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The Impact of Islamic Financial Development on Income Inequality in Selected Countries: A Spatial Panel Data Approach

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Abstract

Income inequality has gained prominence by exacerbating the economic stability of both developed and developing countries over the past few decades. The intensity of this issue is non-trivial with economies witnessing failure in policies, indecorous economic governance, and the challenging economic ideologies. Impact of financial development on economic growth is an important channel in economic issues on which plenty of discussions and challenges have arisen. Financial development involves various dimensions of financial systems and markets. Islamic financial development (IFD) is one of these dimensions. This research investigates the impact of IFD on income inequality in 28 countries active in the IFD area, including 14 high-income and 14 middle-income and low-income countries, over 2013-2017 by considering the Kuznets curve hypothesis, financial curve hypothesis, and Kuznets financial hypothesis and through spatial econometrics technique. Results indicate that Islamic financial development (IFD) decreases income inequality. In addition, the findings of the study reveal that there is no clear-cut evidence to support the proposition of economic development along with financial growth, which would reduce the problem of income inequality. The results show that the GDP per capita, Inflation and Trade Openness increase the income inequality. In contrast, General government final consumption expenditure, urban population and age dependency ratio, help countries reduce income inequality.

Keywords: Islamic Financial Development, Income Inequality, Kuznets Curve, Spatial Panel Data.

JEL Classification: C21, O01, O16, O57.

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1. Introduction

Inequality, the persistent issue of human society, is a challenge that lasts until the end of the world. Economic systems designed so far not only could not solve this society's issue but also income inequality and the gap between wealthy and poor population has had an increasing trend. The outbreak of COVID 19 has increased inequality and decreased social moves in many developing economies, and this issue has directed attention toward inequality. The new study by the International Monetary Fund (IMF) indicates that the Gini coefficient increases by 1.5% after each pandemic. The employment rate for high-educated people does not change significantly, but low-educated people are damaged. The COVID 19 crisis is now known as the world's largest economic catastrophe since the 1930s Great Depression. In January, the IMF forecasted a global income growth of 3%. However, it is now expected to fall 3%, a situation much worse than the global financial crisis in 2008-2009. To resolve the unfair distribution of income, we should identify associated effective factors and adopt appropriate policies.

One of the factors affecting income inequality is the financial development index. Economic and financial studies show that financial development increases productivity, economic growth, income level, and employment by deregulating the banking sector, facilitating exchanges, increasing access to financial resources for investment and loans, and reducing credit constraints (Dehejia & Gupta, 2014). Generally, there are two different views on the relationship between financial development and economic growth. The first view emphasizes the presence of a direct relationship between the development of the financial sector and economic growth (King & Levine, 1993a, b; Levine, 1997, 2002, 2005; Demirguc-Kunt & Maksimovic, 1998; Calderon & Liu, 2003; Rajan & Zingales, 2003; Demetriades & Andrianova, 2004; Honohan, 2004; James, 2008; Zhang et al, 2012; Beck et al, 2015; Batuo et al, 2017). The second view states that not only financial development and liberalization do not help economic growth, but also financial repression policy and interest rate cap should be implemented to achieve economic growth. Keynesian economists are among the proponents of this view. Meier and Seers (1984), Lucas (1988), Stern (1989), Ram (1999), Dawson (2003) have found evidence to support this view. Summarily, research on this area

indicates that no consensus exists about the effect of financial development and economic growth. Different results have been found depending on how financial development has occurred, what indicators have been selected for financial development, whether the country studied is developing or industrialized. An extensive literature also has dealt with the relationship between inflation and financial development. These studies argue that often a negative relationship exists between inflation and financial development (Rousseau & Wachtel, 2000; Hung, 2003; Gillman & Harris, 2004; Rousseau & Yilmazkuday, 2009; Kim, et al, 2010; Bittencourt, 2011; Abbey, 2012; Aboutorabi, 2012; Odhiambo, 2012; Ozturk & Karagoz, 2012; Alimi, 2014; Raheem & Oyinlola, 2015). Belke et al (2004, 2005, 2006), Feldmann (2012), Epstein and Shapiro (2019) investigate the effect of financial development on unemployment and assert that higher levels of diversity in the financial system reduce total unemployment and skilled labor.

Meanwhile, the relationship between the development of financial markets and income inequality is complex and has various dimensions (Jalilian, 2002). The development of financial markets plays a role in improving income distribution by providing resources for poor households more widely and easily and resolving the shortcomings of the capital market, and providing opportunities for poor people to invest in long-term projects (Zhicheng Liang, 2006). The existing theories on income inequality and financial development have introduced different predictions of the relationship between these two variables. For example, the model proposed by Greenwood and Jovanovich (1990) predicted an inverted U-shaped relationship between financial development and income inequality. More clearly, financial development firstly increases the inequality, and it leads to a decrease in income inequality when the average wage increases and most households get access to intermediaries and financial services. In contrast, some other models propose a negative linear relationship between financial development and income inequality and show that the development of financial markets and intermediaries helps to reduce income inequality (Banerjee & Newman, 1993; Galor & Zeira, 1993).

On the other hand, economists such as Loury (1981), Banerjee and Newman (1993), Aghion and Balton (1997) believe that having more access to credits is not

a sufficient condition for reducing income inequality. Therefore, they emphasized on redistribution of income. However, Clarke, Colin, and Zou (2003), Beck, Kunt, and Levin (2004, 2007), Liang and Teng (2006), Jeanneney and Kangni (2008) show that financial development help to reduce income inequality. In other words, they stated that financial development decreases inequality directly by increasing the income of poor people and indirectly by a positive effect on economic growth (economic growth increases the income of poor people disproportionately more than rich people. Indeed, the coefficient of financial development indicator is positive for both poor and reach people but is larger for poor people). They believe that income inequality, which is measured by the Gini coefficient or standard deviation, reduces more sharply in countries having a high level of financial development (Beck et al, 2015). As discussed, despite studies in this area, there is no consensus among the economic researchers in this regard, and studies reported different results on how financial development affects income inequality.

In addition, financial development involves different dimensions of financial systems and markets. The financial system can be divided into Islamic sharia compliance and conventional financial systems. In recent decades, the development of the Islamic financial system, as a goal performance of Islamic countries and a new solution for finance, has received the attention of financial market activists and economists. Nowadays, the Islamic financial industry is progressing in the world, particularly in the Middle East, southern Asia, and southeastern Asia, so that the worth of Islamic financial assets reached about three trillion dollars in 2019 with an increasing trend. Iran, Saudi Arabia, and Malaysia have the highest Islamic market share in terms of assets. Among different sectors of the Islamic financial industry, Sukuks have grown significantly compared with other sectors. The global issuance of Sukuks exceeded one trillion dollars in 2018 for the first time, and it will be expected to play a more important role in the future. Indeed, over recent years, many markets have revealed their interest in attracting capital through Sukuks. According to the report on Islamic financial development published annually by Thomson Reuters, 131 countries in eight different geographical regions were assessed based on different indicators of

Islamic development. Islamic financial development indicator (IFDI) investigates different Islamic financial markets around the world in terms of financial advancement by classifying effective factors into five different areas. These indicators do not merely focus on the size and general growth of Islamic financial sectors across different countries but evaluate the overall power of the ecosystem helping the development of the industry. IFDI is composed of various components, including quantitative development, governance, regulation, corporate social responsibility, knowledge, and awareness, each of which has some sub-indicators having high importance in measuring the global industry. According to this report, the development of the Islamic financial industry at the global level among 131 understudy countries has a growing trend, and the corresponding global average has increased from 9.9 in 2017 to 10.8 in 2019, mainly due to increases in the amount of three principal indicators, knowledge, governance, and awareness.

In this study, several innovations are presented regarding different dimensions of the impact of financial development on inequality. First, the effect of the development of financial institutions and financial markets on inequality is investigated from various aspects. Second, the impact of Islamic financial development on inequality from five different dimensions is examined (Quantitative development, Knowledge, CSR, Government, Awareness). Besides being innovative in the empirical literature, this investigation enables us to compare the impact of Islamic financial development versus conventional financial development in the studied countries. Third, on these grounds, the current study uses a spatial econometric model to examine the spatial characteristics of Islamic financial development on income inequality.

2. literature review

Income inequality and its relevant problems are one of the most complicated issues faced by humanity and a barrier to sustainable development. The emergence of this detrimental phenomenon has been caused by the gradual performance of existing systems in human society and affected and shaped by different factors depending on temporal and spatial conditions. Thus, the income

distribution issue has been a multidimensional problem and can be discussed from different aspects. The empirical literature has widely studied the financial-inequality supply chain. The effective work by Kuznets (1995) explains that income inequality increases firstly in response to the improvement in the financial system, stabilizes, and finally decreases. Indeed, in this study, Kuznets states a hypothesis based on which income inequality raises firstly along with the economic development and decreases gradually after being fixed at a certain level. This model was later called the inverted U-shaped curve. Kuznets defined economic development as a process of transition from the traditional economy to a new (knowledge-based) economy and believed that income distribution worsens in the early stages of the growth because few people can transit to the new sector. Therefore, this problem causes a difference between payment levels and, consequently, incomes. However, in the next stages of growth and development, income distribution improves because now more people earn an opportunity to be attracted to the new economic sector. Thus, a balance and improvement in income distribution are created in society.

Extensive literature that tested the Kuznets curve hypothesis includes Ahluwalia (1976a, b), Robinson (1976), Saith (1983), Lindert and Williamson (1985), Papanek and Kyn (1986), Adelman and Robinson (1988), Campano and Salvatore (1988), Ram (1988), Anand and Kanbur (1993), Jha (1996), Lin (River) Huang, & Weng (2006), Angeles (2010), Shahbaz (2010), Younsi and Bechtini (2018), Martínez-Navarro et al (2020), Sayed (2020) and Cinar et al (2019, 2020). Remarkably, studies like Robinson (1976), Anand and Kanbur (1993), Angeles (2010), Sayed (2020) and Cinar et al (2019, 2020). failed to support the Kuznets curve hypothesis.

Another strand of literature emphasizes that financial development economic growth by assembling savings, evaluating potential entrepreneurs, and diversifying risks (Bencivenga & Smith, 1991; King & Levine, 1993). Afterward, Levine (2005) has done a detailed review of the literature of finance and growth considering various empirical examinations supporting the same hypothesis. Piketty (2015) also challenged the Kuznets curve hypothesis and stated that forces

reducing inequality in society had not the expected influence. Among these, Greenwood & Jovanovic (1990) primarily explored whether all the social classes equally benefited from the process of financial development and the model proposed an inverted U-shaped non-linear association between financial development and income inequality. Financial development helps capital allocation; increases total growth and assist the poor during all stages of economic development. Albeit, there is the distributional influence of financial development, the net effect on the poor depends on the level of economic development. At the initial stages of economic development, the rich only enjoyed access to financial markets and the benefits from the financial services. At the higher levels of economic development, the number of persons accessing the financial market has increased subsequently, resulting in financial development assisting the public. However, the examinations by Banerjee and Newman (1993) and Galor and Zeira (1993) advocate that inequality declines linearly with increasing financial development. The studies argued that the effect of financial market imperfections prevents the efficient allocation of resources to the poor to do human and physical capital investments, indicating that financial development helps improving income inequality (Aghion & Bolton, 1997; Mookherjee & Ray, 2003, 2006). Bittencourt et al (2019) investigated the impact of financial development on income inequality in the United States using the panel model and fixed effects estimation over the period 1976-2011. They concluded that financial development increased the income inequality of 50 states linearly. However, the effect of financial development on income inequality was linear when the 50 states were divided into two separated groups, including above-average inequality and below-average inequality states relative to cross-state average inequality. There was an increasing effect for above-average inequality states in response to improving financial development, while there was an inverted U-shaped relationship for below-average inequality states.

Successively, these two theoretical controversies are subject to various empirical examinations (Levine, 1997; Li, Squire, & Zou, 1998; Rajan & Zingales, 2003; Beck, Demirguc-Kunt, & Levine, 2004; Clarke, Xu, & Zou, 2006; Claessens & Perotti, 2007; Kappel, 2010; Kim & Lin, 2011; Hamori &

Hashiguchi, 2012; Tan & Law, 2012; Nikoloski, 2013; and; Jauch & Watzka, 2016). Nikoloski (2013) tried to test the empirical evidence supporting financial Kuznets curve and suggested the existence of an inverted U shaped pattern between financial sector development and income inequality that validates Greenwood & Jovanovic (1990) hypothesis. Furthermore, Baiardi & Morana (2016) contributed a new specification of financial Kuznets curve hypothesis, by conditioning Kuznets' turning point per capita income on the level of financial development. The study postulate that the favorable influence of financial development on the turning point per capita income of the Kuznets curve enhance economic growth substantially and offer more even distribution of income. In addition to the above specification, Baiardi and Morana (2018) evidenced an EA-wide steady-state financial Kuznets curve, signifying a long-term inverse U shaped relationship between financial development and income inequality. Kavya and Shijin (2019) investigated the relationship between income inequality growth and economic and financial development using the pooled data and generalized method of moments (GMM) estimator. They considered annual data for 85 countries, including 28 high-income, 41 medium-income, and 16 low-income countries over the period 1980-2014. The results found no clear evidence to support the proposition of economic development along with financial growth in order to solve the inequality problem. In addition, most advanced countries or highly advanced countries having high income also did not benefit from the advantages of financial development.

The problem of rising inequality needs an additional check in the aspects of economic and financial development. The theoretical arguments on the distribution of income propose that the effect of economic development along with financial development deteriorate the problem of inequality. The controversy regarding the validity of the measures is still looming on the empirical findings of studies exploring the nexus of growth, finance, and income inequality. Indeed, the data samples concerning the countries and period for the analysis also significantly matter in the findings of these studies. In this regard, very few studies excepting Rehman et al. (2008), Kappel (2010) and Gallup (2012) have identified the problem concerning country classification based on the income

level. Baymul & Sen (2019, 2020) assessed the relationship between structural transformation and inequality using the panel data for 32 developing and developed economies over the periods 1950-2010 and 1960-2012 in two separate studies and asserted that Kuznets relationship between manufacturing employment share with various industrialization paths and inequality was not confirmed. Indeed, in contrast to the Kuznets hypothesis, workers' movement toward production unambiguously increased income inequality regardless of the structural transformation stage in which a specific country was.

Summarily, some research shows a positive impact of financial development on income inequality, but most studies have concluded a negative relationship between financial development and income inequality. The relationship between financial development and income inequality is linear in some studies, confirming the Banerjee and Newman (1993) hypothesis, and inverted U-shaped in some others, following the Greenwood and Jovanovich (1990) hypothesis.

The present study hence revisits inequality widening or inequality narrowing hypothesis in respect of Kuznets curve hypothesis, financial curve hypothesis and financial Kuznets curve hypothesis taking meticulous study variables and Based on selected countries. The major contribution of the present study is twofold: firstly, the study revisits inequality widening or inequality-narrowing hypothesis under financial development. Secondly, the present study introduces a Islamic financial development index.

3. Methodology and Data

3. 1. Spatial Econometric Model

According to Anselin et al. (2008), a spatial panel model could include a lagged dependent variable or follow a spatially autoregressive process in the error term. LeSage and Pace (2009) introduced the spatial Durbin model, which includes spatially lagged independent variables. The spatial lag model, the spatial error model, and the spatial Durbin model are denoted by the following formulas:

$$y_{it} = \lambda \sum_{j=1}^{N} w_{ij} \qquad (a)$$

$$y_{it} = \lambda \sum_{j=1}^{N} w_{ij}\, y_{jt} + \varphi + x_{it}\, \beta + c_i(optional) + \alpha_t(optional) + u_{it} \qquad (b)$$

$$y_{it} = \lambda \sum_{j=1}^{N} w_{ij}\, y_{jt} + \varphi + x_{it}\, \beta + \sum_{j=1}^{N} w_{ij}\, x_{ijt}\, \theta + c_i(optional) + \alpha_t(optional) + v_{it} \qquad (c)$$

Where y_{it} represents a dependent variable for crosssectional unit i = 1,2,…,N at time t = 1,2, …,T. Also, x_{it} stands for a $K \times 1$ vector of exogenous variables, while β represents a $K \times 1$ vector of parameters. It should be noted that $\sum_{j=1}^{N} w_{ij}\, y_{jt}$ accounts for the interaction effects of dependent variables in the adjacent units on the dependent one; w_{ij} denotes element i, j of an $N \times N$ matrix of spatial weights; λ denotes the endogenous interaction effect response parameter; v_{it} stands for an error term of independent and identical distribution; c_i is a particular spatial effect; and αt accounts for the time-period particular effect. A particular spatial effect accounts for all timeinvariant space-specific variables, whose omission would result in biased estimations in a typical cross-sectional study. On the other hand, a time-period-specific effect accounts for all time-specific effects, the absence of which can result in skewed estimations in common time-series research (Baltagi 2005). The error term of unit i in the spatial error model in Eq. (b) (i.e., $u_{it} = \rho \sum_{j=1}^{N} w_{ij}\, u_{jt} + v_{it}$) is considered to be dependent on the error terms of adjacent units j based on matrix W and an idiosyncratic component v_{it}. Furthermore, the spatial Durbin model contained in Eq. (c) was suggested by LeSage and Pace (2009). It would extend the spatial lag model with independent variables of spatial lagging where θ is a $K \times 1$ vector of parameters.

3. 2. Empirical Model

In order to analyze the empirical factors on income inequality, in this study, using the theoretical foundations of three hypotheses 1) Kuznets hypothesis, 2) financial curve hypothesis and 3) Kuznets financial curve hypothesis, we have tried to

investigate the effects of economic development and financial development on income inequality.

Kuznets hypothesis: Simon Kuznets (1953, 1955) introduced a hypothesis based on which income inequality raises firstly along with the economic development of each country and decreases gradually after being fixed at a certain level. This model was later called an inverted U-shaped curve. The model was then completed by Ahluwalia (1976a, b) as a mathematical formula. Accordingly, economic development was defined as a process of transition from the traditional economy to a new (knowledge-based) economy. The income distribution worsens in the early stages of the growth because few people can transit to the new sector. Therefore, this problem causes a difference between payment levels and, consequently, incomes. However, in the next stages of growth and development, income distribution improves because now more people earn an opportunity to be attracted to the new economic sector. This leads to an improvement in income distribution in society. According to the model proposed by Ahluwalia, the mathematical form of the income distribution curve is written as a linear regression model as follows:

$$GINI_{it} = \alpha + \beta_1 \ln GDPP_{it} + \beta_2 \ln GDPP_{it}^2 + \varepsilon_{it} \qquad (1)$$

Gini coefficient denotes income inequality, and GDP per capita ($GDPP_{it}$) represents economic development. The above hypothesis satisfies when coefficients β_1 and β_2 are significant, while their sign is positive and negative, respectively. Based on the discussions presented by Ahluwalia, when the traditional economic sector is converted to the new sector, it is expected that important elements play an effective role in this conversion. Based on equation (1), the effect of changes in logarithmic GDP per capita on the Gini coefficient is stated as follows:

$$\frac{d(GINI_{it})}{d(\ln GDPP_{it})} = \beta_1 + 2\beta_2 \ln GDPP_{it} \qquad (2)$$

Financial curve hypothesis: Greenwood and Jovanovich (1990), Banerjee and Newman (1993), Galor and Zeira (1993) posed the role of the development of the financial sector on income inequality. The relevant literature argues that the

development of the financial sector firstly increases inequality, and it decreases income inequality when the average wage increases and most households get access to intermediaries and financial services. In contrast, some other models suggest a negative linear relationship between financial development and income inequality and demonstrate that the development of financial markets and intermediaries helps to reduce income inequality. Based on this viewpoint, Clarke et al. (2006) presented a model to integrate financial development.

$$GINI_{it} = \alpha + \beta_1 \ln FD_{it} + \beta_2 \ln FD_{it}^2 + \delta \ln CV_{it} + \varepsilon_{it} \quad (3)$$

where, GINI represent income inequality and FD captures financial development as $\beta_1 \ln FD_{it} + \beta_2 \ln FD_{it}^2$. it consistent with the inverted U shape hypothesis where $\beta_1 > 0$ و $\beta_2 < 0$. Finally, CV includes other control variables.

Financial Kuznets hypothesis: In addition to the above discussions, Nikoloski (2013) re-examined the inequality-financial growth relationship and presented the Kuznets financial curve hypothesis.

$$GINI_{it} = \alpha + \beta_1 \ln FD_{it} + \beta_2 \ln FD_{it}^2 + \beta_3 \ln GDPP_{it} + \beta_4 \ln GDPP_{it}^2 + \delta \ln CV_{it} + \varepsilon_{it} \quad (4)$$

where, GINI represent income inequality, FD captures financial development, ED economic development and CV includes other control variables. Moreover, by conditioning the turning point per capita income on the level of financial development, Baiardi & Morana (2016) recommended a new specification to the financial Kuznets curve as follows.

$$GINI_{it} = \alpha + \beta_1 EDG_{it} + \beta_2 G_{it} + \beta_3 \ln FDG_{it} + \delta \ln CV_{it} + \varepsilon_{it} \quad (5)$$

Gini coefficient denotes income inequality, and ED represents GDP per capita. In addition, F shows economic development, and D stands for GDP growth rate. Thus, EDG represents the product of GDP per capita and GDP per capita growth rate, and FDG indicates the product of financial development and GDP growth rate. Finally, CV includes other control variables. Based on constraint $G > 0$, $\beta_1 > 0$ predicts an inverted U-shaped relationship between economic

development and inequality, and $\beta_2 < 0$ forecasts an inverse relationship between financial development and income inequality.

Besides economic development and financial development, the empirical literature has reported the effect of various factors, such as trade openness, inflation rate, government expenditure, dependency ratio, and urban population, on income inequality.

In the aftermath of a massive relaxation on trade regimes during the 1980s and 1990s, many individual economies witnessed an integration into the global economy. Consequently, the debate on the impact of trade openness on income inequality initiated owing to the growing income inequality during the same period. Empirical studies showed mixed evidence on trade openness and income inequality. Barro (2000), Ang (2010), and Jaumotte, Lall, and Papageorgiou (2013) capture the indication of the positive effect of trade openness and income inequality. Conversely, Richardson (1995), Edwards (1997), White & Anderson (2001), Kraal & Dollar (2002) and Kavya and Shijin (2019) addresses the adverse impact of trade openness.

Monetary instability measured by the rate of inflation is a crucial determinant of inequality. Inflation inhibits the real minimum wage through a decrease in purchasing power, which severely affects the poor and middle-class category in comparison with higher income group, who enjoy the benefit of access to finance (Easterly & Fischer, 2001). Frequent empirical studies have dealt with this problem, in this regard, we can refer to the studies of Blinder & Esaki (1978), Blank & Blinder (1986), Ales, Bulir (1988), Nolan (1988), Blejer & Guerrero (1990), Bulir & Gulde (1995), Cole & Towe (1996), Romer (1998), Easterly & Fischer (2000), Galli & Hoeven (2001).

The present study controlled for government expenditure as a measure of macroeconomic stability in accordance with Beck, Levine, & Loayza, 2000. The measure captures public expenditures for purchases of goods and services, the degree of marketplace intervention and the possible use of redistributive expenditures. An effective redistributive mechanism through the tax-transfer

system towards low-income category ensures greater equality, whereas the political influence of wealthy may lead to income inequality (Clarke et al., 2006). the Studies by Anderson et al (2016), Enami et al (2016), Sánchez, Pérez-Corral (2018), İlker ULU (2018) and Alamanda (2020) confirm the importance and impact of government spending on income inequality.

According to the studies by Kavya and Shijin (2019), Dong et al (2018) and Baiardi & Morana (2016), the dependency ratio is an important factor in determining a household's income. Population mix is remarkable from the economic growth viewpoint. Increased dependency ratio leads to a decrease in labor supply, change in the share of production factors from costs, productivity decline, inflation in wages, change in consumption and saving pattern (by increasing dependency burden and consequently reducing the savings of the private sector), reduction in the savings of the public sector (due to increased commitment to salary payment), and change in income distribution through the demand change. These changes affect economic growth and sustainability.

Subsequently, the study tests the urban population as a significant indicator of income inequality. As argued by Kuznets (1955) the negative association between economic development and income inequality is attributable to the positive impact of urban population and income inequality. Meanwhile, highly urbanized economies release from the problems of income inequality. In contrast, the results of the Studies by Wan et al (2022), Minh Ha et al (2019), Wu and Rao (2017) and Sagala et al (2014) show that further urbanization will reduce inequality, with other factors constant.

3. 3. Data

In this study, using data from 2013-2017 for 28 countries (Countries that, based on the Islamic financial development index used, have progress in at least one of the dimensions of Islamic financial development) including 14 high income and 14 middle-income and low-income countries, Kuznets hypothesis and financial curve hypothesis and Kuznets financial hypothesis are evaluated experimentally.

Table 2 shows the variables constructed and the data sources. Given that the value of some of the independent variables is equal to zero in some years, before its logarithmic transformation and its inclusion in model one is added to the value.

Various approaches have been introduced by economists and statisticians to assess and analyze income distribution inequality. One of the appropriate methods is the Gini coefficient, which ranges between zero (minimum inequality) and one (maximum inequality), and it is independent of the mean and symmetric (meaning that if the people exchange their incomes pairwise, this coefficient does not change). Income transfer from the rich to the poor in society reduces the index, and the value of this index is sensitive to income distribution in middle groups of society. Many studies use the Gini coefficient as an indicator of income inequality (Deininger & Squire, 1996, 1998; Li et al, 1998; Hopkins, 2004; Clarke et al, 2003, 2006; Clarke et al, 2007; Gimet & Lagoarde-Segot, 2011; Jauch & Watzka, 2016; Baiardi & Morana, 2016; Chiu & Lee, 2019; Crouch, 2019; Kavya & Shijin, 2019; Vo et al, 2019).

Furthermore, this research uses two different criteria of financial development. To understand the difference in the impact of conventional financial development and Islamic financial development on income inequality in studied countries, we use the financial development index measured by International Monetary Fund to represent conventional financial development in selected countries. In addition, ICD Refinitiv Islamic Finance Development Indicator is used as an index for the Islamic financial development index. Svirydzenka (2016) has developed an index by summarizing many indices measuring developments in financial institutions and financial markets considering their depth, access, and efficiency. Specifically, financial institutions covered banks, insurance and mutual fund companies, whereas financial markets included stock and bond market. The financial development index is thus, an overall index measure on a zero to one scale consisting of depth, access, and efficiency. The depth captures the size and liquidity of markets. The access represents the accessibility of financial services to individuals and companies. The efficiency measures the ability of institutions and capital markets ability to offer financial services at a low cost with sustainable revenues (Kavya & Shijin, 2019). In addition, The ICD Refinitiv Islamic Finance

Development Indicator is a composite weighted index that measures the overall development of the Islamic finance industry by providing an aggregate assessment of the performance of all its parts, in line with Islamic principles.

The Islamic financial development Indicator (IFDI) used in this study, unlike previous studies, which only used Islamic financial concentration (Gazdar et al, 2019) and Islamic financial depth (Law and Singh, 2014; Moradbeigi and Law, 2016; Gazdar et al, 2019) consists of different dimensions to measure Islamic Financial Development.

The different components that make up the Indicator are selected based on an outline of the key constituents of the industry as a whole and are based on key contemporary issues such as Corporate Governance, Corporate Social Responsibility, Knowledge and Awareness.

Table (3) shows the components of the Islamic Finance Development Indicator (IFDI). The different components that make up the Indicator are based on key contemporary issues such as quantitative development of international financial institutions and markets (Quantitative), the quality of governance and risk management measures to protect stakeholders (Corporate Governance), the quality of sharia governance to ensure that Islamic financial institutions and instruments comply with sharia standards (Sharia Governance), the industry's social contribution in line with Islamic principles (Social Responsibility), and the availability and quality of education to ensure that the industry's professionals are well-versed in Islamic finance principles (Education).

Table 1: List of countries.

High-income countries:	Australia, Belgium, Canada, China, Cyprus, France, Germany, Luxembourg, New Zealand, Russia, Singapore, Switzerland, England, USA.
Middle-income and Low-income countries:	Afghanistan, Albania, Djibouti, Egypt, Gabon, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Nigeria, Sierra Leone, South Africa, Thailand, Turkey.

Table 2: Variables definition.

Variable	Variable constructed	Source
		WDI

$lnGDPP_{it}$	$lnGDPP_{it} = log(GDPP_{it})$ GDP_{it}= GDP per capita in 2010 prices$ in the country *i* in period *t*	WDI
$lnGOV_{it}$	$lnGOV_{it} = log(GOV_{it})$ GOV_{it} =General government final consumption expenditure (% of GDP)	WDI
INF_{it}	INF_{it}= Inflation, GDP deflator (annual %)	WDI
$lnURB_{it}$	$lnURB_{it} = \log(URB_{it})$ URB_{it}= Urban population (as a percentage of the total population)	WDI
$lnOPE_{it}$	$lnOPE_{it} = log(OPE_{it})$ OPE_{it}= Trade Openness (total exports and imports divided by GDP)	WDI
$lnAGE_{it}$	$lnAGE_{it} = log(AGE_{it})$ AGE_{it} =Age dependency ratio (% of working-age population)	WDI
$lnFI_{it}$	$lnFI_{it} = log(1 + FI_{it})$ FI_{it}= the Development of Financial Institution	IMF
$lnFM_{it}$	$lnFM_{it} = log(1 + FM_{it})$ FM_{it}= the Development of Financial Market	IMF

WDI: World Development Indicator; https://datacatalog.worldbank.org/dataset/world-development-indicators.
IMF: International Monetary Fund; https://data.imf.org/

Table 3: Islamic Finance Development Indicator (IFDI)

Quantitative Development (QDI)	Knowledge (KNI)	Corporate Social Responsibility (CSR)	Governance (GOI)	Awareness (AWI)
Islamic Banking	Education	Funds Disbursed to Charity / Zakat / Qard Hasan	Regulation	Seminars
Takaful				
Islamic Financial Institutions			Sharia Governance	Conferences
	Research	Disclosed CSR activities		
Sukuk			Corporate Governance	News
Funds				

SOURCE: The Islamic Corporation for the Development of the Private Sector; https://www.zawya.com/islamic-finance-development-indicator/#

Table (4) provides the summary statistics of data over the years 2013-2017. For most variables, the standard deviations are significantly lower than the mean, which indicates a low level of fluctuations in the model variables.

Table 4. Summary statistics over the years 2013-2017.

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
High-income countries:					
GINI	35.616	35.250	64.000	26.800	8.741
$lnGDPP_{it}$	9.609	8.419	12.610	7.089	2.414
$lnGOV_{it}$	16.814	18.364	25.313	5.403	5.632
INF_{it}	5.183	2.935	37.603	-3.097	6.662
$lnURB_{it}$	100.105	63.088	409.362	21.723	94.574
$lnOPE_{it}$	71.596	75.092	101.000	36.517	18.654
$lnAGE_{it}$	53.387	52.688	89.592	28.602	13.323
IFDI	6.638	7.133	9.171	0.000	2.751
QDI	4.443	6.106	9.896	0.000	3.497
KNI	5.413	5.121	9.203	0.000	3.461
CSR	3.555	0.000	9.792	0.000	4.619
GOI	5.544	7.397	9.732	0.000	4.520
AWARE	6.553	6.941	9.229	0.000	2.724
$lnFI_{it}$	5.009	5.205	5.615	3.354	0.527
$lnFM_{it}$	3.532	4.917	5.534	0.000	2.127
Middle-income and Low-income countries:					
GINI	40.516	40.250	67.100	29.700	10.741
$lnGDPP_{it}$	13.409	13.419	15.510	10.089	5.314
$lnGOV_{it}$	19.714	20.264	28.213	8.303	9.632
INF_{it}	8.183	5.835	40.503	-6.097	9.562
$lnURB_{it}$	105.005	66.188	412.062	24.723	97.474
$lnOPE_{it}$	74.496	78.192	105.000	39.417	20.554
$lnAGE_{it}$	56.387	55.588	92.592	30.502	15.023
IFDI	9.538	10.033	13.071	0.000	5.051
QDI	8.343	9.106	13.796	0.000	5.397
KNI	8.313	9.021	13.003	0.000	5.261

CSR	6.455	0.000	13.692	0.000	6.619
GOI	8.444	10.297	13.632	0.000	6.420
AWARE	9.453	9.841	13.129	0.000	4.724
$lnFI_{it}$	9.109	9.105	9.515	6.254	1.527
$lnFM_{it}$	7.532	7.817	9.534	0.000	2.207

4. Experimental results and discussions

To assess determinants of income inequality, it is first necessary to use diagnostic tests to determine the optimal panel. In this study, 25 models have been estimated separately. All models are specified as functions of basic variables including GDP per capita, general government final consumption expenditure, inflation, urban population, trade openness, and age dependency ratio. The nested model of each model is also specified concerning the gradual inclusion of the financial development index and interaction terms. The Twenty-five estimated models are compared using two separate likelihood ratio (LR) tests so that the probability of the existence of the time-period fixed effects and spatial fixed effects in the conventional panel model was investigated and the results are reported in Table 5. The models with simultaneous spatial and time-period fixed effects were compared with the model of time-period fixed effects and/or the model of spatial fixed effects. The significance of the test statistics for examining the time-period and spatial fixed effects in Table 5 indicates the rejection of the null hypothesis for only the model of time-period fixed effects. Therefore, the spatial fixed effects model is used to estimate results. Table 5 represents the Hausman test results to examine the possibility of replacing the fixed-effect model with a random-effect model. The null hypothesis is rejected for all models and the existence of fixed effects is confirmed at a significance level of 1%.

Table 5. The likelihood ratio (LR) test and Hausman test results

	Spatial fixed effects		**Time-period fixed effects**		**Hausman test statistic**	
High-income countries						
Model A1	3.142	-(0.830)	930.438***	(0.000)	29.59***	(0.000)
Model A2	3.649	-(0.755)	932.851***	(0.000)	33.53***	(0.000)

Model A3	3.481	-(0.781)	918.312***	(0.000)	34.98***	(0.000)
Model A4	3.267	-(0.812)	938.496***	(0.000)	40.58***	(0.000)
Model A5	3.454	-(0.632)	916.710***	(0.000)	47.68***	(0.000)
Model A6	2.810	-(0.885)	920.829***	(0.000)	33.38***	(0.000)
Model A7	3.043	-(0.842)	928.315***	(0.000)	29.71***	(0.000)
Model A8	4.256	-(0.666)	908.378***	(0.000)	42.14***	(0.000)
Model A9	1.928	-(0.969)	928.167***	(0.000)	36.71***	(0.000)
Model B2	3.599	-(0.745)	919.045***	(0.000)	33.14***	(0.000)
Model B3	3.301	-(0.782)	913.014***	(0.000)	35.88***	(0.000)
Model B4	3.441	-(0.811)	940.678***	(0.000)	36.88***	(0.000)
Model B5	4.801	-(0.605)	904.001***	(0.000)	40.96***	(0.000)
Model B6	2.401	-(0.900)	920.012***	(0.000)	38.15***	(0.000)
Model B7	2.989	-(0.850)	926.986***	(0.000)	32.99***	(0.000)
Model B8	5.999	-(0.382)	896.973***	(0.000)	42.92***	(0.000)
Model B9	1.989	-(0.918)	905.127***	(0.000)	35.98***	(0.000)
Model C2	3.622	-(0.738)	919.345***	(0.000)	32.14***	(0.000)
Model C3	3.255	-(0.803)	905.814***	(0.000)	34.78***	(0.000)
Model C4	3.431	-(0.757)	933.678***	(0.000)	37.25***	(0.000)
Model C5	2.728	-(0.592)	903.527***	(0.000)	38.36***	(0.000)
Model C6	2.453	-(0.920)	918.938***	(0.000)	36.12***	(0.000)
Model C7	3.034	-(0.855)	925.226***	(0.000)	31.21***	(0.000)
Model C8	6.111	-(0.432)	896.223***	(0.000)	43.32***	(0.000)
Model C9	2.171	-(0.958)	902.169***	(0.000)	37.71***	(0.000)
Middle-income and Low-income countries						
Model A1	2.132	-(0.819)	932.438***	(0.000)	28.51***	(0.000)
Model A2	2.659	-(0.744)	933.851***	(0.000)	32.65***	(0.000)
Model A3	2.491	-(0.768)	918.312***	(0.000)	33.84***	(0.000)
Model A4	2.277	-(0.802)	966.496***	(0.000)	39.65***	(0.000)
Model A5	3.464	-(0.652)	913.710***	(0.000)	46.76***	(0.000)
Model A6	1.820	-(0.847)	920.829***	(0.000)	32.23***	(0.000)
Model A7	2.053	-(0.854)	930.315***	(0.000)	28.85***	(0.000)
Model A8	3.276	-(0.665)	910.378***	(0.000)	41.12***	(0.000)
Model A9	0.968	-(0.985)	926.167***	(0.000)	35.86***	(0.000)
Model B2	2.599	-(0.735)	921.045***	(0.000)	32.56***	(0.000)
Model B3	2.311	-(0.762)	915.014***	(0.000)	34.44***	(0.000)
Model B4	2.451	-(0.823)	936.678***	(0.000)	35.23***	(0.000)
Model B5	3.811	-(0.686)	903.001***	(0.000)	38.89***	(0.000)
Model B6	1.411	-(0.845)	920.012***	(0.000)	34.17***	(0.000)
Model B7	1.999	-(0.852)	915.986***	(0.000)	30.88***	(0.000)
Model B8	4.989	-(0.389)	887.973***	(0.000)	41.96***	(0.000)
Model B9	0.979	-(0.936)	908.127***	(0.000)	34.94***	(0.000)
Model C2	2.632	-(0.745)	917.345***	(0.000)	31.15***	(0.000)
Model C3	2.265	-(0.857)	909.814***	(0.000)	34.88***	(0.000)
Model C4	2.441	-(0.759)	935.678***	(0.000)	36.34***	(0.000)
Model C5	3.748	-(0.586)	906.527***	(0.000)	39.62***	(0.000)
Model C6	1.463	-(0.942)	917.938***	(0.000)	34.17***	(0.000)

Model C7	2.044	-(0.856)	928.226***	(0.000)	30.30***	(0.000)
Model C8	5.131	-(0.445)	891.223***	(0.000)	42.53***	(0.000)
Model C9	1.191	-(0.926)	908.169***	(0.000)	35.81***	(0.000)

Note: p-values in parentheses, ***, **, and * show significance at the 1%, 5%, and 10% level respectively **(Source: Authors' estimations).**

A subsequent test in Table 6 determines whether including the spatial lag or error in the model in the absence of spatial interaction effects results in a statistically significant improvement. Thus, Lagrange multiplier (LM) tests are performed on a spatially lagged dependent variable and spatial error autoregressive model using the residuals from a non-spatial model (Elhorst 2010). The test statistic has the chi-square distribution. If the LM test rejects the null hypothesis, the spatial lagged and spatial error models are confirmed. Due to the existence of spatial fixed effects being confirmed by the LR test, this study examines only the Lagrange multiplier (LM) statistics for this model. The results in Table 6 indicate that the test statistic values in all models are statistically significant at the 1% level. Therefore, spatial lagged and spatial error effects should be ignored in the model. As a result, the model's lack of spatial interaction effects emphasizes the importance of ignoring such effects when conducting experimental studies on the factors affecting income inequality. Based on this, the SDM model is selected.

Table 6. The LM test for the existence of the spatial lag or the spatial error in the models

		Spatial fixed effects		Time-period fixed effects		Spatial and time-period fixed effects	
High-income countries							
Model A1	LM spatial lag	0.348	(0.552)	1.056	(0.322)	0.065	(0.845)
	LM spatial error	1.396	(0.227)	0.050	(0.857)	9.945***	(0.002)
Model A2	LM spatial lag	0.235	(0.626)	0.521	(0.456)	0.345	(0.534)
	LM spatial error	0.035	(0.869)	0.023	(0.856)	12.051***	(0.000)
Model A3	LM spatial lag	2.848*	(0.092)	0.652	(0.456)	4.865**	(0.050)
	LM spatial error	1.421	(0.226)	0.328	(0.546)	28.022***	(0.003)
Model	LM spatial	0.311	(0.612)	1.476	(0.235)	0.130	(0.750)

A4	lag						
	LM spatial error	0.112	(0.761)	0.585	(0.485)	12.358***	(0.000)
Model A5	LM spatial lag	0.170	(0.709)	1.052	(0.345)	0.1258	(0.714)
	LM spatial error	0.173	(0.688)	1.059	(0.398)	14.481***	(0.023)
Model A6	LM spatial lag	0.342	(0.581)	0.645	(0.478)	0.198	(0.684)
	LM spatial error	0.151	(0.710)	0.356	(0.555)	14.662***	(0.000)
Model A7	LM spatial lag	0.485	(0.512)	0.745	(0.343)	0.357	(0.553)
	LM spatial error	3.420*	(0.056)	0.523	(0.476)	14.070***	(0.000)
Model A8	LM spatial lag	1.441	(0.221)	0.822	(0.362)	1.685	(0.223)
	LM spatial error	7.570***	(0.010)	0.192	(0.652)	3.989**	(0.043)
Model A9	LM spatial lag	5.433**	(0.030)	1.185	(0.287)	9.778***	(0.005)
	LM spatial error	24.012***	(0.000)	0.346	(0.565)	0.257	(0.656)
Model B2	LM spatial lag	0.284	(0.549)	1.482	(0.232)	0.178	(0.721)
	LM spatial error	0.111	(0.783)	0.594	(0.715)	0.999	(0.332)
Model B3	LM spatial lag	4.885**	(0.028)	0.198	(0.656)	3.078*	(0.084)
	LM spatial error	0.038	(0.865)	1.052	(0.315)	9.846***	(0.003)
Model B4	LM spatial lag	0.170	(0.713)	1.041	(0.345)	0.136	(0.712)
	LM spatial error	0.169	(0.112)	9.978	(0.279)	14.343***	(0.002)
Model B5	LM spatial lag	0.348	(0545)	1.053	(0.368)	0.089	(0.820)
	LM spatial error	1.397	(0.242)	0.061	(0.884)	9.948***	(0.007)
Model B6	LM spatial lag	2.838*	(0.086)	0.638	(0.454)	4.779**	(0.030)
	LM spatial error	1.420	(0.241)	0.321	(0.512)	27.888***	(0.005)
Model B7	LM spatial lag	0.341	(0.525)	0.645	(0.452)	0.190	(0.765)
	LM spatial error	0.147	(0.721)	0.356	(0.556)	14.603***	(0.005)
Model B8	LM spatial lag	0.285	(0.584)	1.575	(0.264)	0.189	(0.736)
	LM spatial error	0.089	(0.751)	0.581	(0.486)	12.308***	(0.000)
Model B9	LM spatial lag	0.232	(0.654)	0.579	(0.489)	0.476	(0.556)

	LM spatial error	0.040	(0.845)	0.051	(0.856)	12.068***	(0.008)
Model C2	LM spatial lag	0.342	(0.552)	0.640	(0.432)	0.178	(0.727)
	LM spatial error	0.148	(0.623)	0.362	(0.567)	14.696***	(0.000)
Model C3	LM spatial lag	5.429**	(0.019)	1.142	(0.256)	9.860***	(0.003)
	LM spatial error	23.798***	(0.000)	0.345	(0.545)	0.289	(0.668)
Model C4	LM spatial lag	0.487	(0.504)	0.756	(0.378)	0.344	(0.585)
	LM spatial error	3.376*	(0.070)	0.552	(0.496)	13.915***	(0.000)
Model C5	LM spatial lag	0.170	(0.703)	0.945	(0.335)	0.167	(0.683)
	LM spatial error	0.181	(0.684)	0.984	(0.278)	14.421***	(0.004)
Model C6	LM spatial lag	3.022*	(0.098)	0.665	(0.490)	4.878**	(0.036)
	LM spatial error	1.421	(0.240)	0.336	(0.599)	28.012***	(0.000)
Model C7	LM spatial lag	0.284	(0.590)	1.447	(0.267)	0.129	(0.754)
	LM spatial error	0.111	(0.762)	0.578	(0.446)	12.342***	(0.003)
Model C8	LM spatial lag	0.360	(0.620)	0.765	(0.335)	0.189	(0.741)
	LM spatial error	0.152	(0.718)	0.453	(0.580)	14.533***	(0.008)
Model C9	LM spatial lag	0.458	(0.461)	1.143	(0.238)	0.0622	(0.823)
	LM spatial error	1.389	(0.246)	0.112	(0.799)	10.067***	(0.006)
Middle-income and Low-income countries							
Model A1	LM spatial lag	0.338	(0.561)	1.064	(0.302)	0.054	(0.815)
	LM spatial error	1.386	(0.236)	0.02	(0.887)	9.949***	(0.001)
Model A2	LM spatial lag	0.225	(0.635)	0.510	(0.481)	0.398	(0.531)
	LM spatial error	0.025	(0.878)	0.035	(0.855)	12.041***	(0.000)
Model A3	LM spatial lag	2.838*	(0.095)	0.644	(0.422)	4.811**	(0.032)
	LM spatial error	1.411	(0.235)	0.320	(0.575)	28.012***	(0.001)
Model A4	LM spatial lag	0.301	(0.601)	1.461	(0.224)	0.130	(0.722)
	LM spatial error	0.102	(0.752)	0.566	(0.453)	12.338***	(0.000)
Model	LM spatial	0.160	(0.710)	1.051	(0.338)	0.149	(0.712)

A5	lag						
	LM spatial error	0.163	(0.686)	1.056	(0.304)	14.401***	(0.002)
Model A6	LM spatial lag	0.332	(0.572)	0.668	(0.433)	0.136	(0.699)
	LM spatial error	0.141	(0.702)	0.322	(0.587)	14.662***	(0.000)
Model A7	LM spatial lag	0.475	(0.512)	0.764	(0.388)	0.312	(0.577)
	LM spatial error	3.41*	(0.065)	0.530	(0.466)	14.010***	(0.000)
Model A8	LM spatial lag	1.431	(0.221)	0.821	(0.365)	1.685	(0.202)
	LM spatial error	7.560***	(0.005)	0.190	(0.658)	3.987**	(0.043)
Model A9	LM spatial lag	5.423**	(0.021)	1.153	(0.283)	9.771***	(0.004)
	LM spatial error	24.002***	(0.000)	0.338	(0.581)	0.212	(0.654)
Model B2	LM spatial lag	0.294	(0.588)	1.461	(0.277)	0.128	(0.720)
	LM spatial error	0.101	(0.751)	0.565	(0.753)	0.977	(0.324)
Model B3	LM spatial lag	4.875**	(0.030)	0.165	(0.684)	3.002*	(0.089)
	LM spatial error	0.028	(0.896)	1.001	(0.316)	9.812***	(0.003)
Model B4	LM spatial lag	0.160	(0.710)	1.013	(0.350)	0.154	(0.702)
	LM spatial error	0.159	(0.103)	9.986	(0.299)	14.373***	(0.000)
Model B5	LM spatial lag	0.338	(0561)	1.063	(0.304)	0.055	(0.815)
	LM spatial error	1.387	(0.239)	0.021	(0.888)	9.948***	(0.002)
Model B6	LM spatial lag	2.828*	(0.093)	0.648	(0.421)	4.790**	(0.029)
	LM spatial error	1.410	(0.234)	0.317	(0.573)	27.868***	(0.000)
Model B7	LM spatial lag	0.331	(0.565)	0.645	(0.422)	0.135	(0.713)
	LM spatial error	0.137	(0.712)	0.311	(0.577)	14.663***	(0.000)
Model B8	LM spatial lag	0.295	(0.591)	1.505	(0.228)	0.127	(0.724)
	LM spatial error	0.099	(0.747)	0.560	(0.465)	12.338***	(0.001)
Model B9	LM spatial lag	0.222	(0.636)	0.509	(0.476)	0.404	(0.531)
	LM spatial error	0.030	(0.878)	0.040	(0.859)	12.033***	(0.000)
Model C2	LM spatial lag	0.332	(0.555)	0.651	(0.420)	0.135	(0.717)

	LM spatial error	0.138	(0.698)	0.311	(0.588)	14.666***	(0.001)
Model C3	LM spatial lag	5.419**	(0.019)	1.148	(0.279)	9.862***	(0.001)
	LM spatial error	23.698***	(0.000)	0.340	(0.599)	0.202	(0.655)
Model C4	LM spatial lag	0.477	(0.504)	0.748	(0.389)	0.311	(0.579)
	LM spatial error	3.366*	(0.070)	0.530	(0.466)	13.975***	(0.000)
Model C5	LM spatial lag	0.160	(0.703)	0.971	(0.352)	0.151	(0.698)
	LM spatial error	0.171	(0.684)	0.998	(0.296)	14.421***	(0.000)
Model C6	LM spatial lag	3.012*	(0.098)	0.650	(0.420)	4.801**	(0.029)
	LM spatial error	1.411	(0.240)	0.320	(0.577)	28.012***	(0.002)
Model C7	LM spatial lag	0.294	(0.590)	1.460	(0.228)	0.128	(0.723)
	LM spatial error	0.101	(0.762)	0.570	(0.442)	12.342***	(0.000)
Model C8	LM spatial lag	0.350	(0.620)	0.705	(0.322)	0.155	(0.613)
	LM spatial error	0.142	(0.718)	0.410	(0.501)	14.553***	(0.002)
Model C9	LM spatial lag	0.448	(0.461)	1.163	(0.202)	0.066	(0.816)
	LM spatial error	1.399	(0.246)	0.102	(0.777)	10.012***	(0.000)

Note: p-values in parentheses, ***, **, and * show significance at the 1%, 5%, and 10% level respectively **(Source: Authors' estimations).**

Table (7) represents the results of estimating the Kuznets curve given by equation (1). The coefficient of the level values and quadratic form of the logarithmic GDP per capita is significant in most models. According to estimation results, the coefficient of the logarithmic GDP per capita is negative in high-income countries and middle- and low-income countries respectively for level values and positive for the quadratic terms. The coefficient is -5.3 and -4.3 for the former and 0.56 and 0.4 for the latter. The effects of economic growth on the Gini coefficient for different levels of GDP per capita are presented in Figure 1 based on the maximum and minimum amounts of GDP per capita in the studied sample and replacing two estimated coefficients in equation (2). However, its positive impact in countries with higher GDP per capita is more. According to the model

proposed in the theoretical foundation, income inequality was expected to increase in the early stages of the development along with an increase in economic growth and development, and the effects were expected to be reversed after passing the maximum point. Table (8) and (9) represents the results of estimating the Financial curve and Financial Kuznets by equation (2) and (4). In equations (2) and (4) also the coefficient of the level values and quadratic form of the logarithmic GDP per capita is significant in most models. According to estimation results, the coefficient of the logarithmic GDP per capita is negative in high-income countries and middle- and low-income countries respectively for level values and positive for the quadratic terms. In Table (8) The coefficient is -4.6 and -3.6 for the former and 0.24 and 0.34 for the latter. In Table (9) The coefficient is -4.4 and -3.4 for the former and 0.45 and 0.35 for the latter.

According to the model proposed in the theoretical foundation, proponents of the Kuznets curve hypothesis argue that during the transition from traditional to modern economy, income equality will finally be achieved after reaching the maximum point. Diverse results have been obtained in countries under study, meaning that the positive effects of economic growth on inequality are intensified with higher levels of GDP per capita. According to the results of economic development, there is no guarantee for reducing inequality in countries. On the contrary, challenges to poverty and inequality in these countries have lower priority. This result is consistent with the results reported by Robinson (1976), Saith (1983), Papanek & Kyn (1986), Ram (1988), Annand & Kanpur (1993), Angeles (2010), Shabazz (2010), Kavya & Shijin (2019), Sayed (2020) and Cinar et al (2019, 2020).

The general government final consumption expenditure is one of the effective factors in reducing income inequality. In table (7) in high-income countries and middle- and low-income countries respectively, an increase in general government final consumption expenditure by 1% leads to a reduction in income inequality by 0.052% and 0.002%. It is argued that government spending on social transfers tends to reduce income inequality, However, the size of the effect can vary substantially, depending on the extent to which transfers are targeted on lower

income groups; if most spending on transfers are captured by the middle class, for political economy reasons, the impact on inequality may be quite small. To reduce poverty and inequality, governments need to improve targeting, enhance the quality of education and health for the poor, and increase efficiency in social spending. In total, Government spending can help reduce inequality by increasing the income of individuals and households. This result is consistent with the results reported by Anderson et al (2016), Enami et al (2016), Sánchez, Pérez-Corral (2018), İlker ULU (2018), Kavya & Shijin (2019) and Alamanda (2020). In table (8) in high-income countries and middle- and low-income countries respectively, An increase in general government final consumption expenditure by 1% leads to a reduction in income inequality by 0.001% and 0.002%. in table (9) in high-income countries and middle- and low-income countries respectively, An increase in general government final consumption expenditure by 1% leads to a reduction in income inequality by 0.012% and 0.007%.

In table (7) in high-income countries and middle- and low-income countries respectively, An increase in inflation by 1% leads to an increase in income inequality by 0.003% and 0.002%. A rise in the price level will lower the purchasing power, especially the poor. Besides, the real value of government aid could be negatively affected as well since the financial aid will not be adjusted upward to compensate for inflation. In fact, an increase in the inflation rate leads to an increase in the class gap. This result is consistent with the results reported by Bulir & Gulde (1995), Cole & Towe (1996), Romer (1998), Easterly & Fischer (2000), Galli & Hoeven (2001) and Kavya & Shijin (2019). in table (8) in high-income countries and middle- and low-income countries respectively, An increase in inflation by 1% leads to an increase in income inequality by 0.003% and 0.013%. In table (9) in high-income countries and middle- and low-income countries respectively, An increase in inflation by 1% leads to an increase in income inequality by 0.001% and 0.001%.

in table (7) in high-income countries and middle- and low-income countries respectively, an increase of 1% in trade openness leads to a rise in income inequality by 0.01% and 0.004%. so that the development of globalization and

international trade can be effective in intensifying income inequality in countries. Indeed, trade openness leads to a decrease in the income of unskilled and an increase in the income of skilled and medium-skilled employees by reducing tariffs, leading to an increase in the income gap between people with different skill levels. It can be argued that an increase in foreign direct investment leads to an increase in income inequality so that the arrival of foreign direct investment to a country may improve the conditions of skilled workers and create high-income groups, but it does not increase the income of other groups necessarily. These results are in accordance with the study by Barro (2000), Ang (2010), Jaumotte, Lall & Papageorgiou (2013). in table (8) in high-income countries and middle- and low-income countries respectively, An increase of 1% in trade openness leads to a rise in income inequality by 0.001% and 0.003%. in table (9) in high-income countries and middle- and low-income countries respectively, An increase of 1% in trade openness leads to a rise in income inequality by 0.01% and 0.004%.

The urban population is one of the effective factors in reducing income inequality. in table (7) in high-income countries and middle- and low-income countries respectively, an increase in urbanization by 1% leads to a reduction in income inequality by 0.078% and 0.089%. The spectacular growth of urbanization along with the expansion of cities in terms of size and population increase has caused the creation of various administrative structures to provide services and different administrative combinations. Cities are divided into different parts due to structural, physical, social and economic differences, and administrative and social disharmony causes corruption and unequal distribution of income and class gap. Urbanization is a real result of development. This result is consistent with the results reported by Wan et al (2022), Minh Ha et al (2019), Wu and Rao (2017) and Sagala et al (2014) and contrary to Taresh et al (2021) and Kavya and Shijin (2019). in table (8) in high-income countries and middle- and low-income countries respectively, an increase in urbanization by 1% leads to a reduction in income inequality by 0.045% and 0.068%. in table (9) in high-income countries and middle- and low-income countries respectively, an increase in urbanization by 1% leads to a reduction in income inequality by 0.052% and 0.067%.

Finally, in table (7) in high-income countries and middle- and low-income countries respectively, the age dependency ratio with a significant and positive coefficient of about 0.144 and 0.146 indicates that an increase in dependent population leads to an increase in income inequality. Individuals at an old age tend to have a large dispersion in economic status because of some idiosyncratic events or shocks that have accumulated during life. In particular, the income of older individuals reflects their accumulation of human capital, saving behaviors, and capabilities of risk management. Indeed, population aging intensifies the aggregate income inequality of the total economy by increasing the proportion of older groups characterized by a large income dispersion. The increase in the dependency ratio of the population, which is due to the increase in life expectancy compared to the working age, has several consequences, one of which is the increase in government spending (such as raising pensioners' salaries), the loss of pension funds, and the transfer of the tax burden to others. Departments and people. All these things can reduce the "ability" of people, especially retirees, to face economic problems or even buy goods, and as a result, inequality will increase. These results are in accordance with the study by Kavya and Shijin (2019), Dong et al (2018) and Baiardi & Morana (2016). In table (8) in high-income countries and middle- and low-income countries respectively, the age dependency ratio with a significant and positive coefficient of about 0.181 and 0.151 indicates that an increase in dependent population leads to an increase in income inequality. in table (9) in high-income countries and middle- and low-income countries respectively, the age dependency ratio with a significant and positive coefficient of about 0.125 and 0.147 indicates that an increase in dependent population leads to an increase in income inequality.

After examining the effects of control variables on the dependent variable of GINI, we assess the impacts of financial development indices. in tables (7), (8) and (9) The results indicate that IFDI reduces income inequality in countries, but the negative coefficient is significant only for indicators of knowledge (KNI) and corporate social responsibility (CSR) among the five elements.

CSR is evaluated through two components, namely transparency of CSR activities and cash paid from corporate income in a different sector. CSR activities are measured by the information presented in annual reports of IFIs and based on AAOIFI governance standard for IFIs. In this regard, social responsibility includes cash related to charity, Zakat, and Qarz-ul-Hasna paid by IFIs. Due to the frequent use of this indicator and increased public awareness among IFIs about the disclosure of CSR activities, IFIs begin to disclose all their participation. Meanwhile, FinTechs can improve the path for Social-Islamic finance such as Zakat and charity, thus increasing transparency in resource collection, management, and distribution. In addition, digitalization is progressed to create evolutions in Social-Islamic finance. On the other hand, Islamic charities certainly act by helping the poor beyond their role in providing social services as mechanisms for income redistribution to reduce gaps and inequalities. These organizations allow the rich to have empathy with the poor and fight the income gap. These are only a small part of the positive impact of IFD on income inequality through CSR.

Islamic finance knowledge is assessed through education and research as the main elements of each knowledge-based industry. These factors allow getting access to depth and efficiency of the Islamic financial industry and consequently stimulate economic growth, thus leading to a positive effect on income inequality.

Table 7. The GINI model's estimation for Equations (1) using the spatial fixed effects model

	Model A1	Model A2	Model A3	Model A4	Model A5	Model A6	Model A7	Model A8	Model A9
High-income countries									
GDPP	-5.302*	-3.232	-5.245*	-4.356**	-3.533	-3.421*	-4.548*	-5.450*	-2.512
	(0.082)	(0.255)	(0.098)	(0.019)	(0.205)	(0.073)	(0.085)	(0.074)	(0.526)
GDPP^2	0.567**	0.525**	0.745**	0.565**	0.452**	0.356**	0.456**	0.445**	0.356**
	(0.002)	(0.012)	(0.004)	(0.002)	(0.011)	(0.001)	(0.000)	(0.001)	(0.025)
GOV	-0.052**	-0.052**	-0.002**	-0.023*	-0.052**	-0.002**	-0.010**	-0.014**	-0.042*

	(0.041)	(0.001)	(0.016)	(0.054)	(0.012)	(0.001)	(0.007)	(0.042)	(0.056)
INF1	0.003***	0.002**	0.005**	0.004**	0.004**	0.003*	0.008***	0.004*	0.003*
	(0.004)	(0.056)	(0.048)	(0.004)	(0.003)	(0.063)	(0.002)	(0.062)	(0.085)
OPE	0.010***	0.012**	0.006**	0.006**	0.006**	0.005**	0.006**	0.011**	0.009**
	(0.002)	(0.000)	(0.001)	(0.000)	(0.048)	(0.004)	(0.005)	(0.021)	(0.000)
URB	-0.078***	-0.045**	-0.055**	-0.079**	-0.056**	-0.065**	-0.054**	-0.023**	-0.053**
	(0.000)	(0.036)	(0.006)	(0.033)	(0.015)	(0.002)	(0.000)	(0.041)	(0.008)
AGE	0.144***	0.145**	0.143**	0.148**	0.139**	0.165**	0.152**	0.138**	0.147**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IFDI		-0.085**							
		(0.047)							
QDI			0.015						
			(0.423)						
KNI				-0.065**					
				(0.000)					
CSR					-0.045**				
					(0.000)				
GOI						-0.010			
						(0.530)			
AWI							0.042		
							(0.537)		
FI								-1.623**	
								(0.001)	
FM									0.527**
									(0.021)
LogL	45.270	44.523	45.453	50.201	50.520	45.447	43.123	48.682	48.452
R^2	0.999	0.999	1.000	1.000	1.000	1.000	0.999	1.000	0.999
	Model A1	Model A2	Model A3	Model A4	Model A5	Model A6	Model A7	Model A8	Model A9
Middle-income and Low-income countries									
GDPP	-4.302*	-3.332	-4.236*	-5.388**	-3.653	-4.493*	-4.528*	-4.026*	-2.732
	(0.072)	(0.166)	(0.078)	(0.018)	(0.105)	(0.063)	(0.062)	(0.083)	(0.258)
GDPP^2	0.407***	0.345**	0.402**	0.495**	0.350**	0.420**	0.422**	0.409**	0.335**
	(0.005)	(0.018)	(0.006)	(0.000)	(0.011)	(0.004)	(0.004)	(0.004)	(0.020)
GOV	-0.002**	-0.007**	-0.002**	-0.013**	-0.019*	-0.002**	-0.001**	-0.015**	-0.030**

	(0.018)	(0.017)	(0.006)	(0.014)	(0.062)	(0.043)	(0.027)	(0.002)	(0.014)
INF1	0.002**	0.001**	0.002*	0.003**	0.001**	0.002**	0.002**	0.005*	0.001**
	(0.014)	(0.016)	(0.053)	(0.014)	(0.004)	(0.029)	(0.050)	(0.063)	(0.025)
OPE	0.004**	0.004**	0.004**	0.004**	0.003**	0.004**	0.004**	0.004**	0.005**
	(0.005)	(0.003)	(0.005)	(0.004)	(0.044)	(0.005)	(0.006)	(0.012)	(0.001)
URB	-0.089**	-0.073**	-0.090**	-0.068**	-0.068**	-0.086**	-0.091**	-0.062**	-0.090**
	(0.005)	(0.022)	(0.004)	(0.023)	(0.023)	(0.007)	(0.004)	(0.049)	(0.003)
AGE	0.146**	0.142**	0.149**	0.136**	0.151**	0.144**	0.146**	0.149**	0.157**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IFDI		-0.072**							
		(0.037)							
QDI			0.014						
			(0.588)						
KNI				-0.085**					
				(0.000)					
CSR					-0.038**				
					(0.000)				
GOI						-0.009			
						(0.530)			
AWI							0.013		
							(0.564)		
FI								-1.454**	
								(0.003)	
FM									0.387**
									(0.010)
LogL	43.277	45.554	43.433	51.186	51.701	43.487	43.454	47.696	46.698
R^2	0.999	1.000	0.999	1.000	1.000	0.999	0.999	1.000	1.000

Note: p-value, ***, **, and * show significance at the 1%, 5%, and 10% level respectively (**Source: Authors' estimations).**

Table 8. The GINI model's estimation for Equations (2) using the spatial fixed effects model

	Model B2	Model B3	Model B4	Model B5	Model B6	Model B7	Model B8	Model B9
High-income countries								

GDPP	-4.661**	-5.485*	-5.332**	-5.030*	-2.524	-5.328*	-3.892	-2.574
	(0.045)	(0.076)	(0.030)	(0.045)	(0.325)	(0.048)	(0.109)	(0.198)
GDPP ^2	0.244**	0.501***	0.398***	0.414***	0.444**	0.521***	0.408***	0.597***
	(0.025)	(0.003)	(0.000)	(0.007)	(0.040)	(0.000)	(0.001)	(0.002)
GOV	-0.001**	-0.001*	-0.014*	-0.002**	-0.030**	-0.005**	-0.027***	-0.069*
	(0.041)	(0.084)	(0.061)	(0.023)	(0.020)	(0.036)	(0.007)	(0.065)
INF1	0.003**	0.001*	0.002*	0.001*	0.003**	0.004*	0.001**	0.000*
	(0.014)	(0.073)	(0.085)	(0.081)	(0.042)	(0.063)	(0.050)	(0.087)
OPE	0.001**	0.002***	0.007***	0.001*	0.006***	0.005***	0.008***	0.009***
	(0.034)	(0.002)	(0.000)	(0.052)	(0.000)	(0.008)	(0.007)	(0.000)
URB	-0.045**	-0.032***	-0.058**	-0.047**	-0.085*	-0.077***	-0.065*	-0.054***
	(0.021)	(0.002)	(0.017)	(0.036)	(0.001)	(0.004)	(0.091)	(0.002)
AGE	0.181***	0.148***	0.152***	0.185***	0.168***	0.155***	0.169***	0.132***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IFDI	-0.032**							
	(0.044)							
QDI		0.045						
		(0.547)						
KNI			-0.094**					
			(0.041)					
CSR				-0.055*				
				(0.051)				
GOI					0.066			
					(0.652)			
AWI						-0.065		
						(0.762)		
FI							2.545*	
							(0.052)	
FM								0.683**
								(0.014)
LogL	45.523	51.143	50.844	49.847	43.365	45.367	49.490	45.354
R^2	1.000	1.000	0.999	0.999	1.000	0.999	0.999	1.000
	Model B2	Model B3	Model B4	Model B5	Model B6	Model B7	Model B8	Model B9
Middle-income and Low-income countries								

GDPP	-3.661***	-4.473	-5.358**	-4.230*	-2.764	-4.448*	-3.452	-2.852
	(0.002)	(0.068)	(0.020)	(0.080)	(0.260)	(0.060)	(0.124)	(0.251)
GDPP ^2	0.345**	0.422***	0.418***	0.401***	0.333**	0.421***	0.399***	0.455***
	(0.018)	(0.004)	(0.000)	(0.008)	(0.020)	(0.004)	(0.004)	(0.005)
GOV	-0.002**	-0.002*	-0.014*	-0.002*	-0.020**	-0.004**	-0.028***	-0.051*
	(0.041)	(0.085)	(0.061)	(0.053)	(0.020)	(0.031)	(0.007)	(0.065)
INF1	0.013**	0.002*	0.004***	0.007*	0.001*	0.005*	0.008*	0.000*
	(0.004)	(0.073)	(0.005)	(0.081)	(0.052)	(0.063)	(0.051)	(0.087)
OPE	0.003**	0.004***	0.005***	0.002*	0.005***	0.004***	0.003***	0.006***
	(0.044)	(0.004)	(0.000)	(0.050)	(0.000)	(0.009)	(0.009)	(0.000)
URB	-0.068**	-0.085***	-0.079**	-0.062**	-0.090*	-0.081***	-0.045	-0.082***
	(0.023)	(0.004)	(0.016)	(0.049)	(0.003)	(0.005)	(0.285)	(0.003)
AGE	0.151***	0.156***	0.142***	0.160***	0.149***	0.144***	0.146***	0.154***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IFDI	-0.045**							
	(0.044)							
QDI		0.055						
		(0.485)						
KNI			-0.093*					
			(0.056)					
CSR				-0.053*				
				(0.051)				
GOI					0.055			
					(0.453)			
AWI						-0.021		
						(0.741)		
FI							2.545*	
							(0.068)	
FM								0.652**
								(0.012)
LogL	45.803	44.163	49.994	52.987	43.957	44.118	49.852	46.815
R^2	1.000	0.999	1.000	1.000	1.000	0.999	1.000	1.000

Note: p-value, ***, **, and * show significance at the 1%, 5%, and 10% level respectively **(Source: Authors' estimations).**

Table 9. The GINI model's estimation for Equations (4) using the spatial fixed effects model

	Model C2	Model C3	Model C4	Model C5	Model C6	Model C7	Model C8	Model C9
High-income countries								
GDPP	-4.452*	-3.945	-4.436**	-3.847*	-5.452*	-4.851*	-3.599	-2.945
	(0.053)	(0.122)	(0.011)	(0.089)	(0.058)	(0.062)	(0.235)	(0.354)
GDPP ^2	0.452**	0.357***	0.562***	0.524***	0.436***	0.745***	0.987***	0.682**
	(0.042)	(0.005)	(0.000)	(0.004)	(0.003)	(0.001)	(0.000)	(0.045)
GOV	-0.012**	-0.018*	-0.023*	-0.065**	-0.002	-0.023*	-0.053**	-0.031***
	(0.041)	(0.085)	(0.095)	(0.032)	(0.973)	(0.091)	(0.017)	(0.005)
INF1	0.001**	0.017**	0.003*	0.004***	0.004**	0.002*	0.009*	0.000***
	(0.022)	(0.023)	(0.055)	(0.009)	(0.027)	(0.001)	(0.051)	(0.007)
OPE	0.001***	0.003***	0.005***	0.006*	0.007***	0.007***	0.002***	0.001***
	(0.001)	(0.008)	(0.005)	(0.054)	(0.009)	(0.004)	(0.001)	(0.000)
URB	-0.052**	-0.056***	-0.041**	-0.012**	-0.045**	-0.021***	-0.057	-0.065***
	(0.025)	(0.005)	(0.035)	(0.041)	(0.031)	(0.008)	(0.125)	(0.000)
AGE	0.125***	0.125***	0.175***	0.186***	0.198***	0.134***	0.112***	0.136***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IFDI	-0.063**							
	(0.035)							
QDI		0.069						
		(0.355)						
KNI			-0.090*					
			(0.052)					
CSR				-0.064*				
				(0.051)				
GOI					0.064			
					(0.342)			
AWI						-0.013		
						(0.587)		
FI							3.214*	
							(0.068)	
FM								0.521**
								(0.042)

LogL	46.842	43.123	41.196	53.148	52.321	43.988	51.248	42.864
R^2	1.000	1.000	0.999	1.000	0.999	0.999	1.000	1.000
	Model C2	Model C3	Model C4	Model C5	Model C6	Model C7	Model C8	Model C9
Middle-income and Low-income countries								
GDPP	-3.429*	-3.973	-5.428**	-3.936*	-4.364*	-4.676*	-3.432	-2.904
	(0.053)	(0.102)	(0.019)	(0.079)	(0.071)	(0.056)	(0.137)	(0.231)
GDPP ^2	0.353**	0.387***	0.498***	0.360***	0.416***	0.431***	0.386***	0.355**
	(0.015)	(0.008)	(0.000)	(0.008)	(0.004)	(0.004)	(0.005)	(0.015)
GOV	-0.007**	-0.007**	-0.014*	-0.025	-0.001***	-0.002**	-0.028***	-0.031
	(0.021)	(0.015)	(0.095)	(0.332)	(0.003)	(0.031)	(0.007)	(0.285)
INF1	0.001**	0.002*	0.003	0.001**	0.002*	0.002**	0.004*	0.000
	(0.032)	(0.073)	(0.505)	(0.019)	(0.067)	(0.021)	(0.051)	(0.987)
OPE	0.004***	0.004***	0.004***	0.003*	0.004***	0.004***	0.004***	0.005***
	(0.002)	(0.004)	(0.004)	(0.050)	(0.005)	(0.009)	(0.009)	(0.000)
URB	-0.067**	-0.090***	-0.069**	-0.066**	-0.077**	-0.092***	-0.039	-0.093***
	(0.035)	(0.004)	(0.026)	(0.026)	(0.017)	(0.004)	(0.237)	(0.002)
AGE	0.142***	0.149***	0.136***	0.158***	0.147***	0.144***	0.146***	0.157***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IFDI	-0.028**							
	(0.035)							
QDI		0.069						
		(0.355)						
KNI			-0.090*					
			(0.052)					
CSR				-0.063*				
				(0.051)				
GOI					0.044			
					(0.342)			
AWI						-0.020		
						(0.756)		
FI							2.946*	
							(0.068)	
FM								0.536**
								(0.012)

LogL	46.503	43.763	51.194	53.548	44.257	43.618	50.052	47.215
R^2	1.000	0.999	1.000	1.000	1.000	0.999	1.000	1.000

Note: p-value, ***, **, and * show significance at the 1%, 5%, and 10% level respectively **(Source: Authors' estimations).**

5. Conclusion

Increased inequality is today's controversial discussion, mainly attributed to access to financial resources. Some experts believe that inequality is caused by individual efforts and indicates a constructive factor in society. Some others argue that inequality is created by an unfair system that only raises a few boats in a tide, thus preventing hardworking. Nowadays, the importance of income distribution in societies is so that many economic schools introduce regulating an appropriate income distribution model and trying to reduce inequality as one of the main goals of governments. Fair income distribution is one of the main economic development indicators. In this regard, financial development is a potential key to achieving a long-run economic development. There are various studies in this regard, all indicating that financial development can be a policy to enhance economic growth. Economic growth driven by financial development increases average income, while inequality can increase or decrease. In recent few decades, Islamic finance, as a substitute for conventional finance, has widely been developed to achieve sharia compliance performance in Islamic countries and as a financial development strategy along with conventional finance in non-Islamic countries. Measuring the comprehensive development of Islamic financial development is a challenge. Undoubtedly, the choice of measures as subsets and their relationships with IFD assessment is full of subjective value judgments and data resource trade-offs that are accessible easily. Here, the necessity of a direct indicator to assess IFD is posed. In the present research, it was tried to investigate the role of IFD in determining inequality over the period 2013-2017 using the Kuznets hypothesis, financial curve hypothesis, Financial Kuznets hypothesis, ICD Refinitiv Islamic Finance Development Indicator and by identifying effective factors on income inequality in 28 selected countries, Including 14 countries with

high income and 14 countries with middle and low income, and applying spatial panel data approach.

According to the results, the effect of IFD on income inequality is negative. IFD was measured by ICD Refinitiv Islamic Finance Development Indicator. This indicator has five general sub-indicators, each having several distinct components. The five main indicators for the IFDI are: Quantitative Development, Knowledge, Governance, Corporate Social Responsibility, and Awareness. The negative coefficient is significant only for indicators of knowledge (KNI) and corporate social responsibility (CSR) among the five elements. The coefficient is not significant for indicators of Quantitative Development (QDI), Governance (GOI) and Awareness (AWI). The official start of measuring the target index in the countries under review is 2013. During the period of time considered and in selected countries in this research, in the Quantitative Development (QDI) section, only the sub-sectors of Islamic banking and sukuk and in the Awareness (AWI) section, only the news sub-sector has grown significantly. In the meantime, the Governance (GOI) sector has not grown much in any of the sub-sectors. There has not been much growth in any of the sub-sectors. Since 2019, we have seen more growth in the mentioned indicators, especially in the awareness sector. However, based on the available statistical evidence, during the period of 2013-2017, the CRS sector and especially the knowledge sector have grown significantly in almost all of their sub-sectors. This issue can be one of the significant reasons for the two variables CRS and knowledge.

Summarily, according to the analysis results, economic growth alone is not enough to eliminate or reduce income inequality. Proponents of the Kuznets curve argue that industrialization is accompanied by economic equality. Nevertheless, after many years, the advancements of financial and economic sectors have not well been able to meet the expected requirements. Our results show that today's world needs to formulate more policies to resolve the inequality issue. This fact restricts the real effect of financial development, particularly Islamic finance. Economic policies should be revised to deal with this situation so that the poor will benefit from the interests of the economic and financial sectors as much as possible. This study can be further extended by having the time-series research.

Among the countries that may have long information of Islamic finance could be Iran, Sudan, Pakistan, Saudi Arabia, UAE, Egypt, Kuwait, Jordan and Bahrain by the fact that they are having Islamic financial development prior to 1980s. Another possibility is to turn into case study.

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تأثیر توسعهٔ مالی اسلامی بر نابرابری درآمد در کشورهای منتخب: رویکرد پانل فضایی

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چکیده

افزایش نابرابری، بحث‌برانگیزترین مسألهٔ روز کشورهای جهان است که دسترسی به منابع اقتصادی، ازجمله دلایل بارز این نابرابری است. برخی معتقدند که نابرابری ناشی از تلاش فردی و نمایانگر یک عامل سازنده در جامعه است. برخی دیگر استدلال می‌کنند که نابرابری از یک سیستم ناعادلانه به‌وجود می‌آید، که فقط چند قایق را در جریان جزر و مد بالا می‌برد و بنابراین، بازدارندهٔ سخت‌کوشی است. امروزه اهمیت توزیع درآمد در جوامع به‌حدی است که در بسیاری از مکاتب اقتصادی، یکی از اهداف اصلی دولت‌ها را تنظیم الگوی مناسب توزیع درآمد و تلاش در مسیر کاهش نابرابری درآمدی ذکر می‌کنند. توزیع عادلانهٔ درآمد به‌عنوان یکی از شاخص‌های اصلی و مهم در توسعهٔ اقتصادی مطرح می‌شود. در این‌راستا توسعهٔ مالی یکی از کلیدهای بالقوهٔ دست‌یابی به رشد بلندمدت اقتصادی است. مطالعات زیادی در این‌زمینه انجام گرفته است که همگی نشان می‌دهند توسعهٔ مالی می‌تواند به‌عنوان یکی از سیاست‌های ارتقادهندهٔ رشد اقتصادی مطرح باشد. رشد اقتصادی ناشی از توسعهٔ مالی، درآمد متوسط را افزایش می‌دهد، اما نابرابری می‌تواند کاهش یا افزایش داشته باشد. در چند دههٔ اخیر نظام مالی اسلامی، به‌عنوان جایگزین مالی متعارف برای دست‌یابی به عملکرد منطبق‌بر شریعت در کشورهای اسلامی و راهکار توسعهٔ مالی همراه با مالی متعارف در کشورهای غیراسلامی گسترش چشم‌گیری داشته است. خود موضوع اندازه‌گیری توسعهٔ جامع صنعت مالی اسلامی، یک چالش است. بی‌تردید، انتخاب سنجه‌های مناسب به‌عنوان زیرمجموعه‌ها و ارتباط آن‌ها با ارزیابی توسعهٔ مالی اسلامی مملو از قضاوت‌های ارزشی ذهنی و دادوستد منابع داده‌ای است که به‌راحتی قابل دسترسی هستند. در اینجا ضرورت وجود یک شاخص مستقیم برای سنجش توسعهٔ مالی اسلامی مطرح می‌شود. در این پژوهش با استفاده از داده‌های سال‌های ۲۰۱۷-۲۰۱۳ برای ۲۸ کشور (کشورهایی که براساس شاخص توسعهٔ مالی اسلامی مورد استفاده، حداقل در یکی از ابعاد توسعهٔ مالی اسلامی پیشرفت داشته‌اند) شامل ۱۴ کشور با درآمد بالا و ۱۴ کشور با درآمد متوسط و کشورهای کم‌درآمد، فرضیهٔ کوزنتس و فرضیهٔ منحنی مالی و فرضیهٔ مالی کوزنتس؛ به‌صورت تجربی اثرگذاری توسعهٔ مالی اسلامی بر نابرابری مورد ارزیابی قرار گرفته است. نتایج به‌دست آمده از مدل دوربین فضایی (SDM) بیانگر این است که نتایج برای دو گروه کشورها یکسان است و شاخص توسعهٔ مالی اسلامی منجر به کاهش نابرابری درآمدی می‌شود. با وجوداین، از میان پنج جزء تشکیل‌دهندهٔ این شاخص، تنها ضرایب منفی برای شاخص‌های دانش (KNI) و مسئولیت اجتماعی شرکت‌ها (CSR) معنادار است، درحالی‌که ابعاد مختلف توسعهٔ مالی متعارف در نمونهٔ کشورهای مورد مطالعه دارای اثرات متعارض و معنادار می‌باشد. علاوه‌براین، یافته‌های این مطالعه نشان می‌دهد که هیچ شواهد روشنی برای حمایت از پیشنهاد توسعهٔ اقتصادی همراه با رشد مالی وجود ندارد که بتواند مشکل نابرابری درآمد را کاهش دهد. همچنین، یافته‌های پژوهش بیانگر آن است که تولید ناخالص داخلی سرانه، تورم و باز بودن تجارت باعث افزایش نابرابری درآمد گردیده؛ در مقابل، هزینه‌های مصرف نهایی دولت، جمعیت شهری و نسبت وابستگی سن، به کشورها کمک می‌کند تا نابرابری درآمدی را کاهش دهند.

کلیدواژگان: توسعهٔ مالی اسلامی، نابرابری درآمد، منحنی کوزنتس، منحنی مالی، منحنی مالی کوزنتس، رویکرد پانل فضایی.
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