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The Effect Of Digital Financial Inclusion, MSME Productivity, And Regional Investment On Economic Growth In Malang Regency

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Abstract

This study examines the effects of digital financial inclusion, MSME productivity, and regional investment on economic growth in Malang Regency. Malang Regency was selected because it is a large regency with a diverse local economy, including manufacturing, agriculture, trade, tourism, and subdistrict-based micro and small enterprises. Regional economic digitalization is increasingly relevant because digital payments, fintech-based financial services, and MSME digital transformation can expand market access, reduce transaction costs, and promote more inclusive growth. This study applies an explanatory quantitative approach using a subdistrict-year panel design covering 33 subdistricts from 2019 to 2024, yielding 198 observations. Economic growth is proxied by a local economic growth index, digital financial inclusion by an index of digital financial service usage, MSME productivity by an index of turnover and output per worker, and regional investment by realized domestic and foreign investment. Multiple linear regression is employed after classical assumption tests. The simulated estimation results indicate that digital financial inclusion, MSME productivity, and regional investment positively and significantly influence economic growth. The adjusted R-squared value is 0.582, suggesting that the model explains 58.2 percent of the variation in local economic growth. Digital financial inclusion shows the strongest standardized effect, followed by regional investment and MSME productivity. The findings emphasize that inclusive regional growth requires an integrated policy combining digital finance expansion, MSME productivity upgrading, and productive investment acceleration.

Keywords: Digital Financial Inclusion, Local Economic Growth, Malang Regency, MSME Productivity, Regional Digital Economy, Regional Investment

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INTRODUCTION

Regional economic development in the digital era can no longer be understood merely as an increase in gross regional domestic product or sectoral output. Regions are required to build economies that are productive, inclusive, adaptive to technological change, and capable of expanding economic opportunities for society. Economic digitalization has become an important factor because it can accelerate transactions, broaden market access, improve business efficiency, and strengthen the connectivity between local economic actors and the formal financial system. In this context, quality economic growth is not only high growth, but also growth that reaches small business actors, productive community groups, and subdistrict areas that previously had limited economic access (Rusu & Oprean-Stan, 2025).

The acceleration of inclusive growth is increasingly relevant because gaps in access to financial services, technology, and investment remain important issues in regional development. Digital financial inclusion can create opportunities for communities and MSME actors to access cashless payments, savings, financing, transaction records, and other financial services that are cheaper and faster. Khera et al. (2021) show that digital financial inclusion is positively related to economic growth because digital financial services can broaden economic participation, reduce transaction costs, and accelerate the circulation of economic activity. Therefore, digital financial inclusion is an important variable to analyze within the framework of regional development economics.

Regional economic digitalization is also inseparable from the role of MSMEs. MSMEs are the backbone of the local economy because they absorb labor, generate household income, strengthen domestic consumption, and serve as the basis of subdistrict-level economic activity. Masitoh (2025) explains that MSME digitalization can improve operational efficiency, broaden market reach, and strengthen productivity through the use of e-commerce, big data, and digital payment systems. Thus, MSME productivity is an important bridge between digital transformation and regional economic growth.

Malang Regency is a relevant research object because it has a broad territorial coverage, a large number of subdistricts, and a diverse economic structure. The region includes agricultural activities, manufacturing, trade, tourism, services, and rural economic activities spread across 33 subdistricts. This diversity makes Malang Regency suitable for examining the relationship between digital financial inclusion, MSME productivity, regional investment, and economic growth. In the context of development economics, regions with broad economic variation require growth strategies that are not concentrated only in economic centers, but also reach supporting subdistricts.

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The economic performance of Malang Regency shows strong potential. Based on the publication of Statistics of Malang Regency, the economy of Malang Regency in 2024, measured by gross regional domestic product at current prices, reached IDR 138,423.17 billion, while gross regional domestic product at constant 2010 prices reached IDR 79,500.89 billion. The economy of Malang Regency grew by 4.96 percent in 2024, with the highest growth from the production side occurring in transportation and warehousing at 10.27 percent. The 2024 GRDP structure was dominated by manufacturing at 32.71 percent, while household consumption expenditure contributed 65.97 percent from the expenditure side (BPS Kabupaten Malang, 2025).

Although economic growth in Malang Regency remains positive, regional development challenges cannot be ignored. A regency with a large territory faces issues of unequal financial access, differences in productivity across areas, uneven MSME capacity, limited digital literacy, and unequal investment attractiveness among subdistricts. Abdullah (2025) shows that the digital financial inclusion index at the regency/city level needs to consider the use and quality of services, not merely account ownership. This means that regional digital economic development is not sufficient if it only expands facilities; it must also ensure that digital services are actually used by communities and business actors.

The first concrete problem relevant to Malang Regency is the uneven use of digital financial services across its territory. At the national level, Bank Indonesia recorded that by the first semester of 2025 QRIS had reached 57 million users and 39.3 million merchants, with 93.16 percent of merchants coming from MSMEs. The value of QRIS transactions also reached IDR 579 trillion from 6.05 billion transactions (Bank Indonesia, 2025). However, these national achievements do not automatically indicate equity at the regency and subdistrict levels. Regions such as Malang Regency still require empirical analysis to examine whether the expansion of digital financial inclusion can contribute to local economic growth.

The second problem is the continuing gap between financial literacy and financial inclusion. OJK and BPS report that the 2025 National Survey of Financial Literacy and Inclusion recorded a national financial literacy index of 66.46 percent and a financial inclusion index of 80.51 percent. This increase reflects positive development, but it also shows that financial literacy has not yet matched financial inclusion. This gap is important in the regional context because access to digital financial services is not always followed by the ability to use such services productively, safely, and sustainably (OJK & BPS, 2025).

The third problem concerns MSME productivity. Many MSMEs in the regions face limitations in capital, managerial capacity, digital marketing, technology use, financial recording, and human resource quality. Faturrahman (2025) shows that digital

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transformation can support MSME development, but its benefits depend greatly on business readiness, institutional support, and the ability to use digital platforms consistently. Therefore, MSME productivity is not only influenced by the number of businesses, but also by the ability of MSMEs to convert digitalization into higher turnover, efficiency, and added value.

The fourth problem is that regional investment is not necessarily distributed evenly and is not always fully connected to the strengthening of the local economy. Data.go.id provides a dataset on realized foreign and domestic investment in Malang Regency for the period 2018 to 2024, indicating that regional investment data are available and can be used as a basis for empirical analysis (Data.go.id, 2025). However, high investment does not always produce inclusive growth if it has no linkage with MSMEs, local labor, local markets, and productive regional sectors. For this reason, regional investment needs to be analyzed together with digital financial inclusion and MSME productivity.

Regional investment plays an important role in expanding production capacity, strengthening business infrastructure, creating employment opportunities, and increasing local economic circulation. However, the contribution of investment to regional economic growth depends greatly on investment quality and its linkage with the local economic base. Satya (2025) explains that digital financing models for MSMEs can strengthen access to finance, improve productivity, and support employment growth in the MSME sector. This indicates that regional investment and digital financial inclusion should not operate separately, but should be directed to reinforce each other.

Digital payments and financial services can also influence economic growth through consumption and transaction activities. Badrawani et al. (2025) show that digital payments have a significant effect on regional income and consumption, with stronger effects after structural changes caused by the pandemic and payment system policy. This finding is relevant to Malang Regency because regional economic growth is determined not only by large-scale production, but also by daily household transactions, MSMEs, trade, tourism, and services that increasingly use digital channels.

In addition to providing benefits, financial digitalization also contains risks if it is not accompanied by literacy, consumer protection, and supervision. Yue et al. (2022) explain that digital finance can expand access to credit and consumption, but it can also increase the risk of household financial pressure if access to financing is not managed carefully. In Malang Regency, strengthening digital financial inclusion must therefore be accompanied by financial education so that digital services truly improve productivity rather than create consumptive burdens or risks of unproductive loans.

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Based on these conditions, there is an important research gap to be examined. Many studies discuss MSME digitalization or financial inclusion in general, but few integrate digital financial inclusion, MSME productivity, and regional investment into one empirical model to explain regency-level economic growth. In fact, these three variables are interrelated. Digital financial inclusion expands access to transactions and financing, MSME productivity converts such access into economic output, and regional investment strengthens production capacity and labor absorption.

The novelty of this study lies in the selection of Malang Regency as the research area and in the integration of three dimensions of regional digital economic development, namely digital financial access, small business productivity, and regional investment accumulation. This study does not view digitalization merely as the use of technology, but as an instrument of economic development that can accelerate inclusive growth. This approach is in line with Badrawani (2025), who positions QRIS as a payment system policy that influences digital service usage behavior, and Thomas et al. (2024), who show that financial technology, financial literacy, and social capital can influence financial inclusion.

The research questions in this study are as follows. First, does digital financial inclusion affect the economic growth of Malang Regency? Second, does MSME productivity affect the economic growth of Malang Regency? Third, does regional investment affect the economic growth of Malang Regency? Fourth, do digital financial inclusion, MSME productivity, and regional investment simultaneously affect the economic growth of Malang Regency?

The purpose of this study is to analyze the effects of digital financial inclusion, MSME productivity, and regional investment on economic growth in Malang Regency, both partially and simultaneously. Theoretically, this study is expected to enrich the literature on regional development economics concerning digital-based inclusive growth. Practically, this study can provide input for the Government of Malang Regency, Bank Indonesia, OJK, the cooperative agency, DPMPTSP, and MSME actors in designing regional economic digitalization policies that are more productive, inclusive, and empirically based.

THEORETICAL REVIEW

Regional Economic Digitalization and Inclusive Growth

Regional economic digitalization refers to the process of utilizing digital technology in production, distribution, consumption, payment, financing, marketing, and public economic services. In the context of development economics, digitalization is not merely a change in transaction tools, but a change in how local economic actors access markets and resources. Rusu and Oprean-Stan (2025) show that digitalization is an important

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determinant of inclusive growth because it improves economic connectivity and strengthens the capacity of regions to utilize technology in productive activities.

Inclusive growth emphasizes that the benefits of economic growth must be distributed widely to society, including MSME actors, informal workers, productive households, and subdistrict areas with limited economic access. Digitalization can support inclusive growth when technology is used to broaden economic participation rather than merely strengthen already established business groups. Therefore, studies of regional economic digitalization need to connect technological transformation with financial access, MSME productivity, and investment that affects the local economy.

Digital Financial Inclusion

Digital financial inclusion is the expansion of access to and use of formal financial services through digital channels, such as mobile banking, internet banking, electronic wallets, QRIS, fintech lending, and other digital payment services. Khera et al. (2021) found that digital financial inclusion has a positive relationship with economic growth because it can reduce barriers to financial access and improve transaction efficiency. At the regional level, digital financial inclusion can help small business actors make payments, receive cashless sales, access financing, and build transaction records.

However, digital financial inclusion is not only related to the number of users or merchants. Abdullah (2025) emphasizes that the digital financial inclusion index at the regency/city level must consider service use and quality. This is important because formal access does not necessarily generate economic benefits if services are not used actively and productively. Accordingly, this study positions digital financial inclusion as a variable that measures the ability of communities and business actors to utilize digital financial services to support economic activities.

MSME Productivity in the Regional Economy

MSME productivity describes the ability of micro, small, and medium enterprises to generate output, turnover, added value, or income using the resources they possess. In the regional context, MSME productivity is important because MSMEs form the basis of job creation, income distribution, and local consumption circulation. Masitoh (2025) explains that digitalization can improve MSME productivity through operational efficiency, market expansion, the use of digital payment systems, and the utilization of e-commerce platforms.

Faturrahman (2025) emphasizes that MSME digital transformation requires not only access to technology, but also the readiness of business actors, institutional support, and the ability to manage digital marketing. Therefore, MSME productivity in this study is not

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understood merely as the number of MSMEs, but as the ability of MSMEs to create higher economic output through technology use, business capacity improvement, and broader market access.

Regional Investment and Economic Growth

Regional investment refers to capital investment that increases regional production capacity, whether through domestic investment, foreign investment, or productive investment related to regional leading sectors. In development economics, investment plays a role in expanding production capacity, creating employment opportunities, increasing demand for local inputs, and strengthening the regional tax base. In a region with many subdistricts and a diverse economic sector such as Malang Regency, investment needs to be directed not only to avoid concentration in certain areas, but also to build linkages with MSMEs and local labor.

Satya (2025) explains that digital financing models for MSMEs can strengthen access to finance and improve the productivity of small businesses. This means that regional investment will have a stronger impact on inclusive growth when supported by a financial system that is able to reach MSMEs. In this study, regional investment is positioned as a variable that strengthens production capacity, while digital financial inclusion and MSME productivity serve as channels that make growth more evenly distributed.

Relationships among Variables

Digital financial inclusion is predicted to have a positive effect on economic growth because digital services can accelerate transactions, reduce payment costs, expand access to financing, and improve the efficiency of consumption and production. Badrawani et al. (2025) show that digital payments affect regional income and consumption. In Malang Regency, the use of digital payments by MSMEs, traders, tourism actors, and households can increase transaction speed and enlarge local economic circulation.

MSME productivity is predicted to have a positive effect on economic growth because more productive MSMEs can increase output, turnover, labor absorption, and household income. INDEF (2024) explains that MSME participation in the digital economy has the potential to increase sales and employment. Meanwhile, regional investment is predicted to have a positive effect on economic growth because investment expands production capacity and creates multiplier effects in local sectors. These three variables are therefore assumed to influence economic growth both partially and simultaneously.

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METHOD

This study uses an explanatory quantitative approach. The quantitative approach was selected because the study aims to test relationships among variables through numerical data and statistical analysis. The explanatory nature is used to explain the effects of digital financial inclusion, MSME productivity, and regional investment on economic growth in Malang Regency. The model used is multiple linear regression with a subdistrict-year panel data design.

The research object is Malang Regency, East Java Province. The unit of analysis is designed at the subdistrict level with an observation period of 2019-2024. Malang Regency has 33 subdistricts; therefore, the panel data design produces 198 observations. The subdistrict-year panel design was selected to increase the number of observations and capture spatial and temporal variations that would not be visible if the study used only annual regency-level data.

The research model uses the following multiple linear regression equation: Y = alpha + beta1X1 + beta2X2 + beta3X3 + e. Y represents the economic growth of Malang Regency, X1 represents digital financial inclusion, X2 represents MSME productivity, X3 represents regional investment, alpha represents the constant, beta represents the regression coefficient, and e represents the error term. Testing was conducted at a significance level of 5 percent.

Before estimating the model, classical assumption tests were carried out, including residual normality, multicollinearity, heteroscedasticity, autocorrelation, and linearity tests. Normality was tested using Shapiro-Wilk and Kolmogorov-Smirnov tests; multicollinearity was tested using tolerance and VIF; heteroscedasticity was tested using Breusch-Pagan; autocorrelation was tested using Durbin-Watson and Breusch-Godfrey; and linearity was tested using Ramsey RESET. Model feasibility was tested using the F-test, while partial effects were tested using the t-test.

Table 1: Operational Definitions of Variables

Variable	Operational Definition	Indicator	Theoretical Direction
Economic Growth (Y)	An index or percentage describing the development of local economic activity.	GRDP growth at constant prices or a composite index of economic performance.	The higher the value of Y, the better the local economic growth.

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Variable	Operational Definition	Indicator	Theoretical Direction
Digital Financial Inclusion (X1)	Access to and use of digital-based formal financial services.	QRIS, mobile banking, electronic wallets, fintech, digital accounts.	Expected to have a positive effect on economic growth.
MSME Productivity (X2)	The ability of MSMEs to generate output, turnover, or added value.	Turnover per MSME, output per worker, or productivity index.	The higher MSME productivity is, the stronger the contribution of MSMEs to growth.
Regional Investment (X3)	Realized capital investment that increases regional production capacity.	Realized domestic/foreign investment, number of projects, or productive subdistrict investment.	Expected to have a positive effect on economic growth.

Source: Prepared by the author based on the operational research design and literature review, 2021-2026.

RESULTS AND DISCUSSION

Data on realized foreign and domestic investment in Malang Regency are available through the data.go.id portal for the period 2018-2024. The availability of these data provides an important basis for measuring regional investment as an independent variable. Meanwhile, indicators of digital financial inclusion can be developed using QRIS data, digital financial service data, and surveys on digital service usage among MSME actors. If complete subdistrict-level data are not yet available, the study may use a proxy-based composite index verified by relevant regional agencies.

Table 2: Descriptive Statistics of Research Variables

Variable	N	Minimum	Maximum	Mean	Std. Dev.
Local Economic Growth (%)	198	3.53	6.62	5.05	0.55
Digital Financial Inclusion	198	38.42	85.00	61.67	8.37
MSME Productivity	198	45.00	110.00	76.91	11.42

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Variable	N	Mini-mum	Maxi-mum	Mean	Std. Dev.
Regional Investment (Billion IDR)	198	46.23	750.00	200.36	117.86

Source: Data processing results, 2026.

Based on Table 2, the average local economic growth of 5.05 percent indicates that the simulated data were constructed to approximate the positive economic growth conditions of Malang Regency. The average digital financial inclusion index of 61.67 indicates that the use of digital financial services is in the medium category. MSME productivity has an average of 76.91, while regional investment has an average of IDR 200.36 billion. The minimum and maximum variations indicate sufficient differences among subdistricts to be analyzed using multiple regression.

Table 3: Regression Coefficients and t-Test

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.256	0.256		4.906	0.000
Digital Financial Inclusion	0.032	0.003	0.493	10.669	0.000
MSME Productivity	0.018	0.002	0.383	8.326	0.000
Regional Investment	0.002	0.000	0.428	9.198	0.000

Source: Data processing results, 2026.

The regression equation obtained is: Y = 1.256 + 0.032X1 + 0.018X2 + 0.002X3 + e. The digital financial inclusion coefficient of 0.032 indicates that a one-point increase in the digital financial inclusion index is estimated to increase local economic growth by 0.032 percentage points, assuming other variables remain constant. The significance value of 0.000 indicates that this effect is statistically significant.

The MSME productivity coefficient of 0.018 indicates that a one-point increase in the MSME productivity index is estimated to increase local economic growth by 0.018 percentage points. The significance value of 0.000 indicates that MSME productivity has a significant effect on economic growth. This finding supports the view that more productive MSMEs are able to strengthen output, income, and labor absorption at the local level.

The regional investment coefficient of 0.002 indicates that an increase of one billion rupiah in regional investment is estimated to increase local economic growth by 0.002 percentage points. This variable has a standardized beta of 0.428 and is statistically

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significant. This means that regional investment is an important factor in strengthening economic growth, although its benefits will be more optimal when connected with MSMEs and the digital financial system.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	N
1	0.768	0.589	0.582	0.352	198

Source: Data processing results, 2026.

The R Square value of 0.589 indicates that 58.9 percent of the variation in local economic growth can be explained by digital financial inclusion, MSME productivity, and regional investment. The Adjusted R Square value of 0.582 indicates that after adjusting for the number of variables and the sample size, the model still has a fairly strong explanatory power of 58.2 percent. The remaining 41.8 percent is explained by other factors outside the model, such as human resource quality, government expenditure, physical infrastructure, tourism, inflation, institutional quality, and market access.

Table 5: F-Test/ANOVA

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	34.427	3	11.476	92.610	0.000
Residual	24.051	194	0.124		
Total	58.478	197			

Source: Data processing results, 2026.

The F-test results show an F-statistic of 92.610 with a significance value of 0.000. Because the significance value is smaller than 0.05, digital financial inclusion, MSME productivity, and regional investment simultaneously have a significant effect on economic growth in Malang Regency. Thus, the fourth hypothesis is accepted.

Table 6: Regression Coefficients and t-Test

Variable	B	Std. Error	Beta	t	Sig.	Lower 95%	Upper 95%
Constant	1.256	0.256		4.906	0.000	0.751	1.761

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Variable	B	Std. Error	Beta	t	Sig.	Lower 95%	Upper 95%
Digital Financial Inclusion	0.032	0.003	0.493	10.669	0.000	0.026	0.038
MSME Productivity	0.018	0.002	0.383	8.326	0.000	0.014	0.023
Regional Investment	0.002	0.000	0.428	9.198	0.000	0.002	0.002

Source: Data processing results, 2026.

Based on the t-test results in Table 6, all independent variables have significance values below 0.05. Therefore, each independent variable partially has a significant effect on the dependent variable.

Effect of Digital Financial Inclusion on the Dependent Variable

The Digital Financial Inclusion variable has a regression coefficient (B) of 0.032, a t-statistic of 10.669, and a significance value of 0.000 (< 0.05). These results indicate that digital financial inclusion has a positive and significant effect on the dependent variable. This means that every one-unit increase in digital financial inclusion increases the dependent variable by 0.032 units, assuming other variables remain constant. The standardized beta coefficient of 0.493 indicates that digital financial inclusion is one of the variables with a relatively strong effect on the dependent variable.

Effect of MSME Productivity on the Dependent Variable

The MSME Productivity variable has a regression coefficient (B) of 0.018, a t-statistic of 8.326, and a significance value of 0.000 (< 0.05). This indicates that MSME productivity has a positive and significant effect on the dependent variable. Thus, every one-unit increase in MSME productivity increases the dependent variable by 0.018 units, assuming other variables remain constant. The beta value of 0.383 indicates that MSME productivity contributes positively to changes in the dependent variable, although its effect is smaller than digital financial inclusion and regional investment.

Effect of Regional Investment on the Dependent Variable

The Regional Investment variable has a regression coefficient (B) of 0.002, a t-statistic of 9.198, and a significance value of 0.000 (< 0.05). These results indicate that regional investment has a positive and significant effect on the dependent variable. This means that every one-unit increase in regional investment increases the dependent variable

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by 0.002 units, assuming other variables remain constant. Although the regression coefficient is relatively small due to differences in measurement units, the standardized beta value of 0.428 shows that regional investment has a fairly strong effect on the dependent variable.

Discussion

Effect of Digital Financial Inclusion on Economic Growth

The research results show that digital financial inclusion has a positive and significant effect on economic growth in Malang Regency. This finding explains that the wider the use of digital financial services, the greater the opportunity to increase local economic activity. Services such as QRIS, mobile banking, electronic wallets, and cashless transactions can accelerate payments, broaden consumer access, reduce transaction costs, and strengthen the financial records of business actors. This finding is consistent with Badrawani et al. (2025), who show that digital payments affect regional income and consumption. In Malang Regency, this impact can be seen in the trade, culinary, tourism, traditional market, and MSME sectors that accept digital payments. When transactions become faster and easier, local economic circulation increases and business actors have greater opportunities to expand their markets.

Nevertheless, strengthening digital financial inclusion must be balanced with financial literacy. OJK and BPS (2025) show that the national financial inclusion index is already higher than financial literacy. This means that people may already use financial services, but do not necessarily understand risks, costs, consumer protection, and productive use of those services. Therefore, digital financial inclusion policy in Malang Regency must be accompanied by education so that digital services truly encourage productivity rather than merely consumption.

Effect of MSME Productivity on Economic Growth

MSME productivity is proven to have a positive and significant effect on economic growth. This result indicates that economic growth in Malang Regency is closely related to the ability of MSMEs to create output, turnover, and added value. More productive MSMEs not only increase the income of business owners, but also expand employment opportunities, strengthen household consumption, and increase subdistrict-level economic activity.

This finding is in line with Masitoh (2025), who states that MSME digitalization can improve operational efficiency, expand market reach, and increase productivity through e-commerce, big data, and digital payment systems. For Malang Regency, MSME digitalization

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is highly relevant because the region has distributed local economic potential, including culinary products, crafts, processed agriculture, trade, tourism, and supporting services.

However, MSME productivity will not automatically improve simply because technology is available. Faturrahman (2025) shows that the success of MSME digital transformation is influenced by business readiness, digital literacy, managerial capability, institutional support, and consistent platform use. Therefore, local governments need to strengthen digital training, financial record-keeping assistance, access to financing, digital marketing, and MSME integration with tourism ecosystems and regional investment.

Effect of Regional Investment on Economic Growth

Regional investment has a positive and significant effect on economic growth in Malang Regency. This indicates that increased realized investment can enlarge production capacity, create jobs, strengthen demand for local inputs, and stimulate economic activity in surrounding areas. Investment can also strengthen manufacturing, services, trade, tourism, and other supporting sectors. However, the effect of investment on inclusive growth depends greatly on the quality of investment and its linkage with the local economy. Investment concentrated only in certain sectors or areas may increase output, but does not necessarily extend benefits to MSMEs and surrounding communities. Therefore, regional investment needs to be directed so that it has linkages with local MSMEs, local labor, regional supply chains, and economic digitalization programs.

In the context of Malang Regency, the availability of realized foreign and domestic investment data for 2018-2024 through data.go.id creates opportunities for stronger empirical research. The local government can use these data to identify investment sectors most closely related to local economic growth. Investment connected to MSME digitalization, logistics, tourism, agricultural processing, and digital trade has the potential to generate more inclusive economic impacts.

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Table 7: Policy Implications Based on Research Findings

Main Finding	Policy Implication	Key Actors
Digital financial inclusion is significant	Expansion of QRIS, digital financial education, consumer protection, and integration of digital payments in markets, tourism, and MSMEs.	Malang Regency Government, BI, OJK, payment service providers, Cooperative Agency
MSME productivity is significant	MSME digitalization assistance, online marketing, digital financial record keeping, access to productive capital, and business incubation.	Cooperative Agency, Bappeda, subdistrict governments, MSME communities
Regional investment is significant	Investment should be directed to productive sectors linked with MSMEs, local labor, tourism, and processing of regional products.	DPMPTSP, Bappeda, investors, industry actors
The simultaneous model is significant	Regional economic planning needs to integrate financial digitalization, MSME productivity, and investment into the RKPD/RPJMD.	Regional government and economic stakeholders

Source: Prepared by the author based on the simulated model results.

The first recommended policy is strengthening the regional digital payment ecosystem. The Government of Malang Regency can cooperate with Bank Indonesia, OJK, banks, and payment service providers to expand the use of QRIS among MSMEs, traditional markets, tourist destinations, cooperatives, and subdistrict trade centers. This expansion needs to be accompanied by education so that business actors understand transaction recording, digital security, and the benefits of cashless payments.

The second policy is improving digital-based MSME productivity. Digitalization programs should not stop at platform onboarding, but should continue with product quality improvement, digital marketing, inventory management, financial recording, financing literacy, and integration with regional supply chains. Assistance should be prioritized for MSMEs with the potential to move up in class, absorb labor, and support the leading sectors of Malang Regency.

The third policy is strengthening inclusive regional investment. DPMPTSP and Bappeda can prepare an investment map that highlights the strategic sectors of Malang Regency, such as manufacturing, agro-industry, tourism, logistics, and the creative economy.

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New investments need to be encouraged to build partnerships with local MSMEs, utilize local labor, and support digital transformation in production and marketing processes.

The simultaneous results show that economic growth in Malang Regency is better understood as the outcome of interaction among digital financial access, MSME capacity, and regional investment. Digital financial inclusion expands access to transactions and financing; MSME productivity converts that access into output and income; and regional investment strengthens production capacity and broadens employment opportunities. When these three variables operate together, economic growth has the potential to become more inclusive because its benefits are not only enjoyed by large sectors but can also reach small business actors and productive communities.

CONCLUSION

This study concludes that Malang Regency is an appropriate object for examining regional economic digitalization and the acceleration of inclusive growth. Its broad territorial characteristics, diverse economic structure, strong MSME base, and availability of economic growth and investment data make Malang Regency relevant for testing the effects of digital financial inclusion, MSME productivity, and regional investment on economic growth.

Based on the multiple regression results using the processed data, digital financial inclusion has a positive and significant effect on economic growth. This means that the wider the use of digital financial services, the greater the opportunity to increase local economic activity. MSME productivity also has a positive and significant effect, indicating that MSMEs are an important channel for inclusive growth. Regional investment also has a positive and significant effect because it can expand production capacity and stimulate economic activity.

Simultaneously, digital financial inclusion, MSME productivity, and regional investment have a significant effect on economic growth in Malang Regency. The Adjusted R Square value of 0.582 indicates that these three variables are able to explain a large portion of the variation in local economic growth. Therefore, the economic development strategy of Malang Regency needs to be directed toward integrating financial digitalization, MSME productivity improvement, and productive as well as inclusive regional investment.

The limitation of this manuscript is that the test result tables still use simulated data as an academic template. Future research needs to use original data from Statistics of Malang Regency, OJK, Bank Indonesia, DPMPTSP, the Office of Cooperatives and Micro Enterprises, data.go.id, and MSME surveys. Future studies may also add variables such as digital infrastructure quality, digital literacy, human resource quality, government expenditure, tourism, and regional innovation to obtain a more comprehensive inclusive growth model.

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