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Transition to the circular economy under the pressure of the COVID-19 pandemic and stakeholders: application in international firms toward sustainable development goals

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ABSTRACT

This research aims to examine the influence of stakeholders and the COVID-19 pandemic on the transition towards a circular economy of firms, as well as the consequences of this transition on sustainable development. Using the SEM-PLS model to analyze survey data from 358 international firms, the research indicated that pressure from the COVID-19 outbreak, and the involvement of stakeholders affected the shift to a circular economy. The COVID-19 epidemic has caused huge issues for the whole planet, but it is also seen as a crucial motivator for expediting the move to a circular economy. The transition to the circular economy in companies has been demonstrated to be negatively impacted by obstacles and barriers resulting from stakeholder pressure, while the transition is positively impacted by opportunities and advantages supplied by stakeholders. In addition, the study reveals that the shift to a circular economy will aid multinational firms in achieving sustainable development. A range of recommendations are made in light of the study's results for assisting businesses undertake a transition to a circular economy.

IMPACT STATEMENT

The COVID-19 epidemic and rising stakeholder pressures have increased the need to transition to a paradigm of economic development that extends the product life cycle. This study expands the existing knowledge about the stakeholder and COVID-19-driven pressures on firms throughout the globe to adopt a circular economy model and to verify that such an economic model may indeed lead to sustainable development. Based on our research, we recommend that certain stakeholders undertake measures to mitigate the primary obstacle to the adoption of a circular economy inside the organization. This includes resolving challenges such as interdepartmental communication barriers and the ambiguity around departmental duties related to circular economy initiatives inside companies. Furthermore, the emerging technologies of Industry 4.0 have the potential to enable the implementation of circular economy practises. Therefore, it is essential for managers to be aware of the need to transition to digital supply chains to effectively implement circular economy principles. Another solution is that businesses from different industries should link together and build a system to turn waste from one industry into another industry's raw materials, or in other words, recycle thoroughly and efficiently to minimize the amount of waste released into the environment.

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1. Introduction

The severe climate change that threatens the future of the world has attracted the attention of society over the last two decades. Promoting an economy that respects the environment is considered a human responsibility in a globalized world that is endangered by climate change. In order to achieve

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sustainable development objectives, more modern production techniques must be adopted due to global warming and the exhaustion of natural resources. The circular economy is often regarded as a highly effective solution for accomplishing systemic transformation.

The concept of the circular economy involves to a novel economic framework that seeks to supplant the termination of a product's life cycle through the implementation of strategies such as reduction, reuse, recycling, and material recovery throughout the stages of consumption, distribution, and production. The overarching objective of this approach is to attain sustainable development, foster an environment of high quality, promote prosperity, and ensure social justice, all for the betterment of both current and future generations (Kirchherr et al., 2017). The framework for achieving this is included in Agenda 2030 (United Nations, 2020), specifically named the Sustainable Development Goals. In this context, the transition to the circular economy will become an indispensable need for businesses to meet the requirements of sustainable development. The circular economy will reduce the risks of overproduction and resource shortages by promoting investment in technological innovation, cutting production costs, and expanding supply chains. Additionally, it has emerged as the primary engine guiding governments, businesses, and individuals toward sustainable development (Ilić & Nikolić, 2016; Michelino et al., 2019; Silva et al., 2019; Tura et al., 2018). Recently, the circular economy has risen to the top of the political agenda, where it is anticipated to foster economic growth by generating new businesses and job opportunities, saving materials' costs, limiting price volatility, enhancing supply security, and reducing environmental stresses and impacts (Aloini et al., 2020; EC, 2014a; 2014b; 2015). It has been estimated that the possible benefits of implementing a circular economy would amount to €7.3 billion annually in market values, generate 50,000 new jobs and €12 billion in investment in the United Kingdom, and create 54,000 jobs and innumerable environmental benefits in the Netherlands (Kalmykova et al., 2018).

According to stakeholder theory, effective companies are those that can adapt to the demands and expectations of stakeholders (Mani & Gunasekaran, 2018). Stakeholders may be individuals, organizations, or even governmental bodies who are impacted by or have a significant interest in the actions and results of an organization (Mitchell et al., 1997). Stakeholder theory suggests that a firm that only prioritizes financial measurements of success would fail to adequately address the needs and interests of its most vital stakeholders (Friedman & Miles, 2006). Customers, governments, investors, employees, financing organizations, as well as mass media all seem to put pressure on businesses' goals regarding sustainability practices, which include a circular economy, according to the literature (Jakhar et al., 2018; Mitchell et al., 1997; Sarkis et al., 2010; Silva et al., 2019). The COVID-19 has redirected focus towards local manufacturing as a catalyst for a strong and adaptable economy, as well as for generating employment opportunities. It has also prompted a shift in consumer behaviour, highlighted the importance of diversifying and making supply chains more circular, and showcased the efficacy of public policy in tackling urgent socioeconomic challenges. Hence, the formulation of a sustainable future plan necessitates the government's dedication to forging a novel trajectory towards socioeconomic development, alongside the collaboration of local enterprises and consumers to expedite the shift towards a circular economy (Ibn-Mohammed et al., 2021). Typically, businesses implement circular economy principles to improve their social, environmental, and economic indicators (Geissdoerfer et al., 2018). According to Merli et al. (2018), the circular economy adopts a sustainability viewpoint since its goals are linked with those of future generations as a result of efforts to preserve the natural environment.

The incentive to apply circular economy solutions has grown in response to demand from numerous stakeholders (Ghinoi et al., 2020; Gupta et al., 2019), as well as the COVID-19 pandemic (Ibn-Mohammed et al., 2021). However, little research has been conducted on how stakeholder pressure, COVID-19, and the adoption of the circular economy interact. Also, Korhonen, Nuur et al. (2018) argue that the notion of circular economy has emerged without a solid theoretical foundation. Thus, Friedman and Miles (2006) base their research on stakeholder theory to overcome this constraint of circular economy-related literature. Although the circular economy issue has lately gained attention, most relevant research are still in the exploratory stage and are based on qualitative research and theoretical reviews, indicating a lack of empirical evidence (Govindan & Hasanagic, 2018). Simultaneously, the linkage between the circular economy and sustainable development needs to be provided with more concrete empirical evidence (Jabbour et al., 2020).

Based on the previously identified research gap, the purpose of this research is to investigate the stakeholder and COVID-19-driven pressures on firms throughout the globe to adopt a circular economy model and to verify that such an economic model may indeed lead to sustainable development. The study contributes to the circular economy research literature in several ways. First, we enrich the existing knowledge about the determinants of the transition to a circular economy by extending the research of Ibn-Mohammed et al. (2021) and Jabbour et al. (2020). Second, this study presents the first attempt to empirically examine COVID-19 on the circular economy transition of firms. Third, we offer a novel viewpoint on the impact of stakeholders and COVID-19 pressure on a variety of businesses and industries internationally. Fourth, we also contribute to the research strand regarding the consequences of moving to a circular economy on sustainable development, in the view of Geissdoerfer et al. (2018), which focuses on three distinct aspects: a sustainable economy, a sustainable environment, and a sustainable society. This research is expected to provide scientific insight for organizations dealing with stakeholder pressure and COVID-19 in the transition to a circular economy for sustainable development.

Following the introduction, the research is organized into six parts. Section 2 introduces the fundamental concepts investigating in the research. The development of hypotheses will be provided in Section 3. The study's methodology is described in Section 4. Section 5 offers the research findings, whereas Section 6 analyses the results of the study. Section 7 concludes the paper by highlighting the main findings and implications of the research.

2. Conceptual framework

2.1. Circular economy

The idea of a circular economy is derived from a number of previous concepts; nevertheless, global interest in its development has only lately been reignited. Because of China's early embrace of the circular economy as a national policy, the 'circular economy' was largely explored in publications documenting progress in China prior to 2012. The objective of this strategy was to foster sustainable urban development in China while also establishing a harmonious equilibrium between rural and urban areas. Reallocating resources and reducing waste were considered to be effective strategies for retaining rural residents. Three levels were to implement the circular economy in China: individual businesses, eco-industrial complexes, and eco-cities/municipalities (Geng et al., 2013; Geng & Doberstein, 2008; Mathews et al., 2011; Wu et al., 2014; Yuan et al., 2006). The notion of circular economy was subsequently refined and polished from these initial roots.

Guarnieri et al. (2020) assert that the circular economy has gained worldwide recognition as an emerging business model that emphasizes the synchronization of the whole supply chain to mitigate adverse environmental effects. The concept of the circular economy pertains to a framework of production and consumption that seeks to optimize resource use and waste management by means of recycling and reutilization, while avoiding unnecessary consumption of natural resources and optimizing waste treatment processes through the exchange of advanced technologies (Van Buren et al., 2016). The primary goal of the circular economy is to effect change thinking from 'exploit, produce, and dispose' to a circular one, where 'reduce, reuse, re-repair, and recycle' are principles that need to be appreciated (Genovese et al., 2017). The concept of the circular economy emerged from the field of industrial ecology (Geng & Doberstein, 2008), and according to MacArthur (2013) it has been proposed as a viable and environmentally-friendly alternative to the current economic model. The adoption of the circular economy model should be analyzed through consideration of the needs of the stakeholders, as they can be a trigger or impediment to the circular economy initiatives. Therefore, businesses are looking for ways to meet the needs and maximize the profits of stakeholders, which will allow them to grow sustainably and survive in the long run.

2.2. Pressure from the COVID-19 pandemic

The COVID-19 pandemic has put the world under a lot of pressure when the global supply chain is interrupted; the environmental, economic, and social aspects are severely affected, leading to the

impediment of the Sustainable Development Goals. On the positive side, the pandemic has led to significantly reduced pollution from vehicles and factory emissions in many countries (European Environmental Agency, 2020; Ibn-Mohammed et al., 2021). In addition, the environment also experienced a recovery and noticeable changes in appearance when tourists were not allowed to visit during the pandemic period (Zambrano et al., 2020). However, on the negative side, the pandemic caused a serious decline in national GDP in many countries when the economy was stalled and the borders were closed (Ibn-Mohammed et al., 2021). The pressure of COVID-19 has also disrupted the global supply chains, causing crises in sourcing and material supply strategies for companies. According to Naidoo and Fisher (2020), the pressure of the COVID-19 pandemic hinders the Sustainable Development Goals (SDGs) when half of the 169 goals in the SDGs will not be completed on schedule in 2030. In this context, the impact of the COVID-19 pandemic has become a challenge that companies must face. The COVID-19 epidemic has significantly affected the handling of medical waste, posing a serious threat to the environment. It has also increased the amount of medical equipment consumed, such as paper masks, face shields, gloves, etc., which have an enormous impact on recycling and waste disposal. Therefore, the circular economy is known as a useful tool to recover and maintain sustainable development during and after the pandemic.

2.3. Pressures from stakeholders

A stakeholder is an interested party in the company that can influence or be affected by the business and the performance of the business. Without stakeholder support, an organization cannot function and pursue sustainable growth. In addition to the advantages and opportunities, businesses also encounter numerous barriers and challenges in order to fulfill the requirements and optimize the objectives of the stakeholders, with the aim of attaining a competitive edge and ensuring long-term sustainability in the market (Jabbour et al., 2020).

2.3.1. Barriers and challenges

Different stakeholder interests may lead to disputes, drawbacks, and difficulties for a business, according to the International Federation of Accountants (2012). For example, customers want to experience high-quality products and services at reasonable prices, and the community expresses a desire for enterprises to mitigate the environmental repercussions of their manufacturing operations. Shareholders want high profits and dividends, so they want to save maximum production costs and buy cheap, less environmentally friendly materials. In this situation, an organization, whether large or small, must find a way to identify, balance, and address the interests that each stakeholder requires to be considered. This has become a major challenge for a business in transition to a circular economy.

2.3.2. Advantages and opportunities

Jakhar et al. (2018) suggest that stakeholder pressure can encourage businesses understand and appreciate the importance of circular economy activities. According to Mitchell et al. (1997), consumers and governments are the primary drivers of business aspirations for sustainable development activities, including the shift to the circular economy. Govindan and Hasanagic (2018) assert that the government, by means of regulations, initiatives, and assistance to businesses and the economy, is the most influential stakeholder in the adoption of the circular economy. Meanwhile, customers are increasingly concerned about environmental issues. Customers choose environmentally friendly products because they receive information about those products through government announcements or from the community's shopping trends according to the 'crowd effect' (Abdul et al., 2017). When firms handle difficulties and seize possibilities presented by stakeholders, the move to the paradigm of the circular economy becomes much simpler. Hence, the organization might move towards sustainable development because the goal of the circular economy is in line with the goals of future generations to preserve the natural environment (Jabbour et al., 2020).

2.4. Sustainable development

According to Johnston et al. (2007), there exist a multitude of 300 different definitions related to the concept of sustainability. The concept of sustainability encompasses human actions aimed at maintaining the ecological functioning of the earth's ecosystems, as defined by ISO 15392, 15392, 15392 (2008). Sustainability, according to McMichael et al. (2003), is a lifestyle adjustment that increases the likelihood that living situations will constantly support security, well-being, and health. United Nations Brundtland Commission (1987) of the United Nations described sustainable development as development that can simultaneously satisfy the requirements of the current generation without compromising the development capacities and potentials of future generations, while being aware of limitations in the planets' resources (Meadows et al., 1972) and synergies and trade-offs among economic, environmental, and social development (Elkington & Rowlands, 1999; Meadows et al., 1972).

The circular economy is gaining popularity as a comprehensive or partial answer to sustainable development (Geissdoerfer et al., 2017). Table 1 illustrates the relationships between the many elements of a circular business model, namely the value proposition, creation and delivery system, and value capture, and their impact on the core dimensions of economic, environmental, and social sustainability (Lozano, 2008). In relation to the value proposition, it is imperative for the organization to effectively convert its fundamental mission and vision into products and services that yield adequate revenue to encompass both direct and indirect expenses. These offerings should be developed in alignment with eco-design and design for disassembly principles, while also fostering sociocultural well-being. Furthermore, they should ensure the organization's enduring ability to address economic, environmental, and social issues in the long run. It is essential to establish a value network of stakeholders who are motivated by and actively contribute to economic sustainability, environmental benefits, social considerations, and preparedness for enduring business challenges.

On this basis, the sustainable development model suggested by Geissdoerfer et al. (2018) was employed in this study. This model suggests that sustainable development should focus on three distinct aspects: economy, environment, and society.

2.4.1. Sustainable economy

Lorek and Spangenberg (2013) stated that the basis of a sustainable economy is the recognition of natural resources as a common human heritage; therefore, it requires equal sharing among the present generation while at the same time still remaining valuable for future generations. Adopting a sustainable economy offers several benefits, such as lowering expenses related to energy and raw material usage, optimizing waste management strategies, regulating emissions, and decreasing the environmental tax burden on companies (Korhonen, Nuur et al., 2018). In order to achieve a sustainable economy for the whole society, organizations need to build a sustainable macro-economy, protect and ensure long-term development, and at the same time respect the ecological limits of the environment to support long-term sustainability (Jackson, 2009).

Table 1. The circular economy's implementation of sustainability aspects.

Sustainability dimensions	Circular business models		
	Value proposition	Value creation and delivery system	Value capture
Economic	Providing (goods and services) to increase profits	Incentives for supply chain participants to prolong product usage and bring waste back under control	Profit for each stakeholder, or at the very least a positive outcome
Environmental	Providing (goods and services) intended to reduce the loss of natural resources	Environmentally friendly production and logistics	Reduced environmental effect via increased value from decreased usage of natural resources
Social	Optimize the value of products and services for the benefit of society	Proactive engagement with stakeholders in closed loops	Increase the impact of environmental concern on product pricing

Source: Geissdoerfer et al. (2018).

2.4.2. Sustainable environment

As to the findings of the United Nations World Commission on Environment and Development (2018), the implementation of sustainable environmental practices is crucial in guaranteeing the availability of natural resources for future generations, enabling them to maintain or improve their quality of life in a manner comparable to that of present generations. According to the International Union for the Conservation of Nature (2019), a sustainable environment may be characterized as the restoration of equilibrium in the intricate interplay between human civilization and the natural world. In a more specific context, a sustainable environment refers to the capacity to enhance the standard of human existence while coexisting harmoniously within an ecological system.

2.4.3. Sustainable society

Sustainability society refers to the capacity of a place to consistently operate as a sustainable and enduring habitat for human interaction and cultural development (Yiftachel & Hedgcock, 1993). According to Eizenberg & Jabareen (2017), the outcomes of social sustainability are linked to principles of urban planning and design, such as transport sustainability or city greening. Källström & Ljung (2005) point out that the quality of the social and ecological system is resilient to the system, thereby ensuring that economic behavior will change from 'production-consumption-waste' to 'production-consumption-reuse', towards the sustainability of social life. Sustainable societies have a positive impact on generating job prospects in activities linked with the adoption of innovative business models (Korhonen, Nuur et al., 2018).

2.5. The linkage between stakeholder & COVID-19 pressure, circular economy and sustainable development

Stakeholder theory is widely regarded as a robust theoretical framework for comprehending contemporary sustainability ideas, including the principles of the circular economy (Sarkis et al., 2011). The theoretical underpinnings of the interaction between stakeholder theory and circular economy principles are rooted in the established connections between corporate social responsibility and stakeholder theory (Jamali, 2008). Successful businesses, according to stakeholder theory (Donaldson & Preston, 1995; Friedman & Miles, 2006), are those that can adapt to the challenges and expectations of their stakeholders (Mani & Gunasekaran, 2018). According to the stakeholder theory, a business would be disregarding its important stakeholders if it just concentrates on financial metrics of success (Friedman & Miles, 2006). Clients, governments, investors, workers, non-governmental groups, and the media all seem to apply pressure on companies' goals regarding sustainability activities, which include circular economy (Jakhar et al., 2018; Mitchell et al., 1997). Research in this domain has emphasized the significance of involving stakeholders to speed up the shift from a traditional to a circular economy model (Ghinoi et al., 2020; Gupta et al., 2019). In this regard, Winans et al. (2017) contend that the unsuccessful adoption of circular economy is hampered by the lack of stakeholder engagement and involvement.

Pandemics, at the very least, lead to a dual crisis that puts a burden on the healthcare system and the economy. In light of the ongoing COVID-19 epidemic, this is an opportune moment to think about how the ideas of a circular economy may be put into practice after the global economy has begun to recover. This is noteworthy because the pandemic has brought attention to the deficiencies of the prevailing linear economy, exposing the weaknesses of the global ecosystem to risks such as climate disruption, vulnerabilities in supply chains, social disparities, and inherent fragility (Bachman, 2020; Sarkis et al., 2020). The interconnectedness of environmental, economic, and social sustainability has become more apparent as the world economy rebounds from the impact of COVID-19 (Bauwens et al., 2020).

Firstly, there is a requirement for a framework that promotes the widespread adoption of a more robust low-carbon circular economy model. The importance of this matter stems from the projections made by scholars, indicating that climate change is poised to provide a more substantial risk to world health when compared to COVID-19 (Hussey & Arku, 2020; Watts, Amann, Arnell et al., 2018; Watts, Amann, Ayeb-Karlsson et al., 2018). International authorities and regulations have emphasized that shifting to renewables alone would not result in substantial emissions reductions but must be supplemented by circular economy initiatives. The benefits of circular economy for the environment include decreases in the production of trash and pollutants as well as the usage of virgin resources. In addition, renewable

waste may be recycled or recovered, hence enhancing the efficiency of resource utilisation (Korhonen, Honkasalo et al., 2018). Allocating funds towards climate-resilient infrastructure and the shift towards a circular and low-carbon economy has the potential to provide employment opportunities, while simultaneously enhancing both the ecology and the economy.

Furthermore, as stated by Haigh and Bäunker (2020), if we persist in navigating each new crisis by relying on the current economic model and using short-term strategies to mitigate the adverse effects, we will consistently find ourselves overwhelmed by following shocks that surpass our capabilities. This prediction is based on the assumption that we will continue to make the same mistakes. To shift focus from the current prioritisation of profits and imbalanced economic growth, it is crucial to establish enduring risk-reduction and fiscally sustainable policies. In the context of the circular economy, resilience primarily pertains to the optimisation of cycles. This entails designing items for durability and optimising their disassembly and reuse processes, making them easier to handle and convert. The economic advantages include a decrease in expenditures associated with energy and raw material consumption, waste management technologies, emission control, and the payment of environmental taxes (Korhonen, Honkasalo et al., 2018). Moreover, investing in circular economy strategies might increase the market value of firms.

Lastly, Preston et al. (2019) contended that implementing a circular economy might alleviate existing tensions and conflicts arising from an inequitable distribution of resources. This can be achieved via the adoption of participatory modes of governance that include the active involvement of local stakeholders in resource management efforts. This objective can be advanced by implementing closed-loop value chains, a component of the circular economy, whereby refuse is transformed into valuable resources to reduce pollution and promote social inclusion. The social advantages also include the creation of employment possibilities within activities associated to completing the loop, and as a result of new business models (Korhonen, Honkasalo et al., 2018).

This article adopts Geissdoerfer et al. (2018) viewpoint on sustainability and defines sustainable development as the harmonious and methodical incorporation of economic, social, and environmental performance within and between generations. The notion of a circular economy is gaining popularity as a viable remedy for sustainable development, and it is increasingly being regarded as a comprehensive or partial answer to these issues (Geissdoerfer et al., 2017). From the above arguments it can be seen that stakeholder pressure and the COVID-19 pandemic have expedited the transition of companies to a circular economy, which in turn will support sustainable development on three facets proposed by Geissdoerfer et al. (2018): a sustainable economy, a sustainable environment, and a sustainable society. This study presents empirical evidence of the impact of adopting circular economy principles on sustainable development with specific hypotheses presented in [Section 3](#).

3. Hypotheses development

3.1. Pressures from COVID-19 and the transition to the circular economy in organizations

The COVID-19 pandemic has significantly affected the conventional economy, hence highlighting the significance of the circular economy, in which people will use resources more economically and effectively while reducing negative impacts on the environment (McKenzie, 2020; Ibn-Mohammed et al., 2021). Pressure from the COVID-19 pandemic pushes organizations to switch to the circular economy to adapt to the pandemic context by using fewer materials, reusing more, and creating longer product life cycles. Businesses that implement the circular economy principles have been able to save a substantial amount of money and increase their profits, creating opportunities for recovery and enhancing their competitiveness with traditional businesses in the direction of sustainable development. Sarkis et al. (2020) also support the above hypothesis when arguing that the impact of COVID-19 helps organizations see the importance of recycled materials, when supply chains are broken by the pandemic. Therefore, the adoption of the circular economy principles has minimized the impact of production activities on the environment, thereby moving towards sustainable development (Bachman, 2020; Sarkis et al., 2020).

Hypothesis 1: Pressure from the COVID-19 pandemic has a positive impact on the transition to the circular economy in businesses.

3.2. Barriers and challenges from stakeholder pressure and the transition to the circular economy in organizations

Stakeholders often apply pressure on the corporate goals related to sustainability initiatives, especially those related to the circular economy (Jakhar et al., 2018; Mitchell et al., 1997; Silva et al., 2019). Worker involvement and devotion are critical, in addition to customer desire for greater socially conscious behaviour (Govindan & Hasanagic, 2018). Russell et al. (2019) discovered that external stakeholders have a stronger influence on the implementation of the circular economy than internal stakeholders. Govindan and Hasanagic (2018) conclude that the government is the most crucial stakeholder in the circular economy. Government activities have a significant role in the formulation of institutional policies that promote the adoption of a circular economy, which can be both an opportunity and a challenge for enterprises. Recent studies have identified many obstacles to the implementation of the circular economy. These include a lack of skilled workforce, bureaucratic procedures and regulations, limited technological solutions, and insufficient financial resources (De Jesus & Mendonça, 2018; Garcés-Ayerbe et al., 2019).

Hypothesis 2: Barriers and challenges from stakeholder pressure has a negative impact on the transition to the circular economy.

3.3. Advantages and opportunities from stakeholder pressure and the transition to the circular economy in organizations

In most countries, government intervention can stimulate organizations to choose to innovate towards the circular economy as well as to act towards sustainable development (Ilić & Nikolić, 2016; Michelino et al., 2019; Tura et al., 2018). Consequently, the government's backing of the regulatory framework may be the true key to the international economy's robust future growth (Aloini et al., 2020). Besides, having the customer return the product to the business at the end of the product life cycle can improve customer loyalty to the business. This presents novel prospects for enterprises to acquire a competitive edge and enhance their reputation (EMF, 2013). Therefore, the advantages and opportunities from stakeholder pressure help organizations realize and understand the value of moving to a knowledge-based economy (Jakhar et al., 2018).

Hypothesis 3: Advantages and opportunities from stakeholder pressure have a positive impact on the transition to the circular economy.

3.4. The transition to the circular economy in organizations and a sustainable economy

Extensive research has firmly proven the correlation between a sustainable economy and a circular economy. The adoption of a circular economy in this scenario will result in economic advantages, including decreased expenses related to energy and raw materials usage, waste management, emission control, and environmental taxes (Korhonen, Nuur et al., 2018). In addition, investing in approaches to a circular economy can increase the firms' market value, as they are not only concerned with profits, but are also interested in long-term development in the future. Jabbour et al. (2020) demonstrated that applying circular economy principles helps organizations meet sustainability indicators in economic performance. Hence, the implementation of circular economy principles will facilitate the attainment of the objective of a sustainable economy by organizations.

Hypothesis 4: The transition to the circular economy in organizations has a positive impact on the sustainable economy.

Hypothesis 4: The transition to the circular economy in organizations has a positive impact on the sustainable economy.

3.5. The transition to the circular economy in organizations and sustainable environment

Considerable scholarly research has been devoted to examining the correlation between the circular economy and environmental sustainability (Geissdoerfer et al., 2017; Parida et al., 2019). Business enterprises often use the fundamentals of a circular economy in order to identify strategies for improving environmental conditions (Geissdoerfer et al., 2018). Merli et al. (2018) argue that the circular economy embraces a sustainability approach by aligning its objectives with those of future generations via endeavours to save the natural environment. The environmental benefits of implementing the circular economy include reduced raw material consumption, waste generation, and emissions. Furthermore, the reuse of renewable wastes will improve resource efficiency (Geng & Doberstein, 2008; Korhonen, Nuur et al., 2018). Murray et al. (2017) argue that the circular economy may prioritise the reconfiguration of material flows, bioenergy, and engineering to enhance the well-being of the natural surroundings.

Hypothesis 5: The transition to the circular economy in organizations has a positive impact on sustainable environment.

3.6. The transition to the circular economy in organizations and sustainable society

The positive impact of the circular economy on an organization's social performance has been extensively analyzed in the literature, whereby companies often apply circular economy principles to improve social benefits in business processes (Geissdoerfer et al., 2018). The transformation of organizations into the circular economy contributes to the creation of job opportunities related to activities that close the loop and open new business models. In addition, the circular economy provides a great potential for addressing unemployment and social issues as more people may get access to job opportunities. Korhonen, Nuur et al. (2018) argue that the economic model that creates profits and guarantees the wellbeing of society will lead to the creation of sustainable values, such as increased social awareness and fair access to goods and services. Consequently, the circular economy not only has a positive effect on people's quality of life, but also ensures the health and safety of employees and those around them, so contributing to the creation of a sustainable society.

Hypothesis 6: The transition to the circular economy in organizations has a positive impact on sustainable society.

4. Research methodology

4.1. Research model and measurements

The authors utilized a Google Forms-created questionnaire to conduct a survey and gather data. The questionnaire utilized in this study was constructed by drawing upon two seminal works authored by Ibn-Mohammed et al. (2021) and Jabbour et al. (2020), as well as additional relevant research sources as indicated in Table 2. First, Jabbour et al. (2020) examined the interrelationships between stakeholder pressures that influence an organization's transition to the circular economy and, consequently, have an impact on the sustainable development goals of these organizations. Second, the model created by Ibn-Mohammed et al. (2021) serves as the basis for the research model examining the impact of the COVID-19 pandemic on the circular economy in organizations. Accordingly, the pressure from the COVID-19 pandemic will be one of the independent variables and simultaneously affect the transition to a circular economy along with pressure from stakeholders.

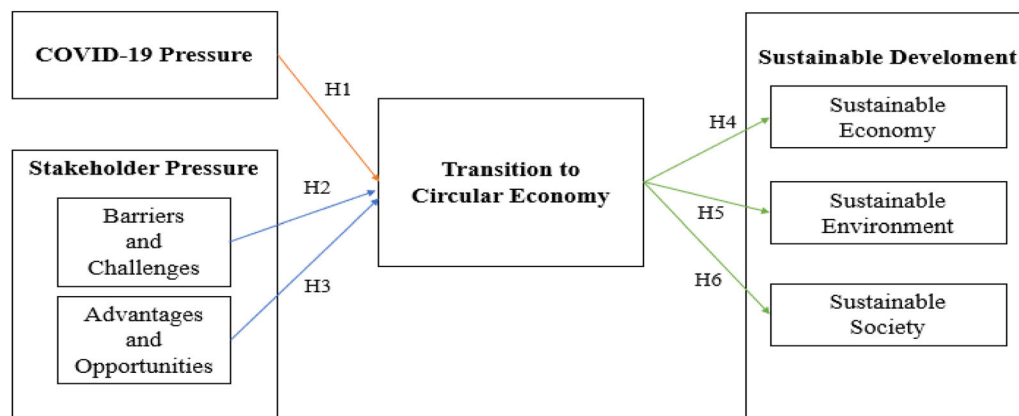
This study uses a questionnaire that was developed from the literature and slightly modified to match the goals and context of the research. The questionnaire utilized in this research comprises of two distinct sections: the first piece included demographic data regarding the participants, while the subsequent component consisted of 42 questions designed to assess 7 distinct constructs. The chosen method for assessing all variables in this study was using a response style that used a 5-point Likert scale, with the endpoints of 'strongly disagree' and 'strongly agree' serving as the anchors. The research model is presented in Figure 1.

Table 2. Measurement variables.

Variables	Items	Measurement	Sources
Pressure from COVID-19 pandemic (PC) ^a	6	Rating (Likert Scale)	(Borrero-Viguera, 2021; Ibn-Mohammed et al., 2021; The authors, 2022))
Stakeholders pressure: Barriers and Challenges (BC)	7	Rating (Likert Scale)	(Jabbour et al., 2020)
Stakeholders pressure: Advantages and Oppotunities (OP)	7	Rating (Likert Scale)	(Govindan & Hasanagic, 2018; Jabbour et al., 2020; Jakhar et al., 2018)
Transition to circular economy (CE)	7	Rating (Likert Scale)	(Garcés-Ayerbe et al., 2019; Ghisellini et al., 2016; Jabbour et al., 2020)
Sustainable economy (SE)	6	Rating (Likert Scale)	(Geissdoerfer et al., 2018; Jabbour et al., 2020; Lorek & Spangenberg, 2013)
Sustainable environment (SE)	7	Rating (Likert Scale)	(Geissdoerfer et al., 2018; Jabbour et al., 2020)
Sustainable social (SS)	7	Rating (Likert Scale)	(Geissdoerfer et al., 2018; Jabbour et al., 2020; Korhonen, Nuur et al., 2018)

^aThe abbreviated names of variables in the model are included in brackets.

Source: The authors (2022).

**Figure 1.** Research model.

Source: The authors (2022).

4.2. Data collection and method of analysis

As per the guidelines established by Tsang et al. (2017), the questionnaire was originally administered in the English language and subsequently translated into Vietnamese. Three main steps are involved: (1) forward translation, (2) backward translation, and (3) pre-testing. Firstly, the researcher performed the initial translation by translating the questionnaire into the mother tongue. Secondly, to prevent bias, the backward translation was then done by an independent translator who was not aware of the topics the questionnaire was meant to measure. Throughout the process, a bilingual expert supported the translator to correct any translation-related misconceptions. The prefinal version (Vietnamese version) was subsequently pilot tested on a small sample of 30 targeted respondents to get their feedback. As a result, the accuracy of the translated version is guaranteed.

The authors delivered survey questionnaires to businesses in a variety of countries, and the study participants are now employed by these businesses. The researchers employed the snowball sampling technique to choose the study participants. With this technique, a small group of volunteers was chosen at the start of the survey, and these individuals were then tasked with finding more acceptable participants for the study. Despite certain limitations, such as the possibility of a relatively small sample size, these concerns were thoroughly taken into account when selecting the initial participants. Nevertheless, given the current COVID-19 pandemic situation where remote work is prevalent and reaching the entire population is difficult, this approach is deemed the most suitable. The online questionnaire was emailed to

750 target respondents. 358 of the 396 completed questionnaires (response rate of 52.8%) are useable, while the remaining 38 exhibit a high possibility of response bias (the majority of responses were limited to 'Neutral' or 'Agree'). Non-response bias may emerge when participants who decline to participate in research are systematically distinct from those who participate. Regarding the 354 non-response questionnaires, they were dispersed fully at random and did not concentrate on a specific set of survey participants. Hence, the bias of the non-response questionnaires was avoided or in other words the differences between respondents and non-respondents are minor. The data collection process took place in 18 countries between June 2021 and December 2021. The targeted countries are distributed mainly in Europe and the Asia-Pacific region, which are typical countries in the transition to a circular economy such as the United Kingdom, Germany, France, and Italy ... in Europe (Garcia-Bernabeu et al., 2020), or China, Japan, Korea, and Australia ... in Asia Pacific (Arthur et al., 2022). The selection of countries with a robust transition to the circular economy by organizations will contribute to the credibility of the study findings. To expand the variety of the sample, opinions on the transition to a circular economy were also gathered from emerging economies such as Vietnam, Thailand, and Indonesia. Additionally, the researchers' accessibility to the survey respondents was taken into consideration while selecting these nations for the sample.

In terms of the questionnaire's format, the demographic questions are used to stratify and categorize the characteristics of the respondents, including a categorization of the participant's country of residence, the organization's industry, and the position they hold within the company.

The results (Table 3) show that out of a total of 358 responses, Vietnam is the country with the most respondents with 88 people, accounting for 24.6%, followed by employees from the UK, China, and Canada, with 57, 42, and 29 people, respectively. Regarding the working industry, the results show that manufacturing, fashion, and construction are the three leading industries, with 110, 82, and 78 people

Table 3. Demographic statistics.

		Frequency	%
Country	Vietnam	88	24.6%
	United Kingdom	57	15.9%
	China	42	11.7%
	Australia	35	9.8%
	Canada	29	8.1%
	Japan	27	7.5%
	Germany	17	4.7%
	New Zealand	12	3.4%
	Korea	8	2.2%
	Singapore	6	1.7%
	Italy	5	1.4%
	France	5	1.4%
	Czech Republic	5	1.4%
	Malaysia	5	1.4%
	Indonesia	5	1.4%
	Poland	4	1.1%
	Thailand	4	1.1%
	Laos	4	1.1%
Industry	Manufacturing	110	30.7%
	Fashion	82	22.9%
	Construction	78	21.8%
	Food & Beverages	44	12.3%
	Technological	15	4.2%
	Electronic	11	3.1%
	Transport service	7	2.0%
	Tourism	4	1.1%
	Medical	4	1.1%
	Finance	2	0.6%
	Media	1	0.2%
Working position	Employee	195	54.5%
	Manager	78	21.8%
	Analyst and Coordinator	42	11.7%
	Supervisor	27	7.5%
	Leader	8	2.2%
	Internship	5	1.4%
	CEO	3	0.8%

Source: The authors (2022).

working in each, respectively. Data from surveys were collected from businesses in 11 industrial sectors, with an emphasis on manufacturing enterprises rather than service organizations, where the transition to a circular economy is more prominent and has a more concrete effect. Finally, when considering the working position of the participants, the result showed that 54.5% of the respondents are employees (195 people) and 21.8% are managers (78 people), accounting for the majority of the total 358 research participants.

Structural equation model (SEM) provide flexibility for testing complex models, including the inclusion of many predictors and criterion variables, the construction of latent variables, and the examination of mediating and moderating effects within a single model. Prominently employed in scientific investigations are two varieties of structural equation modeling: partial least squares structural equation modeling (PLS-SEM) and covariance-based structural equation modeling (CB-SEM). In this study, the PLS-SEM (Partial Least Squares-Structural Equation Models) approach was used for analyzing the data. This is suitable for predictive models that include many highly collinear factors. These models are utilized as path models to investigate the linkages between variables by measuring the strength of a pair of scores (Tobias, 1995). Application analysis is performed using Smart PLS software (Figure 2).

Initially, we evaluated the reliability and validity of construct indicators by assessing the outcomes of the measurement model. We assessed the reliability of the concept by using three measures: Outer Loading, Cronbach's alpha, and Composite reliability. Additionally, the evaluation of convergent validity involves the use of the average variance extracted (AVE), a measurement developed by Fornell and Larcker (1981). Furthermore, authors evaluated the discriminant validity by using the heterotrait–monotrait ratio (HTMT). According to Henseler et al. (2015), a general guideline for evaluating discriminant validity is that the HTMT value should be less than 0.90 or 0.85 for all constructs in the model. Following measurement model evaluation, the next step focused on analysing the structural model, which included examining the Variance Inflation Factor (VIF) and the coefficient of determination. After ensuring the validity of the measurement and structural model, the authors will proceed to examine the relationships through the path coefficient.

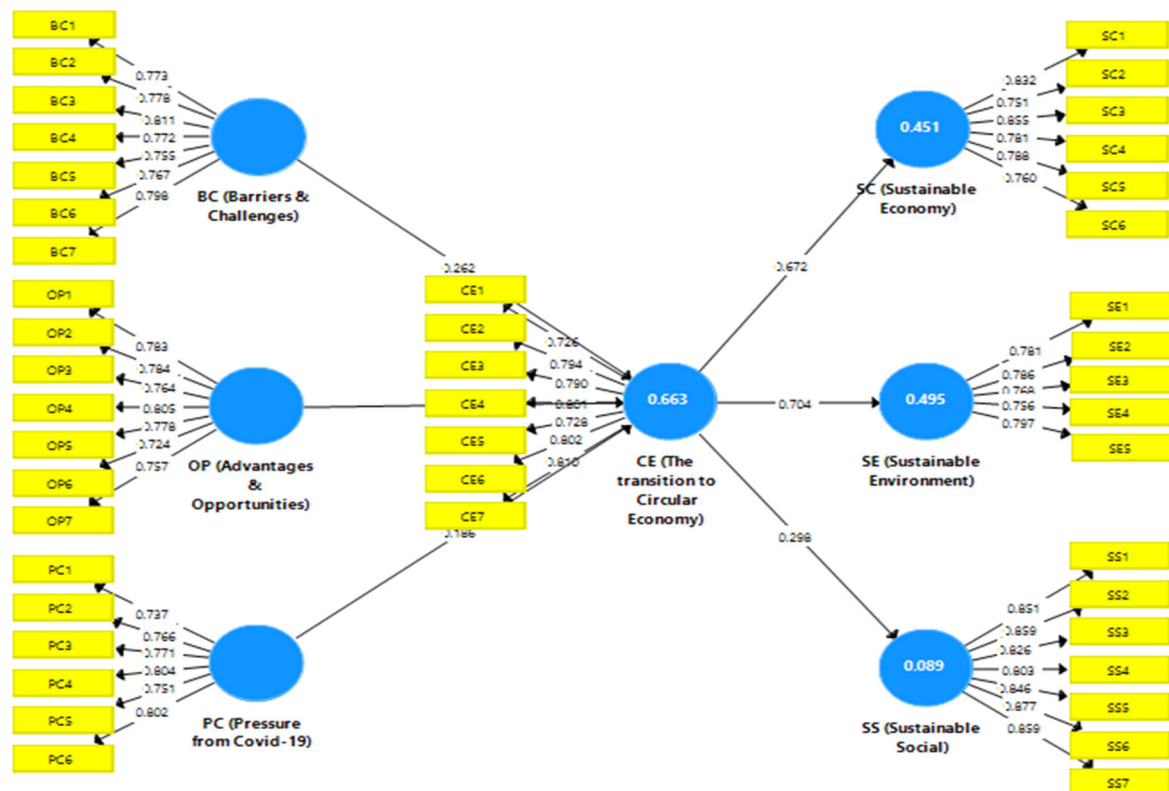


Figure 2. Model examining the linkage between the COVID-19 pandemic, stakeholder pressure, and the transition to a circular economy for sustainable development.

Source: The authors (2022).

5. Research results

The whole content of the questionnaire, which includes items that measure constructs, is outlined in the [Appendix A](#). Upon receiving the questionnaire, the data was encoded using Microsoft Excel software and then analyzed using the SEM-PLS model, using the following particular procedures:

5.1. Measurement model analysis

Three indicators are employed to assess reliability: Composite Reliability, Cronbach's Alpha, and Outer Loadings.

First, the indicator loadings (also known as Outer Loadings in reflective measurement models) assess the satisfactory item reliability, with a suggested minimum value of 0.7 (Hair et al., 2010). Except for 2 factors lower than 0.7 which were removed by the authors to ensure the reliability of the model (SE6; SE7), all other Outer Loadings have values greater than 0.7, meet the recommended threshold level and ensure the reliability of the data. Cronbach's Alpha and composite reliability were employed by the authors to evaluate the internal consistency reliability. Higher values of both measures suggest greater levels of reliability (Hair et al., 2010). [Table 4](#) demonstrates that all these indices surpass 0.83, showing that the created questionnaire is capable of correctly measuring the variables.

Table 4. Construct reliability and convergent validity.

Variables	Items	Outer Loadings	Cronbach's Alpha	Composite reliability	AVE
BC	BC1	0.784	0.892	0.915	0.607
	BC2	0.902			
	BC3	0.851			
	BC4	0.786			
	BC5	0.755			
	BC6	0.767			
	BC7	0.798			
CE	CE1	0.726	0.890	0.912	0.602
	CE2	0.794			
	CE3	0.790			
	CE4	0.801			
	CE5	0.728			
	CE6	0.802			
	CE7	0.810			
OP	OP1	0.743	0.886	0.911	0.594
	OP2	0.784			
	OP3	0.764			
	OP4	0.805			
	OP5	0.778			
	OP6	0.724			
	OP7	0.757			
PC	PC1	0.737	0.865	0.898	0.596
	PC2	0.766			
	PC3	0.771			
	PC4	0.804			
	PC5	0.751			
	PC6	0.802			
SC	SC1	0.832	0.884	0.912	0.633
	SC2	0.751			
	SC3	0.855			
	SC4	0.781			
	SC5	0.788			
	SC6	0.760			
SE	SE1	0.781	0.837	0.884	0.605
	SE2	0.786			
	SE3	0.768			
	SE4	0.756			
	SE5	0.797			
SS	SS1	0.851	0.934	0.946	0.716
	SS2	0.859			
	SS3	0.826			
	SS4	0.803			
	SS5	0.846			
	SS6	0.877			
	SS7	0.859			

Source: The authors (2022).

Table 5. HTMT for discriminant validity.

	BC	CE	OP	PC	SC	SE	SS
BC							
CE	0.796						
OP	0.820	0.86					
PC	0.747	0.8	0.79				
SC	0.672	0.8	0.73	0.9			
SE	0.734	0.8	0.82	0.7	0.73		
SS	0.401	0.3	0.23	0.2	0.2	0.2	

Source: The authors (2022).

Table 6. Path coefficient.

	Original Sample	Sample Mean	STDEV	T Statistics	P-values
(PC) -> (CE)	0.186	0.188	0.069	2.690	0.000
(BC) -> (CE)	-0.262	0.263	0.073	3.583	0.000
(OP) -> (CE)	0.454	0.450	0.070	6.470	0.000
(CE) -> (SC)	0.672	0.670	0.047	14.331	0.000
(CE) -> (SE)	0.704	0.703	0.038	18.524	0.000
(CE) -> (SS)	0.298	0.302	0.058	5.151	0.007

Source: The authors (2022).

Secondly, the average variance extracted (AVE), a measure developed by Fornell and Larcker (1981), is used to evaluate convergent validity. The AVE quantifies the proportion of variation in a construct that is accounted for by the construct itself, relative to the variance attributed to measurement error. Table 4 shows that all AVE indices are more than 0.5, which is acceptable since it exceeds the Hair et al. (2010) suggested criterion.

Thirdly, the study uses the HTMT coefficient to measure the discriminant validity, with the threshold level of the HTMT coefficient suggesting the highest level is 0.9 (Henseler et al., 2015). For this project, there is only one HTMT coefficient greater than 0.9 (0.939) between Sustainable economy and Pressures from COVID-19 pandemic (Table 5). The constructs are essentially empirically distinct from other constructs within the structural model.

5.2. Structural model analysis

Consistent with Reinartz et al. (2009), the statistical significance of the path coefficients was determined using the bootstrapping method. In addition, the study includes the calculation of the percentile bootstrap at a 95% confidence interval of standardized regression coefficients. The results from Table 6 show that all P-values are lower than 0.05, making all relationships significant. Coefficient of determination, or R-squared (R^2), assesses the degree of the least-squares fit to the data in the model. It spans from 0 to 1, with higher values suggesting a larger capability for explanation (Reinartz et al., 2009). The categories of 'substantial, moderate, and weak' are indicated by Hair et al. (2010) for R^2 values of 0.75, 0.50, and 0.25, respectively. However, it is important to consider the context when evaluating the significance of these results. For this study, the R^2 is 0.663 (> 0.5), which meets the moderate threshold level of explanatory power among variables. It is also required to investigate collinearity to see if the regression findings are biased (Hair et al., 2010). VIF values should be close to 1 and below since values of 3-5 may also lead to difficulties while values of 5 and above are suggestive of potential collinearity concerns. The findings of this research show that the majority of the VIF had values that were lower than 3, while the remaining factors fall within the range of 3-5. It is thus unlikely that the model has collinearity problems.

5.3. Multi-Group analysis

In this step, we conducted a partial least squares multigroup analysis (PLS-MGA) to investigate how the geographical location influences the variables in the assessment model (Table 7). MGA provides a comprehensive understanding of the moderator's effect on the analysis findings by shifting the emphasis from studying the moderator's impact on one relationship to assessing its impact on every relationship

Table 7. SEM-multi-group analysis (MGA).

	Path coefficient			P-values
	European, American, and Oceanic countries	Asian countries	Difference	
(PC) -> (CE)	0.199	0.167	0.032	0.323
(BC) -> (CE)	-0.135	-0.413	0.278	0.011
(OP) -> (CE)	0.618	0.334	0.284	0.023
(CE) -> (SC)	0.721	0.628	0.093	0.109
(CE) -> (SE)	0.808	0.585	0.233	0.045
(CE) -> (SS)	0.369	0.188	0.181	0.067

Source: The authors (2022).

Table 8. Hypothesis testing results.

Hypothesis	Relationships	β	p Values	Result
H1	Pressure from the COVID-19 pandemic (PC) -> Circular economy (CE)	0.186	0.000	Supported
H2	Barriers and Challenges (BC) -> Circular economy (CE)	-0.262	0.000	Supported
H3	Advantages and Opportunities (OP) -> Circular economy (CE)	0.454	0.000	Supported
H4	Circular economy (CE) -> Sustainable economy (SC)	0.672	0.000	Supported
H5	Circular economy (CE) -> Sustainable environment (SE)	0.704	0.000	Supported
H6	Circular economy (CE) -> Sustainable society (SS)	0.298	0.007	Supported

Source: The authors (2022).

modeled (Hair et al., 2010). Geographical characteristics are believed to have a significant impact on the transition to a circular economy. One piece of evidence is that the nations in the European area that possess strong financial capabilities and a long-standing commitment to environmental concerns are in the forefront of the shift towards a circular economy (García-Sánchez et al., 2021).

Within our sample, the countries located in Europe, America, and Oceania are classified as developed nations, whilst the countries in Asia are mainly categorised as countries that are developing. Hence, we partitioned the sample into two distinct geographic regions to assess and partially account for the impact of varying levels of economic development. Consequently, the sample sizes for Asian countries ($n = 189$) and European, American, and Oceanic countries ($n = 169$) were deemed adequately substantial, with concerning comparable sample sizes.

The findings from the PLS-MGA p-value indicate that geographical moderation significantly altered the effects of several of the model's relationships within the sample under investigation. In particular, the difference is statistically significant in the impacts of pressure factors of stakeholders (including Barriers and Challenges variable and Advantages and Opportunities variable) on the transition to a circular economy and the impact of circular economy to sustainable environmental practices. Specifically, for H2 hypothesis ($p\text{-value} = 0.011 < 0.05$), the effect of barriers and challenges is greater in Asian countries than in European, American, and Oceanic countries. Meanwhile, the positive impact of advantages and opportunities variable on the transition to a circular economy is more clearly promoted in European, American and Oceania countries. Regarding countries in Europe, America, Oceania, the transition to a circular economy also has a stronger impact on environmental sustainability issues than in Asian countries. The other relationships do not exhibit statistically significant differences in effect according to geographical location.

6. Discussion

From the results of data analysis, the conclusion of the hypotheses can be shown in Table 8:

Hypothesis 1 is supported, with $\beta = 0.186$ and $P\text{ value} = 0.000 < 0.05$, showing that pressure from the epidemic positively affects the transition to a circular economy. This conclusion is also similar to the results of previous studies. Guarnieri et al. (2020) have demonstrated that the COVID-19 pandemic's effects have been positive for the transition to this novel economic paradigm. The impact of the COVID-19 has created an appropriate opportunity for countries and firms to consider applying the circular economy principles, especially when the world is entering the post-pandemic phase (Ibn-Mohammed et al., 2021). Although the pandemic has contributed to the expeditious advancement of the circular economy, it is necessary to acknowledge that this progression may not be sustainable and might

undergo alterations in the foreseeable future, particularly with the conclusion of the COVID-19 pandemic.

Barriers and challenges from stakeholder pressure have been shown to have a negative impact on the transition to the circular economy in organizations. There is evidence in studies that stakeholder pressure has caused obstacles to the adoption of the principles of a circular economy (Jabbour et al., 2020). According to Kirchherr et al. (2017), the shareholders of the company are the primary stakeholders who have the most influence in implementing the concepts of a circular economy in the context of local governments that have not yet developed regulatory frameworks that require companies to implement the practices. The shift to a circular economy has proven to be challenging for firms due to pressure mostly coming from inside (owners, shareholders, and workers). This finding contrasts with the discoveries made by Govindan and Hasanagic (2018), who emphasized that the government, via legislation and policy, has the most significant influence on the adoption of the circular economy.

Empirical evidence demonstrates that the benefits and opportunities provided by stakeholders have a positive influence on the transition to the circular economy. Regulations pertaining to the recycling and reuse of materials or packaging have been implemented by the government, which is widely seen as a commendable regulatory initiative aimed at fostering a circular economy (MacArthur, 2013). Moreover, consumers possess an understanding of the notion of a 'circular economy' and the positive impact it can exert on the environment. As a result, they regard it as a driving force behind their environmentally conscientious buying behavior (De Kock et al., 2020). Changes in consumer behaviors play an essential role in generating possibilities and incentives for firms to adapt to a circular economy.

The hypothesis 4 is supported indicating that the relationship between circular economy and sustainable economy is significant and positively correlated. This result reaches the same conclusion as prior research by Jabbour et al. (2020), which documented that the principles of circular economy have indeed had a positive impact on the sustainable economy, specifically by assisting companies in minimizing expenses related to the consumption of raw materials, enhancing the effective utilisation of resources, and elevating their market reputation, all of which are advantageous to the organization's long-term growth. By implementing the principles of a circular economy, businesses will be able to reduce operational expenses, sustain production in a more environmentally responsible manner, and make profits via the long-term sale of their products. (Geissdoerfer et al., 2018. Also, the adoption of the circular economy in companies has a beneficial effect on the sustainability of the environment, proving Hypothesis 5 to be supported. This finding was in line with Jabbour et al. (2020). It has been discovered that using the concepts of the circular economy enables businesses to meet environmental performance metrics, such as cutting costs for waste and water treatment, pollutant emissions, and CO2 production. By decreasing the quantity of raw materials used or optimizing their utilization throughout manufacturing, the amount of waste generated will be minimized. Implementing the circular economy involves achieving a suitable equilibrium between the resources put into a production system and the products generated, which will assist to reduce the harmful environmental consequences. Lastly, hypothesis 6 is verified, indicating that the circular economy and social sustainability have a positive relationship with each other. Jabbour et al. (2020) documented that switching to the implementation of the principles of a knowledge-based economy improves life and social welfare, thereby enhancing the organization's reputation. In an organizational context, applying the principles of CSOs helps businesses set goals to optimize the value of their products and services to eliminate their negative impact on the environment, thereby providing more job opportunities for workers and contributing to a prosperous society (Hysa et al., 2020).

The results of the PLS-MGA analysis indicate that, within the studied sample, geographic moderation substantially changed the impact of multiple model relationships. The impacts of stakeholder pressure factors, such as the Barriers and Challenges and Advantages and Opportunities variables, on the shift to a circular economy and the circular economy's influence on sustainable environmental practices, show a statistically significant difference. These findings align with other prior studies that analyze the rankings of nations' efforts to transition to a circular economy. It is clear that European countries, such as France, Germany, Italy, and the UK, dominate the top positions. The successful implementation and adoption of a circular economy model is heavily contingent upon a nation's financial capabilities and cultural practices, as evidenced by the experiences of European countries (García-Sánchez et al., 2021). Furthermore,

developing economies that have a reduced dependence on natural resources and instead focus on offering services such as tourism, like France, Italy, have demonstrated a commendable ability to transition to a circular economy. However, in countries that heavily rely on resources like mining or logging, such as China or Vietnam, the progress towards adopting a circular economy is still somewhat limited. In the other Southeast Asian countries, there are no strict legal restrictions on establishing systems to encourage or enforce the adoption of advancements in the circular economy. As a result, there are very few indications of progress or change in this regard.

7. Conclusion and implications

The COVID-19 epidemic and rising stakeholder pressures have increased the need to transition to a paradigm of economic development that extends the product life cycle. Accordingly, the circular economy is the core solution towards sustainable development, in which economic development goes hand in hand with environmental protection and social benefits. This study expands the existing knowledge about the stakeholder and COVID-19-driven pressures on firms throughout the globe to adopt a circular economy model and to verify that such an economic model may indeed lead to sustainable development. Specifically, under the stakeholder theory (Friedman & Miles, 2006), this research extends the findings of Ibn-Mohammed et al. (2021) and Jabbour et al. (2020) on how pressure from stakeholders, COVID-19, and the implementation of the circular economy relate. Our study distinguishes itself from the research conducted by Jabbour et al. (2020) by investigating the interplay between the COVID-19 pandemic and the pressures from stakeholders to transition to a circular economy. Simultaneously, our study also explores this relationship on a larger sample scale, including a diverse range of international companies, in lieu of the study conducted by Jabbour et al. (2020), which only focused on industrial companies inside a single country, Brazil. Our study additionally provides quantitative evidence of the COVID-19 impact on the circular economy applications in businesses, in order to corroborate the conclusions of Ibn-Mohammed et al. (2021) study, which mostly relied on qualitative methodologies. We additionally contribute to the research strand on the impact of transitioning to a circular economy on sustainable development, as defined by Geissdoerfer et al. (2018), which focuses on three unique aspects: a sustainable economy, a sustainable environment, and a sustainable society. In the field's literature, the beneficial influence of circular economy on organizational environmental performance has been extensively investigated, however the social component of sustainable development has not been thoroughly studied (Merli et al., 2018). In addition, the linkage between circular economy and sustainability performance has mostly been analysed in a theoretical approach rather than through empirical investigation (Geissdoerfer et al., 2017). Thus, our study provided more concrete empirical proof of these relationships.

Employing the SEM-PLS model to evaluate survey data from 358 enterprises throughout the globe, the study demonstrated that pressure from the COVID-19 epidemic as well as stakeholders influenced the transition to a circular economy. The pandemic of COVID-19 has posed significant challenges for the whole globe, but it is also seen as a major catalyst for accelerating the shift to a circular economy. Research by Ibn-Mohammed et al. (2021), Guarnieri et al. (2020), and Sarkis et al. (2020) all support this finding. While advantages and opportunities supplied by stakeholders have been demonstrated to have a beneficial effect on the transition to the circular economy, barriers and obstacles resulting from stakeholder pressure have been found to negatively affect the shift in organizations. These results are consistent with the core propositions of stakeholder theory (Friedman & Miles, 2006; Mitchell et al., 1997) and the linkage between stakeholder pressures and circular economy as suggested by Jabbour et al. (2020); Ghinoi et al. (2020); Gupta et al. (2019); Jakhar et al. (2018). Furthermore, the research demonstrates that the shift to a circular economy will assist global corporations in moving toward sustainable development, which includes a sustainable economy, a sustainable environment, and a sustainable society. This conclusion is generally in agreement with a popular strand of research in which the circular economy serves as a facilitator in the transition to sustainable development (Geissdoerfer et al., 2018; Jabbour et al., 2020; Korhonen, Nuur et al., 2018; Merli et al., 2018). The results of our Multi-Group Analysis (PLS-MGA) also provide insightful findings. Specifically, Asian nations see a more pronounced impact from barriers and challenges compared to European, American, and Oceanian countries. However, the

beneficial influence of the advantages and opportunities factor on the shift towards a circular economy is particularly emphasized in European, American, and Oceania nations. When it comes to these nations the shift towards a circular economy has a more significant influence on environmental sustainability concerns compared to Asian countries.

Transitioning to a circular economy is an ongoing process that requires major long-term expenditures and organizational effort. If businesses wish to migrate to a circular economy, they should undertake investments to build their own circular economy model, such as acquiring equipment and propagating the process across the firm. To motivate workers to react to the model, businesses might give incentives and pay increases for exceptional performance and invite a large number of individuals to engage in this process. Based on our research, we recommend that certain stakeholders undertake measures to mitigate the primary obstacle to the adoption of a circular economy inside the organization. This includes resolving challenges such as interdepartmental communication barriers and the ambiguity around departmental duties related to circular economy initiatives inside companies. To remedy these problems, seminars and training sessions aimed at fostering more collaboration and exchange of data amongst different divisions of an organization are recommended. Furthermore, the emerging technologies of Industry 4.0 have the potential to enable the implementation of circular economy practises. Therefore, it is essential for managers to be aware of the need to transition to digital supply chains to effectively implement circular economy principles. Another solution is that businesses from different industries should link together and build a system to turn waste from one industry into another industry's raw materials, or in other words, recycle thoroughly and efficiently to minimize the amount of waste released into the environment. It also has been shown that governmental policies have been effective in persuading companies to adopt the circular economy. As a result, governments should implement regulations that encourage the switch from a linear to a circular economy, allowing businesses to adopt circular economy principles at a deeper level.

This present study offers academics and practitioners with important understanding; yet there are limits and potential for further research. Firstly, because the COVID-19 pandemic just broke out in 2020, the number of studies on the impact of the pandemic on the circular economy is still limited compared to other topics. This leads to a lack of an academic and theoretical background to build a concrete literature. In addition, future research might add additional moderating or dependent factors to the study model to improve the complexity and specificity of the research question. It is advisable to apply qualitative research methodologies, such as the utilization of open-ended questions and conducting focused interviews with personnel. Although answering open-ended questions will take more time, they offer the benefit of eliciting more varied and creative responses from the participants since they lack a predetermined framework. Moreover, qualitative data results may aid in elucidating quantitative data-identified issues more thoroughly.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, [Manh Hung Pham], upon reasonable request.

References

- Abdul-Rashid, S. H., Sakundarini, N., Ghazilla, R. A. R., & Thurasamy, R. (2017). The impact of sustainable manufacturing practices on sustainability performance: Empirical evidence from Malaysia. *International Journal of Operations & Production Management*, 37(2), 182–204. <https://doi.org/10.1108/IJOPM-04-2015-0223>
- Aloini, D., Dulmin, R., Mininno, V., Stefanini, A., & Zerbino, P. (2020). Driving the transition to a circular economic model: A systematic review on drivers and critical success factors in circular economy. *Sustainability*, 12(24), 10672. <https://doi.org/10.3390/su122410672>
- Arthur, L., Hondo, D., & Kohonen, R. (2022). *Prospects for Transitioning from a Linear to Circular Economy in Developing Asia*.
- Bachman, D. (2020). *COVID-19 could affect the global economy in three main ways*. <https://www2.deloitte.com/global/en/insights/economy/COVID-19/economicimpact-COVID-19.html>
- Bauwens, T., Hekkert, M., & Kirchherr, J. (2020). Circular futures: what will they look like? *Ecological Economics*, 175, 106703. <https://doi.org/10.1016/j.ecolecon.2020.106703>
- Borrero-Viguera, J. (2021). *Analysis of factors for the transition to a circular economy*.
- De Jesus, A., & Mendonça, S. (2018). Lost in transition? Drivers and barriers in the eco-innovation road to the circular economy. *Ecological Economics*, 145, 75–89. <https://doi.org/10.1016/j.ecolecon.2017.08.001>
- De Kock, L., Sadan, Z., Arp, R., & Upadhyaya, P. (2020). A circular economy response to plastic pollution: Current policy landscape and consumer perception. *South African Journal of Science*, 116(5/6), 1–2. <https://doi.org/10.17159/sajs.2020/8097>
- Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *The Academy of Management Review*, 20(1), 65–91. <https://doi.org/10.2307/258887>
- EC. (2014a). *Development of Guidance on Extended Producer Responsibility (EPR)*. http://ec.europa.eu/environment/waste/pdf/target_review/Guidance%20on%20EPR%20-%20Final%20Report.pdf
- EC. (2015). Communication from the commission to the parliament, the council and the European economic and social committee and the committee of the regions: Closing the loop – An EU action plan for the Circular Economy. COM (2015) 614 final. European Commission.
- EC. (2014b). *Towards a Circular Economy: A Zero Waste Programme for Europe*. <http://ec.europa.eu/environment/circular-economy/pdf/circular-economy-communication.pdf>
- Eizenberg, E., & Jabareen, Y. (2017). Social sustainability: A new conceptual framework. *Sustainability*, 9(1), 68. <https://doi.org/10.3390/su9010068>
- Elkington, J., & Rowlands, I. H. (1999). Cannibals with forks: The triple bottom line of 21st century business. *Alternatives Journal*, 25(4), 42.
- European Environmental Agency. (2020). *Air pollution goes down as Europe takes hard measures to combat coronavirus*. European Environment Agency. <https://www.eea.europa.eu/highlights/air-pollution-goesdown-as>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.1177/002224378101800104>
- Friedman, A. L., & Miles, S. (2006). *Stakeholders: Theory and Practice*. Oxford University Press on Demand.
- Garcés-Ayerbe, C., Rivera-Torres, P., Suárez-Perales, I., & Leyva-de la Hiz, D. I. (2019). Is it possible to change from a linear to a circular economy? An overview of opportunities and barriers for European small and medium-sized enterprise companies. *International Journal of Environmental Research and Public Health*, 16(5), 851. <https://doi.org/10.3390/ijerph16050851>
- Garcia-Bernabeu, A., Hilario-Caballero, A., Pla-Santamaria, D., & Salas-Molina, F. (2020). A process oriented MCDM approach to construct a circular economy composite index. *Sustainability*, 12(2), 618. <https://doi.org/10.3390/su12020618>
- García-Sánchez, I. M., Somohano-Rodríguez, F. M., Amor-Esteban, V., & Frías-Aceituno, J. V. (2021). Which region and which sector leads the circular economy? Cebix, a multivariant index based on business actions. *Journal of Environmental Management*, 297, 113299. <https://doi.org/10.1016/j.jenvman.2021.113299>

- Geissdoerfer, M., Morioka, S. N., de Carvalho, M. M., & Evans, S. (2018). Business models and supply chains for the circular economy. *Journal of Cleaner Production*, 190, 712–721. <https://doi.org/10.1016/j.jclepro.2018.04.159>
- Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy—A new sustainability paradigm? *Journal of Cleaner Production*, 143, 757–768. <https://doi.org/10.1016/j.jclepro.2016.12.048>
- Genovese, A., Acquaye, A. A., Figueroa, A., & Koh, S. L. (2017). Sustainable supply chain management and the transition towards a circular economy: Evidence and some applications. *Omega*, 66, 344–357. <https://doi.org/10.1016/j.omega.2015.05.015>
- Geng, Y., & Doberstein, B. (2008). Developing the circular economy in China: Challenges and opportunities for achieving leapfrog development. *International Journal of Sustainable Development & World Ecology*, 15(3), 231–239. <https://doi.org/10.3843/SusDev.15.3.6>
- Geng, Y., Sarkis, J., Ulgiati, S., & Zhang, P. (2013). Measuring China's circular economy. *Science (New York, N.Y.)*, 339(6127), 1526–1527. <https://doi.org/10.1126/science.1227059>
- Ghini, S., Silvestri, F., & Steiner, B. (2020). The role of local stakeholders in disseminating knowledge for supporting the circular economy: a network analysis approach. *Ecological Economics*, 169, 106446. <https://doi.org/10.1016/j.ecolecon.2019.106446>
- Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114, 11–32. <https://doi.org/10.1016/j.jclepro.2015.09.007>
- Govindan, K., & Hasanagic, M. (2018). A systematic review on drivers, barriers, and practices towards circular economy: a supply chain perspective. *International Journal of Production Research*, 56(1-2), 278–311. <https://doi.org/10.1080/00207543.2017.1402141>
- Guarnieri, P., Cerqueira-Streit, J. A., & Batista, L. C. (2020). Reverse logistics and the sectoral agreement of packaging industry in Brazil towards a transition to circular economy. *Resources, Conservation and Recycling*, 153, 104541. <https://doi.org/10.1016/j.resconrec.2019.104541>
- Gupta, S., Chen, H., Hazen, B. T., Kaur, S., & Gonzalez, E. D. S. (2019). Circular economy and big data analytics: A stakeholder perspective. *Technological Forecasting and Social Change*, 144, 466–474. <https://doi.org/10.1016/j.techfore.2018.06.030>
- Haigh, L., & Bäumker, L. (2020). Covid-19 and the circular economy: opportunities and reflections. *Medium*. <https://medium.com/circleeconomy/covid-19-and-the-circulareconomy-opportunities-and-reflections-7c2a7db70900>
- Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Pearson Education.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hysa, E., Kruja, A., Rehman, N. U., & Laurenti, R. (2020). Circular Economy Innovation and Environmental Sustainability Impact on Economic Growth: An Integrated Model for Sustainable Development. *Sustainability*, 12(12), 4831. <https://doi.org/10.3390/su12124831>
- Ilić, M., & Nikolić, M. (2016). Drivers for development of circular economy – A case study of Serbia. *Habitat International*, 56, 191–200. <https://doi.org/10.1016/j.habitatint.2016.06.003>
- International Federation of Accountants. (2012). *Stakeholder analysis*. International Auditing and Assurance Standards Board (IAASB) The International Ethics Standards Board for Accountants (IESBA).
- ISO 15392. (2008). *Sustainability in building construction. General principles*. International Organization for Standardization.
- Jabbour, C. J. C., Seuring, S., de Sousa Jabbour, A. B. L., Jugend, D., Fiorini, P. D. C., Latan, H., & Izeppi, W. C. (2020). Stakeholders, innovative business models for the circular economy and sustainable performance of firms in an emerging economy facing institutional voids. *Journal of Environmental Management*, 264, 110416. <https://doi.org/10.1016/j.jenvman.2020.110416>
- Jackson, T. (2009). *Prosperity without growth?: The transition to a sustainable economy*.
- Jakhar, S. K., Mangla, S. K., Luthra, S., & Kusi-Sarpong, S. (2018). When stakeholder pressure drives the circular economy: Measuring the mediating role of innovation capabilities. *Management Decision*, 57(4), 904–920. <https://doi.org/10.1108/MD-09-2018-0990>
- Jamali, D. (2008). A stakeholder approach to corporate social responsibility: A fresh perspective into theory and practice. *Journal of Business Ethics*, 82(1), 213–231. <https://doi.org/10.1007/s10551-007-9572-4>
- Johnston, P., Everard, M., Santillo, D., & Robèrt, K. H. (2007). Reclaiming the definition of sustainability. *Environmental Science and Pollution Research International*, 14(1), 60–66. <https://doi.org/10.1065/espr2007.01.375>
- Hussey, L. K., & Arku, G. (2020). Are we ready for it? Health systems preparedness and capacity towards climate change-induced health risks: perspectives of health professionals in Ghana. *Climate and Development*, 12(2), 170–182. <https://doi.org/10.1080/17565529.2019.1610350>
- Källström, H. N., & Ljung, M. (2005). Social sustainability and collaborative learning. *AMBIO: A Journal of the Human Environment*, 34(4), 376–382. [https://doi.org/10.1639/0044-7447\(2005\)034\[0376:ssaj\]2.0.co;2](https://doi.org/10.1639/0044-7447(2005)034[0376:ssaj]2.0.co;2)

- Kalmykova, Y., Sadagopan, M., & Rosado, L. (2018). Circular economy–From review of theories and practices to development of implementation tools. *Resources, Conservation and Recycling*, 135, 190–201. <https://doi.org/10.1016/j.resconrec.2017.10.034>
- Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127, 221–232. <https://doi.org/10.1016/j.resconrec.2017.09.005>
- Korhonen, J., Honkasalo, A., & Seppälä, J. (2018b). The circular economy: The Concept and its Limitations. *Ecological Economics*, 143, 37–46. <https://doi.org/10.1016/j.ecolecon.2017.06.041>
- Korhonen, J., Nuur, C., Feldmann, A., & Birkie, S. E. (2018a). The circular economy as an essentially contested concept. *Journal of Cleaner Production*, 175, 544–552. <https://doi.org/10.1016/j.jclepro.2017.12.111>
- Lozano, R. (2008). Envisioning sustainability three-dimensionally. *Journal of Cleaner Production*, 16(17), 1838–1846. <https://doi.org/10.1016/j.jclepro.2008.02.008>
- Lorek, S., & Spangenberg, J. (2013). Sustainable consumption within a sustainable economy – beyond green growth and green economies. *Journal of Cleaner Production*, 63, 33–44. <https://doi.org/10.1016/j.jclepro.2013.08.045>
- MacArthur, E. (2013). Towards the circular economy. *Journal of Industrial Ecology*, 2(1), 23–44.
- Mani, V., & Gunasekaran, A. (2018). Four forces of supply chain social sustainability adoption in emerging economies. *International Journal of Production Economics*, 199, 150–161. <https://doi.org/10.1016/j.ijpe.2018.02.015>
- Mathews, J. A., Tang, Y., & Tan, H. (2011). China's move to a Circular Economy as a development strategy. *Asian Business & Management*, 10(4), 463–484. <https://doi.org/10.1057/abm.2011.18>
- McMichael, A. J., Butler, C. D., & Folke, C. (2003). New visions for addressing sustainability. *Science (New York, N.Y.)*, 302(5652), 1919–1920. <https://doi.org/10.1126/science.1090001>
- Meadows, D. H., D., L., Meadows, J., Randers., & W. W., Behrens-llii. (1972). *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (5th ed.). Universe Books.
- Merli, R., Preziosi, M., & Acampora, A. (2018). How do scholars approach the circular economy? A systematic literature review. *Journal of Cleaner Production*, 178, 703–722. <https://doi.org/10.1016/j.jclepro.2017.12.112>
- Michelino, F., Cammarano, A., Celone, A., & Caputo, M. (2019). The linkage between sustainability and innovation performance in IT hardware sector. *Sustainability*, 11(16), 4275. <https://doi.org/10.3390/su11164275>
- Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *The Academy of Management Review*, 22(4), 853–886. <https://doi.org/10.2307/259247>
- Ibn-Mohammed, T., Mustapha, K. B., Godsell, J., Adamu, Z., Babatunde, K. A., Akintade, D. D., Acquaye, A., Fujii, H., Ndiaye, M. M., Yamoah, F. A., & Koh, S. C. L. (2021). A critical analysis of the impacts of COVID-19 on the global economy and ecosystems and opportunities for circular economy strategies. *Resources, Conservation, and Recycling*, 164, 105169. <https://doi.org/10.1016/j.resconrec.2020.105169>
- Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: an interdisciplinary exploration of the concept and application in a global context. *Journal of Business Ethics*, 140(3), 369–380. <https://doi.org/10.1007/s10551-015-2693-2>
- Naidoo, R., & Fisher, B. (2020). Reset sustainable development goals for a pandemic world. *Nature*, 583(7815), 198–201. <https://doi.org/10.1038/d41586-020-01999-x>
- Parida, V., Burström, T., Visnjic, I., & Wincent, J. (2019). Orchestrating industrial ecosystem in circular economy: A two-stage transformation model for large manufacturing companies. *Journal of Business Research*, 101, 715–725. <https://doi.org/10.1016/j.jbusres.2019.01.006>
- Preston, F., Lehne, J., & Wellesley, L. (2019). *An inclusive circular economy*. Priorities for Developing Countries.
- Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing*, 26(4), 332–344. <https://doi.org/10.1016/j.ijres-mar.2009.08.001>
- Russell, M., Gianoli, A., & Grafakos, S. (2019). Getting the ball rolling: an exploration of the drivers and barriers towards the implementation of bottom-up circular economy initiatives in Amsterdam and Rotterdam. *Journal of Environmental Planning and Management*, 63(11), 1903–1926. <https://doi.org/10.1080/09640568.2019.1690435>
- Sarkis, J., Gonzalez-Torre, P., & Adenso-Diaz, B. (2010). Stakeholder pressure and the adoption of environmental practices: The mediating effect of training. *Journal of Operations Management*, 28(2), 163–176. <https://doi.org/10.1016/j.jom.2009.10.001>
- Sarkis, J., Zhu, Q., & Lai, K. H. (2011). An organizational theoretic review of green supply chain management literature. *International Journal of Production Economics*, 130(1), 1–15. <https://doi.org/10.1016/j.ijpe.2010.11.010>
- Sarkis, J. (2020). Supply chain sustainability: learning from the COVID-19 pandemic. *International Journal of Operations & Production Management*, 41(1), 63–73. <https://doi.org/10.1108/IJOPM-08-2020-0568>
- Silva, S., Nuzum, A.-K., & Schaltegger, S. (2019). Stakeholder expectations on sustainability performance measurement and assessment. A systematic literature review. *Journal of Cleaner Production*, 217, 204–215. <https://doi.org/10.1016/j.jclepro.2019.01.203>
- Tsang, S., Royse, C., & Terkawi, A. S. (2017). Guidelines for developing, translating, and validating a questionnaire in perioperative and pain medicine. *Saudi Journal of Anaesthesia*, 11(Suppl 1), S80–S89. https://doi.org/10.4103/sja.SJA_203_17

- Tura, N., Hanski, J., Ahola, T., Ståhle, M., Piiparinen, S., & Valkokari, P. (2018). Unlocking circular business: a framework of barriers and drivers. *Journal of Cleaner Production*, 212, 90–98. <https://doi.org/10.1016/j.jclepro.2018.11.202>
- United Nations Brundtland Commission. (1987). *Report of the World Commission on Environment and Development: Our Common Future*.
- United Nations World Commission on Environment and Development. (2018). *What Is Environmental Sustainability? Sustainable Businesses*.
- United Nations. (2020). *Take Action for the Sustainable Development Goals*.
- Van Buren, N., Demmers, M., van der Heijden, R., & Witlox, F. (2016). Towards a circular economy: The role of Dutch logistics industries and governments. *Sustainability*, 8(7), 647. <https://doi.org/10.3390/su8070647>
- Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Belesova, K., Berry, H., Bouley, T., Boykoff, M., Byass, P., Cai, W., Campbell-Lendrum, D., Chambers, J., Daly, M., Dasandi, N., Davies, M., Depoux, A., Dominguez-Salas, P., Drummond, P., Ebi, K. L., ... Costello, A. (2018). The 2018 report of the Lancet Countdown on health and climate change: shaping the health of nations for centuries to come. *Lancet (London, England)*, 392(10163), 2479–2514. [https://doi.org/10.1016/S0140-6736\(18\)32594-7](https://doi.org/10.1016/S0140-6736(18)32594-7)
- Watts, N., Amann, M., Ayeb-Karlsson, S., Belesova, K., Bouley, T., Boykoff, M., Byass, P., Cai, W., Campbell-Lendrum, D., Chambers, J., Cox, P. M., Daly, M., Dasandi, N., Davies, M., Depledge, M., Depoux, A., Dominguez-Salas, P., Drummond, P., Ekins, P., ... Costello, A. (2018). The Lancet Countdown on health and climate change: from 25 years of inaction to a global transformation for public health. *Lancet (London, England)*, 391(10120), 581–630. [https://doi.org/10.1016/S0140-6736\(17\)32464-9](https://doi.org/10.1016/S0140-6736(17)32464-9)
- Winans, K., Kendall, A., & Deng, H. (2017). The history and current applications of the circular economy concept. *Renewable and Sustainable Energy Reviews*, 68, 825–833. <https://doi.org/10.1016/j.rser.2016.09.123>
- Wu, H. Q., Shi, Y., Xia, Q., & Zhu, W. D. (2014). Effectiveness of the policy of circular economy in China: A DEA-based analysis for the period of 11th five-year-plan. *Resources, Conservation and Recycling*, 83, 163–175. <https://doi.org/10.1016/j.resconrec.2013.10.003>
- Yiftachel, O., & Hedgcock, D. (1993). Urban social sustainability: the planning of an Australian city. *Cities*, 10(2), 139–157. [https://doi.org/10.1016/0264-2751\(93\)90045-K](https://doi.org/10.1016/0264-2751(93)90045-K)
- Yuan, Z., Bi, J., & Moriguchi, Y. (2006). The circular economy: A new development strategy in China. *Journal of Industrial Ecology*, 10(1-2), 4–8. <https://doi.org/10.1162/108819806775545321>
- Zambrano-Monserrate, M. A., Ruano, M. A., & Sanchez-Alcalde, L. (2020). Indirect effects of COVID-19 on the environment. *The Science of the Total Environment*, 728, 138813. <https://doi.org/10.1016/j.scitotenv.2020.138813>

Appendix A. Perceptions on the transition to circular economy and sustainable development of businesses

Table A1. Using the following scale, please select only one answer that best reflects your opinion about the statement. 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree.

Constructs	Code	Items
Stakeholders pressure: Barriers and Challenges (BC)	BC1	Your organization faces financial barriers (can not predict exactly the financial benefits and profitability of the circular economy to raise funds).
	BC2	Your organization faces structural barriers (lack of information and clarity on the responsibilities of each member of the supply chain to adopt the circular economy).
	BC3	Your organization faces operational barriers (lack of infrastructure and operational capacity in the supply chain and production systems to adopt the circular economy)
	BC4	Your organization faces behavioral barriers (people do not perceive sustainability as important and are against change).
	BC5	Your organization faces technological barriers (lack of clarity on how to integrate the circular economy in product development).
	BC6	Your organization has difficulty complying with the law of Government when applying circular economy.
	BC7	Your organization has difficulty in convincing consumers to change their shopping habits.
Stakeholders pressure: Advantages and Oppoturnities (OP)	OP1	Government creates an external environment favorable and removing regulatory obstacles.
	OP2	Government secure smore marketing about remanufacturing products and green public procurement through television.
	OP3	Government brings out tax breaks for reused and recycled products at the end-of-life.
	OP4	Government implements pilot projects to become role models for others follow.
	OP5	Most stakeholders approve organization's responsiveness to environmental concerns.
	OP6	The organization from stakeholder perspectives has the highest rates of environmental orientation in the industry.
	OP7	Your organization from stakeholder perspectives follows government regulations for green operating procedures in the industry.
Pressure from COVID-19 pandemic (PC)	PC1	COVID-19 makes your organization change its strategy in production and business activities.
	PC2	COVID-19 makes your organization to change its product marketing strategy.
	PC3	COVID-19 makes your organization extra costs for technology equipment (online software, online working equipment, etc).
	PC4	COVID-19 reduces employee productivity, adversely affecting organizational performance).
	PC5	Your organization faces a drop in revenue during the pandemic.
	PC6	COVID-19 makes it difficult for your organization to access raw materials.
The transition of the circular economy (CE)	CE1	The principles of the circular economy should be considered business ethics.
	CE2	Your organization has the willingness to generate wastes, recycle wastes or minimize resource consumption and waste production.
	CE3	Your organization establish a special management department of the circular economy.
	CE4	Your organization cooperate with other organizations to establish eco-industrial chains.
	CE5	Your organization disposes of waste properly.
	CE6	Your organization replaces the use of non-renewable raw materials by renewable raw materials.
	CE7	Your organization replaces current equipment and technologies with more modern and efficient ones.
Sustainable economy (SC)	SC1	Your organization makes more profit and revenue.
	SC2	Your organization can reduce electricity usage in operation.
	SC3	Your organization can reduce the number of materials in production.
	SC4	Your organization can reduce the water usage in operation.
	SC5	Your organization improves the number of investments and seeks for more potential investors.
	SC6	Your organization improves its brand image and reputation by achieving business prizes each year.
Sustainable environment (SE)	SE1	Your organization always complies with environmental protection laws, has regulations related to environmental issues and committed to environmental protection in the manufacturing process.

(continued)

Table A1. Continued.

Constructs	Code	Items
Sustainable social (SS)	SE2	Your organization has measures to reduce emissions of polluting gases to the environment during the manufacturing process.
	SE3	Your organization always separates waste and has an efficient waste treatment system to treat waste before discharging it into the environment.
	SE4	Your organization does not consume hazardous, non-environmentally friendly production materials.
	SE5	Your organization is always trying to find ways to reduce the frequency of environmental accidents.
	SE6	Your organization has legally exploited and used natural resources efficiently, including both renewable resources (wind power, light, tides, heat in the ground, water resources, forest resources, aquatic resources ...) and nonrenewable resources (fossil fuels, metals and minerals ...).
	SE7	Your organization always conducts an environmental impact assessment or makes an environmental protection plan before implementing a project, business plan, or service.
	SS1	Your organization proactively manages and defines how your business works for employees and workers.
	SS2	Your organization ensures safety measures to protect the health of workers and the community.
	SS3	Your organization offers safe working conditions, guaranteed wages, and job opportunities.
	SS4	Your organization provides transparent information about the supply chain to consumers.
	SS5	Your organization cooperates with social sustainability organizations to become more transparent, making operations or supply chains more ethical.
	SS6	Your organization ensures fair treatment of all employees in the organization.
	SS7	Your organization has policies in improving capabilities, train and develop skills for specific target groups.