The impact of sharia financing on economic growth and key economic indicators in Sulawesi

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Abstract
Purpose – This study aims to analyze the impact of sharia financing on economic growth (GDP), inequality, poverty, productivity, and school participation rates in the province of Sulawesi, Indonesia. **Method** – This study uses a quantitative approach with a data panel regression method and a fixed effects model. The data used included data from the annual report published by the Central Statistics Agency (CSA) and the Financial Services Authority (FSA) for the 2015-2023 period from 6 provinces in Sulawesi, with 54 observational data. **Findings** – The study results show that sharia financing positively affects economic growth (GDP), poverty, productivity, and school participation in Sulawesi. However, sharia financing does not affect income inequality. Overall, these findings indicate that sharia financing can drive more inclusive and sustainable economic growth. **Implications** – The implications of these findings contribute to the theory of sharia finance by enriching the literature on the role of inclusive finance that can support social justice and equitable economic growth. From a practical point of view, these findings demonstrate the need for governments and financial institutions to prioritize a fairer distribution of sharia financing, especially in underserved areas, to help reduce poverty and inequality and increase economic growth, productivity, and access to education.
Keywords: sharia financing, economic growth, inequality, poverty, productivity.

Introduction

As part of Indonesia, Sulawesi faces major challenges regarding uneven economic growth between provinces. Although Indonesia, as a developing country, shows significant economic growth, Sulawesi still faces striking economic inequality compared to other islands, such as Java (Rahman et al. 2023). Factors such as limited infrastructure, quality of human resources, and limited access to finance are major obstacles to inclusive economic growth in the region (Nguyen 2025; Murialti et al. 2025). This inequality exacerbates the problem of poverty and creates a cycle of economic stagnation in underdeveloped areas (Nguyen 2025). Limited access to financing, especially for micro, small and medium enterprises (MSMEs), further adds to the complexity of this situation. Many MSME actors have difficulty accessing credit from formal financial institutions due to risk factors that are considered high and the lack of guarantees owned by business owners (Azolibe, Dimnwobi, and Obi 2022; Küçükçolak et al. 2025). This inhibits entrepreneurship and innovation, which are critical to driving regional economic growth (Basnayake et al. 2025; Hariyadi et al. 2025).

One potential factor to support economic growth in Sulawesi is sharia financing, which offers an inclusive approach based on social justice and risk-sharing principles. Sharia financing mechanisms, such as murabaha, mudharaba, and musharaka, have been proven to support the entrepreneurship and financial inclusion sectors, as well as have the potential to increase sustainable investment in productive sectors (Ameziane 2024; Avazkhodjaev et al. 2024). Sharia financing also plays a role in reducing poverty by providing access to finance through sharia principles and optimizing social funds such as waqf (Syarifuddin 2024). Although the sharia finance sector in Indonesia is growing rapidly, its uneven distribution remains a major challenge, especially in areas such as Sulawesi, with unique social and economic characteristics (Zuhroh and Malik 2023). High levels of inequality, with significant differences in the level of access to finance and financial services (Khan et al. 2022; Gao 2023).

Several studies have shown a significant positive relationship between sharia financing, economic growth, and key economic indicators. Research focusing on the contribution of sharia financing to economic growth reveals that sharia financing affects economic growth in Southeast Asia, including Indonesia, reflecting the importance of sharia financing contributors to economic growth (Ledhem and Mekidiche 2021). Further, Ledhem and Moussaoui (2024) revealed that sharia financing through entrepreneurial activities contributes to economic growth. However, although several studies have identified such a positive relationship, not many have examined the effect of sharia financing on other variables such as inequality and poverty.

Research focusing on the impact of sharia financing on reducing inequality and poverty shows that the implementation of sharia financing in the wider financial system can reduce economic inequality as well as poverty reduction, by providing more equitable access to finance to all levels of society (Zuhroh and Malik 2023). Another study, which focuses on the contribution of sharia financing in Islamic social finance, such as zakat and waqf, found that sharia financing can reduce poverty and promote economic growth (Muhammad, Al-Shaghdari, and Ibrahim 2023). Research by Nuryitmawan (2023), which focuses on sharia financing through Islamic fintech for poverty alleviation, shows that sharia financing, such as Islamic fintech, can reduce poverty. However, most of the research does not include the effect of sharia financing on economic productivity and school participation.

Additionally, research by Auliah, Saharuddin, and Trimulato (2023), which focuses on Sharia financing through the musharaka contract in working capital financing, shows that Sharia financing can increase productivity. Furthermore, research by Mahmoud et al. (2024) suggests that sharia financing can improve the competitiveness and sustainability of MSMEs, contributing to economic productivity. However, not much has been discussed in the broader economic context. Furthermore, although there is research that discusses the impact of sharia financing on education, as done by Zuhroh and Malik (2023), showing that sharia financing can contribute to improving access to education by reducing poverty and inequality, there is still no in-depth discussion of its effect on school participation rates directly.

The novelty of this study lies in its in-depth focus on provinces in Sulawesi that have challenges in terms of economic inequality, poverty and limited access to finance. This study also offers a broader analysis by examining the relationship between sharia financing and various key economic indicators, such as economic growth (GDP), income inequality (Gini index), poverty, productivity, and school participation rate (SPR), which have not been extensively researched at the provincial level (Azolibe, Dimnwobi, and Obi 2022; Murialti et al. 2025; Küçükçolak et al. 2025). This study explores how sharia financing distribution can affect economic growth, reduce inequality and poverty, and increase school productivity and participation in Sulawesi provinces. Although sharia financing is growing, its uneven distribution remains a major challenge, hindering its positive impact on poverty and reducing inequality. Therefore, this research is important to provide new insights into how sharia financing can contribute to creating more inclusive and sustainable economic growth, as well as provide a policy foundation that can help governments and financial institutions to maximize the distribution of sharia financing in areas of need, to accelerate the reduction of inequality and poverty.

Literature review

Endogenous growth theory

The theory of endogenous growth, introduced by economists such as Romer (1990), emphasizes the internal mechanisms that generate economic growth in a system by highlighting the role of technology, innovation, and human capital. This theory argues that technological progress arises from economic activity driven by the accumulation of knowledge, research and development (R&D), and investment in human capital (Yazgan and Yalçinkaya 2018; Huang 2024). Research shows that technological advancement is at the heart of this theory, focusing on the importance of innovation and technological improvement driven by investment in human capital and R&D. Research has consistently shown that higher R&D expenditures correlate with increased productivity and, in turn, economic output (Stanley, Doucouliagos, and Steel 2018; Yazgan and Yalçinkaya 2018). A thriving economy can drive innovation by promoting diverse technological pathways, creating cyclical dynamics where each element supports the other (Moaniba, Su, and Lee 2018). Therefore, endogenous growth theory provides a robust framework for understanding how innovation, human capital, and technology interact to drive sustainable economic growth.

Islamic economic theory

Islamic economic theory is grounded in rejecting interest (riba), which is viewed as exploitative, advocating instead for risk-sharing through profit and loss (PLS) arrangements. These arrangements foster ethical relationships between investors and entrepreneurs, ensuring fairness and justice in financial transactions (Yaya et al. 2021). Unlike conventional systems prioritizing individual profit maximization, Islamic economics focuses on communal welfare, aiming to elevate society's living standards (Samad and Sugeng 2022). Instruments such as waqf (charitable endowments) leverage resources for social good, demonstrating the social responsibility central to Islamic economic practices (Ascarya et al. 2023). Furthermore, the concept of Maqāṣid al-Sharīʿah, the higher objectives of Islamic law, emphasizes that economic activities should not solely pursue financial gain but should also consider broader societal impacts, including poverty alleviation and economic justice (Hudaefi and Heryani 2019; Nurhadi 2019). Zakat is a practical example of redistributing wealth and addressing socio-economic disparities (Shabir Ahmad, Siddiqui, and AboAlsamh 2020).

The growth of sharia finance spanning banking, insurance (takaful), and capital markets has increasingly benefited from modern financial technologies, including fintech solutions, which improve accessibility and ensure compliance with sharia principles (Kiliç 2023). Additionally, integrating digital tools like blockchain enhances transparency and accountability, aligning with Islamic principles of fairness in transactions (Kiliç 2023). Entrepreneurship plays a crucial role in Islamic economics, emphasizing ethical business practices that extend beyond profit generation to include social responsibilities towards stakeholders. By fostering an entrepreneurial spirit rooted in ethical values, Islamic economics aims to create a sustainable market environment that benefits individuals and society (Lisnawati and Ahman 2019).

Economic growth

Economic growth refers to the increase in a country's output and income, typically measured by the growth of gross domestic product (GDP) over time (Frick and Pose 2018). It is influenced by labor and capital productivity, infrastructure development, technological advancements, and effective economic policies (Duodu and Baidoo 2020). Growth varies across regions and is impacted by institutional quality and urban concentration (Kryeziu and Durguti 2019; Zhu, Bashir, and Marie 2022). Urban concentration can boost productivity through agglomeration economies (Frick and Pose 2018), while a strong financial sector supports investments, though excessive concentration in banking can have negative effects (Duodu and Baidoo 2020). Additionally, foreign direct investment (FDI) and trade openness contribute to economic growth by providing capital, technology transfer, and market access, although their impact is influenced by domestic factors such as economic policy (Kryeziu and Durguti 2019; Abendin and Duan 2021; Ebghaei 2023).

Inequality

Inequality theory refers to the unequal distribution of income or wealth in society (Jensen and Wiedemann 2023). This inequality can hinder inclusive economic growth and exacerbate social injustice (Plamondon 2022). High inequality can decrease social mobility, increase social tension, and exacerbate inequalities in access to education, employment, and public services (Ritter and Solt 2019). Conversely, if it is too low, it can reduce incentives to work and innovate in some contexts. So, inequality is not only about social justice but also significantly impacts a country's economic performance and stability. Thus, high economic inequality can widen the welfare gap between community groups (Lucas 2017). The causes of economic inequality are numerous, including differences in education and skills, unfair economic policies, uncompetitive market structures, discrimination (such as gender or ethnicity), and differences in access to technology and information (Cain 1986; Weeden and Grusky 2014; Jabbar et al. 2018).

Poverty

Poverty is a lack of income and concerns limited access to education, health, and basic services (Ullah et al. 2020). Poverty theory has evolved with various perspectives that highlight the complex dimensions of the problem. One of the famous theories is the culture theory of poverty, proposed by Oscar Lewis, stating that poverty can be a structural inheritance between generations (Sharma 2018). In addition, spatial and social factors also strengthen poverty conditions, especially in rural areas (F. Li and Li 2018). Therefore, tackling poverty requires comprehensive and inclusive policies, which consider social, cultural, and economic factors and provide better access for poor groups to break out of the cycle of poverty (Guo et al. 2018; Walia and Mankoff 2023).

Productivity

Productivity measures efficiency in using resources to produce output (Rahmanti, Dwiastuti, and Hanani 2020). In economic theory, productivity is often associated with the return rate that results from using specific inputs, such as labor, capital, and technology (Wu, Kim, and Oh 2019). Productivity theory emphasizes that investment in education, technology, and workforce skills can increase output per worker, leading to increased productivity in various sectors of the economy (Voznyak, Patytska, and Kloba 2020; Rahma and Fakhrunnas 2022). Easier and fairer access to finance can increase the productivity of neglected sectors, such as micro, small, and medium enterprises (MSMEs) and the agricultural sector. Investment in productive sectors such as MSMEs can increase productivity, impacting economic growth (Mahmoud et al. 2024).

School participation rate

School participation encompasses a wide range of factors that affect how students engage in education, with the family's economic and social backgrounds being the main factors (Wang and Huang 2021). Winoto et al. (2022) emphasize that parents' education levels and income affect educational accessibility and that government policies to improve these factors can increase participation rates. Education access and social inclusion theory focuses on reducing financial barriers that can prevent specific individuals or groups, especially those in low economic conditions, from obtaining a decent education (Sunarya and Rusydiana 2022). Gubbels, Coppens, and Wolf (2018) added that school financial arrangements and local demographic trends contribute to dropout rates and participation, with a supportive environment increasing student engagement in education.

Sharia financing

An inclusive financial system allows more previously marginalized individuals or groups to access fairer and more affordable financial services (Alhammadi 2022; Ngaha and Mbenda 2024). Sharia financing products such as mudharaba and musharaka provide interest-free financing with the principle of risk and benefit-sharing, accelerating the economic empowerment of marginalized groups, including MSMEs and low-income individuals (Syarifuddin 2024). Fadila, Andaru, and Aryani (2023) highlight that the principles of Islamic economics provide broader benefits to the global population, supporting a more inclusive and equitable economic framework.

Hypothesis development

Endogenous growth theory emphasizes the importance of internal economic factors such as innovation and knowledge accumulation to drive sustainable growth (Romer 1990). In this context, sharia financing can function as a more equitable and equitable resource distribution mechanism, supporting inclusive economic growth. By increasing more equitable access to finance, sharia financing can accelerate economic development in areas previously neglected by conventional economic systems by increasing investment in productive sectors such as MSMEs, which encourages innovation and productivity (Gerelmaa and Kotani 2016). Islamic finance serves as a tool to improve the distribution of resources and access to finance for neglected sectors of the economy, which in turn can drive economic growth. Research by Pebruary and Hani'ah (2024) revealed a significant positive relationship between sharia financing and economic growth. Previous research has shown that sharia financing contributes to economic growth in various developing countries, including Indonesia (Yıldırım, Yıldırım, and Diboglu 2020; Ledhem and Moussaoui 2024). Therefore, the hypothesis proposed is:
H1: sharia financing positively affects economic growth.

The endogenous growth theory shows that a more equitable distribution of resources can reduce inequality and promote more sustainable economic growth. Fairer access to economic resources can reduce economic inequality and promote more inclusive economic growth (Dalimunthe, Sitanggang, and Panggabean 2022). In this case, sharia financing can serve as a tool for a more equitable distribution of wealth, reducing economic inequality. Sharia financing, which is based on the principles of social justice and profit-sharing, has the potential to reduce economic inequality, primarily through social products such as zakat and waqf, which serve to distribute wealth to disadvantaged groups in society (Umar et al. 2022; Hunjra, Arunachalam, and Hanif 2024). Research by Zuhroh and Malik (2023) shows that implementing sharia financing in the broader financial system can reduce economic inequality by providing fairer access to finance to all levels of society. Furthermore, some studies suggest that sharia financing can reduce economic inequality, although the results may vary depending on how financing is distributed in different regions (Muhammad, Al-Shaghdari, and Ibrahim 2023; Syarifuddin 2024). Therefore, the hypothesis proposed is:
H2: sharia financing negatively affects income inequality.

Islamic economic theory emphasizes more equitable distribution of wealth and reduced social inequality, especially through social instruments such as zakat and waqf (Ascarya et al. 2023). Increased access to finance can reduce poverty by providing opportunities for poor groups to invest in productive businesses (Voznyak, Patytska, and Kloba 2020; Rahma and Fakhrunnas 2022). Sharia financing is crucial in this regard, as it can empower low-income groups by providing the necessary resources for entrepreneurship and economic independence (Ekmen and Karatepe 2024). By facilitating access to financial services for micro, small, and medium enterprises (MSMEs) as well as low-income populations, sharia financing not only helps reduce poverty but also improves living standards and encourages broader economic growth (Thathsarani and Jianguo 2022; Yan 2025). Research by Ahmad et al. (2019); Hotman, Hilman, and Ahmad (2024) demonstrated that Islamic financing, such as sharia-based microfinance products, can improve access to economic resources needed to reduce poverty. Therefore, sharia financing is important in reducing poverty in Sulawesi through more inclusive economic empowerment. Therefore, the hypothesis proposed is:

H3: sharia financing negatively affects poverty.

The endogenous growth theory suggests that higher productivity can be achieved by increasing investment in productive sectors, such as MSMEs and the agricultural sector (Romer 1990). Sharia financing contributes directly to increasing productivity because it focuses on the real sector, avoids speculation, prioritizes justice and partnership and encourages the growth of MSMEs and entrepreneurship (Raimi and Bamiro 2025). Research by Mahmoud et al. (2024) demonstrates that sharia financial institutions provide access to the financing MSMEs need to increase their operational capacity. Sharia financing allows productive sectors to grow, increasing productivity (Syarifuddin 2024). Research by Siswantoro (2022); Mahmoud et al. (2024) shows that sharia financing can increase MSMEs' competitiveness and sustainability, contributing to economic productivity. Therefore, the hypothesis proposed is:

H4: sharia financing positively affects productivity.

Islamic economic theory also includes aspects of social welfare, which involve increasing access to education as part of human development (Hudaefi and Heryani 2019). Investment in education through social mechanisms such as waqf can improve the quality of human resources and contribute to long-term economic growth (Sunarya and Rusydiana 2022). Sharia financing, especially through education waqf, can increase access to education in underdeveloped areas (Saiti, Dembele, and Bulut 2021; Hunjra, Arunachalam, and Hanif 2024). Research by Muhammad, Al-Shaghdari, and Ibrahim (2023); Pebruary and Hani'ah (2024) shows that the education waqf can increase school participation in underprivileged areas. Sharia financing supports education by providing funds for the education sector, which can potentially increase school participation (SPR) in Sulawesi. Therefore, the hypothesis proposed is:

H5: sharia financing positively affects the school participation rate.

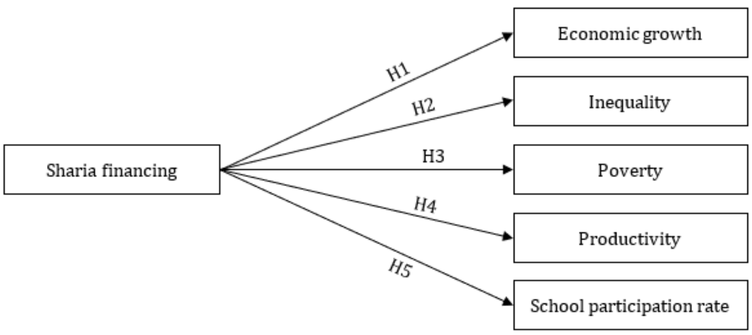

Figure 1 research framework

Method

This study uses panel data covering provinces in Sulawesi. The sample of this study consists of 6 provinces in Sulawesi, namely South Sulawesi, Central Sulawesi, North Sulawesi, Southeast Sulawesi, Gorontalo, and West Sulawesi. The data period used is from 2015 to 2023. The data source used is secondary data. Data on economic growth, poverty, inequality, and school participation rates were obtained from the Central Statistics Agency (CSA). The Financial Services Authority (FSA) obtained data related to sharia financing. The data collection technique is carried out through a documentation study by taking data from the annual report 2015-2023 period of the 6 provinces in Sulawesi with a total of 54 observation data. The data collected will be processed using panel regression to analyze the relationship between variables. The variables used to measure the impact of sharia financing on economic growth and other economic indicators, such as poverty, economic inequality, productivity, and school participation rate (SPR), are explained operationally. These variables are measured using appropriate formulas; each has relevant references in the existing literature. Table 1 shows details of the variables used in this study, along with their measurement formulas, references, and measurement scales.

Table 1 Variable operational definition

Variables	Measurements	References	Scale
Sharia financing	Total sharia financing in each province Sharia financing of Province = ∑ (Sharia financing)	Ledhem and Moussaoui (2024)	Ratio
Economic growth	Gross domestic products in each province GDP of Province = ∑ (Value of goods and services produced)	Pebruary and Hani'ah (2024)	Ratio
Inequality	Gini Index in each province G = A: (A+B) G is the Gini index; A is the area between the Lorenz curve and the equivalence line and B is the area below the Lorenz curve	Muhammad, Al-Shaghdari, and Ibrahim (2023)	Ratio
Poverty	Percentage of the population below the poverty line in each province Poverty Rate = Number of people below the poverty line / Total population x 100	Ahmad et al. (2019)	Ratio
Productivity	Labor output in each province Productivity = Economic output (GDP) / Number of labor force	Mahmoud et al. (2024)	Ratio
School participation	School participation rate (SPR) in each province SPR = Number of children attending school / Number of school-age children x 100	Sunarya and Rusydiana (2022)	Ratio

The data processing of these panels allows for analyzing relationships between variables and considering differences between provinces and changes over time. Correlation analysis is performed first to check the initial relationships between variables before applying the panel regression model. The regression models used in this study are the fixed effects model (FEM) and the random effects model (REM). The Hausman test is used to select the best model by comparing the coefficients of the two models. If the results of the Hausman Test show significant differences, then FEM will be used to account for unobserved inter-provincial variability. Instead, REM will be selected if there is no significant difference (Vrdoljak and Funarić 2022). In assessing the model's validity and ensuring that the regression assumptions of the panel data are met, tests of multicollinearity, heteroscedasticity, and residual normality are used (Ledhem and Mekidiche 2021; Riaz et al. 2022).

Results and discussion

Various tests have been carried out to ensure the validity of the models used and to understand the relationship between sharia financing and other economic variables, such as poverty, economic inequality, and productivity. At this stage, the results of the normality, heteroscedasticity, correlation, Hausman model selection, and panel data regression output with a fixed effects model are presented to provide a clear picture of the dynamics of the relationship between sharia financing and economic variables.

Descriptive statistics

Descriptive statistics provide an overview of the basic data characteristics used in this study. The data analyzed included gross regional domestic product, sharia financing, poverty rate, Gini index, labor productivity, and school participation rate in provinces in Sulawesi from 2015 to 2023. Descriptive statistics for all data obtained can be seen in Table 2.

Table 2 descriptive statistics

Variables	Average	Standard deviation	Minimum	Maximum
Economic growth (IDR billion)	113,800.38	101,280.77	22,068.80	377,162.17
Sharia financing (IDR billion)	2,026.63	2,725.59	172.00	11,539.00
Inequality	0.38	0.03	0.30	0.43
Poverty (%)	11.67	2.93	7.28	18.32
Productivity (IDR billion)	63.55	20.18	29.59	121.17
School participation (%)	72.23	2.36	67.14	76.32

Source: secondary data (processed, 2025)

Table 2 shows that the average economic growth seen from the average GDP value for the provinces in Sulawesi is IDR 113,800.38 billion, which shows the total value of economic production produced by these provinces. Considerable variation can be seen from the standard deviation of IDR 101,280.77 billion, which shows significant inequality between provinces in terms of economy. The minimum value of GDP was recorded at IDR 22,068.80 billion, which was found in Gorontalo province. In contrast, the maximum value of GDP reached IDR 377,162.17 billion, which was recorded in South Sulawesi. This shows a large inequality in economic capacity between provinces, with some provinces being much stronger economically than others.

The average sharia financing in all Sulawesi provinces is IDR 2,026.63 billion, which indicates that sharia financing plays a significant role in supporting economic sectors in these provinces. However, the very large standard deviation figure (IDR 2,725.59 billion) indicates significant variability in the distribution of sharia financing between provinces. The minimum value of sharia financing is IDR 172.00 billion, found in the West Sulawesi province. In contrast, the maximum value of sharia financing is recorded at IDR 11,539.00 billion in South Sulawesi. This shows a large imbalance in the allocation of sharia financing, which may be related to each province's economic factors and financial policies.

The poverty rate in Sulawesi is an average of 11.67%, which shows that most provinces in Sulawesi face challenges in reducing poverty. With a standard deviation of 2.93%, there is considerable variation in poverty rates between provinces. The minimum poverty value is 7.28%, which is recorded in the province of North Sulawesi, while the maximum poverty value reaches 18.32%, found in Gorontalo. This figure indicates that some provinces, especially Gorontalo, still face major challenges in reducing poverty rates, which shows social and economic inequality in various regions.

The average inequality seen from the average Gini Index for the provinces in Sulawesi is 0.38, which indicates a moderate level of economic inequality in the region. With a very small standard deviation (0.03), this figure shows that the variation in the Gini index between provinces is relatively uniform. The minimum value of the Gini index is 0.30, and the maximum value is 0.43, which indicates a variation in the level of economic inequality between provinces. Although overall inequality is not very extreme, provinces with more significant inequality still require special attention in wealth distribution policies.

The average labor productivity in Sulawesi is IDR 63.55 billion, which reflects the labor sector's contribution to these provinces' economies. With a standard deviation of IDR 20.18 billion, there is considerable variation in productivity between provinces, indicating that not all provinces have balanced labor productivity. The minimum value of labor productivity was recorded at IDR 29.59 billion in West Sulawesi. In contrast, the maximum value reached IDR 121.17 billion in South Sulawesi, which shows a large difference in the competitiveness and efficiency of the labor sector between provinces.

As seen from the average school participation rate, the high school score in Sulawesi is 72.23%, which shows a reasonable high school graduation rate overall. The standard deviation of 2.36% shows that the variation in graduation rates between provinces is not too significant. The minimum school participation rate for high school was 67.14% in West Sulawesi, while the maximum score was 76.32% in South Sulawesi, indicating a slight difference in graduation rates between provinces. Nevertheless, high school students' participation rate in most provinces is quite good and shows progress in the education sector.

The results of the descriptive statistics presented show significant economic and social inequality in Sulawesi. Provinces like South Sulawesi show greater economic capacity with high GDP and labor productivity. In contrast, provinces such as Gorontalo and West Sulawesi face greater challenges regarding poverty levels, productivity, and sharia financing. Despite the gaps, this data provides a clear picture of the challenges and potential of each province in developing an economy based on sharia financing.

Normality test

The normality test was carried out to ensure that the data used met the assumption of normal distribution, and the normality test using the Jarque-Bera test was carried out on the residual regression model. The results of the Jarque-Bera test showed that the residual regression model was normally distributed. With 54 observations, the Jarque-Bera test statistic is 1.480551, which shows a p-value of 0.476982. A p-value greater than 0.05 indicates that residual data is usually distributed. Previous research has indicated that regression models that meet the assumptions of normality will produce more accurate and reliable estimates (Riaz et al. 2022; Pebruary and Hani'ah 2024).

Heteroscedasticity test

Heteroscedasticity tests were performed to test whether the regression model's residual variance was constant. The heteroscedasticity test was carried out in this study using the Breusch-Pagan Test. Based on the results of the Breusch-Pagan test, it was shown that there were no significant heteroscedasticity problems in the regression model. The statistical value for Breusch-Pagan of 0.125060 and the p-value of 0.7236, greater than 0.05, suggest insufficient evidence to reject the null hypothesis that the model does not contain heteroscedasticity. Based on these results, the assumption of homoscedasticity (constant residual variance) in this regression model is not violated, and this regression model can be considered valid in terms of heteroscedasticity. Research by Giltman (2020) also shows that models free from heteroscedasticity problems can better provide valid and reliable estimates.

Correlation test

The correlation test evaluated the relationship between sharia financing and other economic variables, such as economic growth, inequality, poverty, productivity, and school participation. This result can be seen in Table 3.

Table 3 correlation results

Variables	Sharia financing	Economic growth	Inequality	Poverty	Productivity	School participation
Sharia financing	1.000000	0.940051	-0.075062	-0.462653	0.437843	0.286923
Economic growth	0.940051	1.000000	-0.153751	-0.580119	0.561442	0.387192
Inequality	-0.075062	-0.153751	1.000000	0.168160	-0.116468	-0.433195
Poverty	-0.462653	-0.580119	0.168160	1.000000	-0.991607	-0.117643
Productivity	0.437843	0.561442	-0.116468	-0.991607	1.000000	0.107255
School participation	0.286900	0.423400	-0.460400	-0.117600	0.756500	1.000000

Source: secondary data (processed, 2025)

Table 3 shows that there is a significant relationship between several variables analyzed. Economic growth and sharia financing have a robust correlation of 0.9401, which shows a very close relationship. This indicates the potential for multicollinearity between the two variables, which needs to be considered in regression analysis, as this robust relationship can affect the stability of the regression coefficient estimation. In addition, there is a moderate positive correlation between economic growth and productivity, with a value of 0.5614, which shows a strong positive relationship between the two. This shows that the higher the economic growth, the higher the productivity, which suggests a relationship supporting the hypothesis that sharia financing can increase productivity. In poverty, there was a robust negative correlation with productivity, which was -0.991607, which shows a robust inverse relationship between the two. This means that the higher the poverty rate, the lower the productivity level in this model. This intense negative relationship should be considered in the analysis, as it can explain how poverty and productivity levels affect each other. Overall, based on the test, there was no correlation between variables that reached a value of 1 or -1, indicating a perfect relationship; the results of the variance inflation factor (VIF) test showed that the multicollinearity problem was not too extreme and did not significantly disturb the stability of the model. Therefore, although it is important to note the robust relationships between some variables in this model, the regression model used is still acceptable.

Hausman model selection test

The Hausman test was performed to choose between the fixed effect model (FEM) and the random effect model (REM) on the variables analyzed. The results of this test are used to determine a more appropriate model in analyzing the influence of sharia financing on economic variables. Table 4 shows that the coefficient comparison results showed a significant difference between the two models in several variables. For example, in economic growth, the coefficient for the fixed effect model is 1.267119, while for the random effect, the coefficient is 1.383828, with a slight difference (0.271648) and a p-value of 0.8228 indicating that this difference is not significant. However, in poverty, the fixed effect coefficient is 0.499405. In contrast, the random effect shows a negative value of -0.188340, with a vast difference (0.020295) and a p-value of 0.0000, which indicates that this difference is significant and favors the fixed effect model. The same is true for productivity, where the coefficient for the Fixed Effect model is 4.980115, while in the random effect model, the coefficient is -2.762745, with a p-value of 0.0003, indicating a significant difference between the two models. Based on the results of the Hausman test, the p-value obtained is 0.0000, which is smaller than 0.05. This shows that the coefficient difference between the fixed effect (FEM) and random effect (REM) models is significant, which means that the difference in coefficients between the two models is not significant. Therefore, the results of this test show that the fixed effect (FEM) model is more appropriate for this analysis because it is better able to overcome differences between units (provinces) that affect dependent variables more accurately.

Table 4 Hausman model selection results

Variables	Fixed effect	Random effects	Difference	Probability
Economic growth	1.267119	1.383828	0.271648	0.8228
Inequality	2.823147	2.274328	9.722484	0.8603
Poverty	0.499405	-0.188340	0.020295	0.0000
Productivity	4.980115	-2.762745	4.533861	0.0003
School participation	0.002470	-0.000397	0.000000	0.0000
Chi-square statistic				112.743410
d.f.				5
Probability				0.0000

Source: secondary data (processed, 2025)

Panel data regression test

Based on the regression analysis results, this model shows the influence of sharia financing on economic growth, inequality, poverty, productivity, and school participation rates in Sulawesi provinces (see Table 5).

Table 5 regression results

Hypothesis	Coefficient	Std. error	t-statistic	Prob.
Sharia financing → economic growth	1.267119	0.523025	2.422675	0.0197
Sharia financing → income inequality	2.823147	3.319500	0.850473	0.3998
Sharia financing → poverty	0.499405	0.164516	3.035595	0.0041
Sharia financing → productivity	4.980115	2.324021	2.142887	0.0378
Sharia financing → school participation	0.002470	0.000475	5.205219	0.0000

Source: secondary data (processed, 2025)

Table 5 shows that sharia financing on economic growth has a coefficient of 1.267119 with a p-value of 0.0197, smaller than 0.05. This shows that sharia financing positively and significantly affects economic growth. Therefore, H1 is accepted. Sharia financing on income inequality has a coefficient of 2.823147 with a p-value of 0.3998, greater than 0.05. This shows that sharia financing does not affect income inequality. Therefore, H2 is rejected. Sharia financing on poverty has a coefficient of 0.499405 with a p-value of 0.0041, smaller than 0.05. This shows that sharia financing positively and significantly affects poverty. Therefore, H3 is rejected. Sharia financing on productivity has a coefficient of 4.980115 with a p-value of 0.0378, smaller than 0.05. This shows that sharia financing positively and significantly affects productivity. Therefore, H4 is accepted. Sharia financing on school participation rate has a coefficient of 0.002470 with a p-value of 0.0000, smaller than 0.05. This shows that sharia financing positively and significantly affects the school participation rate. Therefore, H5 is accepted.

Sharia financing and economic growth

Sharia financing positively affects economic growth in Sulawesi provinces, which shows that increasing sharia financing can increase economic growth in Sulawesi provinces. These findings show that sharia financing is a key driver for economic growth by providing wider access to productive sectors, such as MSMEs, which play a vital role in the regional economy. Previous research, such as that conducted by Supriani et al. (2021), shows that Islamic financing contributes to economic growth by expanding productive sectors. Moreover, Fadila, Andaru, and Aryani (2023) add that the principles of Islamic economics benefit the Muslim community and the global community by supporting more inclusive and sustainable financing. Line with research by Pebruary and Hani'ah (2024) revealed a significant positive relationship between sharia financing and economic growth. Furthermore, previous research has shown that sharia financing contributes to economic growth in various developing countries, including Indonesia (Yıldırım, Yıldırım, and Diboglu 2020; Ledhem and Moussaoui 2024).

Sharia financing can also open access for groups previously unreached by the conventional financial system, thereby increasing broader economic participation (Kaya 2023). For example, sharia microfinance products, along with the concept of zakat, have been shown to increase capital accessibility for individuals and small businesses. This encourages entrepreneurial activities that play a significant role in the local economy (Adinugraha, Shulhoni, and Achmad 2023; Pebruary and Hani'ah 2024). One of the key mechanisms driving this growth is financial inclusion, which is reinforced by Islamic banking principles designed to be more accessible to marginalized groups (Ngaha and Mbenda 2024). Research by Kakembo, Abduh, and Salleh (2021) also shows that sharia microfinance provides important support for MSMEs by providing access to more affordable capital and by sharia principles, which is very relevant to addressing the financial challenges faced by MSMEs. Furthermore, research by Hotman, Hilman, and Ahmad (2024) stated that Islamic financial products, such as mudharaba and murabaha, can increase MSMEs' access to capital, thereby encouraging entrepreneurship and economic growth.

Based on the endogenous growth theory, economic growth is greatly influenced by internal factors, such as economic policies and resource distribution. Sharia financing, with risk-sharing mechanisms used in products such as mudharaba and musharaka, allows access to capital for sectors that can increase productivity and create jobs. This, in turn, encourages faster and more equitable economic growth. In Sulawesi, economic sectors such as agriculture and small industries need affordable financing based on the principles of social justice. Islamic finance provides a more inclusive and equitable financial solution than conventional interest-based systems, which often hinder access to capital for these sectors. Gerelmaa and Kotani (2016); Soula, Mohammad, and Perai (2023) show that a financing system based on social values, such as that found in Islamic finance, can accelerate economic growth. Although many countries rich in natural resources face the problem of the "resource curse," where they experience slower growth due to inequality in the distribution of resources, the principles of justice in sharia finance can help reduce this inequality and improve economic performance. A social justice-first approach to sharia finance can help address the inequality of resource distribution, ensuring that resources are used efficiently and benefit all levels of society, not just the more prosperous or more fortunate groups. Therefore, these findings indicate that governments must expand access to sharia financing, especially for productive sectors with great potential, such as agriculture and small industries. By ensuring that more of these sectors can access financing based on the principles of social justice, inclusive economic growth in Sulawesi can be further encouraged, creating new jobs and improving the overall economic well-being of the community.

Sharia financing and income inequality

Sharia financing does not affect income inequality in Sulawesi provinces. These findings show that, although the main objective of sharia financing is to reduce income inequality, its impact is minimal due to the uneven distribution of financing across regions in Sulawesi provinces. These findings are in line with research by Dalimunthe, Sitanggang, and Panggabean (2022); Zhiqiang and Junyao (2023) show that Islamic financing does have the potential to reduce economic inequality, but its impact depends heavily on the extent to which this financing is distributed evenly across different regions. Research by Zuhroh and Malik (2023) also shows that implementing sharia financing in the broader financial system can reduce economic inequality by providing fairer financial access to all levels of society. Furthermore, some studies suggest that sharia financing can reduce economic inequality, although the results may vary depending on how financing is distributed in different regions (Muhammad, Al-Shaghdari, and Ibrahim 2023; Syarifuddin 2024).

According to Islamic economic theory, a fair and equitable distribution of financing is essential to achieving social welfare goals and reducing inequality. The principles of Maqāṣid al-Sharīʿah, which prioritize broader social goals, such as poverty alleviation and economic justice, emphasize the importance of equitable distribution of resources. This aligns with endogenous growth theory's principle that sustainable economic growth can only be achieved if resources (including financing) are evenly distributed and utilized to increase innovation and technological capacity. Therefore, sharia financing will only effectively reduce economic inequality if distributed fairly.

In the context of Sulawesi, sharia financing is often concentrated in more developed areas, while poor areas have not fully benefited. Research by Masrizal and Trianto (2022) suggests that a fairer policy of distributing sharia financing can maximize its impact on reducing inequality. Moreover, Thaidi, Rahman, and Salleh (2023) show that inclusive finance through the Islamic system can reduce income inequality and provide economic opportunities for those previously marginalized. By adopting these principles in the distribution of sharia financing, a more inclusive and equitable society can be created, with a more effective reduction of economic inequality. Therefore, these findings indicate the need for the government to create policies that ensure that sharia financing is distributed more evenly across the province so that it can help reduce economic inequality in Sulawesi, especially in poorer areas.

Sharia financing and poverty

Sharia financing positively affects poverty in Sulawesi province. However, the positive direction indicates that an increase follows the increase in sharia financing in poverty. These findings show that the distribution of sharia financing is not on target, and there is a need to provide access to capital for people experiencing poverty who were previously unreached by the conventional financial system. Research by Ahmad et al. (2019); Hotman, Hilman, and Ahmad (2024) supports the idea that Islamic finance can reduce poverty by increasing access to economic resources. According to Islamic economic theory, redistributing wealth through instruments such as zakat and waqf is key to reducing economic inequality and fighting poverty. Poverty can be a structural legacy between generations (Sharma 2018). In addition, spatial and social factors also strengthen poverty conditions, especially in rural areas (T. Li et al. 2020). Sharia financing not only aims to reduce poverty directly but also improve the quality of life of the community. Sharia microfinance products provide interest-free capital and fairer access to finance, providing economic empowerment for poor individuals and ultimately contribute to poverty reduction.

In addition, integrating modern financial technologies, such as fintech and blockchain, further facilitates public access to Islamic financing, creates transparency, and ensures fairness in transactions, which are fundamental values in the Islamic economy (Kiliç 2023). It shows how technological developments, which are also reflected in endogenous growth theory, can accelerate the positive impact of sharia financing on poverty alleviation and social welfare improvement. Therefore, tackling poverty requires comprehensive and inclusive policies and providing better access to poor groups to break out of the cycle of poverty (Guo et al. 2018; Walia and Mankoff 2023). Islamic microfinance products, such as qard al-hasan (interest-free loans), allow them to access capital without being burdened with high interest rates, which in turn improves their well-being and helps them get out of poverty (Oyamendan et al. 2024). In Sulawesi, many poor people still do not have access to traditional financial services, and sharia financing offers a fairer and more inclusive solution by providing capital that does not burden them with interest.

Muhammad, Al-Shaghdari, and Ibrahim (2023) affirm that Islamic microfinance products such as qard al-hasan allow individuals to start their businesses without the risk of excessive debt, reducing poverty. Research by Notolegowo et al. (2023) also shows that sharia social finance, through mechanisms such as zakat and waqf, significantly impacts poverty reduction by providing funds to low-income individuals. Research by Widodo (2019); Siswantoro (2022) shows that combining social finance with Islamic commercial finance can strengthen more inclusive economic empowerment efforts. With the development of financial technology, Islamic finance has become more accessible to the broader community, including those previously marginalized from the conventional financial system. The implications of these findings suggest that to accelerate poverty reduction, governments can introduce more sharia-based microfinance schemes that provide access to more poor individuals, thereby improving their quality of life and encouraging economic empowerment. Expanding the sharia financing scheme to be fair and based on the principle of social inclusion is hoped to create a more prosperous and empowered society and significantly reduce the poverty rate in Sulawesi.

Sharia financing and productivity

Sharia financing positively affects productivity in the provinces of Sulawesi. This shows that sharia financing can increase the productivity of productive sectors in Sulawesi. These findings show that sharia financing supports productive sectors such as agriculture and small industries, which can increase output and job creation. Research by Risyad and Mawardi (2023) shows that Islamic financing, through products such as mudharaba and musharaka, is important in increasing productivity by funding sectors that can create jobs and innovation. These productive sectors depend highly on access to adequate capital to support their expansion and increase their competitiveness.

Endogenous growth theory emphasizes that innovation, knowledge accumulation, and investment in human resources are the main factors that drive sustainable economic growth. Sharia financing plays an important role in funding productive sectors, such as agriculture and MSMEs, which has the potential to encourage increased production capacity, innovation, and competitiveness (Syarifuddin 2024). In this context, sharia financing provides capital that does not burden the productive sector with high interest rates, often an obstacle in the conventional financial system (Avazkhodjaev et al. 2024). This is in line with the principle of endogenous growth theory, which states that productive sectors, such as agriculture and MSMEs, need access to capital to innovate and increase their output. Sharia financing, with risk-sharing mechanisms such as mudharaba and musharaka, provides more sustainable and equitable incentives for productive sector actors, increasing their competitiveness and productivity. In other words, sharia financing drives productivity increase, according to endogenous growth theory, which emphasizes the importance of investment in the productive sector to encourage sustainable economic growth.

In Sulawesi, sectors such as agriculture and MSMEs rely heavily on access to capital to increase their production capacity. Islamic finance provides more inclusive financial access for these sectors, especially those previously hampered by conventional financial systems. Research by Wicaksono and Fitriyani (2020) shows that sharia financing plays an important role in supporting Indonesia's agricultural sector, which directly impacts productivity and food security. Therefore, sharia financing provides direct benefits to productive sectors and contributes to food security and economic empowerment of communities. The implications of these findings suggest that policies that support investment in productive sectors through sharia financing can increase productivity and encourage more inclusive economic growth in Sulawesi. By ensuring that more of these sectors can access sharia financing, especially those focused on developing leading sectors such as agriculture and MSMEs, inclusive economic growth can be created, creating new jobs and improving the overall economic well-being of the community. Thus, sharia financing can create more sustainable and equitable growth in Sulawesi.

Sharia financing and school participation

Sharia financing positively affects the level of school participation in Sulawesi provinces. This shows that increasing sharia financing can increase the number of school participants. These findings suggest that through social mechanisms such as education waqf, where funds are available, sharia financing can help fund education in poor areas. Research by Pebruary and Hani'ah (2024) shows that education waqf can increase school participation in poor areas. Other findings also suggest that sharia financing contributes to poverty reduction, which can increase educational participation (Saputri and Zamrudi 2023; Zuhroh and Malik 2023). By reducing poverty, sharia financing provides greater opportunities for low-income families to invest in their children's education.

The endogenous growth theory, principled towards improving the quality and access to education, especially in poor areas, will contribute to greater human capital accumulation. This increases individual productivity and can spark innovation and sustainable economic growth in the long run. Sharia financing supporting education in poor areas is an investment in human capital, which is one of the important pillars in endogenous growth theory to create inclusive and sustainable economic growth. On the other hand, Islamic economic theory emphasizes the importance of social justice and wealth redistribution to create a more just society. Through instruments such as waqf education, sharia financing provides fairer access to education for people experiencing poverty and supports the wealth redistribution principle at the core of Islamic economic theory. By distributing education funds through waqf, sharia financing can reduce inequalities in access to education, supporting marginalized groups to get better education. This suggests that sharia financing can create a more inclusive society where everyone has an equal opportunity to get a quality education regardless of their economic background.

In Sulawesi, although there is great potential to support the education sector through sharia financing, especially education waqf, the allocation of funds for education in poor areas is still limited. Many poor areas in Sulawesi still do not benefit from sharia-based education financing, even though the need for better access to education is enormous. Research by Pebruary and Hani'ah (2024) shows that the education waqf effectively funds education in poor areas. However, better distribution and allocation of funds are needed to increase the positive impact on school participation. Meanwhile, research by Zuhroh and Malik (2023) shows that the principle of wealth redistribution in sharia financing can help reduce inequality in the education sector, supporting marginalized communities to gain better access to education. These findings indicate that to increase school participation in Sulawesi, there needs to be a policy that supports a more equitable distribution of education waqf and more allocation of funds for education in poor areas. The government and Islamic financial institutions need to expand and optimize the use of education waqf as a financing instrument to help create a more inclusive and equitable society regarding access to education.

Conclusions

This research shows that sharia financing positively impacts economic growth in Sulawesi province, as measured by GDP. Sharia financing drives economic growth and plays a crucial role in increasing productivity and school participation rates by increasing access to financial services for low-income groups. Although the impact of sharia financing on economic inequality is limited by uneven distribution, and its impact on poverty is still limited to untargeted distribution and limited access to capital for the poor that were previously unreachable by the conventional financial system, these findings provide new insights into the huge potential of sharia financing, especially in productive sectors such as agriculture and small industries that contribute to economic resilience.

These findings contribute to Islamic financial theory by enriching the literature on the role of inclusive finance that can support social justice and equitable economic growth. Applying endogenous growth theory and Islamic economic theory through financial inclusion in this context shows how sharia-based financial systems can address economic challenges in developing regions, such as poverty and inequality. From a practical point of view, these findings point to the need for governments and financial institutions to prioritize a fairer distribution of sharia financing, especially in underserved areas, as well as promote microfinance products such as qard al-hasan and education financing through waqf to help reduce poverty and inequality and improve economic growth, productivity, and access to education.

While the study provides valuable insights, some limitations are noteworthy, such as the limited data coverage from 2015 to 2023 and the use of aggregated provincial data that may not fully capture regional variation. Therefore, further research can extend the time frame and use more detailed data at the district or city level to understand local dynamics better. In addition, further research can explore the long-term impact of sharia financing on regional disparities and examine the role of digital sharia financing platforms, such as fintech and crowdfunding, in expanding access to finance, especially in rural areas. Further research should also investigate the potential of sharia social finance mechanisms, such as waqf and zakat, in supporting sustainable development goals, especially in the education sector.

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