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Sustainable development goal reporting: Contrasting effects of institutional and organisational factors

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ABSTRACT

Businesses are increasingly expected to disclose their progress towards sustainable development via engagement with the United Nations Sustainable Development Goals. Although there is increasing trend towards disclosure, corporate reporting on Sustainable Development Goals varies in content and quality, posing a challenge to assess and improve the quality of disclosure. To understand variation in Sustainable Development Goal disclosure, it is essential to examine significant factors influencing corporate reporting. Accordingly, this research aims to investigate key drivers of reporting. The study undertakes content analysis of sustainability reports from leading Australian companies and conducts multinomial logistic regression analysis to provide evidence on drivers of disclosure. Using institutional theory and agency theory, a set of hypothesised relationships between Sustainable Development Goal disclosures and determinants of disclosure are developed. The study finds that Sustainable Development Goal reporting practices are a developing trend driven by external institutional factors and organisational characteristics. The study concludes there is need for a more robust Sustainable Development Goal measurement and reporting framework that can support companies to align their business strategies with the goals. This research makes several contributions to the literature by providing empirical evidence on the determinants of specific attributes of Sustainable Development Goal disclosure; empirical insights into potential motives for Sustainable Development Goal reporting; and a unique disclosure quality index that will be useful to academics and practitioners interested in assessing and ranking Sustainable Development Goal disclosures.

1. Introduction

With the announcement of the United Nations (UN) Sustainable Development Goals (SDGs) in 2015, there was substantial public expectation that business activities would align with the global goals. Corporate sustainability reporting has become a vital tool in demonstrating transparency, accountability and sustainability commitments (Adams and Abhayawansa, 2022). There are many commonly used sustainability reporting frameworks, most notably the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC) and the International Sustainability Standards Board (ISSB). The GRI, in collaboration with the UN Global Compact (UNGC) and the World Business Council for Sustainable Development (WBCSD), has played a major role in developing guidelines such as the SDG Compass, to integrate the SDGs into corporate reporting and help companies make SDG-related disclosures (WBCSD, 2015).

Corporate reporting on the SDGs has attracted considerable research interest. Evidence on SDG reporting shows a small but growing trend towards disclosure (Botchway and Bradley, 2023), but substantial gaps have been identified where disclosure is non-existent, poorly established or largely symbolic, or where reporting is unbalanced and disconnected from business goals (Diaz-Sarachaga, 2021; Emma and Jennifer, 2021; Erin et al., 2022). Existing frameworks alone are not sufficient for organisations to report on sustainable development issues (Adams et al., 2020). Wide variation in sustainability reporting makes it challenging to compare SDG performance across companies (Tsalis et al., 2020). There is a need for better quality and more consistent sustainability reporting, and there are calls for more research into corporate reporting on the SDGs (Bebbington and Unerman, 2020; Vasist and Krishnan, 2023).

Studies indicate that institutional factors affect how organisations approach reporting on SDGs. These factors include compliance with the GRI principles (Ordonez-Ponce and Khare, 2021) and external assurance of sustainability reports (van der Waal and Thijssens, 2020), as well as organisational features including organisational size (Rosati and Faria,

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2019b), ownership structure (Aust et al., 2020) and corporate governance elements (Garcia-Sanchez et al., 2022b). Despite a burgeoning body of literature on SDG reporting (Curtó-Pagès et al., 2021; Bose and Khan, 2022; Heras-Saizarbitoria et al., 2022; Kücükgül et al., 2022; Arena et al., 2023), the determinants of SDG disclosure are not yet fully understood and warrant further investigation. Some studies are largely descriptive and do not assess specific attributes of disclosure presented by guidelines such as the SDG Compass (Ike et al., 2019; Gazzola et al., 2020; Di Vaio et al., 2021), but a number of others have developed disclosure quality tools to assess SDG disclosures (Mhlanga et al., 2018; Izzo et al., 2020a; Subramaniam et al., 2020; Khaled et al., 2021; Pizzi et al., 2021; Hummel and Szekely, 2022). Further research examining the content and quality of SDG reporting will facilitate the assessment of disclosures and promote better corporate reporting practices.

The objective of this study is to investigate significant factors influencing specific attributes of corporate SDG reporting. To that end, a series of hypothesised relationships are tested between SDG disclosures and determinants of disclosure. Two conceptual lenses—institutional theory and agency theory—are applied to examine drivers of SDG disclosure and help better understand potential motivations for SDG reporting. The study seeks to answer the following research questions.

RQ1: To what extent do external institutional factors influence the content and quality of corporate SDG disclosures?
RQ2: To what extent do organisational characteristics influence the content and quality of corporate SDG disclosures?
RQ3: To what extent do board governance mechanisms influence the content and quality of corporate SDG disclosures?

The study addresses a literature gap on the determinants of specific attributes of SDG reporting by conducting a systematic assessment of SDG disclosures by top Australian-listed companies. A two-step research method is adopted involving quantitative content analysis of sustainability reports to identify the content and quality of SDG reporting; and multinomial logistic regression analysis to assess internal and external determinant factors of SDG disclosure. This two-step method enables an informative analysis to evaluate SDG reporting practices in Australia. The choice of the Australian corporate setting is based on two main factors. First, Australia as a signatory to the 2030 *Agenda for Sustainable Development* needs to understand how its business organisations support the SDGs. A recent study on Australia's performance on the SDGs shows positive trends in health and education indicators, but performance on CO_2 emissions, waste and environmental degradation, cost of living pressures, and economic inequality is worsening (Allen et al., 2020). Second, a 2018 Australian Government Senate inquiry into the SDGs emphasised the need for increased organisational awareness of and contribution to the SDGs (DFAT, 2019).

This study makes multiple contributions. First, it provides much-needed empirical evidence on the determinants of SDG disclosures as well as insights into their specific attributes. Second, the study contributes to the academic debate on the effects of external institutional factors relative to internal organisational aspects that inform potential motives for SDG reporting. Finally, the study presents a unique disclosure quality index for SDG reporting that will be useful for academics and practitioners interested in assessing and ranking SDG reports. Adapted largely from Subramaniam et al. (2020), the 11 disclosure items used in the index help report writers to compare and evaluate past reports consistently, and improve content and quality, which potentially reduces information asymmetry and enhances decision making by report users.

The outline of the paper is as follows. The following section presents a literature review on determinants and quality of corporate SDG disclosures, the theoretical framework of the study and hypothesis development. Section 3 describes the research method, and Section 4 discusses the results and analysis of the study. Section 5 contains a further discussion and is followed by a final section outlining the conclusions and limitations of the study.

2. Literature review

2.1. Determinants and quality of sustainable development goal disclosure

As organisations increasingly adopt SDG reporting, recent evidence has emerged on determinants of SDG disclosure. External institutional factors that positively influence SDG reporting have been identified as institutional pressures in different country contexts (Garcia-Sanchez et al., 2022b). These include non-government organisation (NGO) and community pressures (Ike et al., 2019), sustainability regulations (Bose and Khan, 2022), and the effect of global sustainability initiatives such as the IIRC (Hamad et al., 2023), the GRI (Curtó-Pagès et al., 2021) and the UNGC (Pizzi et al., 2021). Sustainability report assurance is another external influence on SDG reporting, and has been found to have a positive relationship with SDG disclosure (Rosati and Faria, 2019b). However, research also suggests that the use of GRI standards, the IIRC framework and sustainability assurance by continental European companies does not strongly influence SDG disclosure (van der Waal and Thijssens, 2020).

Internal organisational aspects such as institutional ownership structure, existence of CEO duality and organisational size have also been found to influence SDG disclosure. SDG disclosure is positively influenced by institutional owners of firms listed on the Dow Jones Sustainability Indices (Hummel and Szekely, 2022), the operations of multinational enterprises (Ike et al., 2019) and the influence of foreign direct investment (Aust et al., 2020). Whereas CEO duality has been found to negatively affect SDG disclosure (Martinez-Ferrero and Garca-Meca, 2020; Daniel-Vasconcelos et al., 2022), larger firm size is generally considered to positively affect disclosure (van der Waal and Thijssens, 2020; Khaled et al., 2021; Garcia-Sanchez et al., 2022b).

Investigations of corporate governance mechanism determinants have considered board gender diversity and board commitment to sustainability. Board gender diversity has been found to have a positive effect on SDG disclosure (Zampone et al., 2022). Examining carbon-related SDG disclosures, Toukabri and Mohamed Youssef (2023) find that the presence of females on the board as well as board size play an influential role in SDG disclosure. Having a separate corporate social responsibility (CSR), sustainability or environmental committee signals a board's commitment to addressing sustainability issues and tends to have a positive effect on SDG disclosure (Sekarlangit and Wardhani, 2021). Together, board gender diversity and the existence of a sustainability committee are likely to play a positive moderating role in influencing SDG disclosure (Daniel-Vasconcelos et al., 2022). Despite the strong relationship between environmental protection practices and directors' prior environmental experience (Walls and Hoffman, 2013), research has yet to test the relationship between disclosure and directors' sustainability experience. Farisyi et al. (2022) point out that directors' experience is rarely studied because of the difficulty of obtaining this type of data; in some cases, directors' experience is measured by their educational qualifications.

It is worth noting that findings on the determinants of SDG reporting are mixed, and that further research is needed. While some studies report a significant relationship between factors influencing SDG disclosure, others find no significant relationship. For example, in contrast to studies finding that corporate governance mechanisms such as gender diversity on boards and separate sustainability committees influence SDG disclosure (see above), Krasodomska et al. (2023) find that corporate governance structures have no effect on the disclosure of large public interest entities in the European Union (EU). This study examines how certain external factors and internal organisational characteristics influence content and quality of corporate SDG reporting in the Australian context.

Research on the content and quality of reporting highlights other issues related to SDG disclosure. In a study of the world's 2000 largest listed companies, van der Waal and Thijssens (2020) find that SDG engagement is limited (only 23% of the sample) and disclosure is largely symbolic and superficial. Similarly, Silva (2021) analyses FTSE 100 reports and finds that SDG disclosure is more symbolic than substantive. This finding is confirmed by Calabrese et al. (2022) in a study of 385 reports from the GRI Sustainability Disclosure Database. On a larger scale, Heras-Saizarbitoria et al. (2022, p.325) analysing 1370 sustainability reports from the GRI database published in the period 2018–20 by organisations from 97 countries, paint a 'rather disappointing picture' of global SDG engagement. Only 29% of the organisations had made any association between their overall strategy and the SDGs, while a very low percentage of the organisations had disclosed specific SDG indicators, suggesting a superficial commitment to the SDGs associated with impression management or 'SDG washing'.

To assess the content and quality of disclosure, researchers need to develop a systematic and detailed set of criteria. This area is underdeveloped and many of the studies mentioned above did not develop a quality disclosure matrix. More research is needed in this area. A limited number of studies developed disclosure quality tools to assess corporate SDG disclosures, selecting a variety of disclosure guidelines or criteria. Pizzi et al. (2021) applies the five steps outlined by SDG Compass. These five steps, while useful in guiding organisational actions, are not designated reporting guidelines, and only the fifth step focuses on reporting (WBCSD, 2015). The SDG Reporting Score employed by Pizzi and colleagues is calculated in a ratio comparing the actual number of indicators reported by the organisation with the number required by SDG Compass. Similarly, Khaled et al. (2021) hand-maps SDGs and SDG targets to environmental, social and governance (ESG) scores by applying the SDG Compass. The ESG measures are used as proxies for the effect of the organisation on the SDGs. With a narrow focus on organisations adopting integrated reporting, Izzo et al. (2020b) develops an SDG Disclosure Index and an SDG Compliance Index, as well as a Capital Disclosure Index based on the work of Adams et al. (2020), which includes three fundamental concepts and eight principles. Using the guidelines provided in an Oxfam report, Mhlanga et al. (2018) develops three criteria: general motivation towards SDG engagement, SDG prioritisation and SDG integration. Applying the recommendations provided by the GRI and the UNGC (UNGC, 2018), Hummel and Szekely (2022) develop 11 reporting items under two categories: defining and prioritising SDGs, and measuring and analysing SDGs. Drawing from multiple guidelines, including the SDG Compass, How to report on the SDGs (KPMG, 2018), and the SDG Reporting Challenge (PwC, 2019), Subramaniam et al. (2020) develops 13 criteria under three categories: awareness and commitment to the SDGs, integrating SDGs into strategic materiality analysis, and performance measurement. Their model presents a relatively complex and in-depth assessment of SDG disclosure. In this study, an SDG Disclosure Index based upon the model by Subramaniam et al. (2020), is developed to examine institutional and organisational influences on SDG reporting.

2.2. Multi-theoretical perspectives on sustainability reporting

Over the years, a large body of literature on voluntary corporate sustainability disclosure has emerged, with a variety of theoretical perspectives on such disclosures (Campbell, 2007; Deegan, 2014; Flynn, 2019; Luo, 2019; da Rocha Garcia et al., 2021). Guided by studies on the determinants of voluntary sustainability disclosure (de Villiers et al., 2014; Vitolla et al., 2020), two conceptual lenses are applied in this study to examine key determinants of SDG disclosure: institutional theory (DiMaggio and Powell, 1983) and agency theory (Jensen and Meckling, 1976).

Institutional theory suggests that organisations tend to conform and adopt similar practices because of external pressure, which can come from at least three sources (DiMaggio and Powell, 1983). The first is coercive pressure from external entities such as law or regulatory enforcement-based agencies, or other organisations upon which they are dependent. The second is mimetic pressure arising from stakeholder and general societal-driven values where organisations aim to meet societal expectations by adopting structures and processes similar to others in society. The third is related to normative or professional community-related expectations for consistency in structures and practices. Research suggests that regulatory, societal and professional developments influence the level of sustainability disclosure (de Villiers and Alexander, 2014; Akbar and Deegan, 2021). Research on the EU Directive on the quality of sustainability reporting finds that normative and mimetic mechanisms have a positive influence on the quality of sustainability reporting, whereas coercive mechanisms have no effect, suggesting that the new guidelines do not contribute significantly to the development of better reporting practices (Posadas et al., 2023). The institutional macro context is found to have a significant and positive effect on SDG disclosure (De Iorio et al., 2022). In this study, institutional theory is applied to understand the influence of external environmental factors—namely GRI compliance and sustainability assurance—on the content and quality of corporate SDG reporting.

Conversely, agency theory uses a traditional economics lens where managerial decision making is based on the contractual relationships and conflicts arising from information asymmetry between principals (owners) and agents (managers) (Jensen and Meckling, 1976). Agency theory contends that the interests of the principal and the agent can be aligned through incentive structures such as managerial reward schemes and via internal monitoring mechanisms including governing board structure and processes; for example, audit committees, risk management, sustainability committees and assurance mechanisms (Raimo et al., 2021). From an agency theory perspective, corporate reports are a critical communication source that managers can use to signal and communicate performance outcomes. Corporate reporting studies utilising an agency lens find that organisational characteristics such as organisational size, type and level of ownership, board composition and independence, and CEO duality are significant determinants of voluntary disclosure behaviour (Muttakin et al., 2018; Rao and Tilt, 2020). Companies with greater board diversity and separation of the chair and CEO roles are found to have better sustainability performance, whereas a larger number of independent directors is associated with poorer sustainability performance (Naciti, 2019). In this study, agency theory is applied to examine the effect of internal organisational characteristics—specifically institutional ownership, CEO duality, organisational size, board gender diversity, sustainability committee and board members' sustainability experience—on the content and quality of SDG disclosures.

2.3. Hypothesis development

Considering several dependent, control and independent variables, a series of hypotheses relating to the drivers of SDG disclosure are developed, as outlined in this subsection. The research framework is presented in Fig. 1.

Dependent variables: The dependent variables for the study focus on three distinct dimensions of SDG reporting: (i) acknowledgement of SDG, (ii) prioritisation of one or more SDG, and (iii) extent of SDG disclosure. These three reporting dimensions, based on SDG reporting guidelines, are identified in a report on SDG measurement and disclosure by Subramaniam et al. (2020). SDG acknowledgement is an assessment of whether companies are aware of and formally acknowledge the existence of SDGs. SDG prioritisation involves a process by which companies select or formally identify with one or more of the SDGs. SDG extent refers to the clear alignment of business objectives with the SDGs.

Control variables: Environmentally sensitive industries (Garcia et al., 2017; Radhouane et al., 2020), profitability (Hussain et al., 2018; Wasara and Ganda, 2019) and leverage (Karaman et al., 2018; Bui et al., 2020) are strongly associated with levels of voluntary corporate disclosure. Companies operating in environmentally sensitive industries

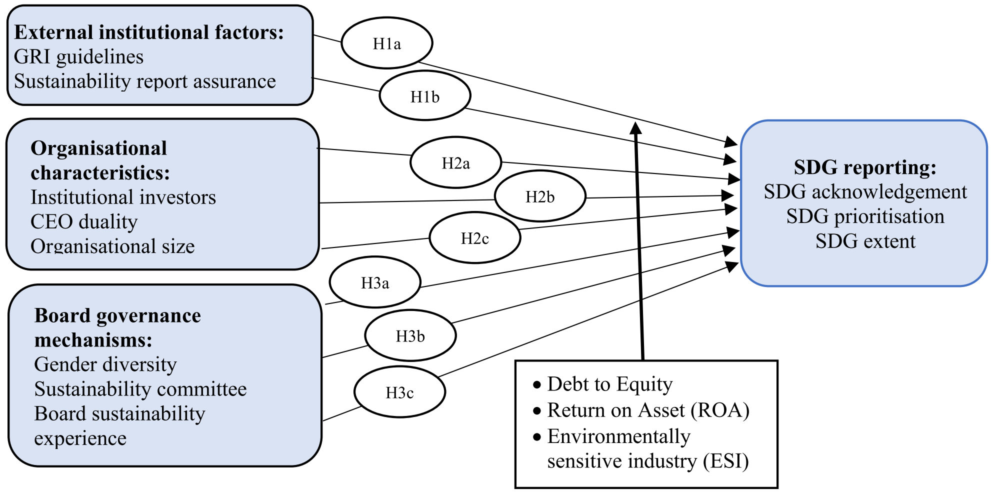

Fig. 1. Conceptual framework of drivers of corporate SDG reporting.

that cause harm to the environment are more likely to disclose high-quality environmental information (Moroney et al., 2012; Papa et al., 2022). Companies with a low return on assets (ROA)—which indicates less management efficiency in generating profits—and a low debt-to-equity ratio—which indicates less risk of loan default, are also found to disclose more social and environmental information (Alsaifi et al., 2020; Palea and Drogo, 2020). Based on this, three variables are used as control variables in this study: (i) whether or not the company operates in an environmentally sensitive industry, (ii) company ROA, and (iii) company debt-to-equity ratio.

Independent variables: Two independent variables in this study are associated with external institutional factors: compliance with GRI guidelines and sustainability report assurance. Three are associated with organisational characteristics: institutional investors, CEO duality and organisational size. The remaining three variable relate to board governance mechanisms: gender diversity, presence of a separate sustainability committee, and having board members with sustainability experience.

2.3.1. External institutional factors

2.3.1.1. GRI guidelines. The pioneer sustainability reporting guidelines of the GRI have gained popularity as a comprehensive reporting framework and have been widely adopted by organisations around the world (Jain et al., 2022). In 2016, the GRI's guidelines moved to include references to the SDG, and in 2018 it published *Integrating the SDG into Corporate Reporting: A Practical Guide*, which aimed to further standardise measurement and reporting on the SDGs. According to institutional theory, professionalisation can place normative pressure on firms to behave according to established professional codes and guidelines (de Villiers and Alexander, 2014). It has been suggested that sustainability reporting is guided less by rational management decisions than by institutionalisation of the reporting practices of peers (Higgins and Larrinaga, 2014). Consequently, the GRI guidelines can potentially exert significant normative pressure on companies to disclose at a minimum the prescribed reporting requirements on SDG governance and performance.

Research shows that organisations that publish information on the SDGs are more likely to follow the GRI guidelines (Curtó-Pagès et al., 2021). Organisations that mention the SDGs in their sustainability reports are also more likely to comply with relevant sustainability frameworks, such as the Carbon Disclosure Project (Rosati and Faria, 2019b). However, some studies identify shortcomings in the quality of sustainability reports produced to the GRI standard, which has been criticised as a 'tick-the-box' framework (Belkhir et al., 2017; Talbot and Boiral, 2018). This implies that not all companies that follow the GRI guidelines are enthusiastic about extending their basic reporting to incorporate the SDGs.

Based on the preceding discussion, the following hypothesis is proposed.

H1a. There is a positive association between companies with GRI compliance and their (i) probability of SDG acknowledgement; (ii) prioritisation of SDGs; and (iii) extent of SDG disclosure in corporate sustainability reports.

2.3.1.2. Sustainability report assurance. Sustainability reports accompanied by an assurance statement are perceived as more accurate and reliable, increasing report users' confidence in such reports (Boiral et al., 2019). Professional groups and assurance providers such as the Big-4 firms have not only been involved in advocating for more reliable corporate disclosures but have actively participated in the integration of SDG into business strategy (EY, 2017; Deloitte, 2018). From an institutional theory perspective, senior-level managers and professional associations are viewed as controlling the assurance of sustainability reporting by taking over the language and processes to meet commercial and professional objectives (Farooq and De Villiers, 2020). Companies that voluntarily undertake assurance of their sustainability reports tend to monitor managerial behaviour and be more invested in achieving their sustainability targets (Al-Shaer and Zaman, 2019).

Research shows that investors rate a company's sustainability performance positively when sustainability reporting is assured (Gürtürk and Hahn, 2016; Reimsbach et al., 2018). Reimsbach et al. (2018) demonstrate a higher weighting of sustainability information when accompanied by an assurance report, leading to better investment-related evaluations. The expected outcome of an organisation's approach to SDG reporting is confirmed by the positive association between the early adoption of SDGs in sustainability reports, and the presence of an external sustainability audit statement (Rosati and Faria, 2019b). Similarly, a positive relationship between the content and quality of SDG disclosures and the presence of sustainability report assurance maybe expected.

Based on the preceding discussion, the following hypothesis is proposed.

H1b. There is a positive association between companies having sustainability assurance and their (i) probability of SDG acknowledgement; (ii) prioritisation of SDGs; and (iii) extent of SDG disclosure in corporate sustainability reports.

2.3.2. Organisational characteristics

2.3.2.1. Institutional investors. Institutional investors are normally entities that invest money on behalf of clients or members; for example, banks, hedge funds and insurance companies (Garcia-Sanchez et al., 2022a). They are bound by established governance standards and codes of conduct, and represent a powerful group of stakeholders with legitimate demands or claims and an investment in the company's performance (Herremans et al., 2016). From an agency theory point of view, institutional investors are well placed to monitor and demand information on company matters. The experience and ability of institutional investors to supervise company management may benefit the company by reducing agency costs and increasing profitability (Garcia-Meca et al., 2017). In terms of voluntary disclosure, higher levels of institutional ownership might be expected to encourage companies to signal positive news through expanded disclosure with the hope of increasing investment and firm value, as well as to mitigate risks (Garcia-Meca and Pucheta-Martínez, 2018; Dyck et al., 2019).

Some empirical studies on the association between having institutional investors and voluntary disclosure demonstrate a significant and positive relationship (Garcia-Meca and Pucheta-Martínez, 2018; Garcia-Sanchez et al., 2022a). However, other studies find that institutional ownership negatively influences the disclosure of sustainability information (Arora and Dharwadkar, 2011; Hidalgo et al., 2011). In the context of the SDGs, Garcia-Sanchez et al. (2020) find that certain institutional investors, including foreign investors and pension funds (and excluding governments, financial institutions and cross-holdings) promote the disclosure of sustainability information. Given the recency of SDG reporting and increasing demands on sustainability information, a positive association between extent of institutional ownership and SDG reporting content and quality may be anticipated.

Based on the preceding discussion, the following hypothesis is proposed.

H2a. There is a positive association between the level of institutional ownership and the (i) probability of SDG acknowledgement; (ii) prioritisation of SDGs; and (iii) extent of SDG disclosure in corporate sustainability reports.

2.3.2.2. CEO duality. Having separate CEO and board chair positions is generally regarded to enhance independence, objectivity and company performance (Duru et al., 2016). From an agency theory perspective, concentration of decision-making power may foster managerial entrenchment and impair governance oversight (Allegrini and Greco, 2013). Conversely, CEO duality (where the CEO is also the chair of the board) allows greater power, and may also reduce board oversight costs with the CEO having a strong handle on company activities (Jizi et al., 2014).

Some studies indicate a negative association between the extent of voluntary disclosure and CEO duality (Saggar and Singh, 2017), suggesting CEOs are not seeking incremental value through voluntary disclosure. It is argued that CEO duality fosters self-interest at the cost of broader CSR practices (Muttakin et al., 2018). However, in some studies, CEO duality is found to increase CSR disclosures (Pucheta-Martinez and Gallego-Alvarez, 2019). Agency theory suggests that powerful CEOs may face pressure to appease stakeholders' concerns and encourage greater voluntary disclosure for their own private benefit. Providing information aligned with societal expectations thwarts reputational risks. In an environment of increasing public scrutiny around corporate accountability in relation to sustainable development, the pressure on CEOs can be expected to be heightened for sustainability and SDG-related disclosures.

Based on the preceding discussion, the following hypothesis is proposed.

H2b. There is a positive association between CEO duality and (i) the probability of SDG acknowledgement; (ii) prioritisation of SDGs; and (iii) extent of SDG disclosure in corporate sustainability reports.

2.3.2.3. Organisational size. Larger companies can afford to produce more sophisticated sustainability reports and reap higher reputational benefits from publication of such reports (Schreck and Raithel, 2018). From an agency perspective, information asymmetry tends to be stronger in larger entities, compelling them to publish more disclosures than do smaller firms to reduce agency costs and cater to the informational needs of more diverse stakeholders (García-Sánchez and Noguer-a-Gámez, 2018; Kılıç and Kuzey, 2018).

Studies on voluntary CSR and SDG reporting reveal positive associations between company size and the extent of voluntary disclosure (Rosati and Faria, 2019b; Khaled et al., 2021; Garcia-Sanchez et al., 2022b). Sustainability reporting by large companies may occur in response to increased pressure in that such disclosures can serve as an impression management tactic to shape stakeholders' perceptions or protect against reputational damage and prevent attacks from powerful stakeholder groups (Al-Shaer, 2020; Orazalin and Mahmood, 2020). Large organisations may thus be expected to publish greater content and higher-quality SDG-related information.

Based on the preceding discussion, the following hypothesis is proposed.

H2c. There is a positive association between organisational size and (i) the probability of SDG acknowledgement; (ii) prioritisation of SDGs; and (iii) extent of SDG disclosure in corporate sustainability reports.

2.3.3. Board governance mechanisms

2.3.3.1. Gender diversity. Board diversity refers to variation among board members in characteristics such as gender, age, expertise and skill. From an agency theory perspective, a diverse board will result in better monitoring of management and increased board independence (Bear et al., 2010). Women directors are potentially invested in shaping the agenda and procedures for board decision making, as well as influencing CSR performance and reporting (Post and Byron, 2015). Board gender diversity is considered to have a positive effect on the voluntary disclosure of holistic information (Hollindale et al., 2019).

Empirical findings generally identify women's representation on boards as a major factor influencing corporate sustainability practices. Women directors generally encourage board members to actively participate and communicate various perspectives and opinions; thus, gender-diverse boards are better able to assess stakeholder needs and make informed decisions (Rao and Tilt, 2016; Nadeem et al., 2017). Although gender diversity has the potential to influence board-level CSR decisions, a study on Australian boards finds an insignificant relationship between gender and CSR decision making, due mainly to the small number of female board directors and lack of support available to them, as well as board members' perceptions of a lack of female directors with requisite skills and competence (Rao and Tilt, 2020). Recent empirical findings by Rosati and Faria (2019a) indicate that organisations that publish sustainability reports mentioning the SDGs are more likely to establish boards with a greater number of female directors. They link the positive relationship to women's tendency to demand higher levels of sustainability and their greater likelihood of demonstrating moral reasoning and ethical behaviour, especially in the absence of clear organisational policies.

Based on the preceding discussion, the following hypothesis is proposed.

H3a. There is a positive association between companies having female directors and their (i) probability of SDG acknowledgement; (ii) prioritisation of SDGs; and (iii) extent of SDG disclosure in corporate sustainability reports.

2.3.3.2. Sustainability committee. Governing boards play important resource allocation and oversight roles within a company (Naciti, 2019). Agency theory suggests that as critical facets of a governance framework, boards play a monitoring role and influence firms to disclose information, to reduce agency costs and information asymmetry (Raimo et al., 2021). Companies that form a separate CSR or sustainability committee within the board demonstrate commitment to sustainability issues and align the corporate structure with the reporting process, improving the quality of sustainability disclosure (Rossi and Tarquinio, 2017).

Studies on the influence of the board on CSR transparency find positive associations between CSR transparency and the presence of a board CSR strategy and establishment of a specific CSR committee (Fuente et al., 2017; Helfaya and Moussa, 2017). The creation of a separate CSR committee has a significant effect on the quality of environmental information revealed (Daniel-Vasconcelos et al., 2022). A distinct subcommittee in charge of corporate sustainability issues will tend to necessitate formalised feedback through corporate disclosures to the board. Reflecting on the guidelines offered by the SDG Compass (WBCSD, 2015), the presence of a subcommittee dedicated to sustainability is considered a likely facilitator of SDG integration.

Based on the preceding discussion, the following hypothesis is proposed.

H3b. There is a positive association between the existence of a separate sustainability committee and (i) the probability of SDG acknowledgement; (ii) prioritisation of SDGs; and (iii) extent of SDG disclosure in corporate sustainability reports.

2.3.3.3. Board sustainability experience. Governing board directors with sustainability experience are likely to be more proactive in advocating for pro-environment practices and policies (Glass et al., 2016). According to agency theory, the board of directors is a control mechanism that is useful for aligning the interests of managers and shareholders to reduce asymmetric information and hence agency costs (Vitolla et al., 2020). Educated and experienced managers have more knowledge in dealing with sustainability-related issues and can positively influence both the sustainability policies of companies and the information released to stakeholders (Elmagrhi et al., 2019). When companies adopt sustainability reporting, the expertise and knowledge of directors helps to improve the quality of the information provided (Zampone et al., 2023).

Sustainability-related training attended by directors and directors with sustainability-related experience have a significant positive effect on sustainability reporting (Jamil et al., 2021). The selection of a director with sustainability experience will likely secure critical resources for investment and actions on the SDGs. Having directors with relevant sustainability experience is likely to aid in developing more value-creating SDG investments and disclosure practices, highlighting social innovations and impact.

Based on the preceding discussion, the following hypothesis is proposed.

H3c. There is a positive association between the presence of board members with sustainability experience and the probability of (i) SDG acknowledgement; (ii) prioritisation of SDGs; and (iii) extent of SDG disclosure in corporate sustainability reports.

3. Research methods

The study uses a two-step research method. Step one involves quantitative content analysis of sustainability reports. Content analysis helps to quantify the meaning of text through use of systematic procedures that can be replicated and applied in an objective fashion (Neuendorf, 2018). Step two uses the content analysis data collected in step one to perform multinomial logistic regression analysis. This is a simple and efficient method for identifying which factors have the strongest effect on a topic of interest (Bayaga, 2010). This two-step approach is considered to enable reliable analysis of SDG reporting practices.

3.1. Content analysis of sustainability reports

The data for this study were collected from the corporate sustainability reports of the top-150 Australian companies by market capitalisation (the ASX150, as of 1 July 2019) for the financial years ending 2018 and 2019. The 2018 reports were selected because companies by this time had several years to incorporate the SDGs into their business strategies; these were compared with the 2019 reports to consider the effect on SDG reporting following the 2018 Australian Government Senate inquiry into the SDGs. The majority of the data for the study were obtained through content analysis of sustainability reports. Some additional financial performance and corporate governance data required for the analysis were sourced from Refinitiv (Thomson Reuters). Safeguard measures in place for coder reliability included an initial review of all sample reports and data by a trained research assistant, followed by cross-check of the data by three experienced researchers. As discrepancies emerged, the data were re-analysed and resolved by the full team. The variables used in the study, measurement criteria and data sources are listed in Table 1. The variables used in the study are detailed below.

3.1.1. Dependent variables

SDGAcknowledgement represents an assessment of whether companies are aware of and formally acknowledge the existence of SDGs in their reports. When the word SDG is present, a value of 1 is assigned, and 0 otherwise. *SDGPrioritisation* refers to whether companies selectively identify one or more SDGs at the goal level in their reports. For companies reporting on specifically identified SDGs—for example, SDG1 or SDG2—a value of 1 is assigned, and 0 otherwise. *SDGExtent* relates to the overall quality of SDG reporting and is measured via an index, the SDG Disclosure Index, which consists of 11 criterion items drawn from global guidelines for business action and based on the study by Subramaniam et al. (2020). The focal items of the SDG Disclosure Index are enumerated in three thematic areas as follows.

Theme 1 ‘Awareness and commitment to SDG’ includes three criterion items.

- Mention of the SDG;
- SDG prioritisation at SDG goal level; and
- SDG prioritisation at SDG target level.

Theme 2 ‘Integrating SDG into strategic materiality analysis’ contains five criterion items.

- Materiality assessment at SDG goal level;
- Materiality assessment at SDG target level;
- Stakeholder engagement processes;
- Sustainability initiatives at SDG goal level; and
- Sustainability initiatives at SDG target level.

Theme 3 ‘SDG and performance measurement’ has three criterion items.

- Indicators of business performance at SDG goal level;
- Indicators of business performance at SDG target level; and
- Historical data indicating SDG contribution.

A score of 1 was given to each item when present in a sustainability report and 0 otherwise, leading to an indexed score ranging from 0 to 11. An indexed score is considered a reliable method because it leaves less choice available for coders (Haniffa and Cooke, 2005), and allowed the SDG disclosure analysis across companies to be undertaken in a

Table 1
Summary of study variables.

Variable		Measurement criterion	Data source
Dependent variables			
SDGAcknowledgement		1 if company acknowledges SDGs and 0 otherwise	Content analysis
SDGPrioritisation		1 if company selectively identifies one or more SDG at goal level and 0 otherwise	Content analysis
SDGExtent		Total score for the 11-criterion index, ranging from 0 to 11	Content analysis
Independent variables			
External institutional factors	*GRICompliance*	1 if sustainability report complies with GRI guidelines and 0 otherwise	Content analysis
	SusAssurance	1 if sustainability report is audited and 0 otherwise	Content analysis
Organisational characteristics	*InsInvestor*	Total number of institutional investors within the top 10 shareholders of a company	Refinitiv
	OperatingRe	Log operating revenue as a proxy for organisational size	Refinitiv
	CEODuality	1 if the chair and CEO are the same person and 0 otherwise.	Refinitiv
Board governance mechanisms	*FemaleDirector*	The proportion of female directors of the total number of directors on the board	Refinitiv
	CSRCommittee	1 if company has a distinct sustainability oversight committee and 0 otherwise	Content analysis
	BoardMemSusExp	1 if a board member has experience in sustainability and 0 otherwise	Content analysis
Control variables			
ESI		1 if company is in the energy, health care, industrials, materials or utilities sectors and 0 otherwise	asx200list.com
ROA		One-year lag return on assets as a proxy for profitability	Refinitiv
Debt to Equity		Debt-to-equity ratio (%) as a proxy for financial leverage	Refinitiv

consistent and systematic manner.

Together, SDG acknowledgement and SDG prioritisation are considered in this study to be indicative of the content of SDG reporting. SDG extent is considered indicative of the overall quality of SDG reporting in this study.

3.1.2. Independent variables

GRICompliance refers to whether companies prepare sustainability reports using GRI standards. When the report uses GRI standards, a value of 1 is assigned, and 0 otherwise. *SusAssurance* refers to whether a company's sustainability report is assured. For companies with sustainability report assurance, a value of 1 is assigned, and 0 otherwise. *InsInvestor* is a proxy variable to represent institutional ownership in the company, and is a count of the number of institutional investors among the top-10 shareholders for that year. *OperatingRe* is the log of the operating revenue of the company, used as a proxy for organisational size. *CEODuality* refers to whether the company CEO also serves as chair of the board of directors. For companies with CEO duality, a value of 1 is assigned, and 0 otherwise. *FemaleDirector* is used as a proxy for gender diversity, calculated as the proportion of female directors of the total number of board members. *CSRCommittee* refers to whether companies have established a separate sustainability committee, with a value of 1 is assigned if they have, and 0 otherwise. *BoardMemSusExp* refers to whether board members have expertise in sustainability issues, with a value 1 is assigned if any have such expertise, and 0 otherwise.

3.1.3. Control variables

ESI refers to whether companies operate in environmentally sensitive industries; that is, energy, healthcare, industrials, materials or utilities. If companies work in these industries, a value of 1 is assigned, and 0 otherwise. *ROA* is used as a proxy for profitability, with low ROA indicating low profitability. For each company, the lagged value of ROA is used. *Debt to Equity* refers to a company's financial leverage, with a low debt-to-equity ratio indicating less risk for investors. For each company, the debt-to-equity ratio is used.

3.2. Regression analysis

The data derived from step one are used to run the regression model. The hypotheses are tested using panel data regression analysis in STATA, running three separate panel data models. Models 1, 2 and 3 are presented below.

Model 1, a binomial probit model, assesses factors affecting the acknowledgement of SDG in sustainability reports; that is, *SDGAcknowledgement*.

$$\begin{aligned} SDGAcknowledgement = {} & \beta_0 + \beta_1(GRICompliance) + \beta_2(\text{SusAssurance}) \\ & + \beta_3(\text{InsInvestor}) + \beta_4(CEODuality) \\ & + \beta_5(LogOperatingRe) + \beta_6(FemaleDirector) \\ & + \beta_7(CSRCommittee) + \beta_8(BoardMemwithSusExp) \\ & + \beta_9(DebtToEquity) + \beta_{10}(LagROA) + \beta_{11}(ESI) + \varepsilon \end{aligned}$$

Model 2, a binomial probit model, assesses factors affecting whether or not a company specifically identifies one or more SDGs; that is, *SDGPrioritisation*.

$$\begin{aligned} SDGPrioritisation = {} & \beta_0 + \beta_1(GRICompliance) + \beta_2(\text{SusAssurance}) \\ & + \beta_3(\text{InsInvestor}) + \beta_4(CEODuality) \\ & + \beta_5(LogOperatingRe) + \beta_6(FemaleDirector) \\ & + \beta_7(CSRCommittee) + \beta_8(BoardMemwithSusExp) \\ & + \beta_9(DebtToEquity) + \beta_{10}(LagROA) + \beta_{11}(ESI) + \varepsilon \end{aligned}$$

Model 3, a linear panel random-effects model, tests factors influencing the extent of SDG reporting, as a proxy for the overall quality of SDG disclosure; that is, *SDGExtent*. The dependent variable is measured using an index comprising 11 criterion items, and is a continuous dependent variable:

$$\begin{aligned} SDGExtent = {} & \beta_0 + \beta_1(GRICompliance) + \beta_2(\text{SusAssurance}) \\ & + \beta_3(\text{InsInvestor}) + \beta_4(CEODuality) + \beta_5(LogOperatingRe) \\ & + \beta_6(FemaleDirector) + \beta_7(CSRCommittee) \\ & + \beta_8(BoardMemwithSusExp) + \beta_9(DebtToEquity) \\ & + \beta_{10}(LagROA) + \beta_{11}(ESI) + \varepsilon \end{aligned}$$

4. Results and analysis

This section presents the findings and analysis of the study. In the following, an overview and descriptive statistics for the sample data is first presented. The results of the regression analysis are then presented and examined.

Table 2
Sample description of ASX150 by industry and market capitalisation.

Industry classification			Market capitalisation	
Type	No. of companies	Percentage	AU$	Percentage
Financials	22	15%	568,135,440,000	31%
Materials	29	19%	345,276,690,000	19%
Health care	9	6%	159,639,130,000	9%
Industrials	16	11%	154,520,920,000	8%
Real estate	17	11%	137,407,280,000	7%
Consumer discretionary	17	11%	117,798,300,000	6%
Energy	11	7%	106,152,470,000	6%
Consumer staples	7	5%	92,101,650,000	5%
Information technology	13	9%	67,902,790,000	4%
Telecommunication services	5	3%	63,184,730,000	3%
Utilities	4	3%	36,802,040,000	2%
All companies	**150**	**100%**	**1,848,921,440,000**	**100%**

4.1. Results of content analysis

The content analysis covers 300 firm-level observations across 11 industries. The majority of companies (67%) are from five industries: the financials, materials, industrials, real estate and consumer discretionary sectors. Companies in the financial sector include the Big-4 banks and companies in the materials sector include mining companies. These two sectors dominate the sample, together representing 50% of market capitalisation. Table 2 provides a description of the sample companies by industry and market capitalisation.

Descriptive statistics for the study variables are presented in Table 3. The study finds that while less than half the top ASX150 in the 2018 and 2019 reporting period of the sample do not even mention SDGs in their corporate sustainability reports, there is a notable increase in the acknowledgement, prioritisation and extent of SDG disclosures between the two reporting periods. SDG acknowledgement denotes the extent to which SDGs are mentioned in the sustainability report. In 2019, 72 (48%) of the ASX150 acknowledge the SDG, an increase of 11% compared to the 56 (37%) companies in 2018. However, over both years, less than half (43%) of the companies mention the SDGs in their sustainability report. SDG prioritisation signifies the proportion of companies that select or identify with one or more SDGs. Even fewer companies (35%) selectively prioritise one or more of the SDGs. Only 38 (25%) and 67 (45%) of the ASX150 prioritise one or more SDGs in 2018 and 2019, respectively. SDG extent is an indicator of overall quality of SDG disclosure. The scores for the sample range from 0 to 10 points (of a total 11 points), with a mean value of 1.67. The findings show that while an increasing number of ASX150 companies are choosing to disclose SDG information, the quality of SDG disclosure remains very low. This indicates that there is much scope for improved SDG reporting.

The study finds 134 (45%) company observations in compliance with GRI guidelines, but only 79 (26%) company observations indicate sustainability reports are audited by a third party. Eight or nine of the top-10 shareholders are institutional investors, and the average operating revenue is high (A$5606 million). There are only 26 (9%) companies in the sample where the same executive holds the dual role of CEO and board chair. The proportion of female directors on boards is generally low, averaging around 30%, There are 156 (52%) observations with an established subcommittee dedicated to sustainability. However, only 54 (18%) companies are observed to have one or more directors with sustainability experience or expertise, The mean debt-to-equity ratio is 1.14, which shows that the companies in the sample are not highly leveraged. The average *ROA* is 7.65%, which is an indication that the companies are performing well in a highly competitive environment. 138 (46%) of the companies in the study operate in environmentally sensitive industries, including energy, healthcare, industrials, materials and utilities.

4.2. Results of regression analyses

A correlation matrix showing the pooled correlation coefficients between all study variables is presented in Table 4. The results show that *SDGAcknowledgement*, *SDGPrioritisation* and *SDGExtent* are all positively and significantly correlated with the level of GRI compliance, degree of sustainability assurance, level of institutional investor participation, organisational size, proportion of female directors, existence of a separate sustainability committee and having board members with sustainability experience. *CEODuality* is found to have no significant correlation

Table 3
Descriptive statistics for SDG disclosure by the ASX150.

Variable	N	**Percentage (yes/present)**	Min	Max	Mean	Std. deviation
SDGAcknowledgement	300	43%				
SDGPrioritisation	300	35%				
SDGExtent	300		0	10	1.67	2.36
#SDGExtent	129		1	10	3.89	2.09
InsInvestor	298		3	10	8.62	1.69
OperatingRe	299		1.6	59984	5606.38	9542.53
FemaleDirector	294		0	57.14%	29.96%	0.11
Lag ROA	298		−33.03	51.98	7.65	8.77
Debt to Equity	297		0	126.42	1.14	7.36
GRICompliance	300	45%				
SusAssurance	300	26%				
CEODuality	293	9%				
CSRCommittee	300	52%				
BoardMemwithSusExp	300	18%				
ESI	300	46%				

Note.
1. *N* varies because of unavailable data.
2. *#SDGExtent*; 129 case observations have at least 1 of the 11 items comprising the disclosure index.

Table 4
Correlation matrix of the study.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1)	***SDGAcknowledgement***	1													
(28)	***SDGPrioritisation***	0.837*	1												
(3)	***SDGExtent***	0.819*	0.893*	1											
(4)	*GRICompliance*	0.445*	0.423*	0.423*	1										
(5)	*SusAssurance*	0.479*	0.434*	0.493*	0.559*	1									
(6)	*InsInvestor*	0.326*	0.295*	0.271*	0.243*	0.166*	1								
(7)	*CEODuality*	0.090	0.095	0.126*	0.005	0.108	−0.188*	1							
(8)	*LogOperatingRe*	0.391*	0.406*	0.403*	0.296*	0.340*	0.391*	0.041	1						
(9)	*FemaleDirector*	0.179*	0.186*	0.169*	0.085*	0.118*	0.245*	−0.168*	0.204*	1					
(10)	*CSRCommittee*	0.424*	0.397*	0.418*	0.461*	0.393*	0.255*	−0.066	0.266*	0.036	1				
(11)	*BoardMemwithSusExp*	0.262*	0.293*	0.341*	0.242*	0.252*	0.131*	−0.051	0.143*	0.062	0.381*	1			
(12)	*Debt to Equity*	0.082	0.099	0.133*	0.079	0.111	0.040	−0.027	0.031	−0.020	0.058	0.130*	1		
(13)	*Lag ROA*	−0.031	−0.026	−0.041	−0.048	0.010	−0.031	−0.022	−0.136*	0.036	−0.048	0.022	−0.074	1	
(14)	*ESI*	0.123*	0.122*	0.142*	0.086	0.056	0.159*	0.099	0.107	−0.183*	0.271*	0.16*	0.048	0.051	1

Note: *Correlation is significant at the 0.05 level (2-tailed).

with *SDGAcknowledgement* or *SDGPrioritisation*, but is positively correlated with *SDGExtent*.

Hence, it can be concluded that external institutional factors, GRI compliance and sustainability assurance are positively correlated with both content and quality of SDG disclosures. With regard to internal organisational factors, having more institutional investors among the top-10 shareholders and having higher operating revenue—that is, larger companies—are both company characteristics that are positively related to both content and quality of SDG disclosures. Additionally, having female directors on the board improves the content and quality of SDG disclosures, relative to having the same person as the board chair and CEO. Further, establishment of a separate sustainability committee has a stronger positive effect on both content and quality of SDG disclosures than does having board members with sustainability experience. Overall, the evidence shows that the explanatory variables are strongly associated with both content and quality of SDG reporting.

Both content and quality of SDG disclosures by companies are found to be significantly positively correlated with operating in environmentally sensitive industries. However, profitability (*ROA*) has no significant relationship with either content or quality of SDG disclosures. Similarly, leverage (*Debt to Equity*) does not have a significant relationship with SDG content, although it is significantly positively correlated with SDG quality.

The results of the regression analyses for Models 1, 2 and 3 are shown in Table 5 and explained below. Multicollinearity is unlikely to be a concern, given the variance inflation factor (VIF) values are all lower than 2.5 (Gujarati and Porter, 2009). All three models are statistically significant (prob $> \text{chi}^2 = 0$).

GRI compliance is positive and significant ($p < 0.05$) in all three models, indicating that both the content and the quality of SDG disclosures increase if companies' sustainability reports comply with GRI guidelines (H1a is supported). Hence, it can be concluded that the GRI guidelines have a positive effect on the reporting of SDG governance and performance measures. This also suggests that companies that mention the SDGs in their sustainability reports are more likely to comply with relevant sustainability frameworks, allowing stakeholders to better follow the company's sustainability initiatives. Sustainability assurance is found to be a significant predictor of SDG acknowledgement ($p < 0.01$), SDG prioritisation ($p < 0.10$), and SDG extent ($p < 0.01$), suggesting that having the sustainability report audited increases the probability of companies disclosing greater content and higher quality SDG information (H1b is supported). Therefore, it can be assumed that if sustainability reporting is assured, there is a greater likelihood that increased SDG reporting will lead investors to positively assess a company's sustainability performance.

The effect of institutional investor ownership is also found to be a significant determinant of SDG acknowledgement ($p < 0.01$) and SDG prioritisation ($p < 0.05$), but not SDG extent. This result provides partial support for H2a. Hence, it can be concluded that when there are more institutional investors among the top-10 shareholders, companies are more likely to mention and prioritise the SDGs in their sustainability reports. However, having more institutional investors among the top-10 shareholders does not clearly translate to a higher quality of SDG reporting. The hypothesised effects of CEO duality and organisational size on SDG reporting are supported for all three models ($p < 0.05$), and the positive coefficients indicate that a larger organisation and presence of CEO duality are positively associated with all three SDG reporting dimensions. These results thus support H2b and H2c. Therefore, the evidence suggests that CEO duality results in increased content and quality of SDG disclosure. This means that companies in which the CEO is also the board chair are more likely to focus on the SDGs and integrate them into their business strategy. With regard to the effect of organisational size on SDG reporting, the study findings support the inference of a positive relationship between company size and the content and quality of SDG disclosures. Larger organisations can be expected to have sufficient resources and motivation to implement the SDG and

Table 5
Regression analyses for Model 1, 2 and 3.

		Model 1 *SDGAcknowledgement*		Model 2 *SDGPrioritisation*		Model 3 *SDGExtent*		VIF
		Coef.	Z	Coef.	Z	Coef.	Z	
H1a	*GRICompliance*	0.48**	1.69	0.632**	1.93	0.492**	1.73	1.64
H1b	*SusAssurance*	0.973***	2.78	0.542*	1.49	0.935***	2.87	1.62
H2a	*InsInvestor*	0.254***	2.45	0.196**	1.63	0.097	1.11	1.37
H2b	*CEODuality*	0.831**	1.70	1.005**	1.84	0.968**	2.06	1.13
H2c	*LogOperatingRe*	0.502**	1.96	0.783***	2.47	0.729***	3.24	1.4
H3a	*FemaleDirector*	2.054*	1.63	3.101**	1.99	2.212**	1.87	1.18
H3b	*CSRCommittee*	0.798***	2.66	0.801***	2.34	0.633***	2.52	1.56
H3c	*BoardMemwithSusExp*	0.208	0.64	0.606**	1.71	0.636**	2.23	1.22
	ESI	0.059	0.21	0.027	0.08	0.181	0.64	1.20
Control	*Debt to Equity*	0.001	0.57	0.002	1.13	0.001*	1.61	1.04
variables	*Lag ROA*	0.007	0.47	0.009	0.51	−0.001	−0.04	1.05
	Constant	−5.921***	−4.55	−7.243***	−4.48	−3.340***	−3.94	
	Observations	289		289				
	289							
	Groups	149		149		149		
	Mean VIF	1.31		1.31		1.31		1.31
	Wald X^2	38.89		30.15		129.99		
	Log-likelihood	−129.08		−123.07				
	Prob > chi^2	0.0001		0.0015		0		
	R^2					39.70%		

Notes.
1. Coef: Raw coefficient value; Z: z-value.
2. Statistical significance is marked as $*p < 0.10$; $**p < 0.05$ and $***p < 0.01$ (1-tailed).
3. *Wald X^2* values are within appropriate ranges and the prob > chi^2 = 0, indicating that all models are robust.
4. The full sample size is 300 observations excluding 11 observations with unavailable data. The final number of observations used in running regression is 289.

communicate their strategies, goals and activities.

The proportion of board directors who are female is found to be a significant ($p < 0.05$) predictor of both content and quality of SDG reporting in all three models. Thus, H3a is supported. This is consistent with the prediction that when the board has more female representation, it is more likely that the company will choose to disclose SDG information, and this information will be of higher quality. In terms of having structural support mechanisms, the existence of a separate sustainability committee is a significant ($p < 0.01$) predictor in all models, indicating H3b is supported. Therefore, the study finds a positive relationship between the existence of a separate sustainability committee and both content and quality of SDG reporting. The establishment of a dedicated sustainability committee is likely to be instrumental in focusing the company's attention on the integration of the SDGs into strategy. The presence of at least one board member with sustainability experience is a significant driver for SDG prioritisation ($p < 0.05$) and SDG extent ($p < 0.05$), but not SDG acknowledgement. These results partly support H3c. The evidence suggests that the sustainability experience of board members is a key factor that influences a company's ability to produce high-quality SDG disclosures. Thus, companies are more likely to emphasise SDG integration if they have board members with sustainability expertise.

No significant relationship was found between operating in an environmentally sensitive industry and any of the three dependent variables. A plausible explanation for this is that because the SDGs cover a broad set of social, economic and environmental aspects, reporting on the SDGs may, in general, be done by firms in both environmentally as well as non-environmentally sensitive sectors. For example, aspects of several SDGs, such as Gender Equality (SDG 5) and Decent Work and Economic Growth (SDG 8) may be equally important for companies in environmentally sensitive and non-sensitive sectors. The control variable relating to leverage is marginally significant and positive ($p < 0.10$), as expected for SDG extent, but not for SDG acknowledgement or prioritisation. Further, there are no significant associations with profitability for any of the three SDG disclosure dimensions. The inference is thus that the amount of debt in the capital structure or how efficient a company's management is in generating profit from their total assets do not have a significant effect on SDG disclosure dimensions.

5. Discussion

5.1. *Discussion of sustainable development goal reporting practices*

The study develops a set of hypothesised relationships between the SDG reporting of top Australian companies and determinants of disclosure. The study assesses the relationship between external institutional factors, organisational characteristics and board governance mechanisms, and the content and quality of SDG disclosures. The results of the study are summarised in Table 6, and discussed below in light of the study's three research questions.

5.1.1. *Influence of institutional factors on sustainable development goal disclosure*

The first research question of the study relates to the influence of external institutional factors—specifically GRI guidelines and sustainability report assurance—on the content (acknowledgement of SDG and prioritisation of one or more SDGs) and quality (extent of SDG disclosure) of corporate SDG reporting.

Table 6
Summary of research results.

Hypothesis	Results		
	SDG Acknowledgement	SDG Prioritisation	SDG Extent
External institutional factors			
H1a (GRI compliance)	Supported	Supported	Supported
H1b (Sustainability assurance)	Supported	Supported	Supported
Organisational characteristics			
H2a (Institutional ownership)	Supported	Supported	Not supported
H2b (CEO duality)	Supported	Supported	Supported
H2c (Organisational size)	Supported	Supported	Supported
Board governance mechanisms			
H3a (Gender diversity)	Supported	Supported	Supported
H3b (Sustainability committee)	Supported	Supported	Supported
H3c (Board sustainability experience)	Not supported	Supported	Supported

The results of the study show that institutional norms and practices—namely GRI compliance and assurance of sustainability reports—are important normative factors that influence both the content and quality of SDG reporting. Institutional theorists (DiMaggio and Powell, 1983; Campbell, 2007) propose that organisational behaviours such as voluntary disclosure practices are often in response to societal, regulatory and professional norms and expectations. With the GRI committed to developing guidelines based on a standardised structure for sustainability reporting, it is not surprising that organisations are encouraged not only to mention or prioritise SDGs, but also adopt higher levels of SDG disclosure. Concerns raised over the shortcomings revealed by past studies regarding the quality and comparability of sustainability reports produced under the GRI standards (Belkhir et al., 2017; Talbot and Boiral, 2018) are thus not echoed in this study. The findings suggest that the adoption of external frameworks can support companies to report more comprehensively on the SDGs.

Moreover, the positive association between external assurance and SDG reporting mirrors the findings of Rosati and Faria (2019b). The study findings support the contention that managers who are invested in voluntary assurance tend also to be concerned about achieving sustainability goals (Al-Shaer and Zaman, 2019). Further, as governance professional bodies and assurance providers increasingly capture market share in corporate sustainability advisory services, and invest in promoting and implementing reporting strategies, professional normative pressures can be seen to exert great explanatory power over SDG reporting practices.

5.1.2. Influence of organisational characteristics on sustainable development goal disclosure

The study's second research question is concerned with the effect of organisational characteristics—specifically institutional ownership, CEO duality and organisational size—on the content (acknowledgement of SDG and prioritisation of one or more SDGs) and quality (extent of SDG disclosure) of corporate SDG reporting.

Interestingly, the analysis on the effects of institutional investor ownership reveal a significant and positive effect on SDG content and a weak effect on quality of SDG disclosures. The study findings suggest that while institutional investors are responding to companies that display better awareness and association with the SDGs, they are less responsive to SDG disclosure quality. This seems counterintuitive because according to agency theory and the findings by Garcia-Meca and Pucheta-Martinez (2018), it is better for institutional investors to gain as much information as possible about a company's environmental and social commitments, particularly to maintain their prestige and professional reputation (Dyck et al., 2019). However, agency theory also proposes that it can be costly to gain information, and that the costs and benefits of acquiring information need to be weighed (von Alberti-Alhtaybat et al., 2012). In this case, with SDG reporting being in a nascent stage, acquiring additional sustainability information may not be deemed cost effective for meeting institutional investor needs. Further, it is likely that institutional investors themselves are still building their knowledge on evaluating SDG impacts and are easily satisfied with minimal information on SDG governance and outcomes.

In contrast, organisational characteristics such as CEO duality and organisational size are found to have a positive effect on both content and quality of SDG disclosures. In the case of CEO duality, the study results support past studies such as Jizi et al. (2014) and Pucheta-Martinez and Gallego-Alvarez (2019), where CEO duality is positively associated with CSR disclosures. Likewise, in this case, aligned with agency theoretic expectations that CEOs in dual roles may seek opportunities to enhance their reputation, greater SDG disclosures may also be viewed as an opportunistic instrument for self-enhancement (Pucheta-Martinez and Gallego-Alvarez, 2019). Further, as contended by Jizi et al. (2014), CEOs tend to encourage publication of CSR reports as this helps avoid pressure from stakeholder groups and tends to reduce monitoring by boards, capital markets and legislators, which is borne out in the case of SDG disclosures by top Australian companies. The findings of this study imply that companies with a strong and unified dual-purpose leader can use their greater control and managerial influence to steer the company towards integrating SDGs into business strategy.

In relation to organisational size, the study findings are consistent with Rosati and Faria (2019b), who also find a positive relationship between organisational size and SDG disclosure, suggesting larger companies have the capacity and the motivation to signal their commitment to the SDGs, enhance their social license to operate and thwart negative public scrutiny. According to agency theory, managers disclose sustainability information in a way that makes their company's prospects appear positive to avoid external pressure (Jeriji and Louhichi, 2021). The results of this study suggest that large firms can be expected to provide detailed information on their SDG activities and commitment, to respond to sustainability-related issues raised by stakeholders.

5.1.3. Effect of board governance mechanisms on sustainable development goal disclosure

The third research question of the study is focused on the influence of board governance mechanisms—specifically gender diversity, a separate sustainability committee and board experience in sustainability—on the content (acknowledgement of SDG and prioritisation of one or more SDG) and quality (extent of SDG disclosure) of corporate SDG reporting.

The study findings reveal that the composition of the board of directors affects the firm's sustainability reporting practices. Female directors on the board have a consistent and strong influence on both content and quality of SDG disclosures. The study findings indicate that women need to be better represented on the boards of Australia's top companies before the SDGs can be better integrated into strategy. Agency theory suggests that a diverse board with an appropriate mix of experience and skills is better able to evaluate management and assess business strategies and their effects on sustainability (Bear et al., 2010). According to Rao and Tilt (2016), the link between the selection of female directors and increased sustainability disclosures may be attributed to women's participative decision-making styles and ability to interact with multiple stakeholder groups. Yet, the inference from this study is different to that of a later study by Rao and Tilt (2020), who find no significant relationship between gender and CSR decision making using data from Australian companies. However, the findings of this study are similar to those of Rosati and Faria (2019a), who find that the presence of female directors leads to higher levels of sustainability as they are more likely to exhibit moral reasoning and ethical behaviour. It is argued that the presence of female directors on the board is likely to lead to greater SDG transparency, as women are more likely to have an ethic of care.

Similarly, this study finds that the presence of a separate sustainability committee is a dominant factor influencing SDG disclosure, supporting the findings of Fuente et al. (2017) and Michelon and Parbonetti (2012) and confirming the agency theory proposition regarding the importance of senior management commitment to sustainability governance and having structures to support sustainability reporting. The presence of a distinct sustainability committee is indicative of an active sustainability strategy (Michelon and Parbonetti, 2012), which creates accountability and increases transparency through the disclosure of sustainability information (Fuente et al., 2017). This is expected to encourage SDG reporting practices and highlight the company's commitment to SDGs.

Having board members with sustainability experience is found to have a stronger positive effect on SDG reporting quality than on the mention of SDG as such. From an agency perspective, managers with sustainability experience are likely to place greater emphasis on sustainability practices and promote sustainability reporting. The study findings suggest that SDG reporting quality would likely improve if more directors had background knowledge of sustainability issues. The study findings are consistent with research finding that managers with sustainability knowledge and education make better quality sustainability-related disclosures (Elmagrhi et al., 2019; Zampone et al., 2023). Having someone at board level with experience and responsibility for sustainability issues helps to align the interests of internal and external stakeholders, and is likely to lead to better quality SDG reporting practices.

5.2. Theoretical and practical implications

The study contributes to the sustainability reporting and SDG literature by identifying specific determinants that influence content and quality of SDG reporting. The research findings show that organisations with more institutional investors and CEOs who have a dual role as chair; large organisations; organisations with more female directors on the board; organisations with a separate sustainability committee; and organisations that hire more directors with sustainability experience and provide sustainability training to existing management, promote sustainability practices and publish increased SDG disclosure. Two conceptual lenses, institutional theory and agency theory, are applied to better understand organisational motivations to publish SDG disclosures. Institutional norms and pressures to comply with GRI guidelines, and to seek assurance of sustainability reports, are found to positively influence SDG reporting practices. Further, from an agency perspective, sustainability reports can be seen as a critical communication mode in which managers can mitigate agency problems by communicating SDG-related performance results.

The findings of the study highlight the need for consistent application of a global framework for SDG reporting. International standard-setting bodies such as the ISSB and the GRI, and influential assurance providers from the Big-4 firms should mandate or encourage companies to adopt uniform sustainability practices and incorporate SDG information into their sustainability reports. Governments can also do more to support businesses to integrate SDGs into their business strategy and report on the SDGs. Australia and other UN member states need to be more proactive in achieving global goals and consider how to effectively enforce and monitor SDG initiatives. Australian businesses, and the corporate sector more broadly, need to take greater responsibility and initiative for sustainability issues and make stronger commitment to SDG performance. This is particularly relevant for environmentally and socially sensitive industries, such as mining and logging, and for industries with global supply chains that affect vulnerable communities in developing countries, such as apparel and food and beverages. NGOs and advocacy groups, such as human rights organisations, global trade unions and environmental and activist groups, must continue to put pressure on companies to communicate their tangible commitment to the SDGs. The SDG Disclosure Index presented in the study can be used by academics, practitioners and companies to conduct further SDG-related research or to compile or assess corporate SDG reports.

6. Conclusions

SDG reporting is an emerging and rapidly growing phenomenon. This study adds to the SDG reporting literature by identifying drivers of SDG disclosure; examining managers' motivations for SDG reporting; and presenting an SDG Disclosure Index that is useful for conducting further SDG-related research or compiling or evaluating corporate SDG reports.

There is a need for continued vigilance regarding the determinants, quality and motivations of SDG reporting. The study finds that both external institutional and organisational-oriented factors are critical determinants of the content and quality of SDG disclosures. The findings show companies that demonstrate GRI compliance, assurance of the sustainability report, CEO duality, larger organisational size, a greater number of female directors and a separate sustainability committee, tend to mention and prioritise SDGs in their corporate sustainability report, as well as displaying higher-quality SDG reporting. Surprisingly, institutional ownership tends to influence SDG acknowledgement and prioritisation, with no effect on SDG quality. Conversely, board members with sustainability experience significantly influence quality of SDG reporting. The motivation for managers to report on the SDGs can be seen as related to societal and professional norms and pressures, and as a strategic tool to mitigate agency problems and communicate performance results. To conclude, it appears institutional and organisational features both coerce and facilitate SDG reporting, and there are potential synergistic benefits to further understanding these factors.

Future studies should consider the demand for information on corporate impacts on sustainable development. Institutional owners whose decisions are best served in the long term by a vibrant, sustainable market and society will demand higher-quality SDG information to better identify risk and opportunities from both short- and long-term perspectives. The study findings indicate the need for a more robust SDG measurement and reporting framework that can support companies to align their business strategy with the SDGs and take advantage of the many opportunities presented by the 2030 *Agenda for Sustainable Development*.

There are several caveats to this study that are associated with the use of thematic documentary content analysis and multivariate data analysis. First, the study is premised on content analysis of annual corporate sustainability reports and thus is open to a high level of subjectivity and interpretation biases. However, the study employed defensive procedures to reduce the level of subjectivity and interpretation biases. Content analysis of each report was undertaken by two researchers, and regular meetings were held to cross-compare data coding; any differences in interpretation were resolved by a third team member. Second, company websites or social media that may hold additional information on SDG embedment in corporate strategy were not reviewed. Future research could employ other qualitative techniques such as interviews with the CEO, CFO or sustainability manager to better understand corporate viewpoints and motives for SDG disclosure. A final limitation is that the data covered sustainability reports over a two-year period only. Future studies could extend to a longer period to enable a longitudinal analysis that may generate valuable insights into the evolving trend of SDG reporting and the associated factors driving any changes.

CRediT authorship contribution statement

Nava Subramaniam: Conceptualization, Methodology, Writing – original draft, Formal analysis, Supervision. **Suraiyah Akbar:** Investigation, Writing – review & editing. **Hui Situ:** Methodology, Data curation. **Sophia Ji:** Investigation, Writing – review & editing. **Nirav Parikh:** Methodology, Validation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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