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Sustainability practices disclosure of top logistics firms in Australia

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Abstract

Purpose – This study explores the scope, materiality and extent of environmental and social sustainability disclosure – as benchmarked against the Global Reporting Initiatives (GRI-G4) – of the top 10 logistics firms operating in Australia. It also investigates the relationships between the extent of environmental and social sustainability disclosure of these firms and their actual financial performance.

Design/methodology/approach – The authors adopted an inductive case study approach for an in-depth investigation of the relationships among concepts. A content analysis of the firms' sustainability reports was performed to determine their pattern and extent of sustainability disclosure against the GRI framework. A disclosure–performance analysis (DPA) matrix was employed to relate the extent of environmental and social sustainability disclosure of these 10 firms with their actual financial performance (i.e. return on assets [ROA] and total revenue growth).

Findings – This study found that the extent of sustainability reporting was relatively high on the labour practices and decent work subgroup, followed by the environmental dimension of the GRI-G4 framework. However, it was relatively low on the society, human rights and product responsibility subgroups of the GRI framework. The DPA revealed that "Leaders" (firms with higher sustainability disclosure levels) achieved significantly higher ROA. However, "Opportunists" (firms with lower sustainability disclosure levels) achieved higher levels of financial returns (i.e. ROA and total revenue growth) with less attention to sustainability issues, which contradicts the win-win view of the sustainability disclosure–financial performance relationship.

Originality/value – First, this study contributes an in-depth review of sustainability disclosure practices of top logistics firms operating in Australia. Second, using DPA, it identifies the novel effects of environmental and social sustainability disclosure levels on these firms' financial performance. It also sheds further light on the potential effect of investments beyond substantial profitability for sustainability growth and corporate governance on the sustainability disclosure–financial performance relationship.

Keywords Australia, Global Reporting Initiative (GRI), Logistics firms, Sustainability disclosure, Disclosure–performance analysis (DPA)

Paper type Research paper

1. Introduction

Environmental issues, including global warming, ozone layer depletion and the depletion of natural, non-renewable resources, arising from various supply chain activities of logistics firms, such as distribution, purchasing and transportation, have drawn attention to the importance of sustainability in the supply chains of the logistics sector (Karaman *et al.*, 2020). According to the International Energy Agency, the logistics sector accounts for 24% of the global CO_2 emissions (IEA, 2020). Since this sector is considered a significant contributor to environmental issues, many stakeholders, including governments, communities and non-governmental organisations, have started to pay close attention to the sustainable performance of logistics firms (Chu *et al.*, 2019). To respond to the increased stakeholder requirements, logistics firms have started to communicate their sustainability performance through sustainability disclosures (Piecyk and Björklund, 2015).

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Sustainability disclosure is a practice of measuring and disclosing the triple bottom line sustainability performance, which allows firms to identify strong and lagging areas of sustainability (Stacchezzini *et al.*, 2016). Moreover, sustainability disclosures enhance firm reputation (Odriozola and Baraibar-Diez, 2017), customer satisfaction (Herremans *et al.*, 2016) and firm financial performance (Hong *et al.*, 2018). Although several voluntary reporting frameworks are available, the Global Reporting Initiatives (GRI) remains the popular sustainability reporting framework. It is considered to be the most reliable and comprehensive framework for sustainability reporting (Karaman *et al.*, 2020). The GRI allows firms to enhance the reliability, accuracy and comparability of their sustainability reports (Karaman *et al.*, 2020). According to the GRI database, 3,012 firms worldwide have disclosed their GRI-G4 sustainability reports in 2017, of which 2.55% are logistics firms (GRI, 2018). The GRI framework encourages firms to report their sustainability vision and strategy, governance framework, stakeholder engagement process and economic, environmental and social sustainability performance by using a series of sustainability indicators (GRI, 2018).

The extant literature has paid significant attention to explore the sustainability reporting practices of firms in various industry sectors. Although logistics is considered a highly environmentally sensitive industry, however, the related literature is in the early phase of investigating the sustainability reporting practices of logistics firms (Karaman *et al.*, 2020). In particular, no substantial research has been conducted till date on the Australian logistics sector, which contributes more than AU$102 billion to the Australian economy and employs more than 1.2 million people (ALC, 2020). Despite it being a key contributor to the Australian economy, the sector is criticised for environmental issues, such as greenhouse gas emissions and global warming, since it accounts for 19% of the total carbon emissions in Australia (Climate Council, 2018). The sector has also been criticised for social issues related to the health, safety, diversity and exploitation of workers (Standards, 2018) Thus, research on the sustainability disclosure practices of logistics firms in Australia would enable these firms to understand their sustainability priorities in greater detail and to develop strategies to improve both sustainability performance and reporting quality.

Another stream of the extant literature has focused on investigating the relationship between firms' sustainability disclosure and financial performance. Although several studies have investigated this relationship, it remains unclear (Sampong *et al.*, 2018; Buallay, 2019; Hussain *et al.*, 2018) and hence requires further research. In addition, no study has related the extent of sustainability disclosure with the actual financial performance of logistics firms. Given that sustainability disclosure requires a significant amount of resource allocation, the lack of clarity on the relationship between sustainability disclosure and financial performance may contribute to the logistics sector's reluctance to disclose their sustainability performance. Therefore, this study has two purposes. The first is to explore the sustainability disclosure practices of logistics firms in Australia. The second is to relate the extent of their environmental and social sustainability disclosure with their actual financial performance. Accordingly, the central research questions are as follows:

RQ1. What type of sustainability issues/indicators does the Australian logistics sector currently disclose?

RQ2. How does its extent of environmental and social sustainability disclosure relate to the financial performance of logistics firms operating in Australia?

To answer the research questions, we performed a content analysis to ascertain the sustainability disclosure of environmental and social practices of the top 10 logistics firms in Australia. Then, we employed the disclosure–performance analysis (DPA) matrix to relate the extent of environmental and social sustainability disclosure of these firms with their actual financial performance. We measured financial performance using the return on assets

(ROA) and the total revenue growth. This study did not focus on the economic sustainability disclosure due to the ambiguous nature of its operational definition which is further explained under the literature review section.

Thus, this study contributes to the literature on logistics sustainability in two ways. First, it attempts to identify the pattern, materiality and extent of the sustainability disclosure practices of the Australian logistics sector. Second, to the best of our knowledge, this study is the first to explore the relationship between the extent of environmental and social sustainability disclosure and the actual financial performance of the logistics firms using the DPA matrix in the Australian context.

The remainder of the paper is organised as follows. Section 2 discusses the context of the study. Section 3 provides a brief review of the sustainability reporting literature. Section 4 discusses the methodology and briefly describes the top 10 logistics firms in Australia. Section 5 provides the results of the analysis of the sustainability reports of the selected firms, and Section 6 discusses the key findings. Section 7 concludes the paper by presenting this study's implications and recommendations and outlining future research directions.

2. Australian logistics sector

As an island, Australia is at the end of supply chain networks and is a net importer country (Rogers and Park, 2018). The Australian logistics sector brings high-quality and low-cost products to the doorsteps of over 25 million Australian consumers, and these products are distributed over an area of 7.68 million km^2 (ABS, 2021). The sector has also played a significant role during the COVID-19 outbreak by ensuring continuous, quick product delivery, regardless of the issues of supply chain disruptions and border closure. Owing to its importance, the government plans to invest AU$110 billion in the country's transport infrastructure (ITRDC, 2021). Australia's logistics sector accounted for 8.6% of its gross domestic product with an annual revenue of AU$102 billion in 2018, which is expected to reach $187 billion by 2021 (Standards, 2018). The sector provides transport, storage and distribution services to the Australian mining, manufacturing, construction, wholesaler and retailer sectors (ALC, 2020). The logistics sector moves more than 738 billion tonne-kilometres (tkm) of freight across Australia per year and is expected to grow by 26% by 2030. Rail freight transportation contributes 50.3% of the total movement followed by road (30.4%), water (14.5%), pipeline (4.7%) and air freight transport (0.1%) (NTC, 2016). Automation, sustainability, traceability, safety and the regulatory environment are considered the most critical challenges for the Australian logistics sector (Standards, 2018). As the second-highest emitter in Australia, the sector consumed 36,957 kt of energy and emitted 99,882 kt of Co_2 in 2014, which is expected to increase by 25% by 2030. Along with these issues, gender diversity and occupational health and safety (OH&S) have emerged as critical issues for this sector to overcome. The fatality rate of the sector is 5.9 (per 10,000 workers) which is significantly greater than the corresponding rates for the construction (2.0), mining (3.7) and manufacturing (1.4) sectors (Safe Work Australia, 2020). Therefore, in this study, we investigate the sustainability practices of the top logistics firms in Australia to understand their priorities for sustainable development and develop strategies to improve their sustainability reporting practices.

3. Literature review

3.1 Sustainability reporting and sustainability disclosure theory

Sustainability is a highly value-laden concept, which is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (Brundtland, 1987, p. 37). At a broader level, it focuses on three dimensions: environmental, economic and social (Elkington, 1998). In the context of the logistics sector, sustainability has

been interpreted in various ways. For example, Poist (1989) suggested that logistics sustainability should include dimensions such as employee training, philanthropy, environment, urban renewables, workplace diversity, OH&S and community issues. Carter and Jennings (2002) proposed a logistics sustainability framework focussing on environment, ethics, diversity, working conditions and human rights. In contrast, Nikolaou *et al.* (2013) developed a conceptual model for the logistics sector based on the triple bottom line approach. Despite the different definitions of sustainability within the logistics sector, achieving environmental, social and economic goals by integrating all business activities based on stakeholder requirements remains the ultimate goal of logistics sustainability (Carter and Rogers, 2008).

In this regard, firms are mainly driven by their stakeholders, such as governments, customers and employees, to implement sustainability practices (Jamali, 2008; Shumon *et al.*, 2019). Roca and Searcy (2012) suggested that a firm's sustainability approach should be grounded in open, honest communication with its stakeholders. Sustainability reporting could be an effective practice to communicate the firm's sustainability performance to a wide range of stakeholders (Higgins and Coffey, 2016). Daub (2007) defined a sustainability report as a report that "must contain qualitative and quantitative information on the extent to which the firm has managed to improve its economic, environmental, social effectiveness and efficiency in the reporting period and integrate these aspects in a sustainability management system" (p. 76). Sustainability reporting enables firms to assess and disclose their sustainability performance, engage their stakeholders in decision-making and enhance both firm image and financial performance (Higgins and Coffey, 2016).

Stakeholder theory (Freeman, 1999), legitimacy theory (Suchman, 1995) and institutional theory (DiMaggio and Powell, 1983) remain popular theoretical bases to explore the notion of sustainability disclosure, including its pattern, importance and materiality. According to stakeholder theory, firms should report on a variety of sustainability issues to meet their stakeholder expectations (Hörisch *et al.*, 2014). From the perspective of institutional theory; coercive, mimetic and normative social pressures may influence firms to adopt sustainability goals and disclose their sustainability performance, whereas according to legitimacy theory, firms could build legitimacy by disclosing their sustainability performance (Guthrie and Parker, 1989). In comparison, stakeholder theory remains the best approach to explore sustainability disclosure because it is more focused on individual behavioural perspectives than on organisational and strategic perspectives (Saenz *et al.*, 2015).

3.2 Global reporting initiatives framework

Several international frameworks, such as the Global Compact of the United Nations, the Green Paper of the European Commission and Business Impact Review Group and the GRI, are available for firms to disclose their sustainability performance (Siew, 2015). Among these, the GRI framework is the most widely used (Karaman *et al.*, 2020). It was first published in 2000 to support firms on their environmental, social and economic reporting. The GRI continuously updates its reporting framework and has published five versions to date: G2 in 2002, G3 in 2006, G3.1 in 2011, G4 in 2013 and GRI Standards in 2016. The G4 version remains a popular framework and has been employed by a vast majority of firms. The G4 version is universally applicable for all types of logistics firms worldwide (GRI, 2018). Hence, as a conceptual framework, this study employed the G4 version rather than the GRI Standards because the Standards have been mandatory only since July 2018, and most firms are yet to adopt it. The GRI-G4 framework includes two types of standard disclosures as shown in Figure 1: general disclosure and specific standard disclosure. General disclosure comprises seven aspects: strategy and analysis, organisational profile, identified materials and boundaries, stakeholder engagement, report profile, governance and ethics and integrity. This section of the GRI-G4 consists of 58 indicators. The specific standard disclosure section is divided into two sections: management approach and performance indicators. The management approach section

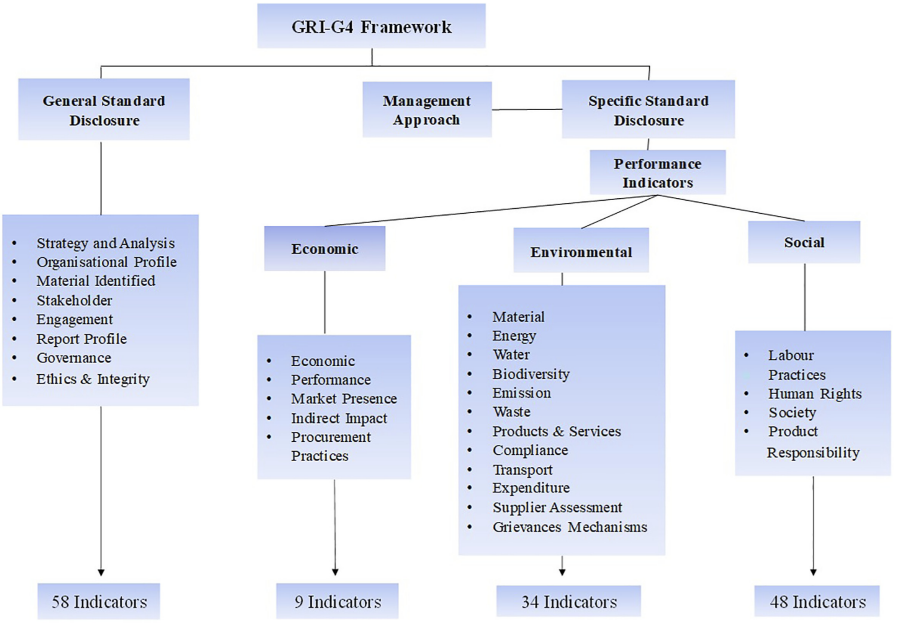

Figure 1.
GRI-G4 framework

Note(s): In this study only the Environmental and Social performance indicators were analysed

provides the context for the selection of particular sustainability indicators, whereas the performance indicators section has 91 indicators related to the firm's economic (9 indicators), environmental (34 indicators) and social (48 indicators) sustainability performance (GRI, 2018). This study explores the scope, materiality and extent of environmental and social sustainability disclosure only. This study did not consider the economic aspect of sustainability disclosure for two important reasons. First, according to the GRI, economic sustainability refers to a firm's ability to impact the economic conditions of its stakeholders and the local, national and global economic systems (GRI, 2018). However, the GRI has incorporated the indicator on "financial implications and other risks and opportunities due to climate change" in its economic section. This indicator is related to climate change, which is the part of environmental sustainability. Second, the GRI has also incorporated "anti-competitive behaviour" and "anti-corruption" indicators as the part of economic sustainability. However, these indicators used to be a part of social sustainability of the GRI framework which makes the definition of economic sustainability ambiguous. Therefore, this study did not consider the economic sustainability disclosure of the GRI framework.

3.3 The state of literature based on the Global Reporting Initiatives framework

Several studies have used GRI data and have focused on identifying the most popular indicators for GRI reporting across a range of industries. One stream of literature has focused on exploring the sustainability practices of the manufacturing and mining sectors. For example, Chen *et al.* (2015) analysed the sustainability reports of 75 global manufacturing firms against the GRI 3.1 framework and found that most firms have mainly disclosed social issues, such as employment, OH&S, human rights, corruption and product responsibility. A study conducted by Mani *et al.* (2018) also reported similar findings. In contrast to these

findings, Singh *et al.* (2021) found the lowest disclosure on human rights and product responsibility issues in the context of the Indian manufacturing sector. However, these studies focused on the social aspects of sustainability practices only. Arthur *et al.* (2017) investigated 50 sustainability reports of 10 large mining firms in Ghana and found the highest disclosure on the economic category of the GRI.

Another stream of research has focused on exploring the sustainability disclosure practices of public sector firms. For example, Guthrie and Farneti (2008) analysed the GRI reports of seven Australian public firms and found that they disclosed only 32% of the GRI indicators. Skouloudis and Evangelinos (2009) examined the sustainability disclosure practices of 16 large Greece firms and found that energy, water consumption, emission and energy initiatives, net sales and the costs of purchased goods, materials and benefits were the most commonly reported indicators. Dissanayake *et al.* (2016) analysed the sustainability reports of publicly listed firms in Sri Lanka and found that most firms had focused on social indicators and had mostly ignored environmental indicators. Notably, these studies explored the reporting practices of publicly listed firms, their sample did not include logistics firms.

Several studies have gone beyond exploring sustainability disclosure practices of firms and investigated the effect of GRI based sustainability disclosure reporting on the performance of firms. As shown in Table 1, studies have identified the positive effect of sustainability disclosure on financial performance (Yang *et al.*, 2021; Chen *et al.*, 2015).

Study	Research focus	Industry	Findings
Yang *et al.* (2021)	Investigated the relationship between GRI reporting and firm performance	122 publicly listed firms in China	The GRI sustainability reporting significantly increases firm profitability
Belkhir *et al.* (2017)	Explored the relationship between the GRI reporting and environmental sustainability performance	40 firms listed on the GRI database	Did not find any correlation between the GRI reporting and sustainability performance improvement
Mukherjee and Nuñez (2019)	Examined the relationship between GRI reporting level and financial performance for firms with different levels of environmental risk	173 USA firms listed on the GRI database	Found an insignificant relationship found between GRI reporting and financial performance at an aggregate level
Chen *et al.* (2015)	Investigated the relationship between corporate social performance and financial performance	75 manufacturing firms listed on the GRI database	the GRI categories of Human Rights, Society and Product responsibility have a significant and positive correlation with the return on equity
Hussain *et al.* (2018)	Investigate the relationship between sustainability reporting and financial performance	100 best performing US organisations	Sustainability reporting does not affect financial performance
Laskar and Maji (2018)	Investigated the relationship between sustainability reporting and organisation performance	111 Asian organisations (Japan, India Indonesia and South Korea)	A positive relationship between sustainability reporting and organisation performance
Loh *et al.* (2017)	Investigated the relationship between sustainability reporting and organisation value	Organisations listed on Singapore Stock Exchange	A positive relationship between sustainability reporting and organisation value
Qureshi *et al.* (2020)	Investigated the impact of sustainability reporting and organisation value	812 European listed organisations	Identified a positive association between sustainability reporting and organisation value

Table 1.
The relationship between sustainability disclosure and firm performance

However, some studies have also identified no relationship (Belkhir *et al.*, 2017; Mukherjee and Nuñez, 2019) between sustainability disclosure and financial performance. Thereby making this relationship unclear and inconclusive. The possible reason for such a relationship could be the improper selection of sustainability disclosure measures and financial performance indicators and the content analysis approach adopted to code the sustainability report.

The extant literature indicates the diversity among industries in the selection of sustainability indicators. Specifically, high environmentally sensitive sectors, such as manufacturing and mining, tend to disclose a higher level of sustainability reports. The logistics sector is also considered a highly environmentally sensitive sector (Karaman *et al.*, 2020). However, its sustainability reporting practices remained an ignored research area. The literature has commenced exploring the sustainability practices of logistics firms only recently. For example, Piecyk and Björklund (2015) examined the sustainability reports of 43 international logistics service providers against the GRI-G3 and found emission, energy consumption, employee practices and decent work, training and education and OH&S to be the most disclosed sustainability indicators. Further, Lambrechts *et al.* (2019) explored the sustainability reports of 52 global logistics firms against the GRI-G4, and their findings support those of Piecyk and Björklund (2015). Herold (2018) examined carbon disclosure practices of 39 leading global logistics firms and found that these firms have implemented more internal and external carbon management practices in 2015 as compared to 2012.

These studies have several limitations. First, they have concentrated on firms from the American, European and Asian regions, and thus, studies on the Oceania region, and in particular, on the Australian logistics sector are limited. Among these, although Lambrechts *et al.* (2019) focused on the Oceania region, their sample included only two Australian logistics firms. Second, these studies mainly focused on identifying the presence of the GRI indicators in the disclosed reports. However, merely identifying the indicators disclosed in sustainability reports may not encourage logistics firms to transition towards a higher level of sustainability reporting. Logistics firms should be guided on whether their level of sustainability disclosure is associated with their actual financial performance to motivate them towards achieving a higher level of sustainability. Several studies have investigated the relationship between green logistics practices and supply chain sustainability and financial performance. However, these studies have identified either positive, negative or no relationships between green logistics practices and supply chain sustainability and financial performance (shown in Table 2). Nevertheless, no study has investigated the relationship between the extent of sustainability disclosure and financial performance in the logistics industry context. Third, although the relationship between the extent of sustainability disclosure and financial performance has been examined in other industry sectors, such as manufacturing and mining, for example, by Sampong *et al.* (2018), Buallay (2019) and Hussain *et al.* (2018), the relationship remains unclear and most importantly, their findings cannot be generalised to the logistics sector. This lack of generalisability is because the logistics sector is a geographically mobile sector involving an unusually large range of stakeholders, including governments, suppliers, society and end-users, which creates a sustainability governance context that differs from that of most industries. Thus, this study aims to address these gaps in the literature by assessing the sustainability disclosures of top 10 logistics firms in Australia and relating these disclosures to the firms' actual financial performance.

4. Methodology

Following Eisenhardt's (1989) approach of conducting a two-step analysis, initially using the GRI-G4 framework we analysed data from the reports of the case firms and then cross-case

Study	Objective	Data collection method	Findings
Yu *et al.* (2021)	Explored the impact of green supply chain management on financial performance	Survey of 308 Chinese manufacturing firms	Found that supplier green management, internal green management, and customer green management positively affect financial performance
Pan *et al.* (2020)	Explored the effect of GSCM practices on manufacturing enterprise performance	Survey of 162 Chinese manufacturing firms	Found that internal environmental management, environmental cooperation and customer collaboration positively affect environmental and economic performance
Agyabeng-Mensah *et al.* (2020)	Explored the impact of GSCM practices on firm performance	A survey of 140 manufacturing firms in Ghana	GSCM practices positively affect firm performance
Mani *et al.* (2020)	Investigated the relationship between social supply chain sustainability practices and firm performance	Survey of Indian manufacturing firms	Found that social sustainability practices positively affect supply chain performance, supplier performance and operational performance
Abbas and Hussien (2021)	Investigated the effect of GSCM practices on firm performance	Survey of international quick-service restaurants	Found that green food dimension negatively affects operational performance
Laari *et al.* (2018)	Investigated the relationship between GSCM practices and firm performance	Using data of 266 Finish logistics service providers	GSCM practices positively affect environmental performance, however, insignificantly affect financial performance
Esfahbodi *et al.* (2016)	Investigated the effect of GSCM practices, sustainability procurement, sustainable distribution, sustainable design, and investment recovery on cost performance	Survey of 128 manufacturing firms in China and Iran	Found an adverse effect of sustainability design on cost performance
Kim and Rhee (2012)	Explored the relationship between green SCS and financial performance	Survey of Korean manufacturing firms	Found the negative effect of green SCS on financial performance
Green *et al.* (2012)	Investigated the effect of GSCM practices; environmental management, green information systems, green purchasing, eco-design, and cooperation with customers on firm performance	Survey of US manufacturing firms	Found a negative influence of eco-design on economic performance
Almajali (2021)	Explored the effect of green supply chain practices on firm performance	A survey of 120 Jordanian firms	Found that green supply chain practices do not affect firm performance
Sahoo and Vijayvargy (2020)	Investigated the relationship between GSCM practices and organisational performance	A survey of 160 Indian manufacturing firms	Investment recovery does not affect operational and economic performance
Pinto (2020)	Explored the relationship between green supply chain practices and firm performance	Semi-structured interviews	Found insignificant relationship between green supply chain practices and firm performance

Table 2.
The relationship between green logistics practices and firm performance

patterns were investigated inductively in the second step for in-depth investigation of the relationships among concepts. As this study is a theory elaborating research, hence it does not predict the empirical findings by making *a priori* propositions, rather develops propositions based on the findings (Ketokivi and Choi, 2014).

4.1 Sample

We obtained the initial list of sample firms from the Australian Logistics Council (ALC, 2020). Our search found only 20 firms who have disclosed their sustainability performance as a part of their annual reports or as sustainability reports. We further refined this list and selected the sample of this study using three criteria:

(1) They have the highest marketing revenues in Australia in 2017.

(2) They had published sustainability reports for the past three consecutive reports during 2015–2017, either as standalone sustainability reports or as a part of their annual reports: and

(3) Their financial measures such as ROA (return on asset) and total revenue growth ratios are publicly available. A flow diagram showing the process employed to select firms is shown in Figure 2.

The selection process allowed us to choose 10 logistics firms in Australia as the cases for this study. Eisenhardt (1989) suggested that including 4–10 cases in case study research "usually works well", given that a study with less than four cases cannot capture real-world complexity and an analysis of more than 10 cases can be difficult to interpret (p. 15). Moreover, Rowley (2002) suggested using 6 to 10 cases in case study research. Although a single case study provides considerable in-depth observation, this approach has several limitations related to the generalisability of the results and the risk of misjudgement (Voss *et al.*, 2002). In line with these suggestions, a sample of 10 cases justifies from the case selective perspective.

The demographics of the selected firms are given in Table 3. To maintain the anonymity of the respondents, the firms included in this study are identified with letter A to letter J. These 10 firms account for nearly 50% of the total market share of the Australian logistics sector. Firm A, C, D, E, G and H are Australian-owned firms, whereas, Firm B, F, I and J are multinational firms. Firm B and G are leader in the road freight transport, which occupies total market share of 8.3 and 4% respectively. Firm E is the leader in the rail freight transport,

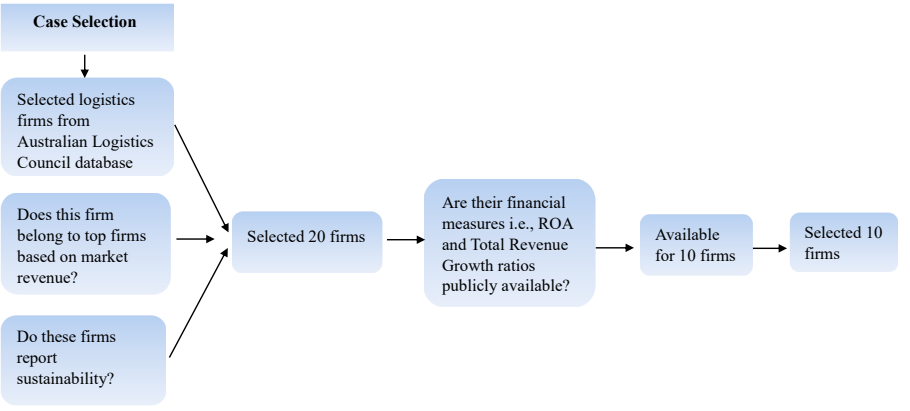

Figure 2.
Case selection flow diagram

Rank	Firm name	Revenue (2017) Billion AUD	Ownership type	No. of employees	Brief description of firms	GRI applicability
1	Firm A	55.77	Australian	29,000	A top ASX listed, Anglo-Australian multinational firm, is a leading supplier of metal and mineral, with headquarters located in the UK and Australia. With more than 29,000 employees, the firm operates in 35 countries. This firm is a wholly subsidiary of Firm A Group, which provides ocean freight services to the Firm A Group. The firm moves a broad range of commodities including iron ore, coal, bauxite, industrial minerals, aluminium, and metal. The firm has collaborated with two major mining firms in Australia to improve maritime safety and environmental standards. The firm has also demonstrated its commitment to UN Guiding Principles on Business and Human rights and set expectations for its suppliers related to working conditions and working rights of their employees. The firm transacted 153,000 thousand tons of iron, 34,500 thousand tons of bauxite, 4,000 thousand tons of Aluminium and 1,000 thousand tons of copper in 2018	GRI
2	Firm B	7.97	Multinational	19,815	A multinational logistics firm is a leading provider of integrated logistics, with headquarters located in Melbourne. The firm employs 19,815 employees and operates with 1,200 sites in +55 countries and primarily serves major industries such as automotive, beverage, food, retail, and resources. The firm transacted 542,000 Twenty-Foot Equivalent (TUS's) of ocean freight and 114,000 tons of air freight volume in 2014. The firm has more than 19,000 logistics vehicles and 13,000 units of containers, ships and vessels for their operating business	Non-GRI

(*continued*)

Table 3.
Top 10 logistics firms in Australia and their business profile

Rank	Firm name	Revenue (2017) Billion AUD	Ownership type	No. of employees	Brief description of firms	GRI applicability
3	Firm C	6.80	Australian	50,000	An ASX listed, Australian owned firm, with headquarters in Melbourne is a leading provider of mail and parcel services. With more than 50,000 employees, the firm provides postal, retail, financial, insurance, and travel services. The firms delivered 3.3 billion items through its 12.1 million delivery points in 2019. The firm has 2,800 electric bikes, 6,225 motorbikes and 4,850 vans and trucks to deliver parcels across Australia	GRI
4	Firm D	6.80	Australian	14,000	An ASX listed, Australian owned firm, is a leading provider of supply chain logistics solutions across Australia and other 60 countries. With more than 14,000 employees, the firm primarily serves the fast-moving consumer goods, beverage, retail and general manufacturing industries with its two business divisions. The firm owns 300 millions of pallets, crates and containers for its operations	GRI
5	Firm E	6.31	Australian	5,600	An ASX listed, Australian owned firms, provides rail-based transport and infrastructure services across Australia and offers haulage services to the mineral, industrial and agricultural industries. The firm's headquarters is located in Queensland and employs 5,600 people for its logistics operations. The firm annually transports 200 million tonnes of coals and 60 million tonnes of iron ore and other bulk commodities across Australia	GRI
6	Firm F	2.14	Multinational	7,000	An ASX listed, a multinational firm, provides supply chain, logistics, warehousing, and logistics services to bulk material industries, with its headquarters located in New Zealand. The firm employs more than 7,000 people for its three primary business divisions: Transport, Air and Ocean, and Warehousing and Distribution	Non-GRI

Table 3. (*continued*)

Rank	Firm name	Revenue (2017) Billion AUD	Ownership type	No. of employees	Brief description of firms	GRI applicability
7	Firm G	1.81	Australian	27,500	An Australian owned logistics firm is based in Melbourne. With more than 27,500 employees, the firm provides supply chain solutions to firms in 10 countries including Australia. The firm provides a range of supply chain services including warehousing, distribution, transportation and logistics. The firm has a network of more than 200 warehouses in Australia and operates using more 5,000 logistics vehicles	Non-GRI
8	Firm H	1.53	Australian	4,665	An ASX listed Australian owned firm, provides supply chain solutions to bulk material industries, with headquarter located in Sydney, Australia. The firm employs 4,665 employees and operates through its three main divisions. The firm operates more than 900 prime movers and an extensive range of trailers across Australia	Non-GRI
9	Firm I	1.27	Multinational	4,435	An ASX listed multinational firm, provides international courier and mail services, with headquarters located in the Netherlands. The firm employs more than 4,435 people. And service includes express, air freight, sea freight and customised pick-up and delivery options	GRI
10	Firm J	1.27	Multinational	3,350	An ASX listed multinational firm, provides international couriers, parcels and express mail services, with headquarters in Bonn, Germany. With more than 3,515 people, the firm provides tracking, shipping, freight transportation, warehouse and distribution across Australia. The firm delivers more than 160 million parcels per year	GRI

Table 3.

which occupies 40% of the total share of the rail freight transport. To assess the sustainability reporting of the sample firms and to identify topics of relevance, we considered sustainability reports published between the period of 2013 and 2017. Few firms have published multiple sustainability (i.e. over different years). Thus, we considered only the most recent reports. Sustainability reports were retrieved from the GRI database and the corporate websites of these firms.

The trustworthiness of the study was ensured using data triangulation, intercoder agreement (member check) and purposive and theoretical sampling techniques (Touboulic

et al., 2014; Shah and Corley, 2006). The validity of the study was achieved using the data triangulation technique. We collected the required data from the sustainability reports of the selected firms and also examined the corporate websites and the annual reports of these firms to ensure the data were valid (Leonard-Barton, 1990). We used two techniques to achieve reliability and the validity of the study. First, we selected the top 10 firms within the same industry as the cases for this study, which is in line with the purposive and theoretical sampling approaches of the case study methodology (Eisenhardt, 1989). The study's reliability was further confirmed by involving several researchers, who examined all the formal content analysis steps (Duriau *et al.*, 2007). For reliability, a study must have at least two researchers, which is the minimum realistic requirement (Matthes and Kohring, 2008). To ensure the reliability of the extracted data, first, the first author examined the coding process, and then, the second and third authors double-checked it using the same process. Following this preliminary coding exercise, we compared coding categorisations and noted disagreements. Then, we discussed these disagreements with reference to the existing literature. Subsequently, we resolved the intercoder reliability issue through consensus by referring back to the codes in question and including them in the final coding (Huberman and Miles, 1994). We also protected the confidentiality of the selected logistics firms to ensure the reliability and validity of the study. Methods and steps implemented to ensure trustworthiness of the research process in provided in Table 4.

4.2 Content analysis

We used the content analysis method to ascertain whether the reports included any sustainability indicators and, if they did, the extent of sustainability indicators disclosed. One systematic technique is to find specific information from sustainability reports and convert it into a few categories based on the coding scheme. The content analysis comprised two steps — coding scheme development and data coding (Krippendorff, 1989)—which are discussed next.

4.2.1 Coding scheme development. Following Chen *et al.* (2015)'s procedure, we used a 5-point Likert scale to examine the extent of sustainability indicators disclosed in the sustainability reports of these firms, with 1 representing no disclosure, 3 representing partial disclosure and 5 representing full disclosure of a particular sustainability indicator against the criteria given by the GRI for its indicators. For example, the G4-EN 3 indicator of the GRI G4 framework asks firms to report on their energy consumption. If a particular firm, did not provide any information, we assigned a score of 1. If that firm has reported only their energy consumption from non-renewable sources and failed to report energy consumption from renewable sources in joules and standards, methodologies used for calculations, we assigned a score of 3. If that firm fully reported on that indicator, including all its total energy consumption from both renewable and non-renewable sources in joules including fuel types, and standards, methodologies used for calculations and source of the conversion factors used, we assigned a score of 5. Then, we summed the data scores for each indicator item to produce a mean index for environmental and social sustainability disclosure, which we used for the DPA. This coding approach also enabled us to identify the presence or absence of pre-specified sustainability indicators disclosed in the sustainability report. It also enabled us to identify the specific sustainability indicators reported which are not defined by the GRI-G4 framework. The evaluation of the selected firms' (mean and standard deviation) sustainability reports against the GRI-G4 framework is summarised in Table 3.

4.2.2 Data coding. Our coding of the sustainability reports took eight weeks. All three authors performed the content analysis since it is a subjective process. Human coders were considered desirable for the study since they can assess the presence as well as the extent of specific sustainability indicators disclosed in the reports (Chen *et al.*, 2015). The authors were provided with a consistent valid coding scheme to ensure the validity of content analysis (Potter and Levine-Donnerstein, 1999).

Research phases Criteria	Design	Case selection	Data collection	Content analysis
Credibility	Selected the GRI-G4 as the theoretical framework to analyse sustainability reports Adopted the environmental and social sustainability constructs identified in the extant literature	Selected top firms on the Australian Logistics Council Database	Validated data using the data triangulation process Checked reporting data with firms' annual reports and websites	Selected multiple (three authors) coders for coding sustainability reports
Transferability	Selected top Australian logistics firms which have the highest marketing revenue	A detailed description of the sample firms while maintaining their confidentiality	Detailed notes of sustainability aspects, indicators and themes included in sustainability reports	Developed a consistent coding scheme to code the sustainability reports
Dependability	Case study protocol	The sample frame was selected using the theoretical and purposive sampling approach	Maintained confidentiality of the sample firms	Achieved intercoder agreement*
Confirmability	Case study protocol	Carefully selected logistics firms who have disclosed their consecutive sustainability reports	Secured recorded and stored data Digital recordings	Data audited for bias and distortion Validated data using the data triangulation process

Note(s): *Three authors analysed sustainability reports of the sample frame using a developed consistent coding scheme and compared their respective coding sheets to increase intercoder reliability, which was 75%, and met the acceptable level of agreement as suggested by Carey *et al.* (1996). The authors discussed the coding and achieved the 100% agreement

Source(s): Touboulic *et al.* (2014) and Shah and Corley (2006)

Table 4.
Methods to ensure trustworthiness of the research process

4.3 Financial performance measures

The ROA and the total revenue growth of the 10 firms were used to measure their financial performance as these measures are commonly used with the measures of sustainability (Feng and Wang, 2016; Panwar *et al.*, 2017). ROA reflects the profitability of a firm relative to its total assets (Panwar *et al.*, 2017). Total revenue growth reveals the change in revenue growth of a firm over a specific time (Feng and Wang, 2016). We collected data for these measures for the 2018 financial year from the IBISWorld database to avoid the possibility of reverse causality (Leszczensky and Wolbring, 2022).

5. Results and analysis

5.1 Content analysis of sustainability reports

5.1.1 Types of reports. The results indicated that four out of the 10 logistics firms have published their GRI-G4 reports, whereas two firms followed the G4 guidelines and the other firms published sustainability reports without following any guidelines. Despite the demanding nature of the GRI framework, Firms A, D and J provided reports that were

comprehensive. Firms C, E and I have disclosed a reasonable level of sustainability performance using the GRI framework. However, other firms that do not follow any reporting guidelines, that is, the "non-GRI firms", have relatively lower level of sustainability disclosure. Figure 3 shows the extent of sustainability disclosure of the GRI and non-GRI logistics firms operating in Australia. The ratings for the extent of sustainability disclosure varies between 1.2 (Firm G) and 4 (Firm D) on a scale of 1–5. It demonstrates that the ratings of GRI firms are well above the overall mean rating (2.2) of the extent of sustainability disclosure. However, the ratings of non-GRI firms are less than the overall mean rating. This indicates that firms following the GRI guidelines provide extensive sustainability reports than the non-GRI firms. Two different subgroups; Australian-owned firms and multinational firms can be derived from the analysis. The results indicate Australian-owned firms (mean for six firms = 2.42) have the rating greater than the overall mean of the extent of sustainability disclosure. On other hand, multinational firms (mean for four firms = 1.87) have the rating less than the overall mean rating. Only one multinational firm, i.e. Firm J (mean = 2.7) has a rating greater than the overall mean of the extent of sustainability disclosure.

5.1.2 Benchmark results for environmental sustainability indicators. There are 34 indicators and 12 categories in the environmental section of the GRI-G4 framework. The mean ratings and standard deviations of these indicators and categories are given in Table 5. The overall mean rating for all the indicators of environmental sustainability disclosure is 2.55, which is higher than the overall meaning of sustainability disclosure (mean = 2.2). Emission (mean = 3.3) and energy (mean = 3.2) were the commonly addressed categories, as shown in Figure 4. Then it is followed by the overall expenditure (mean = 2.6) and transport emission (mean = 2.4) categories. At the indicator level, indicators EN3 (mean = 3.6), EN4 (mean = 3.6), EN15 (mean = 4.2), EN16 (mean = 4.2), EN17 (mean = 3.4) and EN19 (mean = 3.4) are the extensively reported indicators. However, other core environmental categories such as material (mean = 2.2), water (mean = 2.1), biodiversity (mean = 2.25) and waste (mean = 2) are least reported. The analysis results also revealed that Firm D has taken significant efforts for supplier environmental sustainability. It has extensively reported on the EN32 (mean = 5) and EN 33 (mean = 5), followed by Firm J (EN32 (mean = 5) and EN33

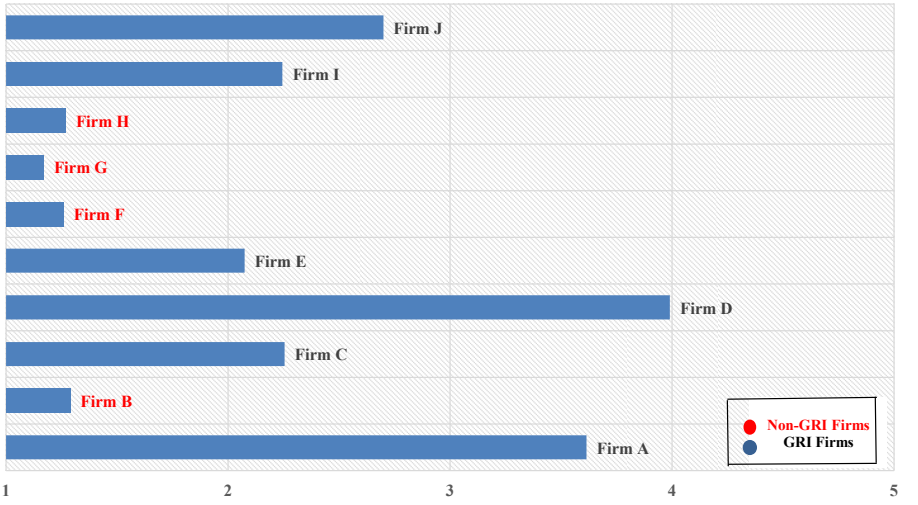

Figure 3.
The extent of sustainability disclosure of the GRI and non-GRI logistics firms as benchmarked against GRI-G4

GRI indicators	Mean	SD
Environmental Sustainability Disclosure	*2.5*	
Materials	*2.2*	*1.8*
G4-EN-1: materials used by weight or volume (renewable and non-renewable)	2.4	1.9
G4-EN-2: percentage of materials used that are recycled input materials	2	1.7
Energy	*3.2*	*1.44*
G4-EN-3: energy consumption within the organisation	3.6	1.35
G4-EN-4: energy consumption outside of the organisation	3.6	1.35
G4-EN-5: energy intensity	2.4	1.90
G4-EN-6: reduction of energy consumption	2.8	1.48
G4-EN-7: reductions in energy requirements of products and services	3.2	1.14
Water	*2.1*	*1.7*
G4-EN-8: total water withdrawal by source	2.4	1.9
G4-EN-9: water sources significantly affected by withdrawal of water	2	1.7
G4-EN-10: percentage and total volume of water recycled and reused	2	1.41
Biodiversity	*2.25*	*1.59*
G4-EN-11: operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside areas	2.6	1.58
G4-EN-12: description of significant impacts of activities, products, and services on biodiversity in protected areas	2.8	1.75
G4-EN-13: habitats protected or restored	2	1.70
G4-EN-14: total number of icon red list species and national conservation list species with habitats in areas affected by operations	1.6	1.35
Emissions	*3.3*	*1.7*
G4-EN-15: direct greenhouse gas (GHG) emissions (scope 1)	4.2	1.4
G4-EN-16: energy indirect greenhouse gas emissions (scope 2)	4.2	1.4
G4-EN-17: other indirect greenhouse gas emissions (scope 3)	3.4	2.07
G4-EN-18: greenhouse gas emissions intensity	2.6	1.84
G4-EN-19: reduction of greenhouse gas emissions	3.6	1.35
G4-EN-20: emissions of ozone-depleting substances	2.6	2.07
G4-EN-21: NOx, SOx, and other significant air emissions	2.4	1.90
Effluents and waste	*2*	*1.37*
G4-EN-22: total water discharge by quality and destination	2.4	1.65
G4-EN-23: total weight of waste by type and disposal method	2.6	1.84
G4-EN-24: total number and volume of significant spills	2.4	1.90
G4-EN-25: weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the base convention *2* annex	1.2	0.63
G4-EN-26: identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected	1.4	0.84
Products and services	*2.4*	*1.65*
G4-EN-27: extent of impact mitigation of environmental impacts of products and services	3	1.89
G4-EN-28: percentage of products sold and their packaging materials that are reclaimed by category	1.8	1.40
Compliance	*2.2*	*1.93*
G4-EN-29: monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws	2.2	1.93
Transport	*2.4*	*1.65*
G4-EN-30: significant environmental impacts of transporting products and other goods and materials for the organisation's operations	2.4	1.65
Overall	*2.6*	1.84
G4-EN-31: total environmental protection expenditures and investments by type	2.6	1.84
Suppliers Environmental Assessment	*2*	*1.62*
G4-EN-32: percentage of new suppliers that were screened using environmental criteria	2.4	1.90
G4-EN-33: significant actual and potential negative environmental impacts in the supply chain and actions taken	1.6	1.35

(*continued*)

Table 5.
Mean values of the extent of environmental and social sustainability indicators

GRI indicators	Mean	SD
Environmental Grievance Mechanism	*2.4*	1.90
G4-EN-34: number of grievances about environmental impacts filed, addressed and resolved through formal grievance mechanisms	2.4	1.90
Category: Social	*2.05*	
Labour Practices and Decent Work	*2.85*	
Employment	*2.6*	*1.56*
G4-LA-1: total number and rates of new employee hires and employee turnover by age group, gender and region	3.8	1.69
G4-LA-2: benefits provided to full-time employees that are not provided to temporary or part-time employees	2.4	1.65
G4-LA-3: return to work and retention rates after parental leave, by gender	1.6	1.34
Labour/Management Relations	*2*	*1.56*
G4-LA-4: minimum notice periods regarding operational changes, including whether these are specified in collective agreements	2	1.56
Occupational Health and Safety	*2.73*	*1.02*
G4-LA-5: percentage of total workforce represented in formal joint management–worker health and safety committees that help monitor and advise on occupational health and safety programs	1.6	0.97
G4-LA-6: type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities	4.8	0.63
G4-LA-7: workers with high incidence or high risk of diseases related to their occupation	3	1.63
G4-LA-8: health and safety topics covered in formal agreements with trade unions	1.5	0.85
Training and Education	*3.07*	*1.48*
G4-LA-9: average hours of training per year per employee by gender, and by employee category	3.4	1.26
G4-LA-10: programs for skills management and lifelong learning that support the continued employability of employees	3.4	1.26
G4-LA-11: percentage of employees receiving regular performance and career development reviews, by gender and by employee category	2.4	1.90
Diversity and Equal Opportunity	*3.6*	*1.35*
G4-LA-12: composition of governance bodies and breakdown of employees per employee category	3.6	1.35
Equal Remuneration for Women and Men	*3*	*1.63*
G4-LA-13: ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation	3	1.63
Suppliers Assessment for Labour Practices	*2.3*	*1.49*
G4-LA-14: percentage of new suppliers that were screened using labour practices criteria	*3.0*	1.35
G4-LA-15: significant actual and potential negative impacts for labour practices in the supply chain and actions taken	1.6	1.49
Labour Practices Grievance Mechanisms	*1.2*	0.63
G4-LA-16: number of grievances about labour practices filed, addressed, and resolved through formal grievance mechanisms	1.2	0.63
Human Rights	*1.85*	
Investment	*1.5*	*0.90*
G4-HR-1: total number and percentage of significant investment agreements and contracts that include human rights clauses	1.6	0.97
G4-HR-2: total hours of employee training on human rights policies or procedures concerning practices of human rights	1.4	0.84
Non-discrimination	*2*	*1.05*
G4-HR-3: total number of incidents of discrimination and corrective actions taken	2	1.05
Freedom of Association and collective bargaining	*2.2*	*1.40*
G4-HR-4: operations and suppliers identified in which the right to exercise freedom of association and collective bargaining	2	1.40

Table 5. (*continued*)

GRI indicators	Mean	SD
Child labour	*2*	*1.05*
G4-HR-5: operations and suppliers identified as having significant risk for incidents of child labour	2	1.05
Forced or compulsory labour	*2.0*	*1.05*
G4-HR-6: operations and suppliers identified as having significant risk for incidents of forced or compulsory labour	2.0	1.05
Security practices	*1.2*	*0.63*
G4-HR-7: percentage of security personnel trained in the organisation's human rights policies or procedures that are relevant to operations	1.2	0.63
Indigenous Rights	*1.8*	*1.69*
G4-HR-8: total number of incidents of violations involving rights of indigenous peoples and actions taken	1.8	1.69
Assessment	*1.2*	*0.63*
G4-HR-9: total number and percentage of operations that have been subject to human rights reviews or impact assessments	1.2	0.63
Supplier Human Right Assessment	*2*	*1.34*
G4-HR-10: percentage of new suppliers that were screened using human rights criteria	2.6	1.84
G4-HR-11: significant actual and potential negative human rights impacts in the supply chain and actions taken	1.4	0.84
Human Rights Grievance Mechanisms	*1.8*	*1.69*
G4-HR-12: number of grievances about human rights impacts filed, addressed and resolved through formal grievance mechanisms	1.8	1.69
Society	*1.95*	
Local Communities	*2.4*	*1.52*
G4-SO-1: percentage of operations with implemented local community engagement, impact assessments, and development programs	2.8	1.99
G4-SO-2: operations with significant actual and potential negative impacts on local communities	2.0	1.05
Anti-corruption	*2.2*	*1.39*
G4-SO-3: total number and percentage of operations assessed for risks related to corruption and the significant risks identified	2.2	1.4
G4-SO-4: communication and training on anti-corruption policies and procedures	2.2	1.4
G4-SO-5: confirmed incidents of corruption and actions taken	2.2	1.4
Public policy	*1.4*	*1.26*
G4-SO-6: total value of political contributions by country and recipient/beneficiary	1.4	1.4
Anti-competitive behaviour	*1.8*	*1.03*
G4-SO-7: total number of legal actions for anti-competitive behaviour, anti-trust and monopoly practices and their outcomes	1.8	1.03
Compliance	*1.2*	*0.63*
G4-SO-8: monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	1.2	0.63
Suppliers Assessment for impacts on society	*2*	*1.34*
G4-SO-9: percentage of new suppliers that were screened using criteria for impacts on society	2.6	1.84
G4-SO-10: significant actual and potential negative impacts on society in the supply chain and actions taken	1.4	0.84
Grievance Mechanisms for Impact on Society	*1.6*	*1.35*
G4-SO-11: number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms	1.6	1.35
Product responsibility	*1.55*	
Customer Health and Safety	*1.5*	*1.31*
G4-PR-1: percentage of significant product and service categories for which health and safety impacts are assessed for improvement	1.6	1.35
G4-PR-2: total number of incidents of non-compliance with regulations and voluntary codes of the health and safety impacts of products	1.4	1.26

(*continued*)

Table 5.

GRI indicators	Mean	SD
Product and Service Labelling	*1.53*	*1.07*
G4-PR-3: type of product and service information required by the organisation's procedures for product and service information and labelling	1.4	1.26
G4-PR-4: total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information	1.0	0.00
G4-PR-5: results of surveys measuring customer satisfaction	2.2	1.93
Marketing Communications	*1.4*	*0.84*
G4-PR-6: sale of banned or disputed products	1.0	0.0
G4-PR-7: total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications	1.4	0.084
Customer Privacy	*1.8*	*1.69*
G4-PR-8: total number of substantiated complaints regarding breaches of customer privacy and losses of customer data	1.8	1.69
Compliance	*1*	0.0
G4-PR-9: monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products	1	0.00

Table 5.

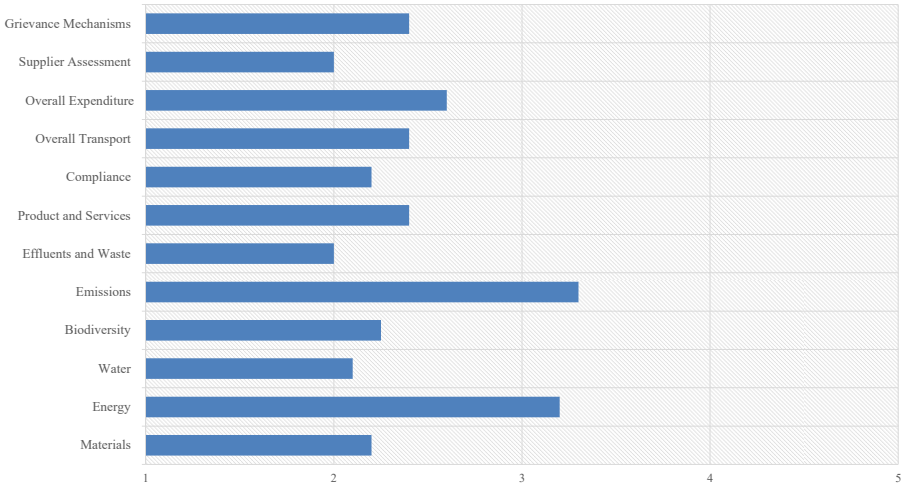

Figure 4.
Extent of environmental sustainability categories as benchmarked against GRI-G4

(mean = 3). However, the remaining firms have provided very generic information on their supplier's code of conduct rather than an assessment of their environmental performance.

5.1.3 Benchmark results for social sustainability indicators. There are 48 indicators, four sub-sections and 30 categories in the social sustainability section of the GRI-G4 framework. The mean ratings and standard deviations of these indicators, sub-sections and categories are given in Table 5. The overall mean rating for all the indicators of social sustainability disclosure is 2.05, which is less than the overall mean of sustainability disclosure (mean = 2.2) and also less than the mid-point (2.5) of the 5-point Likert scale. The extent of sustainability reporting is higher on the labour practices and decent work sub-group (mean = 2.85), followed by the society (mean = 1.95) and human rights (mean = 1.85) sub-groups. However, the extent of reporting is relatively low on the product responsibility (mean = 1.55) sub-group of the GRI-G4 framework. As apparent from Figure 5, the top 5 categories in the social sustainability section are diversity and

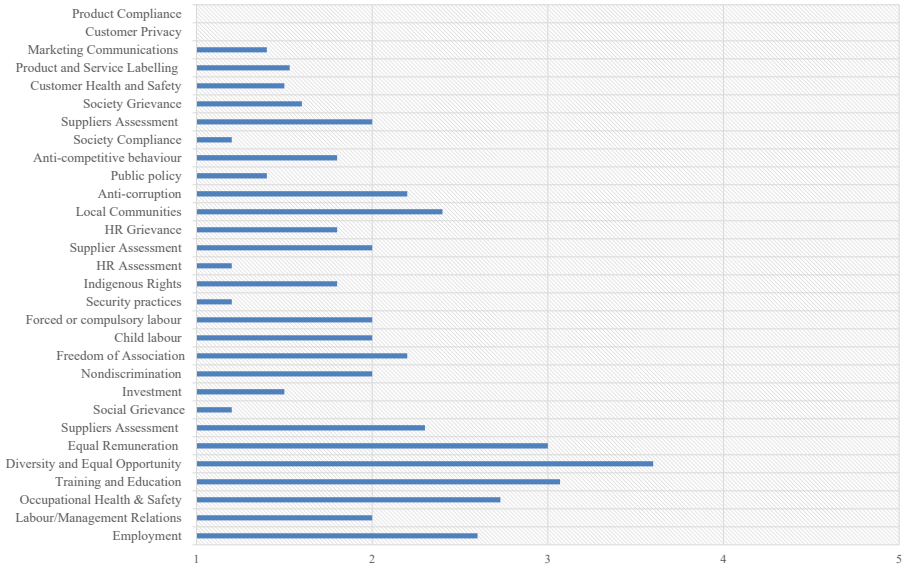

Figure 5.
Extent of social sustainability categories as benchmarked against GRI-G4

equal opportunity (mean = 3.6), equal remuneration (mean = 3.0), training and education (mean = 3.07) and OH&S (mean = 2.73). In the labour practices and decent work sub-group, the extant of reporting is significantly higher on the indicators; LA6 (mean = 4.8), LA9 (3.4), LA10 (mean = 3.4), however, there is relatively a low level of sustainability reporting on the LA5 (mean = 1.2), LA8 (mean = 1.6) and LA16 (mean = 1.2) indicators. Regarding the human rights sub-section, only Firms A, C, D, I and J have discussed the indicators HR3 (mean = 2), HR4 (mean = 2.2), HR5 (mean = 2), HR5 (mean = 2). However, these firms have provided human rights policy statements as a response to these indicators rather than quantitative information. The remained firms, on other hand, have not discussed these indicators nor their human rights policies. Concerning the society sub-section, Firms A, C, D and J have extensively discussed their community investment (SO1 (mean = 2.8) and, anti-corruption policy (SO3 (mean = 2.2). Also, only Firm A has extensively reported the SO6, SO7 and SO8 indicators. However, the remained firms did not report these issues. Regarding the product responsibility category, only Firms C, I and J have reported the customer health and safety category (mean = 2.2); Firms A and J reported on customer privacy (mean = 1.8).

5.2 Disclosure–performance analysis

The DPA matrix was used to relate the extent of environmental and social sustainability disclosure of the logistics firms with their actual financial performance. The *X*-axis of the DPA represents the mean values for the extent of sustainability disclosure from low to high, and the *Y*-axis denotes the financial performance from low to high. Thus, the DPA model is graphically presented as a grid divided into four quadrants. The overall mean values for the extent of environmental and social sustainability disclosure and financial performance measures (ROA and Total Revenue Growth) were used as the dividing points in the DPA analysis to divide the matrix into four quadrants. This influenced the interpretation of the results. The interpretation of the four quadrants is given in Table 6.

Table 6.
Interpretations of the four quadrants of the disclosure–performance analysis (DPA) matrix

Quadrant	Levels of environmental and social sustainability disclosure and financial performance measures	Interpretation
Leaders	High-High	Firms with a higher level of both sustainability have a higher level of financial performance
Opportunists	Low-High	Firms with a low level of sustainability disclosure have a higher level of financial performance
Laggards	Low-Low	Firms with a low level of both sustainability disclosure have a lower level of financial performance
Challengers	High-Low	Firms with a high level of sustainability disclosure have a lower level of financial performance

The DPA matrix which indicates the relationship between environmental sustainability disclosure and ROA (see Figure 6 and Table 7), shows Firms A, C, D, E and J Leaders; Firm B as a Laggard; Firms F, G and H as Opportunists and Firm I as a Challenger.

The DPA matrix indicates the relationship between environmental sustainability disclosure and the total revenue growth (see Figure 7 and Table 7). It appears that Firms C, E and J are Leaders; Firms B, F and H, are Opportunists; Firm G as a Laggard and Firms A, D and I are Challengers.

The DPA matrix indicates the relationship between social sustainability disclosure and ROA (see Figure 8 and Table 7). It appears that Firms A, D and J are Leaders; Firms C, E, F, G and Hare Opportunists; Firm B is a Laggard and Firm I is a Challenger.

The DPA matrix indicates the relationship between social sustainability disclosure and the total revenue growth (see Figure 9 and Table 7). It shows Firm J as a Leader; Firms B, C, E, F and H, as Opportunists; Firm G as a Laggard; and Firms A, D and I as Challengers.

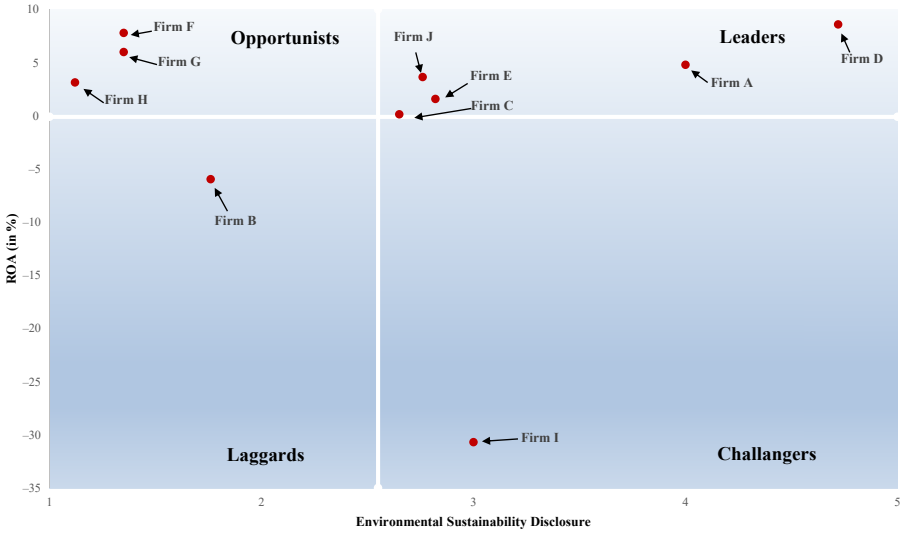

Figure 6.
Environmental sustainability disclosure and ROA of the top logistics firms in Australia

Financial measure	Leaders		Opportunists		Laggards		Challengers	
	Environmental	Social	Environmental	Social	Environmental	Social	Environmental	Social
ROA	Firm A	Firm A	Firm F	Firm C	Firm B	Firm B	Firm I	Firm I
	Firm C	Firm D	Firm H	Firm E				
	Firm D	Firm J	Firm G	Firm F				
	Firm E			Firm G				
	Firm J			Firm H				
Total revenue growth	Firm C	Firm J	Firm B	Firm B	Firm G	Firm G	Firm A	Firm A
	Firm E		Firm F	Firm C			Firm D	Firm D
	Firm J		Firm H	Firm E			Firm I	Firm I
				Firm F				
				Firm H				
Common firms	Firm C, E, J	Firm J	Firm F, H	Firm C, E, F, H			Firm I	Firm I

Table 7.
The relationship between environmental and social sustainability disclosure and financial performance

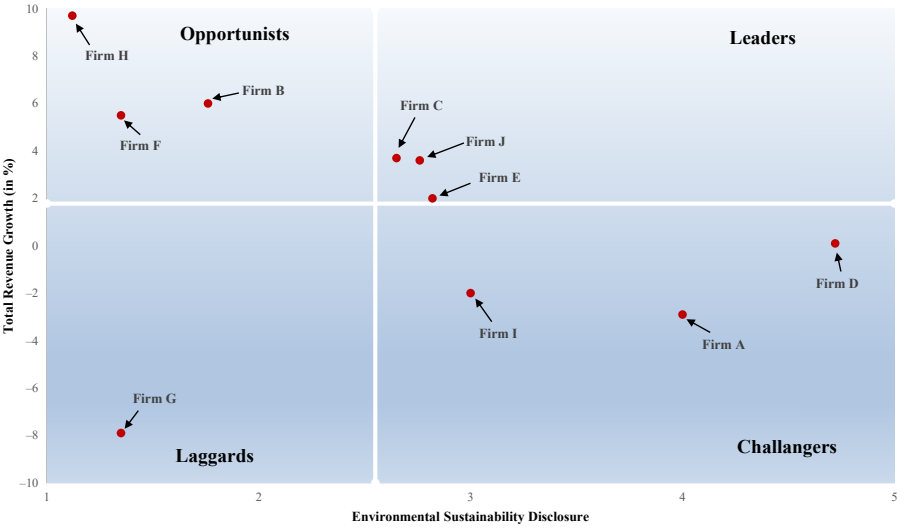

Figure 7.
Environmental sustainability disclosure and total revenue growth of the top 10 logistics firms in Australia

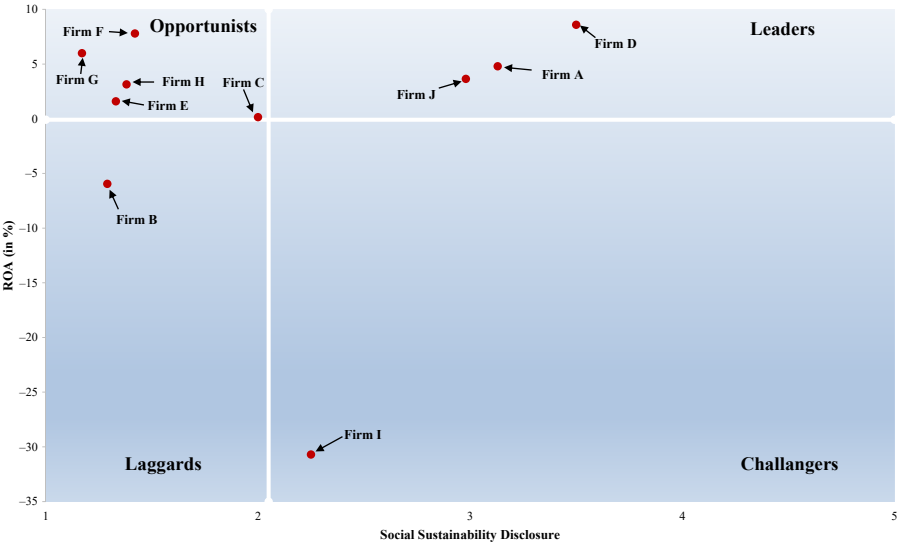

Figure 8.
Social sustainability disclosure and ROA of the top 10 logistics firms in Australia

6. Discussion

6.1 Reasons for diversity in the sustainability disclosure practices of logistics firms

In this study, we assessed the sustainability disclosure practices of the top 10 logistics firms operating in Australia against the GRI-G4 framework. The content analysis indicated that in the environmental category, "energy and emission" were the categories most reported on, whereas categories such as "biodiversity", "compliance", "grievance", "supplier environmental assessment" and "product and responsibility" were the least reported on. In the social category, "health and safety", "training", "employment", "diversity" and "remuneration" are the most disclosed categories. Categories related to product

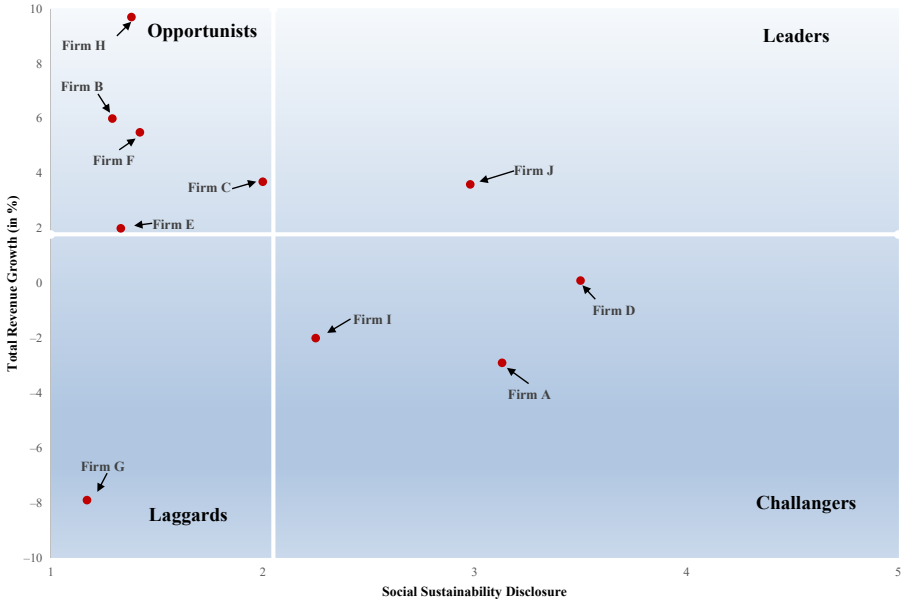

Figure 9.
Social sustainability disclosure and total revenue growth of the top 10 logistics firms in Australia

responsibility, such as "product and service labelling", "customer privacy" and "marketing communications" were least disclosed. Moreover, very few firms reported on "indigenous", "non-discrimination", "social compliance", "social grievance mechanisms", "security practices", "competitive behaviour" and "social supplier assessment" categories.

The diversity in the selection of different sustainability indicators can be explained theoretically using stakeholder theory. Since different logistics firms have different stakeholders, it can be argued that they may have different priorities for those stakeholders. Thus, sustainability reports aimed at these stakeholders would vary in terms of sustainability indicator selection (Roca and Searcy, 2012). Further, this diversity is attributable to the application of the GRI. Because the GRI reports are developed through multiple stakeholder engagements, it is reasonable to assume that stakeholder engagement would have enabled firms to focus on more sustainability indicators. Therefore, the extent of sustainability disclosure of the firms following the GRI framework is significantly greater than that of the non-GRI firms. Thus, it can be argued that the GRI framework influences the materiality and extent of sustainability disclosure. However, it is important to acknowledge that there may be other factors, such as firm size, financial leverage and capability, transparency, visibility and age of the firm, that may influence the extent of sustainability disclosure (Piecyk and Björklund, 2015; Hahn and Kühnen, 2013).

As mentioned earlier that the logistics is among the largest sectors in Australia, but is lagging in sustainability practices, including sustainability reporting. Our analysis results indicated that only six Australian owned logistics firms have published their sustainability reports. This raises an important question: Why is the percentage of firms reporting on their sustainability performance so low? Institutional theory can justify this question. Coercive isomorphisms can influence a firm's ability to disclose its sustainability reports (Amran and Haniffa, 2011). Given that sustainability reporting is voluntary in Australia, it is fair to argue that the lack of government pressures and regulations would have resulted in a low level of sustainability disclosure in the Australian logistics sector. It is also important to acknowledge

that other factors, such as the level of awareness regarding sustainability issues, the lack of an effective reporting process, a low level of customer awareness and mis-conceptualisation regarding the impact of reporting on financial performance, could be the main reasons.

The GRI has been consistently updating its framework to provide a more comprehensive reporting framework. The upcoming version of the GRI framework should address sustainability issues such as noise reduction, traffic congestion, public safety, refugee aid programs and training and strikes and lockouts that have been identified from the sustainability reports of Australian logistics firms. Along with these, the GRI should integrate indicators such as sustainability innovation, sustainability certification and sustainability engagement in its framework since these indicators also reflect the initiatives taken by firms for sustainable development.

6.2 Sustainability disclosure and financial performance relationship

The summary of the DPA results (shown in Table 5) provides some key findings, which are discussed, and four propositions are developed in the following sections.

(1) *Leaders*:

Leader firms with a higher level of environmental and social sustainability disclosure have higher financial performance (ROA ratios). This finding suggests that a higher level of sustainability involvement is associated with the improved financial performance. The extant literature suggests that this relationship should exist because a higher level of environmental and social sustainability disclosure enables firms to enhance transparency and reduce information asymmetry (Vitolla *et al.*, 2020). Moreover, a higher level of sustainability disclosure results in increased customer loyalty, stakeholder support, favourable tax legalisation and positive market reactions and reduces the likelihood of litigation-based costs and penalties (Feng and Wang, 2016; Benlemlih and Girerd-Potin, 2017). The present study's finding indicates that "Leaders" may have developed capabilities related to pollution prevention and service stewardship, which would have created differentiation advantages and enhanced their reputation and, as suggested by Yadav *et al.* (2017) and Maas *et al.* (2014). In addition, the leading firm's commitment to a higher level of sustainability practice would have resulted in the assurance of social sustainability issues. "Leaders" may be able to focus on labour activities related to professional development, fair wages, flexible working hours and OH&S issues, which increase employee morale and productivity, and control costs by reducing the internal costs of accidents (Jamali, 2008). Thus, these findings suggest the following proposition:

Proposition 1. A higher level of environmental and social sustainability disclosure is associated with a higher level of financial performance in terms of ROA and revenue growth.

(2) *Laggards:*

The extant literature suggests the possibility of the relationship between lower level of environmental and social sustainability disclosure with reduced financial performance. Investors may consider it risky to invest in "Laggards", may withdraw their capital and may demand high-risk premiums, which can lead to reduced financial performance (Buysse and Verbeke, 2003). In addition, firms with a lower level of sustainability involvement are more likely to violate sustainability regulations, which can damage their reputation and may result in their having to pay fines, which negatively affects financial performance (Zou *et al.*, 2015). For "Laggards", sustainability disclosure could be an effective tool for managing risks as well as the information needs of stakeholders, which protects firms from the political costs imposed by

stakeholders, as Frias-Aceituno *et al.* (2014) suggested. Further, sustainability performance and its disclosure can help "Laggards" to build moral capital with their stakeholders, and thus, "Laggards" should focus on improving their sustainability performance and disclose a higher level of sustainability performance. Hence, these findings lead to the following proposition:

Proposition 2. A lower level of environmental and social sustainability disclosure is associated with a lower level of financial performance in terms of ROA and revenue growth.

(3) *Opportunists:*

The analysis of disclosure practices of "opportunists" firms pose a few questions: Does sustainability reporting make a difference? Why do some firms perform better than others, without focussing much on sustainability? How do firms use their corporate governance structure to perform well? These disclosure practices can be justified by the fact that these firms may have financed their business activities using their internal resources rather than relying on external resources to raise additional capital, as suggested by Carp *et al.* (2019) and Bhatia and Tuli (2017). It can also be argued that "opportunists" may have achieved strong financial performance owing to their strong corporate governance practices within and outside the firm (Wang and Sarkis, 2017; Husted and de Sousa-Filho, 2017). The political connections of their institutional directors may result in several benefits, such as preferential treatment regarding tax, regulatory favours and oversight and lucrative government contracts, as Goldman *et al.* (2008) and Shin *et al.* (2018) suggested. Moreover, shareholders are more likely to invest in firms with politically connected board members (Faccio *et al.*, 2006). These findings lead to the following proposition:

Proposition 3. A low level of environmental and social sustainability disclosure can be associated with enhanced financial performance in terms of ROA and revenue growth due to strong corporate governance practices.

(4) *Challengers:*

The disclosure practices of "challengers" firms shows that their high level of environmental sustainability practice and disclosure is associated with reduced revenue growth. This particular effect has not been previously identified in the literature. Thus, this finding is considered an important contribution to the sustainable logistics literature. This finding could be justified using the demanding nature of GRI and a higher level of investment for sustainability initiatives. The demanding nature of the GRI framework encourages firms to disclose negative sustainability-related aspects of their performance to increase transparency and reduce information asymmetry (Reimsbach and Hahn, 2015). However, the disclosure of negative performance adversely affects organisational legitimacy and financial performance (Bansal and Clelland, 2004). The analysis also indicates that Firms A and D despite having a higher level of environmental, social and economic sustainability practice and disclosure have experienced a decrease in their revenue growth ratios. This can be justified by the fact that the firms with substantial profitability (ROA) can experience reduced revenue growth as these types of firms tend to develop additional sustainable growth strategies to maintain their social responsible image regardless of their financial situations (Pekovic *et al.*, 2018). Firms A and D may have focused on additional sustainable growth through more environmental investments, community investments and local procurement and could have charged a premium for their products and services to cover these expenses which could have resulted in decreased revenue growth (Jones and Butler, 1988). The literature also indicates that

sustainability governance enables firms to develop their sustainability vision and roadmap, decide materiality, implement sustainability practices and establish sustainability reporting process. It also enables firms to assign and manage their critical resources to achieve sustainability performance and disclosure (Wang and Sarkis, 2017; Husted and de Sousa-Filho, 2017). Therefore, it is more likely that firms without governance structure can focus on sustainability issues which may not be part of their materiality and assign their resources on those issue outside of their impact boundary, which can result in reduced revenue growth and return on asset. Hence, these findings lead to the following proposition:

Proposition 4. A high level of environmental and social sustainability disclosure can be associated with reduced level of financial performance in terms of ROA and revenue growth due to weak corporate governance practices.

The combined diagram for the relationship between environmental and social sustainability disclosure and financial performance (ROA and total revenue growth) is shown in Figure 10. It indicates that Australian-owned Firm C and Firm E, who are "Leaders" for environmental sustainability disclosure, are "Opportunists" for social sustainability disclosure. This indicates that these firms have taken initiatives for sustainability development, however, their focus significantly remains on environmental sustainability with a low level of attention to social sustainability. These firms may have invested only in environmental initiatives to maximise legitimacy and strengthen their image as the "green firm" and experienced an increase in their ROA and total revenue growth ratios due to this image and reduced operational costs. However, it is critical for these firms to focus on the social sustainability issues related to labour practices, human rights, society and product responsibility. These elements provide significant financial returns as they do not require significant resource allocation as compared to environmental sustainability (Wang and Sarkis, 2013). We suggest that this category of firms should broaden their definitions of logistics sustainability and take

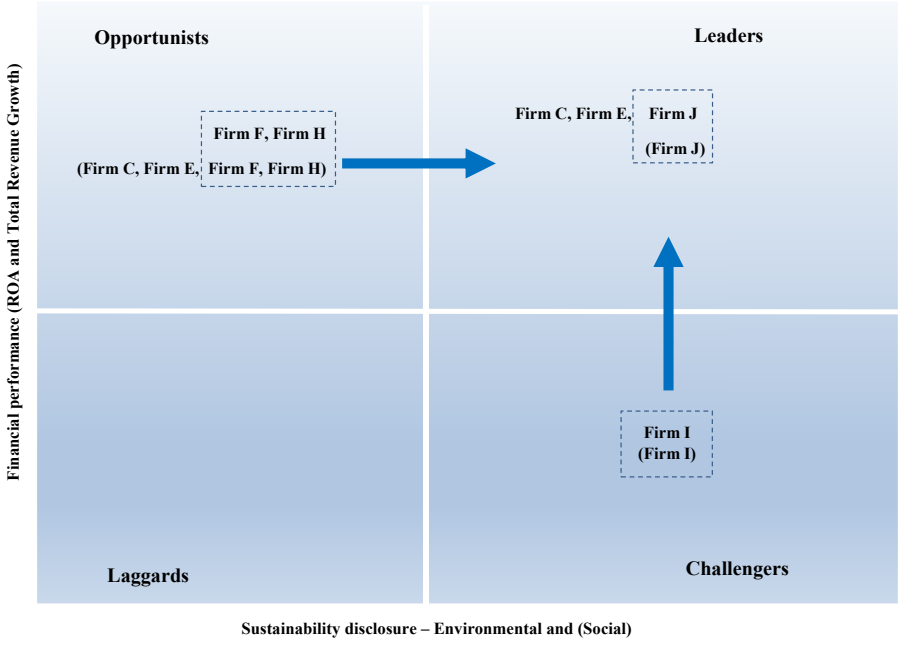

Figure 10.
Sustainability disclosure and financial performance of the top 10 logistics firms in Australia

a balanced approach for both environmental and social sustainability and disclose its performance accordingly.

Figure 10 indicates Firm F and Firm H as "Opportunists" for both environmental and social sustainability disclosure and financial performance. Although we have argued that these firms have achieved substantial financial returns (ROA and total revenue growth) because of their corporate governance structure, we further suggest that these firms should develop sustainability governance mechanisms related to regulations and compliance management and assign a sustainability manager/committee for their logistics sustainability initiatives. Sustainability committee/managers can develop the required framework for sustainability governance and decision-making and integrate them with logistics activities, information management and control systems (Eccles *et al.*, 2012). They can also develop a logistics firm's sustainability orientation and provides a strategic direction to the firm. These firms should involve their internal and external stakeholder in their sustainability decision making as these stakeholders' guide firms to priorities a range of diverse environmental and social sustainability issues and disclose them accordingly.

Figure 10 demonstrates Firm I, which is a multinational firm as a "Challenger" despite having a higher level of environmental and social sustainability disclosure. This indicates that either Firm I did not focus on multi-stakeholder engagement for their sustainability reporting or may have promoted environmental and social sustainability despite having the poor environmental and social performance as their "greenwashing strategy" (Delmas and Burbano, 2011). These types of firms must focus on achieving a higher level of environmental and social sustainability performance and should move away from their greenwashing strategy to achieve a higher level of financial performance. Also, they should focus on a multi-stakeholder approach, align their intra-firm structures, processes and incentives to improve knowledge about greenwashing and information asymmetry as Delmas and Burbano (2011) suggest.

7. Contribution, limitations and further research

In this study, we critically investigated the pattern and the extent of the sustainability disclosure practices of the top 10 logistics firms in Australia and the level of their adherence to the GRI-G4 framework. We found that there was no consistency in the firms' selection of sustainability indicators. Further, the firms following the GRI framework have provided more comprehensive reports and disclosed more sustainability indicators than the non-GRI logistics firms. The conclusions derived from the DPA provide insights into how the high or low level of environmental and social sustainability disclosure are related to financial performance, which is an important contribution to the extant literature. The findings also provide insights into how additional sustainability investments, internal resources and corporate governance can affect the relationship between sustainability disclosure and financial performance.

For practitioners, this study provides an overview of the current trends and patterns of sustainability disclosure of the top 10 logistics firms in Australia. The results indicated that the GRI has a significant impact on a logistics firm's disclosure practices. Logistics firms should use the GRI framework to provide comprehensive sustainability reports. They should focus on achieving higher levels of environmental sustainability disclosure since it results in improved ROA. Simultaneously, firms should disclose a higher level of social sustainability performance to meet stakeholder expectations and build legitimacy. However, investment in additional growth for sustainability initiatives beyond the maximum profitability rate could result in reduced revenue growth. Although a few firms have achieved significant financial returns (ROA and revenue growth) without much attention to environmental and social issues, these firms should focus on sustainability issues since these can improve operational efficiency and act as a risk management tool.

Our study has several limitations that could be considered as future areas of research. Notably, this study is the first to explore the relationship of environmental and social sustainability disclosure with the financial performance of logistics firms in Australia. This investigation can be extended to small- and medium-sized logistics firms. Future research could investigate sustainability initiatives of such firms using survey-based or interview research as these firms are more likely to focus on financial activities with limited attention to environmental and social sustainability practices and may not have enough environmental and social performance to report. Moreover, this study can be extended to develop a framework in a different context, such as the manufacturing, retail or mining sectors, to improve its external validity. Another limitation of the present study is that its findings are less likely to be generalisable to logistics firms in other countries, considering the geographic locations and the specialisation of social interests that create different internal pressures and competencies in logistics. Thus, further research is required to validate these findings for logistics firms in other countries.

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