study contributes by examining the impact of board characteristics on total SR and its three dimensions. The findings show that the impact of some board mechanisms differs by dimension. Thus, the paper uncovers several aspects of the relationship between CG mechanisms and SR practices, contributes to theory development, and adds new evidence to the literature. Moreover, by separately and aggregately quantifying the dimensions of SR, the paper assesses to what extent firms reported on the three dimensions of SR separately and in an integrated manner. In turn, this enhances our understanding about the CG-SR nexus and provides firms, standard setters, and policymakers with significant and crucial implications.

Second, this study contributes to the current literature by examining the relationship between CG mechanisms and SR practices in an international setting. The study is the first to provide a new understanding of, and greater insights into, whether CG mechanisms has different impacts on SR practices in developed and developing countries. Thus, this study also contributes by providing new evidence of the relationship between CG and SR in developed and developing countries. *Finally*, this study contributes by investigating all possible sources of sustainability information (i.e. sustainability reports and sustainability-related reports, annual reports, integrated reports, and websites). According to Tingbani *et al.* (2020), unlike concentrating on one specific source, focusing on various disclosure sources leads to a much more complete view of the research field's related trends.

The rest of the paper is structured as follows. Section 3.2 discusses the theoretical framework and develops the research hypotheses. The data and methodology are discussed in Section 3.3. Section 3.4 describes and discusses the empirical results. Finally, Section 3.5 provides the conclusion of the study and suggests areas for further research.

3.2 Literature review

3.2.1 Theoretical background: Stakeholder-agency theory

This study draws on the stakeholder-agency theory developed by Hill and Jones (1992) by taking both agency and stakeholder theoretical perspectives. According to this theory, the company can be viewed as a link of numerous contracts between seekers and resource holders (Hill and Jones, 1992). As this paradigm portrays, managers in modern-day firms are considered to have implicit contractual relationships with various stakeholder groups (e.g., consumers, employees, government, and media) – beyond just shareholders, as suggested by the agency theory (Tauringana and Chithambo, 2015; Jain and Zaman, 2020). These stakeholders provide vital resources to the company, and, in return, expect the company to meet their demands and interests (Wernerfelt, 1984; Kock, Santalo and Diestre, 2012). Therefore, and because of this interdependence, stakeholders hold legitimate claims regarding the allocation of company resources, including corporate disclosures (Tauringana and Chithambo, 2015). Consequently, managers are duty-bound to allocate critical resources and make decisions in the best interests of stakeholders (Hill and Jones, 1992; Kock *et al.*, 2012). Thus, they will be seen as the stakeholders' agent, and not only as the shareholders' agent (Hill and Jones, 1992).

However, as happens with agency theory, the principal (i.e. stakeholder)–agent (i.e. managers) relations may be filled with a conflict of interests concerning the way of allocating the various resources of organisations (Kock *et al.*, 2012; Tauringana and Chithambo, 2015). This is due to management's self-interests (Jain and Zaman, 2020) and the complex nexuses of implicit and explicit contractual contracts between the company and its stakeholders (Kock *et al.*, 2012). According to Jain and Zaman (2020), the rationalisation for deviant practices arises from the natural conflicts of stakeholder interests (Hill and Jones, 1992), which lead to agency-like issues (Jensen and Meckling, 1976) in the existence of uncertainty, information asymmetry, and power differences.

Accordingly, and in the context of SR practices, the managers may not act according to what stakeholders seek, or may satisfy the interests of one group of stakeholders at other stakeholders' expense. Thus, these circumstances require developing mechanisms to align managers and

stakeholders' conflicting interests to enhance SR activities. In this regard, monitoring and aligning these interests within the stakeholder-agency viewpoint can be achieved by putting in place CG mechanisms (Kock *et al.*, 2012; Tauringana and Chithambo, 2015). According to Giannarakis *et al.* (2020), the CG role has recently changed to enhance the relationship with corporate stakeholders and ensure their interests, rather than only protecting shareholders' wealth. Indeed, CG mechanisms improve firms' ability to handle emerging concerns and mitigate agency problems (Haniffa and Cooke, 2002), and serve to hold the management accountable for its activities (Li, Pike and Haniffa, 2008).

Although stakeholder-agency theory applies to this study, which employs the agency theory's considerations to an extensive set of stakeholders instead of only shareholders, other theories have been adopted in the literature to explain the motivations behind SR practices. According to Deegan (2002), it is common to apply more than one theory due to the overlap among various theoretical frameworks that explain disclosures. For instance, several studies use legitimacy theory, which is frequently applied by SR literature (e.g., Haniffa and Cooke, 2005; Ghazali, 2007; Khan *et al.*, 2013; Chan *et al.*, 2014).

According to Khan *et al.* (2013), this theory depends on the concept of a 'social contract' that limits organisations' practices within society's boundaries. As this theory states, organisations need to have a social license to conduct their business (i.e. legitimacy) and obtain the essential resources to operate (Deegan, 2002; Hahn and Kühnen, 2013). If a firm is perceived or seen to operate in a non-legitimate way, its contract to maintain its operations may be threatened by society (Chan *et al.*, 2014). In this regard, the firm, according to legitimacy theory, can disclose information (e.g., SR) to legitimise its operations (Khan *et al.*, 2013), thus justifying its continued presence (Ghazali, 2007).

Another useful theory to justify SR practices and has applied by prior studies (e.g., Muttakin *et al.*, 2015; Alotaibi and Hussainey, 2016; Bae *et al.*, 2018) is the signalling theory, where the management can use SR practices to signal to stakeholders that the company is involved in sustainability activities. According to Muttakin *et al.* (2015), this theory suggests that management needs to share information about its activities to reduce the information gap between the firm and

its stakeholder groups. Furthermore, it has been suggested that management tends to disclose more information to signal their practices and results (Hassanein and Hussainey, 2015). In return, they receive signals from society, various stakeholders, and the capital market (Connelly *et al.*, 2011).

3.2.2 Hypotheses development

Among CG mechanisms, the board of directors (BoD) is the fundamental mechanism of firms (Jensen and Meckling, 1976; Liao *et al.*, 2021), which has crucial controls and independent supervising roles (Muttakin *et al.*, 2018). Moreover, Jizi *et al.* (2014) state that when external CG mechanisms fail, internal ones, especially BoD, are supposed to play an essential function in monitoring the management and holding it to account (Li *et al.*, 2008). Furthermore, and from a stakeholder-agency theoretical perspective (Hill and Jones, 1992), BoD has the legitimacy and power to monitor firms' management and ensures that it acts in the various stakeholders' best interests (e.g., SR practices), including shareholders. In this regard, boards' effectiveness and how they discharge their responsibilities are based on how they are structured (Chithambo and Tauringana, 2017). Below, the five sets of hypotheses for the examined bundle of board variables (i.e. size, independence, CEO duality, gender diversity, and SC) are presented.

3.2.2.1 Board size

Board size is a significant mechanism for CG in monitoring management behaviour and performance, whereas a board's practices (e.g., monitoring and making decisions) are influenced by its size (Haniffa and Hudaib, 2006). That is, board size may affect corporate outcomes, such as reporting sustainability information, especially in that boards are responsible for setting social responsibility agendas (Jamali, Safieddine and Rabbath, 2008). In this regard, as stakeholder-agency theory argues, large boards are more likely to represent the interests of shareholders and various stakeholders (Jain and Zaman, 2020). Thus, they should be more effective in enhancing SR. Indeed, large boards ensure that strategies and policies are executed (Zahra, Neubaum and Huse, 2000), providing organisations with the necessary diversity to obtain vital resources and broadened networking (Haniffa and Hudaib, 2006; Amran *et al.*, 2014).

Moreover, small boards hold higher responsibilities and more workload, which may reduce their ability to practice their monitoring roles (Beiner *et al.*, 2004; Jizi, 2017). Guest (2009) argues that boards with a small number of directors affect the quality of advice and control offered because such boards have less diversified backgrounds and experience than larger boards. Furthermore, large boards may positively affect disclosure activities, since such boards provide a variety of knowledge and values (Pfeffer and Salancik, 2003) and consist of directors from among various sets of stakeholders (Hahn, Reimsbach and Schiemann, 2015). Therefore, large boards are presumed to affect SR more positively compared to smaller ones.

The empirical findings regarding board size are mostly limited to either significant and positive (e.g., Esa and Ghazali, 2012; Jizi *et al.*, 2014; Shamil *et al.*, 2014), or insignificant impacts (e.g., Amran *et al.*, 2014; Adel *et al.*, 2019). Consistent with stakeholder-agency theory, and based on both the above discussion and empirical results, this study argues that large boards can enhance the disclosure of sustainability information due to such boards' capacity to perform their responsibilities and satisfy stakeholders' needs efficiently. Thus, the first set of hypotheses is:

H1. Board size has a positive influence on total sustainability reporting.
H1a. Board size has a positive influence on economic reporting.
H1b. Board size has a positive influence on environmental reporting.
H1c. Board size has a positive influence on social reporting.

3.2.2.2 Board independence

Independent directors' existence within organisations is a powerful CG mechanism (Khan *et al.*, 2013). Firms with a higher proportion of independent directors are assumed to have higher transparency and accountability (Amran *et al.*, 2014). Furthermore, independent directors are less dependent on CEOs (Jizi *et al.*, 2014), more concerned about their reputation (Amran *et al.*, 2014), and unlike top management and inside directors, their compensation and remuneration are not based on short-term firm performance (Jizi, 2017). Hence, they are considered counterweight mechanisms, who keep management concentrating on long-term corporate interests (e.g., incorporating sustainability activities in business and management), and who reduce managers'

opportunistic behaviour, which maximises firm value and enhances the level of transparency. From a stakeholder-agency theoretical perspective, independent directors represent multiple stakeholders' interests (Hill and Jones, 1992; Jain and Zaman, 2020). Thus, they may have incentives to influence the disclosure of sustainability activities. According to Arora and Dharwadkar (2011) and Jamali *et al.* (2008), a board with a higher percentage of independent directors is expected to direct management more toward engaging in and disclosing social responsibility practices.

Empirically, Khan *et al.* (2013), Jizi *et al.* (2014), and Jizi (2017), for example, find a significant and positive impact on certain SR aspects. On the other hand, Haniffa and Cooke (2005), Esa and Ghazali (2012), and Adel *et al.* (2019) find a significant but negative impact on certain pillars of SR. By contrast, other studies find no significant effect (e.g., Rupley *et al.*, 2012; Amran *et al.*, 2014; Shamil *et al.*, 2014). However, consistent with the stakeholder-agency theoretical perspective, and based on the above discussion, this study argues that independent directors can pressure managers to report sustainability information to ensure sustainability achievement and minimise asymmetric information with different stakeholders. Thus, the second set of hypotheses is drawn as follows:

H2. Board independence has a positive influence on total sustainability reporting.
H2a. Board independence has a positive influence on economic reporting.
H2b. Board independence has a positive influence on environmental reporting.
H2c. Board independence has a positive influence on social reporting.

3.2.2.3 CEO duality

In line with the stakeholder-agency theory, managements' private interests are likely to affect the interests of various sets of stakeholders (i.e. the level of SR) as firms' relationship with their stakeholders is greatly influenced by the CEOs' decisions. In this regard, CEO duality could represent executive power (Jizi *et al.*, 2014; Jizi, 2017). Thus, it might allow CEOs to influence directors' decisions (e.g., accepting management decisions instead of their judgments) (Dey, 2008), affect the boards' appointments for their own benefit (Haniffa and Cooke, 2002), and hide

valuable information from other board members (Li *et al.*, 2008). This, in turn, diminishes the board's objectivity as a controlling mechanism, reduces its independency, and decreases the transparency and accountability of the company. According to Donnelly and Mulcahy (2008), when firms have no independent leaders, their boards execute their functions with difficulty, thus reducing the intention to disclose information.

Similar to board independence, previous studies report mixed results between CEO duality and certain SR aspects. For instance, Jizi *et al.* (2014) and Biswas *et al.* (2019) report a significant and positive relationship with disclosing sustainability-related information, while Shamil *et al.* (2014) show a significant but negative impact. Conversely, others find no significant effect (e.g., Said *et al.*, 2009; Jizi, 2017). Still, based on stakeholder-agency theory and the above discussions, this study argues that separating the CEO and chairman roles helps in better monitoring and reducing information asymmetry between managers and stakeholders through SR. Thus, the third set of hypotheses is proposed as follows:

H3. CEO duality has a negative influence on total sustainability reporting.
H3a. CEO duality has a negative influence on economic reporting.
H3b. CEO duality has a negative influence on environmental reporting.
H3c. CEO duality has a negative influence on social reporting.

3.2.2.4 Board gender diversity

According to Rao and Tilt (2016a), gender diversity is considered one of the most critical concerns to modern contemporary organisations, amongst other board diversity characteristics. Women on boards are likely to affect companies positively (Carter, Simkins and Simpson, 2003), and their governance in significant ways (Adams and Ferreira, 2009). Indeed, several studies argue there is wide variation between males and females in impressions, principles, and perceptions (Cabeza-García *et al.*, 2018). As the stakeholder-agency paradigm argues, boards have the power to control a company's managers and assure that they act in the best interests of stakeholders (Hill and Jones, 1992). In this regard, women on boards tend to be more concerned with protecting stakeholders'

interests, for instance in sustainability practices. Arguably, therefore, gender diversity can be viewed through the lens of stakeholder-agency theory.

Several explanations may underlie the role of gender-diverse boards toward sustainability-related activities.[25] First, women on boards are more afraid of litigations and loss of reputation, thus encouraging disclosure activities (Srinidhi, Gul and Tsui, 2011). Hence, they are motivated to engage more in sustainability issues (Helfaya and Moussa, 2017) and are expected to have higher transparency levels and better monitoring management practices (Jizi, 2017). Second, female directors, compared with their male counterparts, have more diverse values, networks, backgrounds, and beliefs (Campbell and Mínguez-Vera, 2008; Jizi, 2017), unique expertise and working techniques, different communication abilities, and more wisdom and commitment (Huse and Solberg, 2006), and more varied professional and educational backgrounds (Cabeza-García *et al.*, 2018). Accordingly, they offer additional independent views (Jizi, 2017), bring diverse ideas to board discussions (Barako and Brown, 2008), add quality to decision-making processes, and enhance the corporate image (Campbell and Mínguez-Vera, 2008). As a result, they improve corporate dedication to social responsibility practices (Helfaya and Moussa, 2017). Third, gender-diverse boards are more stakeholder-oriented and more sensitive to social responsibility matters (Hussain *et al.*, 2018), because female directors care and engage more in environmental and social issues than male directors (Amran *et al.*, 2014; Rao and Tilt, 2016a). Thus, such boards are expected to promote social responsibility-related activities (Cabeza-García *et al.*, 2018) and move faster towards the economic, environmental, and social aspects of sustainability (Katmon *et al.*, 2019).

Empirical findings on the impact of board gender diversity on specific dimensions of SR practices are mixed and inconclusive, e.g., significant and positive (Jizi, 2017), significant but negative (Shamil *et al.*, 2014), and insignificant (Adel *et al.*, 2019). However, drawing on stakeholder-agency theoretical perspective and the above discussion, this study argues that female directors help to align managerial interests with both shareholders' interests and other stakeholders'

[25] These explanations are related but not limited to enhancing board independence, creating an appropriate boardroom atmosphere, and adding quality to the decision-making process.

interests, reducing sustainability information asymmetry. The fourth set of hypotheses is as follows:

H4. Board gender diversity has a positive influence on total sustainability reporting.
H4a. Board gender diversity has a positive influence on economic reporting.
H4b. Board gender diversity has a positive influence on environmental reporting.
H4c. Board gender diversity has a positive influence on social reporting.

3.2.2.5 Sustainability committee

The sustainability/CSR committee is another component of the CG bundle that has long been neglected but has recently been examined by disclosure literature (e.g., Helfaya and Moussa, 2017; Adel *et al.*, 2019; Giannarakis *et al.*, 2020). According to Jain and Zaman (2020), companies form various board committees to deal with extensive groups of issues based on their severity and particularity. The existence of such sub-committees enables directors to consider matters more thoroughly than the whole board (Tingbani *et al.*, 2020). In the context of SR, literature suggests that one way to measure an organisation's attitude and commitment toward sustainability activities is through the existence of the SC.[26]

Theoretically, the relationship between SC and SR practices can be seen from a stakeholder-agency perspective. According to this theory (Hill and Jones, 1992), boards are tasked to monitor organisations' sustainable behaviour and ensure that companies are accountable to a broad set of stakeholders. In this regard, the board's effectiveness depends on its governance structure, and not only on its composition (John and Senbet, 1998). Given the importance of creating a SC to urge boards toward sustainability practices, it can be argued that the presence of a SC, according to the stakeholder-agency paradigm, helps to satisfy stakeholders' needs. This is also linked to the theoretical foundation coupled with rationality that supports the positive impact of the SC on SR (Ricart, Rodríguez and Sánchez, 2005).

[26] Unlike the audit committee, for example, which is frequently mandated, the SC is purely voluntary.

Indeed, establishing a SC is expected to be a powerful monitoring mechanism (Walls *et al.*, 2012). Furthermore, the existence of such committees is seen as a capital resource for organisations, where the knowledge and experience of the SCs are assumed to perform a significant function in guaranteeing the sustainability aspect (Amran *et al.*, 2014). Moreover, according to Jain and Zaman (2020), SCs are committed to presenting proposals to the full board regarding social responsibility strategies. Accordingly, SCs within organisations help enhance corporate behaviour to satisfy stakeholders' needs regarding sustainability information (Michelon and Parbonetti, 2012).

Nevertheless, there is no clear-cut relationship according to prior empirical results. The literature shows both a positive (e.g., Amran *et al.*, 2014; Adel *et al.*, 2019) and insignificant impact (e.g., Michelon and Parbonetti, 2012; Giannarakis *et al.*, 2020) of SC on SR practices. However, from the stakeholder-agency perspective, this study expects that the SC leads to more SR to reduce information asymmetry between management and various stakeholders. The fifth set of hypotheses in this regard is:

H5. The sustainability committee has a positive influence on total sustainability reporting.
H5a. The sustainability committee has a positive influence on economic reporting.
H5b. The sustainability committee has a positive influence on environmental reporting.
H5c. The sustainability committee has a positive influence on social reporting.

3.3 Data and methodology

3.3.1 Sample selection

Based on an international approach, the sample in this study was taken from a GRI list of reporting companies for the 2017 calendar year (i.e. January to December). This year was chosen because it was the year following the issue of GRI standards (i.e. 2016). A company was included in the sample if it met the following three criteria. First, the company should have issued a report covering 2017, prepared according to GRI standards, and verified and submitted to the GRI database. This resulted in the identification of 878 companies belonging to 77 countries. Second, the company should be listed on a stock exchange. Accordingly, 369 non-listed companies and 14

countries were excluded from the studied sample. Third, the issued report should be prepared in the English language. As a result, the study dropped 114 companies and six countries from the sample. Then, due to missing data, the study excluded further 25 companies and seven countries. The study ended up examining a sample of 370 companies belonging to 50 countries. Panel A of Table 3.1 summarises the sample description in terms of sample size and number of countries. Panel B of the same table shows the distribution of samples across the region and country development.

Table 3.1: Sample description

Panel A: **Sample size and the number of countries**			
Number of companies in 2017	878	Number of countries in 2017	77
Less:		Less:	
Non-listed companies	369	Countries with non-listed companies	14
Non-English reports	114	Countries with non-English reports	6
Missing data	25	Countries with missing data	7
Total	**370**	**Total**	**50**
Panel B: **Distribution of the sample by region and country development**			
Developed countries:	*218 (22)*	*Developing countries:*	*152 (28)*
Europe	140 (20)	Africa	4 (3)
Northern America	78 (2)	Asia	124 (18)
		Europe	6 (1)
		Latin America & the Caribbean	18 (6)

Note: Panel A of this table summarises the sample description in terms of sample size and the number of countries. Panel B shows the distribution across the region and country development. In panel B, the number between parentheses represents the number of countries in the sample. The distribution by region is based on GRI classification.
- The classification of countries into "developed" and "developing" countries is based on the World Economic Situation and Prospects Report (2020).
https://www.un.org/development/desa/dpad/wpcontent/uploads/sites/45/publication/WESP2020_FullReport_web.pdf

3.3.2 Dependent variable(s): Sustainability reporting

According to Hahn and Kühnen (2013), the main sources through which companies demonstrate their sustainability information are annual reports, integrated reports, sustainability reports, separate reports (e.g. sustainability-related reports), and websites. Nevertheless, the majority of previous studies focus on one source to investigate the influence of CG mechanisms on SR practices (e.g., Mallin *et al.*, 2013; Amran *et al.*, 2014; Muttakin *et al.*, 2018; Pucheta-Martínez and Chiva-Ortells, 2018; Katmon *et al.*, 2019). However, there is no agreed medium to disclose sustainability information, especially when examining an international sample. Therefore, this study investigates a broad range of SR sources (i.e. annual reports, integrated reports, websites, sustainability reports, and other sustainability-related reports) to capture as full a picture as possible of reporting activities and to avoid penalising companies for non-disclosure information.[27]

Several guidelines (e.g., ISO 14000 series, SA8000 standard, AA1000 standards, and GRI guidelines) have been developed by several national and international institutions to inform various stakeholders concerning corporations' commitment toward achieving sustainability (Lozano and Huisingh, 2011; Giannarakis *et al.*, 2019). However, GRI is the primary driver of SR practices and considered the most accepted and recognised initiative in the SR field (Fonseca *et al.*, 2014; Junior *et al.*, 2017; Lambrechts *et al.*, 2019). In fact, a recent survey on SR practices that has been conducted by KPMG shows that GRI remains the dominant global standards for SR activities, employed by 67% of N100 and 73% of G250 reporters (KPMG, 2020). The main aim of the GRI is to enhance accountability and transparency of the organisations and improve engagement of the various stakeholder groups (Vigneau *et al.*, 2015). To achieve this aim, Hussain *et al.* (2018) state that the GRI challenges corporations to disclose information about the three

[27] In similar vein, although previous studies have used annual reports to investigate the influence of CG mechanisms on SR practices (e.g., Haniffa and Cooke, 2005; Khan *et al.*, 2013; Hoang *et al.*, 2018), they target specific stakeholder groups and concentrate on financial outcomes compared to sustainability reports that cover broad stakeholder groups and focus on both direct and indirect impacts of sustainability dimensions (Fasan, 2013). Accordingly, annual reports may not truly reflect the reporting activities regarding sustainability practices. Likewise, websites are aimed at a wider public than annual reports (Branco and Rodrigues, 2008a), and more companies are increasingly publishing their sustainability information on their websites (Ong and Djajadikerta, 2018). Therefore, websites are an essential medium to understand SR activities, as it is natural for firms to give prominence to disclosing sustainability information on their web pages.

pillars of sustainability by providing guidelines on what and how to disclose in stand-alone reports, assuming equal importance for each pillar to achieve corporate sustainability.

In this study, the disclosure index is based on GRI standards issued in 2016, which include a set of performance indicators for each dimension that cover a variety of sustainability issues. In greater detail, GRI standards have 77 items in total; 13 items related to the economic dimension, 30 items related to the environmental dimension, and 34 items related to the social dimension (see Appendix B). Under these standards, the economic dimension has six sub-dimensions: economic performance, market presence, indirect economic impacts, procurement practices, anti-corruption, and anti-competitive behaviour.[28] In terms of the environmental dimension, it refers to several issues such as materials, energy, water and effluents, biodiversity, emissions, waste, environmental compliance, and supplier environmental assessment. The social dimension has four sub-groups: labour practices and decent work, human rights, societies, and products responsibility.

To quantify the extent of SR practices, this study performs a content analysis that is extensively applied in disclosure studies. In this regard, quantifying reporting activities can be conducted using a weighted or unweighted approach (Tingbani *et al.*, 2020). Gray, Kouhy and Lavers (1995) suggest that sustainable differences in the produced results between the two approaches are not expected. Nevertheless, the unweighted approach, where all information is equally valued (Cooke, 1989), provides researchers with fewer choices, thereby making it more reliable (Hackston and Milne, 1996). Furthermore, Cooke (1989) mentions that this approach is most appropriate when no significance is provided to any specific user-group. Therefore, and following several studies (e.g., Michelon and Parbonetti, 2012; Muttakin and Subramaniam, 2015; Mahmood and Orazalin, 2017; Pucheta-Martínez and Gallego-Álvarez, 2019), the unweighted approach is used. Under this approach, a firm is awarded one if an item is disclosed, and zero otherwise. Then, for each of the sample companies, the aggregate score for total SR practices and each of its three dimensions is computed.

[28] As stated before, and from a sustainability perspective, it is clear that the economic dimension is different from traditional financial disclosure.

For economic reporting, environmental reporting, and social reporting, the score is calculated as follows:

$$Firm_j, SR_{eco,env,soc} = (Number\ of\ items\ disclosed)\ /\ (Total\ number\ of\ items) \quad (1)$$

where, $SR_{eco,env,soc}$ represents three dependent variables; these are the economic dimension (13 items), the environmental dimension (30 items), and the social dimension (34 items).

As this study acknowledges the equal weight of three dimensions, the aggregate score is calculated as follows:

$$Firm_j, SR_{total} = \left(Score_{eco} * \frac{1}{3}\right) + \left(Score_{env} * \frac{1}{3}\right) + \left(Score_{soc} * \frac{1}{3}\right) \quad (2)$$

3.3.3 Independent variables: Corporate governance

To test the five sets of hypotheses, this study investigates a specific bundle of board-level characteristics: board size, board independence, CEO duality, board gender diversity, and the presence of SC. The data for these variables are obtained manually from the annual reports and sustainability reports and from DataStream, and their measurements are illustrated in detail in Table 3.2.

3.3.4 Control variables

To avoid model misspecification, we control for two sets of variables. The first set is related to firm-level characteristics, while the second set is related to country-level institutional factors. The data for the first set of control variables is obtained from DataStream and annual reports. In contrast, the data for the second set is obtained from multiple sources (i.e. World Bank database, the Worldwide Governance Indicators, and the World Economic Forum's Global Gender Gap Report).

For firm-level characteristics, and in line with prior research into SR, this study controls the firm size. Large companies experience greater attention from different groups in societies (Khan *et al.*, 2013) and perform activities that have more significant effects on communities (Muttakin *et al.*, 2018), thus being under tremendous pressure to disclose more information. Moreover, and following Jizi *et al.* (2014), this study incorporates a variable that captures profitability, as profitable firms tend to influence SR activities positively. Furthermore, and since sustainability report assurance enhances credibility and reliability of the SR practices (Junior, Best and Cotter, 2014), thus positively affecting reporting activities, the assurance quality is also accounted for in the analysis. In addition, the impact of firm leverage is controlled, since organisations with high leverage have fewer chances to disclose social responsibility information (Jizi, 2017). Finally, this study controls for the sector variable, i.e. financial sector or non-financial sector, since the former is different and governed by different statutory requirements (Haniffa and Cooke, 2005).

For country-level factors, this study first controls for the investor protection strength. According to Ioannou and Serafeim (2012), in countries with a great level of shareholder interest protection, other stakeholders' interests are significantly lowered. The study also controls for legal system strength, as the degree of law enforcement in a country is one of the most significant factors that determine how CG evolves in that country (La Porta *et al.*, 1998), and the level of pressure to report information (Barakat *et al.*, 2015). In addition, gender parity is controlled, as it affects decision-making processes and board decisions, and ultimately, firm outcomes (Post and Byron, 2015), for example, SR activities. Finally, and following empirical disclosure literature (Lu and Wang, 2021), GDP growth is controlled in the analysis.

3.3.5 Empirical model

The following model using OLS multiple regression is employed to test the five sets of hypotheses:

$$\chi_{SR,eco,env,soc} = \alpha + \beta_1 BS + \beta_2 BI + \beta_3 Dual + \beta_4 BGD + \beta_5 SC + \beta_6 FS + \beta_7 ROA + \beta_8 AQ + \beta_9 LEV + \beta_{10} SEC + \beta_{11} IPS + \beta_{12} LSS + \beta_{13} GP + \beta_{14} GDPG + \varepsilon \quad (3)$$

Table 3.2 below defines the dependent variables, independent variables, and control variables in this study.

Table 3.2: Definition of variables (all variables at time *t*)

Variable	Symbol	Measurement
Dependent Variables		
Sustainability Reporting	*SR*	(1/3) * (score for Eco + score for Env + score for Soc).
Economic Reporting	*Eco*	Number of economic items disclosed divided by total number of economic items (that is, 13 items).
Environmental Reporting	*Env*	Number of environmental items disclosed divided by total number of environmental items (that is, 30 items).
Social Reporting	*Soc*	Number of social items disclosed divided by total number of social items (that is, 34 items).
Independent Variables		
Board Size	*BS*	The number of directors on the board.
Board Independence	*BI*	The proportion of independent directors on the board of directors.
CEO Duality	*Dual*	Dummy variable equal to one if the CEO and the chairman are the same person and zero otherwise.
Board Gender Diversity	*BGD*	The proportion of female directors on the board of directors.
Sustainability Committee	*SC*	Dummy variable equal to one if the firm has a sustainability committee and zero otherwise.
Control Variables		
Firm Size	*FS*	The logarithmic of total assets.
Profitability	*ROA*	The ratio of earnings before interest and tax to total assets.
Assurance Quality	*AQ*	Dummy variable equal to one if the sustainability/integrated report is externally assured and zero otherwise.
Leverage	*LEV*	The ratio of total liabilities to total assets.
Sector	*SEC*	Dummy variable equal to one if the firm is in the non-financial sector and zero otherwise.
Investor Protection Strength	*IPS*	Using the strength of investor protection index (World Bank).
Legal System Strength	*LSS*	Using the sum score of Worldwide Governance Indicators ranging from -15 (weak) to 15 (strong).
Gender Parity	*GP*	Using the World Economic Forum's Global Gender Gap score.
GDP Growth	*GDPG*	The annual percentage change of GDP growth based on constant 2010 US dollars (World Bank).

3.4 Results and discussion

3.4.1 Descriptive statistics

The mean and standard deviation for the total SR, economic reporting, environmental reporting, and social reporting across the countries are presented under Panel A of Table 3.3. Panel B of the same table reports the mean and standard deviation for the four dependent variables across sectors based on GRI classification.

Table 3.3: Descriptive statistics by country and by sector

Country	Obs.	SR		Eco		Env		Soc	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Panel A: Mean and standard deviation (SD) of SR, Eco, Env, and Soc by country (N=370)									
Argentina	1	0.36		0.23		0.53		0.32	
Austria	7	0.42	0.12	0.45	0.11	0.44	0.12	0.38	0.18
Bahrain	1	0.41		0.46		0.50		0.27	
Belgium	6	0.41	0.12	0.37	0.21	0.42	0.13	0.45	0.16
Brazil	4	0.69	0.17	0.77	0.19	0.63	0.25	0.66	0.11
Canada	12	0.39	0.24	0.44	0.28	0.38	0.24	0.35	0.23
Chile	4	0.60	0.36	0.65	0.37	0.55	0.37	0.59	0.35
Colombia	2	0.49	0.24	0.62	0.33	0.42	0.26	0.44	0.13
Czech Republic	2	0.49	0.13	0.58	0.05	0.33	0.28	0.54	0.06
Egypt	1	0.25		0.39		0.13		0.24	
Finland	10	0.46	0.20	0.49	0.23	0.43	0.21	0.46	0.23
France	3	0.61	0.21	0.69	0.40	0.60	0.22	0.53	0.24
Germany	21	0.58	0.23	0.64	0.26	0.52	0.21	0.57	0.26
Greece	10	0.33	0.21	0.34	0.20	0.32	0.27	0.35	0.23
Hong Kong	18	0.41	0.20	0.43	0.23	0.41	0.23	0.40	0.20
Hungary	3	0.75	0.39	0.77	0.34	0.73	0.43	0.74	0.41
India	2	0.69	0.43	0.65	0.49	0.80	0.28	0.60	0.52
Indonesia	3	0.27	0.01	0.26	0.09	0.21	0.08	0.34	0.02
Ireland	2	0.43	0.37	0.42	0.16	0.41	0.54	0.46	0.41
Italy	7	0.44	0.17	0.46	0.19	0.41	0.14	0.46	0.26
Jordan	3	0.45	0.25	0.64	0.35	0.33	0.24	0.38	0.18

Korea, Republic of	1	0.88		0.85		0.93		0.85	
Kuwait	1	0.54		0.77		0.37		0.47	
Lebanon	1	0.29		0.39		0.20		0.29	
Malaysia	6	0.37	0.30	0.37	0.30	0.40	0.35	0.33	0.29
Mexico	6	0.52	0.19	0.60	0.27	0.39	0.25	0.56	0.17
Netherlands	7	0.44	0.30	0.57	0.30	0.35	0.30	0.39	0.35
Nigeria	2	0.42	0.14	0.54	0.22	0.23	0.14	0.49	0.06
Norway	5	0.30	0.14	0.35	0.21	0.19	0.18	0.37	0.15
Palestine	3	0.41	0.15	0.41	0.32	0.41	0.15	0.41	0.10
Panama	1	0.40		0.62		0.13		0.44	
Philippines	6	0.40	0.18	0.35	0.12	0.44	0.17	0.41	0.29
Poland	1	0.43		0.62		0.23		0.44	
Portugal	4	0.60	0.27	0.69	0.23	0.55	0.32	0.55	0.33
Romania	1	0.93		0.92		0.87		1.00	
Russian Federation	6	0.46	0.14	0.59	0.20	0.41	0.18	0.37	0.15
Saudi Arabia	1	0.62		0.85		0.40		0.62	
Singapore	37	0.29	0.15	0.31	0.17	0.26	0.18	0.29	0.16
Slovenia	2	0.44	0.11	0.65	0.05	0.22	0.17	0.44	0.21
South Africa	1	0.44		0.62		0.52		0.19	
Spain	6	0.68	0.28	0.76	0.23	0.63	0.36	0.65	0.31
Sri Lanka	2	0.56	0.10	0.58	0.16	0.51	0.13	0.59	0.33
Sweden	20	0.27	0.20	0.30	0.22	0.26	0.24	0.26	0.21
Switzerland	13	0.45	0.27	0.47	0.32	0.46	0.31	0.43	0.27
Taiwan	11	0.71	0.23	0.73	0.25	0.70	0.27	0.71	0.24
Thailand	16	0.47	0.22	0.44	0.26	0.50	0.24	0.46	0.24
Turkey	8	0.51	0.22	0.55	0.34	0.50	0.13	0.48	0.24
UAE	4	0.55	0.34	0.51	0.35	0.55	0.37	0.60	0.32
UK	10	0.48	0.22	0.47	0.24	0.50	0.23	0.47	0.24
US	66	0.43	0.22	0.42	0.28	0.46	0.22	0.41	0.25
Sector									
Panel B: Mean and standard deviation (SD) of SR, Eco, Env, and Soc by sector (N=370)									
Agriculture	8	0.47	0.16	0.41	0.21	0.53	0.17	0.45	0.15
Automotive	7	0.45	0.19	0.47	0.22	0.45	0.22	0.44	0.21
Aviation	4	0.54	0.16	0.60	0.21	0.53	0.11	0.50	0.17

Chemicals	23	0.49	0.25	0.45	0.29	0.54	0.24	0.47	0.27
Commercial Services	6	0.47	0.30	0.49	0.33	0.44	0.32	0.47	0.30
Computers	5	0.55	0.29	0.68	0.35	0.51	0.34	0.47	0.25
Conglomerates	11	0.37	0.15	0.36	0.16	0.37	0.20	0.37	0.17
Construction	9	0.27	0.18	0.33	0.26	0.20	0.16	0.29	0.16
Construction Materials	9	0.57	0.28	0.60	0.30	0.57	0.30	0.55	0.32
Consumer Durables	3	0.63	0.30	0.64	0.24	0.61	0.35	0.63	0.32
Energy	31	0.51	0.25	0.54	0.26	0.52	0.27	0.47	0.26
Energy Utilities	16	0.53	0.25	0.56	0.29	0.56	0.28	0.45	0.29
Equipment	5	0.42	0.31	0.35	0.32	0.47	0.30	0.42	0.33
Financial Services	67	0.37	0.22	0.46	0.27	0.28	0.21	0.36	0.23
Food and Beverage Products	8	0.46	0.26	0.43	0.31	0.51	0.24	0.45	0.28
Forest and Paper Products	7	0.40	0.24	0.36	0.28	0.50	0.22	0.33	0.30
Healthcare Products	11	0.52	0.23	0.50	0.25	0.51	0.26	0.54	0.21
Healthcare Services	1	0.34		0.31		0.37		0.35	
Household and Personal Products	3	0.78	0.14	0.85	0.15	0.80	0.17	0.70	0.12
Logistics	1	0.99		1.00		0.97		1.00	
Media	2	0.30	0.05	0.39	0.11	0.22	0.02	0.31	0.02
Metals Products	12	0.43	0.23	0.42	0.25	0.47	0.22	0.41	0.29
Mining	10	0.53	0.28	0.59	0.31	0.53	0.28	0.47	0.26
Others	30	0.40	0.23	0.43	0.28	0.36	0.22	0.42	0.25
Railroad	2	0.55	0.15	0.50	0.05	0.63	0.24	0.52	0.15
Real Estate	37	0.36	0.17	0.40	0.22	0.36	0.18	0.34	0.18
Retailers	6	0.40	0.15	0.47	0.24	0.23	0.17	0.49	0.18
Technology Hardware	11	0.57	0.31	0.54	0.37	0.61	0.27	0.57	0.32
Telecommunication	18	0.48	0.21	0.50	0.22	0.42	0.21	0.52	0.27
Textiles and Apparel	2	0.22	0.00	0.12	0.05	0.34	0.14	0.20	0.07
Tobacco	1	0.63		0.77		0.40		0.71	
Tourism/Leisure	3	0.43	0.25	0.44	0.42	0.44	0.20	0.40	0.29
Water Utilities	1	0.49		0.46		0.50		0.50	

Note: This table reports the mean and standard deviation for the four dependent variables across countries and sectors. All scores range from 0 to 1. Distribution by sector is based on GRI classification.

Abbreviations: N, the number of observations; SR, sustainability reporting; Eco, economic reporting; Env, environmental reporting; Soc, social reporting.

Table 3.4 below presents descriptive statistics for all the variables used in the empirical specifications. The results indicate that the total SR scores have a wide range from 5.5% to a 100% but overall, the mean is 44.3%, which indicates that the level of reporting sustainability information is moderate. For individual dimensions, firms, on average, disclose more information related to the economic dimension (as indicated by a mean of 47.2%), followed by the social dimension (with a mean of 43%) and the environmental dimension (as suggested by the mean of 42.8%). In the same vein, the reporting scores range from 7.7%, 0%, and 2.9% for the economic, environmental, and social dimensions, respectively, to a maximum value of 100%.

Table 3.4: Summary descriptive statistics for all variables (N=370)

Variables	Mean	SD	Min	Max	Skew.	Kurt.
Sustainability reporting	0.443	0.233	0.055	1.00	0.646	2.761
Economic reporting	0.472	0.270	0.077	1.00	0.380	2.131
Environmental reporting	0.428	0.251	0.000	1.00	0.482	2.68
Social reporting	0.430	0.249	0.029	1.00	0.607	2.601
Board size	10.630	3.404	5	29	1.493	7.363
Board independence	0.575	0.247	0.00	1.00	-0.302	2.347
CEO duality	0.222	0.416	0	1	1.340	2.797
Board gender diversity	0.188	0.124	0.00	0.500	0.252	2.518
Sustainability committee	0.654	0.476	0	1	-0.648	1.420
Firm size	9.872	0.839	7.185	12.259	-0.089	3.242
ROA	0.066	0.082	-0.596	0.531	-1.049	19.330
Assurance quality	0.532	0.500	0	1	-0.130	1.017
Leverage	0.618	0.235	0.028	2.225	1.202	9.545
Sector	0.719	0.450	0	1	-0.974	1.949
Investor protection strength	6.710	0.986	3.500	8.300	-0.306	3.252
Legal system strength	6.079	4.479	-6.186	10.917	-0.993	2.636
Gender parity	0.723	0.050	0.584	0.830	0.254	2.851
GDP growth	0.032	0.016	-0.047	0.082	0.818	5.253

Note: Variable definitions are reported in Table 3.2.

In terms of the independent variables, the mean for the board size is about 11 members, with a minimum of five and a maximum of 29. The results also indicate that the percentage of board independence varies between 0% and 100%, with a mean of 57.5% (i.e. on average, more than half of the boards are composed of independent directors). For CEO duality, the results show that most companies have a CEO who is not the chairman of the same firm, whereas only about 22.2% of firms have role duality. Regarding board gender diversity ranging from 0% to 50%, the results show low levels of female engagement, as the mean is 18.8%, which is a sign of male-dominated boards (i.e. heterogeneous boards). On average, about 65.4% of companies have established a SC, which indicates that such committees are becoming common.

3.4.2 Correlation analysis

Table 3.5 presents the correlations among all variables in this study. Most of the variables are significantly correlated with the four dependent variables (total SR, economic reporting, environmental reporting, and social reporting). The results show that all correlation values fall below the threat value recommended by Field (2013), which is 0.8 or 0.9, where the highest correlation is 0.55 between legal system strength and gender parity. Hence, there is no indication of a multicollinearity issue in this study. Nevertheless, although no correlation value is found to be very large, some degree of multicollinearity can remain (Myers, 1990). Thus, this study also uses VIF-test as an additional test to detect multicollinearity issues. The maximum VIF is 2.01 (with a mean of 1.44), which confirms that multicollinearity does not affect the examined models in this study.

Moreover, and to detect the problem of heteroscedasticity, both Breusch–Pagan/Cook–Weisberg tests were performed. The result shows a highly significant test statistic, which indicates the existence of the heteroscedasticity issue. This, in turn, renders the drawn conclusion and results biased and misleading if heteroscedasticity is not controlled. In this regard, different options, such as the use of robust standard errors and variable transformation can be used to control heteroscedasticity (Berry and Feldman, 1985). This study does so, using the robust option in Stata 16 and transforming the firm size using the logarithm.

Table 3.5: Pearson correlation

Variables	VIF	1	2	3	4	5	6	7	8
1. Sustainability reporting		1							
2. Economic reporting		0.914***	1						
3. Environmental reporting		0.882***	0.672***	1					
4. Social reporting		0.934***	0.809***	0.744***	1				
5. Board size	1.40	0.301***	0.283***	0.262***	0.276***	1			
6. Board independence	1.44	-0.102**	-0.129**	-0.018	-0.129**	-0.080	1		
7. CEO duality	1.06	-0.085	-0.079	-0.053	-0.099*	0.031	0.161***	1	
8. Board gender diversity	1.51	0.018	0.033	-0.004	0.019	0.092*	0.318***	0.010	1
9. Sustainability committee	1.24	0.310***	0.238***	0.322***	0.290***	0.192***	0.163***	0.019	0.060
10. Firm size	1.96	0.200***	0.220***	0.176***	0.149***	0.441***	0.196***	0.114**	0.293***
11. ROA	1.07	0.074	0.034	0.136***	0.034	-0.001	0.064	-0.044	0.046
12. Assurance quality	1.29	0.350***	0.300***	0.336***	0.322***	0.328***	-0.016	0.017	0.190***
13. Leverage	1.17	-0.112**	-0.036	-0.190***	-0.085	0.083	0.075	0.064	0.093*
14. Sector	1.27	0.206***	0.076	0.299***	0.196***	-0.020	0.017	-0.057	-0.089*
15. Investor protection strength	1.45	-0.167***	-0.176***	-0.132**	-0.147***	-0.197***	0.055	-0.056	-0.074
16. Legal system strength	2.01	-0.129**	-0.131**	-0.099*	-0.12**	-0.101*	0.384***	0.076	0.293***
17. Gender parity	2.01	-0.087*	-0.079	-0.083	-0.077	-0.034	0.258***	-0.013	0.473***
18. GDP growth	1.22	0.043	0.002	0.062	0.055	-0.039	-0.249***	-0.028	-0.170***

Table 3.5: Continued

Variables	9	10	11	12	13	14	15	16	17	18
1. Sustainability reporting										
2. Economic reporting										
3. Environmental reporting										
4. Social reporting										
5. Board size										
6. Board independence										
7. CEO duality										
8. Board gender diversity										
9. Sustainability committee	1									
10. Firm size	0.276***	1								
11. ROA	-0.013	-0.091*	1							
12. Assurance quality	0.241***	0.335***	0.024	1						
13. Leverage	-0.009	0.279***	-0.141***	-0.039	1					
14. Sector	0.026	-0.354***	0.159***	-0.008	-0.223***	1				
15. Investor protection strength	0.050	-0.203***	-0.093*	-0.065	-0.134***	0.029	1			
16. Legal system strength	-0.023	0.033	-0.031	-0.065	-0.026	0.00	0.313***	1		
17. Gender parity	-0.164***	0.054	0.054	0.049	-0.028	0.058	-0.088*	0.550***	1	
18. GDP growth	0.009	-0.196***	-0.069	0.009	-0.149***	0.042	0.250***	-0.148***	-0.201***	1

Note: The detailed definitions of the variables can be found in Table 3.2.
*significance at 10% level.**significance at 5% level.***significance at 1% level.

3.4.3 Regression analysis and discussion

The baseline results on the influence of the board-level governance bundle (i.e. board size, board independence, CEO duality, board gender diversity, and the presence of SC) on SR practices and its three dimensions (i.e. economic, environmental and social), along with the two sets of control variables (i.e. firm-level characteristics and country-level institutional factors), are presented in Table 3.6. The relationships between board-level governance variables and total SR, economic reporting, environmental reporting, and social reporting practices are investigated in Model 1, Model 2, Model 3, and Model 4, respectively. Regarding the R-squared, the values for the four investigated models are 0.311, 0.213, 0.352, and 0.267, respectively, which indicate the variabilities in the four dependent variables that the examined variables could explain. In terms of the adjusted R-squared, the values for the four investigated models are 0.283, 0.182, 0.326, 0.238, respectively.

The results demonstrate that board size has a significant and positive influence on total SR, economic reporting, and social reporting, at a 5% significance level. However, there is no significant relationship between board size and environmental reporting. Thus, H1, H1a, and H1c are supported, but not H1b. Interestingly, apart from the result of the environmental reporting, which indicates an insignificant effect, board independence is negatively associated to total SR, economic reporting, and social reporting. The significance is at 5%, 1%, and 5% levels, respectively. Therefore, H2, H2a, H2b, and H2c are rejected. Similarly, CEO duality has a significant and negative influence on total SR (at 5% level), economic reporting (at 10% level), and social reporting (at 5% level), but an insignificant influence on environmental reporting. Hence, H3, H3a, and H3c are confirmed, but not H3b. On the other hand, the results show that board gender diversity has no significant influence on total SR, or separately, on its three dimensions. Accordingly, none of the hypotheses (H4, H4a, H4b, and H4c) is supported. Finally, and in terms of the existence of the SC, the study finds a highly significant and positive relationship with the four dependent variables (at 1% level); thereby, H5, H5a, H5b, and H5c are confirmed.

Table 3.6: Baseline regressions results

	Model 1. SR	Model 2. Eco	Model 3. Env	Model 4. Soc
Board size	0.0071**	0.0082**	0.0051	0.0079**
	(0.0033)	(0.0039)	(0.0035)	(0.0036)
Board independence	-0.1080**	-0.1579***	-0.0249	-0.1399**
	(0.0478)	(0.0578)	(0.0517)	(0.0555)
CEO duality	-0.0488**	-0.0528*	-0.0364	-0.0560**
	(0.0232)	(0.0302)	(0.0230)	(0.0268)
Board gender diversity	0.0041	0.0427	-0.0743	0.0425
	(0.0923)	(0.1194)	(0.0972)	(0.1059)
Sustainability committee	0.1002***	0.0869***	0.1029***	0.1108***
	(0.0215)	(0.0264)	(0.0231)	(0.0242)
Firm size	0.0428**	0.0443**	0.0605***	0.0238
	(0.0167)	(0.0197)	(0.0177)	(0.0184)
ROA	0.0932	0.0514	0.2393*	-0.0130
	(0.1428)	(0.1661)	(0.1438)	(0.1481)
Assurance quality	0.0976***	0.0937***	0.1000***	0.0997***
	(0.0242)	(0.0295)	(0.0250)	(0.0264)
Leverage	-0.0974**	-0.0597	-0.1718***	-0.0615
	(0.0393)	(0.0489)	(0.0429)	(0.0419)
Sector	0.1230***	0.0711**	0.1791***	0.1193***
	(0.0243)	(0.0305)	(0.0262)	(0.0266)
Investor protection strength	-0.0392***	-0.0406**	-0.0380***	-0.0391***
	(0.0127)	(0.0158)	(0.0131)	(0.0135)
Legal system strength	0.0028	0.0021	0.0031	0.0032
	(0.0033)	(0.0041)	(0.0036)	(0.0035)
Gender parity	-0.4357	-0.4240	-0.5053	-0.3803
	(0.2976)	(0.3574)	(0.3128)	(0.3243)
GDP growth	0.7371	0.1677	1.2471	0.7905
	(0.7957)	(0.9051)	(0.8211)	(0.8744)
_cons	0.4030	0.4776	0.2149	0.5159
	(0.2954)	(0.3535)	(0.3160)	(0.3166)
R^2	0.311	0.213	0.352	0.267
Adjusted R^2	0.283	0.182	0.326	0.238
N	370	370	370	370

Note: This table presents the baseline results. Model 1 examines the relationship between board characteristics and SR. Model 2 examines the association of board variables and economic reporting. Model 3 examines the impact of board variables on environmental reporting. Model 4 investigates the influence of board characteristics on social reporting. Robust standard errors in parentheses. Detailed definition of all the variables is in Table 3.2.

Abbreviations: SR, sustainability reporting; Eco, economic reporting; Env, environmental reporting; Soc, social reporting.

significance at 10% level.significance at 5% level.***significance at 1% level.

Empirical results show that board size plays a significant role in improving the total SR, economic reporting, and social reporting. Apart from environmental reporting, these results are in line with stakeholder-agency theoretical perspective and support previous research reporting a similar relationship between board size and total SR or specific aspects of SR (e.g., Esa and Ghazali, 2012; Jizi *et al.*, 2014; Pucheta-Martínez and Gallego-Álvarez, 2019). Regarding environmental reporting, the study finds no significant relationship with board size; however, this result is consistent with empirical results on the board size-environmental reporting nexus (e.g., Aliyu, 2019; Fernandes *et al.*, 2019).

Interestingly, and in line with Haniffa and Cooke (2005) and Esa and Ghazali (2012), the findings show a significant and negative relationship between board independence and total SR, economic reporting, and social reporting. For environmental reporting, and similar to board size, no significant impact of board independence is found. The negative impacts are quite surprising, as it is expected that independent directors meet various stakeholder groups' interests (Hill and Jones, 1992). A few possible explanations might account for these unexpected results. First, this may be due to the cost that disclosing sustainability-related information may have for owners. For instance, when firms disclose large amounts of information about environmental and social activities to various stakeholders, this may be at the expense of shareholders (Prado-Lorenzo and Garcia-Sanchez, 2010). In that case, independent directors may oppose the reporting of sustainability matters to preserve and not undermine such shareholders' interests, as they may consider their relationships with shareholders compared to other stakeholders to be more of a priority for their firm (Prado-Lorenzo and Garcia-Sanchez, 2010; Pucheta-Martínez and Gallego-Álvarez, 2019).

Second, the negative impact may be because the independent directors' existence may be a substitute for disclosing voluntary corporate information (Eng and Mak, 2003), such as sustainability information that is often voluntary. According to Barako, Hancock and Izan (2006), firms with higher levels of independent directors have a lesser need to depend on disclosures to reassure their stakeholders about their operations' legitimacy.

Third, engagement in sustainability activities and disclosing related information may not be the primary concern of independent directors. Esa and Ghazali (2012) state that independent directors

are likely to concentrate more on firm financial performance than social performance. In this regard, independent directors, who are mainly elected for their financial experience, may be able to evaluate financial information more easily than other sorts of information, e.g., sustainability information (Pucheta-Martínez and Gallego-Álvarez, 2019). Also, Mangena and Tauringana (2007b) argue that independent directors may be preoccupied with other issues, thus failing to devote enough attention to disclosure (e.g., sustainability disclosure).

Finally, independent directors may not be truly independent in practice, due to being outside the firm (Barako *et al.*, 2006) or because of the impacts that undermine their decisions and professional judgements (Tauringana and Chithambo, 2015). One reason for that may be due to powerful CEOs who may mitigate board independence. According to Muttakin *et al.* (2018), powerful CEOs, who are likely to involve themselves more in self-serving actions and less in sustainability activities, may inhibit outside directors' monitoring ability and elect independent members who are unlikely to question their decisions. Thus, powerful CEOs may compromise the role of independent directors, and hence negatively affect SR practices.

The results also show that CEO duality is negatively related with total SR, economic reporting, and social reporting, while insignificantly associated with environmental reporting. With the exception of environmental reporting, these results are in line with the theoretical argument, where separating the role of chairman and CEO reduces the information asymmetry between management and stakeholders. Moreover, these results are consistent with prior studies that examine the impact of CEO duality on certain aspects of SR (e.g., Muttakin and Subramaniam, 2015; Sundarasen *et al.*, 2016). In terms of environmental reporting, and consistent with previous studies such as Fernandes *et al.* (2019), the results show an insignificant impact of CEO duality.

Contrary to the expectation, but in line with prior empirical results (e.g., Amran *et al.*, 2014; Adel *et al.*, 2019), the study neither finds a significant effect of gender diversity on total SR nor separately on its three dimensions. One possible reason might be the barriers – such as stereotyping, and gender bias – which female directors are likely to encounter, restricting their abilities to fully contribute to corporate strategy and oversight (Galbreath, 2011; Rao and Tilt, 2016a). In other words, female directors may face resistance in making decisions, which could

inhibit their voice on sustainability outcomes, thus limiting their impact on SR practices in this sample. Besides these barriers, the literature often questions whether gender variations indeed apply to leadership or managerial positions (Rao and Tilt, 2016a). According to Powell (1990), women in top-level careers often reject feminine stereotypes and may tend to act in a masculine way (e.g., having leadership approaches, values, and needs similar to men). Another explanation for the insignificant influence might be that the boards in the sample, on average, comprise only 18.8% of female directors, where only 33.2% of the sampled firms have more than two female directors. In male-dominated boards, which is the case in this study, female directors may have little chance to be active or vocal, thus falling behind in decision-making processes, ultimately leading to the failure to affect SR practices (Amran *et al.*, 2014).

Although there is an insignificant influence of gender diversity on SR practices, interestingly, the results show a negative relationship with environmental reporting. This is still in line with prior studies that report a negative but insignificant association between gender diversity and environmental disclosures (e.g., Masud *et al.*, 2018). This negative relationship may be because boards often discount women's input regarding environmental matters, which are more likely to be technical than, for example, social issues that can be seen as "soft issues" (Rao and Tilt, 2016a). According to Galbreath (2011), male directors have more experience in making decisions related to environmental issues than their female counterparts, since they are more likely to have backgrounds and qualifications in technical disciplines.

Finally, the results show that the existence of a SC significantly enhances total SR, economic reporting, environmental reporting, and social reporting. This indicates that SC is a powerful mechanism that helps align managerial interests with various stakeholders' interests by reducing sustainability information asymmetry. The results align with the stakeholder-agency paradigm and with the theoretical underpinning combined with common sense that such a committee positively affects sustainability activities. The results are also in line with other previous studies such as Helfaya and Moussa (2017) and Adel *et al.* (2019). Table 3.7 shows a summary of the results of the tested hypotheses in this study.

Table 3.7: A summary of tested hypotheses

Hypotheses	Relationships (Exp. Sign)	Findings
Board size **- First set of hypotheses:**		
H1	BS → SR (+)	Accepted
H1-a	BS → Eco (+)	Accepted
H1-b	BS → Env (+)	Rejected
H1-c	BS → Soc (+)	Accepted
Board independence **- Second set of hypotheses:**		
H2	BI → SR (+)	Rejected
H2-a	BI → Eco (+)	Rejected
H2-b	BI → Env (+)	Rejected
H2-c	BI → Soc (+)	Rejected
CEO duality **- Third set of hypotheses:**		
H3	Dual → SR (-)	Accepted
H3-a	Dual → Eco (-)	Accepted
H3-b	Dual → Env (-)	Rejected
H3-c	Dual → Soc (-)	Accepted
Board gender diversity **- Fourth set of hypotheses:**		
H4	BGD → SR (+)	Rejected
H4-a	BGD → Eco (+)	Rejected
H4-b	BGD → Env (+)	Rejected
H4-c	BGD → Soc (+)	Rejected
Sustainability committee **- Fifth set of hypotheses:**		
H5	SC → SR (+)	Accepted
H5-a	SC → Eco (+)	Accepted
H5-b	SC → Env (+)	Accepted
H5-c	SC → Soc (+)	Accepted

Note: This table summarises the results of the tested hypotheses in this study. Variable definitions are reported in Table 3.2.
Abbreviations*:* **BS,** board size; **BI,** board independence; **Dual,** CEO duality; **BGD,** board gender diversity; **SC,** sustainability committee; **SR,** sustainability reporting; **Eco,** economic reporting; **Env,** environmental reporting; **Soc,** social reporting.

3.4.4 Robustness checks

This study acknowledges that the investigation may be subject to some statistical limitations, such as the endogeneity issue, which results from omitted variables, leading to failure to offer a full picture. To control for endogeneity problems in the regressions proposed, and following, for example, Tauringana and Chithambo (2015), a number of known board-level characteristics are included. Likewise, this study includes some known institutional-level factors in the baseline models. The rationale for this is that these variables have been widely investigated in previous disclosure literature, where leaving out such variables could lead to incomplete understanding and increase the endogeneity issue (Wang and Hussainey, 2013).

The tested variables that have been included are the board meetings (measured as the number of meetings held in a year by the board of directors), board age (measured as the average age of board members), board tenure (measured as the average tenure of board of directors in the company), internationalisation (measured as a dummy variable equal to one if the company is multinational, and zero otherwise), and the cultural system using the power distance index dimension and individualism dimension (measured using the score provided by Hofstede Insights ranging from 0 to 100).

Nevertheless, when the models are re-run, the results show that none of the tested variables has a significant influence on SR practices, including its three dimensions. Furthermore, no material changes are discovered in the variables of interests compared to the reported results in the baseline regressions. The only remarkable change is regarding CEO duality having a significant and negative impact on environmental reporting compared with an insignificant negative impact in the original models. Table 3.8 below reports on the results after including the tested variables mentioned above.

Table 3.8: Regression results after incorporating the tested variables

	Sustainability Reporting	Economic Reporting	Environmental Reporting	Social Reporting
Board size	0.0077**	0.0090**	0.0053	0.0087**
	(0.0034)	(0.0040)	(0.0036)	(0.0037)
Board independence	-0.1248**	-0.1426**	-0.0789	-0.1515**
	(0.0534)	(0.0644)	(0.0587)	(0.0611)
CEO duality	-0.0517**	-0.0516*	-0.0442*	-0.0583**
	(0.0236)	(0.0306)	(0.0231)	(0.0274)
Board gender diversity	0.0035	0.0456	-0.0785	0.0409
	(0.0972)	(0.1251)	(0.1030)	(0.1108)
Sustainability committee	0.0996***	0.0847***	0.1042***	0.1100***
	(0.0217)	(0.0269)	(0.0234)	(0.0244)
Control variables	Included	Included	Included	Included
Board meetings	0.0002	0.0002	0.0004	0.0002
	(0.0019)	(0.0017)	(0.0021)	(0.0023)
Board age	0.0007	-0.0015	0.0045	-0.0009
	(0.0029)	(0.0034)	(0.0031)	(0.0032)
Board tenure	-0.0008	0.0010	-0.0037	0.0003
	(0.0030)	(0.0038)	(0.0031)	(0.0033)
Internationalisation	0.0154	0.0175	-0.0009	0.0289
	(0.0231)	(0.0283)	(0.0239)	(0.0253)
Power distance index	0.0008	0.0010	0.0003	0.0010
	(0.0009)	(0.0012)	(0.0010)	(0.0010)
Individualism	0.0005	0.0001	0.0009	0.0006
	(0.0007)	(0.0009)	(0.0008)	(0.0008)
_cons	0.3075	0.4373	0.0186	0.4667
	(0.3523)	(0.4129)	(0.3602)	(0.3901)
R^2	0.313	0.216	0.360	0.272
Adjusted R^2	0.274	0.171	0.324	0.230
N	370	370	370	370

Note: This table reports on the results after including other board-level variables (i.e. the frequency of board meetings, average board age, and average board tenure) and institutional-level variables (i.e. internationalisation and the cultural system using the power distance index and individualism dimensions). Robust standard errors in parentheses.
*significance at 10% level.**significance at 5% level.***significance at 1% level.

Furthermore, a sector variable is included in the original models measured as a dummy variable equal to one if the company is in the non-financial sector and zero otherwise. Nevertheless, firms have propensities to offer information according to the particularities of their industries (Haniffa and Cooke, 2005). Hence, firms in particular sectors may encounter various levels of pressure to report different levels and types of information. Previous studies examining the CG-SR nexus, in fact, categorise industry variables differently. For instance, Michelon and Parbonetti (2012) use eight groups; Khan *et al.* (2013) and Helfaya and Moussa (2017) use 10; and Giannarakis *et al.* (2019) use nine. Accordingly, the study reclassifies the sector variable and includes sector fixed effect using 33 activity sectors based on the GRI classification to capture the sector-specific variation as a robustness check.[29] In order to achieve this, the following model is estimated:

$$\chi_{SR,eco,env,soc} = \alpha + \beta_1 BS + \beta_2 BI + \beta_3 Dual + \beta_4 BGD + \beta_5 SC + \beta_6 FS + \beta_7 ROA + \beta_8 AQ + \beta_9 LEV + \beta_{10} IPS + \beta_{11} LSS + \beta_{12} GP + \beta_{13} GDPG + \sum_{n=14}^{46} \beta_n Sector_n + \varepsilon \quad (4)$$

However, the results are consistent with the baseline regressions (i.e. neither the significance, nor the direction of the independent variables has been changed). Table 3.9 below presents the results using the sector fixed effect.

Moreover, in the baseline regression, the total SR is measured as the aggregate of scores obtained from the three individual dimensions (i.e. economic, environmental, and social) based on a weight of 0.33 allocated to each dimension. Although this study acknowledges the equal weight of these dimensions, the total SR is alternatively measured as the number of items disclosed divided by the total number of items (i.e. 77 items). Nevertheless, the results are quantitatively and qualitatively consistent with the baseline results. The findings are also robust to alternative statistical proxies. The number of independent directors on boards is used as an alternative measurement and no substantial changes are found. Likewise, the findings of the variables of interests do not materially differ when employing ROE as a proxy of profitability or when measuring the leverage as total debt divided by total assets.

[29] The standard error is also clustered at sector and country levels to control for the sector and country effects. Still, the results are quantitatively and qualitatively similar to the original results.

Table 3.9: Regressions results using sector fixed effect

	Sustainability Reporting	Economic Reporting	Environmental Reporting	Social Reporting
Board size	0.0076**	0.0085**	0.0049	0.0093**
	(0.0034)	(0.0042)	(0.0034)	(0.0037)
Board independence	-0.1200**	-0.1615***	-0.0474	-0.1501***
	(0.0497)	(0.0607)	(0.0524)	(0.0568)
CEO duality	-0.0545**	-0.0569*	-0.0398	-0.0656**
	(0.0254)	(0.0323)	(0.0250)	(0.0287)
Board gender diversity	0.0030	0.0373	-0.0738	0.0433
	(0.1025)	(0.1273)	(0.1046)	(0.1149)
Sustainability committee	0.0984***	0.0860***	0.0998***	0.1092***
	(0.0224)	(0.0276)	(0.0243)	(0.0250)
Control variables	Included	Included	Included	Included
Sector fixed effect	Included	Included	Included	Included
_cons	0.4290	0.4801	0.2912	0.5113
	(0.3230)	(0.3908)	(0.3430)	(0.3457)
R^2	0.369	0.281	0.432	0.325
Adjusted R^2	0.281	0.181	0.353	0.232
N	370	370	370	370

Note: This table presents the results after reclassifying the industry variable and including the sector fixed effect using 33 activity sectors based on the GRI classification. Detailed definition of all the variables is in Table 3.2. Control variables and sector fixed effect are included in the estimations, but not reported. Robust standard errors in parentheses.
*significance at 10% level.**significance at 5% level.***significance at 1% level.

In addition, small firms have fewer resources to engage in sustainability activities and may have less vigilant CG mechanisms (Hussain *et al.*, 2018), which may influence the main results. Thus, all 25 small and medium-sized enterprises (SMEs) are dropped from the sample and re-run the regressions as an additional robustness test.[30] However, the results show no substantial differences for the independent variables to the original findings. Table 3.10 reports the results after excluding the SMEs.

[30] The firms are classified as SMEs based on GRI classification.

Table 3.10: Regressions results after excluding SMEs

	Sustainability Reporting	Economic Reporting	Environmental Reporting	Social Reporting
Board size	0.0073**	0.0087**	0.0051	0.0079**
	(0.0034)	(0.0040)	(0.0035)	(0.0037)
Board independence	-0.1003**	-0.1409**	-0.0232	-0.1355**
	(0.0490)	(0.0593)	(0.0535)	(0.0576)
CEO duality	-0.0518**	-0.0547*	-0.0388	-0.0604**
	(0.0238)	(0.0315)	(0.0238)	(0.0280)
Board gender diversity	0.0102	0.0102	-0.0569	0.0757
	(0.1052)	(0.1344)	(0.1117)	(0.1219)
Sustainability committee	0.0898***	0.0736***	0.0965***	0.0995***
	(0.0226)	(0.0274)	(0.0244)	(0.0259)
Control variables	Included	Included	Included	Included
_cons	0.4290	0.4801	0.2912	0.5113
	(0.3230)	(0.3908)	(0.3430)	(0.3457)
R^2	0.305	0.214	0.340	0.263
Adjusted R^2	0.278	0.181	0.312	0.232
N	345	345	345	345

Note: This table presents the results after excluding small and medium-sized enterprises. The firms are classified as SMEs based on GRI classification. Detailed definition of all the variables is in Table 3.2. Control variables are included in the estimations, but not reported. Robust standard errors in parentheses.
*significance at 10% level.**significance at 5% level.***significance at 1% level.

Finally, this study conducts further robustness checks to confirm the results regarding board independence and board gender diversity. The study checks for a U-shaped relationship (Lind and Mehlum, 2010) between board independence and SR practices, since it may result in the significant negative impact; however, no evidence of it is found. Also, the sample is split in to high – and low – shareholder protection-oriented countries to investigate whether the former countries drive the negative relationships between board independence and SR practices.[31] This is because countries

[31] The country is classified as a high shareholder protection-oriented country if its protection score is above or equal to the sample countries' median, and as a low shareholder protection-oriented country otherwise.

with higher shareholder protection levels may undermine other stakeholders' interests (Ioannou and Serafeim, 2012). However, the results (not reported here) are almost the same, confirming the baseline results.

For the board gender diversity, the study investigates whether the results are driven by tokenism (i.e. whether the critical mass is a matter). According to Cabeza-García *et al.* (2018), the critical mass theory argues that creating an influential body to make substantial changes (e.g., reporting sustainability information) requires reaching a sufficient threshold number of people (e.g., female directors). Based on that, and to examine the prevalence of tokenism, the study analyses the relationship of boards having at least one female director, two female directors, and three or more female directors. Nevertheless, the results document that the insignificant impacts of board gender diversity on SR practices hold, irrespective of the number of female directors (the results are not reported but are available upon request).

3.4.5 Further analysis: Developed and developing countries

Several studies argue that the results of the relationship between CG mechanisms and SR practices may differ between developed and developing countries (e.g., Khan *et al.*, 2013; Muttakin *et al.*, 2015; Abu Qa'dan and Suwaidan, 2019; Katmon *et al.*, 2019). According to Khan *et al.* (2013), CG mechanisms of the companies in operation may be affected due to the differences between developed and developing countries in various aspects (e.g., business culture and ethics, economic development, and regulation landscape). In other words, the quality and credibility of CG mechanisms may vary between developed and developing countries (Katmon *et al.*, 2019). Moreover, several studies mention that disclosing sustainability-related information in developing countries is in an early stage of adoption and commonly viewed as less credible (e.g., Lock and Seele, 2016; Buallay and Al-Ajmi, 2019). On that basis, the sample is partitioned into developed and developing groups, and the baseline regression is re-run for each group and total SR only. Table 3.11 below shows the results for the full sample, developed countries, and developing countries.

Table 3.11: Regressions results for SR for full sample, developed countries, and developing countries

	Full Sample	Developed Countries	Developing Countries
Board size	0.0071**	0.0086**	-0.0015
	(0.0033)	(0.0037)	(0.0072)
Board independence	-0.1080**	-0.0989	-0.0485
	(0.0478)	(0.0645)	(0.0873)
CEO duality	-0.0488**	-0.0186	-0.0925***
	(0.0232)	(0.0329)	(0.0320)
Board gender diversity	0.0041	0.0126	-0.1375
	(0.0923)	(0.1250)	(0.1555)
Sustainability committee	0.1002***	0.0767**	0.1316***
	(0.0215)	(0.0305)	(0.0325)
Firm size	0.0428**	0.0737***	0.0153
	(0.0167)	(0.0246)	(0.0266)
ROA	0.0932	0.1997	0.1074
	(0.1428)	(0.2158)	(0.2137)
Assurance quality	0.0976***	0.0744**	0.1488***
	(0.0242)	(0.0296)	(0.0402)
Leverage	-0.0974**	-0.1297**	-0.0783
	(0.0393)	(0.0570)	(0.0618)
Sector	0.1230***	0.1785***	0.0736*
	(0.0243)	(0.0313)	(0.0401)
Investor protection strength	-0.0392***	-0.0605***	-0.0376*
	(0.0127)	(0.0199)	(0.0223)
Legal system strength	0.0028	-0.0116	0.0016
	(0.0033)	(0.0087)	(0.0049)
Gender parity	-0.4357	0.3981	-0.9028*
	(0.2976)	(0.5525)	(0.5017)
GDP growth	0.7371	4.2797**	-0.0617
	(0.7957)	(1.9654)	(1.0137)
_cons	0.4030	-0.4000	1.0703**
	(0.2954)	(0.4738)	(0.4714)
R^2	0.311	0.352	0.367
Adjusted R^2	0.283	0.307	0.302
N	370	218	152

Note: This table reports the results on the relationship between corporate governance and total sustainability reporting only after partitioning the sample into developed and developing countries. The classification of countries into "developed" and "developing" countries is based on the World Economic Situation and Prospects Report (2020). Available at: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/WESP2020_FullReport_web.pdf. Detailed definition of all the variables is in Table 3.2. Robust standard errors in parentheses.
*significance at 10% level.**significance at 5% level.***significance at 1% level.

The study finds a significant and positive influence of board size on SR in developed countries, but insignificant influence in developing countries. Thus, the results show that the significant positive relationship in the full sample is due to developed countries only. Interestingly, the findings also reveal a negative, but again insignificant impact of board size in developing countries, which is still in line with prior studies (e.g., Alshbili *et al.*, 2019; Orazalin, 2019). This indicates that large boards in developing countries lead to less effective management, resulting in poor decision-making. Accordingly, the stakeholder-agency theory– which argues that large boards are more likely to represent stakeholders' interests (Hill and Jones, 1992) – is applicable in developed countries but not in developing ones in this study.

For the board independence variable, the baseline results show a significant and negative relationship with SR. However, when the sample is divided, the findings report a negative but insignificant relationship for both developed and developing countries. These results are not in line with stakeholder-agency theory, which suggests that independent directors represent various stakeholders' interests (Hill and Jones, 1992). Still, these results are consistent with prior studies in developed countries (e.g., Michelon and Parbonetti, 2012) and developing countries (e.g., Barakat *et al.*, 2015; Akbas, 2016).

In terms of the impact of CEO duality on SR, the results show a negative but insignificant relationship in developed countries. Thus, separating the role of chairman and CEO may not be a determinant of SR in developed countries, as several companies may be well directed notwithstanding combining these roles. In fact, prior studies report a negative but insignificant impact of duality role SR practices in developed countries (e.g., Michelon and Parbonetti, 2012; Rupley *et al.*, 2012). On the other hand, the results report a significant negative relationship between CEO duality and SR in developing countries. This result is in line with stakeholder-agency theory (Hill and Jones, 1992) and previous studies on developing countries (e.g., Shamil *et al.*, 2014; Muttakin and Subramaniam, 2015). Therefore, the findings indicate that developing countries drive the significant negative impact of CEO duality in the full sample.

Regarding board gender diversity, the study still finds no significant relationship with SR for both developed and developing countries. These results are not in line with stakeholder-agency theory (Hill and Jones, 1992), but are in line with prior disclosure literature. Interestingly, the results also show that gender diversity is negatively correlated with SR in developing countries. This is in line with previous studies such as Abu Qa'dan and Suwaidan (2019), among others, who report an insignificant and negative impact of gender diversity on SR. One plausible reason for this negative direction is that women on boards in developing countries may not recognise the importance of voluntary reporting, due to lack of experience and educational qualifications (Muttakin *et al.*, 2015). Another explanation is that women on boards – who might have been appointed based on family connections – are likely to safeguard family interests, thus paying less attention to SR, resulting in the negative indication (Gallego-Álvarez and Pucheta-Martínez, 2020).

Finally, the presence of SCs behaves similarly in both developed and developing countries, where the results show a significant and positive impact on SR. These results are in line with stakeholder-agency theory (Hill and Jones, 1992) and previous studies in developed countries (e.g., Amran *et al.*, 2014; Adel *et al.*, 2019) and developing countries (e.g., Mahmood *et al.*, 2018; Ashfaq and Rui, 2019). Therefore, it seems that the effectiveness of such committees is not contingent on the economy where the companies are domiciled. Thus, SC is a powerful CG mechanism in developed and developing countries, and plays an essential role in aligning managerial and stakeholders' interests and reducing information asymmetry by disclosing sustainability information.

3.5 Conclusion

This paper investigates the impact of a specific bundle of board characteristics (i.e. size, independence, CEO duality, gender diversity, and SC) on total SR, and separately, on its three dimensions (i.e. economic, environmental, and social). Using an international sample of 370 companies belonging to 50 countries, the paper also examines whether the impact of CG on SR differs in developed and developing countries. Moreover, and in contrast to most existing literature, the study applies GRI standards in this given nexus and relies on various sustainability information sources (e.g., sustainability reports, annual reports, integrated reports, other sustainability-related reports, and websites).

The in-depth examination in this study reveals interesting findings. A strong positive influence of the SC on total SR, economic reporting, environmental reporting, and social reporting is found. The results also document a significant and positive influence of board size on total SR, economic reporting, and social reporting. In contrast, and surprisingly, board independence is significantly and negatively associated with total SR, economic reporting, and social reporting. Likewise, CEO duality has a significant and negative relationship with total SR, economic reporting, and social reporting. In terms of environmental reporting, the results show an insignificant impact regarding board size, board independence, and CEO duality. Contrary to the expectations, the results report an insignificant relationship between board gender and the four dependent variables. Overall, the results support the stakeholder-agency theoretical perspective, where most of the sub-hypotheses are confirmed. After partitioning the sample in this study into developed and developing countries, the results show that board size is significantly and positively associated with SR in developed countries but insignificantly associated in developing countries. Conversely, the results suggest a significant and negative relationship between CEO duality and SR in developing countries, but is insignificant in developed countries. Finally, and for both developed and developing countries, board independence and board gender diversity have an insignificant impact on SR, while SC has a significant and positive influence.

The results reported should be interpreted in view of the following limitations. First, the results are limited to one year (i.e. 2017). Therefore, it would be interesting for future studies to use a larger sample of firms and a longer period of analysis, which would further validate the findings of this study. Second, this study only focuses on a bundle of board-level variables. The examination of external CG mechanisms (e.g., ownership attributes) or institutional CG mechanisms (e.g., political, legal, and culture systems) may offer new insights and expand our knowledge regarding the CG-SR nexus. Furthermore, as this study yields interesting results, it encourages future studies to aggregate and disaggregate the SR dimensions to provide further insights and contribute to theory development.

The findings have important implications for firms and policymakers, and improve the ongoing standard-setting process. The results in this study support the use of GRI as a reporting tool, providing useful insights regarding the extent to which companies disclose the three dimensions

of sustainability, especially the economic dimension that has been widely multi-modified over the last few years. According to Tauringana (2021), GRI's importance is because the information on its database assesses the progress of each country towards the achievement of SDG 12 (i.e. target 12.6). Furthermore, a more adaptable governance system is needed in the age of internationalisation and globalisation. In this regard, the results have significant implications for CG reforms internationally, and specifically for policymakers in developing countries in setting regulations to ensure CG mechanisms' effectiveness. The findings – which indicate that the significant positive relationship between SC and SR holds, irrespective of its three dimensions and partitioning of the sample into developed and developing countries – provide useful insights to carry out further reforms in the CG arena. Therefore, the study would also like to suggest to policymakers to focus on SC, particularly in developing countries where the existence of such committees is not common practice.

Chapter 4: The impact of corporate governance on sustainability reporting in the financial and non-financial sector around the world

Abstract

Through the lens of agency theory and resource dependence theory, and with particular reference to the board characteristics – size, independence, CEO duality, gender diversity, age, tenure, and sustainability committee (SC) – this paper (i) investigates the impact of these corporate governance (CG) mechanisms on sustainability reporting (SR) with a combined sample of financial and non-financial firms and then separately with subsamples of financial and non-financial firms and (ii) analyses differences in the impact of the CG mechanisms on SR between the subsamples of financial and non-financial firms. Using a sample of 370 international firms located in 50 countries and a Global Reporting Initiative (GRI) standards-based disclosure index to quantify SR across various information sources, the main findings are as follows. For the combined sample, board size and SC have a significant and positive impact on SR, while board independence and CEO duality have a significant and negative influence. In contrast, board gender diversity, board age, and board tenure have no significant effect on SR. In the subsample of the financial firms, the results show that board size, board age, and SC are significantly and positively related with SR, while board independence, CEO duality, and board tenure are significantly and negatively associated with SR. Only board gender diversity seems to have an insignificant impact on SR. Regarding the subsample of the non-financial firms, board size and SC have a significant and positive influence on SR, while the remaining variables have no significant effect. In terms of the differences between the financial and non-financial sectors, the results suggest that the impact of board independence, CEO duality, board gender diversity, board age, and board tenure differ, while only board size and SC have the same impact. Overall, the findings show that only board size and SC are positively and significantly associated with SR in the combined sample and financial and non-financial samples, indicating their importance in the governance structure.

Keywords: Corporate governance, sustainability reporting, financial sector, international evidence, agency theory, resource dependence theory

4.1 Introduction

The way companies are governed, and which corporate governance (CG) mechanisms impact sustainability reporting (SR) are important issues academically and practically (Jizi *et al.*, 2014; Jizi, 2017; Mohd-Said *et al.*, 2018; Orazalin, 2019). This is due, but not exclusively, to the issuance of 17 Sustainable Development Goals (SDGs) with 169 associated targets by the United Nation in 2015 that was adopted by 193 countries. Specifically, target 12.6 "encourages companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle" (United Nations, 2015). Jain and Jamali (2016) state that "In a world marked by grave corporate breaches and systemic governance failures on one hand, and gross societal and environmental excesses on the other, the interface between corporate governance (CG) and corporate social responsibility (CSR) has acquired global resonance and is more intriguing than ever before".

Despite the burgeoning research on the relationship between CG and SR (e.g., Haniffa and Cooke, 2005; Ghazali, 2007; Said *et al.*, 2009; Rouf, 2011; Michelon and Parbonetti, 2012; Khan *et al.*, 2013; Muttakin and Subramaniam, 2015; Jizi, 2017; Hoang *et al.*, 2018; Fernandes *et al.*, 2019; Giannarakis *et al.*, 2020), there is need for further sector-based research of this nexus. This is because the impact of CG mechanisms on SR may differ by sector. For instance, according to Haniffa and Cooke (2005), firms may have the propensities to offer information per the particularities of their industries. Therefore, from a practical perspective, firms in certain sectors may face different pressure to disclose different levels and sorts of information (Ghazali, 2007), which may result in different roles of CG mechanisms across sectors. In the case of the financial and non-financial sectors, there is a research gap on whether the CG mechanisms affect SR practices equally in these two sectors. The basis for this question is related to the agency theoretical perspective. According to this theory, CG mechanisms can reduce agency costs (Haniffa and Cooke, 2002) and asymmetric information through disclosure activities (Jizi *et al.*, 2014), which should be applicable to both the financial and non-financial sectors.

However, several accounting literatures argue that the agency costs are probably prominent in the financial sector compared to the non-financial sector due to the former's unique characteristics

(Adams and Mehran, 2012; Laeven, 2013; John *et al.*, 2016). For instance, the structure of information asymmetry is more complex and multidimensional in the financial sector due to the multitude of stakeholders (Yamak and Süer, 2005; Branco and Rodrigues, 2008b), making the information asymmetry issue more critical in this sector (Laeven, 2013). In that case, as agency theory argues, firms with higher agency costs may tend to report more information (Healy and Palepu, 2001) since mitigating asymmetric information is one way to reduce agency issues (Donnelly and Mulcahy, 2008). In other words, the influence of CG mechanisms may differ between the financial and non-financial sectors. However, there is no clear evidence of whether this is the case (i.e. the impact differs by the sector) within the relationship between CG and SR.

Despite the argument that the agency costs may differ between the financial and the non-financial sectors, the existing literature has either focused on the non-financial sector (e.g., Said *et al.*, 2009; Khan *et al.*, 2013; Hoang *et al.*, 2018) or the financial sector (e.g., Jizi *et al.*, 2014; Orazalin, 2019) or has combined these two sectors (e.g., Mallin *et al.*, 2013; Giannarakis *et al.*, 2020). A majority of studies that focus on non-financial sectors argue that the financial sector is different; other statutory requirements govern the financial sector (e.g., Haniffa and Cooke, 2005), or this sector might be subject to other disclosure requirements (e.g., Katmon *et al.*, 2019).[32] These arguments may be applicable for a particular setting or sort of reporting, such as the financial reporting. For instance, Mangena and Tauringana (2007a), who investigate the efficacy of CG in assuring compliance with best practise financial reporting, exclude the financial firms, with the argument that they are subject to additional requirements from regulator parties (e.g., the Bank of England), which may not be subjected by the non-financial sector. However, such arguments may not be the general case when it comes to SR practices. In fact, the Global Reporting Initiative (GRI), which is the main driver of SR and considered the most accepted and recognised initiative in the SR field (Fonseca *et al.*, 2014) with a widely adopted framework across the world (Yadava and Sinha, 2016), does not differentiate between the financial and non-financial sectors. In contrast, the studies that focus on the financial sector argue that there is a lack of studies in this sector and that

[32] Several studies in accounting literature exclude the financial sector from their investigation. In this regard, Wang and Shailer (2015), for example, find that the sampling decision (i.e. including vs excluding financial companies) affects the relationship between ownership concentration and firm performance. Also, Khlif and Hussainey (2016) show that the industry type (i.e. mixed financial and non-financial, financial, and excluding financial companies) moderate the impact of firm characteristics on risk reporting.

this sector is important in fostering sustainability-related issues, but without providing a rational explanation for excluding the non-financial sectors (e.g., Khan, 2010; Sharif and Rashid, 2014). Likewise, most studies that include the financial firms do not offer any specific reason for combining these two sectors (e.g., Jizi, 2017; Adel *et al.*, 2019). Overall, these practices in the literature, where other studies investigate the combined sectors (e.g., Shamil *et al.*, 2014), while others focus on the non-financial sector only (e.g., Abu Qa'dan and Suwaidan, 2019) and others on the financial sector only (e.g., Kiliç *et al.*, 2015) might result in the inconclusive findings.

Therefore, there is a need to investigate whether the efficacy of CG mechanisms on SR practices differs depending on the sampling decision (i.e. combining the financial and non-financial sectors, focusing on the financial sector or the non-financial sector). To the best of our knowledge, no single empirical study has documented whether the exclusion of the financial firms influences the relationship between CG mechanisms and SR practices and whether this relationship differs between the financial and non-financial sectors. This study aims to fill these research gaps by firstly investigating the impact of CG mechanisms on SR practices with a combined sample of financial and non-financial firms and then separately with a subsample of financial and non-financial firms, and secondly, by analysing the differences in the impact of the CG mechanisms on SR between financial and non-financial firms. To achieve these objectives, this study focuses on board characteristics – size, independence, CEO duality, gender, age, tenure, and the existence of sustainability committee (SC).[33] Also, two sets of control variables related to firm-level factors (i.e. firm size, profitability, assurance quality, leverage, and firm age) and institutional-level factors (i.e. investor protection strength, power distance, individualism, and GDP growth) are used. Theoretically, this study mainly draws on the agency theory (Jensen and Meckling, 1976) along with resource dependence theory (Pfeffer and Salancik, 1978), acknowledging the lacuna of using a single theory since it lacks in fully explaining the hypothesised relationship (see also, for instance, Haniffa and Cooke, 2002; Mallin *et al.*, 2013; Hussain *et al.*, 2018).

[33] This study also reviewed the possibility of investigating other variables related to board diversity (i.e. board ethnicity, board nationality, board educational level, and board educational background). However, this could not be achieved due to missing data of such variables in the sampled firms.

The study uses a sample of 370 international firms located in 50 countries, aiming at generalising the results, ensuring the study's reliability, and investigating new critical institutional factors around the relationship between CG mechanisms and SR. The study relies on a wide range of possible sustainability information sources to quantify the level of SR practices (i.e. sustainability reports, annual reports, integrated reports, and websites), aiming to provide a much more complete view of the research field. The rationale for this is that relying upon a specific source may penalise companies for not disclosing sustainability information, thus falling short in true reflection of SR practices (Michelon and Parbonetti, 2012) and causing subjectivity and reducing the reliability of results. Besides, since SR is about disclosing information on the three sustainability dimensions (Hahn and Kühnen, 2013), this study applies a disclosure index based on GRI standards that consider the economic, environmental and social dimensions.[34] As with the environmental and social dimensions, the reporting on the economic dimension, which is different from traditional financial reporting (Al Farooque and Ahulu, 2017),[35] is important because it contributes to sustainability (Schneider and Meins, 2012) and sustainable development agenda.[36]

The results for the combined sample show that board size and SC affect SR significantly and positively, while board independence and CEO duality are significantly and negatively associated with SR. On the other hand, board gender diversity, board age, and board tenure have insignificant influence. Moreover, the results in the subsample of the financial firms suggest that board size, board age, and SC have a significant and positive impact on SR, while board independence, CEO duality, and board tenure have a significant and negative influence. In contrast, there is no relationship between board gender diversity and SR. In the subsample of the non-financial, the results show a significant and positive association between board size and SC and SR, while the remaining variables have no relationship with SR. Thus, it can be concluded that the results of the impact of CG on SR differ between financial and non-financial firms in terms of board

[34] Under these standards, the three dimensions' items have been significantly changed compared with the last versions (e.g., G4 and G3.1), especially for the economic dimension. For example, new standards related to anti-corruption and anti-competitive behaviour have been issued under the economic pillar.
[35] From a sustainability perspective, the economic dimension includes information, such as procurement practices, market presence, anti-corruption, and anti-competitive behaviour.
[36] Several GRI economic dimension standards are linked with UN SDGs. For example, SDG target 16.3 (promote the rule of law at the national and international levels and ensure equal access to justice for all) can be reported under GRI standard 206 (anti-competitive behaviour).

independence, CEO duality, board gender diversity, board age, and board tenure.[37] However, they are similar in that board size and SC have a significant and positive impact on SR practices.

This paper makes four contributions to the existing literature on the relationship between CG and SR. *First,* this study contributes by investigating whether the efficacy of CG mechanisms on SR differs depending on the sampling decision. In fact, the results show that the efficacy of several CG mechanisms with a combined sample of financial and non-financial firms differs mostly from the results of the non-financial firms. These results suggest that the impact of several CG mechanisms in the combined sample is driven by the financial firms. *Second,* this study contributes by analysing whether and to what extent the CG-SR nexus differs between the financial and non-financial firms. In this regard, the results suggest that there are major differences in the efficacy of most investigated variables on SR among the financial and non-financial sectors. Hence, overall, this study contributes by uncovering critical aspects of this given nexus and adding new evidence to the existing literature, which may explain the inconclusive and the mixed results between CG mechanisms and SR. *Third,* and theoretically, this study contributes by providing evidence suggesting that agency theory better explains the impact of CG on SR in the financial sector compared to the non-financial sector. Given that the non-financial sector includes several subsectors, one plausible explanation for this may be that agency costs among these subsectors also differ widely and may need to be separated. *Finally,* this study contributes by providing evidence from the financial sector as there is a surprising dearth of research into this given nexus in this sector (e.g., Khan, 2010; Jizi *et al.*, 2014). Thus, these results are also expected to provide policymakers, companies, and practitioners in this sector with significant implications.

The remainder of this study proceeds as follows. The theoretical framework and hypotheses development are discussed in Section 4.2. Sections 4.3 presents the data and methodology. The empirical results are described and discussed, along with the robustness tests, in Section 4.4. Finally, the conclusion of the study and the suggestions for further research are given in Section 4.5.

[37] Although the board gender diversity has an insignificant impact on SR practices in both sectors, the impact is negative for the financial sector while positive for the non-financial sector.

4.2 Literature Review

4.2.1 Theoretical background

Deegan (2002) argues that it is common to use more than one theory due to the overlap among various theoretical perspectives that explain disclosure practices. In fact, studies examining CG-SR nexus have applied various theories, such as agency theory (Jizi *et al.*, 2014), legitimacy theory (Haniffa and Cooke, 2005), resource dependency theory (Ibrahim and Hanefah, 2016), stakeholder theory (Barako and Brown, 2008), and resource-based view theory (Katmon *et al.*, 2019), etc. This study draws on the agency theory (Jensen and Meckling, 1976) and the resource dependence theory (Pfeffer and Salancik, 1978) because they represent two important roles of boards (Hillman and Dalziel, 2003). These are (i) monitoring top management to guarantee compliance with rules (i.e. monitoring role) as per agency theoretical perspective and (ii) bringing critical resources that the firms need (i.e. advising role) as per resource dependence theoretical perspective (Mallin *et al.*, 2013; Jain and Zaman, 2020). According to Bear, Rahman and Post (2010), agency and resource dependence theories are two organisational theories that explain how boards' composition affects social responsibility activities.

Agency theory is the most used and preferred theory to examine the relationship between CG mechanisms and corporate disclosures (Michelon and Parbonetti, 2012; Khan *et al.*, 2013; Chithambo and Tauringana, 2017). According to Rao and Tilt (2016a), the relationship between CG and corporate disclosures emerges from agency theory, which was developed by Jensen and Meckling (1976). Moreover, Lambert (2001) states that agency theory is an attractive theory in the field of accounting research since it permits us to integrate conflict of interests, incentives problems, and mechanisms for monitoring incentive problems expressly.

Drawing on this theory, firms can reduce asymmetric information between their management and shareholders through disclosures practices (Fama and Jensen, 1983; Jizi *et al.*, 2014), such as sustainability information. According to Hussain *et al.* (2018), agency theory justifies the conflicts in the relationship between shareholders and management assuming the existence of asymmetric information, opportunist behaviours of managers, and the conflict of interests among shareholders (principal) and manager (agent). The separation between management and ownership can usually

result in asymmetric information (Jensen and Meckling, 1976), which if not adequately monitored; could lead to exploit by management for its benefits at the cost of both the owners and stakeholder groups (Hermalin and Weisbach, 1998; Haniffa and Cooke, 2002). Therefore, it is necessary to oversee the managers closely to array the agent-principal objectives, minimise agency conflicts, and increase stockholders' wealth (Hussain *et al.*, 2018). To this end, CG mechanisms, according to agency theory, improve firms' ability to handle the emerging concerns and mitigate agency problems (Haniffa and Cooke, 2002) and serve to hold the management accountable for its activities (Li *et al.*, 2008). According to Said *et al.* (2009), CG can mitigate the anticipated costs and negative influence on a firm's value and therefore reduce agency issues among corporations, society, shareholders and stakeholders.

Unlike agency theory (Jensen and Meckling, 1976) which concentrates on the monitoring function of the boards, the resource dependence theory (Pfeffer and Salancik, 1978) concentrates on boards' function in guaranteeing the critical resources' flow to the companies (Fernández-Gago *et al.*, 2018). Recently, and in the CG-SR nexus, this theory has been applied to explain board members' role in disclosing sustainability information (see, e.g., Ibrahim and Hanefah, 2016; Helfaya and Moussa, 2017; Hoang *et al.*, 2018; Orazalin, 2019). Resource dependence theory concentrates on the external environment as a vital resource factor for companies to reach their goals, improve their benefits, and ensure their survival (Pfeffer and Salancik, 2003). To this end, this theory emphasises the role that boards play in creating the connections and networks between the firm and its environment (Lynall, Golden and Hillman, 2003) and acquiring the critical resources that the firm needs (Cabeza-García *et al.*, 2018).

As this theory suggests, boards are critical and strategic resources for firms, including experience, economic resources, ideas and knowledge, recommendation, personal and professional ties, and legitimacy (Hillman and Dalziel, 2003; Pfeffer and Salancik, 2003). These resources strengthen the connection between firms and their stakeholder groups in maintaining sustainability (Handajani *et al.*, 2014), help firms in responding to their environments and thus better managing social responsibility issues (Bear *et al.*, 2010), and reduce uncertainty by disclosing sustainability-related information (Orazalin, 2019).

According to Chithambo and Tauringana (2017), board effectiveness and how the board discharges its responsibilities depend on its structure. This study investigates a specific board-level governance bundle (i.e. board size, board independence, CEO duality, board gender diversity, board age, board tenure, and the presence of SC). In the following sub-sections, the impact of these variables on SR practices is hypothesised.

4.2.2 Hypotheses development

4.2.2.1 Board size

Board size is a significant determinant of the board's effectiveness (Amran *et al.*, 2014) and has an essential role in controlling and monitoring managers' performance and behaviour (Haniffa and Hudaib, 2006). According to Jamali *et al.* (2008), it is the board responsibility to set social responsibility agenda. Therefore, the board's practices, including disclosing sustainability-related information, are affected by its size. In this vein, the previous literature offers diverse viewpoints for expecting a negative and a positive influence of board size. The first viewpoint argues for a smaller board, consistent with agency theory (Jensen and Meckling, 1976), while the second viewpoint argues for a larger board, consistent with resource dependence theory (Pfeffer and Salancik, 1978).

From the agency theory viewpoint, board size increases lead to less control and monitoring of organisation governance (De Andres, Azofra and Lopez, 2005; Hussain *et al.*, 2018). Several studies (e.g., De Andres *et al.*, 2005; Prado-Lorenzo and Garcia-Sanchez, 2010) state that larger boards are detrimental to the efficiency of the CG mechanisms. According to Cabeza-García *et al.* (2018), having a large number of members on the board lead to agency issues and less interest in disclosing information (Esa and Ghazali, 2012). Furthermore, and from the perspectives of the group dynamics and collective making decisions, small boards are presumed to effectively monitor management compared to large boards (Jizi *et al.*, 2014; Alshbili *et al.*, 2019). Moreover, Ahmed, Hossain and Adams (2006) and Dey (2008) argue that small boards result in more effective monitoring of management's activities because such boards have good coordination, efficient communication, and a high level of commitment and accountability. In addition, large boards lead to ineffective management and result in poor decision-making (Lipton and Lorsch, 1992), take

more time to communicate and make decisions, and create a desirable setting for powerful CEOs to protect their interest (Donnelly and Mulcahy, 2008).

However, and in line with the resource dependence theoretical perspective, larger boards provide firms' decision-making process with various ideas and perspectives (Pfeffer and Salancik, 2003), thus improving the disclosure activities (Mahmood and Orazalin, 2017). According to Chithambo and Tauringana (2017) and Akhtaruddin *et al.* (2009), larger boards are expected to have various skills and expertise that can assist managers in the reporting and processing of useful information. In addition, boards with many directors can result in a frequency of exchanging experiences and values, leading to better advice (Dalton *et al.*, 1999) and implementing firms' policies and strategies (Zahra *et al.*, 2000; Chithambo and Tauringana, 2017).

Furthermore, larger boards provide firms with the appropriate diversity to gain crucial resources and widen their networks (Haniffa and Hudaib, 2006; Amran *et al.*, 2014). Specifically, large boards are expected to have expert directors on specific sustainability-related issues and their members are also expected to be exposed to the impacts of sustainability-related agendas on stakeholder groups (Cabeza-García *et al.*, 2018). Therefore, they are likely to improve companies' social responsibility-related activities through the exchange of sustainability-related perspectives and expertise, and consequently, increase the firm's engagement in sustainability-related initiatives (De Villiers, Naiker and Van Staden, 2011; Esa and Ghazali, 2012).

Empirical findings on the relationship between board size and disclosing sustainability-related information are inconsistent and mixed, e.g., a significant and positive influence (e.g., Said *et al.*, 2009; Shamil *et al.*, 2014; Masud *et al.*, 2018) and insignificant impact (e.g., Amran *et al.*, 2014; Adel *et al.*, 2019; Fallah and Mojarrad, 2019). Given that board size can affect SR negatively (i.e. agency theoretical perspective) and positively (i.e. resource dependence theoretical perspective), no prediction of the relation's direction is made. Therefore, the first set of hypotheses is drawn as follows:

H1. Board size has a significant impact on sustainability reporting.

H1a. Board size has a significant impact on sustainability reporting in the financial sector.

H1b. Board size has a significant on sustainability reporting in the non-financial sector.

4.2.2.2 Board independence

Board independence is an important CG mechanism (Khan *et al.*, 2013), where independent directors advise on the general presentation of corporate performance and practices and provide additional business windows (Haniffa and Cooke, 2005). In the context of sustainability, such independent directors are likely to direct managers more toward reporting social responsibility practices (Jamali *et al.*, 2008).

According to the agency theory, independent directors ensure that managers serve the interest of shareholders (Jensen and Meckling, 1976), are more effective in monitoring management activities (Hussain *et al.*, 2018), and have a significant impact on board independence (Zhou, 2019). As this theory argues, they can mitigate agency problems and costs, reduce information asymmetry, and enhance board monitoring quality (Barako *et al.*, 2006). This, in turn, leads to better monitoring of managers' activities (Ahmed *et al.*, 2006), higher transparency levels (Cheng and Courtenay, 2006), and long-term value-adding activities, such as SR (Ibrahim, Howard and Angelidis, 2003; Adel *et al.*, 2019).

Moreover, and from resource dependence theory, independent directors help companies with resource-rich information by coordinating organisational activities and providing external links (Pfeffer and Salancik, 1978). As this theory argues, such directors have an important role in providing resources, knowledge, and skills to the boards (Hillman, Cannella and Paetzold, 2000). In turn, this enhances boards' decisions, adds value to the firms and society (Ibrahim and Hanefah, 2016), and helps firms survive and be successful (Kor and Misangyi, 2008). Thus, boards with a high proration of independent directors are likely to be more sensitive to the community's expectations and care more about diverse stakeholder groups (Ibrahim *et al.*, 2003).

Compared to non-independent directors, independent ones can more objectively judge and oversee the activities of managers (Jizi, 2017), since they are less strictly engaged in developing corporate policies and strategies, implementing controls, and executing corporate operations (Giannarakis *et*

al., 2020). Moreover, compared with inside board members who have business connections to the firms, independent ones are less dependent on CEOs (Webb, 2004; Jizi *et al.*, 2014). Therefore, it is expected that management performance can be monitored and controlled better by boards with a higher percentage of independent directors (John and Senbet, 1998; Cheng and Courtenay, 2006). Furthermore, the remuneration, incentives, and compensation of independent board members are not based on the company's growth and financial performance (Jizi, 2017). Accordingly, independent board members tend to improve companies' long-term sustainability (e.g., disclosing sustainability information) instead of focusing on short-term financial performance (Jizi *et al.*, 2014).

The findings on the relationship between board independence and SR practices are mixed. For instance, Ibrahim and Hanefah (2016) and Fernandes *et al.* (2019) report a significant and positive association. On the other hand, Abu Qa'dan and Suwaidan (2019) and Pucheta-Martínez and Gallego-Álvarez (2019) show a significant and negative relationship. In contrast, other studies find no relation (e.g., Shamil *et al.*, 2014; Zhou, 2019). However, based on the agency and resource dependence theoretical perspectives and the above discussion, board independence is likely to enhance disclosing sustainability-related information. Thus, the second set of hypotheses is as follows:

H2. Board independence has a significant and positive impact on sustainability reporting.

H2a. Board independence has a significant and positive impact on sustainability reporting in the financial sector.

H2b. Board independence has a significant and positive impact on sustainability reporting in the non-financial sector.

4.2.2.3 CEO duality

CEO duality refers to a situation where one person occupies the roles of chairperson and CEO. In this vein, Haniffa and Cooke (2005) provide two viewpoints regarding combining and separating these two positions. The first viewpoint argues for separating the positions to offer controls for managers' performance. By contrast, the second viewpoint suggests that it is not essential to

separate the positions. Several firms are well operated, notwithstanding the positions combined and have a capable and powerful board to monitor management. Jizi *et al.* (2014) suggest that CEOs may promote reporting practices, aiming at becoming more successful, appeasing influential stakeholders' pressure, and increasing their remuneration and tenure.

However, from the agency theoretical perspective, CEO duality leads to concentrated decision-making processes that diminish the board independence and decrease disclosing corporate information (Donnelly and Mulcahy, 2008). As this theory argues, this duality can increase the risk that CEOs make decisions that prioritise their interests at the expense of the firms (Jensen and Meckling, 1976), thus increasing information asymmetry. Moreover, Haniffa and Cooke (2002) argue that assigning the two roles to a single person enables CEOs to make decisions that are not in the stakeholders' interests. Likewise, Muttakin and Subramaniam (2015) state that such duality can substantially empower the chairperson/CEO, thus neglecting the minority interests. Therefore, CEO and chairperson positions' separation tends to improve monitoring quality regarding crucial decisions related to stakeholder responsiveness (Li *et al.*, 2008).

Furthermore, combining these two roles leads to governance and leadership issues (Khan *et al.*, 2013), such as inducing management entrenchment and decreasing the board's oversight effectiveness (Endrikat *et al.*, 2020). According to Haniffa and Cooke (2002), a CEO - who is also the chairman - has the power to influence the board's appointments for his/her interests. In this regard, board members, and to keep their directorial roles, tend to support decisions made by CEOs instead of making decisions that reflect their independent judgements (Dey, 2008). Moreover, CEOs-chairpersons can advance their agendas at the expense of firms and monopolise board meetings, thus strengthening executive power and increasing information asymmetry (Finkelstein and D'aveni, 1994; De Villiers *et al.*, 2011). Therefore, CEOs-chairpersons, who seek profit maximisation and short-term orientation, can advance their agendas to the detriment of long-term social responsibility activities (Endrikat *et al.*, 2020).

Empirically, several studies report a significant and negative impact of CEO duality on SR practices (e.g., Muttakin and Subramaniam, 2015; Abu Qa'dan and Suwaidan, 2019), while others show a significant but positive influence (e.g., Jizi *et al.*, 2014; Pucheta-Martínez and Gallego-

Álvarez, 2019). On the other hand, other studies find no significant effect (e.g., Michelon and Parbonetti, 2012; Adel *et al.*, 2019). However, drawing on the agency theoretical perspective and based on the above discussion, it is expected that CEO duality negatively affects disclosing sustainability information. Therefore, we draw our third set of hypotheses as follows:

H3. CEO duality has a significant and negative impact on sustainability reporting.

H3a. CEO duality has a significant and negative impact on sustainability reporting in the financial sector.

H3b. CEO duality has a significant and negative impact on sustainability reporting in the non-financial sector.

4.2.2.4 Board gender diversity

One of the most contemporary CG mechanisms that may explain SR practices is board gender diversity. Globally, boards are under growing pressure to appoint female members (Adams and Ferreira, 2009). According to Rao and Tilt (2016a), board diversity is a debatable contemporaneous subject that has become an essential mechanism in CG research, where the heterogeneous boards compared to homogenous ones have a greater understanding of the complexity of the business arena. In the CG context, the existence of female directors could influence the governance of firms by enhancing boardrooms' effectiveness through broader skill and expertise pools for their members (Adams and Ferreira, 2009). Moreover, there is increased recognition that female directors can significantly contribute to the boardrooms about social responsibility activities (Post, Rahman and Rubow, 2011; Liao, Luo and Tang, 2015; Helfaya and Moussa, 2017). Gender-diverse boards are more stakeholder-oriented and more concerned about social responsibility issues (Hussain *et al.*, 2018) and move faster towards sustainability matters (Katmon *et al.*, 2019).

From an agency theory, board diversity is likely to lead to better monitoring of manager's performance (Carter *et al.*, 2003) and assessing manager's strategies and their impact on social responsibility activities (Hillman and Dalziel, 2003). As this theory portrays, boards with more gender diversity enhance governance and board independence, increase monitoring on

management activities, minimise information bias in the decision-making process, and provide various viewpoints on significant issues (Francoeur, Labelle and Sinclair-Desgagné, 2008). According to Hillman, Cannella Jr and Harris (2002), boards with a high proportion of female directors increase the professional expertise range and augment the number of directors with advanced degrees, thus enabling boards to control and monitor managers' actions more effectively (Hillman and Dalziel, 2003).

According to the resource dependence theoretical perspective, female directors are also likely to have a positive influence by sensitizing boards to social responsibility-related activities and providing perspectives that help firms address social-related issues (Bear *et al.*, 2010). Compared to male directors, female ones bring diverse networks, perspectives, and values to boards (Ibrahim and Hanefah, 2016) and have special experience and techniques and various communication abilities (Huse and Solberg, 2006; Barako and Brown, 2008). This, in turn, adds democracy and quality to decision-making processes (Campbell and Mínguez-Vera, 2008; Nielsen and Huse, 2010; Cabeza-García *et al.*, 2018) and creates board discussions with diverse ideas (Barako and Brown, 2008). Thus, women on boards widen discussions to represent stakeholders' needs (Bear *et al.*, 2010) and enhance firms' dedication toward social responsibility activities (Helfaya and Moussa, 2017).

The empirical findings regarding the relationship between board gender diversity and SR practices are mixed and inconsistent. For example, several studies find a significant and positive impact (e.g., Cabeza-García *et al.*, 2018; Khan *et al.*, 2019a). In contrast, Shamil *et al.* (2014) and Muttakin *et al.* (2015) report a significant but negative influence. On the other hand, other studies discover no relationship (e.g., Mahmood *et al.*, 2018; Masud *et al.*, 2018). However, consistent with agency theory and resource dependence theory, and based on both the above discussion, it is likely that board gender diversity influences SR practices positively. Therefore, the fourth set of hypotheses is drawn as follows:

H4. Board gender diversity has a significant and positive impact on sustainability reporting.

H4a. Board gender diversity has a significant and positive impact on sustainability reporting in the financial sector.

H4b. Board gender diversity has a significant and positive impact on sustainability reporting in the non-financial sector.

4.2.2.5 Board age

Although board age has become an important CG mechanism (Ibrahim and Hanefah, 2016; Giannarakis *et al.*, 2020), this topic has not been examined thoroughly, and there is a lack of research investigating the influence of the board age on disclosing sustainability-related information. According to Li *et al.* (2011), board age is one of the essential keystones of the company's human resources that spur creativity in companies and, thus, enhance competitive advantage. Moreover, age is considered an asset to the board and aspect of human capital (Sonnenfeld, 2002), has an essential role in shaping companies' strategies (Fallah and Mojarrad, 2019), and indicates board maturity in guiding the business (Hafsi and Turgut, 2013). Furthermore, and as in the sustainability area, Handajani *et al.* (2014) mention that board age is a significant consideration to determine the board composition and formulate strategies and policies to assure various stakeholders' interests.

According to the agency theory (Jensen and Meckling, 1976), internal CG mechanisms (e.g., board of directors) are set to control and monitor managers' behaviour (Mallin *et al.*, 2013). In this regard, the board monitoring effectiveness is based on the directorial expertise (Hambrick, Misangyi and Park, 2015) and general expertise (Kor, 2006). Xu, Zhang and Chen (2018b) state that older board members acquire more directorial experience, either from the current company or other companies, and more work and life experience. Therefore, the effectiveness of their monitoring can be enhanced by such specific expertise (Hambrick *et al.*, 2015) and general expertise (Kor, 2006).

Moreover, in the framework of resource dependence theory, companies depend on their external environment to acquire the needed resource to survive (Cabeza-García *et al.*, 2018). One aspect that can provide companies with vital resources is board experience (Xie *et al.*, 2019; John *et al.*, 2020). According to the literature, board experience and knowledge can be reflected by board members' ages (Anderson, Mansi and Reeb, 2004; Darmadi, 2011; Hafsi and Turgut, 2013). In

this regard, older board members have more experience, capital resources, and networks (Mahadeo, Soobaroyen and Hanuman, 2012). Furthermore, older people exhibit higher moral thinking (Forte, 2004; McCabe, Ingram and Dato-On, 2006) and have fostered ethical conduct due to more prolonged exposure to traditional customs and culture (Mudrack, 1989). Thus, older directors are expected to disclose more information on social responsibility-related activities (Post *et al.*, 2011) and take ethical decisions (Xu *et al.*, 2018b). According to Hafsi and Turgut (2013), boards with older members are likely to be more responsive about communities' issues, thus contributing more to their welfare.

Still, previous research shows mixed results despite the limited studies on this relationship. For instance, Fernandes *et al.* (2019) find a significant and positive impact, while Abu Qa'dan and Suwaidan (2019) show a significant and negative influence. In contrast, Fallah and Mojarrad (2019) report an insignificant effect. However, on the basis of agency and resource dependence theories, boards with older directors are expected to disclose a large volume of sustainability information. Thus, our fifth set of hypotheses is as follows:

H5. Board age has a significant and positive impact on sustainability reporting.

H5a. Board age has a significant and positive impact on sustainability reporting in the financial sector.

H5b. Board age has a significant and positive impact on sustainability reporting in the non-financial sector.

4.2.2.6 Board tenure

There is growing attention to the issue of board tenure globally (Huang and Hilary, 2018).[38] However, as the case with board age, limited studies have examined the impact of board tenure on SR practices. In this regard, there are two contrasting views in the previous literature. One view argues for short-tenured boards, consistent with agency theory (Jensen and Meckling, 1976) and

[38] Board tenure is the time length of board members holding directorship roles at the company (Shiah-Hou and Cheng, 2012).

one for long-tenured boards, consistent with resource dependence theory (Pfeffer and Salancik, 1978).

From an agency theoretical perspective, long-tenured directors mitigate the board's independence (Hillman *et al.*, 2011) since more extended ties and close relationships with managers may lead to less effectiveness in controlling and monitoring managers' behaviour (Lipton and Lorsch, 1992; Handajani *et al.*, 2014; Fallah and Mojarrad, 2019). Long-tenured boards have a negative consequence for CG mechanisms (Handajani *et al.*, 2014), thus leading to agency problems and less monitoring of management actions (Byrd, Cooperman and Wolfe, 2010). Moreover, long-tenured directors are likely to have limited information sources and be risk-averse decision-makers (Chen, 2013) and are more rigid regarding establishing procedures (Bravo and Reguera-Alvarado, 2017). Thus, they may not undertake new ideas and strategic changes (Golden and Zajac, 2001) and innovation activities (Chen, 2013). Furthermore, Katmon *et al.* (2019) state that these directors, remaining in their comfort zone, are likely to reiterate the same procedure, including reiterating similar content and structure of information offered to the stakeholders. As a result, boards with long-tenured members may not promote SR practices.

In contrast, from a resource dependence theoretical perspective, directors can accumulate more unique abilities and special knowledge during their long service on boards that enable them to evaluate and judge the viability of managers' strategies and plans (Bravo and Reguera-Alvarado, 2017). Moreover, longer tenure can lead to an increase in speeding and interacting information exchange between board and management, thus contributing to less asymmetric information (Rutherford and Buchholtz, 2007) and lower levels of misguided disclosures (Donoher, Reed and Storrud-Barnes, 2007). Furthermore, long-tenured members are likely to hold superior amounts of information, hence being more capable of evaluating firms' strategic choices and decisions and their impact in both the short-run and long-run (Zahra, 1996). Additionally, they have a better understanding of the firm's regulations and activities (Katmon *et al.*, 2019) and, thus, they have greater experience in controlling and monitoring the firms' reporting cycle (Chan, Liu and Sun, 2013). Therefore, they are more concerned about long-term success (Handajani *et al.*, 2014) and building their relationship with the stakeholders (Johnson, Schnatterly and Hill, 2013). As a result, boards with long-tenured directors may lead to a better policy of corporate sustainability.

In fact, although there is a lack of evidence regarding the relationship between board tenure and SR practices, previous studies support long-tenured boards argument and report a significant and positive impact (e.g., Fallah and Mojarrad, 2019), while others support short-tenured boards argument and find a significant and negative influence (e.g., Handajani *et al.*, 2014). On the other hand, some studies discover an insignificant effect (e.g., Khan *et al.*, 2019b). Since there are contrasting arguments for expecting a positive (i.e. resource dependence theory) and a negative impact (i.e. agency theory), the sixth set of hypotheses are developed with no prediction of the sign as follow:

H6. Board tenure has a significant impact on sustainability reporting.

H6a. Board tenure has a significant impact on sustainability reporting in the financial sector.

H6b. Board tenure has a significant on sustainability reporting in the non-financial sector.

4.2.2.7 Sustainability committee

Board structure determines the firm's internal organisation and its segmentation of actions between committees (Zahra and Pearce, 1989) and thus influences board members' participation in forming the firm's strategies and missions (Michelon and Parbonetti, 2012). In this regard, the establishment of sub-committees helps firms handle a broad array of matters (Jain and Zaman, 2020) and allow board members to address issues more broadly than the whole boardroom would do (Tingbani *et al.*, 2020). In the sustainability area, companies show their commitment to social responsibility activities to stakeholder groups by establishing a SC (Amran *et al.*, 2014). The creation of a SC can be seen as effective governance (Mahmood *et al.*, 2018) and controlling (Walls *et al.*, 2012) mechanism for the firms and enhances the level and the quality of SR practices (Michelon and Parbonetti, 2012). Also, the existence of SCs at board levels indicates that sustainability issues are critical to the firms (Rupley *et al.*, 2012), and consequently, that these firms have an active strategic position concerning their stakeholder groups' needs (Ullmann, 1985). Typically, the responsibility of such committees is to review the strategies and policies regarding the firm's commitments and principles toward sustainability matters and its involvement in disclosing sustainability practices (Michelon and Parbonetti, 2012).

From the agency theory perspective, the existence of a SC leads to more consideration about sustainability matters to minimise the interest conflicts between managers and various stakeholder groups concerning sustainability information (Ienciu, 2012; Adel *et al.*, 2019). According to García-Sánchez *et al.* (2019), the establishment of SCs emerges from the need to minimise agency problems and information asymmetry resulting from interest conflicts between management and various stakeholders. Moreover, Masud *et al.* (2018) state that board committees' creation leads to decentralising the board's responsibilities and power, thus minimising agency costs and interest conflicts. The relationship between the existence of SC and SR practices can also be seen from a resource dependence theoretical perspective which suggests that the board of directors helps organisations obtain the vital resources they need (Cabeza-García *et al.*, 2018). In this regard, the presence of SC is considered a capital resource for companies, where such committee's experience and knowledge are essential to ensure sustainability aspects (Amran *et al.*, 2014). Furthermore, a board committee with specific tasks and objectives can bring external links to the board by enhancing communication with various influential stakeholders (Subramaniam, Kansal and Babu, 2017).

The empirical results regarding the impact of SC presence on disclosing sustainability information are mixed. On the one hand, Amran *et al.* (2014) and Helfaya and Moussa (2017), for instance, report a significant and positive relationship. In contrast, Michelon and Parbonetti (2012) and Rupley *et al.* (2012) find no association. Still, drawing on the agency and resource dependence theoretical perspectives and based on the above discussion, it is expected that the existence of a SC promotes disclosing sustainability information. Hence, the seventh set of hypotheses in this regard is:

H7. The sustainability committee has a significant and positive impact on sustainability reporting.

H7a. The sustainability committee has a significant and positive impact on sustainability reporting in the financial sector.

H7b. The sustainability committee has a significant and positive impact on sustainability reporting in the non-financial sector.

4.3 Data and methodology

4.3.1 Sample selection

The sample in this study was obtained from the GRI database. According to Tauringana (2021), the significance of the GRI is that the information on its database evaluates the progress made by each country in achieving Sustainable Development Goal (SDG) 12. The 2017 year was chosen in this study because it was the year after issuing the GRI standards in 2016, which are the first global standards established to guide firms in SR (Hojnik *et al.*, 2020).

Three criteria have been used to include a firm in the sample. First, the firm should have prepared a report, submitted and verified by the GRI, covering 2017 and following the GRI standard. Consequently, 878 firms located in 77 countries were identified. Second, the firms should be listed on a stock exchange. This result in excluding 369 non-listed firms and 14 countries from the study sample. Third, the firm should have prepared the report in the English language. Therefore, 114 firms and six countries were dropped from the sample. Moreover, a further 25 firms and seven countries were excluded due to the missing data. This left a final sample of 370 international firms from 50 countries for analysis (see Table 4.1). Based on GRI classification, there are a total of 33 subsectors in the study sample. These subsectors are divided into two categories: financials (2 subsectors) and non-financials (31 subsectors). The sample distribution across the sector is presented under Panel A of Table 4.2. Panel B of the same table shows the sample distribution across the country.

Table 4.1: Sample size

	No. of firms		**No. of countries**
Initial sample in 2017	878	Initial sample in 2017	77
Less:		Less:	
Non-listed firms	369	Countries with non-listed firms	14
Non-English reports	114	Countries with non-English reports	6
Missing data	25	Countries with missing data	7
Total	**370**	**Total**	**50**

Table 4.2: Sample description

Panel A: Sample distribution across the sector

Financial sector	**N**
1. Financial services	67
2. Real estate	37
Total	***104***
Non-financial sector	**N**
3. Agriculture	8
4. Automotive	7
5. Aviation	4
6. Chemicals	23
7. Commercial Services	6
8. Computers	5
9. Conglomerates	11
10. Construction	9
11. Construction Materials	9
12. Consumer Durables	3
13. Energy	31
14. Energy Utilities	16
15. Equipment	5
16. Food and Beverage Products	8
17. Forest and Paper Products	7

Non-financial sector	**N**
18. Healthcare Products	11
19. Healthcare Services	1
20. Household and Personal Products	3
21. Logistics	1
22. Media	2
23. Metals Products	12
24. Mining	10
25. Others	30
26. Railroad	2
27. Retailers	6
28. Technology Hardware	11
29. Telecommunications	18
30. Textiles and Apparel	2
31. Tobacco	1
32. Tourism/Leisure	3
33. Water Utilities	1
Total	***266***
Total sample	***370***

Panel B: Sample distribution across the country

Country	**N**	**Country**	**N**	**Country**	**N**
1. Argentina	1	18. Indonesia	3	35. Romania ‡	1
2. Austria ‡	7	19. Ireland ‡	2	36. Russian Federation	6
3. Bahrain	1	20. Italy ‡	7	37. Saudi Arabia	1
4. Belgium ‡	6	21. Jordan	3	38. Singapore	37
5. Brazil	4	22. Korea, Republic	1	39. Slovenia ‡	2
6. Canada ‡	12	23. Kuwait	1	40. South Africa	1
7. Chile	4	24. Lebanon	1	41. Spain ‡	6
8. Colombia	2	25. Malaysia	6	42. Sri Lanka	2
9. Czech Republic ‡	2	26. Mexico	6	43. Sweden ‡	20
10. Egypt	1	27. Netherlands ‡	7	44. Switzerland ‡	13
11. Finland ‡	10	28. Nigeria	2	45. Taiwan	11
12. France ‡	3	29. Norway ‡	5	46. Thailand	16
13. Germany ‡	21	30. Palestine	3	47. Turkey	8
14. Greece ‡	10	31. Panama	1	48. United Arab Emirates	4
15. Hong Kong	18	32. Philippines	6	49. United Kingdom ‡	10
16. Hungary ‡	3	33. Poland ‡	1	50. United States ‡	66
17. India	2	34. Portugal ‡	4	***Total***	***370***

Note: Panel A of this table shows the sample distribution across the sector. Distribution by sub-sector is based on GRI classification. Panel B shows the distribution across the country. ‡ in panel B is for developed countries. The classification of countries into "developing" and "developed" is in accordance with the World Economic Situation and Prospects Report (2021). Available at: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/WESP2021_FullReport-optimized.pdf

Abbreviations: N, the number of firms.

4.3.2 Dependent variable: Sustainability reporting

Firms can use various communication channels (e.g., annual reports, sustainability reports, integrated reports, separate reports, and websites) to disclose sustainability information (Hahn and Kühnen, 2013). Still, most prior studies examining the relationship between CG and SR rely on annual reports (e.g., Haniffa and Cooke, 2005; Khan *et al.*, 2013; Hoang *et al.*, 2018; Muttakin *et al.*, 2018; Katmon *et al.*, 2019). However, annual reports target specific stakeholder groups (e.g., shareholders) and focus on financial outcomes and results (Fasan, 2013). Thus, they may not truly reflect the disclosure practices on sustainability information. Moreover, relying on one source, in general, may not truly reflect the SR practices (Michelon and Parbonetti, 2012), hence causing the subjectivity leading to undermining the reliability of the study's findings. Furthermore, there is no prescribed communication channel to report sustainability information, particularly when investigating an international context. To overcome these issues, the study examines all possible sustainability information sources (i.e. annual and integrated reports, websites, and sustainability reports and other sustainability-related reports).[39] By doing so, this study aims at avoiding penalising firms for non-disclosure information and capturing as full a picture as possible of disclosure practices.

The disclosure index in this study is based on GRI standards released in 2016, which includes a list of 77 items categorised into three dimensions and broken down into several sub-dimensions (see Table 4.3). The rationale for adopting GRI standards, among other standards, is that the GRI is the primary driver of SR and considered the most recognised and accepted initiative in the SR area (Fonseca *et al.*, 2014), and its framework is broadly applied across the globe (Yadava and Sinha, 2016).[40] According to Vigneau *et al.* (2015), GRI aims at enhancing stakeholder engagement and the companies' transparency and accountability. To do so, GRI challenges companies to report sustainability activities by offering guidance on what information to disclose and how to do so (Hussain *et al.*, 2018).

[39] Sustainability reports cover a comprehensive set of stakeholders and concentrate on both direct and indirect effects of sustainability activities (Fasan, 2013). Likewise, firms increasingly publish their sustainability information on their websites (Ong and Djajadikerta, 2018).

[40] According to Giannarakis *et al.* (2020), several international organisations have established different guidelines (e.g., ISO series, SA8000 standard, and AA1000 standards) to inform stakeholder groups regarding the progress made by companies in achieving sustainability.

Table 4.3: GRI standards-based disclosure index

	Sub-dimension	N
Economic Dimension	Economic Performance	4
	Market Presence	2
	Indirect Economic Impacts	2
	Procurement Practices	1
	Anti-corruption	3
	Anti-competitive	1
Total items for economic dimension		***13***
Environmental Dimension	Materials	3
	Energy	5
	Water	3
	Biodiversity	4
	Emissions	7
	Effluents and Waste	5
	Environmental Compliance	1
	Supplier Environmental Assessment	2
Total items for environmental dimension		***30***
Social Dimension	Employment	3
	Labor/Management Relations	1
	Occupational Health and Safety	4
	Training and Education	3
	Diversity and Equal Opportunity	2
	Non-discrimination	1
	Freedom of Association and Collective Bargaining	1
	Child Labor	1
	Forced or Compulsory Labor	1
	Security Practices	1
	Rights of Indigenous Peoples	1
	Human Rights Assessment	3
	Local Communities	2
	Supplier Social Assessment	2
	Public Policy	1
	Customer Health and Safety	2
	Marketing and Labeling	3
	Customer Privacy	1
	Socioeconomic Compliance	1
Total items for social dimension		***34***
Total items for sustainability reporting		***77***

Note: This table shows the GRI standards-based disclosure index: the three dimensions of sustainability, their sub-dimensions, and the number of items.
Abbreviation: N, the number of items.

This study conducts a content analysis method that is widely used in investigating the disclosure activities of the companies (e.g., Haniffa and Cooke, 2002; Chan *et al.*, 2014; Jizi *et al.*, 2014; Hoang *et al.*, 2018) to quantify the level of SR practices. To do so, two approaches (i.e. the weighted or the unweighted approach) can be used (Tingbani *et al.*, 2020). In this study, and following prior disclosure literature (e.g., Khan *et al.*, 2013; Katmon *et al.*, 2019), the unweighted approach is adopted.[41] To calculate the scores for SR practices, the ratio of actual scores awarded and the maximum score is taken, using the simple dichotomous scoring process (one if a firm discloses an item in the disclosure index; zero if the firm does not disclose item in the disclosure index):

$$Firm_j, SR = (Number\ of\ items\ disclosed) \ / \ (Total\ number\ of\ items) \quad (1)$$

where, SR represents the dependent variable and the maximum number of items for each firm is 77.

4.3.3 Independent variable: Corporate governance

Seven board characteristics (i.e. board size, board independence, CEO duality, board gender diversity, board age, board tenure, and the presence of SC) are considered as independent variables of the study. The data for these variables are gathered manually (from annual and sustainability reports) and from an electronic database (i.e. DataStream). Table 4.4 illustrates their measurements in detail.

4.3.4 Control variables

In this study, two sets of control variables are included in the statistical regressions to prevent model misspecification. The first set is related to firm-level variables (i.e. firm size, financial performance, assurance quality, leverage, and firm age). In contrast, the second set is related to institutional-level variables (i.e. investor protection strength, power distance, individualism, and

[41] This study chose the unweighted approach because it limits the researchers' choices and makes it more reliable (Hackston and Milne, 1996). Moreover, Cooke (1989) suggests that when no different weights are allocated to any specific user group, the unweighted approach is more appropriate.

GDP growth). Furthermore, the sector fixed effect is controlled to capture the sector-specific variation using 33 activity sectors based on the GRI classification.[42] The study collects the data for the first set of control variables from annual reports and DataStream. On the other hand, the data for the second set of control variables is obtained from the World Bank database and Hofstede Insights website.

In terms of firm-level variables and following previous SR studies, the study controls for firm size given that larger companies are more likely to report social responsibility activities (Kansal, Joshi and Batra, 2014). Large firms are more visible to the political groups (Dowling and Pfeffer, 1975) and the general public (Watts and Zimmerman, 1986) and have a more substantial influence on societies than small companies (Barnea and Rubin, 2010). Accordingly, large companies are more likely to be more subjected to influential stakeholders' effects and encounter strict regulatory requirements (Reverte, 2009). Thus, firm size is expected to affect the social responsibility disclosure level required to deal with the various stakeholders' concerns (Branco and Rodrigues, 2006). In line with Jizi *et al.* (2014), this study also incorporates a control variable to capture the profitability since profitable companies are likely to positively affect disclosing sustainability-related information (Juhmani, 2013). According to Gamerschlag *et al.* (2011), profitable firms have more funding for disclosing activities, and thus, they are assumed to produce and publish sustainability reports.

Moreover, the assurance quality is also controlled, given that it affects reporting practices positively. Junior *et al.* (2014) state that assuring sustainability reports promotes the reliability and credibility of the SR activities. The study also accounts for the influence of firm leverage. On the one hand, companies with high leverage tend to disclose more information to reduce agency costs (Jensen and Meckling, 1976), assure shareholders, and minimise the associated risk related to their image (Mohamed and Basuony, 2014; Adel *et al.*, 2019). On the other hand, companies with a high level of leverage have limited financial resources to fund social responsibility disclosures (Reverte, 2009). Finally, the firm age is controlled in this study as older companies offer more social responsibility disclosures (Roberts, 1992). According to Khan *et al.* (2013), matured firms

[42] SR practices can differ across sectors (Mahadeo, Oogarah-Hanuman and Soobaroyen, 2011) since firms in certain sectors may face different pressure to disclose different levels and sorts of information

care more about their reputations, and accordingly, they tend to reveal more social responsibility information.

Regarding institutional-level variables, and in line with Liao *et al.* (2021), the shareholder protection strength is included in the analysis. Ioannou and Serafeim (2012) state that stakeholders' interests are largely declined in countries with a high level of investor interest protection. Furthermore, this study accounts for the cultural system. Specifically, and following previous research (e.g., Ioannou and Serafeim, 2012), this study controls for the power distance index and individualism dimensions. According to Waldman *et al.* (2006a), managements in communities with a high level of power distance may tend to care more about their benefits than the community's interests. As a result, they are expected to abuse their power to pursue their interests (House *et al.*, 2004) and may not be inclined to build a long-term relationship with various stakeholder groups (Waldman, Siegel and Javidan, 2006b). On the other hand, managers in more individualistic societies tend to make their imprint by taking explicit activities and decisions in the social responsibility domain and more widely (Matten and Moon, 2008; Ioannou and Serafeim, 2012). Finally, and in line with Lu and Wang (2021), this study controls for GDP growth.

4.3.5 Empirical model

The following model using OLS multiple regression is employed to test the seven sets of hypotheses:

$$\chi_{SR} = \alpha + \beta_1 BS + \beta_2 BI + \beta_3 Dual + \beta_4 BGD + \beta_5 BA + \beta_6 BT + \beta_7 SC + \beta_8 FS + \beta_9 ROA + \beta_{10} AQ + \beta_{11} LEV + \beta_{12} FA + \beta_{13} IPS + \beta_{14} PDI + \beta_{15} IDV + \beta_{16} GDPG + \sum_{n=17}^{49} \beta_n Sector_n + \varepsilon \quad (2)$$

The definition of dependent variables, independent variables, and control variables are summarised in Table 4.4.

Table 4.4: Definition of variables (all variables at time *t*)

Variable	Symbol	Measurement
Dependent Variables		
Sustainability Reporting	*SR*	Number of items disclosed by a company divided by the total number of SR items (that is, 77 items)
Independent Variables		
Board Size	*BS*	The number of directors on the board.
Board Independence	*BI*	The number of independent directors divided by the total number of the board of directors.
CEO Duality	*Dual*	Dummy variable (1 = if the same person holds the positions of CEO and chairman; 0 = otherwise).
Board Gender Diversity	*BGD*	The number of female directors divided by the total number of the board of directors.
Board Age	*BA*	The average age of directors on the board.
Board Tenure	*BT*	The average time of directors on the board.
Sustainability Committee	*SC*	Dummy variable (1 = if the firm has a sustainability committee; 0 = otherwise).
Control Variables		
Firm Size	*FS*	The natural logarithmic of total assets.
Profitability	*ROA*	The earnings before interest and tax divided by total assets.
Assurance Quality	*AQ*	Dummy variable (1 = if the sustainability/integrated report is externally assured; 0 = otherwise).
Leverage	*LEV*	Total liabilities divided by total assets.
Firm Age	*FA*	The natural logarithm of the period the firm has been listed on a stock exchange.
Investor Protection Strength	*IPS*	Using the strength of investor protection score ranging from 0 to 10 (best) (World Bank).
Power Distance Index	*PDI*	Using the score of Hofstede Insights ranging from 0 to 100.
Individualism	*IDV*	Using the score of Hofstede Insights ranging from 0 to 100.
GDP Growth	*GDPG*	The annual percentage change of GDP growth based on constant 2010 US dollars (World Bank).

4.4 Empirical results and discussion

4.4.1 Descriptive statistics

Table 4.5 below shows the mean, standard deviation, and ranges for SR across sectors. The sub-sectors are based on GRI classification. In the investigated sample, these subsectors are 33 in total; two subsectors are in the financial sector and 31 subsectors in the non-financial sector. The descriptive statistics of variables for the combined sectors, the financial sector, and the non-financial sector are presented in Table 4.6. The results indicate that the scores of disclosing sustainability information have a wide range. SR scores range from 5.2% to 100% for the combined sectors, but overall, the mean is 43.6%. For the financial sector, the scores range from 7.8% to a 100%, with a mean of 34.9%. In terms of the non-financial sector, the scores for SR practices range from 5.2% to a 100%, with a mean of 47%. As indicated by the mean, the extent of reporting sustainability information in the combined sectors, as well as the financial and non-financial sectors, is moderate.

Furthermore, the results, as shown by a t-test of equality of means (see Table 4.6), indicate that the financial sector has significantly lower average SR scores than the non-financial sector. Still, this is not in line with the agency theoretical perspective which predicts that companies with higher agency costs, which is probably the case in the financial sector (Laeven, 2013), may tend to disclose more information (Healy and Palepu, 2001). One possible reason is that although the financial sector has a significant role in affecting sustainable development (Weber, 2014) since the impression that this sector has an inconsiderable part towards social and environmental issues has been changed (Barako and Brown, 2008; Kiliç *et al.*, 2015), the impact is indirect through the lending and investment activities (Andrikopoulos *et al.*, 2014) compared to a direct effect by the non-financial sector. This, in turn, may lead to disclosing more levels and sorts of sustainability-related information by the non-financial firms.

Table 4.5: Descriptive statistics for SR by sector

SR	N	Mean	SD	Min	Max
Financial Sector					
Financial Services	67	0.347	0.210	0.104	1.00
Real Estate	37	0.355	0.164	0.078	0.818
Non-Financial Sector					
Agriculture	8	0.477	0.151	0.299	0.737
Automotive	7	0.447	0.191	0.104	0.675
Aviation	4	0.529	0.146	0.364	0.701
Chemicals	23	0.493	0.247	0.117	1.00
Commercial Services	6	0.464	0.300	0.156	1.00
Computers	5	0.52	0.288	0.182	0.885
Conglomerates	11	0.369	0.157	0.143	0.688
Construction	9	0.260	0.166	0.052	0.571
Construction Materials	9	0.563	0.281	0.221	0.987
Consumer Durables	3	0.623	0.315	0.273	0.883
Energy	31	0.500	0.247	0.091	0.971
Energy Utilities	16	0.514	0.248	0.078	1.00
Equipment	5	0.429	0.308	0.052	0.857
Food and Beverage Products	8	0.469	0.255	0.260	1.00
Forest and Paper Products	7	0.403	0.238	0.104	0.790
Healthcare Products	11	0.521	0.224	0.273	0.896
Healthcare Services	1	0.351		0.351	0.351
Household and Personal Products	3	0.761	0.141	0.607	0.883
Logistics	1	0.987		0.987	0.987
Media	2	0.286	0.037	0.260	0.312
Metals Products	12	0.434	0.230	0.143	0.935
Mining	10	0.511	0.273	0.091	0.818
Others	30	0.399	0.223	0.052	1.00
Railroad	2	0.558	0.165	0.442	0.675
Retailers	6	0.389	0.150	0.117	0.553
Technology Hardware	11	0.577	0.298	0.247	1.00
Telecommunications	18	0.478	0.215	0.182	1.00
Textiles and Apparel	2	0.239	0.012	0.230	0.247
Tobacco	1	0.597		0.597	0.597
Tourism/Leisure	3	0.425	0.214	0.247	0.662
Water Utilities	1	0.493		0.493	0.493

Note: This table reports the descriptive statistics for the dependent variable across the sector. All scores range from 0 to 1. Distribution by sub-sector is based on GRI classification.
Abbreviations: SR, sustainability reporting; N, the number of observations; SD, standard deviation.

Table 4.6: Descriptive statistics for all variables

Variables	Full sample (N=370)				Financial Sector (N=104)				Non-Financial Sector (N=266)				t-test
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean Difference
SR	0.436	0.232	0.052	1.00	0.349	0.194	0.078	1.00	0.470	0.237	0.052	1.00	-0.121***
BS	10.630	3.404	5	29	10.740	2.949	5	22	10.586	3.571	5	29	0.154
BI	0.575	0.247	0.00	1.00	0.568	0.252	0.00	1.00	0.578	0.246	0.00	1.00	-0.009
Dual	0.222	0.416	0	1	0.260	0.441	0	1	0.207	0.406	0	1	0.053
BGD	0.188	0.124	0.00	0.50	0.206	0.125	0.00	0.50	0.181	0.124	0.00	0.50	0.025*
BA	59.481	4.701	42.600	73.273	59.720	4.696	49.356	73.273	59.387	4.709	42.600	71.800	0.333
BT	6.759	3.683	0.100	20.950	6.887	3.853	0.100	19.220	6.709	3.621	0.100	20.950	0.178
SC	0.654	0.476	0	1	0.635	0.484	0	1	0.662	0.474	0	1	-0.027
FS	22.732	1.932	16.544	28.227	23.825	1.987	18.833	28.227	22.305	1.735	16.544	26.819	1.520***
ROA	0.066	.082	-0.596	0.531	0.045	0.055	-0.019	0.317	0.074	0.089	-0.596	0.531	-0.029***
AQ	0.532	0.500	0	1	0.538	0.501	0	1	0.530	0.500	0	1	0.008
LEV	0.618	0.235	0.028	2.225	0.701	0.251	0.028	1.014	0.585	0.220	0.089	2.225	0.116***
FA	3.773	0.888	0.693	5.858	3.861	0.871	1.609	5.420	3.742	0.896	0.693	5.858	0.110
IPS	6.710	0.986	3.500	8.300	6.664	1.146	3.500	8.300	6.727	0.917	4.200	8.300	-0.063
PDI	53.505	20.209	11	100	56.000	19.708	13	100	52.530	20.356	11	100	3.470
IDV	54.068	27.59	11	91	51.413	27.302	11	91	55.105	27.683	13	91	-3.692
GDPG	0.032	0.016	-0.047	0.082	0.031	0.016	-0.047	0.082	0.032	0.016	0.008	0.082	-0.002

Note: This table shows descriptive statistics for all variables of the full sample, the financial sector, and the non-financial sector. Variable measurements are reported in Table 4.4.

Abbreviations: SR, sustainability reporting; BS, board size; BI, board independence; Dual, CEO duality; BGD, board gender diversity; BA, board age; BT, board tenure; SC, sustainability committee; FS, firm size; ROA, profitability; AQ, assurance quality; LEV, leverage; FA, firm age; IPS, investor protection strength; PDI, power distance index; IDV, individualism; GDPG, GDP growth; N, the number of observations; SD, standard deviation.

The mean for board size is about 11 directors for the combined sectors, the financial sector and the non-financial sector, with a minimum of five and a maximum of 22 and 29 for the financial and non-financial sector. The results also show that the proportion of board independence ranges from 0% to 100%, and the mean is 57.5%, 56.8%, and 57.8% for the combined sectors, the financial sector, and the non-financial sector, respectively. In terms of CEO duality, the results indicate that most firms separate the role of CEO and chairman, whereas only about 22.2 % of firms (26% of financial firms and 20.7% of non-financial firms have role duality) have role duality.

For board gender diversity ranging from 0% to 50%, there are low levels of women engagement as indicated by a mean of 18.8% for the combined sectors (20.6% for the financial sector and 18.1% for the non-financial sector). This indicates that the boards in this sample are heterogeneous (i.e. male-dominated boards). For the combined sectors, board age ranges from 42.6 to 73.27 years, and the mean is 59.48 years. In the financial sector, it ranges from 49.36 to 73.27 years, and the mean is 59.72 years, while from 42.6 to 71.8 years with a mean of 59.387 in the non-financial sector. Board tenure ranges from 0.10 to 20.95 years, and the mean is 6.759 years in the combined sectors. Regarding the financial and non-financial sectors, it ranges from 0.10 to 19.22 and 20.95 years, with a mean of 6.887 and 6.709 years, respectively. Finally, on average, about 65.4% of firms (63.5% and 66.2% of firms in the financial and non-financial sector, respectively) have formed a SC. This signifies that the existence of these committees is becoming a popular trend in the corporate environment.

Furthermore, and for comparing the financial sector with the non-financial sector, a t-test of equality of means was used. The results indicate that the averages of most of the financial sector variables are different from those of the non-financial sector. Specifically, the financial sector has larger boards, lower board independence, more firms with duality role, higher gender diversity, higher values of board age and board tenure, and fewer firms with a SC than the non-financial sector. However, except for board gender diversity, these differences are not significant, as shown by the t-test of equality of means. As for firm-level control variables, the financial sector has significantly higher values of firm size and leverage and lower profitability value, while insignificantly higher values of assurance quality and firm age than the non-financial sector.

4.4.2 Correlation analysis

The correlations between all the variables for the total sample in this study are presented in Table 4.7. The results show that several variables have a significant correlation with the dependent variable (SR). The results also indicate that the highest correlation is between the power distance index and individualism at – 0.744, which falls below the threat value (i.e. 0.8 or 0.9) suggested by Field (2013). This indicates that the multicollinearity problem does not influence the investigated models in this study.

However, Myers (1990) suggests that even when not a substantial value of correlation is found between independent variables, some degree of multicollinearity can still exist. To this end, further test, namely variance inflation factor (VIF), is also used to check for the multicollinearity problem. Still, the maximum VIF is 3.46 for individualism which is less than 10 (Neter, Wasserman and Kutner, 1989), and the mean VIF is 1.56. Therefore, multicollinearity issues are not likely to be a cause for concern.[43]

Furthermore, both Breusch–Pagan/Cook–Weisberg tests were conducted to check for the issue of heteroscedasticity, which, if it exists but is not controlled, the drawn conclusion and results could be biased and false. Our findings indicate the presence of the heteroscedasticity problem as we got a highly significant test statistic. In this matter, and to control the heteroscedasticity issue, Berry and Feldman (1985) suggest different means that can be used, such as variable transformation and the robust option. In this study, we implement robust standard errors and transform the firm size and the firm age using the natural logarithm.

[43] The maximum and the mean VIF values for the financial model as well as the non-financial model are also less than 10.

Table 4.7: Pearson correlation

Variables	VIF	1	2	3	4	5	6	7	8
1. Sustainability reporting		1							
2. Board size	1.40	0.297***	1						
3. Board independence	1.81	-0.094*	-0.08	1					
4. CEO duality	1.11	-0.085	0.031	0.161***	1				
5. Board gender diversity	1.45	0.013	0.092*	0.318***	0.010	1			
6. Board age	1.56	0.078	0.044	0.206***	0.169***	-0.166***	1		
7. Board tenure	1.32	0.052	0.008	-0.046	0.129**	-0.195***	0.417***	1	
8. Sustainability committee	1.24	0.320***	0.192***	0.163***	0.019	0.06	0.246***	0.180***	1
9. Firm size	1.81	0.188***	0.441***	0.196***	0.114**	0.293***	0.187***	0.010	0.276***
10. ROA	1.09	0.080	-0.001	0.064	-0.044	0.046	0.004	0.005	-0.013
11. Assurance quality	1.28	0.353***	0.328***	-0.016	0.017	0.190***	0.055	0.021	0.241***
12. Leverage	1.17	-0.127**	0.083	0.075	0.064	0.093*	0.039	-0.119**	-0.009
13. Firm age	1.17	0.061	0.107**	0.135***	0.117**	0.167***	0.146***	0.142***	0.144***
14. Investor protection strength	1.24	-0.160***	-0.197***	0.055	-0.056	-0.074	0.095*	0.057	0.050
15. Power distance index	2.52	-0.001	-0.129**	-0.427***	-0.088*	-0.373***	0.123**	0.147***	0.032
16. Individualism	3.46	0.003	0.074	0.561***	0.192***	0.412***	0.014	-0.092*	0.008
17.GDP growth	1.38	0.053	-0.039	-0.249***	-0.028	-0.170***	0.141***	0.116**	0.009

Table 4.7: Continued

Variables	9	10	11	12	13	14	15	16	17
1. Sustainability reporting									
2. Board size									
3. Board independence									
4. CEO duality									
5. Board gender diversity									
6. Board age									
7. Board tenure									
8. Sustainability committee									
9. Firm size	1								
10. ROA	-0.091*	1							
11. Assurance quality	0.335***	0.024	1						
12. Leverage	0.279***	-0.141***	-0.039	1					
13. Firm age	0.280***	-0.050	0.100*	0.047	1				
14. Investor protection strength	-0.203***	-0.093*	-0.065	-0.134***	-0.076	1			
15. Power distance index	-0.224***	-0.073	-0.109**	-0.055	-0.185***	0.147***	1		
16. Individualism	0.277***	0.153***	0.039	0.104**	0.147***	-0.252***	-0.744***	1	
17.GDP growth	-0.196***	-0.069	0.009	-0.149***	-0.079	0.250***	0.352***	-0.463***	1

Note: The detailed definitions of the variables can be found in Table 4.4.

*significance at 10% level.**significance at 5% level.***significance at 1% level.

4.4.3 Regression analysis

Table 4.8 presents the relationship between board characteristics (i.e. size, independence, CEO duality, gender diversity, age, tenure, and the SC presence), along with control variables, and SR. The impact of the board-level governance bundle on SR in the total sample, the financial sample, and the non-financial sample are examined in Model 1, Model 2, and Model 3, respectively. The values for R^2 are 0.384, 0.400, and 0.386, respectively, indicating the variations of the SR that can be explained by the variables included in the three models. In terms of the adjusted-R^2 for the three models, the values are 0.292, 0.281, and 0.257, respectively.

The results show that board size is significantly and positively related to the SR practices in the total sample and the financial and non-financial samples. The significance is at 5%, 5%, and 10% levels, respectively. Hence, H1, H1a, and H1b are confirmed. Interestingly, the results demonstrate that board independence has a significant and negative influence on SR in the total sample (at 5% level) and the financial sample (at 1% level) but insignificant in the non-financial sample. Thus, none of the hypotheses (H2, H2a, and H2b) is supported. Likewise, CEO duality has a significant and negative effect on SR in the total sample and the financial sample (at 5% level), but an insignificant influence in the non-financial sample. Therefore, H3 and H3a are confirmed, but not H3b.

The findings also show no significant relationship between board gender diversity and SR in the total sample and the financial sample and non-financial samples. Hence, H4, H4a, and H4b are rejected. Board age has an insignificant impact on SR in the total sample and the non-financial sample, while a significant and positive effect (at 5% level) in the financial sample. Therefore, H5a is confirmed, but not H5 and H5b. Similarly, board tenure has no significant influence on SR in the total sample and the non-financial sample, while a significant and negative impact (at 5% level) in the financial sample. Thus, H6a is supported, but not H6 and H6b. Finally, the presence of a SC is significantly and positively related to SR in the total sample and the financial and non-financial samples at 1%, 10%, and 1%, respectively. Accordingly, H7, H7a, and H7b are supported.

Table 4.8: Baseline regressions results

	Model 1	Model 2	Model 3
Board size	0.0080**	0.0109**	0.0075*
	(0.0033)	(0.0054)	(0.0043)
Board independence	-0.1203**	-0.2719***	-0.0382
	(0.0551)	(0.0810)	(0.0739)
CEO duality	-0.0566**	-0.0817**	-0.0359
	(0.0256)	(0.0395)	(0.0328)
Board gender diversity	-0.0230	-0.1568	0.0271
	(0.1041)	(0.1585)	(0.1328)
Board age	0.0019	0.0104**	0.0008
	(0.0031)	(0.0049)	(0.0040)
Board tenure	-0.0012	-0.0104**	0.0025
	(0.0030)	(0.0050)	(0.0040)
Sustainability committee	0.1028***	0.0679*	0.1087***
	(0.0227)	(0.0403)	(0.0286)
Firm size	0.0208**	0.0103	0.0183
	(0.0083)	(0.0119)	(0.0116)
ROA	0.0133	0.4400	0.0205
	(0.1446)	(0.3053)	(0.1632)
Assurance quality	0.0814***	0.0986**	0.1016***
	(0.0244)	(0.0383)	(0.0326)
Leverage	-0.0782*	0.1965*	-0.1106**
	(0.0435)	(0.0989)	(0.0528)
Firm age	0.0003	-0.0200	0.0093
	(0.0134)	(0.0223)	(0.0164)
Investor protection strength	-0.0404***	-0.0387**	-0.0364*
	(0.0129)	(0.0166)	(0.0188)
Power distance index	0.0008	-0.0014	0.0013
	(0.0009)	(0.0014)	(0.0010)
Individualism	0.0004	-0.0009	0.0006
	(0.0007)	(0.0012)	(0.0009)
GDP growth	1.1098	0.7598	0.9258
	(0.9594)	(1.5054)	(1.2473)
Sector fixed effect	Included	Included	Included
cons	0.0358	-0.2278	-0.0279
	(0.2335)	(0.3448)	(1.2473)
R^2	0.384	0.400	0.386
Adjusted R^2	0.292	0.281	0.257
N	370	104	266

Note: This table presents our baseline results. The relationship between board characteristics and sustainability reporting for the total sample and the financial and non-financial samples is investigated in Model 1, Model 2, and Model 3, respectively. Sector fixed effect is included in the estimations but not reported. Robust standard errors in parentheses. A detailed definition of all the variables is in Table 4.4.

*significance at 10% level.**significance at 5% level.***significance at 1% level.

The empirical findings demonstrate that board size enhances SR practices in the total sample and the financial and non-financial samples. These results align with resource dependence theory (Pfeffer and Salancik, 1978) which suggests that large boards can enhance disclosing sustainability information, but not with agency theory (Jensen and Meckling, 1976) which argues for the opposite. Moreover, these results are consistent with prior studies investigating the impact of board size on SR using a sample of mixed financial and non-financial firms (e.g., Shamil *et al.*, 2014), financial firms (e.g., Jizi *et al.*, 2014), and non-financial firms (e.g., Esa and Ghazali, 2012). Overall, this study shows that the significant and positive impact of board size in the total sample is not affected by inclusion or exclusion of the financial sector and that impact holds for both sectors.

The results also show that the financial firms drive the relationship between board independence and disclosing sustainability information in the total sample. However, interestingly, the results reveal a significant and negative influence of board independence on SR practices in the full sample and the financial sample. These results are still in line with previous studies reporting a significant and negative impact and examining both sectors together (e.g., Adel *et al.*, 2019) and the financial sector (e.g., Ghabayen, Mohamad and Ahmad, 2016). For the non-financial sample, the results indicate an insignificant effect, which is still consistent with Haniffa and Cooke (2005) and Abu Qa'dan and Suwaidan (2019), for example, who investigate non-financial companies. However, these results are surprising because independent directors, according to agency theoretical perspective and resource dependence theoretical perspective, are expected to play a significant role in promoting SR practices. One possible reason for this is that independent board members may not be actually independent because of (i) the powerful CEOs who undermine their monitoring abilities (Muttakin *et al.*, 2018), (ii) standing outside their companies (Barako *et al.*, 2006), and (iii) the influences that inhibit their professional judgements and decisions (Tauringana and Chithambo, 2015). Another reason may be related to the cost for owners to report sustainability-related information (Prado-Lorenzo and Garcia-Sanchez, 2010). Thus, independent directors may decrease SR practices, aiming to protect the shareholders' interests since they consider their relationship with them a more priority for the company than other stakeholder groups (Pucheta-Martínez and Gallego-Álvarez, 2019).

For the CEO duality, the results show a significant and negative impact on the disclosure of sustainability activities in the total sample and the financial sample. These results are in line with the agency theoretical perspective (Jensen and Meckling, 1976), where combining the CEO and chairman's positions leads to less SR information being disclosed. These results also support the empirical evidence from prior literature investigating financial and non-financial firms in one sample (e.g., Muttakin and Subramaniam, 2015) and the financial sector (e.g., Harun *et al.*, 2020). On the other hand, and regarding the non-financial sample, the results show an insignificant influence on SR practices, consistent with Khan *et al.* (2013) and Habbash (2016), but not with agency theory. A plausible reason for the absence of this relationship is that CEOs who are also the chairmen of the examined non-financial firms may be substantial shareholders, making no difference whether the two positions are combined or separated. Overall, the results suggest that the significant and negative effect in the total sample is due to the financial sector only.

Contrary to the arguments of the agency theoretical perspective and the resource dependence theoretical perspective, the results show that the board gender diversity has neither relationship with SR practices in the total sample nor the financial and non-financial samples. Nevertheless, these results are consistent with prior findings in a mixed sample of financial and non-financial companies (e.g., Amran *et al.*, 2014; Adel *et al.*, 2019), financial companies (e.g., Khan, 2010), and non-financial companies (e.g., Abu Qa'dan and Suwaidan, 2019; Fernandes *et al.*, 2019). Two possible reasons may explain these insignificant results in the studied samples. First, this may be because female directors constitute, on average, 20.6% and 18.1% of boards in the financial and non-financial samples, respectively. According to Amran *et al.* (2014), in such cases (i.e. heterogeneous boards), there may be an obstruction of the minority groups' freedom to be vocal and active. Thus, this may justify why female directors, as a minority group in this study, fail to impact SR practices significantly. Second, this may be due to the barriers (e.g., gender and stereotyping bias) that women on boards may face (Galbreath, 2011). According to Rao and Tilt (2016a), such barriers may limit female directors' ability to contribute to firms' strategies effectively, leading to resistance in making decisions (e.g., disclosing information on sustainability activities), which may be the case in this study.

Furthermore, the study finds that board age may not be a determinant of SR practices in the total sample and the non-financial sample. Hence, the results indicate that the non-financial companies are the reason for the insignificant influence of board age in the entire sample. These results are in line with previous studies investigating a total sample (e.g., Bakar *et al.*, 2019) and a non-financial sample (e.g., Khan *et al.*, 2019a), but not in line with the agency and the resource dependence theoretical perspectives. A possible reason for the insignificant impact in the non-financial sample is that older board members may lack enough directorial skills to significantly improve disclosing sustainability-related information. On the other hand, the results demonstrate a significant and positive relationship between board age and SR practices in the financial sample, consistent with the viewpoints of both agency theory and the resource dependence theory. This indicates that older board members in the financial sector play a significant role in fostering sustainability information.

Similarly, the results show that board tenure has a significant and positive effect on SR practices in the financial sector, while insignificant influence in the non-financial sector. Thus, the insignificant relationship between board tenure and SR in the total sample is driven by the non-financial sector. These insignificant impacts are neither in line with agency theory, which predicts a negative relationship nor resource dependence theory, which expects a positive association. Still, these results are in line with prior literature, such as Khan *et al.* (2019b) examining both financial and non-financial sectors and Katmon *et al.* (2019) investigating the non-financial sector, which provides evidence of insignificant impact on disclosing sustainability-related information. According to Hafsi and Turgut (2013), one reason for the absence of this relationship is because short-tenured directors may be highly modest to raise their voice, while long-tenured board members may be over close to management and avert any disagreements in making decisions. In contrast, the significant and positive impact yielded in the financial sample is in line with resource dependence theory that argues for longer-tenured boards but not in line with agency theory that argues for shorter-tenured boards.

Finally, the results also show that the existence of a SC has a significant and positive influence on SR practices in the total sample. When the sample is divided, the significant and positive influence holds for both the financial and non-financial sectors. Therefore, this study suggests that the inclusion or the exclusion of financial companies does not affect the relationship between the

presence of SC and disclosing sustainability information. This indicates the importance of SC in promoting SR practices through reducing information asymmetry and providing companies with critical resources that lead to better managing sustainability issues. These results are consistent with both agency and resource dependence theoretical perspectives and support previous empirical findings (e.g., Kent and Monem, 2008; Amran *et al.*, 2014; Pucheta-Martínez and Gallego-Álvarez, 2019).

Overall, the results indicate that the efficacy of CG mechanisms on disclosing sustainability information depends on the sampling decision (i.e. a combined sample of the financial and non-financial sectors, a subsample of the financial sector or the non-financial sector). Moreover, the results suggest that the impact of most CG mechanisms on SR practices in the financial firms is higher (i.e. more significance) than the one in the non-financial firms. That is, agency theory may be able to better explain the relationship between CG mechanisms and SR practices in the financial sector compared to the non-financial sector. This may be due to the fact that the information asymmetry structure in the financial sector, compared to the non-financial sector, is more complex and multidimensional (Yamak and Süer, 2005) and hence agency issues are likely to be more prominent (John *et al.*, 2016). Therefore, boards in financial firms may tend to have more effective sustainability strategies and more sustainability-oriented directors to mitigate agency costs and information asymmetry. This is especially because legitimacy, social impact, identity, and the accountability of the financial sector have been critical matters for regulatory reformation and public deliberation since the global financial crisis (Andrikopoulos *et al.*, 2014). According to Jizi *et al.* (2014), since the financial crisis, the financial sector has become under growing pressure for taking a more long-term perspective of its shareholders' interests and acknowledging and responding to the societies. A summary of the tested hypotheses and their results in this study are illustrated in Table 4.9.

Table 4.9: A summary of the results of the investigated hypotheses

Hypotheses	Relationships (Exp. Sign)	Findings
Board size and SR - First set of hypotheses:		
H.1	→ Total sample (+/-)	Accepted
H.1.a	→ Financial sample (+/-)	Accepted
H.1.b	→ Non-financial sample (+/-)	Accepted
Board independence and SR - Second set of hypotheses:		
H.2	→ Total sample (+)	Rejected
H.2.a	→ Financial sample (+)	Rejected
H.2.b	→ Non-financial sample (+)	Rejected
CEO duality and SR - Third set of hypotheses:		
H.3	→ Total sample (-)	Accepted
H.3.a	→ Financial sample (-)	Accepted
H.3.b	→ Non-financial sample (-)	Rejected
Board gender diversity and SR - Fourth set of hypotheses:		
H.4	→ Total sample (+)	Rejected
H.4.a	→ Financial sample (+)	Rejected
H.4.b	→ Non-financial sample (+)	Rejected
Board age and SR - Fifth set of hypotheses:		
H.5	→ Total sample (+)	Rejected
H.5.a	→ Financial sample (+)	Accepted
H.5.b	→ Non-financial sample (+)	Rejected
Board tenure and SR - Sixth set of hypotheses:		
H.6	→ Total sample (+/-)	Rejected
H.6.a	→ Financial sample (+/-)	Accepted
H.6.b	→ Non-financial sample (+/-)	Rejected
Sustainability committee and SR - Seventh set of hypotheses:		
H.7	→ Total sample (+)	Accepted
H.7.a	→ Financial sample (+)	Accepted
H.7.b	→ Non-financial sample (+)	Accepted

Note: This table summarises the results of the tested hypotheses. Variable definitions are reported in Table 4.4.
Abbreviations: SR, sustainability reporting.

4.4.4 Robustness checks

In line with Tauringana and Chithambo (2015), this study includes some known governance variables in the original models to control for endogeneity issues that can arise from omitted variables and lead to falling short in providing a complete picture. Additionally, the study also incorporates other country-level variables. These variables are the frequency of board meetings, audit committee size, audit committee independence, legal system strength (the sum score of Worldwide Governance Indicators), internationalisation (whether the firm is multinational), and the absence of corruption (based on World Bank's score). These variables are included because they have been examined in prior disclosure studies, where according to Wang and Hussainey (2013), leaving such governance variables can limit our understanding, thus compounding the endogeneity problem. After rerunning the models, the results show no sustainable changes regarding the impact of independent variables or the significant effect of the tested variables on SR. The results after incorporating the tested variables are presented in Table 4.10.

Furthermore, the baseline results demonstrate a significant and negative impact of board independence on SR in the total sample and the financial sample and an insignificant influence of gender diversity in the total sample and the financial and non-financial samples. In this regard, additional robustness tests are conducted to check these results. First, and for board independence, this study checks for a U-shaped association as it might be the reason for the significant negative influence (Lind and Mehlum, 2010); still, the results show no evidence of such association. Second, and regarding gender diversity, this study examines whether the critical mass is an issue in the studies samples (i.e. investigating the prevalence of tokenism). Given that having an influential body provoking a significant change, according to critical mass theory, requires a sufficient threshold number of women on boards (Cabeza-García *et al.*, 2018), the study tests the influence of boards with one, two and three or more women directors on SR. However, when the models are rerun, the results show that the insignificant effect holds irrespective of the number of female board members (see Table 4.11 below).[44]

[44] Moreover, the results are robust to alternative statistical measures. For example, the results are consistent with the baseline findings when using ROE to measure profitability and use total debt over total assets as a measure of leverage. Also, the study clusters the standard error at the country level to control for the country effect. Still, the results for most of the variables are the same as the original findings.

Table 4.10: Results after including the tested variables

	Total sample	Financial sample	Non-financial sample
Board size	0.0072**	0.0103*	0.0075*
	(0.0034)	(0.0060)	(0.0045)
Board independence	-0.1248*	-0.2977**	-0.0373
	(0.0664)	(0.1165)	(0.0871)
CEO duality	-0.0575**	-0.0767*	-0.0386
	(0.0252)	(0.0425)	(0.0329)
Board gender diversity	-0.0347	-0.1909	0.0098
	(0.1114)	(0.1799)	(0.1424)
Board age	0.0020	0.0097*	0.0013
	(0.0032)	(0.0052)	(0.0041)
Board tenure	-0.0016	-0.0109**	0.0021
	(0.0031)	(0.0052)	(0.0041)
Sustainability committee	0.1027***	0.0707*	0.1105***
	(0.0230)	(0.0417)	(0.0289)
Control variables	Included	Included	Included
Board meetings	0.0006	0.0014	0.0003
	(0.0025)	(0.0026)	(0.0033)
Audit committee size	0.0069	0.0131	0.0007
	(0.0076)	(0.0142)	(0.0096)
Audit committee independence	-0.0113	0.0129	-0.0040
	(0.0464)	(0.0865)	(0.0593)
Legal system strength	-0.0046	0.0063	-0.0043
	(0.0109)	(0.0187)	(0.0136)
Internationalisation	0.0127	-0.0144	0.0132
	(0.0241)	(0.0429)	(0.0298)
Absence of corruption	0.1730	-0.1196	0.1904
	(0.2420)	(0.3886)	(0.3152)
Sector fixed effect	Included	Included	Included
_cons	-0.0598	-0.0413	-0.1546
	(0.2806)	(0.5426)	(0.3772)
R^2	0.389	0.410	0.400
Adjusted R^2	0.284	0.240	0.241
N	370	104	266

Note: This table reports on the results after incorporating other CG variables (i.e. the frequency of board meetings, audit committee size, and audit committee independence) and country-level variables (i.e. legal system strength, internationalisation, and the absence of corruption). Sector fixed effect is included in the estimations but not reported. Robust standard errors in parentheses.
*significance at 10% level.**significance at 5% level.***significance at 1% level.

Table 4.11: Regressions results after investigating the critical mass matter

	Total sample			Financial sample			Non-financial sample		
Board size	0.0080**	0.0086**	0.0090**	0.0105*	0.0131**	0.0129**	0.0074*	0.0074*	0.0077*
	(0.0033)	(0.0033)	(0.0035)	(0.0053)	(0.0055)	(0.0058)	(0.0043)	(0.0043)	(0.0045)
Board independence	-0.1222**	-0.1163**	-0.1170**	-0.2954***	-0.2575***	-0.2782***	-0.0375	-0.0374	-0.0368
	(0.0550)	(0.0551)	(0.0542)	(0.0794)	(0.0790)	(0.0783)	(0.0738)	(0.0739)	(0.0735)
CEO duality	-0.0561**	-0.0572**	-0.0572**	-0.0765*	-0.0842**	-0.0834**	-0.0365	-0.0364	-0.0364
	(0.0255)	(0.0254)	(0.0254)	(0.0395)	(0.0381)	(0.0407)	(0.0329)	(0.0326)	(0.0327)
One female director	0.0011			-0.0217			-0.0037		
	(0.0304)			(0.0503)			(0.0377)		
Two female directors		-0.0186			-0.0656			-0.0012	
		(0.0298)			(0.0486)			(0.0373)	
Three or more female directors			-0.0221			-0.0382			-0.0083
			(0.0300)			(0.0445)			(0.0385)
Board age	0.0020	0.0017	0.0015	0.0122**	0.0097*	0.0108**	0.0007	0.0007	0.0006
	(0.0030)	(0.0031)	(0.0031)	(0.0048)	(0.0049)	(0.0048)	(0.0039)	(0.0039)	(0.0039)
Board tenure	-0.0012	-0.0013	-0.0013	-0.0112**	-0.0098*	-0.0102**	0.0024	0.0024	0.0023
	(0.0031)	(0.0031)	(0.0031)	(0.0050)	(0.0050)	(0.0051)	(0.0040)	(0.0040)	(0.0040)
Sustainability committee	0.1026***	0.1034***	0.1030***	0.0675*	0.0707*	0.0687*	0.1095***	0.1093***	0.1095***
	(0.0229)	(0.0227)	(0.0228)	(0.0406)	(0.0397)	(0.0405)	(0.0291)	(0.0286)	(0.0286)
Control variables	Included	Included	Included	Included	Included	Included	Included	Included	Included
Sector fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
cons	0.0354	0.0271	0.0190	-0.2855	-0.2181	-0.3053	-0.0332	-0.0333	-0.0404
	(0.2331)	(0.2315)	(0.2355)	(0.3395)	(0.3368)	(0.3400)	(0.3227)	(0.3205)	(0.3246)
R^2	0.384	0.385	0.386	0.395	0.409	0.399	0.386	0.386	0.386
Adjusted R^2	0.292	0.293	0.294	0.275	0.292	0.280	0.257	0.257	0.257
N	370	370	370	104	104	104	266	266	266

Note: This table report shows the results after examining the influence of boards with at least one woman, two women, and more than two women directors on SR. Control variables and sector fixed effect are included in the estimations but not reported. Robust standard errors in parentheses.
*significance at 10% level.**significance at 5% level.***significance at 1% level.

In addition, SR is measured as the number of items reported over the total number of items (i.e. 77 items) in the original models. Still, a number of studies (e.g., Lozano, 2008; Hussain *et al.*, 2018) argue that the three dimensions of sustainability (i.e. economic, environmental and social) should have equal weight. Based on that, the SR is alternatively measured as the total scores acquired from the three pillars based on a weight of 0.33 assigned to each pillar as follow:

$$Firm_j, SR = (Score_{eco} + Score_{env} + Score_{soc}) * 0.33 \quad (3)$$

Still, the results show that neither the direction nor the significance of the variables of interest has been changed. The results after using an alternative measure for SR are reported in Table 4.12.

Table 4.12: Regressions results after using alternative measurement for SR

	Total sample	Financial sample	Non-financial sample
Board size	0.0081**	0.0122**	0.0075*
	(0.0034)	(0.0054)	(0.0044)
Board independence	-0.1205**	-0.2444***	-0.0427
	(0.0560)	(0.0835)	(0.0750)
CEO duality	-0.0558**	-0.0911**	-0.0321
	(0.0261)	(0.0409)	(0.0329)
Board gender diversity	-0.0130	-0.1960	0.0490
	(0.1053)	(0.1620)	(0.1332)
Board age	0.0015	0.0097*	0.0005
	(0.0032)	(0.0052)	(0.0040)
Board tenure	-0.0008	-0.0098*	0.0031
	(0.0031)	(0.0054)	(0.0041)
Sustainability committee	0.0991***	0.0596*	0.1081***
	(0.0230)	(0.0418)	(0.0285)
Control variables	Included	Included	Included
Sector fixed effect	Included	Included	Included
cons	0.9848	-0.1526	0.0016
	(0.9694)	(0.3812)	(0.3237)
R^2	0.369	0.393	0.381
Adjusted R^2	0.275	0.272	0.251
N	370	104	266

Note: This table report on the results after measuring sustainability reporting alternatively. Sector fixed effect is included in the estimations but not reported. Robust standard errors in parentheses. A detailed definition of all the variables is in Table 4.4.

*significance at 10% level.**significance at 5% level.***significance at 1% level.

Finally, Hussain *et al.* (2018) state that small companies have less careful CG mechanisms and a low level of resources to invest in sustainability practices. In turn, this may affect the baseline findings. Drawing on that, and as an additional robustness check, the original models are rerun after dropping all small and medium-sized enterprises (SMEs). The enterprise is considered an SME based on GRI classification. Nevertheless, the results are consistent with the baseline results when the models are rerun. Table 4.13 below shows the results after dropping the SMEs from the studies sample.

Table 4.13: Regressions results after dropping SMEs

	Total sample	Financial sample	Non-financial sample
Board size	0.0086**	0.0100*	0.0084*
	(0.0033)	(0.0055)	(0.0044)
Board independence	-0.1180**	-0.2628***	-0.0341
	(0.0564)	(0.0827)	(0.0755)
CEO duality	-0.0578**	-0.0924**	-0.0290
	(0.0271)	(0.0394)	(0.0361)
Board gender diversity	-0.0408	-0.1787	0.0395
	(0.1199)	(0.1729)	(0.1558)
Board age	0.0020	0.0118**	0.0001
	(0.0033)	(0.0052)	(0.0042)
Board tenure	-0.0024	-0.0117**	0.0024
	(0.0036)	(0.0053)	(0.0050)
Sustainability committee	0.0947***	0.0726*	0.0907***
	(0.0242)	(0.0423)	(0.0311)
Control variables	Included	Included	Included
Sector fixed effect	Included	Included	Included
cons	-0.0358	-0.3738	-0.0080
	(0.2435)	(0.3634)	(0.3344)
R^2	0.377	0.420	0.361
Adjusted R^2	0.276	0.294	0.215
N	345	96	249

Note: This table reports on the results after dropping SMEs. A firm is considered an SME based on GRI classification. Sector fixed effect is included in the estimations but not reported. Robust standard errors in parentheses. A detailed definition of all the variables is in Table 4.4.
*significance at 10% level.**significance at 5% level.***significance at 1% level.

4.5 Conclusion

This paper has two-fold objectives. First, to examine the influence of CG mechanisms (i.e. board size, board independence, CEO duality, board gender diversity, board age, board tenure, and SR) on SR with a combined sample of financial and non-financial sectors and then separately with subsamples of financial and non-financial sectors. Second, to analyse the differences in the impact of these CG mechanisms on SR among the financial and non-financial firms. To do so, this study uses an international sample, employs a disclosure index based on GRI standards, and relies on all possible sustainability information sources (e.g., sustainability reports, other sustainability-related reports, annual reports, integrated reports, and websites).

The results in this study demonstrate that board size and the presence of a SC are positively and significantly related to SR in the combined sample, while board independence and CEO duality are negatively and significantly associated with SR. In contrast, there is no significant impact of board gender diversity, board age, and board tenure on SR. In terms of the CG-SR nexus in the sample of financial firms, the results reveal that board size, board age, and SC affect SR positively and significantly, while negatively and significantly for board independence, CEO duality, and board tenure. On the other hand, the results suggest an insignificant influence of board gender diversity. In the sample of non-financial firms, board independence, CEO duality, board gender diversity, board age, and board tenure have insignificant influence, while board size and SC have a positive and significant impact on SR. These results conclude that several CG mechanisms (i.e. board independence, CEO duality, board gender diversity, board age, and board tenure) have different impacts on SR among the financial and non-financial firms, while the results of board size and SC hold irrespective of the sector type.

Overall, the results provide empirical support for both theoretical perspectives applied in this study (agency and resource dependence), where several of the developed hypotheses are confirmed. Moreover, given the importance of the financial sector and its unique characteristics, there is a need for a distinctive CG structure. In this vein, the results have significant implications for policymakers, companies, and practitioners in the financial sector. Particularly, the results can assist regulatory bodies worldwide to adopt a suitable balance of legislations, regulatory reforms

and implementations to enhance CG practices and organisational legitimacy in this sector. Furthermore, the results have important implications for CG reforms internationally. In particular, the findings which suggest that only board size and SC have a significant positive impact on SR in the financial and non-financial sectors imply that they are important governance mechanisms to address sustainability issues.

This study offers a number of suggestions for future research to mitigate its limitations. First, since the findings are based on a one-year analysis (i.e. 2017), future research should investigate a longer period and larger sample. Such investigation would further generalise and validate the results of this study and provide more robustness analysis. Second, as this study focuses on a specific bundle of internal CG mechanisms, future studies can investigate other internal mechanisms (audit attributes and CEO characteristics) or external CG perspective (ownership attributes), which may reveal interesting facts and add to our knowledge about the relationship between CG and SR. Third, this study measures the board independence and board gender diversity as the percentage of independent directors and female directors on the board, respectively, and finds interesting results. Thus, future studies might dig deep and investigate, for instance, the compensation, age, education, and tenure of independent and female members. Likewise, the relationship between SC characteristics and SR could be an interesting research question. Fourth, and given that the results show that agency theory may fall short in explaining the CG-SR nexus in the non-financial sector, which may be due to the differences between agency costs among its subsectors, future studies can focus on these subsectors in the non-financial sector to investigate whether the impact of CG mechanisms on SR differs among the different industries in this sector. Finally, applying other research methods, such as the questionnaire approach, to investigate the CG-SR nexus could also offer in-depth insights by capturing companies and board directors' demographic characteristics.

Chapter 5: Summary and Conclusion

The relationship between CG mechanisms and SR practices is more interesting than ever and has been considered as one of the most critical areas for companies, policymakers, and the academic community. In the current thesis, and through three self-contained papers, a number of issues related to this given nexus have been examined. More distinctively, this thesis investigates; first, a systematic review of prior literature to the CG-SR nexus; second, the impact of CG mechanisms on total SR and separately on each dimension (economic, environmental and social), and whether this relationship differs between developed and developing countries; third, whether the efficacy of CG on SR depends on sampling decision (i.e. combining the financial and non-financial sectors, focusing on the financial sector or the non-financial sector), and whether there is a major difference of this given nexus among the financial and non-financial sector. Section 5.1 summarises each of the three papers. The implications of the current thesis are presented in Section 5.2, while Section 5.3 shows the thesis contributions. Section 5.4 identifies the limitations of the current thesis and offers suggestions for future studies. Finally, Section 5.5 provides a concluding remark.

5.1 Thesis summary

5.1.1 Summary of the first paper

The primary objective of the first paper was to undertake a systematic review of the relationship between CG mechanisms and SR practices to determine what is known about this given nexus and what further research is needed to enhance our knowledge and understanding. For this purpose, this paper reviewed empirical research investigating the impact of multiple levels of CG mechanisms, i.e. group-level (board attributes and audit attributes), firm-level (ownership structure attributes), and individual-level (CEO attributes) on the adoption, the quantity, and the quality of SR practices and its three dimensions (i.e. economic, environmental and social). The sample for the systematic review comprised of 117 articles published in 72 scholarly journals in various disciplines (e.g., accounting, governance, management, ethics, business, finance, and economics) over 20 years (i.e. from 2000 to 2019).

The first paper found that academic researchers have recently paid great attention to the impact of CG mechanisms on SR practices, where 51 studies (about 44% of the sample) have been published in 2018 and 2019. Moreover, this paper reveals that the majority of the current studies (about 75% of the sample) are conducted in developing countries compared to developed countries. Furthermore, the review in this paper showed a lack of studies (about 10% of the sample) investigating this given nexus in the financial sector. Regarding the sample size, the results indicated that the majority of studies (about 57% of the sample) conduct a cross-sectional and short-observation analysis. The results also suggest that very few studies (about 14% of the sample) examined the impact of CG variables on the total three dimensions of SR, while no study has comprehensively examined the influence on each dimension (i.e. economic, environmental and social) and proposed such investigation as a stimulus before. Further, most studies (about 63% of the sample) investigate the quantity of SR, while only a few studies focused on the adoption and quality of SR. Likewise, most studies focus on annual reports compared to other possible sustainability information sources (e.g., sustainability reports, other related sustainability reports, and websites).

Additionally, and regarding the applied theoretical perspectives, the paper found that previous studies used several theories to explain the motivations behind SR practices (e.g., stakeholder theory and legitimacy theory) or why and how CG mechanisms affect SR (e.g., agency theory, resource-based view theory, signal theory, and resource dependence theory). After reviewing the sampled articles, the paper showed that most studies apply one single theory rather than multiple theories. Moreover, the results showed that the most common theoretical perspective used is agency theory followed by legitimacy theory, and then stakeholder theory and resource dependence theory.

Finally, the paper showed that most previous studies examine variables related to board attributes, with considerable attention to board size, board independence, CEO duality, and gender diversity. In contrast, other board attributes, most importantly, related to board diversity (e.g., board age, board ethnicity, board nationality, board tenure, board educational background, and board educational level) were rarely examined. Likewise, the findings in this paper demonstrated that the existing literature is scarce regarding examining audit attributes (e.g., audit committee size, audit

committee independence, audit committee meeting, and audit quality… etc.) and CEO characteristics (compensation, gender, age, and tenure … etc.).

Overall, the paper showed that the empirical evidence of the CG-SR nexus remains inconclusive and mixed in some areas. For instance, there is no clear-cut relationship between a number of board characteristics that have been widely investigated (e.g., board size, board independence, board gender diversity, CEO duality, the presence of sustainability committee (SC)) and SR practices, making it difficult to draw a reliable conclusion to the tendency of this association. This is understandable, given that (i) the research on the relationship between CG mechanisms and sustainability-related activities is still emerging (Jain and Jamali, 2016), and (ii) the previous research varies in terms of the methodological perspectives applied and chosen samples, such as analysing different dimensions, measurements, and mediums of SR practices.

5.1.2 Summary of the second paper

The main objective of the second paper was to examine the influence of CG mechanisms, with a particular reference to the board characteristics (i.e. board size, board independence, CEO duality, board gender diversity, and the existence of SC) on total SR – and separately – on each dimension (economic, environmental and social). Then, the paper conducted further analysis by splitting the studied sample into developed and developing countries to investigate whether and to what extent the relationship between CG mechanisms and SR practices may differ. The paper mainly drew on stakeholder-agency theory to explain the CG-SR nexus, along with other supportive theories (namely, legitimacy theory and signalling theory). The paper analysed 370 companies belonging to 50 countries (22 developed countries and 28 developing countries) in 2017 and quantified the level of SR and its three dimensions using a disclosure index based on the Global Reporting Initiative (GRI) standards across various sources, such as sustainability reports, other related-sustainability reports, integrated reports, annual reports, and websites.

The results in the second paper demonstrated a positive and significant effect of board size on total SR, economic reporting, and social reporting, while an insignificant impact on environmental reporting. In terms of board independence, the results showed a significant and negative

relationship with total SR, economic reporting, and social reporting, while an insignificant association with environmental reporting. Likewise, CEO duality is significantly and negatively related to total SR, economic reporting, and social reporting, while insignificantly associated with environmental reporting. On the other hand, the findings in this paper also suggested an insignificant relationship between board gender diversity and total SR or its three dimensions. In contrast, the SC presence has a positive and significant impact on total SR and its three dimensions. Moreover, the paper addressed the endogeneity issue; however, no substantial changes in the variables of interest compared to the reported results in the original regressions were discovered. Furthermore, the above-mentioned results were confirmed by running several robustness checks, such as using alternative measures for total SR and sector variable, dropping all SMEs from the studied sample, checking for a U-shaped relationship regarding board independence's results, and finally, examining the prevalence of tokenism concerning the board gender diversity's results.

Furthermore, and after splitting the investigated sample into developed and developing countries, the findings of the paper indicated that board size is significantly and positively associated with total SR in developed countries, while insignificantly related to total SR in developing countries. By contrast, CEO duality has a significant and negative impact on total SR in developing countries, while an insignificant influence in developed countries. Notwithstanding, the paper also provided evidence of an insignificant effect of board independence and board gender diversity on total SR in developed and developing countries. Finally, the results showed that the significant and positive relationship between the existence of SC and total SR remains after partitioning the sample into developed and developing countries.

To conclude, the second paper found that the impact of some board mechanisms differs by dimension, suggesting that these mechanisms do not affect all the dimensions of SR, thus acknowledging the multidimensional of sustainability activities (Lozano, 2008; Hahn and Kühnen, 2013; Jain and Jamali, 2016). Moreover, the results indicated that the relationship between some board characteristics and SR practices was different between developed and developing countries, supporting the argument that the governance mechanisms may work differently based on country development (Khan *et al.*, 2013; Abu Qa'dan and Suwaidan, 2019; Katmon *et al.*, 2019).

5.1.3 Summary of the third paper

The third paper explored the association between CG mechanisms focusing on board characteristics (i.e. board size, board independence, CEO duality, board gender diversity, board age, board tenure, and the presence of SC) and SR practices in the light of sector-related issues. Specifically, and through the lens of agency theory and resource dependence theory, this paper had two-fold objectives: first, to investigate this relationship with a combined sample of financial and non-financial sectors and then separately with subsamples of financial and non-financial sectors; second, to examine whether and to what extent the influence of these CG mechanisms on SR differs among the financial and non-financial firms. To achieve these objectives, this paper analysed 370 international firms (104 firms in the financial sector and 266 firms in the non-financial sector) in 50 countries over one year (2017) and constructed a GRI standards-based disclosure index to quantify SR practices across several reporting media (namely, annual reports, sustainability and other related-sustainability reports, integrated reports, and websites).

The results for the combined sample in this paper suggested that board size and the presence of SC affect SR practices significantly and positively, while board independence and CEO duality are significantly but negatively related to disclosing sustainability information. On the other hand, board gender diversity, board age, and board tenure have an insignificant influence on reporting sustainability information. Moreover, and regarding the results in the subsample of the financial firms, the paper shows that board size, board age, and the existence of SC have a significant and positive influence on SR practices, while board independence, CEO duality, and board tenure have a significant and negative impact. On the contrary, there was no significant association between board gender diversity and SR practices. Furthermore, and in terms of the subsample of the non-financial, the results revealed that the board size and the existence of SC are significantly and positively associated with disclosing sustainability information, while remaining variables (i.e. board independence, CEO duality, board gender diversity, board age, and board tenure) had an insignificant influence on SR practices. Hence, the results of the impact of CG mechanisms on SR practices differ between financial and non-financial firms in terms of board independence, CEO

duality, board gender diversity, board age, and board tenure.[45] However, they are similar in that board size and SC have a significant and positive impact on SR.

Overall, the paper demonstrates that (i) the efficacy of several CG mechanisms with a combined sample of financial and non-financial firms differs mostly from the results of the non-financial firms, suggesting that the impact in the combined sample is driven by the financial firms and that (ii) there are significant differences in the efficacy of most examined variables on SR practices among the financial and non-financial firms. These results are confirmed by controlling for the endogeneity problem and conducting additional robustness checks.

5.2 Thesis implications

The current thesis has significant implications for the academic community, companies, policymakers, and practitioners regarding the relationship between CG mechanisms and SR practices. Regarding the systematic review in the first paper, academia could gain in-depth knowledge about the current state of the CG-SR nexus. Thus, researchers can conduct more empirical research on the impact of governance mechanisms on disclosing sustainability information to bridge the research gaps in the existing literature, which the current thesis offers, and thus enhance our knowledge and understanding.

In terms of the second paper, the results support adopting the GRI as a reporting guidance for sustainability information and enhance the ongoing standard-setting process by providing the standard setters with helpful insights regarding to what extent companies disclosed on the three individual dimensions of SR. This allows GRI to assess whether, and to what extent, the firms worldwide are complying with its SR standards. In fact, the GRI is the main driver of SR (Fonseca *et al.*, 2014), considered the most recognised and accepted initiative in the area of SR (Vigneau *et al.*, 2015), and its framework is widely employed around the globe (Yadava and Sinha, 2016).

[45] Despite the insignificant influence of board gender diversity on SR practices in both sectors, the direction is different (i.e. the influence is positive for the non-financial sector while negative for the financial sector).

Moreover, and given that a more adaptable CG system is required, especially in the age of internationalisation, the findings of this paper have important implications for CG reforms internationally. For instance, the findings – which suggest that the presence of SC has a significant and positive impact on total SR and its three dimensions (i.e. economic, environmental and social) and that its effectiveness is not contingent on the country development (i.e. developed vs developing countries) where the firms are operated – vindicate its inclusion among the CG mechanisms dedicated to ensuring addressing sustainability issues. Therefore, policymakers should make SC an integral part of corporate board sub-committees around the world. In the same regard, the second paper also has implications for policymakers to set regulations, aiming at ensuring the effectiveness of CG mechanisms in developing countries. The efficacy of such mechanisms in the context of such countries has been questioned (West, 2006; Siddiqui, 2010; Khan *et al.*, 2013), and is relatively weak due to high corruption index and concentrated ownership, weak standard and legal protection, political interference, weak institutional setup and external mechanism (Khan *et al.*, 2013; Bae *et al.*, 2018; Mahmood *et al.*, 2018; Ullah *et al.*, 2019). In turn, this could foster disclosing relevant information about the economic, environmental, and social dimensions of sustainability, where SR in developing countries is in an early stage of adoption (Alotaibi and Hussainey, 2016; Buallay and Al-Ajmi, 2019) and commonly viewed as less credible (Lock and Seele, 2016; Katmon *et al.*, 2019).

Concerning the third paper, and since the findings showed that there are major differences in the efficacy of several examined CG mechanisms on SR between the financial and non-financial sectors and that there is a dearth of research into the CG-SR nexus in the financial sector (e.g., Jizi *et al.*, 2014; Orazalin, 2019), the results should be of interests to the policymakers and standard setters in the financial sector. This is because the legitimacy, the social impact, the identity, and the accountability of this sector have been critical matters for regulatory reformation and public deliberation since the global financial crisis (Andrikopoulos *et al.*, 2014). In particular, the empirical findings should help them to implement an appropriate balance of regulatory reforms and legislations to improve organisational legitimacy and CG activities in this sector. In this regard, the results suggest that several board characteristics (i.e. board size, board tenure, board age, CEO duality, and the existence of SC) are important governance mechanisms that could affect disclosing sustainability information in the financial sector.

5.3 Thesis contributions

The current thesis, and through the systematic review in the first paper and the empirical evidence of the second and third papers, has several contributions to the existing literature on the impact of CG mechanisms on SR practices. In terms of the first paper, it contributes to the current literature in several ways. The first paper contributes by evaluating the reviewed body of literature regarding several aspects, such as publication outlets, investigated countries, sector affiliation, sample selection, dimensions of SR, measurements of SR, and the different mediums used to quantify SR practices. In the same regard, this paper contributes by reviewing the theoretical frameworks applied to justify the motivations behind SR activities or how and why CG mechanisms affect disclosing sustainability information. *Second*, by analysing empirical evidence, this paper reports on the impact of multi-level governance mechanisms and their different measurements, i.e. group-level (board attributes and audit attributes), firm-level (ownership structure attributes), and individual-level (CEO attributes) on the adoption, the quantity and quality of SR practices and its three dimensions (i.e. economic, environmental and social). *Finally*, this paper contributes by offering areas for future studies based on several limitations among existing literature, such as a dearth of research (i) investigating the impact of CG mechanisms on total SR and separately on its three dimensions, (ii) conducting a comparative analysis between developed and developing countries, (iii) exploring whether the efficacy of CG mechanisms on SR practices differs depending on the sampling decision (i.e. combining the financial and non-financial sectors, concentrating on the financial sector or the non-financial sector), and (iv) examining variables related to board diversity, audit attributes, and CEO characteristics.

Regarding the second paper, it has three main contributions to the existing literature on the relationship between CG and SR. *First*, this paper investigates the relationship between board characteristics and total SR – and separately – with its three dimensions (economic, environmental and social). This is because of the multidimensionality of SR (Hahn and Kühnen, 2013; Lozano, 2013), where the influence of CG mechanisms on individual social responsibility elements drastically differs when aggregating social responsibility variables (Jain and Jamali, 2016). In fact, the results indicate that some board characteristics are restricted in their ability to impact all

dimensions of SR. *Second*, this paper investigates the impact of CG mechanisms on SR practices in an international context, where such investigation can help generalise the results, ensure the reliability of the study (Alhossini, Ntim and Zalata, 2021), and raise new critical institutional issues that can be investigated around this relationship. In particular, and since several studies argue that the country development may affect the CG-SR nexus (e.g., Muttakin *et al.*, 2015; Abu Qa'dan and Suwaidan, 2019), the second paper, for the first time, provides empirical evidence of whether this nexus in the developed countries is different from the one in developing countries. *Finally*, the second paper examines all possible sources of sustainability information (i.e. annual reports and integrated reports, sustainability and sustainability-related reports, and websites), aiming at a much more complete and complete overview of the research field (Tingbani *et al.*, 2020).

Concerning the third paper, the empirical findings contribute in a number of ways. *First*, the paper contributes by examining whether the efficacy of governance mechanisms on SR practices is affected by the sampling decision. The current literature has either concentrated on the financial sector (e.g., Kiliç *et al.*, 2015) or the non-financial sector (e.g., Zhou, 2019) or has combined these sectors (e.g., Adel *et al.*, 2019), without providing rationale explanations or empirical evidence. Thus, the paper contributes to these practices, where the findings demonstrate that the efficacy of several CG mechanisms with a combined sample of non-financial and financial companies differs mostly from the findings of the non-financial companies. These results suggest that the influence of these CG mechanisms in the combined sample is driven by the financial companies. *Second*, and due to the differences in agency costs between the financial and the non-financial sectors (Yamak and Süer, 2005; John *et al.*, 2016), the third paper contributes by investigating whether and to what extent CG mechanisms affect SR practices differently in these two sectors, for the first time to the best of knowledge. In this vein, the empirical findings show that there are significant differences in the efficacy of most examined variables on SR practices among these sectors. These results suggest that agency theory better explains the relationship between CG mechanisms and SR practices in the financial sector compared to the non-financial sector. *Finally*, the third paper contributes by providing empirical evidence from the financial sector as there is a surprising dearth of research into this given nexus in this sector (e.g., Sharif and Rashid, 2014; Ullah *et al.*, 2019). The impression that the financial sector has a limited role regarding environmental and social issues has been changed (Barako and Brown, 2008; Kiliç *et al.*, 2015), and nowadays, this sector

bears significant responsibility towards sustainability issues. Thus, these results are supposed to offer standard-setters, firms, and practitioners in this sector with important implications.

Overall, the current thesis contributes by providing a great knowledge on the current status of the relationship between CG mechanisms and SR practices, uncovering several critical aspects of this given nexus, adding new evidence to the existing literature, offering, to some extent, empirical support for the applied theoretical frameworks (i.e. stakeholder-agency theory, resource dependence theory, and agency theory), and supporting the starting point in theories development.

5.4 Thesis limitations and suggestions for future studies

This thesis attempts to alleviate the research gaps of the previous research. However, there are a number of limitations that need to be addressed in the current thesis. Concerning the systematic review in the first paper, it is restricted to peer-reviewed papers in English-speaking journals. Thus, some vital aspects may have been missed of the relationship between CG mechanisms and SR practices from non-English articles, conference and working papers, books and books chapters. Hence, future research should access these documents to offer an extensive view of the CG-SR nexus.

Furthermore, the systematic review is limited to the empirical papers investigating the impact of CG mechanisms on SR practices. Therefore, future research can review other types of studies (i.e. non-empirical papers, such as theoretical papers, conceptual papers, and literature review papers), which may also provide further insights into this given nexus.

Regarding the second paper, the relationship between CG mechanisms and SR practices has been investigated with a particular reference to the group-level governance mechanisms (i.e. board attributes). Therefore, future research should focus on other governance mechanisms related to other group-level (i.e. audit attributes), firm-level (i.e. ownership attributes), or individual-level (i.e. CEO attributes). Investigating such mechanisms may provide interesting evidence and new facts, thus enhancing our understanding and knowledge of this important relationship.

Additionally, as this paper yields unexpected findings regarding the impact of board independence and board gender diversity, future studies should conduct a more sophisticated analysis. For instance, future studies can examine the age, tenure, education, nationality, and compensation of independent and female directors, which may provide new insights and evidence. Likewise, the second paper shows interesting results concerning the impact of the SC existence (i.e. a significant and positive impact on total SR and each dimension in developed and developing countries and in the financial and non-financial sectors). Bearing this in mind, the relationship between SC characteristics rather than the presence (e.g., size, meetings, and independence… etc.) and SR practices could be an interesting research question.[46]

In terms of the third paper, the conducted analysis was based on a quantitative approach only. Hence, future studies can apply other research methods (i.e. qualitative approach) to investigate the influence of CG mechanisms on SR practices and compare the results between these two approaches. For example, future research might rely on questionnaires or interviews, which enable the researcher to do more investigation in the real world (McNulty, Zattoni and Douglas, 2013). In turn, this can lead to a better capturing of the companies and board members' demographic characteristics (Hussain *et al.*, 2018) and raise the rationality of research (Velte, 2017), thus delivering a better understanding of boards' decision processes towards SR practices.

In addition to the above-mentioned opportunities for future studies, the current thesis would like to offer two other suggestions. First, the current thesis strongly encourages future studies to investigate whether multiple CG mechanisms operate as substitutes or complements for each other in fostering SR practices. Both complementarity and substitution perspectives, which harks back to (Rediker and Seth, 1995), are recently represented in CG studies (e.g., Misangyi and Acharya, 2014). However, to the best of the knowledge, no study has applied this insight in the context of SR.

Second, and thus far, no meta-analysis examines the relationship between CG mechanisms and SR practices considering country development (developing and developed countries), sector effect

[46] This study reviewed the chance of examining such characteristics. However, this could not be achieved due to missing data in the sampled firms.

(financial and non-financial sector), SR dimensions (economic, environmental and social), SR measurements (adoption, quantity and quality), reporting medium (annual/integrated reports, sustainability reports, and websites), and the measurements of CG variables. Having said this, future research should bridge this gap in the existing literature. In fact, the results from the systematic review are mixed and inconclusive, which may be due to these factors.

5.5 Concluding remark

I am greatly pleased that my research has been carried out on this topic. I believe this research journey has significantly contributed to enhancing my understanding of CG mechanisms and SR practices. Indeed, I hope the contributions of the current thesis will assist in advancing the knowledge in this field. Nevertheless, the relationship between CG and SR still has several open research questions expected to be answered. In fact, now there are more and better research questions in my mind than what has been begun with, and I hope for a productive future in this fascinating research area.

Appendices

Appendix A: List of journals and number of sampled articles from each journal

Journal	No of articles
Accounting Research Journal	2
Annals of Operations Research	1
Applied Economics	1
Asian Journal of Accounting and Governance	1
Asian Journal of Accounting Research	1
Asian Journal of Business and Accounting	2
Asian Journal of Sustainability and Social Responsibility	1
Asian Review of Accounting	1
Asia-Pacific Management Accounting Journal	1
Australasian Accounting, Business and Finance Journal	3
Australian Accounting Review	2
Benchmarking: An International Journal	1
Business and Economics Research Journal	1
Business Ethics: A European Review	1
Business Strategy and the Environment	3
Cogent Business & Management	1
Corporate Governance: The International Journal of Business in Society	9
Corporate Ownership and Control	2
Corporate Social Responsibility and Environmental Management	5
European Journal of Business and Social Sciences	1
European Management Review	1
Gender in Management: an international journal	1
Global Business and Management Research	1
Indian Journal of Corporate Governance	2
Indonesian Journal of Sustainability Accounting and Management	1
Indonesian Management and Accounting Research	1
International Journal of Academic Research in Business and Social Sciences	1
International Journal of Accounting & Information Management	2
International Journal of Accounting and Finance	1
International Journal of Behavioural Accounting and Finance	1
International Journal of Business Governance and Ethics	1
International Journal of Disclosure and Governance	2
International Journal of Economics and Financial Issues	1
International Journal of Financial Studies	1
International Journal of Islamic and Middle Eastern Finance and Management	1
International Journal of Law and Management	1
International Journal of Managerial and Financial Accounting	1
International Journal of Monetary Economics and Finance	1
International Journal of Sustainable Strategic Management	1
International Journal of Trade and Global Markets	2

Journal	No of articles
Issues in Social and Environmental Accounting: An International Journal	2
IUP Journal of Corporate Governance	1
Journal for Global Business Advancement (JGBA)	1
Journal of Accounting and Public Policy	2
Journal of Accounting in Emerging Economies	1
Journal of Applied Business Research	1
Journal of Business Ethics	7
Journal of Cleaner Production	2
Journal of Contemporary Accounting and Economics	1
Journal of Economics and Sustainable Development	1
Journal of Environment and Ecology	1
Journal of Financial Reporting and Accounting	1
Journal of Global Responsibility	1
Journal of Islamic Accounting and Business Research	1
Journal of Management and Governance	2
Journal of Management Research	1
Journal on Technical and Vocational Education	1
Management Decision	2
Managerial Auditing Journal	1
Meditari Accountancy Research	1
Organization & Environment	1
Pacific Accounting Review	1
Procedia Economics and Finance	1
Procedia-Social and Behavioral Sciences	1
Quality & Quantity	1
Review of Managerial Science	1
Social Responsibility Journal	7
South East Asia Journal of Contemporary Business, Economics and Law	1
South East European Journal of Economics and Business	1
Sustainability	5
Sustainability Accounting, Management and Policy Journal	1
Sustainable Development	1
Total	**117**

Appendix B: Disclosure index scorecard based on GRI standards

Company:				
Economic Dimension (13 Items)				
GRI Standard		**No**	**Disclosure Title**	**Score (1 if disclosed and 0 if not)**
GRI 201	Economic Performance	201-1	Direct economic value generated and distributed	
		201-2	Financial implications and other risks and opportunities due to climate change	
		201-3	Defined benefit plan obligations and other retirement plans	
		201-4	Financial assistance received from government	
GRI 202	Market Presence	202-1	Ratios of standard entry level wage by gender compared to local minimum wage	
		202-2	Proportion of senior management hired from the local community	
GRI 203	Indirect Economic Impacts	203-1	Infrastructure investments and services supported	
		203-2	Significant indirect economic impacts	
GRI 204	Procurement Practices	204-1	Proportion of spending on local suppliers	
GRI 205	Anti-corruption	205-1	Operations assessed for risks related to corruption	
		205-2	Communication and training about anti-corruption policies and procedures	
		205-3	Confirmed incidents of corruption and actions taken	
GRI 206	Anti-competitive Behavior	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	
Total score for economic reporting				**X/13 = *Eco***
Environmental Dimension (30 Items)				
GRI 301	Materials	301-1	Materials used by weight or volume	
		301-2	Recycled input materials used	
		301-3	Reclaimed products and their packaging materials	
GRI 302	Energy	302-1	Energy consumption within the organization	
		302-2	Energy consumption outside of the organization	
		302-3	Energy intensity	
		302-4	Reduction of energy consumption	
		302-5	Reductions in energy requirements of products and services	
GRI 303	Water	303-1	Water withdrawal by source	
		303-2	Water sources significantly affected by withdrawal of water	
		303-3	Water recycled and reused	

GRI 304	Biodiversity	304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas
		304-2	Significant impacts of activities, products, and services on biodiversity
		304-3	Habitats protected or restored
		304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations
GRI 305	Emissions	305-1	Direct (Scope 1) GHG emissions
		305-2	Energy indirect (Scope 2) GHG emissions
		305-3	Other indirect (Scope 3) GHG emissions
		305-4	GHG emissions intensity
		305-5	Reduction of GHG emissions
		305-6	Emissions of ozone-depleting substances (ODS)
		305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions
GRI 306	Effluents and Waste	306-1	Water discharge by quality and destination
		306-2	Waste by type and disposal method
		306-3	Significant spills
		306-4	Transport of hazardous waste
		306-5	Water bodies affected by water discharges and/or runoff
GRI 307	Environmental Compliance	307-1	Non-compliance with environmental laws and regulations
GRI 308	Supplier Environmental Assessment	308-1	New suppliers that were screened using environmental criteria
		308-2	Negative environmental impacts in the supply chain and actions taken
Total score for environmental reporting			**$X/30 = Env$**
Social Dimension (34 Items)			
GRI 401	Employment	401-1	New employee hires and employee turnover
		401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees
		401-3	Parental leave
GRI 402	Labor/Management Relations	402-1	Minimum notice periods regarding operational changes
GRI 403	Occupational Health and Safety	403-1	Workers' representation in formal joint management–worker health and safety committees
		403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities
		403-3	Workers with high incidence or high risk of diseases related to their occupation
		403-4	Health and safety topics covered in formal agreements with trade unions

GRI 404	Training and Education	404-1	Average hours of training per year per employee
		404-2	Programs for upgrading employee skills and transition assistance programs
		404-3	Percentage of employees receiving regular performance and career development reviews
GRI 405	Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees
		405-2	Ratio of basic salary and remuneration of women to men
GRI 406	Non-discrimination	406-1	Incidents of discrimination and corrective actions taken
GRI 407	Freedom of Association and Collective Bargaining	407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk
GRI 408	Child Labor	408-1	Operations and suppliers at significant risk for incidents of child labor
GRI 409	Forced or Compulsory Labor	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor
GRI 410	Security Practices	410-1	Security personnel trained in human rights policies or procedures
GRI 411	Rights of Indigenous Peoples	411-1	Incidents of violations involving rights of indigenous peoples
GRI 412	Human Rights Assessment	412-1	Operations that have been subject to human rights reviews or impact assessments
		412-2	Employee training on human rights policies or procedures
		412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening
GRI 413	Local Communities	413-1	Operations with local community engagement, impact assessments, and development programs
		413-2	Operations with significant actual and potential negative impacts on local communities
GRI 414	Supplier Social Assessment	414-1	New suppliers that were screened using social criteria
		414-2	Negative social impacts in the supply chain and actions taken
GRI 415	Public Policy	415-1	Political contributions
GRI 416	Customer Health and Safety	416-1	Assessment of the health and safety impacts of product and service categories
		416-2	Incidents of non-compliance concerning the health and safety impacts of products and services
GRI 417	Marketing and Labeling	417-1	Requirements for product and service information and labeling
		417-2	Incidents of non-compliance concerning product and service information and labeling
		417-3	Incidents of non-compliance concerning marketing communications
GRI 418	Customer Privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data
GRI 419	Socioeconomic Compliance	419-1	Non-compliance with laws and regulations in the social and economic area
Total score for social reporting			$\mathbf{X/34 = Soc}$
Total score for sustainability reporting			$\mathbf{(Eco + Env + Soc) / 3}$

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