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Article

Financial development and inequality: The role of religious freedom

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Abstract: The study investigates whether religious freedom affects the relationship between financial development and income inequality in sub-Saharan Africa. The study employs panel data analysis and a causal, quantitative research approach to achieve its research goals, focusing on 39 sub-Saharan African nations between 2000 and 2020. Based on the availability of data, this time frame was selected. Using the instrumental variable estimation method, the study reveals a significant positive correlation between financial development and income inequality, while religious freedom negatively influences income inequality. Again, the moderation analysis shows that religious freedom tends to amplify the inequality-widening effect of financial development. This finding indicates that while religious freedom is beneficial, it should be complemented with policies that ensure financial development does not exacerbate inequality. Governments and religious institutions can collaborate to promote financial literacy, equitable tax policies, and wealth redistribution mechanisms such as progressive taxation and social welfare programs.

Keywords: financial development, freedom of religion, corruption, income inequality, sub-Saharan Africa, panel regression

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1. Introduction

Over the past few decades, policymakers in both developed and developing countries have grown increasingly concerned about the widening gap in income and wealth. While some inequality is required in a well-functioning system to encourage economic activity, an excessive wealth disparity is a significant barrier to sustained economic growth and prosperity. Increased inequality threatens social cohesion, and the rule of law hinders innovation and entrepreneurship, posing a barrier to capital accumulation and intergenerational mobility (Bayar, 2023). Furthermore, excessive inequality can exacerbate political and social unrest, leading to financial and economic crises that endanger sustainable growth and macroeconomic stability (Barhoom, 2023). Policymakers and scholars have long been concerned about the persistence of income inequality (IIQ). As a result, scholars are working diligently to investigate its origins, causes, effects, and socioeconomic implications (Nguyen et al., 2019), as well as the threats it poses to countries' macroeconomic stability, welfare, and growth potential (Siddique & Lee, 2024). In sub-Saharan Africa (SSA), the top 10% of the population earns 30 times more than the bottom 50%, indicating a sizable income gap between the two groups (Shahbaz et al., 2007).

While considerable research has been conducted on the relationship between financial development (FD) and economic growth, further investigation is needed into the relationship between FD and IIQ, as the existing studies have produced conflicting results

(Vo et al., 2023; Cyrille, 2023). The empirical literature has largely neglected the role of freedom of religion, presenting varying findings regarding the correlation between FD and inequality, depending on various factors and aspects. These include variations in the methods used to estimate FD and IIQ, the composition of the countries, and the measurement of these variables (Altunbaş & Thornton, 2020; Batabyal & Chowdhury, 2015; Shahbaz, 2008). FD, therefore, lessens IIQ by enhancing shared prosperity (Weychert, 2020; Chisadza & Biyase, 2023). Additionally, research suggests that a lack of transparency and inadequate statistical capacity to track the distribution of economic growth may be contributing to the region's predominance of IIQ (Shahbaz et al., 2007).

It has been argued that religion significantly impacts IIQ due to its core values and the spiritual and material security it provides its adherents. Because religion encourages people to donate to charity voluntarily and privately, rather than through the government, it leads to lower taxes, reducing public spending and income redistribution (Hekmatpour, 2020; Kim et al., 2020). Transparency and statistical collection are made more difficult because official institutional arrangements of the state do not record this voluntary and private charitable giving. This results in erroneous data and inadequate monitoring throughout Africa and individual countries. This paper explores the moderating role of religion in understanding the impact of FD on IIQ, motivated by the aforementioned considerations. Building on this, the study employs the theories of secularisation hypotheses, inequality, and intergenerational mobility to explain the relationship between FD and IIQ. It delved further to assess the moderating role of religious freedom in the above relationship.

This research makes several contributions. First, it introduces a novel perspective by considering religious freedom as a moderating factor in the relationship between FD and IIQ. While the literature has extensively examined the direct effects of FD on inequality, the unique angle of religious freedom shaping this relationship, particularly in the SSA context, is a fresh addition. Second, a significant methodological contribution of this study lies in its use of instrumental variables (IVs) to address potential endogeneity between FD and IIQ. This robust econometric approach ensures more reliable causal inferences and mitigates bias from reverse causality and omitted variable issues, instilling confidence in the research findings. Third, the study focuses on SSA, a region where financial systems and religious institutions rapidly evolve. The regional scope provides relevant, context-specific insights that add empirical depth to the broader literature on inequality and institutional quality. Fourth, it enriches the theoretical discourse at the intersection of economics, political science, and sociology by connecting FD, income distribution, and religious freedom. We posit that FOR can influence the relationship between FD and IIQ. While the financial systems of SSA markets are relatively young and fragile, this study will assess the robustness of these markets in reducing IIQ among low-income earners. The study's conclusions have essential ramifications for practical interventions and policymaking in SSA countries. This research contributes to developing and implementing policies aimed at mitigating inequality and fostering inclusive growth in developing economies by providing nuanced insights into the relationship between FD and inequality.

The rest of the paper is structured as follows: Section 2 reviews the literature on the relationship between religious beliefs and FD and IIQ. Section 3 thoroughly describes our analysis's data sources and econometric method. Section 4 presents the findings from our analysis. The implications and conclusions drawn from these data are presented in Section 5, where we also emphasise how our research can help shape and implement policies to reduce inequality and promote inclusive growth in SSA.

2. Literature Review

2.1. Theoretical review

The theory of secularisation hypothesises that economic development makes individuals less religious. This theory, among others, could be caused by urbanisation, social and religious reforms, legislation, formal education, communication, and modernisation in transportation. It developed from the social and cultural milieu, and a critical reassessment revealed it as a notion, firm in a philosophical preference rather than a systematic theory. Generally, the theory advocates for economic development to cause religion to engage less with social, legal, economic, and political decision-making processes. However, Weber (2002) believed that religious beliefs and practices significantly impacted economic development. In modern times, Kim et al. (2020) hold the view that virtually all existing religions globally are compelled to respond to the global increase of modernity and the unique challenges they face, as they undergo multiple processes of adapting to the ever-evolving systems of religion. The theory of secularisation, a central theme in our study, serves as the cornerstone of our investigation. We aim to validate Weber's (2002) significant assertion that religion, a powerful force, plays a pivotal role in economic development and directly influences financial IQ. This intriguing theory aspect will be a crucial focus of our exploration.

The theory of inequality and intergenerational mobility posits that an individual's income is influenced by human and non-human capital, connections, endowment, goals, and skills provided by their family environment. More recently, two conflicting theories on intergenerational mobility have dominated the discourse. The inequality and intergenerational mobility theory seeks to explain the persistence and dynamics of income and wealth disparities across generations (Weychert, 2020). It is based on the idea that inequality reflects differences in current income and wealth and affects the opportunities and resources individuals inherit, leading to persistent socio-economic gaps over time. Intergenerational mobility refers to the phenomenon of economic status or class changing from generation to generation. The theory argues that when inequality is high, access to education, healthcare, finance, and employment is uneven. Wealthier families invest more in their children, perpetuating their advantage, while poorer families have limited means to invest in human capital, leading to persistent poverty across generations (Altiner et al., 2022; Wang eta al., 2024). Religious freedom often correlates with stronger institutions and rights, which can foster greater trust in financial systems and improve inclusion. In religious pluralism and freedom contexts, diverse religious communities may contribute to stronger community-based finance (e.g., rotating savings, church-based microfinance). Religious freedom can reduce the exclusion of particular religious or ethnic groups from financial access and economic opportunities. In contrast, low religious freedom can result in biased access to finance, suppressed voices of minority religious groups, and less trust in formal institutions, which pushes people toward informal or less efficient financial systems (Ali, 2023; Siddique & Lee, 2024).

The liberal theory of industrialisation suggests that irreversible commitment to economic and technical rationality is the main characteristic of industrial society (Lassoued, 2021). This leads to equality of opportunity and rising rates of social mobility as the process of social selection becomes more rational. On the other hand, the Marxist theory argues that class reproduction is the distinctive characteristic of capitalist societies. A large, growing number of working-class dynasties are exploited by the few capitalist dynasties who have reproduced themselves from generation to generation. It has been suggested that there is a bifurcative relationship between IIQ and intergenerational mobility. It functions in two ways to attain FD. Thus, the FD theory demonstrates that finance affects income distribution through extensive and intensive margins. People from the lower end of the income distribution are among those who use financial services more frequently due to the wide margin. Therefore, by enabling low-income households to build human capital, lessen liquidity constraints, increase investment opportunities, and

manage risk, the extensive margin effects help to reduce inequality. The term "intensive margin" describes how the calibre and scope of financial services have improved. According to Beck et al. (2007), the intensive margin does not expand access to financial services but benefits those already using them. Put differently, the income distribution will probably become wider due to the intensive margin effects. The theory of inequality and intergenerational mobility has largely guided previous research on FD and IIQ (Jung & Cha, 2021; Wang et al., 2024). This theory presents three key hypotheses: the Kuznets curve (inverted U-shaped) hypothesis, the widening inequality hypothesis, and the narrowing inequality hypothesis (Cyrille, 2023). We delve into these hypotheses in the following sections, particularly emphasising the significance of the Kuznets curve hypothesis, which will undoubtedly pique your interest.

Most current literature suggests that improved financial systems increase economic opportunities, reduce persistent inequality, and narrow income gaps (Makhlouf et al., 2020; Siddique & Lee, 2024). The inequality-widening Hypothesis suggests that FD initially benefits the rich more because they are more likely to have access to financial institutions, credit, and investment opportunities. However, as finance develops, it exacerbates inequality, especially in the early stages of development, because people with low incomes are excluded. The accessibility of financial services can encourage parents to invest in their children's education, decreasing the dropout rate during unfavourable shocks. Moreover, firm-level indicators indicate that a well-functioning financial system can facilitate the launch and maintenance of new enterprises (Shahbaz et al., 2007). Cross-national data also support this narrative. Notably, the three theoretical perspectives covered below are backed by empirical data, offering a promising outlook for the potential of FD in Africa. Three theories summarise theoretical perspectives on the relationship between inequality and finance. The first is the inequality-widening hypothesis, which posits that wealthy and well-connected individuals benefit most from the growth of the financial sector, particularly in environments with inadequate institutional development. However, because more collateral is required and they find it difficult to move to an urban area, poor households might not benefit from advancements in the financial sector (Zungu et al., 2022). This inequality worsens when the wealthy use their power to deny the impoverished access to capital, impeding their opportunities for entrepreneurship and education. This theory holds that the financial industry's growth exaggerates IIQ.

The second theoretical viewpoint on the connection between finance and IIQ is the "finance-narrowing hypothesis." This view holds that poor households are not automatically excluded from FD. Instead, finance becomes more available to all as financial systems develop, increasing their chances of funding their businesses and higher education. FD is essential to reducing financial barriers for individuals and companies and facilitating access to financing. The inequality-widening Hypothesis suggests that FD initially benefits the rich more because they are more likely to have access to financial institutions, credit, and investment opportunities (Jung, 2021). However, as finance develops, it exacerbates inequality, especially in the early stages of development, because people with low incomes are excluded. Disadvantaged groups, in particular, benefit from this, as they are often more financially constrained than the wealthy. Rich people can finance their business endeavours internally, but the impoverished frequently depend on loans or outside investments. Previous research (Makhlouf et al., 2020; Siddique & Lee, 2024) has investigated this idea, suggesting that indivisibilities in human and physical capital investment, as well as imperfect capital markets, may be the reason why IIQ between the rich and the poor persists over the long run. According to Jauch and Watzka's (2016) two-sector model, individuals working in skill-intensive industries invest in indivisible human capital, which can be acquired through borrowing from capital markets or by inheriting assets that exceed the investment of the previous generation. Only generations with large inheritances can invest in human capital and work in skill-intensive industries in an imperfect capital market, perpetuating IIQ. However, as financial sector flaws are addressed and financing becomes more widely available,

generations without large inheritances can eventually borrow enough to engage in skill-intensive industries and invest in human capital, thereby reducing IIQ. Similarly, in Banerjee and Newman's (1993) three-sector model, two technologies are unaffordable for low-income people in imperfect capital markets because they require indivisible investments. The income gap narrows as the industry develops and more people access financing, making all three technologies affordable for low-income individuals. As a result, these models suggest that FD and IIQ are negatively correlated.

According to Shahbaz et al. (2007), the third hypothesis suggests an inverted U-shaped relationship between finance and IIQ. This viewpoint is based on the idea that greater risk equals greater profits. Simon Kuznets originally proposed the Kuznets Curve (U-shaped or inverted-U) Hypothesis to describe the relationship between economic growth and IIQ (Destek et al., 2020). Inequality rises in the early stages of economic development, peaks, and then falls as economies mature and redistribute wealth more effectively (Huynh & Tran, 2023). FD may initially increase inequality, but after a certain point, it enhances inclusion and reduces inequality. SSA countries exhibit varying levels of FD, with large segments of the population excluded from formal financial systems. FD may widen inequality in many cases due to unequal access. However, with inclusive policies, mobile banking, microfinance, and financial literacy, finance can help narrow the inequality gap, especially in rural and informal sectors. Investing in coalitions formed by financial intermediaries enables individuals to diversify their risk and increase the likelihood of profitable ventures. However, joining these coalitions comes with fixed costs, like membership dues, which prevent low-income households from participating in highly profitable investments, thereby widening the income gap (Shahbaz et al., 2007; Makhlouf et al., 2025). The gap in inequality narrows as people experiencing poverty progressively accumulate wealth because they can join, diversify their sources of risk, and undertake profitable endeavours. Therefore, the relationship between FD and IIQ is interpreted as an inverted U-shaped curve. IIQ is initially worsened by FD but eventually improves as the sector develops beyond a certain point.

These three finance and IIQ theories must be distinguished because they carry different policy implications for African policymakers. For instance, if the theory suggests that reducing inequality is correct, FD favours income distribution and its acknowledged role in fostering growth (Tan & Law, 2012; The World Bank, 2022). On the other hand, if the hypothesis that points to a rise in inequality is true, then FD's positive effects on growth might be counterbalanced by its adverse effects on inequality, resulting in an unclear impact on poverty. Lastly, if the inverted U-shaped relationship theory is correct, sufficient FD is required before the benefits of the financial sector's growth for the impoverished become noticeable. Consequently, the connection between inequality and finance is empirical and requires verification using actual data. The notion of an organisation's reputation pertains to its general attractiveness to external parties (Solt, 2020, p. 38). Cognitive assessments deal with how these stakeholders view the organisation (Perugini & Tekin, 2022). According to Jauch and Watzka (2016), stakeholders' perceptions of the organisation are shaped by the information it discloses. That is why companies that rank highly in reputational rankings, such as Fortune, tend to maintain their position (The World Bank, 2022). Organisations employ diverse tactics to maintain and restore stakeholders' confidence in the organisation's effectiveness and moral character (Jauch & Watzka, 2016; Wang et al., 2024). Solt (2020) describes one such tactic as using reputational signals to disseminate reliable information about the company.

2.2. Religion and financial development

According to Anderson (1988) and Adam Smith's theory in The Wealth of Nations, religious affiliation may have two financial advantages. Being a member of a 'good' sect offers potential lenders, employers, and customers a sense of security and lower risk regarding a person's reputation. Second, religious affiliation offers extralegal ways to build and rebuild trust. By punishing miscreants, sectors increase efficiency and lessen

uncertainty in intragroup transactions where civil remedies for contract protection are inadequate (Hekmatpour, 2020). It has been suggested that the Calvinist Protestant doctrine of predestination and the idea of the "calling" as the central idea of modern capitalism is responsible for the shift in attitudes toward thrift, efficient economic activity, modesty, and diligence toward wealth accumulation and economic activity (Kim et al., 2020; Nel, 2021). Thus, religion has been connected to various macroeconomic social decisions (Shahbaz, 2008). According to Shahbaz et al. (2007), streams of literature have concentrated on the relationship between macroeconomic growth, such as FDI and religiosity. According to Barro and McCleary (2003), there is an inverse correlation between macroeconomic development and religiosity, as indicated by church attendance. Shahbaz et al. (2007) investigated the relationship between religion and economic development, focusing on the US and using a more uniform sample of productivity, public infrastructure, legal framework, and FD. The study also sought to apply earlier research by Shahbaz et al. (2007), which indicates that risk-averse individuals are typically more devout than those who take risks. The research investigated the potential impact of an individual's religiosity and risk aversion on organisational behaviour. The results revealed that highly religious US-based firms exhibit lower variances in return on equity and return on assets, indicating reduced risk exposure.

The World Bank (2022) conducted a study encompassing 78 countries, drawing conclusions from three distinct categories of data analysis in both within- and cross-country regressions. Nolan utilised a large dataset spanning decades, a small group of countries with data extending nearly a century, and subnational data from three multiethnic and multireligious countries. The study disproves the idea that Islam hinders development. The research concludes that a relationship exists between religion and economic performance. This lends credence to the findings of Tan and Law (2012), who examined a sample of 88 nations to determine the long-run growth and discovered that Islam and Confucianism are positively correlated with growth in per capita income, but not with growth in the per capita intensity of Islamic and Confucian beliefs.

Conversely, hierarchy-dominant religions did not correlate strongly with infrastructure, growth, an effective judiciary, or academic success (Shahbaz et al., 2007). Furthermore, Barro and McCleary (2003) found a negative correlation between Catholicism and per capita growth, as well as with the following religions: Protestantism, Orthodox Christianity, Islam, and Hinduism. The study covered 59 mainly developed countries. Additionally, they discovered a positive correlation between the growth in per capita income and the intensity of belief. Earlier research has focused on developed nations, with most studies examining the relationship between religion and economic development. Investigating the relationship between religion and IIQ is essential to draw meaningful conclusions about whether religion influences FD, which causes IIQ. However, economic development is primarily dependent on and sustained by FD (Shahbaz, 2008).

2.3. Financial development and income inequality

Understanding the relationship between development and inequality is crucial for devising policies that reduce income disparities (Kuznets, 1955). The foundational work by Kuznets (1955) proposes a non-linear inverted U-shaped relationship between IIQ and finance. IIQ increases at the beginning of economic development, improves in the middle stages, and decreases as the economy matures. Similarly, Koh et al. (2020) find evidence that shifting from slow-growing agrarian to fast-growing industrialised phases of economies widens income distribution. The inverted U-shaped relationship between inequality and finance has been supported by prior research (Huynh & Tran, 2023; Siddique & Lee, 2024; Makhlouf et al., 2020).

Tan and Law (2012), in contrast to the previously mentioned findings, used the Standardised World Income Inequality Database (SWIID) to analyse 35 developing countries over 20 years and found a non-linear but U-shaped relationship between FD

and IIQ. From 1961 to 2017, Solt (2020) examined the effects of FD on IIQ in 21 emerging economies. Their results lend credence to a U-shaped relationship between IIQ and FD, suggesting that inequality may rise in the early stages of FD and decline after reaching a certain threshold. Shahbaz et al. (2007) employed panel estimation techniques and data from 90 economies spanning 1970 to 2015 to examine the impact of FD, globalisation, and technology on IIQ. Their findings reveal significant nonlinearities consistent with U-shaped or inverted-U-shaped relationships. The same variables that affect income distribution can have different effects in different nations based on whether a particular threshold is reached. Inequality is reduced in most emerging economies while increasing in many developed countries due to globalisation. While their effects on advanced economies vary, improved technology and increased FDI exacerbate IIQ for most emerging economies. Furthermore, the findings suggest that a lack of credit acts as a conduit through which the effects of FD on inequality are transmitted. These studies failed to capture the importance of religious freedom, which is a critical factor in this situation.

However, other research suggests a connection between IIQ and FD. Shahbaz et al. (2007) use the dynamic GMM technique to analyse a panel dataset of 22 African countries over 14 years and find a negative linear correlation between FD and IIQ. Zungu et al. (2022) examine the non-linear dynamic impact of FD on IIQ in an unconventional policy regime in a panel of 21 African countries. Using Panel Smooth Transition Regression and data from 1990 to 2019, they found evidence of a non-linear effect between the two variables, with the threshold found to be 21.90% of GDP, below which FD reduces inequality in Africa. This paper supports a non-linear relationship between FD and IIQ, suggesting that FD may exacerbate inequality at lower levels, while it can mitigate it at higher levels. The paper does not consider the role of social or institutional moderators such as religious freedom. Our study builds on this by proposing that FOR, an overlooked factor, may influence the point at which this transition occurs. This intriguing possibility adds a new dimension to the discussion, as religious freedom can influence financial inclusion, trust in institutions, and access to credit, all vital in translating FD into equitable outcomes. Previous studies have shown that FD plays a crucial role in reducing IIQ. However, empirical research on a Chinese case shows varied empirical findings or no clear association between FD and IIQ (Jung, 2021). Similarly, Sotiropoulou et al. (2023) found no causal relationships between banking efficiency and stability, stock market development, economic growth, and IIQ in European Union countries.

Siddique and Lee (2024) investigate the effect of FD on top income concentration and IIQ. The authors employed a dynamic panel estimation and GMM method for 171 countries, encompassing both developed and developing economies, from 1970 to 2017. Results indicate that FD has a linear, positive, and significant effect on the income shares of the top 1% and top 10%. The non-linear regression results also indicate that private credit has a U-shaped effect on top income concentration. This suggests that too much finance is beneficial for the top income group but detrimental to income distribution for the entire population. Bayar (2023) empirically investigates the impact of FD on inequalities and poverty during the 2002–2017 period when Turkiye was relatively prosperous. The findings show that expanding the financial sector leads to a more equal income distribution and poverty alleviation. Wang et al. (2024) noted that, except for South Korea, the other countries in the high economic development group showed that FD exacerbated IIQ. Therefore, the impact of FD on income should be examined by groups, with moderately developed countries devoting more attention to promoting income equality through reforms that focus on developing financial diversification and enhancing financial depth.

Using fixed panel data from 2003 to 2014, Altunbaş and Thornton (2020) investigated the impact of FD on IIQ by examining how different aspects of FD affect IIQ, revealing divergent views on the connection between finance and income distribution. The findings suggest that financial access lowers IIQ, as measured by income distribution quintiles, and analyze financial variables' short- and long-term effects on the Gini coefficient. Wang et

al. (2024) analysed the long-term relationship between IIQ and FD at the provincial level in China. Province-specific data indicate that deepening financial systems worsen inequality, defying the common belief that greater financial depth reduces inequality. This suggests that even though GDP per capita and IIQ may rise due to FD, China must still pass the turning point of the inverted U-shaped curve to maintain its status as a developing nation. However, these studies failed to consider the role of religious freedom in the FD and IIQ nexus. The evidence remains equivocal, offering only a limited understanding of the fundamental mechanisms underlying FD.

The widespread corruption among public officials, civil servants, and politicians from many Commonwealth countries has exacerbated income inequalities. However, the high rates of corruption in these countries are crowding out the return to FD (Batabyal & Chowdhury, 2015). Consequently, policies that simultaneously reduce corruption and promote FD have a greater impact on reducing IIQ than implementing these policies separately. The impact of FD on IIQ is multifaceted. It is primarily influenced by the characteristics of the data and estimation methods, the consideration of endogeneity, the various measures of FD, and the inclusion of financial openness, inflation, and income variables in the regressions. This complexity highlights the need to understand the relationship between FD and IIQ comprehensively.

An examination of current empirical research reveals that various factors, including data variations, observed and unobserved country-specific effects, and the methodologies employed, influence how FD affects IIQ. Consequently, worldwide research on this relationship has yielded conflicting results. To tackle this problem, we consider these variables when analysing the relationship between FD and IIQ. We examine panel data covering developing nations between 2000 and 2020. We also considered how the relationship between FD and IIQ is moderated by religious freedom. The data and empirical methods used in this study are further described in the following sections.

3. Methodology

3.1. Data

Our dataset comprises 39 African countries, spanning from 2000 to 2020. We focus solely on African countries for several reasons. Many countries are classified as low-income due to their more pronounced income disparities and weaker financial infrastructure. The FD of these countries is comparatively lower than that of developed countries. Consequently, our sample is suitable for investigating the relationship between FD and IIQ. Because data for some countries were unavailable before this period, we began in 2000. The Fraser Institute provided information on religion, the UNDP's Human Development Index database provided data on IIQ, and the World Bank's World Development Indicators provided data on the control variables.

3.2. Dependent variable

Income inequality, which measures the degree of income difference from a state of perfect equality, is the primary variable of interest. The Gini coefficient (Gini), a frequently used metric in studies examining the relationship between FD and inequality, is employed to assess inequality (Luptáčik & Nežinský, 2020; Hasell, 2023). Perfect equality is represented by a Gini coefficient of 0, and perfect inequality is represented by a coefficient of 100. The market Gini and the disposable Gini are two different kinds of coefficients. The disposable Gini considers subsidies and transfers less tax payments, whereas the market Gini only considers an individual's gross income (The World Bank, 2022). The World Bank's SWIID and World Development Indicator (WDI) databases provide access to data on the Gini coefficient. The four dimensions of welfare, as defined by the SWIID database, are market income, gross income, consumption, and disposable income. This ensures cross-national comparability of welfare. Equivalency scales are also integrated to account for household size and composition (Solt, 2020; Charles et al., 2022). However,

due to its higher variability, the WDI Gini primarily uses data on consumption-based inequality, although it also includes some data on disposable income. These indices come from national surveys published on the World Bank's poverty and inequality platform. However, aside from not being additive, the WDI Gini is not comparable between nations for two reasons: first, variations in living standard indicators (income vs. consumption) lead to different welfare definitions, especially in developing countries; and second, household characteristics such as size, age, consumption needs, and income sharing among members lead to inaccurate measures of IIQ. The dependent variable used in our research is the SWIID Gini coefficient.

3.3. Independent variables

Financial development (FD), measured by dividing the natural logarithm of private credit by GDP, is the primary variable of interest. Private credit refers to financial institutions' funds, such as trade and business credit (Shahbaz, 2008; Li et al., 2021). The private credit to GDP ratio provides insight into the extent of financial institution-facilitated intermediation, encompassing credit disbursal and availability. This differs from other proxies frequently used in the literature, including the number of deposits or liquid liabilities. Liquid liabilities and deposits are primarily concerned with money management rather than making profitable investments. The use of private credit to GDP is widespread in the empirical literature for several practical and theoretical reasons. It directly reflects the ability of the financial system to channel savings into productive investment in the private sector, particularly to firms and households. It is clear, quantifiable, comparable, and captures the core function of financial intermediation. It is unique due to its empirical robustness in growth and inequality studies (e.g., Beck et al., 2007; Levine, 2021), making it a benchmark measure. Lastly, it is relatively objective and less prone to manipulation.

Few studies have examined the possibility of investing, despite many others investigating the potential of fund savings (Kavya & Shijin, 2020; Shahbaz et al., 2007). According to Khatri Chettri (2022) and Bayar (2023), the private credit-to-GDP ratio is a proxy for FD. The global FD database is the source of the data on FD. A greater FD is indicated by a higher value on the FD value scale, which ranges from 0 to 1.

3.4. Control variables

The control variables taken into account in this study are the growth rate of real GDP per capita (GDPG), measured as the annual percentage change in GDP at market prices using constant US dollars, trade openness (TROP), which is the ratio of GDP to the total value of imports and exports, government size (GSIZE), which is determined by government spending, and inflation (INFL), which is estimated as the annual percentage change in the consumer price index. These control variables are selected based on data from the World Bank's database (WDI), considering relevant literature on inequality (Vo et al., 2023; Solt, 2020; Destek et al., 2020). We include corruption (CORR) as an additional control variable, enhancing our study's robustness by examining the role of institutional quality in the relationship between IIQ, FD, and corruption. According to the literature on inequality, corruption is a critical institutional factor (Hudson et al., 2023). Transparency International created the Corruption Perception Index (CPI), a composite index of corruption perception derived from 13 publicly and commercially accessible data sources (Alfaro, 2022). The perceived corruption index (CPI) ranges from 0 to 10, where 0 denotes high perceived corruption and 10 denotes low perceived corruption. Following Vo et al. (2023), logarithms were used to transform each variable. The GDP percentage was used to express these variables. The Fraser Institute measures religious freedom using two metrics. The first is based on two indices that measure the degree of religious freedom in a given society. These indices include the freedom to choose and practice one's faith, to convert to another religion peacefully, and to change one's religion. The second evaluates

the degree of governmental repression of religious institutions. The index is rated from 0 to 10, where a jurisdiction with a score of 10 offers greater religious freedom (Petri, 2022).

3.5. Model specification

Understanding the fundamental relationship between FD and IIQ and the impact of religious freedom requires a thorough understanding of the complexities of the African economy. This study aims to determine whether finance and inequality are related in this context. Therefore, to answer our research question, we have developed the following model:

$$IIQ_{i,t} = \beta_1 FD_{i,t} + \beta_2 FOR_{i,t} + \beta_3 GSIZE_{i,t} + \beta_4 INFL_{i,t} + \beta_5 TROP_{i,t} + \beta_6 CORR_{i,t} + \beta_7 GDP_{i,t} + \theta_i + \mu_t + \vartheta_{i,t} \quad (1)$$

We propose that the interaction between freedom of religion and FD influences the relationship between IIQ and FD. To investigate the indirect effect of FD on IIQ through the freedom of religion factor, we expand the model given in equation (1) and add the interaction term (FOR_{it}*$DCPS_{it}$).

$$IIQ_{i,t} = \gamma_1 FD_{i,t} + \gamma_2 FOR_{i,t} + \gamma_3 GSIZE_{it} + \gamma_4 (FOR_{i,t} * DCPS_{it}) + \gamma_5 INFL_{i,t} + \gamma_6 TROP_{i,t} + \gamma_7 CORR_{i,t} + \gamma_8 GDP_{it} + \epsilon_i + \delta_t + \varepsilon_{i,t} \quad (2)$$

where:
$IIQ_{i,t}$ = Income inequality in the country i at time t
$FD_{i,t}$= Financial development in the country at time t
$FOR_{i,t}$ = Freedom of religion in the country at time t
$GSIZE_{i,t}$ = Government general consumption in the country i at time t
$CDPG_{i,t}$ = GDP growth in country i at time t
$CORR_{i,t}$ = Corruption perception in the country i at time t
$INFL_{i,t}$ = inflation in country i at time t
$TROP_{i,t}$ = Trade openness in country i at time t
t_i = Time effect in country i
ϑ_t = Country fixed effect at time t
$\varepsilon_{I,t}$ = Error term in the country i at time t.

Based on γ_1 and γ_2, the direct effects of FD and religious freedom are investigated; γ_4 is used to assess the indirect effects of the interactive term. Based on previous research, we anticipate a positive correlation between religious freedom and economic advancement. However, since religion lowers poverty by promoting societal productivity, the FOR is anticipated to hurt IIQ. However, an interactive term involving FD and FOR is anticipated to have a positive effect.

3.6. Estimation technique

These studies undoubtedly require panel models because they can reduce estimation biases by combining data sets into a single time series. Nonetheless, there are inherent difficulties with traditional panel estimation techniques, such as random effects, fixed effects, and pooled ordinary least squares. Assuming homogeneous intercept and slope parameters for every cross-section while ignoring their heterogeneity, pooled OLS, for example, is frequently unduly restrictive and may allow the error term to correlate with specific regressors (Eberhardt, 2022). On the other hand, the fixed-effects model includes intercepts unique to each country while assuming known variance and slope estimators. Adding dummy variables enables the observation of cross-sectional and time effects, particularly in two-way fixed effects models. However, the loss of degrees of freedom undermines the fixed-effect estimation method.

The Wald test for groupwise heteroskedasticity was significant at the 1 % level (p-value < 0.001), indicating rejection of the constant variance null hypothesis and confirming heteroskedasticity. As a result, assumptions made using regression estimates could be

biased or inconsistent. Furthermore, the Wooldridge test for autocorrelation was used to detect first-order autocorrelation at a 5% significance level, indicating that the residuals are correlated over time. Moreover, at a 5% significance level, Pesaran's test of cross-sectional independence revealed a significant cross-sectional correlation among the residuals. According to Solt (2020), the instrumental variables technique should be employed to address heteroskedasticity, endogeneity, first-order autocorrelation, and cross-sectional dependence, thereby facilitating the estimation of the model and mitigating estimation bias. Consequently, the model was estimated using the instrumental variables estimator to deal with potential endogeneity. Reverse causation may be the driving force behind the relationship between FD and IIQ. Key economic variables were observed, and their correlations were examined using descriptive analysis.

4. Results

This section examines the connections between FD, FOR, and IIQ, providing in-depth insights into the empirical findings. Table 1 presents the descriptive statistics for the variables, while Table 2 displays their correlations, which clarify the direction of their relationships.

Table 1. Descriptive statistics

VARIABLES	Obs.	Mean	Std. Dev.	Min	Max
IIQ	840	0.509	0.127	0.253	0.803
FOR	840	7.858	1.872	2.312	9.911
FD	817	2.652	0.886	-0.910	4.959
GSIZE	803	2.594	0.481	-0.0495	4.114
GDPG	728	1.386	0.763	-2.678	4.464
CORR	712	2.246	1.248	0.000	4.190
INFL	728	1.530	1.093	-3.305	6.323
TROP	810	4.115	0.471	2.298	5.403

Note: This table presents descriptive statistics based on varying-size aggregate samples due to missing values. All other variables have been log-transformed to normalize their histogram distributions except for income inequality and freedom of religion, which are represented in levels.

The descriptive statistics for the regression variables are shown in Table 1. A significant inequality exists in Africa, as evidenced by the average IQ of 0.509 and the standard deviation of 0.127. FD, however, averages a pitiful 2.65. The average level of FOR in African nations is a remarkable 7.85. The average GDP share of government consumption expenditure is approximately 1.386%, whereas the average inflation rate in Africa is approximately 1.53%. Significant differences exist between African countries, as evidenced by the wide range between the lowest and maximum values for inflation and government spending. Once more, trade openness as a percentage of GDP averages roughly 4.115%, demonstrating Africa's high degree of trade openness.

Table 2. Correlation and VIF coefficients

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	VIF
(1) IIQ	1.000								
(2) FOR	-0.192***	1.000							1.08
(3) FD	0.607***	0.070**	1.000						1.52
(4) GSIZE	0.354***	0.046	0.436***	1.000					1.55
(5) GDPG	-0.112***	0.004	-0.119***	-0.089**	1.000				1.05
(6) CORR	0.302***	0.085**	0.346***	0.212***	-0.109***	1.000			3.18
(7) INFL	-0.073*	-0.168***	-0.166***	-0.204***	0.030	-0.153***	1.000		1.07
(8) TROP	0.480***	0.224***	0.269***	0.398***	0.050	0.090**	-0.146***	1.000	1.34

Note: This table presents pairwise correlation coefficients based on aggregate samples, the sizes of which may vary due to missing values. The variables are as defined on page 10. The variance

inflation factors (VIFs) are based on the standard sample of 492 firm-year observations. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***) levels.

Table 3. The effect of financial development on income inequality without the FOR variable

	(1)	(2)
VARIABLES	IV 2SLS Estimator Model 1	IV 2SLS Estimator Model 2
FD	0.0772***	0.0818***
	(0.00720)	(0.00778)
GSIZE	-0.0567***	-0.0618***
	(0.0139)	(0.0133)
GDPG	-0.0729***	-0.0620**
	(0.0251)	(0.0255)
CORR	0.0134***	0.0276**
	(0.00486)	(0.0113)
INFL	0.0140*	0.0144*
	(0.00800)	(0.00772)
TROP	0.0944***	0.0862***
	(0.0129)	(0.0132)
Constant	0.118*	6.858
	(0.0656)	(4.628)
Country-fixed-effects	No	Yes
Year-fixed-effects	No	Yes
Observations	432	432
R-squared	0.454	0.494
F-statistic	68.21***	57.18***
Anderson Canon. Corr. LM Statistic	31.990	28.819
Chi-sq(1). P-value	(0.0000)	(0.0000)
Cragg-Donald Wald F statistic	5.665	5.039

Note: This table reports empirical results from estimating the study's models using the baseline 2SLS Instrumental Variables estimator (column 1). Column 2 presents the results of robustness checks with additional controls for year and country fixed effects. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***) levels.

4.1. The effect of financial development on income inequality without FOR

The regression model is deemed fit and dependable based on the significant p-value of the F-statistic ($p < 0.001$). The independent variables account for 45.4% of the variations in IIQ, based on the R-squared value. Furthermore, the Anderson-Canova LM test of the null hypothesis that the 2SLS model is under-identified results in the rejection of the null hypothesis, which implies that the model is well-identified, and the 2SLS estimator can be used with confidence. FD's positive and significant effects on IIQ support the inequality-widening hypothesis. The primary beneficiaries of the financial sector's expansion are the wealthy and well-connected, particularly in areas with weak institutional frameworks. Similarly, government spending and economic growth significantly reduce IIQ. However, trade openness, corruption, and inflation positively and significantly influence IIQ.

4.2. The effect of financial development on income inequality with a moderating variable FOR

The output of the instrumental variable estimator for the regression, as displayed in Table 4, reveals significant findings. The overall results of the causality analysis highlight the crucial role of FD in IIQ, with a significant impact ($p < 0.0001$). According to the R-squared value, approximately 56% of the variation in IIQ can be attributed to the independent variables in the model. This highlights the significance of understanding the role of financial system development in the growth of IIQ, a crucial issue in Africa's economic landscape.

Table 4: The effect of financial development on income inequality with the FOR variable

VARIABLES	(1) IV 2SLS Estimator Model 1	(2) IV 2SLS Estimator Model 2
FOR	-0.0189***	-0.0182***
	(0.00255)	(0.00246)
FD	0.0777***	0.0814***
	(0.00650)	(0.00706)
GSIZE	-0.0563***	-0.0607***
	(0.0125)	(0.0121)
GDPG	-0.0575**	-0.0487**
	(0.0233)	(0.0236)
CORR	0.0153***	0.0282***
	(0.00441)	(0.0102)
INFL	0.00660	0.00719
	(0.00739)	(0.00720)
TROP	0.111***	0.103***
	(0.0118)	(0.0121)
Constant	0.180***	6.375
	(0.0585)	(4.202)
Country-fixed-effects	No	Yes
Year-fixed-effects	No	Yes
Observations	432	432
R-squared	0.556	0.582
F-statistic	81.99***	68.98***
Anderson Canon. Corr. LM Statistic	30.413	27.797
Chi-sq(1). P-value	(0.0000)	(0.0000)
Cragg-Donald Wald F statistic	4.587	4.146

Note: This table reports empirical results from estimating the study's models using the baseline 2SLS Instrumental Variables estimator (column 1). Column 2 presents the results of robustness checks with additional controls for year and country fixed effects. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***) levels.

This outcome supports the inequality-widening hypothesis. Despite being small, the estimated coefficient exacerbates the inequality. This finding suggests that the wealthiest individuals have exclusive access to most financial resources, as measured by the proportion of loans to GDP. Similarly, the central banks in Africa are more focused on economic growth than income equality because accessibility can depend on economic policy. This result complements the work of Kavya and Shijin (2020) and Jung and Cha (2021). According to Kavya and Shijin's (2020) research, there is a complicated connection between IIQ, financial growth, and economic development. Their results cast doubt on the notion that increased financial prosperity inevitably results in less IIQ. Remarkably, the advantages of FD are not always felt, even in highly developed or advanced nations. Jung and Cha (2021) offer a startling discovery that defies the hypothesis that financial deepening would reduce inequality. Their analysis of Chinese provincial data demonstrates that financial deepening positively impacts inequality. Indeed, it may exacerbate the situation. This surprising discovery casts doubt on the widely held notion that increased FD inevitably leads to lower IIQ and higher GDP per capita. The importance of considering all facets of FD cannot be underestimated. According to their research, every factor affects IIQ differently. While FD's accessibility, stability, and efficiency components can mitigate IIQ, its depth component, especially in Africa, can potentially exacerbate it. This finding highlights the significance of not ignoring any financial component when pursuing economic development.

FD in Africa may exacerbate IIQ for several reasons. The wealthier companies may have easier access to financial institutions, while the poor, particularly those living in rural areas, frequently face obstacles to access. Richer individuals benefit from FD because they can better navigate complex economic systems and possess credit histories, collateral, and financial literacy (Altiner et al, 2022). Low-income earners, however, might continue to be financially marginalised. Wealthy individuals can often enhance their returns by investing in stocks, bonds, real estate, and other financial assets through an FD. FD can result in asset price inflation that benefits asset owners. Rising living expenses, however, may lessen the purchasing power of those without assets, thereby escalating inequality (Lassoued, 2021). FD can be appropriated by elites in nations with weak institutional frameworks, who then use their clout to sway policy in their favour, collecting rents and widening inequality. A lack of transparency and corruption can worsen the uneven distribution of the advantages of FD. Some African nations' FD could benefit big businesses and industries. However, these opportunities are not accessible to low-income people, who often have little to no savings to invest. Those with credit and the ability to take financial risks typically gain from FD. Wealthier people and well-established companies can borrow and use money at favourable interest rates to fund successful projects. Nonetheless, poor households find it difficult to make investments in housing, entrepreneurship, or even education due to limited or nonexistent access to credit, which feeds poverty cycles. Finally, FD may occasionally encourage "capital flight" to take advantage of international financial markets at the expense of domestic investment. Institutional difficulties, regional imbalances, structural disparities, and poor access have all contributed to the uneven distribution of FD's benefits in Africa despite its potential to foster economic growth and stability (Cyrille, 2023).

Conversely, some researchers have found that FD hurts IIQ (Gravina & Lanzafame, 2021). These findings are consistent with the view that macroeconomic stability and reforms that strengthen creditor rights, contract enforcement, and financial institution regulation are needed to ensure that the FD fully supports poverty reduction and income equality. Consistent with the theory of inequality and intergenerational mobility, as well as empirical research, the IIQ decreases as economies develop their financial sector. FD enhances growth and prosperity for many, including rural communities, small enterprises, and lower-class households. Once they have access to credit, these groups can invest in revenue-generating endeavors, such as small-scale farming, entrepreneurship, and education. This potential for growth and prosperity can lead to increased earnings and closing the wealth gap. By opening up more investment options to a larger population, FD can help distribute wealth more effectively. As financial markets and investment vehicles become more accessible to the general public, IIQ decreases as middle-class and lower-class individuals accumulate wealth (Siddique & Lee, 2024). People with low incomes can benefit from financial products such as government bonds, mutual funds, and pension funds by using them to invest in and save for the future.

IIQ is negatively impacted by religious freedom. The results show an approximately 0.02% reduction in IIQ for every 1% increase in FOR. This finding contradicts the theory of secularisation. According to the secularisation theory, people become less religious as their economy grows, leading to lower IIQ. The results indicate that religious freedom fosters inclusive social policies, reduces discrimination in economic opportunities, and promotes ethical financial and business practices, leading to a more equitable income distribution. Jauch and Watzka (2016) highlight the importance of carefully considering the implications of theoretical models of the secularisation process for different aspects of religion. Greater IIQ might make individuals feel less secure materially and spiritually, potentially driving them to seek religious comfort (Norris & Inglehart, 2004). Religious freedom serves as a proxy for broader institutional openness and societal pluralism. When individuals can practice and express their religious beliefs without fear of discrimination or repression, a parallel respect for other civil liberties and human rights is fostered. This broader culture of inclusion facilitates more equitable access to public goods such as

education, healthcare, and economic opportunities, thereby reducing structural income disparities. When religious institutions operate in the context of freedom, they advocate for social justice, economic equity, and transparent governance (Kim et al., 2020). Religious freedom reduces the marginalisation of minority groups, many of whom may face barriers to economic participation in more repressive contexts. By promoting tolerance and protecting minority rights, religious freedom enables fuller participation in the labour market, entrepreneurship, and public life. The economic inclusion base is broadened, fostering a more diverse and innovative economy. Consequently, productivity is increased, and IIQ is reduced. The outcome aligns with the findings of Barro and McCleary (2003), who discovered a negative correlation between macroeconomic development and religiosity, as measured by church attendance. Similarly, Ali (2023) and Noland (2005) concluded that there is an inverse relationship between religion and economic performance.

Table 5 table presents the results of the effect of FD on IIQ, using the FOR variable and its interaction terms.

Table 5: The effect of financial development on income inequality with the FOR variable and its interaction terms

	(1)	(2)
VARIABLES	IV 2SLS Estimator Model 1	IV 2SLS Estimator Model 2
FOR	-0.0383***	-0.0381***
	(0.00900)	(0.00872)
FD	0.0280	0.0302
	(0.0219)	(0.0215)
FOR#FD	0.00617**	0.00633**
	(0.00267)	(0.00259)
GSIZE	-0.0562***	-0.0607***
	(0.0125)	(0.0121)
GDPG	-0.0581**	-0.0496**
	(0.0231)	(0.0234)
CORR	0.0154***	0.0288***
	(0.00439)	(0.0102)
INFL	0.00622	0.00676
	(0.00737)	(0.00717)
TROP	0.113***	0.105***
	(0.0117)	(0.0120)
Constant	0.328***	6.843
	(0.0823)	(4.190)
Country-fixed-effects	No	Yes
Year-fixed-effects	No	Yes
Observations	432	432
R-squared	0.560	0.586
F-statistic	72.99***	63.15***
Anderson Canon. Corr. LM Statistic	30.543	27.932
Chi-sq(1). P-value	(0.0000)	(0.0000)
Cragg-Donald Wald F statistic	4.023	3.638

Note: This table reports empirical results from estimating the study's models using the baseline 2SLS Instrumental Variables estimator (column 1). Column 2 presents the results of robustness checks with additional controls for year and country-fixed effects. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***) levels.

*4.3. The interaction effect FD*FOR on the relationship between IIQ and FD*

Next, we examine the interaction between FD and FOR to determine whether FOR is a channel through which FD can influence IIQ. The interaction term suggests that the impact of FD on IIQ depends on the level of religious freedom in African countries. The positive interaction implies that higher levels of FOR make FD more likely to increase IIQ. This awareness is crucial as FOR rises, and the tendency for FD to worsen IIQ becomes stronger. In societies with higher religious freedom, the inequality-enhancing effect of FD becomes stronger. While religious freedom promotes fairness, it may also create an environment where FD accelerates wealth accumulation for the already financially privileged. Since FD directly increases inequality, the positive interaction suggests that FD is even more likely to worsen inequality in countries with greater FOR. This could occur due to the role of religious privilege, where certain groups are better positioned to take advantage of financial opportunities, thereby exacerbating existing social and economic disparities. The theory of secularisation advocates that economic development will cause religion to engage less with social, legal, economic, and political decision-making processes. Contrarily, Weber (2002) and Ali (2023) believed that religious beliefs and practices significantly impacted economic development, reducing IIQ. While FD is generally expected to reduce inequality by providing greater access to financial services, the moderating role of religious freedom suggests that it might not be sufficient in contexts where social or institutional challenges associated with religious diversity exist. The result indicates that as religious freedom increases, the effectiveness of FD in reducing IIQ diminishes. To address the IIQ, SSA religious leaders can promote fairness, transparency, and inclusiveness in financial services by opposing exploitative lending and advocating for charitable redistribution. The positive and significant coefficient on the interaction term suggests that higher levels of religious freedom strengthen the inequality-increasing effect of FD. This may indicate that religious freedom empowers voices, without redistributive or regulatory institutions, it can also enable dominant religious or financial elites to consolidate power, resulting in a non-inclusive financial expansion.

Government spending has a 1% significant indirect impact on IIQ. A 1% increase in government spending results in a 0.056% reduction in IIQ. Government spending decisions are made based on needs rather than politics. Prosperous development projects receive the allocation of national resources. Investing in health care and human capital development is crucial for African leaders. This will enhance Africa's prospects for short- and long-term economic growth. Countries with strong public sector involvement may provide more effective safety nets for low-income groups, thereby reducing economic inequality. The findings of Dollar and Kraay (2003), who discovered that high government consumption lowers IIQ, are supported by this outcome. Through a transfer system and increased employment opportunities, many public sectors in a pluralistic democracy assist the core urban formal sectors, thereby reducing IIQ (Clark, 2020; Cheema, 2020).

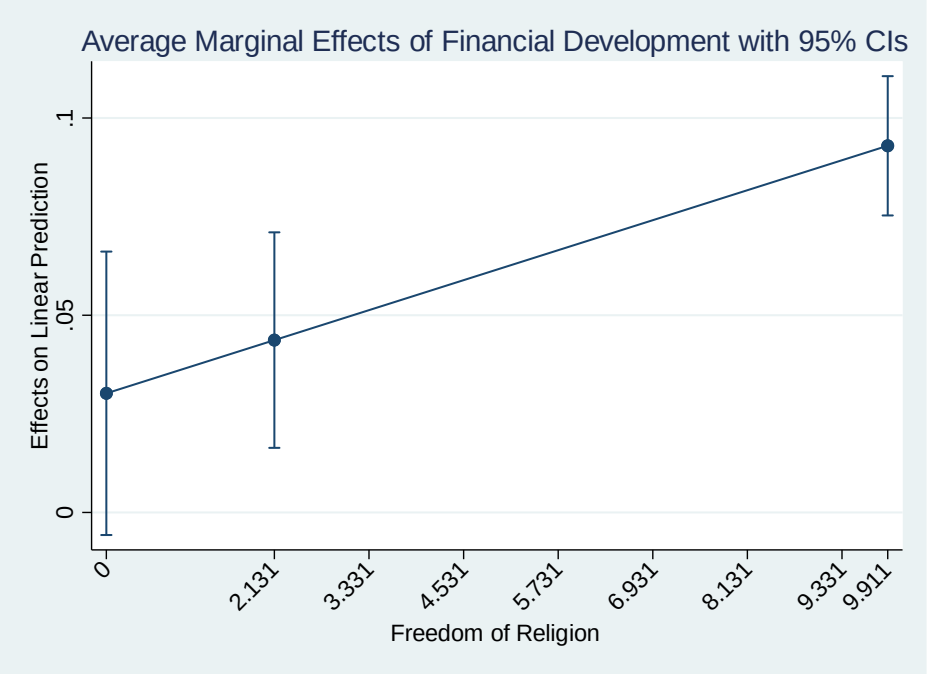
Trade openness and IIQ have a substantial and positive relationship. A 1% increase in trade openness results in a 0.113% rise in IIQ. This is consistent with the arguments made by Shahbaz et al. (2007) and Cheema (2020), who contend that because most exporting companies employ educated workers, trade openness exacerbates IIQ. This clarifies why lower-class workers with limited education may not benefit from trade. In a groundbreaking paper published in 2002, Bhagwati and Srinivasan stated: "Recent critics of globalisation argue that it has negative social implications, particularly concerning poverty, while the widespread belief in the economic benefits of freer trade, also known as trade openness, revolves around its capacity to expand the overall economic output." They contend that trade exacerbates and intensifies poverty in wealthy and poor countries, rather than reducing it. Globalisation and trade liberalisation may benefit high-skilled workers and capital owners more than low-skilled labour, leading to a widening income gap. In many developing economies, trade liberalisation can expose low-wage workers to competition from cheaper foreign labour or automation, potentially increasing wage disparities. There is an acknowledged asymmetry in the theoretical and empirical

assessments of how increased trade affects poverty in wealthy versus less affluent nations. Several economists, including Bhagwati (Wade, 2020; Douglas & Isherwood, 2021; Cerra et al., 2021), have expressed concerns about the connection between increased trade and poverty in the recent past.

IIQ is positively and significantly impacted by corruption. When corruption rises by 1%, IIQ rises by 0.0154%. Wealth tends to be concentrated among a smaller population in a corrupt environment, creating unequal access to resources and opportunities. Corrupt individuals may benefit disproportionately while others suffer consequences. These unequal playing fields exacerbate IIQ. Institutions designed to ensure equitable wealth distribution and economic participation may be compromised by widespread corruption, exacerbating existing disparities (Khan, 2022). Reducing corruption may eliminate informal income redistribution mechanisms that previously benefited lower-income groups. Additionally, corruption control often accompanies structural economic reforms that may initially favour businesses and elites, leading to a widening income gap before the long-term benefits materialise. A substantial proportion of the population feels that the system is unfair due to corruption, which can lead to protests, discontent, or even more severe social and political instability (Yan & Wen, 2020). The outcome aligns with earlier research, which found that increased levels of corruption can exacerbate poverty, IIQ, and bank stability (Khan et al., 2022; Ali et al., 2020). Remarkably, while GDP and inflation had a negative and positive relationship with IIQ, respectively, inflation was statistically insignificant in explaining IIQ.

Figure 1 presents the key finding relating to the interaction between FD and religious freedom.

Figure 1. Average marginal effects of financial development on income inequality across different values of freedom of religion



Note. The marginal effect of FD on IIQ increases with greater religious freedom. FD significantly increases IIQ in countries with high levels of religious freedom.

Table 6 presents the results of the robustness test of the effect of FD on IIQ with alternative metrics for religious freedom (i.e., Muslim and Christian). The coefficients are positive, except for Christian, which agrees with the moderating variable in Table 5. The interaction term of FOR_Christian agrees with FOR in Table 5. However, the interaction

term FOR_Muslim significantly and inversely affects IIQ. The finding implies that FD is more effective in reducing IIQ in societies with greater religious freedom. The result aligns with the findings that religious freedom fosters fairness and equity, indicating that the inequality-widening effect of FD is weakened or even reversed in societies with stronger Muslim religious freedom. Islamic financial principles, such as interest-free banking, profit-and-loss sharing, and zakat, actively promote wealth redistribution and discourage the concentration of excessive income (Kato, 2022; Saba et al., 2021). This may occur because religious freedom fosters an inclusive environment, which can improve access to financial services for diverse socio-economic groups, thereby reducing disparities.

Table 6. Robustness test of the effect of financial development on income inequality with alternative metrics for religious freedom (i.e., Muslim and Christian)

	(1)	(2)	(3)	(4)
VARIABLES	IV 2SLS Estimator Model 1	IV 2SLS Estimator Model 2	IV 2SLS Estimator Model 1	IV 2SLS Estimator Model 2
FOR_muslim	-0.000344**	0.000758		
	(0.000138)	(0.000525)		
FD	0.0804***	0.0656***	0.0857***	0.115***
	(0.00996)	(0.0130)	(0.00782)	(0.0100)
FOR_muslim # FD		-0.000368**		
		(0.000165)		
GSIZE	-0.0630***	-0.0621***	-0.0572***	-0.0519***
	(0.0158)	(0.0158)	(0.0131)	(0.0129)
GDPG	-0.0832***	-0.0837***	-0.0619**	-0.0634**
	(0.0316)	(0.0314)	(0.0266)	(0.0263)
CORR	0.0289**	0.0275**	0.0268**	0.0263**
	(0.0124)	(0.0123)	(0.0118)	(0.0116)
INFL	0.0230***	0.0232***	0.0243***	0.0256***
	(0.00867)	(0.00861)	(0.00800)	(0.00788)
TROP	0.0838***	0.0819***	0.0656***	0.0633***
	(0.0154)	(0.0152)	(0.0153)	(0.0149)
FOR_christian			0.000272	-0.00208***
			(0.000184)	(0.000688)
FOR_christian # FD				0.000820***
				(0.000226)
Constant	9.444*	8.794*	5.304	4.844
	(5.224)	(5.194)	(4.736)	(4.678)
Country fixed-effects	No	Yes	No	Yes
Year fixed-effects	No	Yes	No	Yes
Observations	375	375	386	386
R-squared	0.447	0.453	0.505	0.521
F-statistic	40.11***	36.62***	47.69***	44.78***
Anderson Canon. Corr. LM Statistic	21.766	21.710	23.695	23.584
Chi-sq(1). P-value	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Cragg-Donald Wald F statistic	3.213	2.796	3.513	3.050

Note: This table reports empirical results from estimating the study's models using the baseline 2SLS Instrumental Variables estimator with alternative metrics for freedom of religion. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***) levels.

Table 7 presents the additional robustness test of the effect of FD on IIQ using alternative metrics for FD (i.e., employing principal component analysis of five financial inclusion variables in their level forms). The five metrics of financial inclusion (FI)

variables in their level forms are commercial bank branches (per 100,000 adults), borrowers from commercial banks (per 1,000 adults), depositors with commercial banks (per 1,000 adults), account ownerships with commercial banks and the number of ATMs of commercial banks (per 100,000 adults). These indicators primarily capture two key financial inclusion dimensions: access and usage. The PCA approach provided an effective dimensionality reduction technique for measuring the financial inclusion proxy, enhancing interpretability and reducing multicollinearity (Manly & Alberto, 2016; Pesqué-Cela et al., 2021). The directions and the coefficients for FD and FI are positive and significant. Most African countries are considered low-income due to their more pronounced income disparities and weaker financial infrastructures. However, the results indicate that individual financial behaviour patterns, in terms of savings, borrowings, payments, and risk management, reflect the risk level at the stage of FD in Africa.

Table 7. Additional robustness test of the effect of financial development on income inequality with alternative metrics for financial development (i.e., using PCA of five metrics of financial inclusion variables in their level forms)

	(1)	(2)
VARIABLES	IV 2SLS Estimator Model 1	IV 2SLS Estimator Model 2
FOR	-0.0161***	-0.0144***
	(0.00259)	(0.00257)
FII	0.0305***	0.0530***
	(0.00311)	(0.0154)
FOR#FII		-0.00228
		(0.00180)
GSIZE	0.0296***	0.0229**
	(0.0108)	(0.0103)
GDPG	-0.00739	0.00323
	(0.0278)	(0.0336)
CORR	0.00277	0.0379***
	(0.00565)	(0.0113)
INFL	0.0133*	0.0111
	(0.00788)	(0.00769)
TROP	0.0122	-0.00400
	(0.0125)	(0.0133)
Constant	0.520***	21.30***
	(0.0678)	(4.329)
Country-fixed-effects	Yes	Yes
Year-fixed-effects	Yes	Yes
Observations	211	211
R-squared	0.605	0.640
F-statistic	42.39***	35.34***
Anderson Canon. Corr. LM Statistic	15.192	10.019
Chi-sq(1). P-value	(0.0001)	(0.0015)
Cragg-Donald Wald F statistic	2.250	1.246

Note: This table presents empirical results from estimating the study's models using the baseline 2SLS Instrumental Variables estimator with an alternative metric for financial development, based on a principal component analysis (PCA) of five variables related to financial inclusion. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***).

Our findings regarding the significance of FOR and its moderating effect on IIQ are robust across different econometric estimators with similar signs and coefficients, except for FOR_Muslim. The IV estimator was employed to cater for any endogeneity issues in the model. The effect of FD on IIQ is also consistent across all the models in Table 5.

Additionally, CORR and TROP are consistent regarding direction and magnitude of effect. While GSIZE and GDPG have an indirect, significant relationship with IIQ, INFL has no significant influence on IIQ, except in the robustness test results in Table 6; the directions and magnitudes of their impact remain robust across the three models.

The temporal scope of this study (2000–2020) includes several critical global and regional shocks that may structurally influence the relationships under investigation. The 2008 global financial crisis, the 2010–2012 Arab Spring, and the COVID-19 pandemic in 2020 disrupted FD pathways and redefined the institutional and social expressions of religious freedom in various SSA contexts. These events may introduce non-linearities or structural breaks in the observed associations between FD, religious freedom, and IIQ. While year fixed effects are included to account for time-specific shocks, the possibility of unobserved regime shifts remains a limitation. To validate the robustness of our results, we substitute the religious freedom index with religious composition variables (% Muslim, % Christian), following theories that link religious dominance to institutional behaviour and de facto freedoms (Barro & McCleary, 2003; Kim et al., 2020). These measures are grounded in the notion that hegemonic religious structures may curtail pluralism or shape access to financial systems differently.

5. Concluding Remarks and Policy Implications

The present study investigated the effect of FD on IIQ in thirty-nine selected SSA countries and evaluated the moderating role of FOR in the FD and IIQ nexus. The regression results show a positive effect of FD on IIQ. While FD, trade openness, and corruption positively influence IIQ, FOR affects it negatively. However, FOR moderates the FD and IIQ nexus positively in SSA countries.

Our research advances the theory by clarifying the relationship between FOR and the connection between economic growth and income disparity. By doing this, we can better understand how the dynamics of IIQ are influenced by both FD and religious freedom. Additionally, we address the World Bank's (2022) request for additional studies to investigate how religious freedom affects the relationship between economic growth and income disparity. Furthermore, with strong empirical evidence from SSA, the study supports the inequality-widening hypothesis, which posits a causal relationship between financial system enhancement and IIQ. These findings have significant policy implications for managing IIQ. The study's findings highlight the importance of carefully designed financial policies that promote growth and inclusivity. While FD fosters economic growth, it may also increase inequality. On the other hand, religious freedom plays a vital role in reducing inequality, but it may also exacerbate the unequal effects of FD. A balanced approach, incorporating inclusive financial policies and ethical economic frameworks, is necessary to ensure that financial progress leads to shared prosperity rather than deepening wealth disparities.

Specifically, policymakers should focus on financial inclusion programs that ensure marginalised groups, such as low-income earners and rural populations, have access to credit, banking services, and investment opportunities. This can be achieved through microfinance, mobile banking, and policies that support small businesses and entrepreneurship among the low-income population. Again, raising the minimum wage periodically to account for changes in inflation and the cost of living can help prevent wage stagnation and reduce IIQ. Policymakers may establish and enforce laws to guarantee that labourers of all races and genders are paid fairly for work of equivalent value. Managers can promote greater employment opportunities and raise productivity and income equality by investing in human capital. Regulators may recognise that enacting laws that protect people's freedom to practice their religion without interference or discrimination is beneficial. This includes safeguards against hate speech and religious discrimination in public accommodations, the workplace, and housing. While religious freedom is individually beneficial, the moderation analysis suggests it should be complemented with policies ensuring that FD does not exacerbate inequality.

Governments and religious institutions can collaborate to promote financial literacy, equitable tax policies, and wealth redistribution mechanisms such as progressive taxation and social welfare programs. Christian organisations can promote financial literacy and ethical investment strategies, while Islamic financial institutions can be further integrated into national financial systems to enhance their redistributive effects.

This research has certain limitations. Although the sample size was deemed adequate, a larger sample would have enabled a more comprehensive analysis and enhanced the relevance of our results. Furthermore, we recognise that FOR varies in its legal, political, and cultural expressions. However, due to state restrictions and social hostilities, our limited access to disaggregated data on FOR, as measured by the Fraser Institute's sub-indices, does not allow us to perform such a disaggregated analysis. We therefore recommend that future studies consider such disaggregation when data become available or accessible. Again, using instrumental variable techniques, such as the 2SLS, to address endogeneity and enhance causal interpretation does not guarantee that causality would be definitively established. Because the growth model lacks institutional controls, nations with different institutional frameworks may strive for varying degrees of religious freedom, impacting the strength of the correlation between FD and IIQ. By increasing the sample size, a theoretical framework for evaluating the overall effects of FD could be developed to overcome these limitations. Moreover, different indicators of economic growth and religious liberty could be utilised to validate the findings of this study. Lastly, while cross-country analysis enables macro-inference, country-level heterogeneity is a concern. We therefore suggest that future sub-national or micro-level studies be conducted to unpack country-specific dynamics.

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Appendix A

Shapiro-Wilk	W		Test for		Normal Data
Variable	Obs	W	V	Z	Prob>z
IIQ	840	0.95782	22.698	7.677	0.000000
FOR	840	0.87158	69.106	10.414	0.000000
FD	817	0.97916	10.933	5.874	0.000000
GSIZE	803	0.96714	16.973	6.949	0.000000
GDPG	728	0.89637	48.971	9.509	0.000000
CORR	712	0.85476	67.262	10.275	0.000000
INFL	728	0.95447	21.513	7.499	0.000000
TROP	810	0.99538	2.403	2.152	0.01569

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