

Minimizing Plastic Pollution: The Role of Market Pressure and Green Production Practices on the Practices of a Circular Economy and Its Impact on Green Product Innovation

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ABSTRACT

The issue of plastic waste generated by small and medium-sized manufacturing enterprises (SMEs) is a problem that deserves attention. This research aims to examine the role of market pressure, green production, and circular economic practices toward environmentally friendly product innovation. The sample consists of 190 respondents who are owners/managers of manufacturing SMEs in DIY (Daerah Istimewa Yogyakarta) and Central Java. This is a quantitative research study utilizing the SmartPLS program. The research concluded that: (1) market pressure has a positive effect on circular economy practices, (2) market pressure has a positive effect on green production, (3) green production has a positive effect on circular economy practices, and (4) circular Economy Practices have a positive effect on green product innovation. This research provides theoretical and managerial implications related to improving business practices that lead to environmentally friendly business operations.

Keywords: Market pressure, green production, circular economy practices, green product innovation.

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1. INTRODUCTION

Every organization, upon establishment, inherently shares the common goal of maximizing profit in its business endeavors. To achieve this objective, organizations consistently strive to optimize their activities for optimal profitability (Raza *et al.*, 2019). On one hand, it raises the question of whether a business solely focuses on profit without considering its responsibility towards environmental sustainability. Although every business activity should ideally contribute positively to the broader economy (Kałdoński, 2020; Qiu *et al.*, 2020a) and environmental factors (Nascimento *et al.*, 2019; Raza *et al.*, 2019). The positive impacts on society and the economy include job creation, improved well-being, and the provision of necessary goods or services (Kałdoński, 2020; Qiu *et al.*, 2020a). Failure to consider environmental responsibility in business activities can lead to negative impacts such as water, air, and soil pollution, as well as other forms of environmental damage (Muafi & Sugarinda, 2023; Nascimento *et al.*, 2019). The ongoing globalization and industrialization since the 19th century have underscored the necessity for sustainable practices that guarantee

environmental preservation. A report by the Organization for Economic Co-operation and Development (OECD, 2010) further emphasizes that industrialization has significantly increased across various industries, motivating Small and Medium Enterprises (SMEs) to constitute the majority of the top 90% of key industries worldwide, especially in developing countries (Sheldon & Norton, 2020).

Despite the significant economic benefits brought about by industrialization and globalization, the negative impact on the environment has garnered substantial attention from various stakeholders, including governments, communities, and others (Kałdoński, 2020). Therefore, achieving environmental sustainability has become not just an option but a mandatory consideration for every organization. As addressed in this research, green production practices are a crucial concept necessary for attaining a competitive position and superior performance (Muafi, 2021; Rihn *et al.*, 2021). Concerns about the limited resilience of a product have escalated, prompting many organizations to steer all business activities towards environmentally friendly practices. One of the major contributors to emissions in the industrial sector, particularly in plastic waste management, is the manufacturing industry (Sheldon & Norton, 2020). It is indeed challenging to envision a world without plastic, given its affordability and lightweight nature. However, in reality, plastic is seen as a convenient and widely used material, simultaneously serving as a major source of environmental pollution (Moraga *et al.*, 2019; Schroeder *et al.*, 2019; Yadav *et al.*, 2020).

Currently, one of the most significant challenges of the 21st century is addressing environmental issues caused by plastic waste. In Indonesia, the problem of waste, particularly plastic waste, continues to escalate and requires solutions for resolution. Only around 20 percent of the collected plastic waste can currently be utilized as food-grade quality plastic raw material. Hence, one of the national waste management approaches is adopting a circular economy perspective. Environmental pollution, especially in rivers due to plastic waste, is a global-scale problem (Shibuya *et al.*, 2023; Kuo *et al.*, 2022; Sassanelli *et al.*, 2019).

The implementation of a circular economy in waste management is manifested through recycling. As the business trend continues to rise, the demand for recycled products increases. Consequently, this encourages organizations to be more responsible and actively engage in environmental sustainability management (Baah *et al.*, 2021). The issue of plastic pollution arises from a systemic failure in the collaboration among various stakeholders in the product design chain, marketing departments, consumers, and recycling processes. With the intensification of campaigns addressing environmental damage, demanding businesses worldwide to conduct eco-friendly activities, organizations must participate in adopting green business practices. Engaging in environmentally responsible business activities not only provides economic benefits but also helps avoid environmental violation penalties (Bulfone & Tassinari, 2021). The concept of green business can be applied as a solution to minimize the negative effects generated by business activities (Hamilton-Hart & Wai-chung Yeung, 2021).

Green business is an organizational activity aimed at achieving good environmental performance while simultaneously impacting the organization's overall performance. The concept of green business emerged in response to pressure from stakeholders urging businesses to adopt environmentally friendly practices (Kałdoński, 2020). Green business, encompassing green products, green production, and green marketing, is a concept not solely focused on profit but rather as steps to provide environmental protection (for water, air, and ecosystems). These environmentally

friendly business activities can minimize damage to the environment, especially regarding the plastic waste generated. It is estimated that if the use of plastic in business practices amounted to 6,300 tons in 2015, with approximately 800 tons of this waste being incinerated and only 600 tons recycled, then only 10% is recycled more than once. Thus, only 60% of all produced plastic is discarded and ends up in landfills. If this practice continues without intervention, it is projected to result in the accumulation of 12,000 million tons of plastic waste by 2050 (Sheldon & Norton, 2020). Additionally, consumer awareness of the dangers of plastic usage plays a crucial role in avoiding plastic pollution. In this context, consumers are considered stakeholders responsible not only for final product consumption but also for contributing to environmental preservation. Consumers should provide understanding to service or product providers and alter their behavior, particularly in cases where many businesses charge for plastic bags.

Thus, to realize a circular economy, the roles of various parties, including stakeholders such as consumers and business actors, must be aligned to support environmentally friendly businesses. The concept of green business applies to all entities, whether large, medium, small, or micro-scale organizations (Le *et al.*, 2023). However, this concept cannot be fully executed if the organization lacks environmental awareness. Understanding the circular economy concept in the context of Small and Medium Enterprises (SMEs) becomes crucial, especially in reducing the environmental impact. In Indonesia, the promotion and implementation of "go green" campaigns within the context of SMEs are not yet fully optimized. There are rivers in Central Java Province polluted with a significant amount of plastic waste, rendering them unhealthy.

Baah's *et al.* study (2021) suggests that businesses should implement green production to reduce negative impacts on environmental damage, especially concerning the use of plastic materials. The practice of green production can make businesses more sustainable by considering environmental factors. Although this activity is widely applied in developed countries within a corporate context, its implementation in developing countries, particularly in the context of Small and Medium Enterprises (SMEs), has not been fully realized. Therefore, this research attempts to address the gap in the literature regarding the implementation of a circular economy by examining the roles of stakeholder pressure and green production in the context of SMEs in Indonesia, specifically in DIY and Central Java. DIY and Central Java are used as research objects because these two provinces are known to have the largest fashion industry compared to other provinces in Indonesia (Humas DIY, 2022). The fashion business uses a lot of chemical-based materials and often involves production processes that use the most plastic-based materials. This industry is the largest contributor to microplastics (Megumi, 2019).

2. THEORY REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Stakeholder Theory

Freeman (2010) asserts that every organization has responsibilities to various stakeholders, including consumers, markets, and owners. According to Wang *et al.* (2020), the pressure from stakeholders has a strong correlation with improving business performance, especially in dynamic environments. Furthermore, Huijgens (2017) states that a company's commitment to the environment can be influenced by external factors, namely pressures from stakeholders such as consumers, suppliers,

markets, and others in the external environment. Thus, the better an organization manages its relationships with stakeholder groups, the better its performance over time (McGahan, 2021; Shanks, 1983).

Stakeholders, as explained by Donaldson (1999), Jia & Chen (2003), and Huijgens *et al.* (2017), encompass customers, suppliers, competitors, investors, employees, government, and the community, with the potential to influence organizational performance. According to Yang *et al.* (2018), stakeholders correlate with an organization's practices through direct or indirect pressures. The most influential stakeholders are those capable of exerting direct pressure on organizations for practices causing environmental pollution and contamination (Jalali *et al.*, 2020; Rui & Lu, 2021; Vitolla *et al.*, 2019). Stakeholder theory emphasizes that organizations are required to protect consumers and the environment, ensuring fair competition for the safety of various parties, including consumer protection. In the stakeholder theory, the market pressure, green production, and circular economic practice approaches are predicted to enhance SME business performance, rendering stakeholder theory relevant.

2.2. Hypothesis Development

Market Pressure and Circular Economy Practices

As market players strive to mitigate the escalating environmental issues, particularly concerning plastic pollution, business organizations, especially small and medium-sized enterprises engaged in plastic pollution, tend to adopt green-based strategies to appease stakeholders such as markets and consumers (Muafi, 2021; Dai *et al.*, 2018; Goncalves-Pinto *et al.*, 2020). According to Sukoco *et al.* (2018), market pressure can arise from competition, customer demands, government regulations, and economic conditions, shaping and determining specific strategies. On one hand, when organizations operate in the same industry, pressure emerges from various parties experiencing the negative impacts of business practices, such as pollution and plastic waste, affecting the environment and society. Circular economic practices aim to minimize waste and maximize resource efficiency, promoting sustainable production and consumption by providing durable and reusable products (Muafi & Sugarindra, 2023; Muafi, 2021). As mentioned by Qiu *et al.* (2020a), market demand has compelled organizations to deliver sustainable products and services. Anzules-Falcones *et al.* (2021) argue that to offer sustainable products and services, organizations must adopt circular economic practices by implementing environmentally friendly business practices to minimize various risks and reduce waste generation. Hence, there is an interconnection between market pressure and the principles of a circular economy.

H1. Market pressure has a positive effect on circular economy practices

Market Pressure and Green Production

On the other hand, the call for an orientation towards environmentally friendly business practices in various countries has been extensive to ensure the sustainability of businesses. Various significant efforts have encouraged SME players to implement environmentally friendly production and preserve sustainability (Muafi & Sugarindra, 2023). The role of market pressure in implementing environmentally friendly production has been extensively explored, especially in developed countries (Agyabeng-mensah *et al.*, 2020). In the theory of social influence, contemporary business organizations are inseparable from stakeholders, markets, and society. As a

result, most organizations are compelled to adopt specific practices that can influence their resource base and encourage organizations to utilize their resources over a relatively long period (Freeman & McVea, 2001). Research conducted by Baah *et al.* (2021), using empirical data, found that stakeholders, including shareholders, consumers, competitors, and markets, influence organizations to implement strategic business plans. The research findings of Johan *et al.* (2023) conclude that market pressure positively influences green production.

H2. Market pressure has a positive effect on green production

Green Production and Circular Economy Practices

In addition to market pressure, environmentally friendly production (green production) is a crucial factor that SME players need to consider in enhancing economic sustainability. According to Setyaningrum *et al.* (2023, Setyaningrum & Muafi, 2023; Muafi & Sugarindra (2023), Jabbour *et al.* (2020), and Zameer *et al.* (2020), green production can serve as a solution to address resource scarcity and the increasing costs of materials. Green production is highly significant in responding to environmental issues that currently require attention. Machado & Davim (2022) add that green production involves integrating environmentally friendly concepts into the product life cycle, substantially reducing waste, and enhancing overall productivity. Zameer *et al.* (2020) state that green production practices have become a mandatory option since the introduction and implementation of ISO 14001 in 1996. This is due to stakeholder demands for environmental preservation, pollution prevention, and the sustenance of the economy. By implementing green production in their business processes, SMEs can differentiate their activities from competitors, attract environmentally oriented customers, and simultaneously seize opportunities to enter new markets (Wong & Ngai, 2021; Nilashi *et al.*, 2019). The findings from Muafi & Sugarindra explain that green production is part of green logistics, bringing significant positive impacts to enhance circular economic practices. These findings also support research by Zhang *et al.* (2020), indicating that companies can be assisted in reducing emissions and improving energy efficiency when utilizing green-based operational resources.

H3. Green production has a positive effect on circular economy practices

Circular Economy Practices and Green Product Innovation

In the field of transition management, Loorbach (2010) suggested that for businesses to be able to innovate, a linear business transition towards a circular economy (CE) is needed. Transformation towards a circular economy in various countries has become a strategic priority for organizations to obtain better business performance, especially in environmental aspects, resulting in product innovation. Circular economy principle is seen as regeneration principles to keep resources in use and reduce negative impacts resulting from business practices. Organizations that have an orientation towards developing a high culture of innovation must consider circular economy practices as it enables them to have the awareness and view of sustainability (Muafi & Sugarindra, 2023; Chauhan *et al.*, 2022). According to Ajwani (2021), a circular economy system can be implemented by organizations to achieve business performance by using the principles of reduction, return, recycling, and recovery which will lead to green product innovation. Likewise, Chauhan *et al.* (2022; Muafi, 2021) mentioned that to achieve green product innovation, organizations must have a good understanding of maintaining the environment in which the business operates.

According to Hart *et al.* (2019), circular economy practices are suitable for developing green product innovation as these principles are part of a new, redesigned business model. The implementation of the circular economy has received high attention, not only at the consumer and company level, but it has also developed at the regional, national, and global levels. In addition, Lamptey *et al.* (2021) mentioned that the CE concept is the antithesis of environmentally friendly production which prioritizes linear calculations so that it can be used to achieve economy, sustainability, environmental quality, economic prosperity, and product innovation (Setyaningrum *et al.*, 2023, Setyaningrum & Muafi, 2023; Purwanti, 2021). Kristianto & Nadapdap (2021) and Muafi (2021) also stated that in principle CE is based on the 3R concept (reduce, reuse, and recycle) with optimal production levels in utilizing natural resources by minimizing natural exploitation, minimizing environmental pollution, and reducing emissions and waste levels. When CE is practiced in firms, it will eventually lead to green product innovation due to its principles that are oriented towards the environment. Thus, there is a correlation between the application of circular economy principles carried out by business actors to achieve green product innovation to enable the organization to have positive value.

H4. Circular Economy Practices have a positive effect on green product innovation

3. METHODOLOGY

This research adopts a quantitative approach with an explanatory research design. Data collection was obtained from respondents, namely owners/managers of fashion SMEs, totaling 190, using purposive sampling. The sample selection in this study is based on criteria, namely having been in business for 5 years, private ownership, innovation in product development, and the implementation of green production processes as efforts to enhance business performance. In addition, this research is limited to fashion SMEs that have at least 5 employees. Data collection was performed by distributing offline questionnaires through visits to SME businesses in the DIY and Central Java provinces. Additionally, sample selection was also based on the business's establishment duration. The questionnaire, using a Likert scale of 5 (strongly disagree to strongly agree), was employed to collect data from fashion SME owners/managers.

Variables Measurement

Market pressure is measured using 4 items adopted from Zameer *et al.* (2020; Wang *et al.*, 2020). The example of the item is “Consumer preferences for eco-friendly product encourage our firms to carry out pro-environmental business activities.” Green production practice is measured using 4 items adopted from Zameer *et al.* (2020; Chan *et al.*, 2016). The example of the item are “Our firm uses raw materials that do not cause pollution, do not contain toxins, and are environmentally-friendly” and “Our firm uses raw materials that can be recycled, reused, and decomposed”. In addition, green product innovation is measured using 3 items from the study carried out by Qiu *et al.* (2020b). The example of the item is “Our firm uses the most energy-efficient approach during the process of product development, design, or production”. Finally, circular economy practice is measured using items developed by Jabbour *et al.* (2020). The example of the item is “Our firm replace the use of non-renewable raw materials by renewable raw materials”.

4. RESEARCH RESULT

Respondent Profiles

The respondents involved in this study are individuals who have been engaged in manufacturing SME businesses for a minimum of 5 years. To provide more detailed information, the respondents are categorized into several groups. In terms of gender, the majority of respondents are female, accounting for 53%, while males constitute 47%. Regarding age categories, the distribution is relatively even, with the highest percentage in the age range of 20–29 years at 27%, followed by 40–49 years at 25%, 30–39 years at 24%, and > 49 years at 24%. In terms of the duration of business operations, the majority of respondents have been running their businesses for 9–12 years, making up 38%, followed by those in business for 5–8 years at 36%, and > 12 years at 25%. In the innovation interval category, where respondents have specific targets within a given time unit to innovate their products, the majority choose to do so conditionally, accounting for 32%. Additionally, 1–2 years is selected by 28%, < 1 year by 25%, and > 2 years by 15%. This data is summarized in Table 1.

Table 1. Respondent Profiles

Respondent	Total	Percentages
Gender		
Male	89	47%
Female	101	53%
Age		
20 – 29 Years old	51	27%
30 – 39 Years old	45	24%
40 – 49 Years old	48	25%
> 49 Years old	46	24%
Length of time in business		
5 – 8 Years old	69	36%
9 – 12 Years old	73	38%
> 12 Years old	48	25%
Innovation Interval		
< 1 Years old	47	25%
1 – 2 Years old	53	28%
> 2 Years old	29	15%
Conditional	61	32%

Source: Processed data, 2023

Descriptive Statistics

Descriptive statistics provide a general description of the construct data used in the

study. The test results are summarized in Table 2. Market pressure has an average score of 4.00 with a standard deviation value of 0.958. Green production practice has an average score of 4.34 with a standard deviation value of 0.842. Circular economy practice has an average score of 4.30 with a standard deviation value of 0.831. Meanwhile, green product innovation has an average score of 4.33 with a standard deviation value of 0.826.

Table 2. Descriptive Statistics Analysis

Variable	N	Mean	Standard Deviation
Green Production Practice (GPP)	190	4.28	0.857
Green Product Innovation (GPI)	190	4.34	0.795
Market Pressure (MP)	190	4.10	0.938
Circular Economy Practice (CEP)	190	4.19	0.908

Reliability and Validity of Measurement Model

The reliability of each variable is calculated using Cronbach's Alpha to determine the reliability of the measurement model (Narasimhan & Jayaram, 1998). The Cronbach's Alpha value of each variable is in the range of 0.730 to 0.855, higher than the generally agreed lower limit of 0.70 (Nunnally, 1978; Flynn *et al.*, 1990). Furthermore, the Composite Reliability value is in the range of 0.828 to 0.902, which shows the reliability of the item. Next, discriminant validity and convergent validity were tested using the Confirmatory Factor Analysis (CFA) model (O'Leary-Kelly and Vokurka, 1998). In the CFA model, each item is linked to its construct and average variance extracted (AVE) (Fornell and Larcker, 1981; Henseler *et al.*, 2015; Voorhees *et al.*, 2016).

Table 3. Results of Reliability Test

Construct	Cronbach's Alpha	Composite Reliability	AVE
Green Production (GPP)	0.752	0.858	0.669
Green Product Innovation (GPI)	0.855	0.902	0.699
Market Pressure (MP)	0.730	0.828	0.550
Circular Economy Practices (CEP)	0.806	0.860	0.506

This study uses the AVE value to determine convergent validity. An acceptable AVE is 0.50 or higher, so at least 50% of the item variance can be explained by the construct. In Table 3, it can be seen that all AVE values have exceeded the recommended threshold. Discriminant validity is evaluated using Fornell-Larcker Criterion, which results are presented in Table 4. The Fornell-Larcker Criterion involves a comparison between the square root of AVE and the correlation between items. The square root value of AVE must be greater than the correlation between items. As presented in Table 4, this criterion is met for all constructs. Thus, it confirms the discriminant validity of the measurement model.

Table 4. Discriminant Validity with Fornell-Larcker Criterion

	CEP	GPI	GPP	MP
CEP	0.711			
GPI	0.610	0.836		
GPP	0.703	0.780	0.818	
MP	0.518	0.622	0.546	0.741

Furthermore, reflective model assessment involves examining loading factors. A loading factor value which exceeds 0.700 indicates that the construct explains more than 50% of the indicator variance, thus providing acceptable item validity. As seen in Table 5, all recommended thresholds have been met (Hair *et al.*, 2019).

Table 5. Loading Factor and Collinearity Statistics

Latent Constructs	Items	Loadings	VIF
Green Product Innovation	GPI1	0.825	1.681
	GPI2	0.773	1.329
	GPI3	0.855	1.758
Green Production Practice	GPP1	0.741	1.578
	GPP2	0.876	3.187
	GPP3	0.896	3.457
	GPP4	0.822	1.850
Market Pressure	MP1	0.791	1.278
	MP2	0.797	2.399
	MP3	0.801	2.333
	MP4	0.757	1.267
Circular Economy Practices	CEP1	0.790	1.821
	CEP2	0.703	2.104
	CEP3	0.740	2.530
	CEP4	0.739	1.482
	CEP5	0.729	2.150
	CEP6	0.757	1.771

Structural Equation Modelling

To evaluate the quality of the structural model, the standard assessment criterion considered in this study is the coefficient of determination (R^2). Before testing the structural model, model collinearity is checked to ensure that the regression test results are not biased. The collinearity test is carried out using the Variance Inflation Factor (VIF). A VIF value that exceeds 5 indicates that there are possible symptoms of collinearity between the predictors. The coefficient of determination value for the

variables studied is 0.299 for Green Production, 0.657 for Green Product Innovation and 0.520 for Circular Economy Practices. In the collinearity test, the VIF value is in the range 1,267 to 3,457, where the value is below 5, meaning that there are no symptoms of collinearity between the predictors.

Furthermore, to evaluate the significance level of the path coefficient, a bootstrapping test is carried out with a subsample of 500. Table 6 displays the path analysis of the structural model. Market pressure ($\beta = 0.191$; $t = 2.313$; p -values = 0.021), has a positive and significant influence on circular economy practices, which supports hypothesis 1. Market pressure ($\beta = 0.546$; $t = 10.564$; p -values = 0.000), has a positive and significant influence on green production practice, supporting hypothesis 2. Green production practice ($\beta = 0.599$; $t = 7.888$; p -values = 0.000), has a positive and significant influence on circular economy practices, which supports hypothesis 3. Circular economy practices ($\beta = 0.810$; $t = 28.014$; p -values = 0.000), have a positive and significant influence on Green Product Innovation, supporting hypothesis 4.

Table 6. Path Coefficient

Path Relationship	Unstandardized beta	Standardized beta	STDEV	T-Statistics	P-Values
MP → CEP	0.191	0.193	0.082	2.313	0.021*
MP → GPP	0.546	0.554	0.052	10.564	0.000*
GPP → CEP	0.599	0.597	0.076	7.888	0.000*
CEP → GPI	0.810	0.810	0.029	28.014	0.000*

*note= sign with alpha 0.05.

5. DISCUSSION AND IMPLICATION

The research findings indicate that market pressure has a positive impact on circular economy practices (H1 accepted). As stated by Wang *et al.* (2020), external factors beyond an organization's control can influence its activities. Environmental issues, particularly plastic pollution, have become crucial concerns, leading to various pressures, including those from the market. Kaldonski *et al.* (2020) notes recent advancements indicating that many SMEs are making efforts toward environmental protection through the implementation of circular economy practices. Market pressure engages businesses in adopting circular economy practices. As highlighted by Ajwani (2021), the circular economy is an economic concept focused on reducing resource consumption and minimizing waste and environmental damage resulting from business practices. The circular economy concept encompasses various practices such as recycling, reusing, repairing, and reshaping business models, prioritizing sustainability.

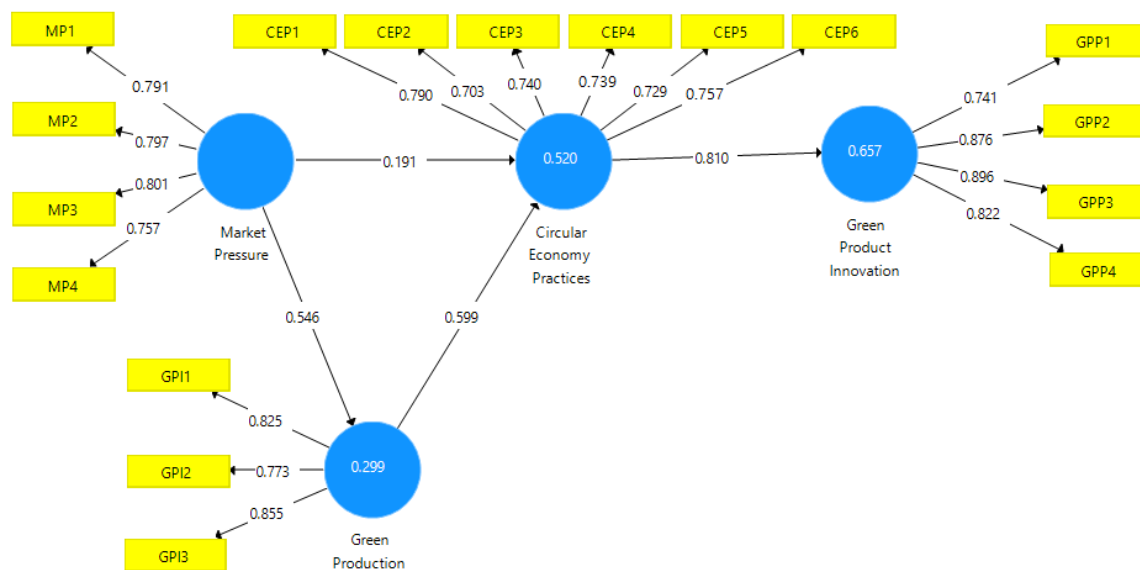


Figure 1. Output of Measurement and Structural Model

The findings of this study align with the statement by Tjahjadi *et al.* (2022) that firms will experience pressure when external issues regarding the environment arise, along with pressures from various stakeholders such as the market. By adopting circular economy practices, such as reducing plastic usage and implementing reduce, reuse, and recycle in their business processes, manufacturing SMEs can continue to enhance their performance and maximize profits. These findings also indicate that despite many entrepreneurs exclusively pursuing profit, environmental issues are often overlooked. In the stakeholder approach, the roles of the market and organizations are inseparable and interconnected. Moreover, current resource and environmental issues have become dilemmas faced by many organizations. Numerous efforts have been made to ensure that businesses can have a positive impact on the environment, especially in terms of production. The concept and practice of environmentally friendly production in the context of SMEs have gained significant attention, given the increasing magnitude of plastic pollution. According to Zameer *et al.* (2020), environmentally friendly production in this study refers to the product life cycle. Nevertheless, the role of market pressure emerges as a strong predictor in driving environmentally friendly production. The concept and practice of environmentally friendly production have yielded many positive impacts on environmental preservation and have mitigated the negative effects generated by business practices, reducing the resulting waste (Shibuya *et al.*, 2023; Kuo *et al.*, 2022; Sunarjo *et al.*, 2022). As stated by Shibuya *et al.*, 2023; Kuo *et al.*, 2022; Agyabeng-mensah *et al.* (2020), market pressure for environmentally friendly production is increasing in tandem with growing awareness of environmental issues. Consumers tend to choose products produced with consideration for their environmental impact. This, in turn, encourages organizations to adopt more sustainable production practices. Consequently, organizations can utilize their resources more efficiently (H2 accepted).

Furthermore, this study also found that environmentally friendly business practices are strong predictors of enhancing circular economic practices. According to Zhang *et al.* (2020), environmentally friendly production also benefits in building the

organization's image. For example, an entrepreneur who has implemented a cocoa board (particle board made from coconut fibers) has successfully generated positive socio-economic impacts. Circular economic practices can be well implemented if SME actors are willing to adopt environmentally friendly production (H3 accepted). Finally, this study also found that circular economic practices implemented by entrepreneurs can lead to valuable product innovation. As stated by Awan & Sroufe (2022); Ncube *et al.*, (2023), circular economic practices have provided new knowledge that can be adopted by SME actors. Environmentally friendly production processes can be a strong supporter in generating product innovation. This study also found that when SMEs implement circular economic practices involving reduction, reuse, recycling, and resource regeneration, it will positively impact the business performance of SMEs, resulting in new product innovations (H4 accepted).

In conclusion, this research suggests that the implementation of circular economic practices can enhance business performance by producing innovative products using environmentally friendly production practices. Issues regarding plastic waste pollution generated by SME actors still need solutions. Also, the increasing market pressure supports business actors in directing environmentally friendly business practices by reducing the pollution generated. Furthermore, the implementation of circular economic practices can help drive SME actors to improve their product innovation. This is because the circular economy demands revolutionary technology that encourages reuse, repair, and improvement in products as a means of reducing generated waste.

Green innovation products are the result of product circularity, playing a crucial role in environmental sustainability. In this study, the circular economy focuses on prolonging the use of products and encourages product development. As stated by Ncube *et al.* (2023), adopting environmentally friendly production principles and implementing a circular economy can be a solution to address economic recessions in the coming years. This is because the implementation of these two factors can help save raw materials, transportation costs, and storage costs that support business operations. By successfully adapting environmentally friendly business practices with a circular economy approach, the issues of growing waste and pollution are likely to be addressed, and market pressure can be minimized. Additionally, this research provides implications for business actors to adopt a circular economy model by building innovative technologies, using materials with long durability, promoting reuse, and minimizing pollution impact.

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