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# Exploring Stability of Ijarah Financing Market in Full Fledged Islamic Banks

**Rukhsana KALIM** [1]
**Noman ARSHED** [2]

## Abstract

Ijarah contract is analogous to conventional lease contracts for customers, but in essence, it is different. Many empirical studies have worked on the issues and acceptability of Ijarah. However, the exploration of demand and supply-based determinants of Ijarah is overlooked. This study is designed to find such determinants using bank-based indicators from financial statements and macroeconomic data for countries with full-fledged Islamic banks. This study has used the panel FGLS model to estimate the demand for Ijarah and the supply of Ijarah models using determinants via theoretical models and empirical literature. The result of the study is instrumental in determining the equilibrium of Ijarah and future trends in terms of under or over-supply of Ijarah. Further, this study has identified the price elasticity of demand and supply for the case of Ijarah financing. Islamic banks can identify their operational strategies based on the elasticity of their Ijarah product.

**Key words:** Ijarah Market Stability; Equilibrium Modeling; Panel FGLS Model; Demand Elasticity; Supply Elasticity

**JEL Code:** D53, G2

## 1. Introduction

Several studies consider Islamic banking an equitable and financially robust alternative to conventional banking (Abduh, Omar, & Duasa, 2011; Alqahtani, Mayes, & Brown, 2016; How, Abdul Karim, & Verhoeven, 2004; M. S. Khan, 1986). This asset-based financing system restricts the debt from growing beyond the growth of the economy, where its repayment is unaffordable (Chapra, 2007). There are two major forms of financing by Islamic banks. The first is the financing in sale-based modes (i.e. Ijarah, Murabaha), and the second form of financing is based on profit and loss sharing (i.e. Musharaka, Mudarabah). Here bank shares a risk during the contract, and a further bank cannot sell before getting possession (Chapra, 2007). Also, unlike conventional lending,

[1] Prof. PhD, Department of Economics and Quantitative Methods, University of Management and Technology, Lahore, Pakistan, drrukhsana@umt.edu.pk, https://orcid.org/0000-0002-0618-8986)
[2] Assist Prof., PhD, Department of Economics, University of Education, Lahore Pakistan, noman.arshed@ue.edu.pk, https://orcid.org/0000-0002-8940-5391

once agreed upon, the product price in a sale-based mode does not change. The second type of financing is based on profit and loss sharing (i.e. Musharakah, Mudarabah). Here banks participate in asset creation and claim a portion of returns determined by the size of participation size and the growth of assets (Hasan, 2014; Usmani, 2002).

Ijarah is a type of sale contract which is different from the sale (bay'), gift (hibah) and charity (sadaqah) contracts where the ownership is transferred, whereas, in the Ijarah contract, only the usufruct of durable goods is transferred (Kamali, 2007; Billah, 2019). While it offers banks (who are a lessor of Ijarah property) a fixed rate of return as compared to variable returns in partnership-based financing (Musharakah or Mudarabah) (Rosly, 2007). Holy Qur'an, in several instances, has hinted at this mode of finance (Al-Qur'an, 18:77, 28:26, 65:6), and it is accepted as Shari'ah compliant mode because of conclusive ijma (Al-Zuhayli, 1989).

Ijarah financing facilitates the user with the product using the hire-purchase facility, similar to the leasing done by the conventional banking system (Yusoff, Kamdari, & Masri, 2013). This product helps meet the current demand for durable goods and motor vehicles while ensuring lower risk (Abdullah & Dusuki, 2006). It is currently gaining market share compared to conventional leasing contracts in Pakistan because of its features (Sabir, 2008). This contract has a potential source of debt-based borrowing for the government, where the government can develop durable assets from the capital provided by the public and pays rentals in return (particularly in the form of Sukuk al-Ijarah) (Ayub, 2007; Kamali, 2007).

Ijarah is gaining public acceptance among Muslims as well as non-Muslims. For example, the Ijarah contract imposes a 1% penalty for late payment compared to the 8% penalty imposed by conventional hire purchases. In some institutes in Malaysia, 60% of the new clients are non-Muslims (Abdullah & Dusuki, 2004). Similarly, another reason for popularity from the demand side is that the bank does not charge rent if the vehicle is damaged or in repairs and on the supply side, it has a high recovery rate and risk. Standard Chartered Bank Pakistan is considering stopping forwarding conventional leasing (IFResource, 2007), and it has shown to be profitable for Islamic banks in Malaysia (Yusuf & Isa, 2021). In accepting Ijarah financing, Islamic banks need to understand and predict the market's stable quantity and prices. The questions this study tends to answer are the determinants of Ijarah demand and supply and how the Ijarah equilibrium is evolving across countries and time.

### Objectives

This study intends to build and estimate the theoretical model of demand and supply of Ijarah commodities for the economy where Islamic banks operate parallel to the conventional banking system. This model aims to identify the factors that persuade the consumer to prefer the Ijarah commodity over the leasing commodity.

## 2. Literature Review

**Determinants of Ijarah Supply**

Allah has provided trade as an alternative to Islamic banks against the usury-based financing practiced by conventional banks (Al-Qur'an 2:275). Further trade must be rightly guided by Islamic law (Al-Qur'an 2:16). Islamic banks use Ijarah as a trade mode with fixed and predictable returns to stabilize banking returns (Usmani, 2002).

Few studies claim that Ijarah is one of those financing products Islamic banks have developed by mimicking the conventional counterpart such as leasing (El-Gamal, 2008; F. Khan, 2010; Saleem, 2006a, 2006b). However, there is evidence available regarding the legitimacy of this Islamic financing product (Ahmed, 2014; Kahf, 2004) and its incidence from the early periods of Islam. An investigation of UAE Islamic banks revealed that the accounting treatment of the leasing agreement is handled using IAS-17 while the accounting treatment of Ijarah is done using FAS-8 proposed by AAOIFI, both of them are similar to each other with few exceptions (Gupta, 2015). The similarities in the consumer end are intentional to minimize the advertisement cost.

While exploring factors affecting motor vehicle hire purchase, Bain (1966) claims that administrative cost comprises marketing cost and collection cost, as an essential cost factor faced by the banks. Similarly, a study by (Isa & Lee, 2016) on the perceptions regarding the financing rate for Ijarah in Islamic banks of Malaysia listed operating costs, the market rate of interest and cost of deposit as important determining factors. Amin, Rahman, Sondoh Jr., and Hwa (2011) surveyed 136 users of personal financing from Malaysia. They concluded that government regulatory support has a moderating role in developing the intention to use Islamic financing.

This study has instrumented the liquidity risk using total financing to total deposit ratio (Al-Tamimi & Al-Mazrooei, 2007; Samad, 2004; van der End, 2013). This increase lands banks in a higher risk environment where they face a liquidity shortage for financing or meeting withdrawals (Ghenimi, Chaibi, & Omri, 2017). A panel data study on Islamic banks of Pakistan and Malaysia by (Riaz & Hussain, 2018) showed that an increase in deposits helps reduce liquidity risk and cost of capital, leading to an increase in financing.

Empirically, a dearth of studies directly studied the factors determining the supply of Ijarah. The decision to invest in Ijarah financing depends on the rate of return relative to the cost of capital, market size, and availability of the commodity used for Ijarah financing. Hence, further evidence can be assumed from the studies regarding the capital structure of banks, specifically Islamic banks. Modigliani and Miller (1958) formulated the model for capital structure for non-financial firms, which was later adapted for conventional banks, but because of the profit and loss structure in Islamic banks, there is no formulated model which can be used to study capital structure (Al-Deehani, Karim, & Murinde, 1999). Pratomo and Ismail (2006) postulated that according to regulations that set the risk-taking nature of Islamic or conventional banks influence the financing behavior of the banks through changes in the agency cost (Haddad & Ren, 2013). Further, a decrease in agency cost because of increased profit leads to higher financing.

**Determinants of Ijarah Demand**

While exploring the determinants of Ijarah demand, the first factor that is crucial for this market's existence is compliance with religious obligations. A study by (Abdullah & Dusuki, 2006; Yusoff et al., 2013) confirmed that Ijarah financing complied with the Shari'ah regulations regarding banking hire-purchase and is a significant factor persuades people to opt for Ijarah financing.

Going forward, when a customer decides to buy a product or a service, it requires purchasing power and the ability to buy the product (Mankiw, 2014). Hence, while exploring the ability to buy, a survey study on 200 customers of the automobile in Pakistan by (Chhapra, Ahmed, Rehan, & Hussain, 2018) stated that the buyer's income has a significant effect on the buyer's purchase of automobiles using Ijarah financing. Similar is the outcome of a study of 278 people in Malaysia (Amin, Rahman, & Razak, 2014). Similarly, for the case of the power to buy, Amin (2008) surveyed 141 Malaysian bank customers and concluded that lower rentals are one of the important factors explaining the selection of home financing. While Ahmad (2014) interviewed 200 customers of Bank Islam Malaysia, Berhad and Amin (2010) studied 150 bank customers of various banks in Labuan. They showed that the pricing of Islamic financial products is not a significant predictor of intention to use Islamic financing.

Banks tend to forward loans to businesses that can afford to pay them back and share returns from their growth with the bank via debt financing (Holmstrom & Tirole, 1997). A study of 300 respondents from Pakistan using a logit model of Ijarah model selection showed that income does not significantly affect the decision to use Ijarah (Ehsan, Hasan, & Bhatti, 2018). While there are some demand-related factors which identify the financial firm's capital structure. A study by Baltaci and Ayaydin (2014) on quarterly data of Turkish banks between 2002-2012 showed that an increase in GDP positively affects and an increase in inflation negatively affects the investment decision of financial and non-financial firms. A similar outcome regarding income was proposed for the case of Islamic banks of Pakistan and Malaysia by (Riaz & Hussain, 2018).

Finally, the effect of banking sector development is multifaceted. On one side, it expands the banking network making banking services competitive with each other, and consequently, on another side, it includes more people in the financial system by making banking services more accessible and demanding. Thus, by being competitive, the traditional structure conduct and performance (SCP) hypothesis indicates that higher competition does not favor banking profitability (Berger, Demirguc-Kunt, Levine, & Haubrich, 2004). Further, a study on firms from 74 countries, including firms of all sizes, showed that an increase in the development of the financial system or competitiveness of the banks leads to ease in access to credit by the firms (Beck, Demirguc-Kunt, & Maksimovic, 2004).

# 3. Theoretical Model of Ijarah

Ijarah is the mode of finance which Islamic banks can use to earn rental income by sharing the usufruct of the commodity. The amount of Ijarah financing in the economy depends on:

1. The types of commodities which are, first permissible to be sold under the Ijarah contract, second Islamic bank has the means to have constructive or physical ownership of the commodity and lastly, the product is durable so that its usufruct can be rented.
2. Demand factors assist the consumer in purchasing from the on-spot purchase market, conventional leasing market, or Ijarah market. First is the price of the product, and second is the cost of deferment.
3. Supply factors which assist the Islamic bank in choosing between Ijarah financing or other forms of financing. The cost and functionality is a major determinant.
4. For any particular product, sale market, Ijarah market and leasing market are assumed to be in perfect competition.

**Ijarah Demand Model**

In this section, the factors which assist the consumer in purchasing come under factors affecting demand for Ijarah. Here, the total demand of the commodity ($\text{Commodity}_D$) is equal to the demand in on spot sale market ($\text{Demand}_{OS}$), demand in the lease market ($\text{Demand}_C$) and demand in the Ijarah market ($\text{Demand}_I$). Hence three markets can be accessed to buy a particular non-consumable commodity.

$$\text{Demand of Commodity}_D = \text{Demand}_{OS} + \text{Demand}_C + \text{Demand}_I$$

Where, the demand in an on-spot sale market is similar to any standard determinants of demand like price, income and other factors. While, the demand in the lease and Ijarah market depends on the real interest rate, rent, income and preferences. In the decision to buy the commodity, the consumer utility from purchase faces a tri-dimensional substitution. Following is a Cobb-Douglas function

$$U = A(\text{Demand}_I^\alpha \text{Demand}_C^\beta)^\varepsilon \text{Demand}^\theta{}_{OS}$$

Where $\theta + \varepsilon > 1$ and $\alpha + \beta = 1$

The properties of this assumed utility function are:
1. The consumer either buys from the on-spot purchase market or the deferred sale market (i.e., lease market or Ijarah market)
2. Here A defines scalar times increase in utility when a commodity is purchased, based on the commodity's need.

3. Here $\theta$ defines the disliking of using debt. Since Islam discourages the habitual demand for debt[3,4], so $\theta$ is be 1 for those consumers who dislike debt, and rich consumers can afford to pay lump sum whenever they need the commodity (Raza et al., 2021). While it will be between 0 and 1 for those consumers who cannot afford the lump sum price and need the commodity.

4. The consumer can partially pay the price and the remaining pay in instalments. This means to say he can access both on-spot and deferred markets simultaneously.[5]

5. Here $\alpha$ defines the faith consumer has on the notion that conventional and Islamic banks are not substitutes (Amin, 2019; Raza et al., 2021), and only Islamic banks are *Shari'ah* compliant. Since the consumer cannot split the deferred payments into the lease and Ijarah market simultaneously, consumers have to either access the lease market or the Ijarah market. It depicts that $\alpha$ will either be 1 or 0 for *Shari'ah* sensitive and *Shari'ah* neutral consumers, respectively.

This above-stated utility has a constraint[6] such as

$$\text{Income} = p * \text{Demand}_{OS} + i * \text{Demand}_C + r * \text{Demand}_I$$

Here p is the price of the product, i is the interest rate on conventional leasing, and r is the rental rate on Ijarah leasing. Applying the constraints on the objective (utility) function, we have the Lagrange function (Arshed & Kalim, 2020; Chiang & Wainwright, 2005). Solving for the commodity demand we have;

$$\text{Demand}_{OS} = \frac{\theta r}{\alpha \varepsilon p} \text{Demand}_I$$

$$\text{Demand}_{OS} = \frac{\theta i}{\beta \varepsilon p} \text{Demand}_C$$

$$\text{Demand}_I = \frac{\alpha i}{\beta r} \text{Demand}_c$$

The derivations show that consumers prefer the on-spot sale over lease or rental when

1. The customer dislikes debt, or he can afford to pay a lump sum,
2. Prices are low as compared to rentals and interest payments.
3. And the consumer prefers rental commodity over lease commodity when

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[3] Narrated Salama bin Al-Akwa`: A dead person was brought to the Prophet (ﷺ) so that he might lead the funeral prayer for him. He asked, "Is he in debt?" When the people replied in the negative, he led the funeral prayer. Another dead person was brought and he asked, "Is he in debt?" They said, "Yes." He (refused to lead the prayer and) said, "Lead the prayer of your friend." Abu Qatada said, "O Allah's Messenger (ﷺ)! I undertake to pay his debt." Allah's Messenger (ﷺ) then led his funeral prayer. (Sahih al-Bukhari 2295).

[4] It has been reported on the authority of 'Amr b. al-'As that the Messenger of Allah (ﷺ) said: All the sins of a Shahid (martyr) are forgiven except debt. (Sahih al Muslim 1886a).

[5] Both conventional and Islamic banks allow customer to vary the initial lump sum payment and defer the remaining in installments of interest or rental payments respectively.

[6] The function of the constraint is to put restraints of on objective function (utility function). These restraints can be because of resource limitation, resource scarcity and in some cases to limit the outcome within the first (nonnegative) quadrant (Chiang & Wainwright, 2005).

4. His beliefs and obligations are inclined toward Islamic finance, i.e. $\alpha = 1$ [7]
5. Rentals of the commodity are lower than interest payments.

By placing the above relations in the constraint equation, we have the case of demand for commodity via Ijarah is

$$\text{Demand}_I = \frac{\alpha(1 - \theta)}{r(\theta + \beta(1 - \theta) + \alpha(1 - \theta))} \text{Income}$$

$$\text{Demand}_I = \frac{\alpha(1 - \theta)}{r} \text{Income}$$

Here the demand for commodities via Ijarah is based on the following factors
1. Income of the customer
2. Faith of consumer in a verdict of Allah
3. Rental rate in Ijarah market
4. Acceptability of debt-based transaction or unaffordability of on spot market price

**Ijarah Supply Model**

In the Ijarah supply model, we compare the supply side for all possible means of supply of a commodity, such as on-spot sale, leasing, and Ijarah. Since all avenues are assumed to be perfectly competitive. The demand curve will be horizontal (in Figure 1), depicting that the amount of supply by an individual (firm, Islamic bank or conventional bank) will not influence the market price, rent or interest, respectively. The difference between the rent and leasing interest rate as compared to the price of the product in the on-spot sale market is the degree of deferment has opted.

Now we construct the supply of Ijarah, considering there are two financing options: Ijarah (IJA) and all others (OTH), which constitute total Islamic financing. So total output of the Islamic bank follows a Cobb – Douglas production function with two inputs Ijarah financing and all other financings.

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[7] As evident from (Amin, 2010; Gerrard & Cunningham, 1997; Yusoff & Kamdari, 2014)

**Figure 1**. Firm supply of non-consumable commodity



**Competitive Supply of Firms**
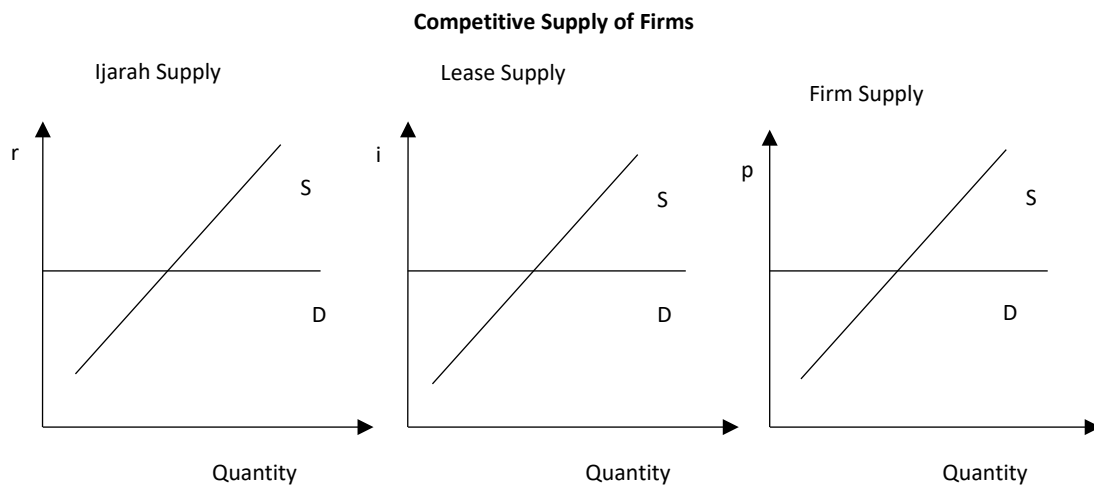
$$Y_I = IJA^\mu OTH^\eta$$

Where $\mu + \eta = 1$

The properties of the production function are following
1.  Both proposed forms of financing (IJA & OTH) are substitutes for each other, forming the frontier of production possibilities.
2.  Here μ identifies the productivity of Ijarah financing, which depends on the degree of specialization and innovation. Also, the risk associated with this financing plays a role in determining μ. [8] At the same time, η is the specialization in other financings relative to Ijarah financing.

The constraint the Islamic bank faces is defined as the total financing available and the price and opportunity cost of both forms of financing.

$$TF = \frac{r_{oth}}{r_{ija}} IJA + \frac{r_{ija}}{r_{oth}} OTH$$

Here $r_{ija}$ is the return on Ijarah financing, which is stable and fixed, while $r_{oth}$ is an average return on all other forms of financing and can be negative and variable.[9] Solving both equations, we have a relationship that determines the decisive factors for supply of Ijarah.

$$IJA = \frac{\mu}{\eta} \frac{r_{ija}^2}{r_{oth}^2} OTH$$

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[8] Competitiveness in the market and experience of the bank plays important role in success of Ijarah financing (Abdullah & Dusuki, 2004).
[9] This is because all other forms include the Mudarabah and Musharakah financing which are based on profit and loss sharing.

Here Islamic banks prefer Ijarah financing over all other financings if they are specialized or Ijarah is more productive (μ) and if the return on Ijarah financing ($r_{ija}$) is higher than the average return on all other forms of financing ($r_{oth}$). Solving the constraint for Ijarah financing, we have

$$TF = \frac{r_{oth}}{r_{ija}} IJA + \frac{r_{ija}}{r_{oth}} \frac{\eta}{\mu} \frac{r_{oth}^2}{r_{ija}^2} IJA$$

$$IJA = \mu \frac{r_{ija}}{r_{oth}} TF$$

Hence the supply of Ijarah is determined by the following factors
1. The specialization, productivity and risk associated with Ijarah
2. Return/rents on Ijarah financing (positively related as μ is positive)
3. The average return on other financings
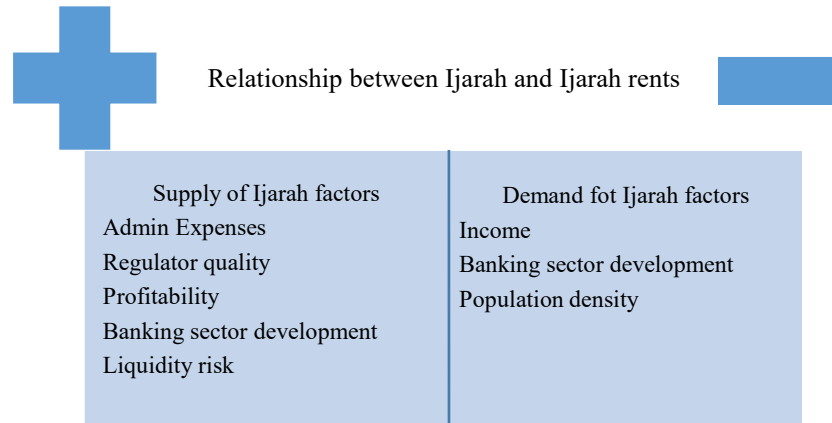
## 3. Model Estimation

### Identifying demand and supply model

While estimating the demand and supply model, there is an issue of identification of demand and supply component of the transaction of the product/service. As in the market, we only observe the data of equilibrium price (Ijarah rentals) and quantity (Ijarah investment). Hence using the information on Ijarah financing and Ijarah rental only, it is impossible to determine the demand relation where both are negatively related and the supply relation where both are positively related. This study has adopted the methodology of (Arshed & Kalim, 2020) for deposits and (Arshed & Kalim, 2021) for Musharakah to split the demand for Ijarah and supply of Ijarah.

### Variables and Data Sources

Figure 2 divides the available variables into demand and supply, indicating factors based on the abovementioned method. This study has proposed a quadratic effect of income of the customer, banking sector development, and population density as an indicator of the demand for Islamic banking in Ijarah, while administrative expenditures, regulatory quality, profitability, banking sector development and liquidity risk as an indicator for the supply of Islamic banking Ijarah.

**Figure 2**. Grouping of determinants of deposits

Relationship between Ijarah and Ijarah rents

| Supply of Ijarah factors | Demand fot Ijarah factors |
|---|---|
| Admin Expenses | Income |
| Regulator quality | Banking sector development |
| Profitability | Population density |
| Banking sector development | |
| Liquidity risk | |

Following in Table 1, are the symbols, units and sources of all the variables used in this study. These variables are collected from various reputable resources like World Development Indicators (WDI), International Financial Statistics (IFS), Worldwide Governance Indicators (WGI), Central banks of respective countries and Audited Annual Reports. The data is collected between 2012 and 2017 based on availability for all indicators for all 65 full-fledged Islamic banks shown in table A1 in the appendix.

**Table 1**. Variables and data sources

| Variables (Symbol) | Units | Source |
|---|---|---|
| Ijarah Financing (IJ) | Total Ijarah financing as a percent of total financing | Annual Reports |
| Ijarah rental rate (RENT) | Percentage change in rentals which depends on the price of the commodity (CPI) and the degree of deferment (Interest Rate) [10] | IFS |
| Income of customers (GDP) | Percentage change in GDP per capita (natural log) | WDI |
| Banking profitability (ROB) | Banking net profit (natural log) | Annual Reports |
| Banking Sector Development (DCPS) | Domestic credit to private sector as % of GDP | WDI |
| Administrative Expenditures (EXP) | Administrative expenditures as a percent of total liabilities and equity | Annual Reports |
| Regulatory Quality (RQ) | Index | WGI |
| Population Density (PD) | Population per km$^2$ | WDI |
| Liquidity Risk (LR) | Total financing to total deposit ratio | Annual Reports |

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[10] Here Ijarah contract is facing criticism that it is charging for the deferment which is analogous to interest based calculation of rent (Azma, Rahman, & Albaity, 2014). One criticism is that real rental rate can be different between two same houses in a street as they are defined by true usufruct rather than the same rate defined by assets usufruct (Shiyuti, Khairat, Mourtada, & Ghani, 2013). The justification of use of CPI and CPI is provided by (Arshed, 2020).

**Stochastic Equation**

Since the variables are defined, their stochastic form in equations 3 and 4, which this study uses to estimate the model follows.

$$IJD_{it} = \alpha_0 + \alpha_1 RENT_{it} + \alpha_2 GDP_{it} + \alpha_3 GDP^2{}_{it} + \alpha_4 DCPS_{it} + \alpha_5 PD_{it} + \varepsilon_{it}$$
(3)
$$IJS_{it} = \beta_0 + \beta_1 RENT_{it} + \beta_2 EXP_{it} + \beta_3 LR_{it} + \beta_4 RQ_{it} + \beta_5 ROB_{it} + \beta_6 DCPS_{it} + \mu_{it}$$
(4)

Here i represents the banks, and t represents the time. While $\varepsilon_{it}$ and $\mu_{it}$ denotes the randomly distributed factors that could determine the demand and supply of the Ijarah, respectively, which are not included in this study and are assumed to have a negligible effect on the demand and supply of Ijarah.

**Estimation Approach**

Since the data varies across firms and time in this model, estimating Pooled OLS by assuming all firms to be the same and all time periods to have similar effects lead to heteroskedasticity in estimation results. While, models like fixed effect and random effect model allow for the changes in the firms or time to change intercept of the model (Gujarati, Porter, & Gunasekar, 2012). Other than data changing across firms and time, the few variables used in this study are firm invariant; they vary across countries, assuming all slopes to behave similarly seem outstretched. This study opts for a panel feasible generalized least square (FGLS) approach, which allows the bank differences to change the standard errors of each coefficient (Arshed & Kalim, 2020; Greene, 2012). This study further uses country and time dummies to control the cross-sectional heteroskedasticity and time series heteroskedasticity, as shown in the equations below. These equations are used to determine demand and supply value of Ijarah financing and its equilibrium using the methodology provided by (Gujarati et al., 2012).

$$IJD_{it} = \alpha_0 + \alpha_1 RENT_{it} + \alpha_2 GDP_{it} + \alpha_3 GDP^2{}_{it} + \alpha_4 DCPS_{it} + \alpha_5 PD_{it} + \sum_i^n Bank$$

$$+ \alpha_9 \sum_j^t Year + \varepsilon_{it}$$

$$IJS_{it} = \beta_0 + \beta_1 RENT_{it} + \beta_2 EXP_{it} + \beta_3 LR_{it} + \beta_4 RQ_{it} + \beta_5 ROB_{it} + \beta_6 DCPS_{it}$$

$$+ \beta_7 \sum_i^n Bank + \beta_8 \sum_j^t Year + \mu_{it}$$

**Descriptive Statistics**

Table 2 below shows the descriptive statistics and normality test for all the variables included in the model. Here we can see that variable like IJ, LR, RQ and PD have mean values smaller than the standard deviation, hence they are over dispersed or relatively heterogeneous across all banks and all time periods. Similarly, variables like RENT, GDP, ROB, and DCPS have mean values greater than the standard deviation, hence they are under dispersed or relatively homogeneous across all the banks and all the time periods. This mixture of under and over dispersed variables renders the use of panel feasible generalized least squares.

This study used the panel variant of (Jarque & Bera, 1987) test proposed by (Alejo, Galvao, Montes-Rojas, & Sosa-Escudero, 2015) to test the normality of the variables across cross sections and time periods. Here for the case of cross section normality, EXP, LR and RQ are normal at 5%, and GDP is normal at 10%, this means that these are not skewed, and there are no outliers when assessed across banks and countries. While for the case of time series normality, IJA, GDP and LR are normally distributed at 5%, this means that these variables are not skewed, and there are no outliers when assessed across time. All other variables are non-normal, which may have caused because of the presence of outliers in the data, and there is a mixture of under and over dispersed variables, the pooled OLS model seems redundant.

**Table 2** – Descriptive Statistics

| | Obs. | | Mean | Std. dev. | Cross-sectional normality | Time normality |
|---|---|---|---|---|---|---|
| **IJ** | 393 | | 19.80 | 22.98 | 7.07 (0.03)* | 2.99 (0.22) |
| **RENT** | 703 | | 5.14 | 4.04 | 7.34 (0.02)* | 33.61 (0.00)* |
| **GDP** | 932 | | 8.84 | 1.42 | 5.50 (0.06) | 2.90 (0.38) |
| **ROB** | 387 | | 12.39 | 2.24 | 7.25 (0.03)* | 22.53 (0.00)* |
| **DCPS** | 927 | | 65.05 | 37.36 | 7.82 (0.02)* | 16.51 (0.00)* |
| **EXP** | 437 | | 12.82 | 2.22 | 1.75 (0.42) | 14.68 (0.00)* |
| **LR** | 428 | | 2.56 | 20.80 | 2.30 (0.32) | 2.73 (0.25) |
| **RQ** | 935 | | 0.01 | 0.74 | 4.15 (0.13) | 12.39 (0.00)* |
| **PD** | 866 | | 266.44 | 421.20 | 27.64 (0.00)* | 10.03 (0.01)* |

**\*** Significant at 5%

While exploring the dynamics of independent and dependent variables, in figure 3 while comparing the Ijarah financing and profitability of the banks, it can be seen that where theoretically they should be positively associated, there are some countries where profitability is not translated into Ijarah financing. This hints that when banks face low profitability, they favor trade-based financing to stabilize their returns. However, overall figure 4 confirms the long run positive relation between Ijarah financing and profitability of Islamic banks.

**Figure 3**. Country wise time averages of Ijarah financing and banking profitability
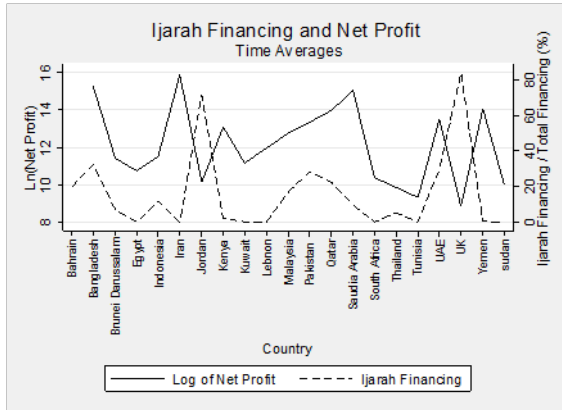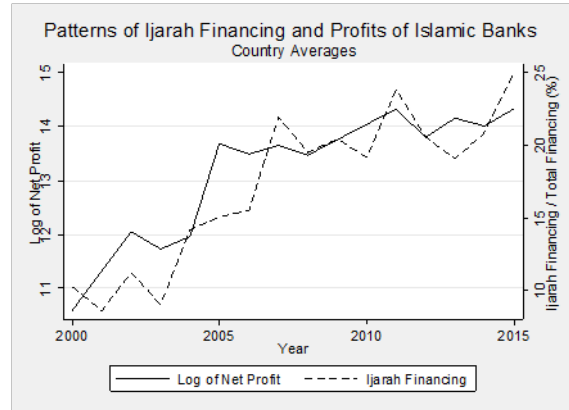


**Figure 4**. Year wise bank averages of Ijarah financing and profitability



Further, it is depicted in figure 5 that initially, from 2003 to 2007, when the market was growing, an increase in rentals was associated with the increase in Ijarah financing, but following the year 2007, the increase in the number of banks offering has increased competition, and increase in Ijarah financing is associated with a decrease in rentals. This ambiguity between supply related positive association and demand related negative association can also be seen in the country wise illustration in figure 6. This calls for an analysis specifying demand and supply equations for Ijarah financing.

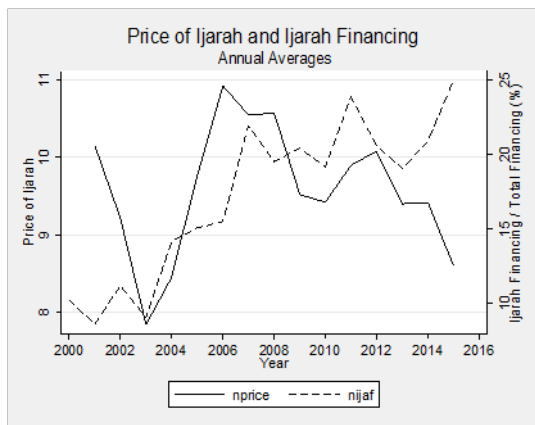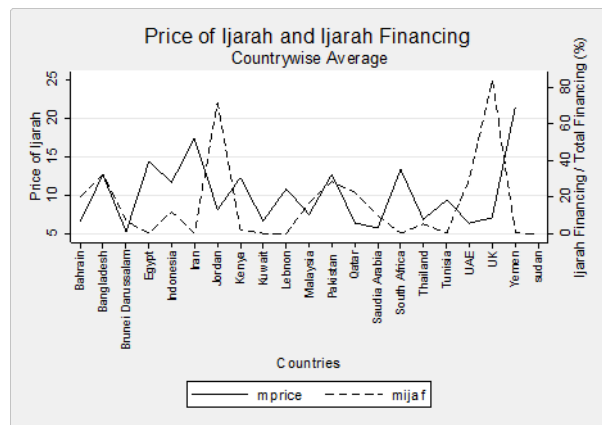**Figure 5**. Bank averages of Ijarah rentals and Ijarah financing



**Figure 6**. Time averages of Ijarah rental and Ijarah financing



### Multicollinearity Test

To detect the presence of multicollinearity in the model VIF test by Gujarati et al. (2012) is used. According to this, if VIF < 10, there is no evidence that independent variables are collinear. Below table 3 and 4 show that none of the variable pairs has corresponding VIF values, which are more than 10, confirming that both models are free of multicollinearity.

**Table 3**. VIF statistics on Ijarah Demand Model

| VIF – Ijarah Demand Model | | | | |
|---|---|---|---|---|
| | **RENT** | **GDP** | **DCPS** | **PD** |
| **RENT** | - | | | |
| **GDP** | 1.72 | - | | |
| **DCPS** | 1.40 | 1.31 | - | |
| **PD** | 1.00 | 1.04 | 1.04 | **-** |

**Table 4**. VIF statistics on Ijarah Supply Model

| VIF – Ijarah Supply Model | | | | | | |
|---|---|---|---|---|---|---|
| | **RENT** | **ROB** | **DCPS** | **EXP** | **LR** | **RQ** |
| **RENT** | - | | | | | |
| **ROB** | 1.13 | - | | | | |
| **DCPS** | 1.29 | 1.20 | - | | | |
| **EXP** | 1.33 | 2.76 | 1.27 | - | | |
| **LR** | 1.01 | 1.00 | 1.01 | 1.04 | - | |
| **RQ** | 2.20 | 1.22 | 1.78 | 1.46 | 1.04 | - |

## 4. Estimation Results

In this section, the estimation of the stochastic equations shown in section 4.4 is estimated using two-way fixed effect panel feasible generalized least squares. The estimation of the supply of Ijarah financing is shown in table 5, the significant Wald test value of 179.88 confirms that the overall model is fit at the 1% level. This estimation has used 50 Islamic banks and an average of 5.8 years per bank to a total of 290 bank – years observations. While the Wald test on time and country effects are significant, indicating that countries and time affect Ijarah supply differently. The significant positive value of the intercept shows that Islamic banks are trying to promote Ijarah financing. Similarly, for the case of demand for Ijarah, the significant value of the Wald test confirms that the overall model is fit. This estimation has used a sample of 52 Islamic banks and an average of 6.84 years per bank to a total of 356 bank – years observations. The time and country effects test confirm that all other factors affect demand for Ijarah differently.

The results reveal that a 1% increase in the Ijarah rent increases the Ijarah supply by 0.72% on average. This shows that either increase in the price of the product or money market rate increases the profitability of the Ijarah investment, this motivates Islamic banks to increase Ijarah financing. Generally, banks supply more financing when the money market rate increases (Riaz & Hussain, 2018). Similarly, if the product price increases, the bank tends to extend that product via Ijarah, as the price elasticity of demand is inelastic when buying in deferred payments compared to buying at a lump sum price (Mankiw, 2014).

Similarly, a 1% increase in the administrative expenses of the bank reduces the Ijarah financing by 2.91% on average. When expenses increase, it becomes non-feasible to sell a product at the same price as the supply curve shifts left, also suggested by (Bain, 1966). Also, a 1% increase in the liquidity risk forces banks to reduce the Ijarah financing by 2.72% on average. This is evident because when banks do not have deposits available to forward as financing, they reduce the financing to reduce the risk, these results complement the study like (Riaz & Hussain, 2018).

**Table 5**. Estimation of Supply and Demand for the Ijarah model

| Panel FGLS (Two Way) | | | | | |
|---|---|---|---|---|---|
| **Dep. Var.** | **Supply of Ijarah** | | **Demand for Ijarah** | | |
| **Indep. Var** | **Coef. (Std. Err.)** | **Z (Prob)** | **Indep. Var** | **Coef. (Std. Err.)** | **Z (Prob)** |
| **RENT** | 0.72 (0.30) | 2.42 (0.02) ** | **RENT** | -0.66 (0.09) | -6.86 (0.00)*** |
| **EXP** | -2.91 (0.64) | -4.57 (0.00) *** | **GDP** | -96.61 (6.29) | -15.36 (0.00)*** |
| **LR** | -2.72 (0.35) | -7.75 (0.00) *** | **GDP$^2$** | 5.24 (0.35) | 14.94 (0.00)*** |
| **RQ** | 13.06 (1.79) | 7.27 (0.00) *** | **DCPS** | 0.17 (0.02) | 7.60 (0.00)*** |
| **ROB** | 1.87 (0.57) | 3.25 (0.00) *** | **PD** | -0.001 (0.001) | -0.86 (0.38) |
| **DCPS** | -0.12 (0.03) | -4.48 (0.00) *** | | | |
| **Cons** | 41.55 (6.16) | 6.74 (0.00) *** | **Cons** | 446.04 (26.74) | 16.68 (0.00)*** |
| **Regression Statistics** | | | | | |
| **Obs.** | 290 | | **Obs.** | | 356 |
| **No of groups** | 50 | | **No of groups** | | 52 |
| **Avg. obs per group** | 5.8 | | **Avg. obs per group** | | 5.84 |
| **Wald Chi$^2$ (prob)** | 179.88 (0.00) *** | | **Wald Chi$^2$ (prob)** | | 1059.9 (0.00)** |
| **Wald test on time effects** | 28.83 (0.00)*** | | 30.8 (0.00)*** | | |
| **Wald test on country effects** | 2668 (0.00)*** | | 2670 (0.00)*** | | |

*** Significant at 1%, ** Significant at 5%

Increased regulatory quality by 1% in the economy leads to increased Ijarah financing by Islamic banks by 13.06%. The concerned institutes' better regulatory provisions help banks sell their service faster (Amin et al., 2011). An increase in the bank profitability by 1% increases the Ijarah financing by 1.87% on average. Higher profit allows the bank to extend their financing to either profitable ventures or have the potential to earn a profit (Haddad & Ren, 2013). Finally, a 1% increase in the banking sector development reduces the Ijarah financing by 0.12% on average. This is because a higher

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degree of banking sector development leads to higher competition between banks and thus reduces their market share, as proposed earlier by (Berger et al., 2004).

As expected from the demand function, an increase of 1% in the Ijarah rental rate leads to a decrease in demand for Ijarah by 0.66%. A price increase reduces the purchasing power and forces the individual towards the alternative of on-spot sale (Amin, 2008, 2010; Mankiw, 2014). It also reduces its perceived benefits (Raza et al., 2021).

Here income estimated using GDP per capita forms a quadratic relationship with the demand for Ijarah. A 1% increase in income decreases initially (from zero), leading to a decrease in demand for Ijarah by 96.61%, but after that, for every percentage increase in income, the demand for Ijarah increases by 5.24%. This non-linear pattern is expected as banks would not extend financing to a person who has a very low income. Secondly, only those individuals would hope to get Ijarah who expect an increase in income because of that commodity. By solving the optimal equation, it is found that any increase in the GDP per person beyond $10,076.9 increases the Ijarah demand11. The pattern is shown in Figure 7. This outcome complements the study by (Baltaci & Ayaydin, 2014; Ehsan et al., 2018; Holmstrom & Tirole, 1997; Chapra et al., 2018).

**Figure 7**. Quadratic Effect of Income on Ijarah Demand
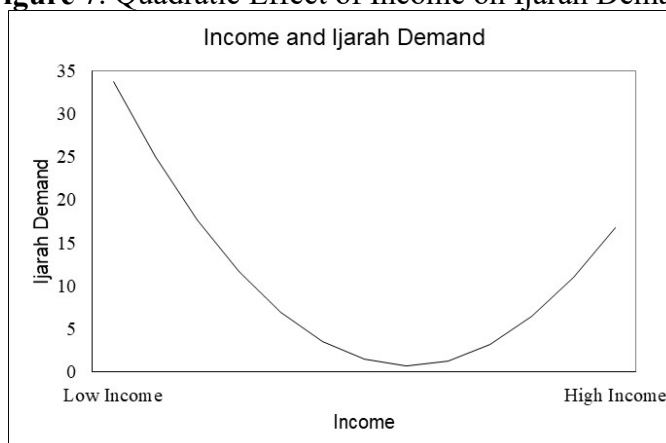


Results show that a 1% increase in the banking sector development leads to an increase in demand for Ijarah by 0.17% on average (Table 5). This is because when the banking sector develops, it increases the facilities for the customer and makes it easier to access financing (Beck et al., 2004). Lastly, the increase in population density has no significant effect on the demand for Ijarah. The diagnostics of the estimation models reveal that no multicollinearity exists. The cross-sectional and time dummies coefficients are not shown to simplify the estimates output. But they are significant, as shown in the

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[11] $IJD = -96.61\ GDP + 5.24\ GDP^2$
$\partial IJD\ /\ \partial GDP = -96.61 + (5.24*2)\ GDP$
To find turning point of GDP put the above derivative equal to zero we have
$GDP* = 96.61\ /\ (5.24*2) = 9.218$
To find the actual value of GDP per capita, we calculate the antilog
$GDP* = \$10076.89$

Wald test. Further heteroskedasticity and autocorrelation tests confirmed that the model is valid.

### Demand – Supply Equilibrium of Ijarah

By plotting the lines of estimated demand for Ijarah and estimated supply of Ijarah generated from the estimated models in tables 7 and 8 with the returns on Ijarah, we can see negatively sloped demand for Ijarah and positively sloped supply of Ijarah shown in figure 8. This graph depicts that both supply and demand for Ijarah represent Ijarah operating in the market of necessity goods, and supply of Ijarah is inelastic, representing that banks are not specialists in selling goods on a rental basis.

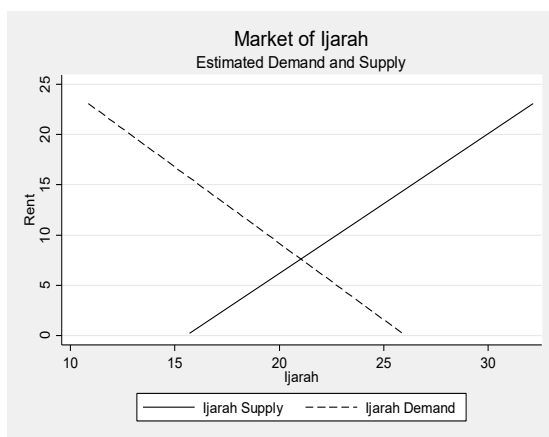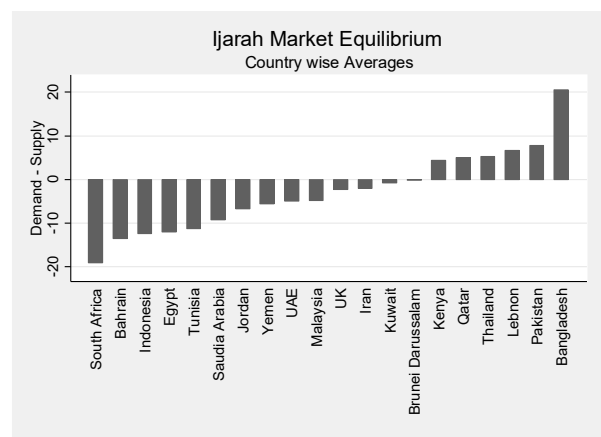**Figure 8.** Demand Supply Equilibrium      **Figure 9.** Country wise Equilibriums



Figure 9 shows the country-wise values of equilibrium which are calculated by subtracting supply from demand. Here negative bars represent a surplus of Ijarah, while positive bars represent a shortage of Ijarah. While the overall average is -1.82 with the standardized value of 0.20, confirming that globally Ijarah market is in equilibrium12. Only Kuwait and Brunei Darussalam show the presence of equilibrium in the economy, while other countries having positive bars show a shortage of Ijarah, while countries having negative bars show a surplus of Ijarah. Figure 10 indicates the evolution of the Ijarah market equilibrium. It can be seen that initially, there was a surplus of Ijarah, which has changed into a shortage of Ijarah, hinting at the expansion of the Ijarah market.

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[12] Normalized value = z = (mean – benchmark) / standard deviation. If the standardized value is lesser or greater than -1.96 and 1.96, it will indicate that the mean value is actually far from the benchmark value (i.e. equilibrium = 0)

**Figure 10.** Time evolution of Ijarah Equilibrium
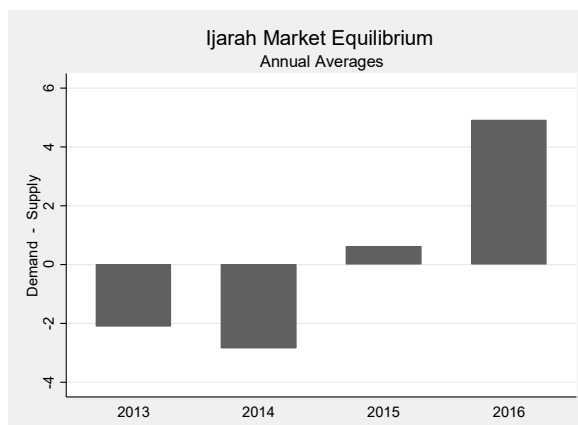


Now since we have the equation for demand and equation for supply, we need the time evolution equation of the Ijarah rental rate to find the nature of this equilibrium for which the procedure is provided by (Chiang & Wainwright, 2005; Hoy, Livernois, McKenna, Rees, & Stengos, 2011).

$$Q_{dt} = \alpha - \beta P_t$$
$$Q_{st} = -\gamma + \delta P_t$$
$$P_{t+1} = P_t - \sigma(Q_{st} - Q_{dt})^{13}$$

From the estimations, the values of $\beta = 0.66$, $\delta = 0.72$ and $\sigma = 0.026$, which leads to the value of b as

$$b = 1 - \sigma(\beta + \delta) = 0.99$$

And according to (Chiang & Wainwright, 2005), these equilibrium lines within region 3 indicate that this market is barely convergent and stable. This means that the price (Ijarah rental rate) smoothly responds to the disequilibrium formed when demand for Ijarah is not equal to the supply of Ijarah and adjust to the new equilibrium value.

## 5. Conclusions and Policy Implications

**Conclusion**

A dearth of studies applied the demand-supply framework to explore the interrelationship between the Ijarah and Ijarah rentals. This has led to a gap in terms of the importance of Ijarah rentals with respect to Ijarah suppliers and Ijarah demanders. In anticipation, this study sets itself to construct and estimate the theoretical model of Ijarah demand and Ijarah supply.

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[13] This model is estimated separately in the background

This study has selected all available full-fledged Islamic banks worldwide for the years 2012 and 2017. The variables used in the study are extracted from two sources: bank based, collected from audited annual reports, and economy-based variables selected from reputed secondary sources like WDI, WGI, IFS etc. Since there is a mixture of bank- and economy-based variables, this study has resorted to panel FGLS estimation.

The results showed that for the supply of Ijarah, rental rate, admin expenses, liquidity risk, regulatory quality, profitability and baking sector development plays a significant role. Moreover, in demand for Ijarah, rental rate, income, and banking sector development have a significant effect. The coefficient of the rental rate being negative in demand for Ijarah and positive in the supply of Ijarah confirms that the model successfully differentiates between demand and supply curves. Further, in both demand and supply models, the rental rate coefficient is inelastic. Also, country-wise incidence showed that overall there is equilibrium, but some countries face a shortage, and some face a surplus that dissipates when banks interact across borders. The test for stability of equilibrium showed that there is a significant force available that restores the equilibrium for every distortion.

Finally, we confirm that a considerable share of domestic FCI fluctuations is attributable to the global financial conditions shifts or domestic policy rate variations, namely almost 38.16%. This share of variation weakens and during the fifth year, its value is equal to 35.28%.

The future research will be focused on the dynamic of the FCI during the COVID-19 pandemic and its influence on the monetary conditions of the explored countries.

**Policy Implications**

Since both demand and supply curves of Ijarah are price inelastic, both agents are insensitive to the changes in the rental rate of Ijarah. Following are the policy implications based on the new information.

1) Since from the demand side, Ijarah is price inelastic. Banks can anticipate that consumers want to fulfil the need/utility, which overweighs the cost of acquiring this service. This utility can be the benefit that they will be enjoying product at deferred payment. Here the bank can increase the rental rate without a significant increase in add-ons.
2) Similarly, Ijarah for banks is price inelastic, indicating that banks are actually designed to provide financial services rather than trading services. In order to increase the returns / decrease the admin expenses from Ijarah financing, Islamic banks must increase industry collaboration/alliances to provide the goods at a discounted rate.
3) The effect of income is positive, joining it with the prediction of World Economic Forum that the future of rented commodities is bright, and banks can expand the variety of goods that can be offered as Ijarah.

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**Appendix Table A1** – Sample Banks

| Countries | Islamic Banks | |
|---|---|---|
| Bahrain | Al Baraka Islamic Bank<br>Bahrain Islamic Bank | Citi Islamic Bank<br>Ithmaar Bank |
| Bangladesh | Islamic Bank of Bangladesh<br>Shahjalal Islamic Bank | EXIM Bank<br>Al Arafa Islamic Bank |
| Brunei Darussalam | Bank Islam Brunei Darussalam | |
| Egypt | Abu Dhabi Islamic Bank | |
| Indonesia | Bank Muamalat Indonesia | MayBank Shariah |
| Iran | Bank Maskan<br>Bank Pasargad | Bank Tejarat |
| Jordan | Islamic International Arab Bank | Jordan Islamic Bank |
| Kenya | Gulf African Bank | |
| Kuwait | Kuwait Finance House | |
| Lebanon | Al Baraka Bank | |
| Malaysia | Affin Islamic bank<br>Al Rajhi bank<br>Alliance Islamic bank<br>Am-Islamic bank<br>Asian Finance bank<br>Bank Islam Malaysia Berhad<br>Bank Muamalat Malaysia Berhad | Bank Rakyat<br>Cimb Islamic bank<br>Hong Leong Islamic bank<br>Koperasi Bank Persatuan<br>Public Islamic bank<br>RHB Islamic bank<br>OCBC Al Amin Bank |
| Nigeria | Jaiz Islamic Bank | |
| Oman | Alizz Islamic Bank | |
| Pakistan | Al Baraka bank<br>Bank Islami<br>Burj Bank | Dubai Islamic Bank<br>Meezan Bank<br>MCB Islamic |
| Philippines | Al Amanah Bank | |
| Qatar | Qatar International Islamic Bank | Qatar Islamic Bank |
| Saudi Arabia | Al Bilad Bank<br>Al Ranjhi Bank | Alnima Bank |
| South Africa | Al Baraka Bank | |
| Sri Lanka | Amanah Bank | |
| Sudan | Al Baraka Bank Sudan<br>Al Shamal Bank | Faisal Islamic Bank |
| Syria | Bank Sham | |
| Thailand | Islamic bank of Thailand | |
| Tunisia | Al Baraka Bank Tunisia | |
| Turkey | Al Baraka Bank Turkey | |
| UAE | Dubai Islamic Bank<br>Noor Islamic Bank<br>Sharjah Islamic Bank | Abu Dhabi Islamic Bank<br>Al Hilal Bank<br>Ajman Bank |
| UK | Al Rayan Islamic Bank | |
| Yemen | Tadhamon Islamic bank | |