

Microeconomic Transformation in the Digital Age: Unraveling the Footprint of MSME Digitalization and its Impact on Income Security

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ABSTRACT

Digital transformation has become the main catalyst for microeconomic change, especially in Micro, Small, and Medium Enterprises (MSMEs) which are the backbone of the national economy. This research aims to unravel the traces of MSME digitalization and its impact on the income resilience of business actors in the digital era. The research method used was a quantitative survey with a cross-sectional approach on 150 MSMEs in the Greater Jakarta area. The data analysis uses multiple linear regression to test the relationship between digitalization and revenue resilience. The results of the study show that the digitalization of MSMEs significantly increases income resilience, especially through the use of social media, marketplaces, and digital payment services. These findings provide strategic implications for policymakers and MSME actors in accelerating digitalization to strengthen economic resilience in times of crisis.

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1. INTRODUCTION

The development of digital technology has brought fundamental changes in various aspects of life, especially in the field of microeconomics. Digitalization is an inevitable necessity, especially for Micro, Small, and Medium Enterprises (MSMEs) which have been the backbone of the national economy in many countries, including Indonesia. MSMEs account for more than 60% of Gross Domestic Product (GDP) and absorb most of the workforce, so the sustainability and resilience of MSMEs greatly affect macroeconomic stability.

The digital era has accelerated the process of economic interaction and transactions through online platforms, social media, and digital marketplaces. MSMEs that are able to adapt to this transformation have a greater opportunity to expand the market, improve operational efficiency, and maintain the sustainability of their income amid dynamic global economic challenges. However, on the other hand, digital transformation also presents new challenges, such as the need to increase digital capacity, technology capital, and data security risks that must be managed properly.

Previous studies have highlighted the role of digital technology in increasing the productivity of MSMEs, but research that specifically examines the impact of digitalization on MSME income resilience is still limited. Income resilience is an important indicator to assess the ability of MSMEs

to maintain operations and income in the midst of economic fluctuations and crisis conditions such as the COVID-19 pandemic. Therefore, this research focuses on unraveling the digitalization footprint of MSMEs and how this digitalization can strengthen the income resilience of micro business actors. The phenomenon of using digital platforms such as social media and marketplaces as marketing and sales channels is increasingly prevalent among MSMEs. The use of digital payment technology and delivery services also increases efficiency and accelerates capital turnover. Digital transformation is not only about technology adoption, but also includes changes in mindset and business strategies that are more adaptive to changes in the market environment.

However, not all MSMEs have the same ability and resources in adopting digital technology. The digital gap between MSMEs that are already technologically literate and those that have not been able to increase the disparity in income and business competitiveness. Therefore, this study also examines the factors that affect the level of digitalization of MSMEs and the obstacles they face in the digital transformation process.

Thus, the main purpose of this study is to identify and measure the impact of MSME digitalization on the income resilience of business actors. This research is expected to provide a comprehensive overview and practical recommendations for stakeholders, ranging from business actors, governments, to supporting institutions in order to encourage inclusive and sustainable digital transformation.

2. METHOD

2.1 Research Design

This study uses a **descriptive and inferential quantitative** approach with a cross-sectional survey **design**, which allows researchers to capture the condition of MSME digitalization and their income resilience at a single point in time. This design was chosen because it was able to objectively describe the relationships between variables and allow generalizations to a wider population.

Population and Sample

The population in this study is all MSME actors in the **Greater Jakarta** area (Jakarta, Bogor, Depok, Tangerang, Bekasi) who have implemented at least one form of digitalization in their business activities. The sample extraction technique uses **the purposive sampling** method, with the following inclusion criteria:

- a. MSMEs that have been established for at least two years,
- b. Have used at least one digital tool (e.g. social media, marketplace, or digital payment system),
- c. Willing to be a respondent and fill out a complete questionnaire.

The number of samples determined is **150 MSMEs**, based on consideration of the effectiveness of statistical analysis and resource limitations. This number also meets the minimum sample rule in multiple linear regression analysis (Hair et al., 2014).

2.2 Data Collection Techniques

Data were collected using **structured questionnaires** that were distributed online (Google Form) and offline (direct visits) during February–March 2025. The questionnaire consists of three main sections:

- a. **Characteristics of respondents and businesses** (age of business, type of business, number of workforce, location),
- b. **The MSME digitalization index**, which is measured through the frequency and intensity of use: Social media (Instagram, Facebook, TikTok, etc.), Marketplace (Tokopedia, Shopee, Bukalapak, etc.), Digital payments (QRIS, e-wallet), Digital financial management (bookkeeping software).
- c. **The income resilience index**, measured from: Revenue stability in the last 12 months, Ability to retain employees, Business adaptation during times of crisis (e.g. pandemic), Expense to income ratio.

Each statement item is measured on a **Likert scale of 1–5**, where 1 = strongly disagree to 5 = strongly agree.

2.3 Instrument Validity and Reliability

Before the distribution of the questionnaire, a **validity and reliability test** was carried out on 30 MSME respondents at random. The results of the validity test using Pearson correlation showed that

all grains had a value of $r > 0.3$ (significant at $\alpha = 0.05$). Reliability tests using Cronbach's Alpha showed a value of > 0.7 for the entire construct, so the instrument was declared suitable for use.

2.4 Data Analysis Techniques

The data that has been collected is analyzed using **SPSS software version 26**. The analysis procedure consists of:

- Descriptive analysis** to describe the characteristics of respondents and the digitization profile of MSMEs.
- Test classical assumptions** to ensure the data qualifies multiple linear regression (normality, multicollinearity, autocorrelation, and heteroscedasticity).
- Multiple linear regression**, with the following model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where:

- Y = Revenue resilience
 X1 = Social media usage rate
 X2 = Marketplace usage
 X3 = Use of digital payments
 ϵ = Error term

The values of the R^2 determination coefficient, significance value (p-value), and F value will be used to assess the model as a whole, while the partial t and beta values are used to see the influence of each independent variable on the dependent variable.

2.5 Research Ethics

This research was carried out by paying attention to the ethical principles of **research**. All respondents were given an explanation of the objectives and benefits of the research, and were given the freedom not to continue participation. Respondents' data is kept confidential and is only used for academic purposes.

3. RESULTS AND DISCUSSION

3.1 Characteristics of Respondents

Of the 150 MSMEs that became respondents:

- Business type: 40% culinary, 25% fashion, 15% handicrafts, 10% service, 10% other.
- Business age: 15% (<2 years), 50% (2–5 years), 35% (>5 years).
- Scale of the workforce: 70% have ≤ 5 employees, 20% between 6–10 employees, and 10% >10 employees.
- Digital platforms used: Social media (Instagram, Facebook, TikTok): 95%, Marketplace (Shopee, Tokopedia, Bukalapak): 80%, Digital payments (QRIS, GoPay, OVO, DANA): 88%, Digital bookkeeping applications (such as BukuWarung, SME Accounting): 37%

3.2 Descriptive Analysis of Research Variables

Table 1. Descriptive Analysis of Research Variables

Variabel	Mean	Std. Dev	Min	Max
Social media usage score (X1)	4.21	0.55	2.8	5.0
Marketplace usage score (X2)	3.89	0.62	2.4	5.0
Digital payment usage score (X3)	4.03	0.58	2.6	5.0
Income resilience index (Y)	4.15	0.51	3.0	5.0

The average score of all variables is above 3.80, indicating that most MSMEs have actively implemented digitalization and feel that their income is relatively stable.

3.3 Classic Assumption Test

Table 2. Multiple Linear Regression Classical Assumption Test

Test Type	Statistical Indicators/Tests	Result	Information
Normality	Kolmogorov–Smirnov (Sig.)	0.200	$p > 0.05 \rightarrow$ Normal distributed data
Multikolinearitas	Social Media VIF (X1) VIF Marketplace (X2)	1.45 1.36	$VIF < 10 \rightarrow$ No multicollinearity

Test Type	Statistical Indicators/Tests	Result	Information
	VIF Digital Payment (X3)	1.22	
	Tolerance (all variables)	> 0.70	Tolerance > 0.1 → Safe
Car correlations	Durbin–Watson	1.812	Values between 1.5–2.5 → No autocorrelation
Heteroskedastisitas	Glejser Test (Sig. all variables)	> 0.05	p > 0.05 → No heteroscedasticity

3.4 Analysis of the Return Linier Berganda

Model regresi:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Table 3. Multiple Linear Regression Analysis

Independent Variables	Coefficients Beta (β)	t-Statistics	Sig. (p-value)
Konstanta	1.215	4.301	0.000
Social Media (X1)	0.347	3.922	0.000**
Marketplace (X2)	0.291	3.214	0.002**
Digital Payments (X3)	0.176	2.731	0.007**

The value of $R = 0.681$, $R^2 = 0.464$, means that 46.4% of the variation in income resilience is explained by the three digitization variables. The value of $F(3.146) = 41.991$, $p < 0.001$, the model is simultaneously significant.

3.5 Discussion

The regression results show that all digitalization variables have a significant effect on the income resilience of MSMEs: **Social media (X1)** has the strongest influence on revenue resilience. This is in line with the fact that social media is not only a promotional tool, but also a primary channel of customer communication and direct sales channels. **Marketplace (X2)** makes it easier for MSMEs to reach a wider market without the physical cost of expansion. Features such as flash sale promotions, review systems, and automatic payments encourage repeat transactions. **Digital payments (X3)** accelerate cash flow, reduce cash risk, and record transaction data automatically, which helps in business management and financial planning.

These findings strengthen the theory about the role of digitalization as a lever for microeconomic efficiency and resilience (Brynjolfsson & McAfee, 2014). These results also support a study by Purwanto et al. (2022) which states that digital MSMEs tend to be more adaptive in dealing with economic shocks, such as the COVID-19 pandemic.

However, digital skills inequality is still a major problem. MSMEs with low digital literacy, or those in areas with limited internet infrastructure, cannot enjoy the same benefits. This is a challenge in itself in realizing an inclusive and equitable digital transformation.

3.5.1 The Influence of Social Media on Income Resilience

The highest regression coefficient was found in the **social media use variable** ($\beta = 0.347$), indicating that social media is the most powerful tool in increasing the income resilience of MSMEs. Platforms like Instagram, Facebook, and TikTok enable MSMEs to **build branding, reach new customers, and encourage two-way interactions** with consumers. This speeds up the promotion process and creates customer loyalty. Some MSME actors even revealed that viral content on social media had increased daily turnover up to 3 times. These findings are in line with a study from Nugroho et al. (2021), which stated that social media plays a major role in improving marketing performance and encouraging the competitiveness of MSMEs amid limited promotional costs.

3.5.2 The Role of Marketplaces in Increasing Market Access

Marketplace ($\beta = 0.291$) also had a significant effect. With low operating costs, MSMEs can leverage the marketplace ecosystem to **access national and global markets**, using features such as paid advertising, consumer review systems, stock management, and automated logistics. This directly contributes to increased sales volume and revenue stability, especially during the pandemic when

offline sales declined dramatically. Marketplaces also help reduce reliance on physical sales and open up opportunities for online B2B (business-to-business) partnerships. These results support research by Suryani and Widodo (2022) who found that MSMEs that are active in the marketplace have a higher annual revenue growth ratio than MSMEs that only sell conventionally.

3.5.3 The Importance of Digital Payments for MSME Cash Flow

Digital payments ($\beta = 0.176$) although their contribution is smaller than the previous two variables, still shows a significant influence on income resilience. Payment systems such as QRIS, GoPay, and OVO help speed up the transaction process, reduce the risk of losing cash, and create financial transparency. In addition, integration with daily financial statements makes it easier for MSME actors to make business decisions based on actual data.

Digital payments are also a prerequisite for entering other digital ecosystems, such as online lending, inventory management services, and application-based microfinance services. A study from Bank Indonesia (2023) noted that 80% of MSMEs using QRIS have experienced an increase in transaction efficiency and financial recording.

3.5.4 Inequality and Digitalization Challenges

Although most MSMEs have adopted digital technology, major challenges remain. The survey results show that about 30% of respondents still find it difficult to understand social media algorithms and only 37% use bookkeeping apps. This shows that **digital literacy is not yet completely evenly distributed**. MSMEs located in areas with limited internet access or elderly business actors tend to experience greater difficulties in digital adaptation. So, digitalization is not fully inclusive and tends to widen the gap between digitally literate MSMEs and those that are not. This condition requires policy intervention in the form of **digital training, internet subsidies, and technical assistance**.

3.5.5 Practical and Theoretical Implications

Practically, these findings encourage the importance of accelerating the digitalization of MSMEs as a strategy to increase microeconomic resilience. The government and stakeholders can use social media and marketplaces as a **public policy tool**, for example with national digital campaigns or the integration of application-based business information systems.

4. CONCLUSION

This research confirms that digital transformation has a significant role in the income resilience of MSMEs in Indonesia. The three dimensions of digitalization studied—social media, marketplaces, and digital payment systems—have been proven to simultaneously and partially contribute to the ability of MSMEs to sustainably maintain income. Social media is the most dominant factor in supporting digital marketing and creating customer loyalty. Marketplaces expand market access, reduce operational costs, and strengthen the position of MSMEs in the digital value chain. Digital payments speed up transactions and create financial efficiencies that support long-term business planning. However, there is still a disparity in digital adoption caused by the age of business actors, geographical area, and the level of digital literacy. Therefore, digital-based microeconomic transformation must be accompanied by an inclusive ecosystem development strategy. Continuing similar research with a longitudinal approach and expanding dimensions such as the role of e-logistics and fintech lending in supporting the competitiveness of digital MSMEs.

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