Journal of Data Acquisition and Processing
ISSN: 1004-9037
https://sjcjycl.cn/
DOI: 10.5281/zenodo.755230

EFFECT OF CIRCULAR ECONOMY ON FINANCIAL SUSTAINABILITY IN DEVELOPING ECONOMY. EVIDENCE FROM NIGERIA.

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Abstract

The study examined the effect of the Circular Economy on Financial Sustainability in Developing Economies.: Evidence from Nigeria. The specific objectives are to; examine the effect of recycling waste material on the Financial Sustainability of the Developing Economy. and evaluate the effect of recovery material on the Financial Sustainability in the Developing Economy: Evidence from Nigeria. A descriptive cross-sectional research design was adopted for the study. The study adopts a primary source of data, a structured questionnaire was used to collect the data. The questionnaire was designed on a five-point Likert scale. The collected data was presented and examined using tables and other common statistical methods including simple percentages, Pearson correlation coefficient, and simple linear regression analysis. We used SPSS 27.0 to carry out the data analysis. The results of the study indicate that at a 5% level of significance, there is a significant effect of recycling waste material on Financial Sustainability in the developing economy; evidenced by Nigeria with a positive value of 0.494. Also, recovery material has a substantial effect on Financial Sustainability in developing economies: Evidence from Nigeria with a P- value Obtained (0.001). we concluded that Circular Economy has a significant effect on Financial Sustainability in Developing

Economies. The study recommended among others that Developing economies should prioritize investments in recycling infrastructure and technologies to support efficient waste management systems.

Keywords: Circular, Developing, Economy, Financial, Sustainability

1.1 Introduction

The paradigm for sustainable development has shifted in recent decades to emphasize the circular economy, acknowledging the limited nature of resources and the necessity of separating economic expansion from environmental damage and resource depletion. Reducing, reusing, recycling, and recovering resources are the hallmarks of a circular economy, which is a revolutionary strategy for attaining environmental and financial sustainability. Even if this idea is becoming more and more popular worldwide, there is still much to learn about how it affects developing economies' ability to maintain their financial stability. This study investigates the relationship between financial sustainability and circular economy principles, with a particular emphasis on Nigeria. Nigeria faces the twin problem of balancing environmental concerns with economic growth as a developing nation with an abundance of natural resources. Economic thought has undergone a paradigm shift in the twenty-first century as countries become more aware of the drawbacks of linear production and consumption models. The regenerative use of resources is given priority in circular economies, which are gaining popularity as a workable way to mitigate the negative environmental effects of traditional linear economic systems.

This study places itself in the context of this global conversation and aims to add empirical data to the continuing discussion on the economic effects of circularity. Nigeria, with its rapidly growing population, an abundance of natural resources, and an ambitious goal for economic progress, is at a crossroads where the need for development and the pursuit of sustainability collide. Resource management and environmental protection are challenged by fast industrialization, urbanization, and changes in consumption habits. To understand how circular economy ideas might be applied to attain financial sustainability without sacrificing economic advancement, this study focuses on the Nigerian setting. Despite the growing scholarly interest in the circular economy discourse, there is a significant research vacuum on the direct effects of this discourse on financial sustainability in emerging economies, especially when it comes to Nigeria. By offering empirical insights into the effects of circular behaviors on economic indicators, this research seeks to close this knowledge gap and add significant knowledge to the corpus of existing work.

1.2 Statement of the problem

The adoption of circular economy concepts raises important questions about how financial sustainability is impacted, particularly in developing economies, as the world community comes to understand how urgent it is to shift towards circular economies. The goal of this study is to examine the unique opportunities and problems that Nigeria's adoption of circular economy principles presents. examining how Nigeria's financial sustainability is affected by circular economy activities, both directly and indirectly. The main issue facing the nation is the

deficiency in waste material recovery and recycling. This entails looking at economic metrics like GDP growth, resource efficiency, employment generation, and investment trends in order to comprehend the concrete ways that circularity contributes to the economy's financial health. Investigating the difficulties and impediments to Nigeria's successful adoption of circular economy principles. These include obstacles that could threaten the financial viability of the shift to circular models, such as institutional, legislative, and cultural impediments.

1.1 Objective of the study

The main objective of this study is to examine the Effect of Circular Economy on Financial Sustainability in Developing Economies. Evidence from Nigeria. The specific objectives of this study are to;

i. Examine the effect of recycling waste material on the Financial Sustainability of the Developing Economy. Evidence from Nigeria.
ii. Evaluate the effect of recovery material on the Financial Sustainability in the Developing Economy. Evidence from Nigeria.

1.2 Hypotheses of the study

i. Recycling of waste material has no significant effect on the Financial Sustainability of the Developing Economy. Evidence from Nigeria.
ii. Recovery material has no significant effect on Financial Sustainability in a Developing Economy. Evidence from Nigeria.

Review of Related Literature

2.1 Conceptual Review

Circular Economy

Pearce et al. (1990) established the notion of the circular economy to highlight the necessity of assessing the interdependence of economic and environmental activities. They have imposed a closed-loop material flow economic system in which everything is an input into everything else. Different evolving ideas, including the green economy, bio-economy, industrial ecology, industrial symbiosis, and cradle-to-cradle design, have led to the provision of multiple definitions of the circular economy over time (Vitolla et al., 2023). A circular economy, which distinguishes between technological and biological cycles, is restorative and regenerative by design and strives to maintain goods, components, and materials at their maximum utility and worth at all times, according to the Ellen MacArthur Foundation (2016). A "closed-loop economy" that "does not generate excessive waste and whereby any waste becomes a resource" is how Wysokinska (2016) defined CE. The following is taken from the EU Action Plan for the Circular Economy: "In a circular economy, resources are kept within the economy when a product has reached the end of its life, to be used again and again to create further value; waste and resource use are minimized" (European Commission, 2015).

The circular economy is a sustainable development project that applies material cycles, renewable energy sources, and cascade-type energy flows to the linear system of society production-consumption in order to reduce the linear material and energy throughput flows. In addition to more conventional recycling, CE supports high-value material cycles and creates systemic ways for producers, consumers, and other social actors to collaborate on sustainable

development initiatives (Korhonen, Nuur, Feldmann, and Birkie, 2018). The circular (closed) flow of raw materials and energy consumption in several stages is the core of a circular economy (Frankline-Johnson, Figge & Canning, 2016). "A system that minimizes matter, energy flow, and environmental deterioration without limiting economic growth or social and technical advancement" is another definition of this type of economy (Geng, Zhu, Doberstein & Fujita, 2009).

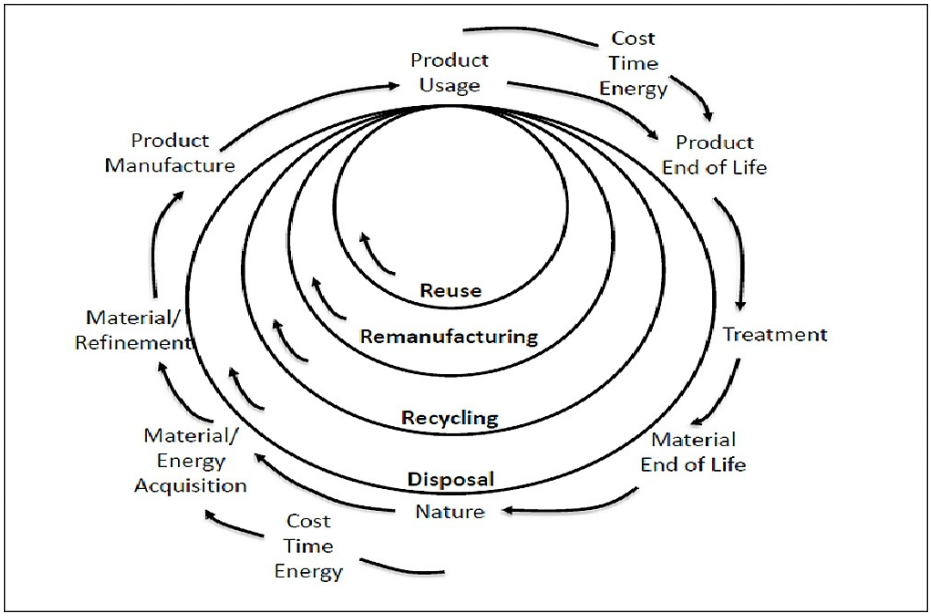

Figure 1. The current concept of circular economy (Korhonen et al., 2018)

Four fundamental natural laws form the foundation of the circular economy (Ellen MacArthur Foundation, 2013; Weetman, 2017). One way to define these ideas would be as follows:

1. **Waste as nutrients:** Just like in the natural world, waste can either nourish the soil or serve as food for other creatures. When it comes to things, this means preserving them so they can be used and reinvented to increase their longevity by maintaining the best quality in all of their pieces. Thus, a product's life cycle might be perpetually prolonged.
2. **Resilience:** The diversity of species fosters resilience, just as it does in nature. The circular economy generates a vast reservoir of resources that it may utilize to adapt to any situation.
3. **Renewable energy:** to establish an interconnected system that facilitates the exchange of ideas, information, and resources—all driven by renewable energy.
4. **Systemic:** it is founded on the relationships among its components, generating chances for the environment in which it grows and serving as a model for other economies, cultures, and civilizations.

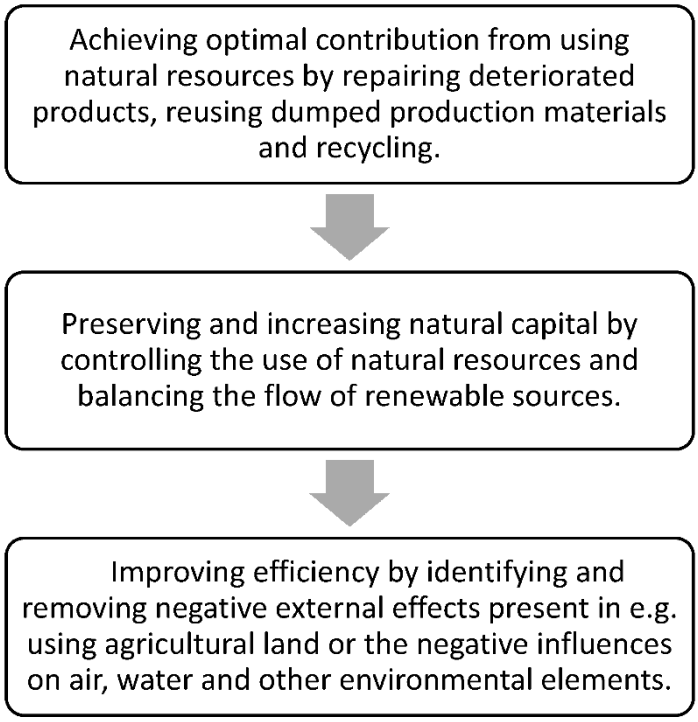

Figure 2. Principles of Circular Economy (Tisma et al., 2017)

Recyclable materials are reintroduced into the economy as fresh raw materials in a CE, hence boosting supply security. Similar to main raw materials from conventional extractive resources, these "secondary raw materials" can be delivered and exchanged. In order to lessen production costs and environmental effects, materials from goods that have reached the end of their lives are recovered through disassembly and recycling. According to Aanda-Uson, Portillo-Tarragona, Marin-Vinuesa, and Scarpellini (2019), recycling is therefore a prerequisite for a CE that incorporates eco-design for recyclability, reuse, and other environmental management strategies, such resource efficiency.

Recycling

Recycling, which ranks third on the waste management hierarchy and is a waste management technique, has revolutionized how people handle waste (Mwanza, 2021). It's amazing to note that recycling has been around since the 1800s and has only gotten bigger worldwide. There are benefits and drawbacks to recycling's expansion and developments. Hopewell et al. (2009) conducted a study that addresses the potential benefits and drawbacks of recycling plastics, but emphasizes that recycling remains a crucial strategy for reducing the environmental damage that plastics create. Furthermore, recycling is a dynamic representation of the plastics business. It has grown quickly and offers the recycling sector and society at large a number of benefits. The following are some of the benefits of recycling:

a. Reduction of landfill contamination
b. Diversion of waste materials into other recovery streams
c. Reduction of raw material consumption
d. Ability to work as an open and a closed loop system
e. Reduction of pollution levels

f. Creation of educational opportunities.

Recycling initiatives have two main benefits: they reduce global warming and generate jobs (Mwanza, 2021). Tshifularo and Patnaik (2020) have noted that low melting viscosity and poor mechanical and thermal qualities are among the drawbacks of new goods made from recycled plastics. Recycling also has drawbacks in that the degraded mechanical and physical qualities of the recycled wastes lead to the presence of pollutants and lower molecular weight.
Besides these demerits presented in recycled plastics, several demerits on recycling exist such as.

a. Recycling is expensive compared to landfilling
b. Communities lack of compliance with recycling programs
c. Unhygienic and unsafe recycling sites
d. Problems created by contaminants
e. Litter creation by waste collectors
f. Non-durability of recycled products
g. Energy consumption and Pollution (Mwanza, 2021)

Material Recovery

To minimize the usage of new resources and eliminate waste materials, a material recovery approach is presented that involves recycling, reusing, and regenerating. Several material recovery methods are now commonly used. "Reuse" refers to the process of sending resource-consuming unit output material to other operations rather than back into the original processes from whence it was released (Arif and Muhammad, 2022). The process of gathering, processing, and repurposing items that would otherwise be thrown away as garbage is known as material recovery. Material recovery aims to remove valuable materials from the waste stream, lessen the negative environmental effects of disposing of garbage, and encourage a more sustainable circular economy (Jacobs et al., 2022).
Components of material recovery include:

1. **Collection:** The goal of source separation is to motivate people and organizations to separate recyclables from non-recyclable garbage at the place of origin. Curbside recycling refers to the collection systems that collect recyclables from homes in addition to ordinary rubbish. Drop-off centers are places where people can bring recyclables to be disposed of properly.
2. **Sorting and Processing:** Material recovery facilities, or MRFs, are establishments that are outfitted with the tools and gear necessary to effectively sort and process recyclables. Workers who engage in manual sorting must physically arrange materials to guarantee correct separation. To aid in simplifying the process, advanced technologies include automated systems including conveyor belts, screens, magnets, and optical sorting devices.
3. **Recycling:** The process of transforming recyclable resources into new goods or raw materials for production is known as conversion. The goal of closed-loop recycling is to minimize the consumption of virgin resources by recycling materials back into the same or a comparable product. Upcycling, a subset of recycling, is the process of repurposing materials to create more valuable goods.

4. **Composting:** Composting is the process of breaking down organic waste into nutrient-rich soil amendments in addition to the usual recycling methods.
5. **Waste-to-Energy (WTE):** Energy recovery refers to the utilization of some non-recyclable materials as a fuel source for incineration or other technologies that generate energy.
6. **Awareness and Education:** Part of community participation is teaching the general public the value of recycling, appropriate trash disposal, and the advantages of material recovery for the environment. Policies and Laws: putting into effect rules and legislation that promote ethical waste management techniques.
7. **Circular Economy:** The goal of Design for Recycling is to motivate product designers to make products that are easily disassembled and recyclable. Extended Producer Responsibility (EPR): Encouraging manufacturers to design their products for recyclability by holding them accountable for the disposal of their products at the end of their useful lives.

To lessen waste's negative effects on the environment, preserve natural resources, and encourage more sustainable methods of production and consumption, material recovery is essential. It is essential to international efforts to solve environmental issues and transition to a circular economy.

Circular Economy and Financial Sustainability

Sustainability encompasses environmental, social, and economic dimensions. Of the three factors used to measure sustainability, economic feasibility is the easiest to measure when it comes to solid waste management systems (Domenech and Bahn-Walkowiak, 2019). According to Mayer et al. (2019), a circular economy is one option that will aid in the transition to sustainable waste management systems, which are becoming more and more popular in many nations. By switching from the conventional linear economic model to a circular one, waste will be reduced since resources, materials, and products will be kept in the system for longer. Although the circular economy concept encompasses systemic changes based on innovations and the use of new technological systems, as well as by altering how policies, society, business models, and funding methods are perceived and managed, consumer involvement plays a significant role in the implementation of the circular economy (Domenech and Bahn-Walkowiak, 2019). The primary objective is to construct a system that permits the regeneration of products, product components, and materials in a way that maintains their maximum value for as long as feasible. Resources should be able to be used as fertilizer for the environment or reformed and reintegrated into the economic system simultaneously. There are a ton of advantages associated with novel company models. According to Meyer's (2019) assessment, enhancing resource consumption efficiency can result in savings of 17%–24% for raw materials and 630 million euros in cost savings for Europe. Applying the circular economy concept might boost the GDP of the European Union by 3.9% by 2030, according to estimates based on product-based modeling (Sverko Grdic, Krstinic Nizic, and Rudan, 2020).

Theoretical Framework

Voluntary disclosure theory (signaling theory)

Signaling theory is another name for voluntary disclosure theory (Luo and Tang, 2014). Voluntary disclosure theory states that a corporation is not at all likely to "hide the good deed" when it comes to accomplishments in the circular economy. The corporation aims to cultivate a positive corporate image by aggressively disclosing its green information. Businesses can use

signaling theory to communicate with the public and improve corporate transparency, as demonstrated by Dye (1985). Companies can avoid investors' negative selection by setting themselves apart from underperforming competitors through the dissemination of positive information to stakeholders. According to Clarkson et al. (2015), implementing an active environmental strategy and communicating this information to investors can raise the value of the company's shares. Since environmental pollution carries a larger financial risk, an increasing number of commercial banks have become more cautious in recent years when extending loans to businesses that produce large amounts of pollution. Businesses that can borrow more money are typically worth more. This may serve as proof for the presumption of business value and environmental preservation. According to Yu (2015), investors would view a company's value and reputation as higher if they discover from the signals they have received that it has comparatively less potential environmental debt and risk. In addition to indicating regulatory compliance, green signals let stakeholders know whether the company faces suspension.

Stakeholder theory

According to Freeman's (1984) stakeholder theory, a company's operational success should also be assessed in terms of the value enjoyed by all parties impacted by the business, not only shareholders. Diverse stakeholders exert varying degrees of influence over a company. By managing the resources necessary for a business to continue operating, they have an impact on management choices made by the organization (Ullmann, 1985). The guidelines were created to improve stakeholder communication while enhancing corporate environmental performance of enterprises through incentives and special rewards (Kazancoglu et al., 2021).

Roberts (1992), however, provides evidence that the government can influence corporate plans through tax subsidies, laws, or special treatment. In contrast to other stakeholders, the government has the ability to impose laws that give it more power and coercion over businesses. As a result, it is believed that the government is the primary stakeholder in businesses. Evidence that corporate environmental disclosure has a favorable and significant relationship with the government has been obtained by scholars from China. China is a socialist nation, meaning that the government has complete control over business affairs. Businesses that break any state laws face penalties that, in the worst situation, can include license revocation, fines, and company suspension (Kuo and Chang, 2021). Li and Zhang (2010) have also noted that the bulk of Chinese publicly traded companies are state-owned enterprises (SOEs), under government control. From the explanation above, it is clear that the government is by far the largest stakeholder in Chinese publicly traded companies. One of the major obstacles to a successful circular economy is the absence of legislation. Previous research suggests that governments have the potential to significantly stimulate businesses' shift to a circular economy (Manninen et al., 2018).

2.3 Empirical Studies

Marmolejo, Diaz, Torres, Garcia, Burbano, Blanco, Erazo, and Pereira (2010) studied the influence of handling practices on material recovery from residential solid waste. In three Colombian towns with solid waste management plants, the study examined how residential

solid waste is generated, what makes up that garbage, and how users handle it (SWMP). A systematic selection process combined with random sampling was used to choose the homes that would be surveyed. The results indicate that while a sizable amount of valuable materials are there, material recovery and the effectiveness of SWMPs are hampered by their treatment of the materials as "garbage," their lack of appreciation for the recovery effort, and their poor source and storage management procedures.
The solid waste management system and the manner in which the SWMPs under analysis operate are comparable to those of every other municipality in the nation and the other nations in the region, thus these findings might be used as a guide for this kind of municipality.

Kuo and Chang (2021) studied the affecting factors of circular economy information and its impact on corporate economic sustainability with evidence from China. This viewpoint informs the research, which centers on the years 2011–2017. Regression analysis is employed in the analysis of the sample, which comprises 3,768 companies. The content analysis coding approach is used to gauge how much information about the circular economy is disclosed. Text descriptions can be methodically and impartially turned into quantitative data using the analytical methodology of content analysis. The study's empirical findings demonstrate that, to satisfy stakeholders' information needs, businesses in environmentally sensitive industries and larger businesses tend to release noticeably more information on the circular economy. It also demonstrates how, between 2013 and 2017, state-owned businesses took the lead in putting the circular economy into practice. Moreover, companies that revealed a greater amount of information on the circular economy were linked to noticeably greater rates of return on equity and sustainable growth. Corporate managers should rethink production processes to achieve resource efficiency and zero waste, according to the paper's results.

Yu, Xu, Zhang, Wu, and Liao (2022) conducted a study that drew upon the organizational capability view to investigate the impact of circular economy practices (ecological design and investment recovery) on financial performance through environmental and innovation performance. Employing structural equation modeling and AMOS 21.0 software to analyze data from 308 Chinese enterprises, we discover that investment recovery and ecological design can improve business performance. Furthermore, the benefits of circular economy policies on financial performance are mediated by environmental and innovative performance. Ecological design implementation aids in investment recovery in the interim. Our research highlights the new avenue that circular economy practices might take to boost financial performance by fostering innovation and the environment.

Zaman, Malik, Awa, Handayani, Jabor and Asif (2022) carried out a study on the environmental effects of bio-waste recycling on industrial circular economy and eco-sustainability. The impact of trash production and recycling data on the country's emissions per capita during the last 46 years, from 1975 to 2020, was examined in this study. The unit root test, which finds the stationary process of the variables' underlying processes, was the first of four main techniques utilized in this study to ascertain the relationships between the variables under investigation. Second, the short- and long-run estimates for the variables were generated using the autoregressive distributed lag (ARDL) model. Third, the causal connections between

the variables were investigated using Granger causality estimates. Lastly, the correlations between variables over the course of the next ten years were predicted using innovation accounting matrices (IAM). Since the unit root estimates suggest a mixed order of variable integration, ARDL modeling should be used for estimating parameters. The ARDL estimates show that waste and combustible renewables reduce a country's carbon emissions by increasing the recycling of industrial waste. The huge output of municipal solid waste has led to uncontrollably high levels of carbon emissions, even with recycling mechanisms in place. Reducing carbon emissions requires sustainable recycling and waste management. According to Granger's estimates of causality, recycling of municipal and industrial solid waste is caused by waste, carbon emissions, and combustible renewable energy sources.

3.0 Research Design and Methods

A descriptive cross-sectional research design was used for this investigation. The responders were selected at random from among the numerous corporate divisions, including the procurement, finance, and human resources divisions. Simple random sampling was used to choose these organizations for the investigation. The survey findings were evaluated using SPSS 27.0's simple linear regression analysis. The study aimed to investigate the effect of a circular economy on financial sustainability in developing economies. Evidence from Nigeria.

3.1 Model Specification

Based on the link between predictors and dependent variables, simple linear regression analysis is the model specification employed in this study endeavor.

$$Y = \beta_0 + \beta_1 x_1 + \mu \dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$
$$Y = f(X)$$

Where Y=Dependent variable represented by financial performance
x_i= Predictors variable (Internal Audit)
β_0= Slope or intercept
β_1= Regression coefficients
μ= Error term

4 Data Analysis and Interpretation

The data collected from respondents in the various firms under study are presented, analyzed, and interpreted in this part. To meet our goal for this study, the replies were categorized by categorizing them using a Likert scale approach. A study of the structured questionnaire was conducted utilizing social science statistical software (SPSS version 27.0).

Table 1: Response Rate

	Frequency	Percentage	Cumulative Percent
Returned	152	87.86	87.86

Unreturned	21	12.14	100
Total	173	100	

Source: Field Work 2024

One hundred seventy-three (173 copies) of the questionnaires were distributed, but only one hundred and fifty-two (152) of them were returned, and the remaining copies were not. There were 21 unreturned items (21). The following are some of the causes for the unreturned.

- A few respondents lost the questionnaire given to them.
- A few respondents reluctantly did not respond to the questionnaire and lastly few others ticked two answers for a question, and this was recorded as a void to avoid incorrect interpretations.

4.2.2 Recycling of waste material

The instrument sought to find out about recycling of waste material

Table 2: Recycling of waste material

Statement	Strongly Agree	Agree	Neutral	Strongly Disagree
Waste recycling initiatives are essential for environmental sustainability	47(30.9%)	69(45.4%)	24(15.8%)	12(7.2%)
Waste recycling efforts contribute to reducing landfill waste.	55(36.2%)	63(41.4%)	14(14.5%)	10(6.6%)
Existing waste recycling programs in my community are effective	53(34.9%)	64(42.1%)	23(15.1%)	12(7.8%)
I am confident in my knowledge of how to properly segregate waste for recycling	41(26.9%)	66(43.4%)	31(20.4%)	14(9.2%)

Source: Fieldwork 2024

Waste recycling initiatives are essential for environmental sustainability, the findings revealed that 31% strongly agreed and 45% agreed. Because a greater % of respondents agreed, this implies that there is clear evidence that waste recycling initiatives are essential for environmental sustainability.

The study sought to determine whether waste recycling efforts contribute to reducing landfill waste. According to Table 2, 36% of employees strongly agreed that the waste recycling efforts contribute to reducing landfill waste, 41% agreed, 15% were neutral, and 7% strongly disagreed.

Furthermore, 35% of employees strongly agreed that the existing waste recycling programs in my community are effective. 42% agreed, 15% were neutral, and 8% strongly disagreed that the existing waste recycling programs in their community are effective. The study went on to

determine whether they were confident in their knowledge of how to properly segregate waste for recycling. According to table 2, the majority of respondents (27% strongly agreed, 43% agreed, 20% were neutral, and only 9% strongly disagreed).

4.2.3 Recovery material

This instrument seeks to find out about the recovery material.

Table 3: Recovery material

Statement	Strongly Agree	Agree	Neutral	Strongly Disagree
Material recovery initiatives are crucial for environmental sustainability.	73(48%)	62(40.8)	11(7.2%)	6(3.9%)
I believe that material recovery efforts can significantly reduce waste generation.	55(36.2)	61(40.1)	16(10.5)	20(13.2%)
I am motivated to participate in material recovery activities	66(43.3%)	60(39.5)	17(11.2%)	9(5.9%)
I am satisfied with the support provided by local authorities for material recovery efforts.	55(36.2%)	32(21.1%)	26(17.1%)	39(25.7%)

Source: Fieldwork 2024

According to the findings, 48% of respondents strongly agreed, 41% agreed, 7% were neutral, and 4% strongly disagreed that material recovery initiatives are crucial for environmental sustainability. The results indicate that 36% of the participants strongly agreed, 40% agreed, 11% were neutral and 13% strongly disagreed that they believe that material recovery efforts can significantly reduce waste generation. Table 3 shows 43% of the respondents strongly agreed, 40% agreed, 11% were neutral and 6% strongly disagreed that they are motivated to participate in material recovery activities. From the study 36% of the participants strongly agreed, 21% agreed, 17% were neutral and 26% strongly disagreed that they were satisfied with the support provided by local authorities for material recovery efforts.

4.2.4 Financial Stability in Developing Economy

This instrument seeks to find out about the financial stability in developing economies.

Table 3: Financial Stability in Developing Economy

Statement	Strongly Agree	Agree	Neutral	Strongly Disagree
The government's economic policies contribute positively to the financial stability of our country.	73(48%)	62(40.8%)	11(7.2%)	6(3.9%)
The unemployment rate in our country is manageable and not a significant concern.	20(13.2%)	16(10.5%)	61(40%)	55(36.2%)
The cost of living in our country is reasonable and manageable for the majority of citizens.	9(5.9%)	17(11.2%)	66(43.3%)	60(39.5%)
Our country's economy demonstrates resilience in the face of external economic shocks (e.g., global financial crises).	55(36.2%)	32(21.1%)	26(17.1%)	39(25.7%)

Source: Fieldwork 2024

According to the findings, 48% of respondents strongly agreed, 41% agreed, 7% were neutral, and 4% strongly disagreed that the government's economic policies contribute positively to the financial stability of their country. The results also indicate that 13% of the participants strongly agreed, 11% agreed, 40% were neutral and 36% strongly disagreed that the unemployment rate in Nigeria is reasonable and not a significant concern. Table 3 shows that 6% of the respondents strongly agreed, 11% agreed, 43% were neutral and 40% strongly disagreed that they feel that the cost of living in their country is reasonable and manageable for the majority of citizens. From the study 36% of the participants strongly agreed, 21% agreed, 17% were neutral and 26% strongly disagreed that their country's economy demonstrates resilience in the face of economic shock.

4.3 Hypothesis Testing

Decision Rule: Accept the null hypothesis if the probability value >0.05 otherwise accept the alternative hypothesis.

4.3.1 Hypothesis One

Ho_1: Recycling of waste material has no significant effect on the financial sustainability in developing economies; evidence from Nigeria.

4.3.2 Hypothesis Two

Ho1: Recovery material has no significant effect on the financial sustainability in developing economy; evidence from Nigeria.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.494[a]	.722	.689	3.08124
a. Predictors: (Constant), Recycling of waste material; Recovery material				

4.3.2 Model Testing and Interpretation

The model summary above explains the percentage of the dependent variable (financial stability of developing economy), that can be determined by the independent variable (recycling of waste material and recovery material). According to this Table, the dependent variables account for 72.2% (R Square, 0.722) of the independent variable. While the remaining 27.8% can be explained by other factors outside the scope of this model. This implies that recycling of waste material and recovery material has a direct influence on the financial stability of Nigeria. This Pearson correlation coefficient (R) result also showed a positive value of 0.494, which also lends credence to the fact that the predictor variable has a direct relationship with the response variable.

Table 5: ANOVA table

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	129.014	1	129.014	4.860	.001[a]
	Residual	3982.249	151	26.548		
	Total	4111.263	152			
a. Dependent Variable: Financial sustainability						
b. Predictors: (Constant): Recycling of waste material; Recovery material						

The study also analyzed variance to determine the extent to which the Independent and dependent variable relates with each other, and the result showed that P- value Obtained (0.001) was lower than the 5% level of significance specified in SPSS software for this analysis, therefore, according to the decision rule, the Alternate hypothesis will be accepted, while the Null hypothesis will be rejected. This implies that the recycling of waste material and recovery material has a significant influence on the financial stability of the Nigerian economy.

Table 6: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.968	2.415		7.855	.000
	Recycling of waste material	0.318	0.104	0.177	3.057	.019
	Recovery material	0.098	0.061	0.005	1.606	.249
a. Dependent Variable: Financial sustainability						

Simple linear regression analysis was also conducted to determine if the result established by ANOVA Statistics is similar to that of the regression coefficient. The result shows that the P-value obtained (i.e., 0.019) for the regression coefficient of recycling of waste material was also lower than the alpha level of significance of 5% specified in SPSS for this analysis therefore, thus, it can be inferred from this result, that the ANOVA Statistic is similar to that of the regression coefficient. Thus, the Alternate Hypothesis will be accepted while the Null Hypothesis will be rejected, which means that recycling of waste material has a significant positive effect on the financial stability of the Nigerian economy. Also, the result shows that the P-value obtained (i.e., 0.249) for the regression coefficient of working condition was also higher than the alpha level of significance of 5% specified in SPSS for this analysis therefore, thus, it can be inferred from this result. Thus, the Alternate Hypothesis will be rejected while the Null Hypothesis will be accepted, which means that recovery material has no significant positive effect on the financial stability of the Nigerian economy.

4.0 Discussion of Result

The result of this study indicates that recycling of waste material will significantly improve the financial stability of the Nigerian economy. This was confirmed by the result of the statistical analysis which shows that the P-value obtained (0.019) was lower than the significance value of 5% specified in SPSS for this analysis. Similarly, the result of this study indicates that recovery material will not significantly improve the financial stability of the Nigerian economy. This was confirmed by the result of the statistical analysis which shows that the P-value obtained (0.249) was higher than the significance value of 5% specified in SPSS for this analysis.

5. Conclusion

In conclusion, the effect of the circular economy on financial sustainability in developing economies, with evidence from Nigeria, highlights the transformative potential of sustainable waste management practices. This analysis underscores the significant impact of recycling waste materials and recovering materials on the financial sustainability of the Nigerian economy.

Firstly, the findings suggest that recycling waste materials plays a pivotal role in enhancing financial sustainability. By diverting waste from landfills and reintroducing materials into the production cycle, recycling not only conserves valuable resources but also reduces the costs associated with waste disposal and environmental degradation. Moreover, the establishment of recycling infrastructure creates employment opportunities and stimulates economic growth, contributing to overall financial stability and resilience.

Secondly, the recovery of materials emerges as another key driver of financial sustainability in developing economies like Nigeria. The efficient recovery and reuse of materials from discarded products and industrial processes not only minimizes resource depletion but also generates economic value through the creation of secondary markets and the reduction of raw material costs. Additionally, the adoption of innovative technologies and practices for material recovery can enhance productivity and competitiveness, positioning the economy for sustainable growth and development. We, therefore, concluded that the circular economy has

a significant effect on financial sustainability in developing economies, with evidence from Nigeria.

Recommendations

Based on the evidence demonstrating the significant impact of circular economy practices, particularly recycling waste material and recovering materials, on financial sustainability in developing economies like Nigeria, the following recommendations are proposed:

i. Developing economies should prioritize investments in recycling infrastructure and technologies to support efficient waste management systems. This includes establishing collection networks, sorting facilities, and recycling plants to facilitate the separation and processing of recyclable materials. Embracing innovative technologies for material recovery, such as advanced sorting techniques and waste-to-energy solutions, can enhance resource efficiency and economic viability.
ii. Governments and industry stakeholders should incentivize and promote circular business models that prioritize resource conservation and waste minimization. This may involve providing financial incentives, tax breaks, or subsidies for businesses that adopt circular practices, such as product redesign for recyclability, remanufacturing, or extended producer responsibility schemes. Encouraging partnerships between businesses and waste management enterprises can also foster collaboration and knowledge sharing to accelerate the transition towards circularity.

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