Sukūk and Income Inequality

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Abstract

This paper investigates the link between *sukūk* development and income inequality by scrutinizing the data of twenty-two *sukūk*-issuing countries from 1995 to 2019. We employ the two-stage Fractional Regression Model to illustrate that *sukūk* issuance increases the income disparity proxied by the share of the top 1% earners. Our findings also indicate that a well-developed financial market improves income redistribution. Our results are robust for both government and corporate *sukūk*. The results also hold when the Gini coefficient is used as a proxy of income disparity. We rationalize this *sukūk*-inequality nexus in light of the ethical objectives of Islamic law. We argue that reinforcing property rights by mitigating the ill-effects of excessive risk-taking (i.e., *gharar*) and endemic agency costs of debt (i.e., *ribā*) in our ethical framework can improve *sukūk's* role in socio-economic development.

Keywords: *Sukūk*, Income inequality, Islamic finance, Financial development, Socio-economic development,

JEL classification: D30, O15, O16, Z12

1.   Introduction

"There is no fundamental reason why we should believe that growth is automatically balanced. It is long since past the time when we should have put the question of inequality back at the center of economic analysis…"

(Thomas Piketty, 2017, p. 20)

The empirical literature unambiguously documents an upsurge in income disparity worldwide, particularly in Muslim countries (Alvaredo et al., 2018). For example, according to the World Income Database, the top 1% earners in oil-rich Saudi Arabia and Qatar claim 18.86% and 18.95% of the respective nations' total income in 2019. These are higher than 1995's figures of 18.58% and 18.51%, respectively. This issue is even worse in Turkey, which experienced a significant rise in income disparity from 21.99% in 1995 to 23.35% in 2019. The least unequal region of Europe is not an exception (Alvaredo et al., 2018). For instance, the Netherlands' highest 1% income increased from 5.77% in 1995 to 6.97% in 2019.

Whether finance contributes to the above (income) inequality has been a growing debate in the literature. Earlier studies offer conflicting results of the finance-inequality nexus, even though they concur on the relationship between the two. For example, Banerjee and Newman (1993) and Galor and Zeira (1993) theorize a positive impact of better-developed financial markets on income redistribution. Beck et al. (2007) and Zhang and Naceur (2019) are among the proponents of this view, providing empirical proof of the negative relationship between finance and inequality. Meanwhile, Greenwood and Jovanovic (1990) theoretically derive the finance-inequality nexus from the Kuznets' inverted U-curve as financial development is closely linked to economic growth. The empirical works of Clarke et al. (2006) and Kim and Lin (2011) support this view. In the long run, inequality decreases as finance advances, but it may increase in the rudimentary stage of financial sector development. Piketty (2017)

advocates a linear positive finance-inequality relationship by showing that the inverted U-curve pattern holds only because of major structural breaks in the first half of the 20th century, namely the Great Depression and the two world wars. Controlling for these anomalies offers a robust positive association between finance and inequality as long as the return on capital exceeds the economic growth rate (Piketty, 2017). Jaumotte et al. (2013), Jauch and Watzka (2016), and De Haan and Sturm (2017) concur with Piketty's results.

The main financial instruments employed by the private and public sectors are bonds and *sukūk* (loosely translated as Islamic bonds). A recent study by Mian et al. (2020) uncovers the adverse impact of debt, including government bonds, on income redistribution. This is because the debt instrument used by the rich to increase their saving does not boost investment in the real sector of the economy. Instead, it is linked with dissaving by the government and the household sectors of the economy (Mian et al., 2020). This result agrees with Azzimonti et al. (2014), who document a higher inequality in countries with more outstanding government bonds.

Sukūk, unlike bonds, is a financial certificate representing an undivided claim in ownership of religiously permissible assets, usufructs, or services (Abdul Halim et al., 2019; Shafron, 2019). It mainly comprises of facilities ranging from those using (i) debt-based mark-up vehicle involving a buy-sell agreement (*Murabaha*), (ii) financial leasing in the form of sale-leaseback-buyback (*Ijara*), (iii) a portfolio of assets yielding a stream of income akin to a mutual fund (*Wakala bil Istithmar*), and (iv) quasi-equity medieval vehicle of trust financing (*Mudharaba*). The ethical axioms of Islamic Finance (IF) necessitate *sukūk* to strengthen property rights and be linked to the real sector of the economy, thereby promoting an equitable socio-economic order (Sidani and Ariss, 2015). However, the Muslim majority countries that host *sukūk* have suffered more from income inequality, as explained at the onset of this study,

raises an intriguing question: Does *sukūk* development truly contribute to inequality reduction?[1]

This paper seeks to examine the link between *sukūk* development and income inequality. Our analytical framework mainly benefits from the finance-inequality nexus theory. Financial development (FD) can have a remarkable role in ensuring a well-functioning financial system by improving financial access, depth, efficiency, and stability (Beck et al. 2007). This is a crucial recipe for more inclusive growth. However, poorly managed financial development can also exacerbate inequalities when economic advancement is only experienced by the elite leaving behind the rest of the society (Čihák and Sahay, 2020). In this case, the process turns into a mere 'financialization,' decoupling finance from the real sector of the economy (Krippner, 2005).

The literature, however, is silent on the interaction between *sukūk* development and inequality. Most studies focus on the role of Islamic banks (IBs) on economic growth. Gheeraert and Weill (2015), Abedifar et al. (2016), and Imam and Kpodar (2016) unanimously report that the IB development is conducive to economic growth. Abedifar et al. (2016) go the extra mile by documenting a negative link between IBs' development and inequality. In the context of *sukūk*, Smaoui and Nechi (2017), Yildirim et al. (2020), and Smaoui et al. (2021) also depict its constructive role in economic and infrastructure development, while Echchabi et al. (2018) suggest no relationship between the two. However, its link with inequality is left unexplored despite the growing concern about the adverse impact of public and corporate bonds on income redistribution (Dwyer, 2018; Mian et al., 2020). This study aims to fill this research gap.

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1 The above question broadly echoes with the view of Shafron (2019, p. 24) that states "Relying heavily on structuring to meet Shariah compliance, the forms of many Islamic finance products differ drastically the economic substance of the transactions. This disconnect between substance and form provides a unique setting for in depth exploration of interesting research and questions…".

To the best of our knowledge, our study is the first to examine the nexus between *sukūk* development and income inequality. We first develop the ethical framework of *sukūk* in the context of socio-economic justice. We, next, empirically evaluate the connection between the yearly *sukūk* issuance and the income share of the top 1% earners in 22 *sukūk*-issuing countries. We also examine the nexus between FD and income inequality. Our sample covers the Organization of Islamic Cooperation (OIC - hereafter) member countries and developed economies such as Ireland, the Netherlands, Singapore, Switzerland, and the United Kingdom (UK), where the *sukūk* market has thrived. Our analysis also controls for the critical determinants of income inequality, including gender equality (Gender), globalization (Global), ethnic-fractionalization (Ethnic), population growth (Popg), school enrolment (Educ), income category (Income), and telecommunication infrastructure (Telecom) (Clarke et al., 2006; Beck et al., 2007; Ang, 2008; Čihák and Sahay, 2020).

We perform the Fractional Regression Model (FRM, hereafter) with the Logit link function, as our dependent variable (i.e., Top 1% income group) is bounded between 0 and 1. We employ a two-step FRM estimation to address the endogeneity problem of the financial development reported in the literature (see Beck et al., 2007). We ensure the robustness of our findings by separating the sample for the Government and Corporate *sukūk* categories and using the Gini coefficient (Gini) as an alternative measure of inequality.

Our results illustrate that *sukūk* development has a positive relationship with income inequality. Countries with a higher level of *sukūk* issuance experience a more profound income disparity. This result is in harmony with Mian et al. (2020) but contrary to that of Abedifar et al. (2016). This positive effect weakens (yet remains positive) after the 2008 Global Financial Crisis (GFC). This may be due to a shift towards more issuance of equity-type *sukūk* after the crisis and the infamous critique of Taqi Usmani suggesting that the majority of *sukūk* were not

deemed Islamic in late 2007.[2] This shows that the industry has been heading towards improvement. However, immense efforts remain needed to stem the tide.

Our findings also show that, in general, FD has a negative impact on income inequality. A well-developed financial market leads to more equitable income redistribution. This is consistent with Banerjee and Newman (1993), Galor and Zeira (1993), Beck et al. (2007), and Zhang and Naceur (2019). However, our results contradict Greenwood and Jovanovic's (1990), Clarke et al. (2006) and Kim and Lin (2011), Jaumotte et al. (2013), Jauch and Watzka (2016), De Haan and Sturm (2017), and Piketty (2017).

Our study contributes to extensive studies of the finance-inequality nexus mentioned above, but it also enhances the policy-oriented literature on the effects of IF on socio-economic development. Several studies advocate the favorable roles of IBs and *sukūk* on development (Gheeraert and Weill, 2015; Abedifar et al., 2016; Imam and Kpodar, 2016; Smaoui and Nechi, 2017; Yildirim et al., 2020; Smaoui et al., 2021). According to Smaoui and Nechi (2017), this positive link is reinforced as *sukūk* progression leads to greater access to finance for religious agents who otherwise are self-excluded from the financial market. However, the socio-economic issues are not only about economic growth. Inequality is among the oldest puzzles in the literature. As far as bonds are concerned, Mian et al. (2020) document an adverse effect of public debt on income redistributions. Higher government bond issuance is associated with more concentrated savings for the wealthy and considerable household debts for laypeople. Our findings concur with Mian et al. (2020) in the context of *sukūk*. We highlight that the meticulous design of *sukūk* extricating the ill-effects of agency costs of debt and excessive risk transfer is needed to deliver the ethical promise of *sukūk*.

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2   Taqi Usmani is a religious scholar and former judge of Pakistan's supreme court.

Our paper also contributes to the broad debate on the 'culturalization' of the financial services industry, thereby extending the fifty-fifth Special issue of the Journal of Corporate Finance. Most studies document the ethical gaps in the IF industry (Haniffa and Hudaib, 2007; Mergaliyev et al., 2019). Khan (2010) argues that the drawback of the industry lies in its lack of deliberation and implementation of the ethical objectives of the law. We provide an ethical framework of *sukūk* in light of the socio-economic objectives of IF. Here, we also analyze the religious injunctions within the framework of economic theory as implying property rights. We establish the link between the two endemic problems in IF and inequality. Our empirical findings indicate that the IF industry has yet to extricate itself from the above injunctions to instill socio-economic justice to reduce income disparity. This fast-growing sector has been developed solely based on the literal interpretations of the primary sources of Islamic law (i.e., *Sharī'ah* - described below) but falls short of fulfilling the ethical objectives of Islamic law (*Maqāsid al- Sharī'ah*).

The remainder of this paper is structured as follows. Section 2 discusses the Islamic ethics of *sukūk*. Section 3 develops our hypothesis linking *sukūk* development, financial development, and income disparity. We then proceed with the methodology and data in Section 4. Section 5 examines the empirical results, followed by a thorough discussion in Section 6. Finally, section 7 concludes our study.

2.   Islamic ethics of *sukūk*

The Islamic moral system is highlighted in the Qur'ān (i.e., Muslim holy book) and the authentic traditions of Prophet Muhammad (i.e., *aḥādīth*). The objectives of religious law are to prevent harm and promote human/ social welfare (Naqvi, 1981). The literature suggests that

the primary goal of the Islamic economic system is social justice (Chapra, 1992; Rice, 1999).[3] This entails safeguarding property rights in the realm of the economic system. In the context of *sukūk*, this implies the alleviation of mainly *ribā* (agency costs of debt) and *gharar* (asymmetric information or excessive risk transfer), as encapsulated in Figure 1 and elaborated below.

[Insert Figure 1 here]

The global financial crisis of 2008 exemplifies how the liquidity of debt securities was impaired by its toxicity stemming from asymmetric information and agency issues. The structural deterioration at the origination of these securities led to the freezing of the secondary market for debt and the failure of institutions holding them as collateral (Ebrahim et al., 2016).[4] This aggravated inequality in the US, as roughly a million American families lost their homes and thus their meager life savings in the form of home equity. This had a devastating impact on the global economy (Economist, 2007, Gapper, 2007).

The adverse impact of a highly leveraged economy implicates debt with income inequality (Piketty, 2017; Dwyer, 2018; Mian et al., 2020). Azzimonti et al. (2014) illustrate a positive link between greater government deficits (financed by bonds) and higher income inequality. Mian et al. (2020) offer some possible rationales behind this phenomenon. From the issuer's perspective, most plain-vanilla bonds raised by the government have not been channeled into the real sector of the economy. They are mainly used to refinance and fulfill budget deficits. From the lender's perspective, it has been used by the affluent to raise their income and wealth while the less-affluent cannot afford to save.

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3   This goal is alluded to in the Qur'ānic verse (2:143), characterizing Muslims as following the middle (non-extreme) path of justice and equity.

4   The finance literature attributes the lack of meticulous pricing of debt securities at origination to the capital structure puzzle (Graham and Leary, 2011; Graham et al., 2015). This is because the capital structure theories have yet to discuss the technical means to alleviate information opacity and the agency costs of debt. One also needs to account for 'managerial miscalibration' (Ben-David et al., 2013).

We argue that the above problems are related to the twin issues of *ribā* and *gharar*. Prohibiting the two allows *sukūk* to promote a more equitable resource distribution. However, this cannot be accomplished without deeply understanding the objectives of Islamic law. In so doing, our framework in Figure 1 extends Jatmiko et al.'s (2022) economic equivalence of *ribā* and *gharar*.

Jatmiko et al. (2022) argue that the deeper meaning of *ribā* goes beyond the terminology of interest.[5] They instead decipher this concept to the agency cost of debt attributed to the unethical behavior of financial decoupling-led risk-shifting and price gouging-led underinvestment. In risk-shifting, the borrower strategically defaults when the equity goes 'underwater,' violating the contractual agreement as illustrated in Figure 2. In underinvestment, the onerous financial obligations do not allow the borrower to undertake any positive NPV project as the benefits are usurped by the financier, as depicted in Figure 3. These two intertwined improprieties are connected with the issue of income inequality as risk-shifting [underinvestment] by the borrower [financier] harms the financier [borrower].

[Insert Figures 2 and 3 here]

Financial decoupling refers to the high dependence on the debt-based financial market leads to its divergence from the real sector of the economy (Davis and Kim, 2015). Three possible scenarios linking financialization with inequality are documented in the literature, namely (i) the disproportionate increase in financial institutions directly impacts intersectoral wage inequality (Kaplan and Rauh, 2010), (ii) the high concentration of investment in the debt-based financial sector (Stockhammer, 2004; Van der Zwan, 2014), and (iii) the privatized gain and socialized loss of the plain vanilla financial assets (Stiglitz, 2012; Volscho and Kelly, 2012).

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5   This terminology stems from the Arabic word *rabā*, implying an increase or growth (Al-Zuhayli, 2006).

Price gouging is related to the steep pricing of interest-bearing debt over its 'just price.'[6] First, it impedes the access to finance of a significant portion of skilled entrepreneurs as they possess no assets for collateral (Claessens, 2006; Honohan, 2006). Second, the excessive price of debt also deters the borrowers' growth potential (Ebrahim et al., 2016; Piketty, 2017). Finally, it prevents debt retirement (Mian et al., 2020).

On the other hand, *Gharar* involves information opacity or excessive risk-taking behavior (El-Gamal, 2006; Ebrahim et al., 2016, Jatmiko et al., 2022).[7] We argue that information opacity or risk-taking behavior can also contribute to the earning inequality in the economy as follows.

A large number of studies illustrate that asymmetric information enlarges the gap of access to finance between the rich and the poor and ultimately escalates income disparity (de Mendonça and Esteves, 2018; Lei, 2019; Tchamyou, 2019). This relationship is alluded to in Akerlof's (1970) classic paper. Lack of transparency increases the cost of borrowing as the lender assumes that the issued debt is backed by a 'bad' project. It thus incentivizes the borrower to issue unsecured debt to the public while keeping the secured one limited to relationship lending (Duqi et al., 2017). This mechanism opens the door to the underinvestment issue (*ribā* – see Figure 2) and further aggravates income inequality.

Furthermore, studies such as Stiglitz (2012), Fligstein and Goldstein (2015), and Bazillier and Hericourt (2017) document that the excessive risk-taking embedded in the use of debt also contributes to inequality. One way to look at its underlying mechanism is through the potential speculation feature of the unsecured debt, which dominates the world economy (Chatterjee et al., 2007). Landier and Plantin (2017) attribute the endogenous increase in inequality to the tax avoidance schemes in conjunction with the risk-taking behavior of the rich employing varying

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6   See Jatmiko et al. (2022) for a terse debate on the definition of just price from neoclassical, Marxian, and Islamic economic perspectives.

7   *Gharar* stemming from the trilateral Arabic root *ghrra* means to deceive or fog the mind (Thomas, 1995).

debt arbitrage strategies. The phenomenon of the rise of super-rich produced by hedge funds and subprime derivatives offers compelling evidence of this argument (Stockhammer, 2015). In the context of public debt, the highly unsecured leveraged economy can lose its growth potential and thus misallocate resources equitably (Stiglitz, 2012).

3.   Hypothesis development of *sukūk*-income inequality nexus

 We pose a crucial question here as follows: Can *sukūk* practically curb the adverse impact of debt on income distribution? The last three decades have witnessed the significant role of *sukūk* in government and corporate financing. While the instrument domiciles are mainly in the OIC territories, some developed countries such as Singapore, the Netherlands, the UK, Switzerland, and Ireland also welcome it to generate income and as a source of diversification. *Sukūk* supposedly incorporates the Islamic ethical system discussed in Section 2 to overcome the issues of *ribā* and *gharar* embedded in the plain vanilla debt. It should promote a more sustainable development paradigm by reducing income inequality through eliminating financial decoupling, price gouging, and excessive risk-taking behavior. However, whether *sukūk* is distinct from bonds and incorporate the above ethical values has been a subject of ongoing debate in the literature described below.

Many comparative empirical studies suggest that *sukūk's* performance is distinct from bonds and thus provides an avenue for diversification (Cakir and Raei, 2007; Maghyereh and Awartani, 2016; Naifar et al., 2017; Haque et al., 2017; Hassan et al., 2018; Bhuiyan et al., 2019, 2020; Hossain et al., 2020). On the contrary, Azmat et al. (2017) and Ahmed and Elsayed (2019) document similarities between the two assets by examining their co-movements (see Table 1 for a terse summary of these studies). However, one should construe the mixed empirical findings with caution as they may not truly reflect the underlying mechanism of the *sukūk* design (Alzahrani, 2019). For instance, the different market reaction of *sukūk* and bonds

does not necessarily suggest their structural distinction (Godlewski et al., 2013). As Klein et al. (2017) and Shafron (2019) explain, investors can have distinct perceptions of similar assets.

[Insert Table 1 here]

In theory, the primary difference between *sukūk* and bonds lies in the former's asset centrality (El-Gamal, 2006). *Sukūk* should be structured as asset-backed instead of asset-based security.[8] It should incorporate income-generating underlying assets from which the issuer can pay the coupon and the (risk-adjusted) principal back to the holders. This feature allows the payoffs to be contingent on the assets' performance. The underlying assets should also serve as collateral securing the contract. It should thus mitigate the issues of *ribā* and *gharar* and hence income disparity. However, many studies cast doubt on whether *sukūk*'s asset centrality holds practically. See the examples below for elaboration of the same.

The most common *sukūk* is the cost-plus, or the *Murabaha sukūk* is described below along with its financially engineered versions. According to the Bloomberg database, in early March 2021, this type of asset accounted for 41.76% of outstanding *sukūk* in the world.[9] This facility can be structured either as an asset-backed one or an asset-based one. In the asset-backed case, a Special Purpose Vehicle (SPV) is created by the originating firm. This firm sells an income-generating asset (or business) (thereby transferring its title) to the SPV. It simultaneously enters into a binding contract with the SPV to buy back the same at the original price at maturity.[10] The SPV generates the proceeds of this purchase by issuing a *sukūk* to investors. It uses the payoffs of the asset/ business to compensate the coupon payments of the

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8   The notable discrepancy between asset-backed and asset-based *sukūk* lies in the event of default. The former bestows recourse to the underlying assets, while the latter does not.

9   The majority of them are issued in Malaysia, where the trading of debt (*Murabaha sukūk*) is permissible. Most countries forbid this practice (Abdul Halim et al., 2019).

10   The mandatory arrangement to buy back the asset/ business by the firm relieves the SPV of the downside risk of the ownership of the asset. This is considered an infringement of the property rights of the owners of the firm and breaches the spirit of the *Shari'ah* (Azrak and Hazaa, 2021). This is one of the reasons why Taqi Usmani was up in arms against the structure of *sukūk*.

sukūk holders. At maturity, the SPV sells the asset/ business back to the firm and repatriates the received funds back to the investors.

However, in reality, when the *sukūk* is structured as an asset-based one, the originating firm does not make a legitimate sale of the asset to the SPV and withholds the transfer of its title. In other words, the firm retains the title, thereby aggravating the risk should it fall on hard times and cannot make the 'cash' payments. This transition in structure deprives the source of income for the investors, but it also makes the contract unsecured. This change also transforms the asset-backed *sukūk* into an asset-based one, exacerbating its risk (Jatmiko et al., 2021).[11] Unlike the former structure, the latter has no recourse to the underlying asset, leading to financial fragility. The same data from Bloomberg suggests that 72.98% of *sukūk* are unsecured, i.e., not backed by any collaterals.[12]

The literature also critiques the pricing issue of *sukūk*. The coupon of *sukūk* is often linked to interest-based indices such as LIBOR (Kuran, 2018). This makes the payments of *sukūk* deviate even further from the underlying performance of the originator. The 'Islamic' Interbank Benchmark Rate (IIBR) development does not remedy this issue. Jatmiko et al. (2022) suggest that the IIBR has short and long-term relationships with LIBOR. The 'Islamic' rate is also significantly higher than its conventional counterparts without evidence of its interlink with the performance of the underlying real asset. This raises the ethical issue of *ribā* in the form of financial decoupling and price gouging (see Jatmiko et al., 2022).

In light of the above discussions, we thus argue that *sukūk* is not fundamentally distinct from interest-bearing debt-based transactions. Therefore, it is unlikely to remedy the positive

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11   The aggravation of risk of the asset-based *sukūk* infringes up the property rights of investors. This is another reason why the structure of *sukūk* has earned the ire of Taqi Usmani.

12   The situation gets more complicated and thus more risky when the originator enters into a 'sale' and 'buy-back' arrangement with itself (in an *inah* sale) or with a third party (in a *tawarruq* or a reverse *Murabaha*, i.e., a synthetic loan) (see Jatmiko et al., 2022).

nexus of debt and income inequality caused by *ribā* and *gharar*, as illustrated in Figure 1. Consequently, we derive our hypothesis as follows.

Hypothesis 1: The development of *sukūk* has an adverse impact on income redistribution.

4. Methodology and data

4.1. Empirical strategy

We examine the above hypothesis by emulating the empirical techniques of the key studies in the area. These include Clarke et al. (2006), Beck et al. (2007), Ang (2008), and Čihák and Sahay (2020). Our panel data regressions employ income inequality proxied by the Top 1% of the highest earners in the country as the dependent variable and *sukūk* issuance as the primary independent one. We employ the FRM as the values of our dependent variable (Top 1%) range between 0 and 1. This also applies to the Gini coefficients that are used for robustness. We benefit from the two-step FRM to address the endogeneity problem of the Financial Development variable (FD) as reported by the previous literature (see Beck et al., 2007). Our first step FRM model is represented in Equation (1) below, where the Legal origin (Lo), Investment profile (Ip), and Corruption (Corr) are used as Instrumental Variables (IV). Equation (2) depicts the second stage of our model, where we regress Top1% on *Sukūk*, the fitted value of Financial Development ($\widehat{FD}$) obtained from Equation (1), and the remaining control variables (CTR) are listed in Table 2. We also control for heteroscedasticity and serial correlation in the residuals using robust standard errors.

$$FD_{it} = \alpha + \beta_1 Lo_{it} + \beta_2 Ip_{it} + \beta_3 Corr_{it} + \mu_i + \epsilon_{it} \tag{1}$$

$$Top1\%_{it} = \gamma + \delta_1 Sukūk_{it} + \delta_2 \widehat{FD_{it}} + \theta CTR_{it} + \alpha_i + \upsilon_{it} \tag{2}$$

where *i* and *t* respectively represent the country and the year; μ_i and α_i are the unobserved country-specific effects; ϵ_{it} and υ_{it} denote the zero-mean disturbance terms.

[Insert Table 2 here]

4.2.   Data

Table 2 summarizes the operational variables and data sources used to examine our hypothesis. The dependent variable, Top 1%, represents the claims of the highest 1% earners over the country's total income. We retrieve this data from the World Inequality Database from 1995 to 2019. Our independent variable of s*ukūk* is measured with the ratio of s*ukūk* market capitalization to the Gross Domestic Product (GDP). The numerator and denominator are obtained from Bloomberg and the World Bank, respectively. Our proxy of FD is calculated as the proportion of the domestic financial institutions' financing and loans over the GDP. This data is also derived from the World Bank database, like most control variables, including Gender, Popg, Educ, GDP per capita growth (Gdpg), Income, Inflation (Inf), and Telecommunication infrastructure (Telecom). The Globalization Index (Global) data is obtained from the KOF Swiss Economic Institute. This covers the economic and interpersonal, informational, cultural, and political aspects of globalization. Historical Index of Ethnic Fractionalization (Ethnic) data is employed to represent the country's ethnic diversity. This data is made available by Harvard Dataverse. We also employ IVs to predict the FD using La Porta et al.'s (1998) Legal origin (Lo) and the Investment Profile (Ip) and Control of Corruption (Corr) indexes provided by the International Country Risk Guide (ICRG). Finally, we also employ the Gini coefficient (Gini) from the World Bank and local statistics bureau to replace the Top 1% in the robustness check.

Our dataset includes all *sukūk*-issuing countries recorded by Bloomberg between 1995 and 2019. However, we exclude countries with only one-off issuance (such as Morocco, Kazakhstan, and South Africa), the British Overseas Territories (including Bermuda, British Virgin Island, and Cayman Island), and the Crown Dependencies (i.e., Jersey and Guernsey).

Luxemburg is also omitted as it has no Ethnic data. It is worth noting that the Ethnic data was terminated in 2013. We extrapolated seasonally-adjusted missing Ethnic data to forecast it as its trend is clearly observable. Our final sample covers 22 countries, namely (1) Bahrain; (2) Bangladesh; (3) Gambia; (4) Indonesia; (5) Ireland; (6) Ivory Coast; (7) Jordan; (8) Kingdom of Saudi Arabia; (9) Kuwait; (10) Malaysia; (11) Netherlands; (12) Nigeria; (13) Oman; (14) Pakistan; (15) Qatar; (16) Senegal; (17) Singapore; (18) Switzerland; (19) Turkey; (20) United Arab Emirate (UAE); (21) United Kingdom (UK); and (22) Yemen.

4.3. Description of data

We summarize the descriptive statistics of our variables in Table 3. Our balanced-panel dataset encompasses 550 observations across 22 countries within the 1995-2019 period. The dependent variable representing the inequality shows a relatively large income disparity. That is, the Top 1% group of income, on average, claims 15.51% of the whole population's earnings. In the worst-case scenario, only a tiny fraction of elites enjoy 23.35% of the population's total income. The mean of Gini also indicates a high inequality, i.e., 37.32%, with a minimum value of 27.6% (i.e., Netherlands in 2012) and a maximum value of 49.1% (i.e., Malaysia in 1997).[13]

[Insert Table 3 here]

The OIC countries generally have a higher inequality level than their non-OIC counterparts, as shown in Figure 4. The top 1% of the former's income taxpayers possess an average of 15.03% to 20.63% of the countries' total earnings. Indonesia and Nigeria are the only exceptions, where their proportions resemble the non-OIC countries, in which the disparity ranges between 6.57% and 13.25%. Turkey is the most uneven income inequality country in the sample, followed by Qatar and Saudi Arabia, while the Netherlands, Ireland, and

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13 As far as the Gini is concerned, Luebker (2010) categorizes inequality into Low (around 20%), Medium (25%), High (35%), and Extreme (50%).

Switzerland are the least unequal. The time-varying income inequality trend is mixed. Some nations have experienced an increase in income disparity. This includes Turkey, Pakistan, the UK, and Singapore. Others, such as Gambia and Senegal, seem to reduce the shares of the top 1% income group over time.

[Insert Figure 4 here]

Table 3 also shows that our primary independent variable (i.e., *sukūk* issuance) remains small compared to the economy (% of GDP). However, its role in public and private financing has become crucial over time. On average, the country's yearly *sukūk* issuance is equal to 1.22% of its economy, with the highest issuance of 37.97%. Figure 5 illustrates the dynamics of *sukūk* issuance across countries from 1995 to 2019. The rapid development of *sukūk* as the government and corporate financing alternatives has been pioneered by Malaysia. Its market penetration has been impressive over the past three decades. The peak was in 2012, when the *sukūk* issuance of the Southeast Asian Country reached 37.97% of its GDP. However, it is not surprising that *sukūk* issuance in non-OIC countries is relatively small compared to their economic sizes.

[Insert Figure 5 here]

The Pearson correlations in Table 4 indicate a positive association between the s*ukūk* and Top 1%. However, the coefficient is very low and has yet to imply any causation between the two. The pairwise-correlation coefficients of our independent variables are also small to moderate. *Sukūk* and FD have a very weak positive correlation of 0.11. This is because FD covers only financing offered by financial institutions, while a significant proportion of *sukūk* holders come from non-financial corporations. Thus, the two variables are complements rather than substitutes. Two pairs have higher than 0.8 correlations, namely Global-FD and Global-Telecom. However, our further investigation using the Variance Inflation Factor (VIF) technique suggests mere moderate multicollinearity among them. Winsorizing the top 5% and

bottom 5% of data points also reduces the correlation between Global and FD well below 0.8. This leaves the possibility of multicollinearity to Global-Telecom only. Therefore, we refrain from including the two independent variables in the same specification.

[Insert Table 4 here]

5. Empirical results

5.1. *Sukūk* issuance and income inequality

Table 5 shows the results of our two-stage Fractional Regression Model (FRM) estimation of the effect of *sukūk* on income inequality for our sample of 22 countries spanning the period 1995 to 2019 while controlling for the major determinants of income inequality. The seven specifications presented in the table offer consistent and robust results. The *sukūk* development has a strong positive relationship with the top 1% earners at the 1% significance level across all our specifications. This suggests that countries with well-developed *sukūk* markets exhibit a more profound income disparity, which supports our hypothesis. The marginal effect of *sukūk* issuance is also economically significant, ranging from 0.93 to 1.96. This implies that a 1% increase in the proportion of *sukūk* issuance over the GDP enhances the highest earners' claim on the population's income by 1% to 2%.

[Insert Table 5 here]

Neighboring Malaysia and Indonesia exemplify this substantial economic effect. On average, Malaysian *sukūk* issuance has been growing at 2.82% annually over the study period (1995-2019). This is more than twice that of Indonesia's 1.20% per annum expansion rate. Based on this data, our regression results suggest that the 25-year cumulative increase in Malaysia's top 1% associated with the level of *sukūk* development ranges from 0.66% to 1.39%. This deepening of income inequality is 2.4 times more acute than that of Indonesia, where the progression of *sukūk* is slower. Here, the top earners seize an additional 0.28% to

0.59% share of the country's income, *ceteris paribus*. We discuss further the rationale behind this positive impact of *sukūk* development on income inequality in Section 6.

The positive nexus between *sukūk* development and income inequality seems to be moderated after the Global Financial Crisis (GFC). It is possible that after the crisis, issuers switched to asset-backed *sukūk* to attract investors and capture the flight-to-quality phenomenon. This was also in concurrence with the infamous statement of Taqi Usmani in late 2007 that 85% of the *sukūk* in the market are not in compliance with Islamic law. It is also plausible that the industry also responded to Usmani's statement by offering more asset-backed *sukūk*. Specification (7) in Table 5 illustrates the negative marginal effect of the interaction between Crisis and *Sukūk*. This result implies that a 1% increase in *sukūk* issuance before 2009 corresponds to a 1.96% increase in income inequality. Subsequently, the magnitude of this is reduced to only 1.05% in post-2009.[14] This suggests that the market seems to have incorporated Taqi Usmani's critique and have issued a more genuine (asset-backed) *sukūk*, reducing the negative impact of income redistribution. However, the net effect remains negative.

5.2. Financial Development and income inequality

Table 5 also shows a negative link between FD and inequality, suggesting that a well-developed financial market leads to more equitable income redistribution. This result concurs with that of Banerjee and Newman (1993), Galor and Zeira (1993), Beck et al. (2007), and Zhang and Naceur (2019) but contrasts with Jaumotte et al. (2013), Jauch and Watzka (2016), De Haan and Sturm (2017), and Piketty (2017). This relationship is statistically significant at 5% in specifications (1)-(4) and 10% in specifications (5)-(7). The economic impact of FD is also non-trivial, even though it is lower than that of *sukūk*. Indeed, a 1% increase in the former

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14   It is conceivable that the changes in the structure of *sukuk* would not take place immediately. Therefore, this study presumes a minimum one-year gap between Taqi Usmani's statement and its reaction in the market.

leads to an approximately 0.1% lower income disparity. To put this magnitude in context, we examine the case of Indonesia between the period of 2010 and 2019.

The Indonesian financial institutions' contribution to the national private sector financing as a fraction of GDP grew from 27.25% in 2010 to 37.75% in 2019. Our model predicts that the increase in FD in Indonesia in the same period is associated with a 3.85% decrease in income inequality, *ceteris paribus*. That is, the share of the top 1% of income of the population earning decreased from 11.18% in 2010 to 10.75% in 2019. (The actual number of Indonesian income inequality in 2019 was 10.71%.). If Indonesia were to reduce its income inequality to 10% in the next five years, the Southeast- Asian country must attain around 63% of FD within the same time frame.

5.3.   Some other variables

Table 5 also provides interesting evidence of other determinants of income inequality. Gender loads are negative and significant at the 1% significance level across all the specifications, implying a robust negative relationship between gender empowerment and inequality. For instance, a unit increase in Gender is associated with a 0.3% or 0.4% improvement in income redistribution. This expected finding is in harmony with the vast literature on gender inequality that documents the persistent lack of economic opportunities for women over men globally (see Lusardi and Mitchell, 2014; Jayachandran, 2015; Ponthieux and Meurs, 2015; Hoffmann et al., 2020). Lusardi and Mitchell (2014) document that women are disadvantaged in terms of financial literacy, contributing to income inequality. King and Mason (2001) suggest empowering women through equality in rights, resources, and voice leads to lower income inequality and higher growth.

Our findings also document an adverse effect of countries' openness on income inequality. Global adversely affects the income disparity at the 1% significance level in 6 out

of our 7 specifications. A 1% increase in the country's openness leads to a decrease of 0.13% to 0.50% in income disparity, consistent with Wood (1997). We argue that this negative outcome is not achieved through the conventional channel of intervening in unskilled labor's demand. It is instead realized by incorporating non-economic elements into the openness dimensions. This is because our Globalization Index aggregates the *de facto* and *de jure* country's trade, financial, political, informational, and cultural openness. In other words, our study suggests that the non-economic elements of globalization play a crucial role in equalizing countries' income distribution.

From table 5, it appears that population growth is also a strong determinant of income inequality. This relationship is highly significant (at the 1% level) and economically meaningful. For instance, a 1% increase in the annual population growth escalates the income disparity by 1.55% to 1.83%. Earlier studies also document this positive relationship between population growth and inequality (see Ram, 1984; Mierau and Turnovsky, 2014).

Our results also confirm the well-known negative association between education and income inequality (see Gregorio and Lee, 2002; Sylwester, 2002; Abdullah et al., 2015). Access to school, especially the primary one, leads to a better redistribution of income. This result is robust and statistically significant at 1% across all our specifications. Its economic impact is also substantial. A 1% increase in Educ decreases income inequality by 0.30% to 0.43%.

The results in Table 5 show that the coefficients of Income are all positive and significant at the 5% significance level, indicating that the more developed economies generally suffer from higher income gaps. However, this puzzling result requires further analysis. The Muslim-majority countries contributing (the most) to this study are generally less developed but have higher income inequality than their non-OIC counterparts. The gap between the two is relatively high, ranging from 8.1% to 8.4%. This may be an early indication of how the

disparity in the quality of the political and economic institutions between OIC countries and non-OIC ones leads to the divergence of income inequality between the two regions, as suggested by Acemoglu et al. (2002).

Finally, our findings indicate a negative relationship between Telecommunication Infrastructure (Telecom) and income inequality, in harmony with Čihák and Sahay (2020). The marginal effect suggests that every additional Telecom subscription per 100 population reduces the income inequality by 0.2 basis points (bps). This result is plausible as access to Telecom infrastructure can expose households to many economic opportunities, hence improving income redistribution.

5.4. Robustness

5.4.1. *Robustness check: Government and corporate sukūk*

The positive association between *sukūk* development and income inequality may be contingent on the type of *sukūk*: government versus corporate. To check for this likelihood, we re-estimate our models using two explanatory variables: (1) *Government sukūk* market development measured by the ratio of government *sukūk* issuances to GDP (*sukūkg)*, (2) corporate *sukūk* market development measured by the ratio of corporate *sukūk* market capitalization to GDP (*sukūkc)*. Table 6 shows the results of our government *sukūk* regressions, while Table 7 illustrates the regression outcomes for the corporate *sukūk*. The results in Tables 6 and 7 persistently show the positive effect of *sukūk* (both government and corporate) on income inequality. Moreover, the relationship between FD and other independent variables and income inequality is highly consistent. It is worth mentioning that the marginal effect of *sukūkc* on income inequality is significantly higher than that of *sukūkg*. One plausible reason behind this difference stems from the divergence of the investor base between the two types. Corporate *sukūk* is practically designated and sold to institutional investors or high net worth investors.

On the other hand, government *sukūk* offers investment opportunities for all investors, including those in the middle and bottom income categories. Therefore, the adverse impact of *sukūkc* issuances on income inequality is expected to be higher than that of their government counterparts.

[Insert Tables 6 & 7 here]

5.4.2. *Robustness check: reduced samples*

Table 8 provides an additional robustness check by excluding countries with a proportion of *sukūk* issuance to the GDP of less than five bps.[15] The view is that the regression results may be diluted by including countries with an insignificant amount of *sukūk* issuances. This leads us to eliminate Bangladesh, the Netherlands, Switzerland, and the United Kingdom from our sample. Again, Table 8 illustrates consistent and robust findings concurring with the previous results. *Sukūk* positively impacts income inequality across different types of government and corporate issuances. The economic magnitude of corporate *sukūk* is the highest among the different types of issuance. This is in harmony with Tables 5, 6, and 7. The impact of FD on income inequality is also consistently negative across different panels.

[Insert Table 8 here]

5.4.3. *Robustness check: Gini coefficient*

Finally, to assess the robustness of our results, we re-estimate our models using the Gini coefficient as an alternative measure of income inequality. Gini coefficient complements the top 1% as it captures the income inequality of the entire population and is more sensitive to the center of the income distribution instead of its tails. The evidence in Table 9 shows that the results are overall consistent with the original ones. *Sukūk* issuance is positively and

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15   Given that Telecom and Globalization have a high correlation, Table 8 reports only Globalization for brevity. However, substituting Globalization with Telecom yields consistent findings.

significantly related to Gini regardless of the types of the *Sukūk* and the regression models used. Here, the positive effect of *Sukūk* on inequality has also been moderated after the GFC for both the government and corporate issuances. However, the reduction in the former is more than three times bigger than that of the latter. FD also persistently has a negative relationship with Gini.

[Insert Table 9 here]

Interestingly, the positive effects of ethnic diversity on income inequality are evident in the Gini model. All the regression models in Table 9 indicate that countries with higher ethnic diversity tend to experience higher income inequality, consistent with Desmet et al. (2012) and Strum and De Haan (2015). A 1% increase in the probability of the two randomly selected individuals (in the country) coming from different racial backgrounds is associated with 0.06% or 0.13% higher income inequality.

6. Discussions of our results

The positive relationship between *sukūk* development and income inequality reinforces the socio-economic problems in conventional bonds, as suggested in Azzimonti et al. (2014) and Mian et al. (2020). Our ethical framework in Figure 1 predicts that these issues stem from the agency costs of debt (*ribā*) and excessive risk-taking (*gharar*) in its structure. Even though this conclusion is unfavorable to the IF proponents, it is not surprising. The half-century of IF experimentation has been mainly centered around the jurisprudential (*fiqh)*-based product development with little emphasis on socio-economics. It is in no way that we underestimate the role of *fiqh* in the innovation process. However, the following fundamental flaws of *sukūk* illustrate that reliance on only legal theory is not enough to realize the ethical objectives of Islamic law.

First, the design of *sukūk* is captivated by traditional transaction methods at the expense of socio-economic efficiency. IF strives to restructure conventional debt contracts by reviving medieval (8th to the late 14th century) contracts of the prosperous era of the Muslim world (Pamuk and Shatzmiller, 2014). The industry employs those contracts merely as a legal stratagem to evade the issue of *ribā* and *gharar*. In practice, *sukūk* design is similar to debt facility but less efficient and riskier, as elaborated below.[16]

First, the cost-plus *Murabaha* contract (accounting for roughly 41.76% of the existing *sukūk* in March 2021, according to Bloomberg) implies a fixed rate that exposes the transaction to the market risk and hence the risk-shifting problem. This is not to mention that the reverse *Murabaha* (organized *Tawarruq*) or sale and buy-back arrangement (*Inah*) replicates a conventional debt facility, thereby suffering from the twin issues of *ribā* and *gharar*. The financial leasing (*Ijara*) contract (roughly employed in 21.65% of the *sukūk* in March 2021) may reduce the risk-shifting and underinvestment issues as a floating (i.e., adjustable) rate is allowed in pricing the facility. However, the contract requires the issuer to have an income-generating asset for the underlying transaction. It disallows the securitization of intangible or even non-income producing (i.e., growth) assets and discourages greenfield (non-existing) infrastructure financing (Jatmiko et al., 2021).

Second, the asset centrality holds only in theory as most *sukūk* are asset-based instead of asset-backed (Jatmiko et al., 2021). In the latter, the underlying asset is real. Not only does it become the source of cash flows for the *sukūk* holders, but it also serves as collateral. In the event of default, the holders have recourse to the underlying asset. These features, however, barely exist in the contemporary *sukūk*. Its asset-based structure does not truly transfer the title of the underlying asset to the SPV. This leaves the *sukūk* holders no recourse to the collateral

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16   The empirical literature documents that *sukūk* is generally issued by less profitable and high leveraged firms with severe information opacity (Mohamed et al., 2015; Minhat and Dzolkarnaini, 2017; Nagano, 2017; Klein et al., 2018).

in the event of default, thus aggravating the risk of the facility. The payoffs of securitization also diverge from that of the underlying assets. On the contrary, the industry prices *sukūk* employing interest-based benchmark, as discussed below.

Third, interest-based pricing is one of the most endemic problems of the IF industry. *Sukūk* is no exception (Kuran, 2018). This type of pricing disconnects with the underlying asset's performance and amplifies the agency costs of debt in IF products. The industry mainly relies on local variants of LIBOR for pricing. This is regardless of the contractual types of *sukūk*.[17]

Finally, the disconnect between the innovation process and *Maqāsid al-Sharī'ah* is also attributed to the institutional failure of *Sharī'ah* certification. Gözübüyük et al. (2020) argue that the lack of innovation roots in the interlocking network and monopoly of the religious scholars who legitimate the issuance of *sukūk*. Another study raises the governance issue as the industry pays those scholars for legitimizing their issuance (Al Mannai and Ahmed, 2019). Hasan (2014) documents that while religious scholars are experts on Islamic jurisprudence, their inadequate technical knowledge of the financial instruments, institutions, and markets leads to the lack of reinforcing the ethical dimensions of the *Sharī'ah* in the *sukūk* development process.

To summarize, the deviation of *sukūk* in practice from that hypothesized is not surprising. Developing products without implementing the objectives of the Islamic law converges the securitization to a facility that is even less efficient and riskier than plain vanilla debt. It thus fails to remedy the positive nexus between financialization and inequality.

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17   In 2011, the IF industry attempted to delink from LIBOR by inventing the IIBR. However, this alternative pricing offered a trivial difference from and was priced higher than the LIBOR. Jatmiko et al. (2022) document the short-run and long-run convergence between LIBOR (and its local variants) and IIBR. It is thus unsurprising that the IIBR was discontinued from August 18, 2016.

7.   Conclusions

Equitable income distribution is an integral part of the ethical objectives of Islam to attain socio-economic justice. However, to the best of our knowledge there has been no attempt to link the development of *sukūk* with inequality. This is despite its growing importance as a corporate and government financing facility in developing and developed economies. The theory offers divergent predictions of the *sukūk*-inequality nexus. Banerjee and Newman (1993) and Galor and Zeira (1993) advocate for a negative link between finance and inequality, while Greenwood and Jovanovic (1990) postulate the Kuznets' inverted U-curve style relationship between the two. The recent literature documents a positive effect of finance in exaggerating income inequality as prescribed by Piketty (2017). This paper examines the role of *sukūk* development on income inequality in light of the above-competing theories.

We employ a large cross-country sample of both OIC and non-OIC *sukūk*-issuing countries over the 1995-2019 period. Our findings document a positive nexus between *sukūk* development and the top 1% earners. A 1% increase in the *sukūk* issuance induces a hike in income inequality from 0.93% to 1.96%. This result contradicts Abedifar et al. (2016), who establish a negative link between IBs and inequality but is in harmony with Mian et al. (2020), who demonstrate the positive relationship between bond issuance and income inequality. However, our findings also document that *sukūk* development has improved, especially in the post-GFC, where the flight-to-safety may have incentivized issuers to offer more asset-backed *sukuk*. This motive may also be driven by the infamous 2007 statement of Taqi Usmani, suggesting that 85% of *sukūk* are not Islamic. The statement seems to induce a feedback mechanism in the structure of *sukūk* and thus reduces its adverse impact on income redistribution.

Our results also suggest a negative link between inequality and FD. In general, a 1% improvement in our proxy of FD corresponds to a 0.1% reduction in income inequality. This

is consistent with Banerjee and Newman (1993), Galor and Zeira (1993), Beck et al. (2007), and Zhang and Naceur (2019), but in contrast to Greenwood and Jovanovic's (1990), Clarke et al. (2006) and Kim and Lin (2011), Jaumotte et al. (2013), Jauch and Watzka (2016), De Haan and Sturm (2017), and Piketty (2017).

The *sukūk*-inequality implication is prevalent in our study. *Sukūk* fails to incorporate the ethical objectives of Islamic law in its product development. *Sukūk* design is captivated by inefficient medieval contracting, preferential employment of asset-based (instead of asset-backed) structure, and reliance on interest-based pricing models. The overly concentrated network of religious scholars who grant *Sharī'ah* certifications exacerbates these problems. Like other IF products, *Sukūk* has hitherto been developed on a narrow adherence to legal theory without contextualizing its socio-economic ramifications. This makes 'Islamic' securitization mimic the conventional bonds, albeit inefficiently and with excessive risk. The ill-effects of agency costs of debt (*ribā*) and unreasonable risk (*gharar*) persist. These two endemic issues embedded in debt are among the sources of inequality from an ethical and economic perspective. This is why our study documents a positive link between *sukūk* and inequality. The only way forward is by incorporating the moral objectives of Islamic law in the *sukūk* development process.

We acknowledge some limitations of our study. We do not categorize *sukūk* based on the form of contract (*Murabaha, Ijara, Wakala bil Istithmar, Mudharaba*, etc.) due to data availability and sufficiency constraints. We have argued in this paper that, in practice, *sukūk* is primarily unsecured securities mimicking conventional bonds. However, accounting for the above categories can help us evaluate their varied impacts on income redistributions. Moreover, our paper only emphasizes the flow concept of inequality (i.e., income) and is silent on wealth disparity. These are the gaps that future research can aim to fill.

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Appendix: Figures and Tables

Figures

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┌─────────────────────────────────────────────────────────────┐
│                  Sources of Islamic Ethics                   │
│   Al-Qur'ān (scripture) & Aḥādīth (Prophetic traditions)     │
└─────────────────────────────────────────────────────────────┘

┌─────────────────────────────────────────────────────────────┐
│                        Objective                             │
│   Society's betterment towards Falāh: Preventing harms and   │
│                 promoting human welfare.                     │
└─────────────────────────────────────────────────────────────┘

                      ┌──────────────────┐
                      │  Ethical Axioms  │
                      └──────────────────┘

┌──────────────┐     ┌────────────────────────┐     ┌──────────────┐
│ Divine unity │ <-> │ Socio-economic justice │ <-> │ Trusteeship  │
└──────────────┘     └────────────────────────┘     └──────────────┘

              ┌─────────────────────────────────────┐
              │              Corollary              │
              │ Equitable distribution of income    │
              │            and wealth               │
              └─────────────────────────────────────┘

┌─────────────────────────────────────────────────────────────┐
│             Application of Ethics in Sukūk                   │
│ Sukūk should alleviate the ill-effects of ribā and gharar to │
│ address the inequality issue embedded in interest-bearing    │
│                         debt.                                │
└─────────────────────────────────────────────────────────────┘
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Ribā		*Gharar*
Financial Decoupling-led Risk-shifting	Price Gouging-led Underinvestment	Excessive Risk-taking
• Aids disproportionate growth of financial sector • Lowers productive investments • Privatizes gains but socializes losses	• Constraints access to finance for MSMEs • Deters borrowers' growth potential • Prevents debt retirement leading to debt-trap	• Serves as a medium of speculation for the rich • Impedes equitable resource allocation.

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┌─────────────────────────────────────────────────────────────┐
│           Deteriorating socio-economic inequality           │
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Figure 1. Ethical framework for *sukūk*
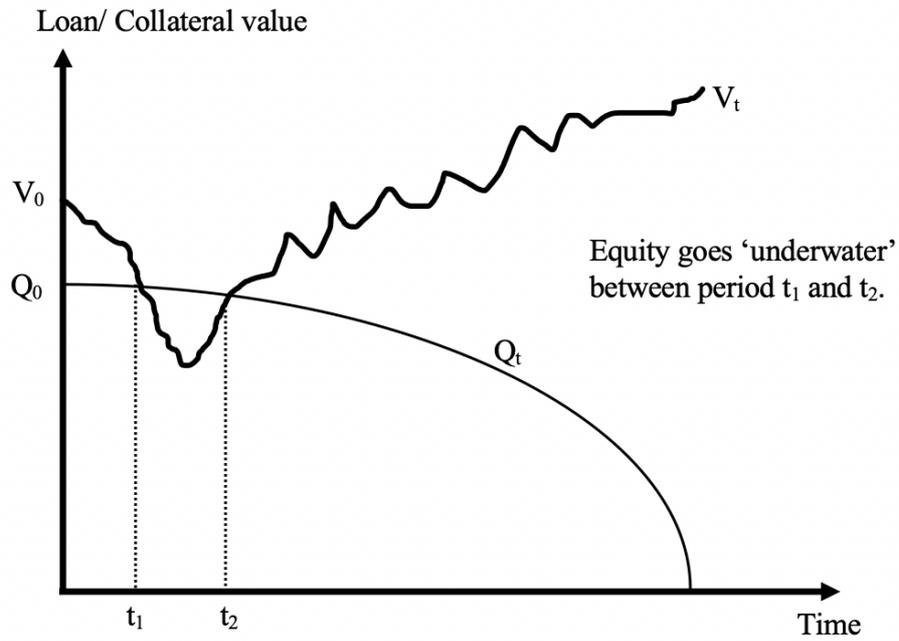
Figure 2. Risk-shifting

Notes: The equity goes underwater when the value of the asset (V_t) is lower than the debt obligation (Q_t), as observed in the interval (t_1, t_2). This leads the borrower to default by transferring the downside risk of the asset to the financier. Source: Jatmiko et al. (2022).
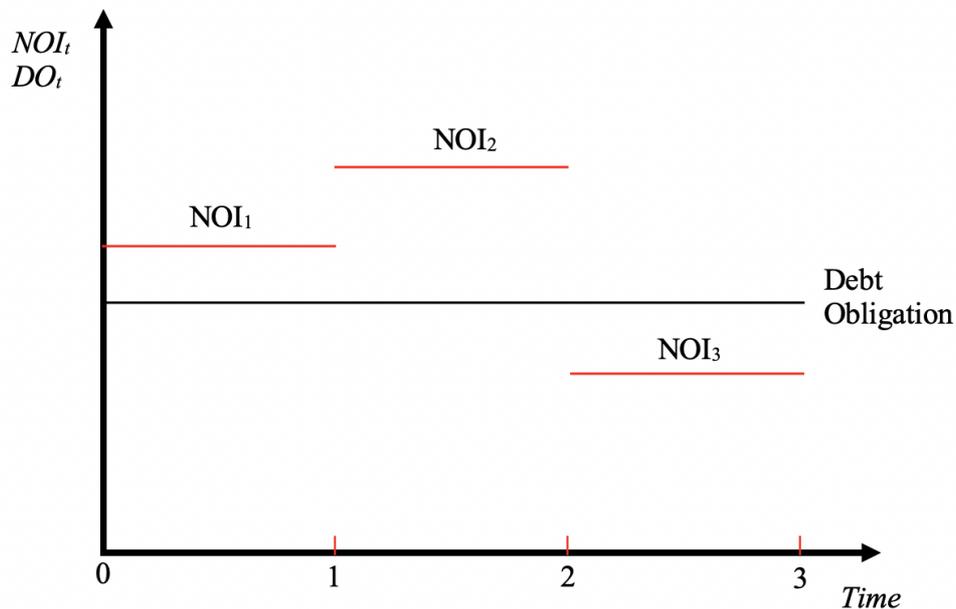
Figure 3. Underinvestment

Notes: Underinvestment occurs in Period 3 when the borrower's Net Operating Income (NOI_t) is lower than its Debt Obligations (DO). Here, the borrower rejects profitable (i.e., the positive net present value - NPV) projects as the additional wealth mainly accrues to the financier. Source: Jatmiko et al. (2022)
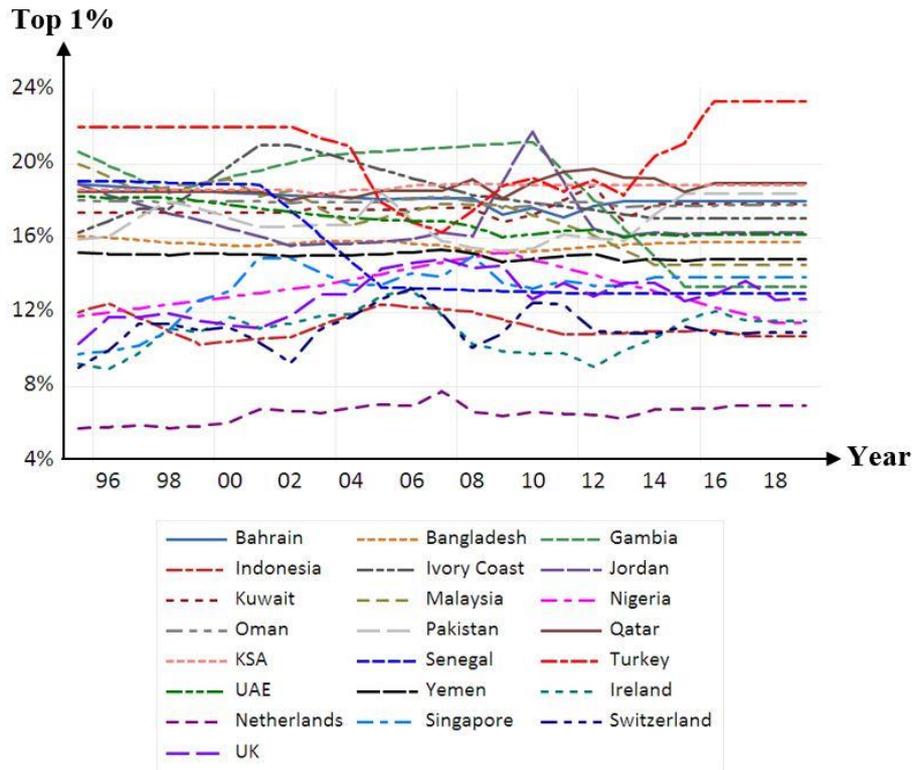
Top 1%

Figure 4. Share of the top 1 percent income group (1995-2019)
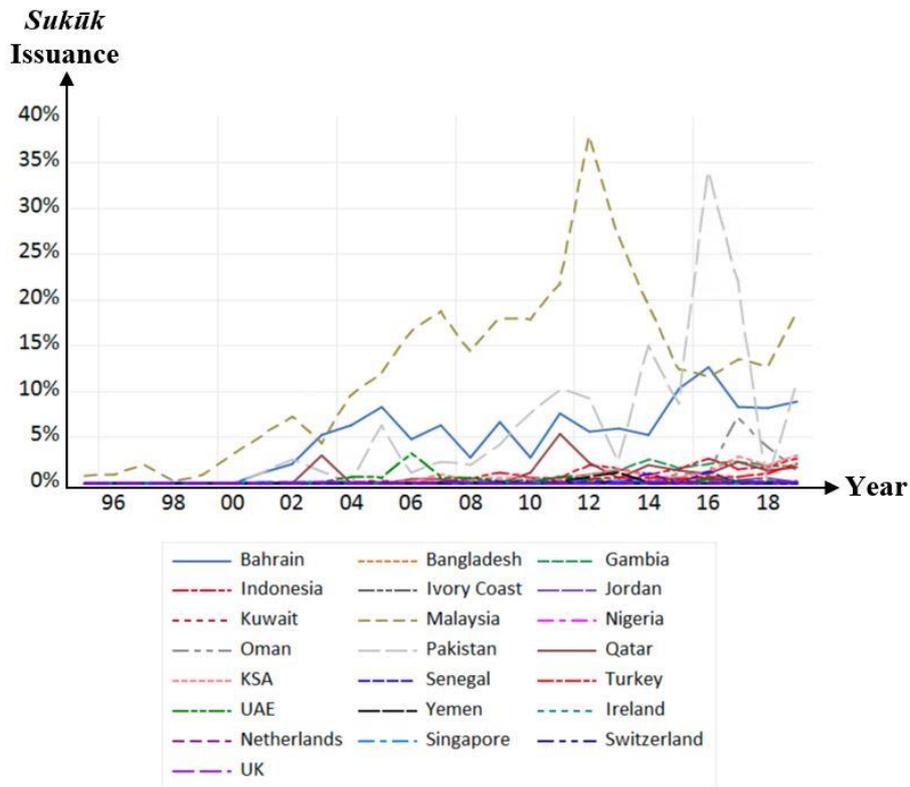
***Sukūk* Issuance**

Figure 5. *Sukūk* issuance over GDP (1995-2019)

Tables

Table 1. Selected Empirical Literature on Differences between *Sukūk* and Bonds

| Author(s)	Period	Sample	Methodology	Main Findings
Samitas et al. (2021)	2010-2020	USA, Malaysia, Indonesia, Africa, and Qatar *sukūk* and bond indices	Time-Varying Parameter (TVP) VAR	*Sukūk* and bond markets are highly integrated and interconnected.
Saeed et al. (2021)	2002-2013	Malaysian *sukūk* and bonds	Fixed Effect Model	The determinants of bond yield spread come from firm-and bond-specifics, while that of *sukūk* stem only from firm-level variables.
Hossain et al. (2020)	2010-2016	Malaysian *sukūk* and bonds portfolio	Autoregressive Distribution Lag (ARDL)	The performance of *sukūk* is not related to that of bonds. However, *sukūk* offers less risk-adjusted return than its conventional counterparts.
Bhuiyan et al. (2020)	2010-2015	Global *sukūk* and bond and indices	Value-at-Risk (VaR)	*Sukūk* offers lower VaR than bonds. Therefore, combining it into a bond index reduces the overall portfolio risk.
Ahmed and Elsayed (2019)	2007-2017	Malaysian *sukūk* and bonds	Vector Autoregression (VAR)	*The sukūk* market is closely interconnected with bonds. As a result, *sukūk* is the highest net receiver of the Malaysian capital market spillovers.
Bhuiyan et al. (2019)	2010-2015	Malaysian *sukūk* and bonds indices (US, UK, Australia, Canada, Germany, and Japan).	Wavelet Coherence and multivariate-GARCH.	Combining *sukūk* with bonds can be an efficient portfolio diversification, yielding a lower unconditional correlation and weak co-movement.
Shafron (2019)	2005-2013	Malaysia *sukūk* and bonds	Fama & French (2007)	Investors' tastes imply different demand distributions of *sukūk* and conventional bonds. As a result, investors' preference for the Sharī'ah investment products lowers their price compared to their traditional counterparts.
Hassan et al. (2018)	2010-2014	Europe, US, Emerging markets.	Multivariate GARCH	*Sukūk* can be a potential diversification instrument for bond investors as their correlation with bonds indices is relatively low. However, this diversification opportunity diminishes in high uncertainty periods.
Azmat et al. (2017)	2002-2010	458 *sukūk* from 83 issuers in Malaysia.	Ordered Probit	The determinant of *sukūk* rating converges to that of conventional bonds except for the characteristics of *sukūk*.
Haque et al. (2017)	2007-2013	Malaysian government *sukūk* and bonds.	Continuous Wavelet Transform	The cost of capital of *Sukūk* and their return are distinct from that of bonds. The former is relatively more costly than the latter.

Klein et al. (2017)	2000-2013	2140 *sukūk* and bonds issuances from 133 issuers in Malaysia.	Event study and multivariate OLS	During Ramadan, investors penalize the issuance of bonds but appreciate that of *sukūk*. However, the benefit of issuing *sukūk* disappears when the firm also issues bonds simultaneously.
Naifar et al. (2017)	2010-2014	Dow Jones (DJ) & Malaysian *sukūk* indices; DJ Asia & Malaysia corporate bond indices.	Quantile regression	*Sukūk* diverges from the conventional bonds in terms of co-movement profile with global and regional economic uncertainty.
Maghyereh and Awartani (2016)	2005-2014	Dow Jones Citigroup *Sukūk* and Bonds Index and the Dow Jones Global and Islamic stock market index.	VAR and DCC-GARCH	Diversification opportunity exists between *sukūk* and bonds, for they have different transmission mechanisms. The former is a net receiver of equity and bond markets spillovers.
Godlewski et al. (2013)	2002-2009	Malaysian public listed companies (77 *sukūk*, 93 bonds).	Event study	The stock market is neutral to the announcements of conventional bond issuance while it reacts negatively to that of *sukūk*.
Cakir and Raei (2007)	1999-2007	Malaysia, Pakistan, Qatar, and Bahrain	VaR	Adding *sukūk* into the international bond portfolio yields a lower VaR and thus diversifies a portfolio.

Table 2. Variable definitions and data sources

Variable name	Definition	Source
Dependent Variables		
Income Inequality (Top1%)	The share of the top 1% income group over the population's total income.	World Inequality Database
GINI (Gini)	Gini Coefficient	World Bank, Local statistics bureau
Independent and Control Variables		
Sukūk	The *sukūk* development: the ratio of annual *sukūk* market capitalization to GDP.	Bloomberg, World Bank
Financial Development (FD)	The financial institutions' claim on the private sector as a percentage of GDP.	World Bank
Gender Equality (Gender)	The Women, Business and the Law (WBL): A 1-100-scale index gauging how institutions promote women's economic opportunity.	World Bank
Globalization Index (Global)	The KOF Globalization Index: An aggregate index measuring the *de facto* and *de jure* level of globalization in the trade, financial, interpersonal, informational, cultural, and political dimensions.	KOF Swiss Economic Institute
Ethnic-fractionalization (Ethnic)	Historical Index of Ethnic Fractionalization: The likelihood of two randomly selected individuals in the same country coming from a different ethnic group.	Harvard Dataverse
Population growth (Popg)	The annual percentage changes of the midyear estimated population.	World Bank
School Enrolment (Educ)	The ratio of total primary school enrollment, regardless of age, to the population of the age primary education group.	World Bank
GDP per Capita Growth Gdpg)	The annual growth rate of the GDP.	World Bank
Income Category (Income)	A categorical variable: low (0), low-middle (1), upper-middle (2), and high-income country (3).	World Bank
Inflation (Inf)	The annual percentage changes of the Consumer Price Index.	World Bank
Telecommunication Infrastructure (Telecom)	The yearly subscriptions per 100 people of fixed telephone, voice-over-IP, fixed wireless local loop, ISDN voice-channel equivalents, and fixed public payphones.	World Bank
Post-Global Financial Crisis (Crisis)	A dummy variable coded 1 for 2009 onwards.	
Instrumental Variables		
Legal Origin (Lo)	A categorical variable: French-origin (0); English-origin (1); German-origin (2).	La Porta et al. (1998)
Investment Profile (Ip)	Factors affecting the risk to investment that are not covered by other political, economic, and financial risk components.	The International Country Risk Guide (ICRG)
Corruption (Corr)	Risk of actual or potential corruption in the forms of excessive patronage, nepotism, job reservations, 'favor-for-favors,' secret party funding, and suspiciously close ties between politics and business.	ICRG

Table 3. Descriptive statistics

	Obs.	Mean	Std. Dev.	Min.	Max.
Top1%	550	15.505	3.570	5.770	23.350
Gini	300	37.316	5.483	27.600	49.100
Sukūk	550	1.222	3.938	0.000	37.970
FD	550	58.017	46.299	1.385	192.592
Gender	550	53.996	23.288	17.500	97.500
Global	550	64.978	14.664	34.445	90.984
Ethnic	550	49.587	26.128	2.266	85.400
Popg	550	2.667	2.467	-3.219	19.138
Educ	550	95.480	13.370	0.000	119.033
Gdpg	550	5.150	12.101	-56.384	91.35
Inf	550	5.407	10.172	-4.863	89.113
Income	550	3.000*	1.041	0.000	3.000
Telecom	550	19.474	18.900	0.072	74.988
Crisis	550	0.400	0.490	0.000	1.000
Lo	550	0.000*	0.584	0.000	2.000
Ip	550	8.687	2.269	2.000	12.000
Corr	550	2.908	1.128	1.000	6.000

All variables are presented in percentage (%) except for Gender, Telecom, Income, Crisis, Lo, Ip, and Corr. * represents the value of mode instead of mean. The variable definitions follow Table 2.

Table 4. Correlation matrix

Variables	Top1%	*Sukūk*	FD	Gender	Global	Ethnic	Popg	Educ	Gdpg	Inf	Income	Tel	Crisis	Lo	Ip	Corr
Sukūk	0.121															
FD	-0.416	0.109														
Gender	-0.595	-0.114	0.460													
Global	-0.480	0.096	0.866	0.523												
Ethic	0.228	0.147	-0.307	-0.049	-0.264											
Popg	0.365	0.001	-0.253	-0.462	-0.170	0.247										
Educ	-0.302	0.052	0.426	0.117	0.503	-0.193	-0.049									
Gdpg	0.005	-0.013	-0.141	-0.031	-0.080	-0.010	-0.002	0.016								
Inf	0.173	-0.059	-0.282	-0.090	-0.237	0.031	0.018	-0.024	0.110							
Income	-0.174	-0.027	0.613	0.098	0.725	-0.141	0.069	0.542	-0.022	-0.249						
Telecom	-0.486	-0.094	0.771	0.538	0.830	-0.312	-0.208	0.447	-0.024	-0.162	0.701					
Crisis	-0.072	0.200	0.132	0.148	0.232	0.047	-0.088	0.172	-0.169	-0.136	0.000	-0.099				
Lo	-0.261	0.195	0.439	0.380	0.259	-0.094	-0.246	0.087	-0.018	-0.108	0.000	0.389	0.000			
Ip	-0.199	0.017	0.528	0.198	0.647	-0.201	0.088	0.369	0.017	-0.261	0.608	0.577	0.068	0.086		
Corr	-0.502	-0.137	0.732	0.551	0.729	-0.337	-0.304	0.294	-0.059	-0.267	0.520	0.752	0.081	0.263	0.512	
Gini	0.671	0.150	-0.211	-0.212	-0.249	0.442	0.540	-0.348	0.003	0.076	-0.361	-0.320	-0.082	-0.123	-0.136	-0.297

The variable definitions follow Table 2. While two correlations are higher than 0.8, their calculated Variance Inflation Factors (VIFs) show mere moderate multicollinearity. Global-FD: 4.01 and Global-Telecom: 3.21. Moreover, winsorizing the outliers of the data leaves the Global-Telecom as the only pair with a correlation higher than 0.8. (Global-FD becomes 0.619). We control this potential multicollinearity by not including Global-Telecom in the same system equation.

Table 5. Regression results

	(1) Top1%	(2) Top1%	(3) Top1%	(4) Top1%	(5) Top1%	(6) Top1%	(7) Top1%
Sukūk	1.040***	1.432***	1.435***	1.430***	1.354***	0.928***	1.964***
	(0.194)	(0.228)	(0.227)	(0.233)	(0.236)	(0.214)	(0.417)
FD	-0.105**	-0.109**	-0.110**	-0.111**	-0.099*	-0.107*	-0.099*
	(0.053)	(0.053)	(0.053)	(0.051)	(0.051)	(0.055)	(0.051)
Gender	-0.004***	-0.003***	-0.003***	-0.003***	-0.003***	-0.004***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Global	-0.134**	-0.419***	-0.432***	-0.432***	-0.475***		-0.499***
	(0.058)	(0.071)	(0.070)	(0.070)	(0.076)		(0.076)
Ethnic	0.069***	0.037	0.035	0.036	0.032	0.063***	0.031
	(0.026)	(0.026)	(0.026)	(0.027)	(0.027)	(0.024)	(0.027)
Popg	1.828***	1.760***	1.741***	1.749***	1.741***	1.549***	1.636***
	(0.335)	(0.341)	(0.341)	(0.355)	(0.348)	(0.004)	(0.357)
Educ	-0.304***	-0.408***	-0.401***	-0.396***	-0.421***	-0.423***	-0.427***
	(0.070)	(0.071)	(0.070)	(0.072)	(0.075)	(0.080)	(0.075)
Income		0.045***	0.046***	0.045***	0.051***	0.030**	0.053***
		(0.009)	(0.009)	(0.011)	(0.012)	(0.012)	(0.012)
Gdpg			-0.088	-0.085	-0.071	-0.066	-0.072
			(0.071)	(0.076)	(0.077)	(0.078)	(0.077)
Inf				-0.041	-0.001	-0.024	0.016
				(0.263)	(0.266)	(0.268)	(0.267)
Crisis					0.021	-0.009	0.030*
					(0.015)	(0.014)	(0.016)
Telecom						-0.002**	
						(0.001)	
Sukūk*Crisis							-0.915**
							(0.443)
Intercept	-1.057***	-0.867***	-0.860***	-0.861***	-0.831***	-1.048***	-0.815***
	(0.070)	(0.070)	(0.069)	(0.069)	(0.074)	(0.085)	(0.074)
Observations	550	550	550	550	550	550	550
Pseudo R^2	0.466	0.485	0.487	0.487	0.488	0.474	0.490

This table reports the marginal effects of the two-stage Fractional Regression Model (FRM) with robust standard errors in parentheses. We instrument the FD variable using Lo, Ip, and Corr. All variable definitions follow Table 2. In addition to the post-Global Financial Crisis, the Crisis variable also captures the aftermath of the infamous statement of Taqi Usmani, suggesting the majority of the *Sukūk* are non-Sharī'ah Compliant. ***, **, * respectively represent significance at 1%, 5%, and 10%.

Table 6. Robustness check: Government *Sukūk*

	(1) Top1%	(2) Top1%	(3) Top1%	(4) Top1%	(5) Top1%	(6) Top1%	(7) Top1%
Sukūkg	1.110***	1.553***	1.556***	1.545***	1.395***	0.954***	2.184***
	(0.290)	(0.323)	(0.325)	(0.332)	(0.339)	(0.313)	(0.649)
FD	-0.097*	-0.098*	-0.099*	-0.100*	-0.088*	-0.094*	-0.088*
	(0.053)	(0.053)	(0.053)	(0.051)	(0.051)	(0.055)	(0.051)
Gender	-0.004***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Global	-0.118**	-0.372***	-0.385***	-0.384***	-0.426***		-0.440***
	(0.059)	(0.072)	(0.071)	(0.071)	(0.079)		(0.078)
Ethnic	0.077***	0.050*	0.048*	0.049*	0.046*	0.069***	0.046*
	(0.025)	(0.026)	(0.026)	(0.026)	(0.026)	(0.024)	(0.027)
Popg	1.762***	1.688***	1.669***	1.678***	1.670***	1.519***	1.586***
	(0.331)	(0.333)	(0.333)	(0.348)	(0.342)	(0.342)	(0.349)
Educ	-0.310***	-0.405***	-0.399***	-0.393***	-0.417***	-0.418***	-0.422***
	(0.071)	(0.071)	(0.071)	(0.073)	(0.076)	(0.080)	(0.076)
Income		0.041***	0.042***	0.040***	0.046***	0.030**	0.047***
		(0.009)	(0.009)	(0.011)	(0.012)	(0.012)	(0.012)
Gdpg			-0.086	-0.083	-0.069	-0.065	-0.068
			(0.072)	(0.077)	(0.077)	(0.078)	(0.078)
Inf				-0.047	-0.009	-0.027	-0.001
				(0.266)	(0.270)	(0.271)	(0.270)
Crisis					0.209	-0.007	0.028
					(0.015)	(0.015)	(0.016)
Telecom						-0.002**	
						(0.001)	
Sukūkg*Crisis							-1.120
							(0.688)
Intercept	-1.058***	-0.886***	-0.879***	-0.881***	-0.851***	-1.055***	-0.815***
	(0.070)	(0.070)	(0.070)	(0.070)	(0.074)	(0.085)	(0.074)
Observations	550	550	550	550	550	550	550
Pseudo R^2	0.462	0.478	0.480	0.480	0.481	0.470	0.490

This robustness check focuses only on the government *Sukūk* sample (*Sukūkg*). The marginal effects of the two-stage Fractional Regression Model (FRM) are reported with robust standard errors in parentheses. We instrument the FD variable using Lo, Ip, and Corr. All variable definitions follow Table 2. In addition to the post-Global Financial Crisis, the Crisis variable also captures the aftermath of the infamous statement of Taqi Usmani, suggesting the majority of the *Sukūk* are non-Sharī'ah Compliant. ***, **, * respectively represent significance at 1%, 5%, and 10%.

Table 7. Robustness check: Corporate *Sukūk*

	(1) Top1%	(2) Top1%	(3) Top1%	(4) Top1%	(5) Top1%	(6) Top1%	(7) Top1%
Sukūkc	4.483***	6.068***	6.168***	6.147***	6.646***	3.922***	6.124***
	(0.932)	(1.137)	(1.138)	(1.156)	(1.199)	(0.958)	(1.582)
FD	-0.096*	-0.095*	-0.097*	-0.098**	-0.080	-0.100*	-0.079
	(0.052)	(0.052)	(0.051)	(0.050)	(0.049)	(0.053)	(0.049)
Gender	-0.004***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Global	-0.150**	-0.445***	-0.462***	-0.462***	-0.573***		-0.574***
	(0.059)	(0.075)	(0.074)	(0.074)	(0.081)		(0.081)
Ethnic	0.075***	0.046*	0.044*	0.044*	0.029	0.069***	0.029
	(0.025)	(0.026)	(0.025)	(0.026)	(0.025)	(0.024)	(0.025)
Popg	1.859***	1.793***	1.775***	1.786***	1.801***	1.548***	1.847***
	(0.355)	(0.369)	(0.369)	(0.381)	(0.374)	(0.358)	(0.381)
Educ	-0.298***	-0.403***	-0.396***	-0.389***	-0.443***	-0.438***	-0.446***
	(0.070)	(0.071)	(0.071)	(0.072)	(0.075)	(0.081)	(0.075)
Income		0.046***	0.048***	0.046***	0.060***	0.031**	0.060***
		(0.009)	(0.009)	(0.011)	(0.013)	(0.012)	(0.013)
Gdpg			-0.101	-0.096	-0.072	-0.064	-0.071
			(0.071)	(0.076)	(0.076)	(0.077)	(0.075)
Inf				-0.054	0.035	-0.011	0.034
				(0.260)	(0.264)	(0.267)	(0.263)
Crisis					0.041***	0.001	0.038**
					(0.015)	(0.014)	(0.015)
Telecom						-0.002**	
						(0.001)	
Sukūkc*Crisis							1.398
							(1.874)
Intercept	-1.061***	-0.869***	-0.860***	-0.861***	-0.788***	-1.042***	-0.788***
	(0.071)	(0.072)	(0.072)	(0.072)	(0.077)	(0.085)	(0.077)
Observations	550	550	550	550	550	550	550
Pseudo R^2	0.467	0.486	0.488	0.488	0.494	0.475	0.495

This robustness check focuses only on the corporate *Sukūk* sample (*Sukūkc*). The marginal effects of the two-stage Fractional Regression Model (FRM) are reported with robust standard errors in parentheses. We instrument the FD variable using Lo, Ip, and Corr. All variable definitions follow Table 2. In addition to the post-Global Financial Crisis, the Crisis variable also captures the aftermath of the infamous statement of Taqi Usmani, suggesting the majority of the *Sukūk* are non-Sharī'ah Compliant. ***, **, * respectively represent significance at 1%, 5%, and 10%.

Table 8. Robustness check: Reduced Samples

	(1) Top1%	(2) Top1%	(3) Top1%	(4) Top1%	(5) Top1%	(6) Top1%
Sukūk (All)	1.324***			1.687***		
	(0.236)			(0.383)		
Sukūkg		1.377***			1.823***	
		(0.340)			(0.582)	
Sukūkc			5.719***			5.273***
			(1.126)			(1.437)
FD	-0.256**	-0.138**	-0.125**	-0.154**	-0.137**	-0.125**
	(0.067)	(0.067)	(0.063)	(0.067)	(0.066)	(0.063)
Gender	-0.002***	-0.002***	-0.002***	-0.002***	-0.003***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Global	-0.272***	-0.217**	-0.375***	-0.294***	-0.229**	-0.374***
	(0.094)	(0.097)	(0.099)	(0.096)	(0.098)	(0.100)
Ethnic	0.025	0.040	0.023	0.023	0.039	0.023
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.029)
Popg	1.382***	1.290***	1.438***	1.325***	1.245***	1.477***
	(0.350)	(0.346)	(0.370)	(0.355)	(0.350)	(0.378)
Educ	-0.438***	-0.436***	-0.447***	-0.439***	-0.437***	-0.450***
	(0.085)	(0.086)	(0.084)	(0.085)	(0.086)	(0.084)
Income	0.049***	0.044***	0.056***	0.051***	0.045***	0.056***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Gdpg	-0.112	-0.111	-0.108	-0.112	-0.110	-0.107
	(0.079)	(0.080)	(0.078)	(0.079)	(0.080)	(0.078)
Inf	-0.069	-0.076	-0.039	-0.058	-0.071	-0.040
	(0.255)	(0.257)	(0.254)	(0.256)	(0.258)	(0.253)
Crisis	-0.007	-0.007	0.016	0.000	-0.003	0.014
	(0.016)	(0.017)	(0.016)	(0.018)	(0.019)	(0.017)
*Sukūk(a/g/c)*Crisis*				-0.551	-0.644	1.189
				(0.408)	(0.621)	(1.771)
Intercept	-0.912***	-0.940***	-0.876***	-0.902***	-0.933***	-0.875***
	(0.075)	(0.076)	(0.080)	(0.076)	(0.076)	(0.080)
Observations	450	450	450	450	450	450
Pseudo R^2	0.311	0.302	0.314	0.312	0.302	0.315

This robustness check excludes Bangladesh, Netherlands, Switzerland, and the United Kingdom from our sample as their proportion of the *Sukūk* issuance to the GDP is less than 5 bps. The marginal effects of the two-stage Fractional Regression Model (FRM) are reported with robust standard errors in parentheses. We instrument the FD variable using Lo, Ip, and Corr. All variable definitions follow Table 2. In addition to the post-Global Financial Crisis, the Crisis variable also captures the aftermath of the infamous statement of Taqi Usmani, suggesting the majority of the *Sukūk* are non-Sharī'ah Compliant. *Sukūk(a/g/c)*Crisis* represents the interaction between Crisis and *Sukūk* (Panel 4), *Sukūkg* (Panel 5), and *Sukūkc* (Panel 6). ***, **, * respectively represent significance at 1%, 5%, and 10%.

Table 9. Robustness check: Gini Coefficients

	(1) GINI	(2) GINI	(3) GINI	(4) GINI	(5) GINI	(6) GINI
Sukūk (All)	0.888***			1.775***		
	(0.306)			(0.275)		
Sukūkg		0.835			2.325 **	
		(0.680)			(0.972)	
Sukūkc			3.509***			4.141***
			(0.494)			(0.448)
FD	-0.081*	-0.084**	-0.074*	-0.094**	-0.096**	-0.079*
	(0.042)	(0.041)	(0.042)	(0.041)	(0.041)	(0.042)
Gender	0.001	0.000	0.002**	0.000	-0.001	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Telecom	0.002	0.002	0.001	0.002*	0.003**	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ethnic	0.087**	0.116***	0.062*	0.093***	0.126***	0.062*
	(0.037)	(0.039)	(0.032)	(0.035)	(0.038)	(0.032)
Popg	10.799***	10.433***	10.688***	10.256***	10.056***	10.484***
	(1.236)	(1.238)	(1.132)	(1.177)	(1.190)	(1.130)
Educ	0.203*	0.222*	0.126	0.178	0.211*	0.120
	(0.111)	(0.114)	(0.104)	(0.110)	(0.113)	(0.105)
Income	-0.020	-0.022	-0.025	-0.029	-0.030	-0.028
	(0.021)	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)
Gdpg	0.021	0.019	0.035	0.015	0.017	0.031
	(0.077)	(0.179)	(0.074)	(0.077)	(0.078)	(0.073)
Inf	-0.399	-0.500*	-0.118	-0.363	-0.499*	-0.107
	(0.262)	(0.269)	(0.244)	(0.257)	(0.269)	(0.240)
Crisis	-0.032*	-0.021	-0.030**	-0.001	-0.001	-0.023
	(0.017)	(0.018)	(0.014)	(0.017)	(0.017)	(0.016)
Sukūk(a/g/c)*Crisis				-0.014***	-0.024**	-0.011*
				(0.004)	(0.011)	(0.006)
Intercept	-1.166***	-1.107***	-1.164***	-1.079***	-1.042***	-1.136***
	(0.215)	(0.217)	(0.203)	(0.215)	(0.214)	(0.208)
Observations	300	300	300	300	300	300
Pseudo R^2	0.403	0.385	0.478	0.424	0.400	0.482

This robustness check replaces the proxy of inequality Top 1% with the Gini Coefficient. The marginal effects of the two-stage Fractional Regression Model (FRM) are reported with robust standard errors in parentheses. We instrument the FD variable using Lo, Ip, and Corr. All variable definitions follow Table 2. In addition to the post-Global Financial Crisis, the Crisis variable also captures the aftermath of the infamous statement of Taqi Usmani, suggesting the majority of the *Sukūk* are non-Sharī'ah Compliant. *Sukūk(a/g/c)**Crisis represents the interaction between Crisis and *Sukūk* (Panel 4), *Sukūkg* (Panel 5), and *Sukūkc* (Panel 6). ***, **, * respectively represent significance at 1%, 5%, and 10%.