Exploring the role of external pressure, environmental sustainability commitment, engagement, alliance and circular supply chain capability in circular economy performance

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Exploring the role of external pressure, environmental sustainability commitment, engagement, alliance and circular supply chain capability in circular economy performance

Abstract

Purpose – This study explores the role of external pressure, engagement capability, alliance capability, environmental sustainability commitment, and circular supply chain capability in circular economy performance.

Methodology - Through a cross-sectional survey and data collected from 124 small and medium enterprises (SMEs) in Ghana, this study employs partial least square structural equation modelling (PLS-SEM) to test the proposed model.

Findings - The findings reveal the following; first, external pressure has a significant impact on environmental sustainability commitment. Second, environmental sustainability commitment positively impacts alliance capability, engagement capability and circular supply chain capability. Third, alliance capability and engagement capability mediate the relationship between environmental sustainability commitment and circular supply chain capability. Finally, circular supply chain capability has a significant impact on circular economy performance.

Originality – The originality of this study lies in testing a novel model that confirms that SMEs respond to external pressure by enhancing environmental sustainability commitment as well as develop engagement and alliance capabilities to improve circular supply chain capability to achieve circular economy performance goals.

Keywords: External pressures; engagement capability; alliance capability; environmental sustainability commitment; circular supply chain capability; circular economy performance

1. Introduction

The unsustainable operations of firms are gravitating the Earth towards a tipping point of destruction and irreversible climate change (Heikkurinen, 2018). Globally, firms are experiencing shortage of key resources (Preston and Herron, 2016) due to global warming and climate change that hurt the biodiversity of the earth (Agyabeng-Mensah et al., 2021). Circular economy (CE) is a promising approach for overcoming environmental challenges (Bag et al., 2021) and achieving sustainable development (Del Guidice et al., 2020). Nations such as China,
Japan and USA as well as a regional bloc such as EU, have in recent times adopted CE principles (Yadav et al., 2020).

Philips has also established a strategic corporation with the Ellen McArthur foundation to transition from linear operation to CE as part of its sustainability programme (Bag and Rahman, 2021). Firms are faced with extensive external pressure from several stakeholders (e.g., communities, SC partners, government) to integrate sustainability initiatives into supply chain to make their operations sustainable (Guenther et al., 2016). Large firms and firms in developed countries used to be the focus of the external pressure to adopt sustainability initiatives (Talbot et al., 2021). Meanwhile, recently, stakeholders have been on the neck of SMEs in developing countries to adopt and commit to sustainability practices (Chassé and Boiral, 2017).

In literature, studies that examine the role of external pressure towards the adoption of sustainability practices in SMEs in developing countries are not new. Some studies have examined how stakeholder pressure drives social sustainability of suppliers (Yawar and Kauppi, 2018), green innovation and resources of manufacturing SMEs (Bag et al., 2021; Bag et al., 2022), green production (Baah et al., 2021) and top management commitment (Dubey et al., 2019).

However, some studies acknowledge that the focus on the impact of stakeholder pressures on SMEs’ Environmental Sustainability Commitment (ESC), remains understudied and lacks theoretical understanding (Nguyen and Adomako, 2022). Some scholars indicate that stakeholder pressures can influence the behaviour of SMEs (Roxas et al., 2017) by promoting environmental commitment (Sendawula et al., 2020; Nguyen and Adomako, 2022). Baah et al. (2021) suggest that the growing institutional pressure in Ghana (Coercive, mimetic and normative isomorphism) influences SMEs to implement sustainability initiatives. Hence, to address the research gap, this study firstly attempts to answer the research question;

RQ1. Does external pressure positively affect ESC of SMEs in developing country?

Circular supply chain practices have been proposed as an effective approach for achieving circular economy performance (Del Giudice et al., 2020). In CE literature, studies have examined the drivers and outcomes of CE capabilities of both large firms and SMEs. Some of the studies explore sustainable supply chain flexibility (SSCF) (Bag and Rahman, 2021), circular economy readiness (Singh et al., 2018), big data analytics and sustainable manufacturing (Bag et al., 2021) and Eco-innovation and green supply chain practices (Bag et al., 2022) as drivers of CE capabilities.
Other studies examine the impact of CE capabilities on the environmental aspects of CE performance. For instance, Bag and Rahman (2021) examine the role of Engagement Capability (ENC) and Alliance Capability (ACA) in SSCF and circular economy target performance in India. Agyabeng-Mensah et al. (2021) explore the contribution of zero waste and lean practices on circular economy target performance with focus on environment benefits. Yet, what has not been studied is how environmentally committed SMEs that face resource scarcity can develop Circular Supply Chain Capabilities (CSCC) to achieve CE performance (cost, social and environmental).

Arguably, the success of implementing sustainability practices in a supply chain depends on the sustainability capabilities of the firm (Dai et al., 2021). Developing CSCC can promote the effectiveness of CE implementation in supply chain. CSCC refers to the abilities, attributes, organizational processes, skills and knowledge that permit a firm to assimilate, construct and realign competencies to circular economy initiatives in supply chain. Developing CE initiatives and capabilities in supply chain may be reliant on ESC of SMEs (Centobelli et al., 2021).

ESC refers to the extent of the firm’s support for environmental protection and environmental strategy implementation (Banerjee et al., 2003). ESC ensures effective resource allocation to build capabilities (Chadwick et al., 2015) to promote environmental sustainability (Dias et al., 2021). CE initiatives require high financial resources, technology capabilities and technical expertise (Ghenţa et al., 2018). However, SMEs in developing countries face resources scarcity challenges relating to technology, financing, and/or technical expertise, which makes them lag behind CE implementation (Pereira et al., 2022).

Social Network Theory (SNT) suggests that firms that lack resources and knowledge can obtain additional resources through external social network ties to achieve improved performance outcomes (Burt, 2000; Alkahtani et al., 2020). Social network ties create the avenue for SMEs to acquire specialist knowledge from external sources (Alvarez and Busenitz, 2001). In Ghana, SMEs depend on stakeholders to obtain additional resources and knowledge to implement sustainability practices (Agyabeng-Mensah et al., 2022) and learn from partners to acquire knowledge to develop ENC and ACA (Anning-Dorson and Nyamekye, 2020; Takyi et al., 2022). Ghanaian SMEs create alliances and engage with several parties to obtain resources and knowledge (Anning-Dorson and Nyamekye, 2020; Takyi et al., 2022).

ENC and ACA supports the development of effective alliances and engagements with suppliers and customers to acquire resources, knowledge, skills and information from stakeholders (Rincón-Moreno et al., 2021) to develop CE capabilities (Bag and Raman, 2021). This study
argues that ACA and ENC can facilitate forging alliance and an engagement with stakeholders to obtain resources and knowledge to create CSCC to achieve CE performance. Despite the admitted potential contributions of ENC and ACA to acquire resources and knowledge to develop CSCC to achieve CE performance in SMEs, literature is insufficient in this aspect. Some studies claim that survey studies as well as studies in SMEs in developing countries deserve further attention in circular supply chain literature (Pereira et al., 2022; Zhang et al., 2021).

In response, this study addresses the gaps in literature by empirically exploring the direct and indirect impact of ESC on CSCC through ACA and ENC to achieve CE performance. Therefore, this study attempts to address the following research questions: RQ2. How do ESC, ACA and ENC relate with CSCC? RQ3. Does CSCC improve CE performance?

Using 124 managers of SMEs in Ghana, and drawing on the institutional theory and SNT, this study generates a theoretical debate on how external pressure influences ESC of SMEs to develop ACA, ENC and CSCC to achieve CE performance. The main contribution of this study lies in exploring both the direct and indirect impact of ESC on CSC through ACA and ENC. In this regard, this study enriches literature by confirming that, in addition to external pressures, the resources of stakeholders are important for promoting CE in SMEs. This study extends the usual perspective in literature that stakeholders drive circularity through only pressures. Also, this study has a novel contribution to theory by combining institutional theory and SNT, particularly, in SMEs.

The remainder of the paper is organized as follows. The literature review and hypotheses development are presented in Section 2. Methodology is presented in section 3. The section 4 presents data analysis and results; Section 5 presents discussions and implications, while section 6 presents the conclusion.

2. Literature review and hypotheses development

2.1. Theories and model development

This study’s research model (see Figure 1) consists of external pressures, environmental sustainability commitment, engagement capability, alliance capability, circular supply chain capability and CE performance. The model is explained using a combination of institutional theory and SNT. The institutional theory is used to explain the relationship between external pressures and ESC, while the relationships among ESC, ACA, ENC, CSCC and CE performance are explained through the theoretical lens of SNT.
In sustainable supply chain literature, studies have primarily used institutional theory as a theoretical framework to explain how pressures can influence the implementation of green practices in supply chains (Bhakoo and Choi, 2013; Fontana et al., 2022). Institutional scholars argue that institutional pressures drive certain practices in institutional settings (Scott, 2003). External pressures influence the decision of SMEs to engage in sustainability practices such as circular economy practices (Rodríguez-Espínola et al., 2022; Bag et al., 2021).

SMEs in Ghana respond to external pressures from several parties (UN, regulatory institutions, customers, suppliers, and community) by developing environmental values, assuming responsibility for environmental quality, enhancing top management commitment to the environment and developing new/altering existing products and production processes to protect the natural environment. SMEs commit to the natural environment by developing CSCC, which requires a blend of internal and external resources.

Meanwhile, SMEs face resource and knowledge constraint, which can be overcome by tapping into external social network ties to gain access to external resources and knowledge (Lee and Wong, 2015). However, institutional theory falls short of explaining the use of network ties to obtain access to external knowledge and resources to implement sustainability practices to achieve improved performance. Thus, to gain an understanding into this situation, this study further adopts SNT.

SNT explains social network ties as tools through which SMEs can acquire resources to effectively implement sustainability practices (Bai et al., 2022; Varsei et al., 2014). SNT indicates that firms that have networking ties with other firms can have easy access to resources to achieve competitive advantage (Burt, 2000; Alkahtani et al., 2020). Social network ties create the avenue for SMEs to acquire specialist knowledge from external sources (Alvarez and Busenitz, 2001).

For Ghanaian SMEs to acquire external resources and knowledge to overcome resources and knowledge constraint to effectively develop CSCC to achieve performance improvement, they create alliances and engagement capabilities to build stronger alliance and better engage with stakeholders. In this study, we argue that external pressure drives SMEs’ ESC, which further leads to the development of ENC, ACA and CSCC and in turn improves CE performance.
2.2. External pressure and environmental sustainability commitment

SMEs in Ghana have often pursued environmental management practices as a means to reduce waste to realize cost reduction, rather than a major approach towards achieving environmental sustainability, which negatively affects their environmental commitment (Ahinful et al., 2019). Currently, institutions have pressurized SMEs to vary their business model to consider environmental sustainability as a major part of their operations (Chassé and Boiral, 2017). This has driven their decision to adopt environmental practices (Baah et al., 2021). Institutional theory indicates that external forces play a crucial role in the choice of organizational behaviour and processes of a firm (Scott, 2005).

The external forces can be referred to as external pressure. Essentially, external pressure refers to a combination of injunctive and descriptive norms which promote firm’s awareness of what diverse actors think they ought to do (Rivis and Sheeran, 2003). Suppliers, local and international customers, state institutions, local community, industry/trade associations, NGOs, lenders (banks/others), and the media are the actors that account for the growing pressure on SMEs in Ghana to adopt environmental management practices (Ahinful et al., 2019). External pressure contributes to firms’ environmental/green behaviour and commitment (Roxas and Coetzer, 2012) and effort towards CE practices (Singh et al., 2018).

Govindan et al. (2021) suggest that governments create external pressure by designing policies and regulations that compel SMEs to integrate sustainability practices in supply chains. Baah et al. (2021) claim that regulatory and organisational pressures contribute to the recent increase...
of the adoption of environmental sustainability initiatives in Ghanaian SMEs. Acquah et al. (2021) suggest that pressure from industry players play significant role in the effort of Ghanaian SMEs to implement green innovation and green procurement practices. Centobelli et al. (2021) have explore the impact of social pressure on green economic incentives, sustainable supply chain design and supply chain relationship in SMEs in India, and discovered that social pressure drives the adoption of circular economy principles.

Bag et al. (2021) and Bag et al. (2022) investigate and confirm the role of institutional pressure in developing tangible resources and workforce skills and implementing eco-innovation in SMEs in South Africa and India. Baah et al. (2021) examine the relationship between stakeholder influence and circular economy principles and their impact on environmental legitimacy and customer satisfaction in Ghana. Drawing on the institutional theory and prior studies, this study argues that external pressure drives SMEs’ ESC. Therefore, this study hypothesizes that:

H1. External pressure has a positive impact on ESC.

2.3. Environmental sustainability commitment, alliance capability, and engagement capability

The firm’s success in implementing environmental management initiatives does not only depend on its commitments towards environmental sustainability, but to a larger extent the availability resources (Wang et al., 2018). Wong et al. (2020) suggest that sustainability practices in supply chain is resource-demanding. However, it is generally argued that small firms lack adequate knowledge, skills, and human and financial resources to successfully implement sustainability initiatives (Wong et al., 2020).

SNT suggests that social network ties can provide firms access to external resources to implement sustainability in supply chain to achieve competitive advantage (Burt, 2000; Alkahtani et al., 2020). Similarly, Beckmann et al. (2021) suggest that creating relationships and networks shapes information flows required to adapt skills, products, and processes. For Halme and Korpela (2014), SMEs engage in cooperation with external partners to compensate for lack of resources needed for engaging in sustainable innovation.

In light of these, SMEs develop alliance and engagement capabilities to form alliances and engagements with their stakeholders to acquire additional resources, skills and knowledge (Ählström and Sjöström, 2005). Engagement and alliance capabilities are crucial for learning and obtaining knowledge from stakeholders for implementing circular practices (Bag and Rahman, 2021). Firm’s commitment to the environment
contribute to the success of their alliance with stakeholders (Shamdasani and Sheth, 1995). SMEs build network ties and collaborate with external parties to have access to relevant information (Thrassou et al., 2020) to build ACA (Leischnig and Geigenmüller, 2020) and ENC (Watson et al., 2018). On the premise of SNT and prior literature, this study hypothesizes that:

H2. ESC has a positive impact on ENC

H3. ESC has a positive impact on ACA

2.4. Environmental sustainability commitment, alliance capability, engagement capability and circular supply chain capability

ESC plays a crucial role in determining the success and failure of environmental sustainability initiatives in SMEs’ supply chain (Ilyas et al., 2020). ESC refers to the extent of top management’s support and involvement in environmental protection and implementation of environmental protection practices (Jansson et al., 2017). SMEs with low levels of environmental commitment are not usually successful at implementing sustainable practices due to inadequate training for employees on environmental issues, low top management commitment, and lack of resource allocation for environmental issues (Nath and Ramanathan, 2016). Meanwhile, firms with high levels of environmental commitments consider environmental initiatives as corporate social responsibilities and can easily cultivate green organizational culture (Wang et al., 2018) to achieve environmental sustainability goals in supply chain (Moktadir et al., 2018).

Environmentally committed firms share environmental initiatives and information with stakeholders (Yang et al., 2019) and organise environmental training programs for employees to obtain knowledge to eliminate knowledge gap in SMEs (Handfield et al., 2005). Ahinful et al. (2019) assert that SMEs in Ghana with high levels of environmental commitment are successful at implementing environmental sustainability practices. SMEs’ ESC can motivate their decision to gather and deploy resources and capabilities to support circular economy initiatives (Centobelli et al., 2021). Hence, based on literature, this study argues that SMEs with high levels of ESC develop capabilities that promote CE initiatives in supply chain. Thus, this study hypothesizes that;

H4. ESC has a direct positive impact on CSCC

Alternatively, SMEs can develop CSCC through developing of capabilities that help them effectively engage and form alliance with stakeholders. Developing capabilities to implement sustainability initiatives in supply chain is not that simple and straightforward, especially for
SMEs, known to suffer from resource poverty (Journeault et al., 2021). In fact, prior studies argue that SMEs are laggards in ESC due to resource constraints (Jansson et al., 2017). Following this line of argument, it is intuitive to argue that SMEs’ ESC is inadequate to develop CSCC alone. Thus, in addition to ESC, SMEs need resources, skills, and knowledge to be successful at CE implementation.

SNT indicates that firms that have networking ties with other firms can have access to external resources to achieve competitive advantage (Burt, 2000; Alkahtani et al., 2020). SMEs create alliances and engage with stakeholders to gain more resources and learn to increase their knowledge and skills (Franco and Haase, 2015). SMEs develop capabilities to effectively engage and form alliances with partners (Iturrioz et al., 2015) to acquire resources, knowledge and skills to contribute to the transition of supply chain towards CE (De Angelis et al., 2018).

ACA is the eagerness of firms to continuously collaborate with partners to achieve strategic goals (Leischnig and Geigenmüller, 2020). ACA increases flexibility and promotes coordination and cooperation across the supply chain partners (Bag and Rahman, 2021). This makes it easier for SMEs to gain support and trust to obtain resources and knowledge (Ziggers and Duysters, 2004). SMEs engaging in collaboration with suppliers and customers can create cleaner technology, create and redesign supply chain system to promote reuse/recycle of materials energy to achieve resource efficiency and CE objectives (Mishra et al. 2018). SMEs with scarce resources engage in collaboration to co-develop and invest in technology to access resources to develop capability to transition towards CE implementation. Therefore, on the logic of the above literature, this study argues that ACA can advance alliance processes to build CSCC in SMEs. Hence, these hypotheses are proposed:

**H5a. ACA has a positive impact on CSCC**

**H5b. ACA mediates the relationship between ESC and CSCC**

Also, it has been shown in literature that SMEs, through collaboration and partnership benefit from stakeholders’ resources, expertise, and knowledge in dealing with sustainability issues (Journeault et al., 2021). Jarillo (1988) claims that SMEs tap into networks that give them accessibility to external resources in order to solve the problem of capability limitations and resource constraints. Relational collaboration helps SMEs to better engage supply chain partners to facilitate the implementation of CE principles such as refurbish, repair, remanufacture and resell/reuse (Jabbour et al., 2019). Stakeholder engagement promotes the development of collaboration with stakeholders (Sharma, 2005), and allows access to new information and knowledge (Hughes et al., 2021).
ENC assists firms to better engage their stakeholders to promote learning processes (Hollebeek, 2019) and tap into the operant and market-based resources (Anning-Dorson and Nyamekye, 2020) to support sustainability initiatives (Journeault et al., 2021). Engaging stakeholders facilitates shared understanding, which promotes sharing technical and human capabilities to facilitate CE in supply chain (Mishra et al., 2019). Drawing on the SNT and above discussion, this study argues that ENC advances engagement with stakeholders to create SMEs’ CSCC. Thus, this study hypothesizes that:

**H6a. ENC has a positive impact on CSCC.**

**H6b. ENC mediates the relationship between ESC and CSCC.**

### 2.5. Circular supply chain capability and circular economy performance

The implementation of CE initiatives mostly requires high initial investments to conduct training, modify existing processes and acquire new equipment (Geng et al., 2009). This creates high costs of capital in the short term (Zheng et al., 2021). Meanwhile, empirical evidence reveal that sustainability initiatives can create value for firms (Van Holt et al., 2020). Bai et al. (2022) posit that firms can actively enhance their sustainability to reduce external costs. CE practices promote the production of green products, aid service quality improvement and cost reduction (Tang and Veelenturf, 2019).

CE initiatives can also reduce cost associated with energy use, waste treatment and discharge and increase savings from using reused/recycled/ materials in the long-term (Mathews and Tan, 2016). According to Geissdoerfer et al. (2017) and Jabbour et al. (2020), CE helps to minimize cost related with firm’s use of resources and raw material usage. A study conducted by Farooque et al. (2022) reveal that circular supply chain practices reduce cost performance in Chinese manufacturing firms. Brydges (2021) claims that CE practices reduce system waste, production cost, save the environment, and boost efficiency. Rodríguez-Espíndola et al. (2022) suggest that CE initiatives can help SMEs to enhance sustainability performance.

Developing capabilities to enhance product quality and resource efficiency (Sharma et al., 2017), can help firms meet regulatory requirements, avoid fines and reduce cost of waste treatment (Jabbour et al., 2019). Information management system helps firms analyze data to provide information for better understanding of how to design supply chain processes, coordinate networks and operations, and allow supply chain partners to work with employees on circular economy paradigm (Gupta et al., 2019).

Rich data analysis that comes from management systems and intelligence technologies in supply chain processes (Kouhizadeh and Sarkis, 2018) helps improve resource and energy conservation, reduce carbon footprints, minimize labour and material costs, and reduce
compact set-up times (Razzaq et al., 2021). For firms to ensure reuse of materials and products (Ripanti and Tjahjono, 2019) to maximize resource usage, management support is essential (Ying and Li-jun, 2012). Employees with the right competences and skills can also support the success of CE practices (Dibia et al., 2020) to reduce energy consumption and waste and improve cost (Ashraf et al., 2015). Hence, this study theorizes that:

**H7. CSCC has a positive impact on CE performance.**

3. Methodology

3.1. Operationalization of constructs

This paper employs survey questionnaire items to measure all the six reflective constructs, including, external pressures, ESC, ENC, ACA, CSCC and CE performance of the research model shown in Figure 1. The items used to measure each of the construct were adopted from previous studies through literature review (see Appendix 1). The researchers conducted two pilot tests to evaluate validity and reliability of the items used for the questionnaires. The feedbacks received from the experts after each pilot test were consolidated to improve the wording of the questionnaire. All the items were sent to 10 academics via an email attachment to assess their content and wording.

Further, the researchers sent the questionnaire via email attachment to 22 supply chain managers and 18 operation managers. The questions were carefully worded to avoid ambiguity as well as all the items were made straightforward and concise, eradicating complex syntax and unfamiliar terms to ensure understanding. All the items used to measure the constructs were measured on a five-point Likert scale from “1 = strongly disagree” to “5 = strongly agree”.

This study measured external pressure with five items adopted from Zeng et al. (2017), Singh et al. (2018) and Centobelli et al. (2021).

The firm’s ESC was also measured using four items adopted from Sendawula et al. (2020) and Liu and Bai (2014). The firms’ ENC was measured with three items adopted from Anning-Dorson and Nyamekye (2020) and Bag and Rahman (2021). The study also measures ACA using four items adopted from Leischnig and Geigenmüller (2020), and Bag and Rahman (2021). The CSCC construct was operationalized using five items adapted from the study of Borazon et al. (2021). Finally, six items adopted from Jabbour et al. (2019), Agyabeng-Mensah et al. (2021), and Jain et al. (2020) were used to measure CE performance.

Finally, this study controls firm size, firm age, and industry to account for factors that may influence CE performance. Firm age and firm size are controlled because larger-size and old firms have higher experience and resource sets to develop circular supply chain capabilities.
better than younger and smaller-size firms (Bag and Rahman, 2021; Agyabeng-Mensah and Tang, 2021). Besides, “industry” is controlled due to the differences in rules and regulations governing different industries, which may vary performance outcome (Bag et al., 2022; Agyabeng-Mensah et al., 2021).

3.3. Data collection

This paper employs a quantitative approach, using survey data gathered from a sample of Ghanaian SMEs. This is motivated by the call by Lahane et al. (2020) to conduct more survey oriented quantitative studies in circular supply chain due to the dominance of researches using qualitative and case approaches in this area of study. A cross-sectional design is employed as a result of its flexibility and cost effectiveness (Spector, 2019). Ghana has been selected as a suitable research context because, it is a lower-middle-income country (GNI per capita = US $5,470) and one of the fastest growing economies in Africa. Scholarly studies in the domain of CE at the micro level remains are untapped, especially in Africa (Kwarteng et al, 2021). Also, Ghana has shown significant commitment towards CE transition and the achievement of Sustainable Development Goals (SDGs). For instance, Ghana was chosen a co-chair of the United Nations SDGs advocate to help achieve the transformative and ambitious global development agenda (Kwarteng et al, 2021). Ghana has implemented National Plastic Management Policy as well as Global Plastic Action Partnership (GPAP) in its quest to transition to CE. Aside from Ghana’s existing environmental legislations that support CE, CE initiatives have been integrated into every part of business model in Ghana as the country advances towards a modern society (Kwarteng et al., 2021).

We used a simple random sampling technique to select 243 manufacturing SMEs from a total population of 3,485 from the database of Ghana Enterprise Agency. Through emails, we realized that 162 of the sampled SMEs had one way or the other incorporated some CE practices in their operations and supply chain and agreed to take part in the study. 364 web-based survey were sent to the respondents and 124 valid responses were returned. The online survey method was used for data collection due to the Covid-19 pandemic (Del Giudice et al., 2021). The initial follow-up resulted in 69 responses, while the second follow-up resulted in 55 completed responses. The response rate was 38.27%, which is adequate for research in social science (Darnall et al., 2010)

The respondents included 6.61% of CEOs/general managers/managing directors, 13.39% of senior managers and managers; 54.58% of supply chain/logistics managers and 25.42% of operations managers. The respondents with work experience between 15 to 20 years dominated our sample with 40.5%, followed by 5 to 9 years (26%), 10 to 14 years (19%) and less than 5
years (14.5%). Concerning the industry, 38.33% of respondents are from food and beverage, 19.37% are from fashion and textile, 15.24% are from electronic and electrical, 1.73% are from automobiles, 17.9% from chemicals and materials and 7.43% from others.

3.4. Common method bias and non-response bias

The potential existence of non-response bias was tested via comparison of the early responses (69) and late responses (55) (Armstrong and Overton, 1977). The research team conducted a t-tests on early and late response on all the data. The findings of the statistical test reveal that there is insignificant difference between non-respondents and respondents (i.e. p>0.05).

The following five steps are taken to mitigate the occurrence of common response bias. First, we removed any information that could expose the identity of the respondents to ensure their anonymity. This curtails the perceived need of the respondents to give socially desirable responses. Second, we pretested the questionnaire using 5 experts to provide clarity to reduce ambiguity as well as place the dependent and independent constructs in separate sections (Jahanmir and Lages, 2016). Third, we conducted Harman’s single-factor test to determine the existence of a possible common method bias (Podsakoffet al., 2003). The result (43.67%) of exploratory factor analysis (EFA) confirm that common method bias is not a key issue this study. Fourth, the marker variable approach was used to further test for common method variance (Lindell and Whitney, 2001). The result indicate that the proposed relationships do not change after adding the marker variable (Johnson and LeBreton, 2004). Finally, all the variance inflated factors (VIFs) (from 1.00 to 1.313) are less than 3.3, suggesting that common method bias is not a problem in this study (Kock, 2019).

4. Data analysis and results

This study employs structural equation modelling (SEM) because it is considered as a powerful and robust statistical tool in several disciplines (Hair et al., 2011). SEM is both variance based (partial least squares-PLS-SEM) and covariance-based (CB-SEM). This study uses PLS-SEM (SmartPLS 3.2) because this study is exploratory in nature, analyses a complex structural model, focuses on predicting target constructs, and the constructs are reflectively measured (Hair et al., 2011). We conducted and interpreted the analysis with PLS-SEM in two phases (Hair et al., 2019). Initially, we evaluated the measurement model using a PLS algorithm with 300 iterations. We further assessed the structural model to test the proposed relationships between the constructs by using bootstrapping approach with 5,000 subsamples (Hair et al., 2019).
4.1. Validity and reliability

Usually, before path analysis, validity and reliability for the constructs are assessed through composite reliability (C.R.), average variance extracted (AVE), Cronbach alpha, Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT). As depicted in Table 1, all the values of C.R (ranging from 0.825 to 0.940) and the Cronbach’s alpha (ranging from 0.716 to 0.923) are more than 0.70, signifying sufficient reliability. All AVE values are higher than 0.50, showing acceptable level of convergent validity. The discriminant validity was evaluated by assessing whether the square root of AVE for each construct was higher than its correlation with other factors. Table 3 confirmed that the square roots of the AVEs on the diagonal are higher than the correlations off-diagonal of the matrix, suggesting a sufficient discriminant validity. Additionally, HTMT values ranging from 0.388 to 0.809, which are shown in Table indicates acceptable discriminant validity since the values are less than 0.850.

<table>
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<tr>
<th>Construct</th>
<th>Loadings</th>
<th>Reliability and validity</th>
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<tbody>
<tr>
<td>ACA</td>
<td>AC1 0.714 AC2 0.751 AC3 0.829 AC4 0.641</td>
<td>AVE=0.543, C.R =0.825, Cronbach alpha=0.716, R²=0.238 Q²= 0.213</td>
</tr>
<tr>
<td>CE performance</td>
<td>CEP1 0.817 CEP2 0.852 CEP3 0.865 CEP4 0.882 CEP5 0.821 CEP6 0.858</td>
<td>AVE=0.722, C. R=0.940, Cronbach alpha=0.923 R²=0.444 Q²=0.123</td>
</tr>
<tr>
<td>ENC</td>
<td>ENC1 0.740 ENC2 0.841 ENC3 0.830</td>
<td>AVE=0.648, C.R =0.846, Cronbach alpha=0.730 R²=0.286 Q²=0.160</td>
</tr>
<tr>
<td>ESC</td>
<td>ESC1 0.776 ESC2 0.788 ESC3 0.741 ESC4 0.735</td>
<td>AVE=0.578, CR =0.846, Cronbach alpha=0.758 R²=0.110 Q²=0.068</td>
</tr>
<tr>
<td>CSCC</td>
<td>CSCC1 0.727 CSCC2 0.768 CSCC3 0.704 CSCC4 0.760 CSCC5 0.664</td>
<td>AVE=0.548, CR =0.829, Cronbach alpha=0.730 R²=0.378 Q²=0.180</td>
</tr>
<tr>
<td>External pressures</td>
<td>EP1 0.805 EP2 0.771 EP3 0.771 EP4 0.708 EP5 0.814</td>
<td>AVE=0.600 CR=0.882 Cronbach alpha=0.758</td>
</tr>
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Table 2
Fornell-Larcker Criterion
4.2. Structural model

First, we evaluated the structural model for a potential multi-collinearity issues. We found that there were no multi-collinearity problems since VIF values of all the constructs were less than 3.3 (see Table 1) (Hair et al., 2019). Also, the predictive power of the model is evaluate using coefficient $R^2$. The results suggest that ACA, CE performance, CSCC, ENC, and ESC explain 23.8%, 44.4%, 28.6%, 37.8% and 11% of the model respectively. Subsequently, we employed the blindfolding procedure to obtain Stone-Geisser’s $Q^2$ value for assessing the predictive relevance of the structural model (Hair et al., 2019). The results revealed $Q^2$ values ranging from 0.068 to 0.213, showing the adequacy of predictive relevance for the model because the values are more than the suggested minimum threshold of zero.

![Figure 2. Structural model](image-url)
4.3 Hypotheses tests

4.3.1. Direct effects

The empirical findings reveal that external pressures have a significant positive impact on ESC ($f^2 = 0.313$, $β = 0.488$, $t = 7.235$). The results also show that ESC has a positive impact on ENC ($f^2 = 0.220$, $β = 0.454$, $t = 3.386$), ACA ($f^2 = 0.277$, $β = 0.449$, $t = 7.195$) and CSCC ($f^2 = 0.250$, $β = 0.436$, $t = 5.366$). Similarly, the results reveal that ENC ($f^2 = 0.107$, $β = 0.285$, $t = 3.384$) and ACA ($f^2 = 0.104$, $β = 0.232$, $t = 3.242$) relate positively with CSCC. Finally, the results indicate that CSCC has a positive impact on CE performance ($f^2 = 0.124$, $β = 0.332$, $t = 4.741$). The findings support all the proposed hypotheses as shown in Table 4 and Figure 2.

<table>
<thead>
<tr>
<th>Path</th>
<th>Hypothesis</th>
<th>$F^2$</th>
<th>Inner VIFs</th>
<th>Beta</th>
<th>T Statistics</th>
<th>P Values</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>External pressures -&gt; ESC</td>
<td>H1</td>
<td>0.313</td>
<td>1.000</td>
<td>0.488</td>
<td>7.235</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>ESC-&gt; ENC</td>
<td>H2</td>
<td>0.220</td>
<td>1.313</td>
<td>0.454</td>
<td>3.386</td>
<td>0.001</td>
<td>Supported</td>
</tr>
<tr>
<td>ESC -&gt; ACA</td>
<td>H3</td>
<td>0.277</td>
<td>1.313</td>
<td>0.449</td>
<td>7.195</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>ESC -&gt; CSCC</td>
<td>H4</td>
<td>0.250</td>
<td>1.000</td>
<td>0.436</td>
<td>5.366</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>ACA -&gt; CSCC</td>
<td>H5a</td>
<td>0.104</td>
<td>1.225</td>
<td>0.232</td>
<td>3.242</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>ENC -&gt; CSCC</td>
<td>H6a</td>
<td>0.107</td>
<td>1.225</td>
<td>0.285</td>
<td>3.384</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>CSCC -&gt; CE performance</td>
<td>H7</td>
<td>0.124</td>
<td>1.000</td>
<td>0.332</td>
<td>4.741</td>
<td>0.000</td>
<td>Supported</td>
</tr>
</tbody>
</table>

4.3.2. Mediation effects

This study uses SmartPLS 3 software to conduct bootstrapping mediation analysis to test the indirect effects (Hayes, 2017). Thus, this study uses the bias-corrected bootstrapping approach, which produced 5000 resamples for estimating the indirect effects. This mediation analysis approach is grounded in more robust assumptions of statistical power and normality and has the ability to test several mediation hypotheses in a model (Rungtusanatham et al., 2014). The estimation of the direct and indirect paths between dependent and independent constructs provide the required information to ascertain the existence or non-existence of mediation effects (Zhao et al., 2010). The results of the mediation analysis for the associations between ESC and CSCC through ENC and ACA are shown in Table 5.

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>IV</th>
<th>MV</th>
<th>DV</th>
<th>Effect of IV on MV (a)</th>
<th>Effect of MV on IV (b)</th>
<th>Direct effect (c')</th>
<th>Indirect effect of IV on DV</th>
<th>95% CI for indirect effects</th>
<th>SE of indirect effects</th>
<th>VAF (=a<em>b/a</em>b+c')</th>
<th>Mediation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>H5b</td>
<td>ESC</td>
<td>ACA</td>
<td>CSCC</td>
<td>0.449</td>
<td>0.232</td>
<td>0.436</td>
<td>0.128</td>
<td>0.053-0.217</td>
<td>0.043</td>
<td>0.20</td>
<td>Partial</td>
</tr>
<tr>
<td>H6b</td>
<td>ESC</td>
<td>ENC</td>
<td>CSCC</td>
<td>0.454</td>
<td>0.285</td>
<td>0.436</td>
<td>0.198</td>
<td>0.085-0.306</td>
<td>0.055</td>
<td>0.23</td>
<td>Partial</td>
</tr>
</tbody>
</table>
5. Discussion

The results confirm external pressure as an important factor that positively influences ESC. This indicates that pressures from regulatory institutions, civil society organisations and community members impact SMEs’ decision to commit to protecting the natural environment. However, this is inconsistent with Dubey et al. (2019), who discover that normative pressure has insignificant impact on top management’s commitment in the context of CE in India.

On the part of the impact of ESC, the findings affirm that ESC enhances ENC and ACA. This is an indication that SMEs’ commitment towards environmental sustainability has a crucial role to play in developing capabilities to form alliance and engage with stakeholders in their attempt to adopt and integrate circularity into supply chain. These findings are similar with Luzzini et al. (2015) who found positive relationship between ESC and inter-firm collaborative capabilities.

Concerning CSCC, this study’s findings confirm the significant roles of ACA, ENC and ESC in developing CSCC. This study suggests that developing capabilities for engaging and forming alliance with stakeholders help create CSCC, which is consistent with O’Dwyer and Gilmore (2018). What is novel and surprising is that the findings indicate that ESC has a positive impact on CSCC. This suggests that SMEs committed to reducing the energy and material consumption, waste generation and promoting recycling, reuse and remanufacturing develop capabilities that promote circular supply chain practices. This is contrary to existing research perspective, suggesting that SMEs are usually laggards in their commitment to adopting environmental sustainability practices to protect the natural environmental (Jansson et al., 2017).

Regarding the results of the mediation effects, this study confirms ACA and ENC as partial mediators between ESC and CSCC. These findings confirm the relevance of developing the right capabilities for engaging and forming alliance with stakeholders to acquire the requisite skills, experiences, knowledge and resources to ensure effective integration of CE initiatives into supply chain. This is an indication that forming engagement and alliance with stakeholders are effective approaches for SMEs committed to environmental sustainability to overcome their resource constraint and inadequacy to develop capabilities for effective transition towards circular supply chain. Regardless, the partial mediation also indicates that it is possible for
SMEs in Ghana, committed to protecting the natural environment, to develop CSCC without necessarily, depending on stakeholders’ resources.

Finally, our results support the role of CSCC in improving CE performance. This indicates that to improve CE performance, SMEs acquire the skills, knowledge, and obtain adequate resources to integrate circular economy initiatives into supply chain. This finding is dissimilar to Hong et al. (2018) who report insignificant relationship between supply chain capabilities and both social and economic performance. In summary, the findings establish that not only do stakeholders advance SMEs’ ESC through external pressure, but they can provide essential resources through alliances and engagements to help build capabilities to support CE initiatives of SMEs in supply chain.

5.1. Theoretical implication

This study makes some key theoretical contributions. First, this study contributes to the debates about how to understand SMEs’ resource scarcity by providing empirical evidence about the mechanisms SMEs use to acquire resources from external sources. Of course, the study finds that SMEs in Ghana can directly develop CSCC if they are committed to environmental sustainability, and that we should not underestimate their resources and capabilities. Nevertheless, scholars should also theorize the ways ESC affects CSCC through acquiring skills and knowledge from external sources. Thus, researchers should consider the use of network ties and collaboration as resource acquisition mechanisms for understanding SMEs and circular economy.

Second, this study provides a new insight about the impact of external pressures on SMEs’ ESC. Contrary to the assumptions that external pressures are less effective for driving ESC among SMEs (Hillary, 2004; Jansson et al., 2017; Cantele and Zardini, 2020), this study posits that external pressures play significant role in SMEs’ ESC. This study argues that developing ACA and ENC to have access to new resources and knowledge to become successful at CE implementation is a sign of effective external pressure on SMEs’ ESC. Also, the production of environmental friendly products and growing implementation of environmental responsible practices and processes among manufacturing SMEs to meet customers’ requirements, have access to the global market, protect the natural environment, and avoid environmental fines are signs of effective external pressures.

Third, this study advances existing literature by confirming CSCC as a capability that enhances SMEs’ CE performance. Unlike previous studies that consider CE performance from only environmental perspective (Awan et al., 2021; Bag et al., 2021; Agyabeng-Mensah et al.,
2021), this study provides insights into comprehensive evaluation of CE performance from the environmental, social and cost perspectives.

Fourth, though institutional pressure and SNT have been applied in supply chain literature. Yet, these theories have not been jointly used, particularly, to explain the role external pressures from multiple stakeholders play in SMEs’ ESC and mechanisms SMEs use to access external resources to resolve the issue of resource scarcity. Thus, providing empirical evidence about the distinct role of external pressures in developing ESC as well as the mediating roles of ACA and ENC in developing CSCC in Ghana, extends these theories and serves as a contribution to theory.

Finally, this study provides contextual relevance to literature. A few research in CE have been conducted in developing and lower income countries such as India, China and South Africa. Meanwhile, differences in crucial contextual factors such as technology, policies, and regulatory framework may vary the outcome of environmental sustainability and CE implementation of firms in each of the developing countries. Thus, conducting this study in the Ghanaian context; in response to Pereira et al. (2022) and Zhang et al (2021) brings another perspective of understanding of CE issues of SMEs in different developing countries.

5.2. Managerial and policy implications

Studies that focus on institutional pressures, ESC, ENC, ACA and performance in sustainability are not new. Nonetheless, this study’s findings can be of importance to managers and policy makers.

First, it is obvious that stakeholders express their expectations and demands through pressures, which can be translated into actions through ESC. Thus, managers of SMEs should ensure that they clearly understand the expectations and demands of stakeholders and institutions to adopt environmental strategies and practices to meet them. Also, managers of SMEs should ensure that they organise sustainability focused training programs for themselves and their employees to acquire the right skills, knowledge and expertise to effectively implement CE practices in supply chain.

Second, the findings show that the resources of stakeholders play crucial role in developing capabilities that facilitate the success of CE adoption in supply chain. This study urges managers of SMEs to ensure that they build collaborative alliances and engagements with their stakeholders in order to benefit from their resources to implement circular supply chain practices. For instance, SMEs can form alliances and engagements with customers, suppliers, tertiary institutions and NGOs, such as Ellen McArthur Foundation to obtain resources, skills
and knowledge to engage in capital intensive research and development projects in the area of CE.

Third, the findings have proven that SMEs’ resolve to develop the right capabilities for CE implementation reflect positively in their performance. Managers, are thus, urged to ensure that their firms transition from the linear model of supply chain to CE model to achieve resource efficiency, reduced waste and energy and provide customers with quality products at reduced cost. This is likely to make them remain relevant and outperform their competitors in today’s highly environmentally focused and cost sensitive market.

Fourth, this study’s findings also have implications for policymakers. It is obvious that SMEs can have a crucial role to play in achieving circularity at the macro, meso and micro levels. However, lack of government support and unfavourable policies, especially in developing countries, hamper their environmental commitment. This study urges policy-makers to make policies that specifically target SMEs. For instance, the government can scrap all taxes on recycled and recyclable materials, provide tax exemptions for firms adopting CE practices, and ensure that there are available and accessible credit facilities for SMEs engaging in CE practices. The government should make a policy that sets up a fund for SMEs that collaborate and form alliance to undertake important research projects in CE. Also, circular economy focused digital platforms should be built to provide avenues for SMEs with common interest to meet to engage and form alliances for CE.

In addition, the government can make policies that enjoins every electronic media to integrate CE initiatives into their daily programs to create more awareness and education for firms. Finally, the government can organise CE seminars, symposiums and conferences for managers of SMEs to equip them with skills, knowledge and information for CE implementation.

6. Conclusion

The integration of CE into supply chain is an emerging area both in practice and research (Lahane et al., 2020). In response to the call for more studies in CE to be conducted in SMEs, this study combines institutional theory and UET to develop a research model consisting of six components, including, external pressure, ESC, ENC, ACA, CSCC and CE performance. The model also contains controlled variables - geographical location, firm size, firm age and industry type to account for other factors that could affect CE performance.

The study uses cross sectional survey data gathered from 124 managers from Ghanaian SMEs to empirically test the research model. The results suggest that ESC, ACA, CE performance, CSCC, ENC, and were 11%, 23.8%, 44.4%, 28.6%, and 37.8% of variance respectively.
Similar to existing perspective in sustainability literature, this study’s findings reveal that external pressure plays a significant role in the environmental commitment of SMEs. Meanwhile, it is surprising to find that SMEs’ ESC is adequate to motivate the adoption of CE practices in supply chain to enhance CE performance.

The findings also prove that SMEs in Ghana do not necessarily require to build a resourced focused alliances and engagement with stakeholders to achieve success in CE implementation in their supply chain. This is confirmed by the partial mediation of ACA and ENC between ESC and CSCC. The findings also claim that SMEs’ CSCC is crucial for achieving CE performance goals. In the end, the findings indicate that not only do stakeholders act as pressure groups to force SMEs vary their approach to circularize their supply chain activities, but they also provide resources for their implementation.

Similar to any research, the current study is not without limitations. Firstly, to improve the generalizability of the findings of this study, three research areas could be followed: (a) this research focused on only SMEs in Ghana. Future research may assess the proposed model in using other SMEs in other continents to offer thought-provoking comparative insights (b) future research may assess the proposed model in the context of large manufacturing firms. (c) a novel model may be proposed to assess the predictors of circular supply chain capability in service-oriented firms. This study uses cross-sectional design and self-reporting survey data which may create response and method biases. Despite our significant effort to curtail this, future studies may use longitudinal data, which may improve the reliability and validity of results.

References:


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Ziggers, G. W., & Duysters, G. M. (2004). “Alliance capability and relational capital: implications for alliance success”. In Demand Driven Chains and Networks (pp. 31-56). Reed Business.

### Appendix 1

#### Items for measuring the constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External pressure</strong></td>
<td>1. Adoption of UN environmental conventions/directives/regulations</td>
<td>Singh et al. (2018), Centobelli et al. (2021)</td>
</tr>
<tr>
<td></td>
<td>2. Regulatory institutions insist on following stringent rules and regulations in development of eco-efficient waste management methodology in production and supply chain processes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Strong social responsibility are appreciated by customers and suppliers and attract collaborations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Community demands the adoption of circular economy practices in supply chain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Civil society organisations demand the adoption of circular economy practices in supply chain</td>
<td></td>
</tr>
<tr>
<td><strong>ESC</strong></td>
<td>1. My firm considers the potential environmental consciousness of product and production process</td>
<td>Sendawula et al. (2020)</td>
</tr>
<tr>
<td></td>
<td>3. My firm’s top management assumes responsibility for environmental quality</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. My firm values the environment and describe ourselves as environmentally responsible firm</td>
<td></td>
</tr>
<tr>
<td><strong>ACA</strong></td>
<td>1. My firm has experience in supply chain alliances to achieve its strategic goals</td>
<td>Leischning and Geigenmüller (2020), and Bag and Rahman (2021)</td>
</tr>
<tr>
<td></td>
<td>2. My firm always evaluates new partner opportunities to contribute to the core business</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. My firm has specific training programmes for managers and supply chain partners to optimize alliances</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. My firm has institutionalized routines to evaluate supply chain alliances activities</td>
<td></td>
</tr>
<tr>
<td><strong>ENC</strong></td>
<td>1. My firm engages its suppliers and customers to provide their inputs into production</td>
<td>Anning-Dorson and Nyamekye (2020) and Bag and Rahman (2021)</td>
</tr>
<tr>
<td></td>
<td>2. My firm engages its suppliers and customers to contribute to product design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. My firm engages suppliers and customers to share their environmental experiences</td>
<td></td>
</tr>
<tr>
<td><strong>CE performance</strong></td>
<td>1. My firm has improved the quality and durability of products</td>
<td>Jabbour et al. (2019), Agyabeng-Mensah et al. (2021), and Jain et al. (2020)</td>
</tr>
<tr>
<td></td>
<td>2. My firm has reduced supply related risks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. My firm has decreased energy consumption and its associated cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. My firm has reduced waste generation and treatment and its associated cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. My firm has decreased material usage and its associated cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. My firm has reduced environmental accidents and fines.</td>
<td></td>
</tr>
<tr>
<td><strong>Please provide your rate from (1) strongly disagree to (5) strongly agree</strong></td>
<td>1. My firm’s managerial processes supports reuse, remanufacturing and recycling of materials</td>
<td>Del Guidice et al. (2020)</td>
</tr>
<tr>
<td></td>
<td>2. My firm has information systems to manage its ability to monitor circular supply chains activities</td>
<td></td>
</tr>
<tr>
<td>CSCC</td>
<td>3. My firm’s product design and manufacturing processes support reuse, remanufacturing and recycling of materials</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. My firm’s supplier selection and management processes support reuse, remanufacturing and recycling of materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. My firm’s human resource management processes support reuse, remanufacturing and recycling of materials</td>
<td></td>
</tr>
</tbody>
</table>