

HOW SHARIA MICROFINANCE INFLUENCES INFORMAL SECTOR ENTREPRENEURSHIP IN INDONESIA?

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Abstract

This study examines the impact of Islamic microfinance on informal businesses in Indonesia, controlling for conventional bank credit, education, population density, and per capita income. Using panel data from 34 provinces (2013–2024) and a Fixed Effects regression model, the analysis shows that Islamic microfinance has a positive but insignificant effect on informal business numbers. Conventional credit also has an insignificant negative effect, while higher education significantly promotes informal entrepreneurship. Population density has a negative but insignificant impact. The findings suggest that education is the key driver of informal sector dynamics, whereas financial access—both Islamic and conventional—faces structural limitations. Strengthening human capital, expanding inclusive financing, and supporting the formalization of informal enterprises are crucial for inclusive development in line with Islamic economic principles.

Keywords: Islamic Microfinance, Informal Sector, Education, Population Density

Introduction

Indonesia's economy continues to be heavily supported by the informal sector, which employs a significant portion of the national workforce. According to the Central Statistics Agency (BPS, 2024), approximately 75.05 million people, or 58.4% of the total workforce, are engaged in informal businesses, compared to 53 million working in the formal sector. Informal enterprises generally operate without official permits, lack legal protections and social security, and have limited access to formal financial services (Sari, 2024). Between 2023 and 2024, trends in informal employment varied across provinces. While Papua, Central Java, and East Java experienced notable declines in the share of informal workers, provinces such as West Nusa Tenggara, North Sulawesi, and North Maluku saw increases, reflecting regional disparities in economic development, access to finance, and labor market infrastructure (BPS, 2024; Faharuddin & Endrawati, 2022). These disparities underscore the structural inequality inherent in Indonesia's economic system, where access to financial and productive resources is often concentrated among more established groups, contradicting fundamental principles of Islamic economics that promote equitable distribution of wealth (Amin, 2023).

Sharia-compliant microfinance emerges as a strategic instrument to address these structural gaps. Unlike conventional financing, which often requires collateral and imposes interest, Islamic microfinance provides ethical, partnership-based funding mechanisms such as *mudharabah*, *musyarakah*, and *qardhul hasan*, allowing micro and informal businesses to access working capital without excessive financial burdens (Ginanjar & Kassim, 2020; Iswanto et al., 2022). By combining financial support with social empowerment, Sharia microfinance not only facilitates the growth of small enterprises but also encourages formalization, fostering inclusive economic participation and social justice in line with *maqashid syariah* principles, particularly the protection and equitable circulation of wealth (Alhifni, 2018; Junaidi, 2024).

Empirical evidence highlights the potential of Sharia microfinance to transform the informal sector. Studies indicate that access to Sharia-compliant financing improves business capacity, promotes formal registration and record-keeping, and enhances financial management, which collectively support the transition from informal to formal enterprises (Jamaludin et al., 2023; Marlina et al., 2025). From 2020 to 2024, the volume of Sharia microfinance in Indonesia grew by over 70%, reflecting increasing trust in the system and its expanding role in promoting inclusive financial access (OJK, 2024). While the absolute scale of Sharia microfinance remains smaller than conventional bank credit, its growth rate and ethical framework render it particularly suitable for underserved micro-entrepreneurs who are excluded from conventional banking channels (Faizi & Sulthan Suci Yudhistira, 2023; Islam & Ahmad, 2020).

Beyond financial access, other socio-demographic factors play crucial roles in shaping informal business dynamics. Education, for instance, enhances entrepreneurial skills, financial literacy, and managerial capacity, enabling individuals to either enter the formal

labour market or strengthen their informal enterprises. Population density also influences market opportunities, though its effect is contingent on local infrastructure, market competition, and social networks, suggesting that demographic factors alone are insufficient to determine informal sector expansion (Todaro & Smith, 2020; Mulyanto, 2022). Meanwhile, conventional bank credit remains a complementary or alternative source of financing, but its reliance on interest and collateral limits its accessibility to informal entrepreneurs (Elliyana & Bachtiar, 2020; Puspitasari, 2018).

Taken together, these observations underscore the importance of contextual and multi-dimensional approaches when analysing informal sector dynamics. Sharia microfinance, with its ethical, inclusive, and partnership-oriented mechanisms, holds significant promise as a catalyst for formalization, poverty reduction, and equitable economic development. By integrating financial inclusion, human capital development, and adherence to Islamic economic principles, it offers a sustainable pathway for transforming Indonesia's informal sector into a more structured and productive component of the national economy.

However, despite the growing literature on Islamic microfinance, most studies have primarily concentrated on its role in financial inclusion and poverty alleviation, with limited attention to its impact on informal entrepreneurship as a distinct category. Existing research also tends to generalize entrepreneurial activities without distinguishing the unique dynamics of the informal sector, which employs the majority of Indonesia's workforce. This paper seeks to fill that gap by explicitly examining the intersection between Islamic microfinance and informal entrepreneurship, employing recent panel data to provide context-specific evidence. The novelty of this study lies in its focus on informal enterprises, an area often overlooked in mainstream research, and in its integration of financial, social, and demographic factors to assess how Sharia-compliant microfinance can catalyze inclusive and sustainable economic transformation.

Literature Review

Islamic Microfinance as a Solution for Informal Enterprises

The informal sector has become a characteristic feature of the economic structure in developing countries, including Indonesia (Hapsari et al., 2023). It is marked by minimal regulation, the absence of formal legality, and limited access to financing and social protection, absorbing the majority of workers who cannot enter the formal labor market (Torm & Oehme, 2024). In this context, Islamic microfinance emerges as an alternative solution that is not only financial but also social and spiritual.

Conceptually, Islamic microfinance is a financing system based on Islamic values, aimed at low-income communities or small business actors, following principles of justice, mutual assistance, and free from usury (*riba*), uncertainty (*gharar*), and gambling (*maysir*). Common instruments include contracts such as *mudharabah* (profit-sharing), *musyarakah* (partnership), *murabahah* (cost-plus sale), *ijarah* (leasing), and *qardhul hasan* (benevolent loans) (Catherine et al., 2023; Murizal & Soemitra, 2022a).

The uniqueness of Islamic microfinance lies in its focus not merely on profit, but also on

social welfare and empowering the poor (Pertiwi et al., 2024). Informal business actors often remain unregistered due to difficulties accessing conventional credit, which typically requires collateral, high interest rates, and complex administrative procedures. Islamic microfinance addresses these constraints with a more flexible, human-centered, and community-oriented approach (Dabla-Norris & Koeda, 2008; Munishi et al., 2021).

Moreover, the role of Islamic microfinance institutions (IMFIs) extends beyond financing (Ülev et al., 2023). Many actively provide business mentoring, entrepreneurship training, financial literacy programs, and assistance in record-keeping, gradually encouraging informal businesses to enter the formal economic ecosystem (Judijanto & Mu'min, 2024; Subchi et al., 2024). By formalizing business activities, establishing proper administrative records, and enhancing business capacity, informal actors can obtain legal recognition, broader market access, and legal protection (Barron, 2020; Dabla-Norris & Koeda, 2008).

The Role of Conventional Banking Credit in Reducing Informal Enterprises

A major challenge in reducing the dominance of the informal sector is limited access to formal financing. Many informal business actors struggle to grow due to insufficient capital, lack of collateral, and inability to meet administrative requirements set by financial institutions (Chu Khanh, 2019; Dela Cruz et al., 2023; Mpofu & Sibindi, 2022). In this context, conventional banking plays a crucial role as a financial intermediary that can alleviate capital constraints and encourage the transition of informal businesses to the formal sector.

Credit is the main instrument through which banks perform intermediation, mobilizing surplus funds from society and distributing them to deficit units, including micro and small business actors (Auwalin, 2021; Jimi et al., 2019; F. Wang, 2022). Productive loans such as working capital and investment loans provide opportunities for businesses to expand operations, improve production quality, and access more competitive, regulated markets. This scaling of businesses gradually encourages informal actors to integrate into the formal system (Widyastuti et al., 2023).

From a macroeconomic perspective, access to formal credit can enhance labour market efficiency, create new jobs, and expand the national tax base (Ayyagari et al., 2016). Bank credit serves not only as a tool for economic growth but also to improve economic structure by transforming actors previously operating in the shadow economy into participants in the formal economy (Bose et al., 2012; Malkova & Sabirianova Peter, 2023; Safuan et al., 2021).

Programs like *Kredit Usaha Rakyat* (KUR), supported by government subsidies, have successfully reached millions of micro-entrepreneurs previously excluded from formal financial systems (World Bank, 2020). KUR provides financing ceilings with low-interest rates and minimal collateral requirements for certain amounts, encouraging informal actors to formalize their businesses to access these benefits.

Panuntun & Sutrisno (2018) argue that bank performance is directly influenced by the

volume of productive loans disbursed. Therefore, greater credit distribution to micro and small enterprises enhances financial inclusion and reduces the proportion of informal enterprises in the national economy.

However, challenges remain, including complex documentation requirements, physical collateral, and low financial literacy among informal actors. Policy reforms are needed to make banking more inclusive, including group lending, character-based lending, and collaboration between banks and MSME support institutions.

Thus, conventional bank credit serves not only as a funding source but also as a driver of structural transformation from informal to formal economic activity. Inclusive, affordable, and targeted financing schemes can foster a healthier, transparent, and sustainable economic ecosystem.

Education and Its Impact on Informal Enterprises

Education is a fundamental factor determining human capital quality and socio-economic mobility. Years of schooling reflect formal knowledge acquisition and serve as an indicator of an individual's ability to adapt to the labour market, productivity, and opportunities for formal employment. Human capital theory (Becker, 1993) asserts that higher education increases the likelihood of obtaining well-paid jobs with social protection, thereby reducing dependence on the informal sector.

Empirical findings in this study indicate that the variable years of schooling (lnLP) has a significant negative effect on informal enterprise participation. In other words, higher education tends to reduce engagement in informal economic activities. BPS (2023) data corroborate this, showing that low-educated workers dominate the informal sector, whereas those with secondary or higher education are more likely to be employed in the formal sector.

Education affects informal enterprise participation through multiple mechanisms. First, extended education enhances cognitive and non-cognitive skills necessary for entering modern labour markets (Psacharopoulos & Patrinos, 2018). Second, formal education expands social and professional networks, facilitating transitions to formal employment. Third, higher education correlates with better financial literacy, enabling access to formal financial services such as savings, credit, and business financing (Lusardi & Mitchell, 2014).

However, "low-quality education" remains a challenge in Indonesia, as not all secondary or tertiary graduates secure formal employment due to skill mismatches with market needs, creating educated informality (Fields, 2019). From an Islamic perspective, education is pivotal for achieving *maqashid al-shariah*, especially in protecting intellect (*hifz al-'aql*) and wealth (*hifz al-mal*). High-quality education enables communities to escape structural poverty and informal work, aligning with the Prophet Muhammad's (PBUH) emphasis on seeking knowledge for productive, lawful, and equitable economic participation.

Empirical and theoretical evidence suggest that increasing educational attainment

significantly reduces informal enterprise participation in Indonesia. Public policies should strengthen access to quality education while ensuring curriculum relevance to labour market needs, promoting formal employment, and aligning with Islamic principles of justice and human dignity.

Population Density and Informal Enterprises

Population density, measured as the number of individuals per unit area, influences complex economic, social, and environmental dynamics. High density can simultaneously create opportunities and challenges for informal enterprises.

On one hand, high population density generates larger markets due to increased demand for goods and services. This creates opportunities for small and informal businesses to respond flexibly to local needs (Harris & Todaro, 1970). Informal sectors such as street vendors, informal transport services, and household-based businesses thrive in densely populated urban areas. Cities like Jakarta, Surabaya, and Medan illustrate this phenomenon, where informal enterprises provide affordable goods and services for low-income populations.

On the other hand, without adequate formal employment opportunities, high population density can exacerbate structural problems. According to dual labour market theory, additional labour in dense areas often cannot be fully absorbed by the formal sectors, pushing surplus workers into low-productivity informal activities (Fields, 2019).

In Indonesia, BPS (2023) data indicate that high-density provinces such as West Java, Central Java, and East Java still report significant informal workforce shares in trade, services, and transport sectors. This demonstrates that population density alone does not guarantee formalization but often reinforces informal sector growth when regulatory systems, financing access, and formal employment opportunities lag behind population growth.

High population density also increases competition among informal actors, reducing profit margins and economic resilience (Roy, 2005). Therefore, population density affects informal enterprises ambivalently: while creating market opportunities, it may also expand informal activity and vulnerability.

Sustainable development approaches must treat population density not merely as a challenge but as a potential. Proper urban planning, economic infrastructure, and inclusive financial instruments—including Islamic finance—can turn densely populated areas into economic growth centres, fostering the transition from informal to formal and productive enterprises.

Research Methods

This study employs a quantitative approach to examine the factors influencing informal businesses in Indonesia. The quantitative method was chosen because it allows researchers to objectively collect, process, and analyse numerical data, enabling systematic hypothesis

testing and producing results that are concrete, empirical, measurable, and generalizable. One key advantage of this approach is that it maintains a level of distance between the researcher and the subject, minimizing personal bias and enhancing the objectivity of the findings.

The research focuses on one dependent variable, Informal Business, and four independent variables: Sharia Microfinance, Conventional Bank Credit, Length of Education, and Population Density. Informal Business is measured by the proportion of informal businesses per province, expressed in percentages based on data from the Central Bureau of Statistics (BPS). Sharia Microfinance is measured by the total financing provided by BPRS, BMT, and Sharia Cooperatives, while Conventional Bank Credit refers to the total credit distributed by conventional banks; both are sourced from the Financial Services Authority (OJK) and expressed in billion IDR per year. Length of Education is measured by the average years of schooling of the working-age population, and Population Density represents the number of people per square kilometre, with both variables sourced from BPS.

The study utilizes panel data covering 34 provinces in Indonesia over the period 2013–2024. Panel data allows the analysis to capture both cross-sectional variations among provinces and changes over time, improving the accuracy and efficiency of the statistical estimation. Multiple regression analysis is employed to examine the relationships between independent and dependent variables. Three panel data estimation models are considered: the Common Effect Model (CEM), which assumes uniform behaviour across provinces and time; the Fixed Effect Model (FEM), which allows individual intercepts for each province while keeping slopes constant; and the Random Effect Model (REM), which accounts for random variations across provinces in the residuals.

To determine the most appropriate model, the Hausman test is applied, choosing between FEM and REM. Once the model is selected, the study conducts F-tests to examine the simultaneous effect of independent variables on informal businesses, and t-tests to assess the partial effect of each variable.

Overall, this methodology ensures a rigorous and objective analysis of how Sharia Microfinance, Conventional Bank Credit, Length of Education, and Population Density influence the prevalence of informal businesses across Indonesian provinces, providing insights for policy development and regional economic planning.

Finding and Analysis

Before conducting panel regression analysis, an initial step is to present an overview of the research data using descriptive statistics. Descriptive statistics summarize the basic characteristics of each variable, including minimum, maximum, mean, and standard deviation. This information helps to understand data distribution, variation among observations, and potential outliers that may affect estimation results.

Table 1. Descriptive of Variables

Variable	Mean	Median	S.D.	Min	Max
UI	44,0	44,7	7,06	22,1	63,2
lnPMS	10,7	11,0	2,16	5,14	15,0
lnKBK	9,70	9,56	1,11	7,24	12,3
lnLP	2,18	2,19	0,104	1,81	2,44
lnKP	4,89	4,62	1,58	2,08	9,69

Based on Table 1, the average proportion of informal enterprises (IE) during the study period was 44.0 percent, with a median of 44.7 percent. The minimum value of 22.1 percent and the maximum of 63.2 percent indicate a fairly wide variation across provinces and over time in the share of the workforce employed in the informal sector. A standard deviation of 7.06 suggests that differences between observations are relatively moderate.

The variable lnPMS (Sharia Microfinance) has an average of 10.7 with a median of 11.0. The range is quite broad, from 5.14 to 15.0, indicating significant disparities in the distribution of sharia microfinance across provinces. A standard deviation of 2.16 shows relatively high variation compared to other variables, suggesting that the contribution of sharia financing to informal enterprises may be influenced by province-specific factors.

For the variable lnKBK (Conventional Bank Credit), the average is 9.70 with a median of 9.56. The minimum value of 7.24 and maximum of 12.3 indicate that the distribution of conventional bank credit is relatively more even compared to PMS, with a lower standard deviation of 1.11. This suggests that access to conventional credit across provinces is more homogeneous, although the informal sector may not always be the main beneficiary.

The variable lnLP (Years of Schooling) has an average of 2.18 (in natural log), with a minimum of 1.81 and a maximum of 2.44. When converted, this corresponds to an average schooling range of approximately 6.1 to 11.5 years. This reflects differences in education levels across provinces, although the relatively small standard deviation of 0.104 indicates that the distribution is fairly concentrated around the mean.

Finally, the variable lnKP (Population Density) shows an average of 4.89 with a median of 4.62. The minimum value of 2.08 and the maximum of 9.69 indicate significant disparities in population density across provinces. A standard deviation of 1.58 confirms a fairly large variation, which is reasonable given Indonesia's uneven geographic and population distribution.

Overall, these descriptive statistics indicate considerable variation across provinces in terms of employment, financing, education, and population density. This variation provides the foundation for the subsequent panel regression analysis to examine the relationships between the study variables.

Assumption Testing

Based on the Chow test results, the probability value is 4.82e-16, which is smaller than

the 5 percent significance level. Therefore, the null hypothesis is rejected, indicating that the Fixed Effects model is more appropriate than the Pooled OLS model.

Next, the Breusch-Pagan Lagrange Multiplier (LM) test shows a probability value of $2.09e-144$, also below 0.05. This indicates that a panel model is more suitable than the Pooled OLS, meaning that both the Random Effects and Fixed Effects models can be considered.

To compare the Random Effects and Fixed Effects models, the Hausman test was conducted. The test result shows a probability value of $3.51e-05$, which is smaller than 0.05. This leads to the rejection of the null hypothesis, confirming that the Fixed Effects model is the most appropriate and consistent.

In conclusion, based on these three assumption tests, the model used in this study is the Fixed Effects Model (FEM). This model allows the researcher to capture province-specific variations that influence the development of informal enterprises in Indonesia.

Fixed Effects Regression Results

Based on the previous assumption tests, the most appropriate model for this study is the Fixed Effects Model (FEM). This model is selected because it can capture province-specific characteristics that are not directly observable but may influence the dynamics of informal enterprises. Using FEM is expected to produce more consistent estimates compared to the Random Effects or Pooled OLS models.

The estimation was conducted with Informal Enterprises (UI) as the dependent variable, while the independent variables include Sharia Microfinance (lnPMS), Conventional Bank Credit (lnKBK), Years of Schooling (lnLP), and Population Density (lnKP). The estimation results provide information on the direction of influence (positive/negative) as well as the significance level of each variable on the development of informal enterprises in Indonesia.

Table 2. Regresi Fixed Effect

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-36,0017	18,8394	-1,911	0,0572	*
lnPMS	0,309590	0,203201	1,524	0,1289	
lnKBK	-0,356906	0,663085	-0,5383	0,5909	
lnLP	41,7681	7,96529	5,244	<0,0001	***
lnKP	-2,08507	4,80164	-0,4342	0,6645	
Mean dependent var	43,87630	S.D. dependent var	7,427923		
Sum squared resid	1672,745	S.E. of regression	2,602354		
LSDV R-squared	0,889754	Within R-squared	0,287454		
LSDV F(28, 247)	71,19452	P-value(F)	6,1e-102		
Log-likelihood	-640,2783	Akaike criterion	1338,557		
Schwarz criterion	1443,548	Hannan-Quinn	1380,688		
rho	0,379795	Durbin-Watson	1,131449		

Joint test on named regressors -
Test statistic: $F(4, 247) = 24,9111$

with p-value = $P(F(4, 247) > 24,9111) = 2,42478e-17$

Test for differing group intercepts -

Null hypothesis: The groups have a common intercept

Test statistic: $F(24, 247) = 59,1282$

with p-value = $P(F(24, 247) > 59,1282) = 3,09908e-88$

Based on prior assumption tests, the Fixed Effects Model (FEM) was selected as the most appropriate approach to analyze the determinants of informal enterprises (UI) in Indonesia. The FEM allows capturing province-specific characteristics that are unobservable yet potentially influence the dynamics of informal business activities. The dependent variable in the model is the proportion of informal enterprises, while the independent variables include Sharia Microfinance (lnPMS), Conventional Bank Credit (lnKBK), Years of Schooling (lnLP), and Population Density (lnKP). This model provides consistent estimations compared to Random Effects or Pooled OLS models.

The FEM estimation shows a high explanatory power, with an R-squared of 0.8897, indicating that nearly 89% of the variation in informal enterprises is explained by the model. This suggests that the included variables, especially education, are strongly associated with informal sector dynamics, whereas financial and demographic factors play a more limited role. The F-test confirms that all independent variables jointly affect informal enterprises significantly (F-statistic = 56.21; p-value = 0.000), validating the use of the panel regression model for inference.

Although the coefficient is positive (0.309), the effect is statistically insignificant ($p = 0.1289$). This suggests that while Sharia microfinance provides opportunities for additional capital, its impact on increasing or formalizing informal enterprises remains limited. Factors contributing to this include small loan sizes, allocation for working capital rather than expansion, low financial literacy among recipients, and structural barriers that prevent microfinance from translating into enterprise growth or formalization. Overlapping loans and the flexible nature of informal businesses may further dilute its effectiveness.

The coefficient is negative (-0.356) but also not significant ($p = 0.6645$), indicating that conventional bank credit does not substantially influence the informal sector. The strict eligibility criteria, collateral requirements, and documentation burden render conventional loans largely inaccessible to informal business operators. In practice, conventional credit primarily supports formal businesses or larger enterprises, leaving informal actors largely unaffected.

Education emerges as the strongest determinant of informal enterprise participation, with a positive and highly significant coefficient (41.7681; $p < 0.01$). This indicates that higher average education levels are associated with an increase in informal enterprises. The result reflects a labor market paradox: although education should facilitate access to formal employment, mismatches between skills and labor demand, limited formal job creation, and increased entrepreneurial aspirations drive educated individuals to engage in informal

activities. Education also enhances social capital, managerial knowledge, and risk-taking capacity, which supports the creation and sustainability of informal businesses.

Population density shows a negative but insignificant effect (-2.085; $p = 0.6645$), suggesting that mere density does not determine informal enterprise growth. The presence of informal enterprises depends more on regional economic opportunities, urban policies, and labor market conditions than on population size alone. High-density areas may have more regulation and formal employment options, which can offset the potential for informal enterprise expansion.

The analysis highlights a nuanced understanding of informal enterprise dynamics in Indonesia. Education significantly drives informal sector participation, underscoring the need to align educational outcomes with labour market demands through vocational training, industry linkages, and integrated entrepreneurship programs. In contrast, both Sharia microfinance and conventional bank credit face structural limitations that constrain their ability to transform the informal sector or promote formalization. This indicates that financial interventions alone are insufficient without addressing regulatory barriers, loan allocation, and business support services.

Population density, while theoretically relevant, is less influential than economic, educational, and policy factors, suggesting that interventions to reduce informality should focus on creating inclusive formal employment opportunities, enhancing skill alignment, and facilitating the transition of informal enterprises into the formal economy. Overall, the FEM results reinforce the central role of education in shaping the informal sector, while also illustrating the limited and context-dependent impact of financial and demographic variables.

Shariah Microfinance and Informal Enterprise

The finding that Sharia microfinance does not significantly affect GRDP or the dynamics of the informal sector is somewhat surprising, given the growing body of literature emphasizing its transformative potential. Jamaludin et al. (2023) and Marlina et al. (2025) argue that access to Sharia-compliant financing strengthens microenterprises by expanding working capital, encouraging record-keeping, and facilitating formalization. However, the insignificance in this study suggests that in practice, the scale and implementation of such financing may be too limited to generate macroeconomic effects.

One possible explanation is that the majority of Sharia microfinance in Indonesia remains small in scale, primarily directed toward subsistence businesses rather than growth-oriented enterprises. This aligns with Munishi et al. (2021), who highlight that microfinance loans are often used for short-term consumption smoothing or modest working capital, instead of productive investment capable of expanding output. Furthermore, the absence of robust mentoring and monitoring mechanisms can weaken the intended developmental role of Sharia microfinance.

From a theoretical perspective, this result challenges the assumption that access to

ethical, interest-free capital automatically translates into higher productivity. It underscores the importance of complementary factors—such as entrepreneurial skills, market access, and institutional support—in determining the effectiveness of financing. Policy-wise, this implies that strengthening Sharia microfinance should not only focus on expanding disbursement but also on enhancing its integration with capacity-building programs, ensuring that it supports long-term business growth rather than short-term survival.

Conventional Bank Credit and Informal Enterprises

The insignificance of conventional bank credit reinforces the long-standing narrative of financial exclusion in Indonesia. Elliyan and Bachtiar (2020) as well as Puspitasari (2018) demonstrate that informal enterprises struggle to access bank credit due to collateral requirements, administrative barriers, and the absence of legal business status. This study's result confirms that such structural barriers effectively neutralize any potential benefits of bank lending for the informal sector.

In contrast, Panuntun and Sutrisno (2018) document that productive credit can stimulate small business performance, suggesting that when access is granted, credit has a positive role. The contradiction arises because formal bank credit is disproportionately channelled toward medium and large enterprises, leaving micro and informal actors marginalized. Thus, the lack of significance does not imply that credit is inherently irrelevant to informal business performance, but rather that the institutional architecture of the financial system systematically excludes these actors.

This result strengthens the argument that banking institutions in developing economies remain heavily biased toward the formal sector. It also raises critical questions about the inclusivity of financial intermediation and its alignment with developmental objectives. A possible implication is that unless collateral-free or guarantee-based mechanisms are expanded, conventional credit will remain insignificant for informal enterprises, perpetuating structural inequalities in financial access.

Education and Informal Enterprises

Unlike financial variables, education demonstrates a significant and positive influence. This result presents an intriguing paradox when viewed through the lens of human capital theory. According to Psacharopoulos and Patrinos (2018) and Lusardi and Mitchell (2014), education should improve skills, financial literacy, and competitiveness, thereby increasing the likelihood of individuals securing employment in the formal sector. Yet, this study finds that education actually reinforces participation in informal activities.

The phenomenon can be explained through the concept of *educated informality* (Fields, 2019). Structural constraints in the Indonesian labour market—particularly the limited capacity of the formal sector to absorb new entrants—push educated individuals into self-employment or informal entrepreneurship. In this sense, education still enhances productivity and entrepreneurial potential, but the absence of sufficient formal opportunities redirects these skills into informal channels.

This finding suggests a mismatch between the supply of educated labour and the demand for skilled workers in the formal economy. It also highlights the adaptive capacity of the informal sector, which absorbs educated individuals and allows them to leverage their knowledge in non-formalized settings. From a policy standpoint, this calls for structural reforms in labour market development and industrial policy to ensure that education translates into formal opportunities, while also recognizing the informal sector as a legitimate arena for skilled entrepreneurship.

Population and Informal Enterprises

The absence of a significant relationship between population density and informal business dynamics indicates that demographic size alone is insufficient to explain sectoral growth. This contradicts the arguments of Todaro and Smith (2020) and Mulyanto (2022), who posit that higher density and urbanization can create demand for informal goods and services.

A plausible explanation lies in the role of enabling conditions. High population density does not automatically generate productive opportunities if it is not accompanied by adequate infrastructure, efficient markets, and institutional support. Instead, excessive population density in resource-constrained environments may produce disguised unemployment, increased competition among microenterprises, and stagnation rather than growth.

This finding emphasizes the importance of contextual and structural factors over simple demographic indicators. It suggests that policies targeting informal sector development should move beyond population-driven assumptions and instead focus on improving market infrastructure, reducing entry barriers, and strengthening networks that convert population density into economic opportunities.

Conclusion

Based on the Fixed Effects analysis of panel data from 34 provinces in Indonesia spanning the period 2013–2024, several important conclusions can be drawn regarding the dynamics of informal enterprises. The analysis indicates that Sharia microfinance exhibits a positive effect on the growth of informal enterprises; however, this effect is not statistically significant. This suggests that while microfinance provides relatively accessible capital to low-income communities, it has not yet been able to generate a substantial impact in reducing the dominance of the informal sector. Limitations in the scale of distribution, uneven access across regions, and the limited capacity of informal entrepreneurs to optimally utilize these funds appear to constrain its effectiveness.

Conventional bank credit, on the other hand, shows a negative yet insignificant effect on informal enterprises. This outcome reflects the structural difficulties faced by informal businesses in accessing formal credit due to collateral requirements, administrative burdens, and other formal conditions. Consequently, conventional banking remains an

underutilized source of capital for the informal sector, which further explains the lack of significant impact observed in the analysis.

Years of schooling emerge as a significant and positive determinant of informal enterprise activity. Higher average education levels correlate with an increase in entrepreneurial activity, both formal and informal. Education enhances individuals' skills, creativity, and entrepreneurial capacity, which empirically manifests in the expansion of small enterprises, including those operating informally. This finding highlights a paradox within the Indonesian labor market, where increased educational attainment does not automatically translate into higher absorption into formal employment. Instead, education fosters the ability to engage in entrepreneurial activities, often within the informal sector, due to the limited availability of formal employment opportunities.

Population density appears to have a negative but statistically insignificant influence on informal enterprises. This indicates that a high concentration of people alone does not necessarily stimulate the expansion of the informal sector. Structural factors, such as the availability of formal employment, urban planning, and local regulations, play a more decisive role in shaping the dynamics of informal economic activity.

Overall, the analysis underscores that education is the most influential factor affecting informal enterprise growth, while the contributions of both Sharia microfinance and conventional banking remain limited by structural constraints. These findings carry several implications for policy and practice. Strengthening the quality of education, aligning vocational and entrepreneurial training with labour market needs, and enhancing inclusive access to finance are critical strategies to support the transformation of informal enterprises into formal, productive, and competitive businesses. Furthermore, policies aimed at creating more formal employment opportunities can complement financial interventions, ensuring that improvements in human capital translate into broader economic formalization in line with Islamic economic principles.

From an academic perspective, this study contributes to the literature by demonstrating that informal sector dynamics are shaped not only by financial access but also by structural factors such as education and population distribution. The use of provincial-level panel data reveals inter-regional variations that are often overlooked in studies at the household or individual level. Moreover, the findings challenge normative assumptions that the availability of Sharia-based financial instruments automatically reduces informality, opening avenues for further research using qualitative or mixed-method approaches to explore implementation mechanisms, barriers, and context-specific solutions.

Despite these insights, the study has several limitations. The provincial-level focus captures macro-level dynamics but does not account for individual or household variations, such as gender, age, entrepreneurial motivation, and social networks, which can strongly influence decisions to participate in the informal sector. The independent variables are limited to microfinance, conventional credit, education, population density, and per capita income, leaving out potentially relevant factors such as labour regulations, institutional quality, technological advancement, and entrepreneurial culture. Data

inconsistencies across provinces may also affect reliability, particularly for financing variables. Finally, the Fixed Effects Model used in this study, while capable of capturing inter-provincial heterogeneity, does not fully establish causal relationships. Future studies could employ instrumental variable approaches, structural equation modelling, or qualitative methods to provide deeper insights into the determinants of informal sector development.

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