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The Impact of Islamic Financial Inclusion on Gender Inequality Reduction in Indonesia

Muhammad Syarif H Djauhari
Faculty of Islamic Economics and Business, IAIN Sultan Amai Gorontalo, Indonesia
syarif@iaingorontalo.ac.id

Rifadli D. Kadir*
Faculty of Islamic Economics and Business, IAIN Sultan Amai Gorontalo, Indonesia
rkadir@iaingorontalo.ac.id

Chitra Yuliashri Katili
Faculty of Islamic Economics and Business, IAIN Sultan Amai Gorontalo, Indonesia
chitrakatili@iaingorontalo.ac.id

Edo Segara Gustanto
Faculty of Islamic Economics and Business, IIQ An-Nur Yogyakarta, Indonesia
edo_lpg@yahoo.com

Luthfia Ayu Karina
Faculty of Economics and Social Humanities, Universitas Nahdatul Ulama, South Borneo, Indonesia
luthfia.aka@gmail.com

Selfia Bintariningtyas
Faculty of Economics and Business, Sebelas Maret University, Indonesia
selfia85@gmail.com

Yeni Puspita
Faculty of Social Sciences and Politics, Jember University, Indonesia
yeni.fisip@unej.ac.id

Corresponding author

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Abstract

This study examines whether Islamic financial inclusion contributes to reducing gender inequality across 33 Indonesian provinces during 2018–2023. Using a balanced panel of 198 observations, the Islamic Financial Inclusion Index was constructed through Principal Component Analysis based on accessibility, availability, and usage. At the same time, gender inequality was measured using the provincial Gender Inequality Index. Panel-model selection identified the Common Effect Model as the most appropriate specification. The results reveal regional disparities in Islamic financial inclusion, with DKI Jakarta, Aceh, and West Nusa Tenggara recording the highest levels, while East Nusa Tenggara remained the least inclusive. More importantly, Islamic financial inclusion has a negative and statistically significant association with gender inequality, indicating that provinces with broader access to and use of Islamic financial services tend to exhibit lower gender inequality. These findings extend financial development theory by showing that the equalizing role of financial inclusion also operates within an Islamic financial framework. The study implies that policymakers and Islamic financial institutions should adopt gender-responsive strategies, strengthen women's effective use of financial services, expand digital and financial literacy, and prioritize underserved provinces.

Keywords: Islamic financial inclusion; gender inequality; Islamic bank; PCA

Abstrak

Studi ini meneliti apakah inklusi keuangan syariah berkontribusi dalam mengurangi ketimpangan gender di 33 provinsi di Indonesia selama 2018–2023. Dengan menggunakan data panel dari 198 pengamatan, Indeks Inklusi Keuangan Islam dibangun melalui Principal Component Analysis (PCA) berdasarkan aksesibilitas, ketersediaan, dan penggunaan. Pada saat yang sama, ketimpangan gender diukur menggunakan Indeks Ketimpangan Gender pada tingkat provinsi. Pemilihan model data panel mengidentifikasi Random Effects Model (REM) sebagai model yang paling tepat. Hasil penelitian ini mengungkapkan kesenjangan regional dalam inklusi keuangan syariah, dengan DKI Jakarta, Aceh, dan Nusa Tenggara Barat mencatatkan tingkat tertinggi, sementara Nusa Tenggara Timur tetap menjadi yang paling tidak inklusif. Lebih lanjut, inklusi keuangan Islam memiliki hubungan negatif dan signifikan secara statistik dengan ketimpangan gender, yang menunjukkan bahwa provinsi dengan akses dan penggunaan layanan keuangan Islam yang lebih luas cenderung memiliki ketimpangan gender yang lebih rendah. Temuan ini memperluas financial development theory dengan menunjukkan bahwa peran penyetaraan inklusi keuangan juga beroperasi dalam kerangka keuangan Islam. Studi ini menyiratkan bahwa pembuat kebijakan dan lembaga keuangan Islam harus mengadopsi strategi responsif gender, memperkuat penggunaan layanan keuangan yang efektif oleh perempuan, memperluas literasi digital dan keuangan, serta memprioritaskan provinsi yang kurang terlayani.

Kata kunci: Inklusi keuangan Islam; Ketimpangan gender; Bank Islam; PCA

INTRODUCTION

Gender inequality is a global issue that can be found in various regions, sectors, and levels of development, affecting broader social and economic outcomes (Ekaputri et al., 2025; Yoon, Lee, et al., 2025). In 2023, the global gender inequality index (GII) was 0.455. This score shows that, on average, in the world, gender inequality is still quite significant (UNDP, 2023). To overcome gender inequality, the United Nations established the program to eliminate it as one of the Sustainable Development Goals (SDG 5). Various countries worldwide, including Indonesia, have ratified this program as part of efforts to reduce gender inequality and increase women's empowerment. The Indonesian government includes the agenda of reducing gender inequality in the Medium-Term Development Plan (RPJMN) as part of the mainstream of national development (Suryani & Putri, 2025).

Based on data from the Central Statistics Agency (BPS), Indonesia's GII in 2023 was 0.447. This figure shows that, nationally, there remains an inequality in achievement between men and women across three main dimensions: reproductive health, empowerment, and participation in the labor market. Despite a 0.012-point decrease from 2022, Indonesia's GII figure still indicates inequality. Although the GII in Indonesia declined significantly from 0.459 in 2022 to 0.447 in 2023, it still reflects a fairly high level of inequality (BPS, 2023). This shows that, despite improvements in several areas, including reproductive health, women's empowerment, and participation in the labor market, gender equality in Indonesia still faces major challenges. The gap between men and women, especially in terms of equal access to education, representation in decision-making, and the elimination of gender-based violence, remains an issue that needs more attention. Therefore, although this downward trend in GII is positive, more intensive efforts and more inclusive policies are still needed to achieve full gender equality in Indonesia.

Financial inclusion is recognized as an important instrument for reducing gender inequality by expanding women's access to financial services, including credit, savings, and payment systems. This access not only supports women's entrepreneurship and their participation in the workforce, but also contributes to poverty reduction, particularly in low-income countries (Ayodeji et al., 2025; Maruta et al., 2023). In a variety of contexts, financial inclusion driven by financial technology (FinTech) has been shown to empower women, improve their well-being, and contribute to gender equality and broader development (Duvendack et al., 2023). In particular, financial inclusion can reduce women's barriers to accessing financial services (Razzaq et al., 2024), increase women's empowerment, and ultimately accelerate poverty reduction (Herbert et al., 2024). In addition, reducing gender inequality through financial inclusion also contributes to more inclusive growth (Xu et al., 2023; Le Quoc, 2024).

From a gender perspective, limited access to financial resources remains one of the structural factors contributing to persistent gender disparities (Aziz et al., 2022). Women, particularly those engaged in micro and small enterprises, often face greater barriers in accessing formal financial services due to limited ownership of productive assets, inadequate financial literacy, and social norms that influence economic decision-making (Andriamahery & Qamruzzaman, 2022; Kamuhuza et al., 2022; Khan et al., 2024). These constraints not only limit women's ability to participate in productive economic activities but also reduce their capacity to improve household welfare and achieve economic independence. Therefore, expanding access to inclusive financial services represents not merely a financial intervention but also an important mechanism for strengthening women's empowerment and promoting gender equality (Agusti et al., 2024; Cheng et al., 2024; Rakshit & Bardhan, 2024).

In this regard, Islamic financial inclusion offers a distinctive pathway to address these challenges. Unlike conventional financial systems, Islamic finance is based on principles of justice (*adl*), social responsibility, and equitable access to economic resources (Alhammadi, 2022; N. Ali, 2022). Islamic financial instruments, including Islamic microfinance, productive zakat financing, and Sharia-compliant financing schemes, have the potential to reach underserved groups, such as women who face difficulties accessing conventional financial institutions (Nawawi et al., 2022; Saadah et al., 2024; Widiastuti et al., 2024). By improving women's access to capital and financial services, Islamic financial inclusion may enhance entrepreneurial opportunities, strengthen women's economic participation, and increase their role in household and community decision-making (Faridi et al., 2022; Nawaz et al., 2021). Consequently, Islamic financial inclusion may help reduce gender inequality by creating more equitable opportunities for women to access and use financial resources.

In line with the role of financial inclusion in general, Islamic financial inclusion also offers significant potential to address the needs of segments that have been marginalized from traditional financial services (Ameziane, 2024). Based on the principles of Islamic law, Islamic financial inclusion can serve as an economic pillar supporting economic and social development. As an important part of the economy, Islamic financial inclusion is believed to drive economic growth (Ameziane, 2024), reduce poverty, and enhance human development (Novreska & Arundina, 2024). In addition, Islamic financial inclusion also has a greater strategic role towards financial services that support independence and well-being (Alaghbari et al., 2021).

The role of Islamic financial inclusion in promoting inclusive and sustainable development has received increasing attention in recent years. Previous studies have demonstrated that Islamic financial inclusion contributes to broader economic and social development by expanding access to financial services among underserved communities. Empirical evidence shows that Islamic financial inclusion can stimulate economic growth through improved access to financial resources provided by Islamic financial institutions in Indonesia, Iraq, and OIC countries (Ameziane, 2024; Hasan et al., 2024). Furthermore, Islamic financial inclusion has been associated with poverty reduction and improvements in human development outcomes, particularly in regions with stronger development capacities (Novreska & Arundina, 2024). At the microeconomic level, Islamic financial inclusion supported by financial literacy has also been shown to enhance the growth and performance of microenterprises in Indonesia (Elfi Barus et al., 2023). These findings indicate that Islamic financial inclusion has significant potential as an instrument for improving economic opportunities and social welfare.

However, despite the growing literature on the developmental role of Islamic financial inclusion, its relationship with gender equality remains insufficiently explored. Existing studies have primarily focused on aggregate economic outcomes, such as economic growth, poverty alleviation, human development, and enterprise performance, while paying limited attention to whether Islamic financial inclusion can reduce structural disparities between women and men. This limitation is important because financial exclusion is not gender neutral. Women often experience greater barriers in accessing formal financial resources due to limited ownership of productive assets, lower financial literacy, restricted mobility, and social norms that influence economic decision-making (Andriamahery & Qamruzzaman, 2022; Kamuhuza et al., 2022; Khan et al., 2024). Therefore, improving financial access alone does not necessarily guarantee equal economic benefits unless the gender dimension is explicitly considered.

This limitation highlights several important gaps in existing literature. First, from an outcome perspective, gender inequality has rarely been positioned as a primary consequence of Islamic financial inclusion, as previous studies have predominantly emphasized economic and welfare indicators. Second, from a conceptual perspective, although Islamic finance is frequently associated with principles of justice and inclusion, the pathway linking these principles to gender equality has not been adequately tested empirically. Third, from a contextual perspective, evidence from Indonesia remains particularly limited, despite the country's commitment to financial inclusion, the development of Islamic finance, and the achievement of SDG No. 5 on gender equality. Therefore, a more comprehensive understanding is needed of whether Islamic financial inclusion can function not only as an economic development instrument but also as a mechanism to reduce gender inequality.

This study explores how Islamic financial inclusion relates to gender inequality in Indonesia to fill existing knowledge gaps. Unlike previous studies that mainly examine the effects of Islamic financial inclusion on economic growth, poverty reduction, human development, or business performance, this research focuses specifically on its potential contribution to improving gender equality. By integrating perspectives from Islamic finance and gender development, this study extends the existing literature by providing empirical evidence on whether expanding access to Islamic financial services can support more equitable economic opportunities for women and men. The findings are expected to provide important implications for policymakers in designing gender-responsive financial inclusion strategies and strengthening Indonesia's efforts to achieve SDG 5.

LITERATURE REVIEW

Financial Development Theory

Based on the framework of financial development theory, financial inclusion can be understood as a mechanism that expands individuals' ability to access, use, and benefit from formal financial services, thereby reducing liquidity barriers, transaction costs, and information asymmetry (Tripathi & Rajeev, 2023). As these barriers diminish for women, their space for economic participation expands, as they are no longer fully dependent on informal financial mechanisms that are often expensive, insecure, and limited in scale (Maruta et al., 2023; Ozili, 2024). From this point on, financial inclusion does not stop at account ownership alone, but works through three interrelated dimensions, namely access, use, and quality of services, which together determine whether women can truly transform financial access into real economic capacity (Yoon, Lee, et al., 2025). Thus, financial development theory posits that the deeper the financial system reaches previously marginalized groups, the more likely the distribution of economic opportunities will be more equitable, including across genders (Maruta et al., 2023; Saha & Qin, 2023a).

The relationship between financial inclusion and the reduction of gender inequality, within the Financial Development Theory framework, can be traced along two paths. First, financial inclusion can empower women's economies through savings, credit, and business financing that are more affordable and more suited to their needs (Maruta et al., 2023). Access to formal accounts gives women greater control over cash flow, allowing them to save safely, separate consumption from venture capital, and gradually build assets that ultimately strengthen their bargaining position within the household and in the labor market (Letong et al., 2025). As such, access evolves into active use, such as through productive credit, insurance, or digital payment services; women gain the ability to start or expand micro and small businesses, manage risk, and reduce vulnerability to economic shocks (Saha & Qin, 2023a; Tripathi & Rajeev, 2023). This process allows women who have been on the fringes of the financial system to have more equal opportunities to access productive financing, so that the gender gap in income, asset ownership, and economic participation can decrease (Yoon, Lee, et al., 2025; Yoon, Oh, et al., 2025).

Second, financial inclusion works through strengthening human capital and household well-being, which allows women to allocate resources for education, health, and long-term productive needs more consistently (Manta, 2019; Razzaq et al., 2024). When women have greater control over financial resources, they tend to be more able to influence household decisions related to investments in children's education, health services, and consumption that support quality of life, so that power relations at the domestic level become more balanced (Letong et al., 2025). This is where financial inclusion not only plays a role as an economic instrument, but also as an expansion of women's capabilities to achieve valued functions, in line with the capability perspective that emphasizes substantive freedom to choose and act (Razzaq et al., 2024). Therefore, the reduction of gender inequality through financial inclusion does not occur solely because women enter the financial system, but because such access increases the power of their agency in determining the use of resources for themselves and their families (Fowowe, 2025).

Thus, the theoretical mechanisms linking financial inclusion to the reduction of gender inequality are multi-layered and circular: access to and use of financial services increases women's economic empowerment; such empowerment strengthens investment in human capital and well-being; and the whole process contributes to the reduction of poverty and broader inequality, which in turn deepens the quality of financial development itself (Maruta et al., 2023; Saha & Qin, 2023a). Therefore, financial inclusion in financial development theory should not be understood as an expansion of the reach of financial institutions alone, but as a process of transforming the distribution of economic opportunities that can shift gender relations towards more equal conditions when supported by good governance, affirmative policies, and a supportive social environment (Binsuwadan et al., 2024; Gibson et al., 2015; Razzaq et al., 2024). The consensus in the literature suggests that financial inclusion can reduce gender inequality, but the magnitude of its impact depends on the extent to which financial access translates into control over resources, productive opportunities, and increased agency for women in economic and social life.

Islamic Financial Inclusion

Islamic financial inclusion is a condition in which individuals and business actors have access to and use financial services in accordance with sharia principles, provided by Islamic financial institutions and products (Ameziane, 2024). These services can be provided through Islamic banking, Islamic microfinance institutions, takaful, or other financial products that use contracts in accordance with Islamic law (Novreska & Arundina, 2024). Islamic financial inclusion not only emphasizes the availability of financial services, but also ensures that its products and transaction mechanisms are free from usury, excessive gharar, maysir, and prohibited economic activities (Alhammadi, 2022). The mechanism used can be in the form of profit sharing, risk sharing, buying and selling, renting, and service-based rewards as an alternative to interest-based financial contracts (M. M. Ali et al., 2020; Novreska & Arundina, 2024). Thus, Islamic financial inclusion differs from conventional financial inclusion, which focuses on expanding access to accounts, savings, credit, payments, and insurance without requiring adherence to certain religious principles. Islamic financial inclusion also has a normative foundation of *Maqasid al-Shariah*, which directs financial activities to achieve social justice, equitable distribution of wealth, welfare, and community benefits (Alhammadi, 2022; M. M. Ali et al., 2019). Islamic financial inclusion generally includes the dimensions of access, availability, use, quality, sharia compliance, as well as the social and economic impact of the financial services used (Novreska & Arundina, 2024).

Islamic financial inclusion can serve as a strategic instrument to improve socio-economic conditions by expanding public access to Islamic financial services and encouraging more inclusive economic growth. Empirical evidence suggests that Islamic financial inclusion contributes positively to economic growth in OIC countries, plays a role in reducing poverty and enhancing human development in Indonesia, and has a long-term relationship with economic development in Indonesia and Iraq (Ameziane, 2024; Saluja et al., 2023). The role of Islamic financial inclusion can improve the ability of individuals and business actors to obtain capital, save, make transactions, and manage financial risks more safely and in accordance with religious values (Novreska & Arundina, 2024). This role is in line with *Maqasid al-Shariah*, which places social welfare, wealth circulation, distributive justice, and the benefit of the community as the main goals of economic activities, not solely to maximize profits (Rahman et al., 2022). Thus, Islamic financial inclusion not only serves as a mechanism for expanding access to finance but also as an instrument to reduce poverty, improve the quality of human resources, strengthen micro-enterprises, empower women, and encourage more equitable and sustainable economic development.

Gender Inequality

Gender inequality is a condition in which women and men do not have equal access to opportunities, resources, and outcomes in education, employment, health, politics, and finance (Aziz et al., 2022; Shabir & Ali, 2022). In the financial sector, this inequality can be seen from low account ownership, limited access to credit, and low participation of women in the formal economy, which is influenced by income, education, cultural norms, and quality of governance (Ndoya & Tsala, 2021; Yoon, Lee, et al., 2025). This condition can hinder women's economic empowerment, family welfare, and broader socio-economic development (Kara et al., 2021).

This gender inequality in Indonesia is still evident in access to education, formal work participation, and income levels, with women, especially in rural areas and the informal sector, facing more limited educational opportunities, lower formal labor participation rates, and lower incomes than men (Tjahyadi et al., 2023; Yuniashri et al., 2023). The gap is getting stronger due to differences in urban and rural conditions, the concentration of women in informal work, differences in the structure of the economic sector, and the inequality of education benefits to wage increases (Yuniashri, 2022; Yunisvita et al., 2022). Although women's participation in the labor force continues to increase and the wage gap shows a downward trend, women still receive lower average incomes than men, mainly due to differences in region, education level, and gender (Faharuddin & Endrawati, 2022). Gender inequality needs to be resolved because these conditions limit women's economic independence and empowerment, reduce labor productivity, widen the household income gap, and hinder the achievement of inclusive and sustainable economic development.

Islamic Financial Inclusion and Gender Inequality

Islamic financial inclusion has the potential to reduce gender inequality through expanding women's access to Islamic financial asset ownership, savings accounts, and financing, thereby increasing women's control over economic resources and strengthening their financial independence (Rahman et al., 2022). This influence is further strengthened by increased literacy and financial capabilities that enable women to make more rational economic decisions, manage income, and participate in productive and entrepreneurial activities (Ameziane, 2024; Andriamahery & Qamruzzaman, 2022). Islamic financial inclusion also provides productive financing that is more in line with the principle of risk sharing, thereby reducing collateral barriers and credit exclusion often experienced by women-owned businesses (Aterido et al., 2013).

This mechanism is in line with the theory of financial development and financial intermediation, which explains that expanding access to savings, financing, and risk protection can increase the economic capacity of previously marginalized groups and reduce the gender gap (Ayayi & Dout, 2024). However, the influence of Islamic financial inclusion is not automatic, as its effectiveness depends on the quality of governance, education levels, financial literacy, cultural norms, and the strength of the financial ecosystem that supports women's participation (Rahman et al., 2022). A number of studies have even shown that the existence of financial institutions or the digitization of services alone does not necessarily reduce gender inequality and can widen the gap when discrimination, low literacy, limited access to technology, and social barriers persist (Andriamahery & Qamruzzaman, 2022; Mabrouk et al., 2023). Thus, Islamic financial inclusion has an important role in reducing gender inequality through expanding access to finance, strengthening women's capabilities, providing productive financing, and supporting institutional policies and a social environment that is responsive to women's economic empowerment.

RESEARCH METHOD

This study employs a quantitative explanatory approach to examine whether Islamic financial inclusion contributes to reducing gender inequality in Indonesia. Secondary panel data were used to achieve the research objective. The dataset covers 33 Indonesian provinces over the 2018–2023 period, with the province-year serving as the unit of analysis. Accordingly, the study uses a balanced panel consisting of 198 province-year observations. The selection of 33 provinces was based on the completeness, consistency, and comparability of data for all research variables throughout the observation period. Provinces with incomplete data or administrative changes that prevented the construction of a consistent data series from 2018 to 2023 were excluded from the analysis. This selection was intended to maintain consistent units of analysis and reduce potential estimation bias arising from missing or incomparable observations. Therefore, the inclusion of 33 provinces was determined by methodological and data-availability considerations rather than by geographical preferences.

Data were obtained from two official sources. First, Badan Pusat Statistik (BPS) provided macroeconomic, demographic, and social data, including the Gender Inequality Index, economic growth, unemployment rate, adult population, internet use, and provincial Gross Regional Domestic Product. Second, the Financial Services Authority (OJK) provided data related to Islamic financial inclusion, including third-party funds, Islamic banking office networks, and Islamic bank financing. The Islamic banking data cover Islamic commercial banks, Islamic business units, and Islamic rural banks.

Variable measurement

The dependent variable is gender inequality as measured using the gender inequality index by BPS in Indonesia (BPS, 2024). BPS measures gender inequality by adopting the United Nations Development Programme’s 2010 Gender Inequality Index methodology. The index combines the achievements of women and men across three dimensions: reproductive health, empowerment, and labor market participation. These dimensions are aggregated using harmonic and geometric means to produce an index ranging from 0 to 1. A value approaching 0 indicates a lower level of gender inequality, whereas a value approaching 1 indicates a higher level of gender inequality.

The main independent variable is the Islamic Financial Inclusion Index (FII). The construction of this index was adapted from the multidimensional financial inclusion framework developed by Sarma (2012), and subsequently used by Ali et al. (2019) and Novreska and Arundina (2024). The IFII consists of three dimensions: accessibility, availability, and usage. Accessibility is measured by the amount of third-party funds held by Islamic commercial banks, Islamic business units, and Islamic rural banks per 1,000 adults. Availability is measured by the number of Islamic banking office networks per 100,000 adults. Usage is measured by the amount of Islamic bank financing relative to each province's Gross Regional Domestic Product. These three indicators represent the extent to which Islamic financial services are accessible, geographically available, and used in provincial economic activities.

Because the three indicators are expressed in different units and scales, they were first standardized using z-scores. Principal Component Analysis (PCA) was then applied to combine the standardized indicators into a single composite Islamic financial inclusion index (Maruta et al., 2023; Moghadam & Karami, 2023). The first principal component, which explains the largest proportion of shared variation among the indicators, was used as the composite index. The resulting PCA score was subsequently transformed using min–max normalization to obtain an index ranging from 0 to 1. A value close to 0 indicates a relatively low level of Islamic financial inclusion, whereas a value close to 1 indicates a relatively high level of Islamic financial inclusion (Saha & Qin, 2023a).

Several control variables were included to account for socioeconomic, demographic, and technological factors that may also influence gender inequality. The annual percentage growth of provincial real Gross Regional Domestic Product measures economic growth. The provincial open unemployment rate measures the unemployment rate. Population is measured using the natural logarithm of the population aged 15 years and above. Internet use is measured by the percentage of residents aged 5 years and above who accessed the internet via a mobile phone in the previous 3 months. A summary of the variable measurements is presented in Table 1.

Table 1. Variables Measurement

Variables	Indicator	Symbol	Sources
Dependent			
Gender Inequality	Gender inequality index (GII) in 33 provinces	GI	BPS
Independent			
Islamic Financial Inclusion Index	PCA-based composite index constructed from accessibility, availability, and usage dimensions and normalized to a scale of 0–1	IFII	OJK
Control variables			
Economic Growth	Annual percentage growth of provincial real Gross Regional Domestic Product (GRDP)	EG	BPS
Unemployment Rate	Provincial open unemployment rate	Unem	
Population	Natural logarithm of the population aged 15 years and above	LnPop	
Internet	Percentage of residents aged five years and above who accessed the internet through a mobile phone during the previous three months	Int	

Source: Author (2026)

Estimation technique

This study uses panel data regression because the dataset combines cross-sectional observations across provinces with time-series observations over the 2018–2023 period. Panel data analysis allows the study to examine variations in gender inequality across provinces and over time while accounting for unobserved province-specific characteristics. The econometric model used in this study was developed from research conducted by Omar and Inaba (2020) and Novreska and Arundina (2024). The empirical model is specified as follows (Equation 1).

$$GI_{i,t} = \alpha_0 + \beta_1 IFII_{i\,t} + \beta_{2i,t} + \beta_3 Unem_{i,t} + \beta_4 LnPOP_{i,t} + \beta_5 Int_{i,\,t} + \varepsilon_{i,t} \quad (1)$$

Where *GI* is the gender inequality index, *IFII* is the Islamic financial inclusion index, *EG* is economic growth, *Unem* is the unemployment rate, *LnPOP* is the natural logarithm of the adult population in natural logarithms, and *INT* is the percentage of the population aged 5+ who use the internet via mobile phones. As well as those that are term errors. Based on the proposed hypothesis, Islamic financial inclusion is expected to have a negative effect on gender inequality. A negative coefficient indicates that improvements in access to, availability of, and use of Islamic financial services are associated with lower levels of gender inequality.

Three alternative panel regression models were considered: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model

(REM). Model selection was conducted using the Chow test, the Lagrange Multiplier test, and the Hausman test. The Chow test was used to determine whether the FEM was more appropriate than the CEM. The Lagrange Multiplier test was used to compare the REM with the CEM. The Hausman test was subsequently applied to determine whether the FEM or the REM produced the most appropriate and consistent estimates. The model selected through these tests was used as the main estimation model.

RESULTS AND DISCUSSION

Statistics Descriptive

Table 2 shows descriptive statistics. The Gender Inequality (GI) Index has an average of 0.475 and a standard deviation of 0.094. The GI values, ranging from 0.142 to 0.668, indicate significant differences in gender inequality across regions. Although the overall level of variation is relatively small, it shows the consistency of gender inequality in many regions. In the Islamic Financial Inclusion Index (IFI) variable, the average was 0.432 with a standard deviation of 0.213, indicating considerable variation in the level of Islamic financial inclusion across regions. The wide range of IFI values, ranging from 0.176 to 1,000, shows a clear inequality in access to and utilization of Islamic-based financial services. Some regions are recorded as very inclusive, while others still have a very low level of inclusion.

Table 2. Statistics Descriptive

Variable	Obs	Mean	Std. Dev.	Min	Max
GI	198	0.475	0.094	0.142	0.668
IFI	198	0.432	0.213	0.176	1.000
EG	198	3.985	3.932	-15.740	20.600
UNEM	198	5.129	1.770	1.400	10.950
POP	198	6257823	9027692	418183	45700000
INT	198	97.056	3.072	80.940	99.410

Source: Author (2026)

Economic Growth (EG) averaged 3.985, with a standard deviation of 3.932, indicating high volatility in economic performance across regions. A very wide range of values, from -15,740 to 20,600, indicates that some regions are experiencing a sharp economic contraction, while others are experiencing rapid growth. This shows that there is a disparity in economic growth rates across regions, influenced by factors such as local government policies, market conditions, and the dominant economic sector. For the unemployment rate (Unem), the average is 5.129%, with a standard deviation of 1.770%, indicating that unemployment in Indonesia varies across regions. The range of unemployment values from 1.4% to 10.95% indicates a significant difference between regions with low and high unemployment rates. This reflects the major challenge in creating adequate employment in various regions.

The number of Adult Population (POPs) shows an average of 6,257,823 with a standard deviation of 9,027,692, which reflects the unevenness of the size of the adult population between regions. The very large range of adult population values, from 418,183 to 45,700,000, suggests that regions with very large populations face different challenges than regions with smaller populations in providing social and economic services. Meanwhile, the Internet Usage (INT) variable has a very high average of 97.056%, with a standard deviation of 3.072%. The range between 80.94% and 99.41% shows that although most of the adult population in Indonesia has access to the internet through mobile phones, there are still some areas that experience limited digital access. This shows the need for equitable distribution of digital infrastructure to ensure that all regions have equal opportunities to access technology-based information and services. Overall, these descriptive statistics reveal that there are significant disparities in various aspects of social and economic life between regions in Indonesia. These findings highlight the major challenges in achieving equitable development and socio-economic inclusion across regions, which require serious attention from relevant stakeholders in designing more effective, data-driven policies.

Islamic Financial Inclusion in Indonesia

Islamic financial inclusion at the provincial level is calculated based on three dimensions, namely accessibility, availability, and use, using Principal Component Analysis (PCA). Based on these calculations, the index shown in Table 3 ranges from 0 to 1. It is shown that DKI Jakarta ranks at the top, with almost all Islamic financial inclusion values throughout the year at 1. Table 3 shows significant variation in the level of accessibility, availability, and use of Islamic financial services across Indonesia. This provides a clear picture of the extent to which each province in Indonesia is integrated into the Islamic financial system. DKI Jakarta, which ranks first with an index of 1.00 for the period from 2018 to 2023, indicates that the province has excellent access to Islamic financial services. In addition, Aceh and West Nusa Tenggara rank second and third, with indices of 0.998 and 0.817, respectively. The results of this calculation are in line with the findings of Novreska and Arundina (2024) which stated that DKI Jakarta, Aceh, and Nusa Tenggara have higher Islamic financial inclusion index scores than other regions.

During this period, Riau Province and Riau Islands experienced a very rapid growth in the Islamic financial inclusion index from 0.365 in 2018 to 0.845 in 2023. This growth is driven by the transformation of the Regional Development Bank (BPD) of Bank Riau Kepri (BRK) into BRK Syariah in 2022. This has led to rapidly increasing levels of penetration, availability, and use of Islamic banking in the two provinces, especially since 2022 and 2023. Meanwhile, East Nusa Tenggara is the region with the lowest level of Islamic financial inclusion during the 2018-2023 period, with an average index of 0.178 and very low growth, from 0.176 in 2018 to 0.182 in 2023.

Table 3. Islamic Financial Inclusion in Indonesia

Province	2018	2019	2020	2021	2022	2023	Avg	Rank
DKI Jakarta	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
Aceh	0.993	0.996	1.000	1.000	1.000	1.000	0.998	2
Nusa Tenggara Barat	0.561	0.797	0.849	0.880	0.892	0.925	0.817	3
Yogyakarta	0.658	0.684	0.714	0.723	0.725	0.741	0.708	4
Kepulauan Riau	0.541	0.544	0.561	0.560	0.756	0.963	0.654	5
Kalimantan Timur	0.583	0.631	0.647	0.644	0.630	0.669	0.634	6
Kalimantan Selatan	0.540	0.567	0.574	0.590	0.597	0.629	0.583	7
Riau	0.365	0.380	0.420	0.452	0.605	0.845	0.511	8
Sumatera Barat	0.453	0.467	0.474	0.501	0.522	0.585	0.500	9
Bengkulu	0.443	0.436	0.458	0.475	0.579	0.534	0.487	10
Kalimantan Barat	0.403	0.403	0.413	0.426	0.452	0.491	0.431	11
Jawa Barat	0.391	0.401	0.424	0.435	0.438	0.456	0.424	12
Banten	0.381	0.392	0.412	0.437	0.430	0.473	0.421	13
Sumatera Selatan	0.371	0.392	0.409	0.429	0.431	0.472	0.417	14
Sumatera Utara	0.390	0.408	0.408	0.401	0.420	0.434	0.410	15
Jambi	0.352	0.374	0.381	0.424	0.387	0.434	0.392	16
Maluku Utara	0.366	0.379	0.366	0.390	0.397	0.377	0.379	17
Sulawesi Selatan	0.356	0.368	0.371	0.377	0.383	0.398	0.376	18
Bangka Belitung	0.342	0.368	0.367	0.378	0.379	0.383	0.370	19
Jawa Timur	0.332	0.346	0.349	0.356	0.349	0.360	0.349	20
Sulawesi Tenggara	0.307	0.310	0.324	0.330	0.321	0.348	0.323	21
Jawa Tengah	0.262	0.316	0.313	0.337	0.339	0.353	0.320	22
Lampung	0.302	0.309	0.306	0.306	0.303	0.315	0.307	23
Sulawesi Tengah	0.278	0.280	0.286	0.295	0.289	0.291	0.286	24
Sulawesi Barat	0.248	0.257	0.266	0.288	0.294	0.316	0.278	25
Kalimantan Tengah	0.270	0.272	0.286	0.287	0.276	0.276	0.278	26
Bali	0.269	0.273	0.278	0.267	0.274	0.282	0.274	27
Gorontalo	0.248	0.246	0.262	0.272	0.278	0.300	0.268	28
Papua Barat	0.240	0.236	0.225	0.226	0.229	0.294	0.242	29
Maluku	0.221	0.223	0.215	0.221	0.228	0.228	0.223	30
Sulawesi Utara	0.210	0.217	0.221	0.222	0.227	0.236	0.222	31
Papua	0.199	0.222	0.214	0.211	0.210	0.219	0.212	32
Nusa Tenggara Timur	0.176	0.176	0.176	0.177	0.179	0.182	0.178	33

Source: Author (2026)

In line with Novreska and Arundina (2024) provinces in Eastern Indonesia exhibit lower development than those in Western Indonesia, except in provinces such as West Nusa Tenggara and North Maluku. The Islamic banking dimension in this province shows a low index, making it challenging to promote the Islamic banking system and its availability, especially in the eastern region of Indonesia. The low inclusion of Islamic finance is due to Islamic banking lagging in innovation and competitiveness, with a wide network of conventional offices that can reach remote areas, compared to an inadequate Islamic banking infrastructure. Therefore, innovation and digitalization in Islamic banking are important for increasing the penetration, availability, and use of Islamic banking services, especially in remote areas.

Correlation Matrix

Based on the correlation matrix in Table 4, the relationship between Gender Inequality (GI) and the Islamic Financial Inclusion Index (IFII) is -0.1982. This value indicates a weak negative relationship: increased Islamic financial inclusion tends to be associated with a decrease in gender inequality, but the linear relationship remains low. Thus, based on a simple correlation, IFII moves in the opposite direction to GI, although the relationship is not yet strong. The control variable also indicates the direction of different relationships to the GI. Economic growth (EG) has a very weak positive correlation with GI (0.0296), indicating little linear relationship between the two. The unemployment rate (Unem) has a weak negative correlation of -0.1359 with GI. Furthermore, lnPOP has a weak negative correlation with GI (-0.2322), and INT also has a weak negative correlation (-0.1316). Other correlations that are relatively quite visible are Unem and lnPOP of 0.3168, IFII and Unem of 0.2878, and EG and Unem of -0.2610. However, the overall correlation among the independent variables remains below 0.80. Thus, based on the correlation matrix, there is no significant indication of multicollinearity. No independent variable has a very high correlation, for example, above 0.80 or 0.90. Therefore, the variables IFII, EG, Unem, lnPOP, and INT can still be used together in regression models.

Table 4. Correlation Matrix

	GI	IFII	EG	Unem	lnPOP	INT
GI	1					
IFII	-0.1982	1				
EG	0.0296	-0.039	1			
Unem	-0.1359	0.2878	-0.261	1		
lnPOP	-0.2322	0.2144	-0.0762	0.3168	1	
INT	-0.1316	0.0765	-0.211	0.0911	0.1085	1

Source: Author (2026)

Variance Inflation Factor (VIF)

Table 5 shows the results of the multicollinearity test, indicating that all independent variables have low VIF values in the range of 1.09 to 1.28, with an average VIF of 1.19. The value is well below the 10 thresholds, so it can be concluded that the model does not suffer from multicollinearity. In addition, the tolerance values (1/VIF) for all variables are above 0.10, indicating no strong linear relationships among the independent variables. Thus, all variables in the model are suitable for further estimation.

Table 5. Variance Inflation Factor

Variable	VIF	1/VIF
Unem	1.28	0.783368
IFII	1.27	0.788064
lnPOP	1.14	0.87744
EG	1.12	0.892648
INT	1.09	0.921445
Mean VIF	1.19	

Source: Author (2026)

Regression Results

Based on the results of the best-model selection, the Chow test yielded a p-value of 0.594 (>0.05). Thus, the hypothesis that FEM is the best model is rejected, so CEM is accepted. Next, the Breusch-Pagan LM test was performed to determine which model was better; it yielded a p-value of 1,000 (>0.05), indicating that the CEM model was the best. Therefore, the regression results in this study use the CEM model shown in Table 6. Thus, an increase in Islamic financial inclusion by one unit can reduce gender inequality by 0.084 units, assuming other variables remain constant. The negative coefficient indicates that the greater the access to and use of Islamic financial services, the lower the level of gender inequality.

Table 6. Regression Results

Variables	(1)	(2)	(3)
	CEM	FEM	RE
IFII	-0.084***	-0.076**	-0.084***
	(0.031)	(0.032)	(0.031)
Unem	-0.001	-0.002	-0.001
	(0.004)	(0.004)	(0.004)
EG	-0.000	0.000	-0.000
	(0.001)	(0.002)	(0.001)
lnPOP	-0.017**	-0.017**	-0.0175**
	(0.006)	(0.007)	(0.006)
INT	-0.003	-0.000	-0.003
	(0.002)	(0.005)	(0.002)
Constant	1.076***	0.787	1.076***
	(0.225)	(0.508)	(0.225)
Observations	198	198	198
R-squared	0.103	0.089	
Number of Years		6	6
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1			

Source: Author (2026)

Discussion

The results demonstrate that Islamic financial inclusion has a negative and statistically significant effect on gender inequality, indicating that broader access to Islamic-compliant financial services is associated with lower levels of inequality between women and men. This finding confirms previous empirical evidence showing that financial inclusion can promote gender equality by expanding women's access to economic resources and productive opportunities (Assaf, 2024; Binsuwadan et al., 2024; Demirgüç-Kunt et al., 2013). However, the present study extends these earlier findings by demonstrating that the gender-equalizing effect of financial inclusion also operates within an Islamic financial framework. This distinction is important because Islamic financial inclusion does not merely increase access to conventional accounts and credit but provides financial instruments that comply with Islamic principles and may therefore reach women who remain excluded from interest-based financial institutions for religious, social, or institutional reasons.

The consistency between the present findings and previous studies can be explained through financial development theory. This theory suggests that the expansion and deepening of the financial system can reduce inequality by lowering information asymmetries, transaction costs, collateral constraints, and other barriers that prevent disadvantaged groups from accessing formal financial services (Asiamah et al., 2021; Fitriatinnisa & Khoirunurrofik, 2021; Tabash et al., 2023). Women are often disproportionately affected by these barriers because they tend to have less ownership of assets, weaker access to collateral, lower financial literacy, and fewer connections to formal financial institutions. Consequently, when affordable savings accounts, financing, digital payments, insurance, and other formal services become more accessible, the structural constraints limiting women's economic participation may gradually decline (Faridi et al., 2022; Moghadam & Karami, 2023; Shabir & Ali, 2022). In this regard, the findings support previous arguments that financial inclusion can stimulate economic growth, reduce poverty, and distribute economic opportunities more broadly, particularly among women.

The findings also clarify several mechanisms through which Islamic financial inclusion may reduce gender inequality. First, access to formal Islamic financial services can strengthen women's control over economic resources. Women who can independently save income, accumulate assets, obtain financing, and conduct financial transactions have greater autonomy in managing their economic lives (Kara et al., 2021; Shabir & Ali, 2022). This autonomy can strengthen their bargaining position within the household because their economic contribution becomes more visible, stable, and measurable (Rahman et al., 2022). The present findings therefore confirm earlier evidence regarding the relationship between financial access and women's empowerment, while extending it by suggesting that Sharia-compliant financial services can provide an additional pathway for strengthening women's financial independence. This mechanism is particularly relevant in communities where religious considerations influence decisions regarding the use of formal financial products.

Second, Islamic financial inclusion can expand women's participation in entrepreneurship and employment. Financial development theory emphasizes that an inclusive financial system improves the allocation of capital by directing resources toward productive individuals who were previously constrained by limited access to financing. Women frequently experience credit constraints arising from limited collateral ownership, discriminatory lending practices, restricted financial networks, and dependence on costly or unstable informal funding sources (Koti & Modiba, 2022). Access to Islamic microfinance, working capital financing, savings facilities, and payment services can reduce these constraints and support women's participation in microenterprises and other income-generating activities (Rambaud et al., 2022). The negative relationship between Islamic financial inclusion and gender inequality may therefore reflect an expansion of women's productive capacity, income generation, and participation in household and community economies. Unlike studies that consider financial inclusion primarily in terms of access to banking services, the present study highlights its broader role as a mechanism for economic participation and empowerment.

Third, the findings suggest that Islamic financial inclusion can reduce the gendered consequences of poverty and economic vulnerability. Gender inequality is closely associated with women's limited access to assets, education, formal employment, and financial resources (Bandara, 2024; Bello et al., 2022). Access to savings, financing, insurance, and other Islamic financial instruments enables women to manage consumption, finance productive activities, respond to emergencies, and protect household welfare against economic shocks (Aziz et al., 2022; Hasan et al., 2024). This mechanism helps explain why the effect of Islamic financial inclusion may extend beyond individual women. When women gain greater control over financial resources, household expenditure is often more strongly directed toward food, education, health, children's welfare, water, energy, and other essential needs. Thus, Islamic financial inclusion may contribute not only to women's current economic position but also to intergenerational improvements in welfare and human-capital development.

Fourth, digital financial services can strengthen the effect of Islamic financial inclusion on gender equality. Mobile financial services, digital wallets, and electronic payment platforms can reduce transaction costs, overcome geographic distance, and enable women to access financial services without repeatedly visiting physical financial institutions (Mabrouk et al., 2023). These advantages are especially relevant for women living in areas with limited banking infrastructure or facing mobility restrictions caused by domestic responsibilities and social norms. Nevertheless, the present findings should not be interpreted as evidence that digital access automatically eliminates gender inequality. Women may continue to face unequal access to mobile devices, limited digital and financial literacy, cybersecurity risks, restrictive gender norms, and unequal domestic workloads (Ayodeji et al., 2025). Therefore, digital Islamic financial inclusion is likely to generate stronger gender-equality outcomes when it is accompanied by digital literacy, consumer protection, affordable technology, and financial products designed around women's specific economic and social circumstances.

The results contribute to a better understanding of the relationship between Islamic financial inclusion and gender equality in at least three respects. First, they confirm that financial access is an important determinant of gender-related economic outcomes. Second, they extend existing empirical evidence by showing that the characteristics of Islamic finance, including Sharia compliance, ethical financing, risk sharing, and the potential integration of social finance instruments, may provide additional channels for reaching financially excluded women. Third, the findings indicate that the contribution of Islamic financial inclusion to gender equality should not be assessed solely through the number of women holding accounts or receiving financing. Its effectiveness must also be evaluated in terms of women's active use of financial services, control over income and assets, participation in business and employment, influence in household decision-making, and ability to improve their long-term socioeconomic opportunities.

From a practical perspective, these findings imply that Islamic financial institutions and policymakers should adopt a gender-responsive approach to financial inclusion. Expanding access alone may be insufficient when women remain constrained by low literacy, collateral requirements, unequal access to technology, discriminatory practices, and restrictive social norms. Islamic financial inclusion should therefore be integrated with financial and digital education, business-development assistance, consumer protection, simplified financing procedures, and products that respond to women's income patterns and productive activities. Strengthening these supporting conditions would enable Islamic financial services to function not only as instruments of financial access but also as mechanisms for women's participation, empowerment, and socioeconomic mobility.

Overall, Islamic financial inclusion can help reduce gender inequality by expanding women's access to productive resources, lowering financial barriers, strengthening control over income and assets, increasing household bargaining power, and creating broader opportunities for entrepreneurship and employment. However, its gender-equalizing effect is conditional rather than automatic. The effect will be stronger when financial inclusion is positioned as a comprehensive empowerment strategy that combines access to Sharia-compliant services with literacy improvement, institutional protection against gender bias, digital accessibility, and policies that address the sociocultural factors underlying women's financial exclusion.

Policy implications

The significant negative effect of Islamic financial inclusion on gender inequality implies that financial inclusion policies should be designed not merely to increase women's account ownership, but to strengthen their effective access to financing, productive assets, entrepreneurship, employment, and economic decision-making. Governments, financial regulators, and Islamic financial institutions should establish gender-responsive targets, collect gender-disaggregated data, simplify financing procedures, reduce excessive collateral requirements, and develop Islamic financial products that reflect women's income patterns and business characteristics. Financing programs should also be integrated with financial and digital literacy, business mentoring, market access, consumer protection, and accessible digital services to ensure that women can use financial resources productively and independently.

Policy implementation requires coordinated action among regulators, government agencies, Islamic banks, Islamic microfinance institutions, zakat and waqf organizations, local governments, and women's organizations. Islamic social finance instruments, such as zakat, waqf, and qard hasan, can support financially vulnerable women before they transition to commercial financing and sustainable economic activities. The effectiveness of these policies should be assessed not only by the number of accounts or financing recipients, but also by improvements in women's income, business sustainability, asset ownership, resilience to economic shocks, participation in household decision-making, and access to long-term socioeconomic opportunities. In this way, Islamic financial inclusion can serve as a practical instrument to advance inclusive and gender-equitable financial development.

CONCLUSION

This study examined the relationship between Islamic financial inclusion and gender inequality across 33 Indonesian provinces during 2018–2023. The empirical results reveal substantial regional disparities in Islamic financial inclusion, with DKI Jakarta, Aceh, and West Nusa Tenggara recording relatively high inclusion levels, while several provinces, particularly East Nusa Tenggara, remain substantially underserved. More importantly, the Common Effect Model shows that Islamic financial inclusion has a negative and statistically significant association with gender inequality, with a coefficient of −0.084 at the 1% significance level. Thus, provinces with greater accessibility, availability, and use of Islamic financial services tend to exhibit lower levels of gender inequality. This finding supports the central argument of financial development theory that a broader financial system can contribute to a more equitable distribution of economic opportunities.

The main contribution of this study is to demonstrate that the gender-equalizing role of financial inclusion is also evident within an Islamic financial framework. However, this relationship should not be interpreted as indicating that the expansion of Islamic banking services automatically produces gender equality. Rather, the result suggests that Islamic financial inclusion may support gender equality when financial access is transformed into the effective use of savings, financing, payment services, and other productive financial facilities. As discussed in the study, these services can help reduce financial barriers that disproportionately affect women and expand their opportunities to participate in entrepreneurship, employment, and economic decision-making. Nevertheless, the mechanisms underlying this relationship were not directly tested; therefore, interpretations concerning women's asset ownership, bargaining power, or entrepreneurial participation should be regarded as theoretically supported explanations rather than separately established empirical findings.

The findings imply that financial inclusion policy should move beyond increasing the number of Islamic banking accounts or expanding institutional networks. The government, financial regulators, local authorities, and Islamic financial institutions should adopt gender-responsive targets and use gender-disaggregated indicators to assess whether women actively use financial services and derive productive economic benefits from them. Financing procedures should be simplified, excessive collateral barriers should be reduced, and Islamic financial products should be adjusted to women's income patterns and business characteristics. These measures should be combined with financial and digital literacy, business mentoring, market access, consumer protection, and accessible digital services. Considering the wide provincial disparities identified in the study, policy interventions should also be differentiated geographically, with greater attention given to provinces where the accessibility, availability, and use of Islamic financial services remain persistently low.

Several limitations should be considered when interpreting these findings. First, the analysis covers only 33 provinces and a relatively short observation period of 2018–2023, limiting its ability to capture longer-term changes and the most recent administrative development of Indonesian provinces. Second, the Islamic Financial Inclusion Index is constructed from aggregate Islamic banking indicators and does not capture women's individual ownership or use of financial services, the quality of services received, or other segments such as Islamic microfinance, takaful, zakat, and waqf. Third, the model's relatively modest explanatory power suggests that gender inequality is also influenced by factors not included in the analysis, such as education, access to health care, cultural norms, institutional quality, women's political representation, asset ownership, and regional economic structures. Finally, because the study relies on observational provincial data, the estimated relationship should be interpreted as a robust statistical association rather than definitive causal evidence.

Future research should extend the observation period, include all provinces when comparable data become available, and use gender-disaggregated household or individual-level data to examine whether women directly access, use, and control Islamic financial resources. Further studies could also distinguish among the accessibility, availability, and usage dimensions to identify which aspect of Islamic financial inclusion is most relevant to reducing gender inequality. Dynamic panel models, instrumental-variable approaches, spatial analysis, or quasi-experimental designs may provide stronger evidence regarding causality and regional spillover effects. In addition, future research should empirically test the mechanisms discussed in this study, particularly the roles of financial literacy, productive financing, women's entrepreneurship, asset ownership, digital access, and household decision-making in transmitting the relationship between Islamic financial inclusion and gender equality.

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