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SMES' FLIGHT TO DIGITAL AND GREEN ECONOMY: EVIDENCE FROM INDONESIA

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ABSTRACT

This research aims to examine the impact of SMEs' digital transformation on improving green economy implementation in Indonesia. This research will analyze how the influence of digitalization on SMEs on green economy implementation is getting stronger in SMEs that have access to financial services in Indonesia. This research will have implications on both theoretical and practical points of view regarding the importance of digital transformation in SMEs, the role of financial access, and green economy. The current research provides empirical evidence on the implementation of digital technology by Indonesian SMEs and the environmental issues that received renewed attention recently. The data in this study were collected using an interviewer-administered survey using google forms with the owners or managers of SMEs in the manufacturing, retail, and services sectors. The variables of interest in this study are the digital transformation of SMEs and green economy implementation. Furthermore, access to financial services is proposed as a moderating variable. In addition, the analytical method used in this quantitative study regression model and processed using STATA 17 software. This research shows that the digital transformation of SMEs helps improve green economy implementation in Indonesia.

Keywords: SMEs, digital transformation, access to financial services, green economy, Indonesia.

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1. INTRODUCTION

Small, and Medium Enterprises (SMEs) are one of the driving sectors and the backbone of the economy in Indonesia. Based on the data from the ministry of cooperatives and SMEs in 2018, SMEs contributed to the employment of 99.99% of the total business actors or as many as 64,199,606 business units, contributing to gross domestic product (GDP) in Indonesia up to 57.24

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% of the total GDP, and absorbed around 116,978,681 workers or equivalent to 97% of the total workforce, emphasizing SMEs strong contribution on the Indonesian economy.

As one of the sectors driving the Indonesian economy in today's digital era, SMEs need to adapt and start utilizing digital technology in their business models to increase their business competitiveness. As reported by kemenkoukm.go.id in june 2019, there was a low number of Indonesian SMEs that have implemented digital transformation (digitalization) in their business practices. The government targeted 30 million SMEs can enter the digital ecosystem by 2024. Digital transformation in SMEs is considered necessary because it could help SMEs in various ways, such as open up a series of innovation possibilities that combine business schemes and digital technology, namely E-commerce (Miller & Wilsdon, 2001), expanding market share (Goerge et al., 2020; Parida & Wincent, 2001), and improving competitiveness and performance (Pal et al., 2008; Duch-Brown et al., 2017; Sadeghi & Biancone, 2018; Zhou et al., 2019; Hansen & Bøgh, 2020; Räisänen & Tuovinen, 2020). SMEs can implement a digital transformation through increasing IT application technology (Ramdani et al., 2013) such as cloud computing (Brennen & Kreiss, 2016), electronic cash registers, marketplaces usages such as Shopee, Tokopedia, Bukalapak, and social media usage such as WhatsApp, Instagram, Twitter, TikTok, and online marketing implementation, online payment and point of sales (POS) in marketing their products (Trinugroho et al., 2022).

The development of digital transformation advances in technology and information rapidly develop business and industrial processes and affects a multitude of aspects, including environmental issues. This situation gave rise to new ideas of sustainable and eco-friendly movements. It is known as sustainable economics, a concept of combining Economic, Social, Environmental, and Institutional aspects into consideration (Spageenberg, 2005). In recent years, the issue has re-emerged and given rise to a new term, namely the Green Economy. A green economy describes a situation in which economic growth and environmental responsibility work together to support progress in social development while increasing human well-being and significantly reducing environmental risks and ecological scarcity (UNEP, 2011). Previous studies have shown that green economy ecosystem can be developed by applying digital technology to SMEs. For example, the research conducted by Koirala (2018), Hinson et al. (2019), Seele and Lock (2017), and Creech et al. (2014) on 1337 SMEs in Africa, Latin America, and Asia. Moreover, Alizadeh-Basban and Taleizadeh (2020) find that the environmental economics principle has three points: reducing carbon emissions, creating a green-investment climate from restrictive trade regulations, and remanufacturing through manufacturers and distributors under technological advances.

Based on Ulas (2019), Digital transformation is the business operations of SMEs, the internet, and digital technology, affecting a business's financial inclusion. Agyekum et al. (2021) find that the adoption of digital technology encourages business actors to access external funding such as credit. In other words, business actors who still maintain conventional business processes do not have good financial literacy and access to financial services. In short, It can influence the decision of business actors in implementing a green economy. In line with Sanfey and Milatovic (2018), they find that the decision to transition to green economy in the business world, especially SMEs, faces several obstacles such as lack of capital, organizational and managerial, government support and limited access to finance. Hence, access to financial services is one of the drivers that support the digital transformation of SMEs to implement a green economy in their business processes.

The various explanations above encourage the researcher to investigate this issue further. It is essential to research the influence of digital transformation in SMEs and its relation to green economy. Apart from supporting the SDGs' program and the COP21 agreement, this research is quite rare in Indonesia. Therefore, this research is expected to provide policy recommendations related to the right strategies and steps that SMEs can take to implement green economy concept in Indonesia through the digitalization process. Since access to finance will help SMEs enter the digital ecosystem, it should be important to make sure that it can help improve the implementation of Green Economy in Indonesia.

2. LITERATURE REVIEW

The following section highlights some of the previous literature concerning issues related to the digital transformation of SMEs, access to finance, and green economy implementation, the research framework, and the hypothesis of the research.

2.1. Theoretical Framework

a) Digital transformation of SMEs

Digital transformation has far-reaching impacts on the business environment, creating both opportunities and challenges. An example of digital transformation in the business is the use of the internet and digital technology, online marketing, including social media, which is currently an essential component in the marketing strategy of a business (Trinugroho et al. 2021, Li et al., 2017; Son et al., 2017; Dong & Li, 2018; Nijssen & Ordanini, 2020; Sharma et al., 2020; Alavion & Taghdisi, 2020).

Digital transformation can affect the financial inclusion of a business. Research by Agyekum, Reddy, Wallace, and Wellalage (2021) find that the adoption of digital technology encourages business actors to access external funding such as credit. In other words, business actors who still maintain conventional business processes do not have good financial literacy and access to financial services.

b) Green Economy

The concept of green economy has been developed through international institutions such as the United Nations Environment Program (UNEP), OECD, and the Green Economy Coalition. Green economy describes a situation in which economic growth and environmental responsibility work together to support social development while increasing human well-being and significantly reducing environmental risks and ecological scarcity (UNEP, 2011). In other words, economic growth will always impact the environment. A company's performance needs an evaluation indicator that does not only focus on profitability but integrates it with environmentally friendly management in its business operations (Porter & Van der Linde, 1995; Bakaret al., 2017; Abdullah et al., 2017).

c) Digital transformation of SMEs and Green Economy

As one of the driving factors of the economy, SMEs, especially in Indonesia, experience various challenges in running their business, one of which is the ability to adapt amid advances in information and digital technology. Although various government programs are implemented to encourage productivity and sustainability of SMEs, challenges will remain when SMEs continue to maintain their conventional business model. The inevitable penetration of digital technology such as smartphones and internet opens up various opportunities for SMEs to develop business processes and survive in the digital era by implementing digital technology itself (Alcacer et al., 2016; Urbinati et al., 2018; Trinugroho et al., 2021).

Applying digital technology to SMEs means applying digital transformation to business processes and even the entire MSME organization (Lu, 2017). Digital transformation in SMEs opens up various innovations, starting from digital technology or applications used by SMEs (Brennen & Kreiss, 2016; Street et al., 2017). Moreover, digital transformation in SMEs can expand market share (George et al., 2020; Cenamor et al., 2019) and change the organizational work culture (Lu, 2017). According to Trinugroho et al. (2021), the application of online marketing, online payment, and point of sales is the form of digital business transformation. However, digital technology application to SMEs is not easy and cannot be done quickly and thoroughly because SMEs have limited resources and sources of funds (Li et al., 2018).

Previous studies have shown that the digitalization of MSME business processes and organizations helps sustainability and improves MSME performance. Such as business operational efficiency (Putra & Santoso, 2020), they create a good customer experience (Lorente-Martinez et al., 2020) and improve competitiveness and overall performance (Pal et al., 2008; Duch-Brown et al., 2017; Sadeghi & Biancone, 2018; Zhou et al., 2019; Hansen & Bagh, 2020; Raisanen & Touvinen, 2020).

However, it should be realized that the sustainability of SMEs depends not only on profits or profitability and economic value created (Malesios et al., 2020) but also on social and environmental values, which are the impact of MSME business activities being carried out. MSME business activities should also be evaluated and viewed from the impact on the surrounding environment (Porter & Van der Linde, 1995). The integration process that considers environmental aspects with digitalization in the business operational processes of an MSME not only provides significant economic benefits for the business organization itself but also has an impact on good and sustainable business practices (Bakar et al., 2017). Several previous studies have found that the application of digital transformation to an organization or business can contribute to encouraging them to implement an environmentally friendly business or what is called a green economy (Seele & Lock, 2017; Evans et al., 2017; Munoz & Cohen, 2018; Lensink & Mueller, 2019). The existence of digital technology creates more efficient and inexpensive SMEs business processes and operatios. It can contribute to a sustainable environment, such as online cashiers that replace manual cashiers to reduce paper.

However, not all SMEs can implement digital transformation and the green economy simultaneously. Sanfey and Milatovic (2018) reveal that the decision of transition to green economy is influenced by various factors, one of which is the factor of financial limitations. Thus, access to financial services can encourage SMEs actors to carry out green economy in their business.

3. METHODOLOGY

This research focuses to find out whether the level of digital transformation in SMEs can improve green economy implementation (Hinson et al., 2019; Seele & Lock, 2017), and whether the influence of SMEs digital transformation on green economy is getting stronger towards SMEs that have good finance access in Indonesia.

The type of data used in this research is primary data. Primary data in this study was obtained through a survey with a total respondents of 515 SMEs located in Java, Indonesia. In line with Affandi et al. (2019), which states that the island of Java is the most densely populated in Indonesia, about 56% of the Indonesian population lives on the island of Java, including the center of government activities, business administration, and industry. The data was obtained using the purposive sampling method. The sample will be selected because it meets specific criteria following the purpose of this research. Therefore, the sample of this research is SMEs that have implemented digital transformation in their business activities and are engaged in specific business sectors, namely; manufacturing, trading, and services. The survey was conducted online via a google form. In addition, to ensure that our respondents will fully understand what we asked in the research questionnaire, we also conduct in-depth interviews with several individual respondents. The survey instrument will be designed by combining the answers to questionnaire questions such as open text, multiple-option, and yes/no answers. The data will be processed using STATA 17 software and a regression model.

Access to financial services is used as a moderating variable and the digitization index variable for SMEs in line with research by Irwan, et. al. (2021) and Putra and Santoso (2020) is an independent variable. The control variables used in this study are the characteristics of SMEs which consist of size (Ln_Aset) (Pablo et al., 2020), the type of MSME owner, the age of the MSME owner, the age of the MSME, the education level of the owner SMEs, turnover/total income and number of employees. We analyze this research using the regression model.

3.1. Model Specification

The baseline model used in this study is as follows:

$$Green\ Economy\ Index = \alpha + \beta_1 onlinemarketing + \beta_2 pointofsales + \beta_3 onlinepayment + \beta_4 ControlVariables + \varepsilon \quad (1)$$

In this research, we want to examine each element of the formation of the Green Economy implementation index. Here's the model:

$$GEA = \alpha + \beta_1 \text{onlinemarketing} + \beta_2 \text{pointofsales} + \beta_3 \text{onlinepayment} + \beta_4 ControlVariables + \varepsilon \quad (2)$$

$$GOS = \alpha + \beta_1 onlinemarketing + \beta_2 pointofsales + \beta_3 onlinepayment + \beta_4 ControlVariables + \varepsilon \quad (3)$$

$$GEK = \alpha + \alpha + \beta_1 onlinemarketing + \beta_2 pointofsales + \beta_3 onlinepayment + \beta_4 ControlVariables + \varepsilon \quad (4)$$

Going deeper, this research tried to interact the relationship between access to financial services and the digital transformation of SMEs on the green economy implementation in Indonesia. The following is the estimation model:

$$Green\ Economy\ Index = \alpha + \beta_1 onlinemarketing + \beta_2\ aFinancialAccess + onlinemarketing * FinancialAccess + \beta_3 ControlVariables_t + \varepsilon \quad (5)$$

$$Green\ Economy\ Index = \alpha + \beta_1 onlinemarketing + \beta_2\ aFinancialAccess + pointofsales * FinancialAccess + \beta_3 ControlVariables_t + \varepsilon \quad (6)$$

$$Green\ Economy\ Index = \alpha + \beta_1 onlinemarketing + \beta_2\ aFinancialAccess + onlinepayment * FinancialAccess + \beta_3 ControlVariables_t + \varepsilon \quad (7)$$

The interpretation of the interaction results can be explained that a positive interaction occurs if the digitization of SMEs is supported by easy access to finance, the implementation of green economy in Indonesia will be stronger and higher and vice versa if there is a negative interaction relationship.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Descriptive statistics is used to explain the distribution of each variable. The descriptive statistics consist of measurements such as mean, standard deviation, min, and max.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
GE	515	26.06796	13.05202	1	51
GEA	515	5.132039	2.226049	1	9
GEK	515	6.961165	1.524906	1	9
GOS	515	2.182524	1.07396	1	4
onlinemarketing	515	.9108527	.2852327	0	1
pointofsales	515	.3662791	.4822545	0	1
onlinepayment	515	.8313953	.3747657	0	1
ownermanager	515	.8914729	.3113468	0	1
gender_respondent	515	.6647287	.4725433	0	1
age_respondent	515	3450194	11.13823	25	67
edu_respondent	515	3.69186	1.097221	1	6
province	515	2.28876	.9094699	1	5
type_smes	515	1.856589	.8236641	1	3
grossincome_beforetransform	515	2.156977	1.466973	1	6
grossincome_aftertransform	515	2.726744	1.533111	1	6
assets_smes	515	2.102713	1.374918	1	5
employments	515	.496124	.5004702	0	1
numberofemployment	515	1.815891	.9868157	1	4

Source: Data processed, STATA 17.

Based on table 1, it can be seen that the dependent variables used in this research are the green economy (GE) index, where the average value (mean) is 26.06796. This means that the average implementation of GE by Indonesian SMEs is 26%. With a standard deviation of 1.305.202. Therefore, the lowest value (min) is 1 and the highest value (max) is 51. In this research, we have 3 proxies for GE namely Green Economy Awareness (GEA), Green Economy Knowledge (GEK), and Green Economy Operations Sustainability (GOS). Based on table descriptive statistics, we can see that the mean of each variable is 5.132039, 6.961165, and 2.182524. While the standard deviation value is 2.226049, 1.524906, and 1.07396. For the lowest value of 3 proxies of GE is 1 and finally, the highest value is 9,9, and 4 respectively.

This research also uses independent variables digital transformation index of SMEs that consist of 3 proxies namely online_marketing, point of sales, and online_payment. Furthermore, access to finance is taken into account as moderating variable in this research. While, control variables in this research are SMEs characteristics which are proxied into several indicators such as owner-manager, gender_respondent, age_respondent, edu_respondent, province, type_smes, grossincome_beforetransform, grossincome_aftertransform, assets_smes, employments, and number of employment.

4.2. Regression Result

Table 2: Baseline Regression Smes Digital Transformation on Green Economy

	(1) **GE**	**(2)** **GEA**	**(3)** **GEK**	**(4)** **GOS**
onlinemarketing	-0.755	0.351	-0.282	-0.188
	(-0.41)	(1.08)	(-1.19)	(-1.22)
pointofsales	**4.472*****	**1.139*****	**0.260***	0.108
	(3.83)	**(5.53)**	**(1.74)**	(1.11)
onlinepayment	**4.547*****	0.0953	**0.425****	**0.417*****
	(2.98)	(0.35)	**(2.17)**	**(3.28)**
ownermanager	2.074	0.134	0.0950	0.233
	(1.21)	(0.44)	(0.43)	(1.63)
gender_respondent	-0.356	-0.354*	0.0797	0.0511
	(-0.32)	(-1.79)	(0.56)	(0.55)
age_respondent	0.121**	0.0147*	0.00658	0.00759*
	(2.42)	(1.67)	(1.03)	(1.82)
edu_respondent	1.798***	0.261***	0.0791	0.130***
	(3.41)	(2.81)	(1.17)	(2.95)
province	-2.590***	0.0149	-0.210***	-0.269***
	(-4.19)	(0.14)	(-2.66)	(-5.22)
type_smes	0.340	-0.219*	0.141*	0.0842
	(0.52)	(-1.92)	(1.70)	(1.56)
grossincome_beforetransformation	-0.440	0.305**	-0.0204	-0.191***
	(-0.64)	(2.53)	(-0.23)	(-3.36)
grossincome_aftertransformation	-0.363	-0.371***	-0.00114	0.105**
	(-0.57)	(-3.31)	(-0.01)	(1.98)
assets_smes	0.664	0.0669	0.00943	0.0631
	(1.26)	(0.72)	(0.14)	(1.44)
employment_smes	1.278	0.328	0.216	-0.0286
	(0.69)	(1.00)	(0.91)	(-0.18)
numberofemployment_smes	1.002	0.0530	-0.0337	0.140

	(0.91)	(0.27)	(-0.24)	(1.53)
_cons	12.30***	3.290***	6.312***	1.197***
	(2.91)	(4.40)	(11.65)	(3.39)
N	515	515	515	515
pseudo R^2				

Source: Data processed, STATA 17, *t* statistics in parentheses, * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

Descriptions:

onlinemarketing	:	A dummy variable 1 if the firms offer and promote the product through online platform, 0 otherwise
pointofsales	:	A dummy variable for point of sales system. 1 means that the firm uses software to electronically record their daily transactions.
onlinepayment	:	A dummy variable for availability of online payment. 1 means firm accept online payment platform from e-wallet using QR code, 0 otherwise
ownermanager	:	A dummy variable for the status of the respondent, 1 if the respondent is the owner of SMEs, 0 otherwise
gender_respondent	:	A dummy variable for gender of the SMEs owner, if 1 means male and 0 women.
age_respondent	:	Age of owner of SMes
edu_respondent	:	Education level of the owner of SMEs
province	:	The province ranges 1 to 5
type_smes	:	Type of SMEs ranges 1-3, 1 is categorized as retail industry, 2 as manufacturing industry, and 3 as services.
grossincome_beforetransformation	:	Gross income of SMEs before transform to digital ranges from 1 to 5
grossincome_aftertransformation	:	Gross income of SMEs after transform to digital ranges from 1 to 5
assets_smes	:	The asset of the SMEs ranges 1 to 5
employment_smes	:	A dummy variable 1 means the SMEs have employment, 0 otherwise
numberofemployment_smes	:	Number of employment of SMEs ranges from 1 to 5
Green Economy Index (GE)	:	A composite index measuring a SMEs performance in achieving sustainability dimensions: awareness, knowledge, and operations sustainability about green economy.
Green Economy Knowledge (GEK)	:	A composite index measuring a SMEs performance on knowledge or the better understanding of green economy
Green Economy Awareness (GEA)	:	A composite index measuring a SMEs performance on the aspirations/awareness for green economy
Green Economy Operations Sustainability (GOS)	:	A composite index measuring a SMEs performance on implemented green economy aspects in their business

Table 2 present the regression result of the effect of SMEs' digital transformation on green economy (GE) index, which has three components as explained in this research. So, in this research has three dependent variables to measure GE implementation in Indonesia. Following Aznin et al (2017), first, this research considers awareness of SMEs to implement a green economy in their business model measured by a 1-5 likert scale, measuring SME's awareness toward green economy (GEA). Second, to measure whether the owner/manager of SMEs has a better understanding of green economy implementation or not. This aspect is measured using a 1-5 likert scale, measuring SME's understanding toward green economy (GEK). Lastly, this research take into account green economy operational sustainability (GOS) if the SMEs have implemented green economy aspects

in their business, which is measured with a dummy variable, a score of 1 is given if the owner/manager of SMEs has implemented green economy in their business and 0 otherwise. Thus, the GEA, GEK, and GOS score shows the average score for each green economy proxy.

The regression result shows that SMEs' digital transformation for point of sales, table 5 shows that point of sales variable is positive and significantly correlated with GE at 1 % with a coefficient score is 4.472. It can be concluded that the use of point of sales in the daily operation of SMEs can help to improve the implementation of a GE in general. The second proxy of SMEs' digital transformation is proxy online payment is positively significant to the GE, at 1 % level of significance with the score of R-square is 4.547. This result in line with the expectation that the use of online payment on SMEs' business models will improve the implementation of GE. Thus, the result is accepted and supports the first hypothesis. The last proxy of SMEs' digital transformation is online marketing. The regression result shows that there is no positive or negative correlation between using online marketing strategy in their business activity and GE implementation. Overall, from the regression result, it can be concluded that the 2 of 3 proxies of SMes' digital transformation support the first hypothesis and the other is not.

In this regression result, I tried to look into a deeper relationship between each proxy of SMEs' digital transformation and GE implementation. This will give us an insight into which SMEs' digital transformation proxies support GE implementation. In addition, this research uses three (3) dimensions of GE Index, namely green economy awareness (GEA), green economy knowledge (GEK), and green economy operations sustainability (GOS).

First, in the model (2) shows that only point of sales support GEA with 1.139 as a coefficient score. The relationship is positive and significant at 1%. Furthermore, in model (3) we can see that point of sales and online payment have a positive significant effect on GEK with 0.260 and 0.425 as a coefficient score, at levels of a significant 10%, and 5% respectively. Lastly, in model (4) only online payment the proxy of SMEs' digital transformation can improve the GOS implementation with a coefficient score is 0.417 with a level of significance of 1%. In short, only online marketing is the proxy of SMEs' digital transformation that does not significant effect on GEA, GEK, GOS as well as the GE implementation index in general.

The control variables used in this research are SMEs' characteristics. For SMEs characteristics are proxied into several indicators such as owner-manager, gender_respondent, age_respondent, edu_respondent, province, type_smes, grossincome_beforetransform, grossincome_aftertransform, assets_smes, employments, and number of employment.

Table 3: Regression Model with Split Sample by Sector

	GE		
	(1)	**(2)**	**(3)**
	Retail	**Manufacturing**	**Service**
onlinemarketing	1.003	-1.645	-0.381
	(0.34)	(-0.52)	(-0.10)
pointofsales	**8.330*** **	-2.385	1.867
	(4.92)	(-0.91)	(0.87)
onlinepayment	1.990	**7.113** **	3.690
	(0.86)	**(2.47)**	(1.27)
accesstofinance	0.688	-1.069	0.349
	(0.36)	(-0.51)	(0.15)
ownermanager	1.198	8.105**	-3.147
	(0.47)	(2.38)	(-0.99)
gender_respondent	-0.145	-2.207	0.898
	(-0.09)	(-1.00)	(0.43)
age_respondent	-0.0353	0.308***	0.0196
	(-0.47)	(3.28)	(0.16)
edu_respondent	0.774	2.482***	1.800*
	(0.92)	(2.67)	(1.87)
province	-5.432***	0.106	-2.390*
	(-4.67)	(0.11)	(-1.84)
grossincome_beforetransformation	-1.160	0.660	0.675
	(-1.02)	(0.51)	(0.54)
grossincome_aftertransformation	-1.053	-0.272	0.0461
	(-0.94)	(-0.24)	(0.04)
assets_smes	1.796**	0.872	-1.174
	(2.09)	(0.91)	(-1.15)
employment_smes	3.903	-1.507	-0.224
	(1.37)	(-0.45)	(-0.06)
numberofemployment_smes	-0.144	1.345	1.037
	(-0.08)	(0.62)	(0.57)
_cons	28.95***	-9.758	22.33**
	(4.45)	(-1.34)	(2.52)
N	217	155	143
pseudo R^2			

Source: Data processed, *t* statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

To further examine this relationship, this research split the sample into three industry categories namely retail, manufacturing, and service, since the sample consists of that three industry. Based on Table 3, shows that the point of sales the proxy of the SMEs' digital transformation shows positive and significant influence on green economy implementation in the retail industry, with 8.330 as a coefficient in the level of significant 1%. It indicates that poin of sales influences 8.3 % green economy implementation in retail industry. Moreover, online payment has a positive and significant effect on green economy implementation only in the manufacturing industry. It can be seen that the cooefisient of online payment is 7.113 or it can affect the green economy implementation around 7.1%. Lastly, there is no relationship between each proxy of SMEs' digital transformation on green economy implementation in the service industry.

Table 4: Regression on Split Sample by Assets

	GE	
	(1) **Big Assets Group**	**(2)** **Small Assets Group**
onlinemarketingom	-0.982	-2.206
	(-0.44)	(-0.63)
pointofsalespos	**3.737****	**5.015*****
	(2.29)	**(2.96)**
onlinepaymentop	**7.069*****	2.812
	(3.11)	(1.34)
ownermanager	0.584	3.606
	(0.23)	(1.50)
gender_respondent	-0.893	-0.518
	(-0.59)	(-0.29)
age_respondent	0.196***	0.113
	(2.76)	(1.44)
edu_respondent	1.294*	2.331***
	(1.77)	(3.00)
province	-1.515*	-3.524***
	(-1.77)	(-3.82)
grossincome_beforetransformation	0.379	-1.993
	(0.44)	(-1.55)
grossincome_aftertransformation	-0.216	0.513
	(-0.25)	(0.53)
type_smes	0.303	0.0935
	(0.33)	(0.10)
employment_smes	1.091	2.147
	(0.44)	(0.60)
numberofemployment_smes	1.127	0.979
	(0.88)	(0.41)
_cons	7.451	16.38**
	(1.27)	(2.38)
N	263	252

Source: Data processed, STATA 17, *t* statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

This research also looks at whether SMEs with different assets size has a different relationship in terms of going digital and boost green economy implementation shown in Table 9. This research tried to split the sample into small and big assets groups, based to the median value of the sample data.

The result shows that point of sales is significant both in big and small assets group, implying that green economy implementation in SME with big and small asset is affected by the usage of point of sales with a coefficient 3.737 and 5.015, respectively. Additionally online payment also affects the green economy implementation in SME under the big assets group with 7.069 as a coefficient. In the second hypothesis will focus on the interaction between access to finance and SMEs digital transformation on green economy implementation. The table 10 shows the baseline OLS r egression for the interaction of moderating variable. The effect of access to finance and online marketing is presented in model (1), while the effect of access to finance and point of sales is

shown in model (2), and the effect of access to finance and online payment is provided in model (3).

Table 5: Baseline Regression Model with Interaction

	(1) GE	(2) GE	(3) GE
onlinemarketingom	-4.86e-09**		
	(-2.02)		
Acceestofinance*onlinemarketingom	**-1.33e-09**		
	(-0.36)		
pointofsalespos		**3.677****	
		(2.47)	
accesstofinance*pointofsalespos		3.728	
		(1.63)	
onlinepaymentop			**5.766*****
			(3.07)
accesstofinance*onlinepaymentop			0.301
			(0.10)
accesstofinance	1.431	1.162	0.870
	(0.78)	(0.99)	(0.74)
ownermanager	2.694	2.663	1.998
	(1.55)	(1.55)	(1.15)
gender_respondent	0.136	0.232	-0.553
	(0.12)	(0.21)	(-0.49)
age_respondent	0.0759	0.0815	0.110**
	(1.42)	(1.54)	(2.07)
edu_respondent	2.369***	2.070***	1.875***
	(4.52)	(3.99)	(3.51)
province	-2.756***	-2.497***	-2.761***
	(-4.36)	(-3.99)	(-4.42)
type_smes	0.218	0.388	0.123
	(0.33)	(0.59)	(0.19)
grossincome_beforetransformation	-0.518	-0.838	-0.219
	(-0.73)	(-1.20)	(-0.31)
grossincome_aftertransformation	-0.362	-0.0642	-0.611
	(-0.55)	(-0.10)	(-0.95)
assets_smes	0.759	0.868*	0.566
	(1.43)	(1.66)	(1.08)
employment_smes	1.476	1.326	0.821
	(0.77)	(0.71)	(0.43)
numberofemployment_smes	1.272	0.956	1.537
	(1.13)	(0.86)	(1.39)
_cons	16.90***	15.25***	17.39***
	(4.21)	(3.96)	(4.42)
N	515	515	515
pseudo R^2			

Source: Data processed, STATA 17, *t* statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

As presented in table 10, the current result finds that there is no significant correlation between the interaction of access to finance as moderating variable and each proxy of SMEs' digital transformation on green economy implementation. However, this result is slightly different from

Sanfey and Milatovic (2018), revealing that access to finance is likely boosting the implementation of a green economy among SMEs.

It is indicated that this research sample did not get and use bank lending for improving their business instead they rely on internal funds, or cash from friends and family to launch and initially run their business (Worldbank, 2022). It is confirmed that many owner-manager of the SMEs in this research said that they get loans from other non-bank financial institutions such as some microloan organizations, BPR/BPRS, koperasi, peer to peer lending.

Furthermore, there is no significant difference between those SMEs who have access to finance and doesn't have access to finance. Arguably, credit officer doesn't consider sustainable finance/economy as one of their credit requirements. It can be concluded that this result does not support hypothesis II.

4.3. Robustness Test

section will report the result of robust estimation results for main regression model. The robustness test was conducted through the split sample regession provided in Table 8 and Table 9. The result shows that the robustness test inform us that our model are robust, highlighting the effect of point of sales and online payment on green economy implementation in SMEs.

4.4. Discussion

In this section, the result from this research will be discussed according to the theoretical background discussed in Chapter II. This section also provides the supporting arguments based on the previous research to justify the research result and to further examine interesting insight from the result.

4.5. Discussion on Digital Transformation on Green Economy Implementation

The regression result shows that SMEs' digital transformation for proxy onlinepayment is positively significant to the GE, at 1 % level of significance with the score of R-square is 4,547. It is in line with the expectation that the use of online payment on SMEs' business models will improve the implementation of GE. Thus, the result is accepted and supports the first hypothesis. The second proxy of SMEs' digital transformation is pointofsales, from table 5, it shows that point of sales variable is positive and significant at 1 % with coefficient score is 4.472. It can be concluded that the use of point of sales in the daily operation of SMEs can help to improve the implementation of a GE in general. The last proxy of SMEs' digital transformation is onlinemarketing. The regression result said that there is no positive or negative correlation between using online marketing strategy in their business activity and GE implementation. Overall, from the regression result, it can be concluded that the 2 of 3 proxies of SMEs' digital transformation support the first hypothesis and the other is not.

In this regression result, I tried to look into a deeper relationship between each proxy of SMEs' digital transformation and GE implementation. This will give us insight into which SMEs' digital transformation proxies supports GE proxies. First, Green Economy Awareness (GEA), shows that only pointofsales support GEA with 1.139 as as a coefficient score. The relationship is positive

and significant at 1%. Furthermore, we can see that pointofsales and onlinepayment have a positive significant effect on GEK with the as a coefficient score is 0.260 and 0.425, at levels of a significant 5% and 10%, respectively. Lastly, only onlinepayment proxy of SMEs' digital transformation can improve the GOS implementation with a coefficient score is 0.417 at 1% level of significance. In short, only onlinemarketing does not significant effect on GE implementation.

4.6. Discussion on Digital Transformation on Green Economy Implementation

The current result finds that there is no significant relationship in the interaction between access to finance as moderating variable and each proxy of SMEs' digital transformation on green economy implementation. However, this result is slightly different from Sanfey and Milatovic (2018), revealing that access to finance is likely boosting the implementation of a green economy among SMEs.

It is indicated that this research sample did not get and use bank lending for improving their business instead they rely on internal funds, or cash from friends and family to launch and initially run their business (Worldbank, 2022). It is confirmed that many owner-manager of the SMEs in this research said that they get loans from other non-bank financial institutions such as some microloan organizations, BPR/BPRS, koperasi, peer to peer lending. Arguably, credit officer doesn't consider sustainable finance and economy as one of their credit requirement. This finding is in line with Volz (2018), who states that only relatively few financial institutions in Asia systematically integrated ESG factors into their lending or investment decision-making processes. Green banking and sustainable investment are still niche markets, and few staff in the industry have been trained in ESG issues.

5. CONCLUSION

Some SMEs and owner characteristics significantly affect the probability to implement the green economy in their business model. Younger owners with higher education have more tendency to implement a green economy concept; Two of the SMEs digital transformation proxy has positive and significant effect on GE implementation index (namely point of sales and online payment); Other variables have not been positive and significant to green economy implementation variable; There is no significant direct effect in the relationship between access to finance and the SME's digital transformation on the green economy implementation in Indonesia. In conclusion, this study shows that the digital transformation of SMEs helps improve green economy implementation in Indonesia.

Policy Recommendations:

1. Extending this research to the provincial level could be more interesting.
2. Taking into account some other control variables could strengthen the research model.
3. it is essential to identify practical steps that can be taken to address barriers to green economy implementation of SMEs in Indonesia. For instance, practical green economy concept and awareness should be addressed to SMEs in Indonesia especially in the retail, manufacturing, and service industry.

4. The government should encourage the SMEs, especially in the retail industry to increase the use of point of sales so that the index of green economy can be increased as well.
5. The government should also encourage SMEs, especially in the manufacturing industry to maximize the use of online payment so that the index of green economy can be accelerated as well.

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