Global Financial Inclusion: The Role of Islamic Finance Towards an Inclusive Financial System

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ABSTRACT

Although there has been improvement in the financial inclusion levels around the world, the World Bank reported that 1.7 billion adults worldwide still do not have a formal bank account, wherein nearly half of them are Muslims. Some key countries with Islamic finance presence are also lagging behind the global average level of financial inclusion. Meanwhile, the world has witnessed the rapid growth of Islamic finance in the past three decades. To be true to its premise, Islamic finance industry should make a difference to the global agenda on financial inclusion. However, there is limited empirical evidence to attest this claim and the link between Islamic finance and financial inclusion is an area yet to be established. Therefore, this research aims to fill the gap by examining the relationship between the development in Islamic finance with financial inclusion using panel data analysis. Firstly, four financial services usage indicators are transformed into a single financial inclusion index using Principal Component Analysis. Panel data of 28 countries with presence of Islamic finance industry are collected from the World Bank’s Findex Database and World Development Indicators. The presence of Islamic finance shall be represented by the Islamic Finance Development Indicators (IFDI). This research shall provide a contribution to the body of knowledge by providing empirical evidences on the relationship between Islamic finance and financial inclusion. Most importantly, if the link between Islamic finance and financial inclusion can be established, this would provide a bigger case for the policymakers to promote Islamic finance as an avenue for improving usage and access to financial services.

Keywords: Islamic Finance, Financial Inclusion, Panel Data Analysis, Islamic Finance Development Index

1.0 INTRODUCTION

In recent decades, financial inclusion is becoming one of the most important agendas of many governments, central banks, policy makers, international organisations and financial institutions (Cámara & Tuesta, 2014). Although financial inclusion is not explicitly listed as one of the United Nation’s Sustainable Development Goals (SDGs), it is recognised to be the key enabler
of various other development goals (Klapper, El-Zoghbi, & Hess, 2016). Generally, the global community has made significant progress in recent years to enhance the financial inclusion level as evidenced by the improvement in several financial inclusion indicators. For example, the percentage of account ownership has increased from 62 percent in 2014 to 69 percent in 2017. As account ownership increases, formal saving increases as well because having an account at formal financial institution is a prerequisite for formal saving. In addition, 54 percent of the global adults are now able to come up with emergency funds (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2018).

However, in several countries, financial inclusion remains a major challenge (Bank Negara Malaysia, 2014). 1.7 billion of adults worldwide are still without a formal bank account. Most of these people live in the developing economies with predominantly Muslim population (Mirakhor & Iqbal, 2012). According to the 2017 Global Findex Database, nearly half of the global unbanked population came from just seven developing economies i.e. Bangladesh, China, India, Indonesia, Mexico, Nigeria and Pakistan (Demirguc-Kunt et al., 2018). Most Muslim countries with presence of Islamic finance are also found to be lagging behind the other developing economies in terms of the access and usage of financial services (Zulkhibri, 2016). In addition, gender gap in bank account ownership has persisted at 9 percent for developing economies. If there is no improvement made to close these gaps, it would cause serious damage as studies have found that financial exclusion increases the risk of social exclusion and poverty (Lämmermann, 2010).

Meanwhile, the global Islamic finance industry has been growing at a fast pace in the past three decades, primarily contributed by the leading key markets in the MENA and Asian regions. The global Islamic finance assets has grown from USD2 trillion in 2016 to USD2.6 trillion in 2017 (Al Awar, 2018). The increasing awareness about Islamic finance products, the growing global Muslim population as well as the increase in the income per capita owned by Muslims are expected to support the growth of the industry. Based on the Global Islamic Finance Report 2017, there are now 48 countries with notable presence of Islamic finance industry (Hadad et al., 2017). 1.6 billion of Muslims worldwide represent a massive untapped market for the Islamic finance industry as Muslims with strong religious beliefs choose not to take up the conventional banking services. The only way to extend financial services to these voluntarily unbanked Muslims is through Shariah compliant products and services offered by the Islamic finance industry (El-Zoghbi, Karlan, Osman, & Shammout, 2016; Mohseni-Cheraghlou, 2013).

The latest discourse of Islamic finance point to the need to address the issue of financial inclusion. At its core value, Islamic finance as a faith based alternative form of finance ought to be able to contribute to the global agenda of financial inclusion. As Islam strongly emphasized on fair and equitable distribution of wealth between the rich and poor, the Islamic finance industry should play a crucial role in narrowing the financial inclusion gap. However, the link between Islamic finance and financial inclusion is an area yet to be established. In addition, while financial inclusion is an important indicator for inclusive development, there is no consensus regarding the best measure and indicator of financial inclusion as different studies used different measures, indicators and measurement methodologies.

The objectives of this paper are threefold. First, the paper aims to review the concept of financial inclusion as well as the existing measurement methodologies and its determinants. Second, using Principal Component Analysis, the paper shall develop a simple measure of financial inclusion by constructing an index of financial inclusion for 28 countries with notable presence of Islamic finance industry. Third, using panel data analysis, this paper seeks to analyse the determinants of financial inclusion and the interplay of the presence of Islamic finance, from a macroeconomics perspective.
perspective. This paper shall provide a contribution to the body of knowledge as studies on this issue is limited and inconclusive. Most importantly, if the relationship between Islamic finance and financial inclusion can be recognized, this would have policy implication for the Islamic finance industry and providing a bigger case for the policymakers to promote Islamic finance as an avenue for improving access to financial products and services, particularly in Muslim majority countries.

This paper is organised as follows. A brief discussion on the global importance of financial inclusion, the issues of the unbanked as well as the objectives of the paper are presented in the introduction section. The second section discusses the concept of financial inclusion as well as reviews the existing literatures on measurement and determinants of financial inclusion. The third section describes the dimension, indicators and methodology used for constructing the financial inclusion index as well as the variables and methodology used to examine the determinants of financial inclusion. The findings and discussions are presented in the fourth section. Lastly, Section 5 concludes.

2.0 FINANCIAL INCLUSION: A REVIEW OF THE CONCEPT, MEASUREMENT AND DETERMINANTS

Financial inclusion is a recent idea which was used for the first time in UK public policy back in 1997. In general, financial inclusion can be defined individual’s access and usage of useful and affordable financial products and services such as transactions account, payments, savings, credit and insurance. At the most fundamental level, financial inclusion starts by having a formal bank account (Zins & Weill, 2016). Although there is no consensus yet regarding its definition, all researchers agree that financial inclusion is multidimensional in nature. Recent studies have been focused on understanding the concept and dimensions of financial inclusion as well as comprehensively measuring it, particularly in the setting of developing economies.

The most typical measure of financial inclusion is account ownership at formal financial inclusion. However, financial inclusion cannot be measured by using only a single indicator. To capture the inclusiveness of the financial system, studies have incorporated various dimensions and developed index of financial inclusion. The most common dimensions used by most studies are access and usage dimensions (Chakravarty & Pal, 2010; Goel & Sharma, 2017; Sarma, 2008; Yorulmaz, 2016). Several studies have also included other dimensions such as ease and cost dimensions (Arora, 2014; Gupte, Venkataramani, & Gupta, 2012), barrier dimension (Cámara & Tuesta, 2014) as well as financial education, consumer protection and social development dimensions (Piñeyro & Manuel, 2013). Each of these dimensions can be further divided into various indicators. While using as many dimensions and indicators as possible will make the index more comprehensive, availability of data is also an issue. Thus, researchers have to weigh and balance between the need for having highly credible and comprehensive index with the availability of consistent data sets.

A considerably large number of studies adopted the same methodology used by the United Nation Development Program (UNDP) in constructing the Human Development Index (HDI) in order to develop the financial inclusion index. However, the methodology used in assigning weights to the dimensions vary between studies. Generally, there are three methods used to assign weights; normative (equal weights or expert opinion), data driven (statistical methods) or a hybrid of both methods (Decancq & Lugo, 2012). Most researchers assume that all variables contribute equally to the index, thus they used normative method by assigning equal weights to all dimensions and indicators such as the studies done by Sarma (2008), Chakravarty and Pal (2013), Gupte et al.
(2012), Kainth (2013), Yorulmaz (2016), Sethy (2016) as well as Goel and Sharma (2017). On the other hands, other researchers used data driven method such as Principal Component Analysis (PCA) (Arora, 2014; Cáمرا & Tuesta, 2014; Mukherjee, 2015; Piňeyro & Manuel, 2013), Common Factor Analysis (CFA) (Amidžić, Massara, & Mialou, 2014) and TOPSIS (Yadav & Sharma, 2016).

The studies revolving the determinants of financial inclusion can be divided into two categories; micro-level (individual) determinants and macro-level (country-specific) determinants. Various literatures established that various individual-specific factors may affect financial inclusion, for instance, gender, age, financial literacy and income level (Akudugu, 2013; Clamara, Peña, & Tuesta, 2015; Nandru, Byram, & Rentala, 2016; Shawaqfeh & Al-Nimri, 2016; Zulfiqar, Chaudhary, & Aslam, 2016). Several other studies found that education level, financial discipline and ICT literacy affect financial inclusion (Efobi, Beecroft, & Osabuohien, 2014). Soumaré, Tchana, and Kengne (2016) also founds that employment status and marital status as well as degree of trust in financial institutions significantly influence financial inclusion.

From macro-level perspective, Beck, Demirguc-Kunt, and Martinez Peria (2007) made the very first attempt investigating the determinants of financial access and usage, which are two of the many dimensions of financial inclusion. They have found significant associations between the indicators of financial access and usage with theGDP per capita as well as Governance Index. Macro-level studies also found that GDP growth, GNI per capita, inflation rate, inequality (represented by GINI coefficient), employment, mobile and internet penetration as well as adult literacy rate are important determinants of financial inclusion (Cámara & Tuesta, 2014; Chikalipah, 2017; Clamara et al., 2015; Evans & Adeoye, 2016; Fungăcová & Weill, 2016; Park & Mercado, 2018; Rajput, 2017; Sarma & Pais, 2011).

Although the studies on the determinants of financial inclusion has been extensively researched, very few studies have attempted to empirically examine the influence of the Islamic banking industry on the level of financial inclusion. Naceur, Barajas, and Massara (2015) provide evidences that the presence of Islamic banking is associated with a higher level of financial inclusion for OIC member countries. In a later study, Evans and Adeoye (2016) show that Islamic finance industry is an important factor explaining financial inclusion. However, Suseno and Fitriyani (2018) failed to find any significant impact of Islamic finance with financial inclusion. They claimed that this is due to Islamic finance being in its early growth stage and it is still too early to establish that Islamic finance is in favour of financial inclusion.

3.0 METHODOLOGY

The objective of this study is to examine the determinants of financial inclusion, particularly the impact of the Islamic finance industry, in developing countries. The unit of analysis is developing countries with notable presence of Islamic finance industry. If the study incorporates all dimensions, the sample size may be smaller and statistical analysis would be unfeasible. To ensure that as many countries can be included in the analysis, this study adopted the most commonly used definition of financial inclusion i.e. individual’s usage of basic financial products and services. The sample consists of 28 countries. Panel data are collected from the World Bank’s Global Findex Database, World Development Indicators (WDI) and Thomson Reuter’s Islamic Finance Development Indicators (IFDI) for the year 2014 and 2017.
Financial inclusion is the dependent variable in this study. It is represented by the Index of Financial Inclusion (IFI), developed following the UNDP’s methodology. The study uses usage dimension which comprises of four indicators. The indicators are percentage of adults with bank account at financial institution (ACCOUNT), percentage of adults that save at financial institution (SAVE), percentage of adults that own debit card (DEBIT) and percentage of adults that borrowed from financial institution or used a credit card (CREDIT). For each indicator, we have \( n \) number of variables. Thus, for each variable, the study computes \( D_i \) by using the following formula:

\[
D_i = \frac{A_i - m_i}{M_i - m_i}
\]  

(1)

where \( A_i \) is the actual value of variable \( i \), \( m_i \) is the minimum value of variable \( i \) and \( M_i \) is the minimum value of variable \( i \). Then, the weights for each indicator are assigned using Principal Component Analysis (PCA). PCA is a more precise method for assigning weights because it reduces the problem of multicollinearity between the four indicators (Arora, 2014). The IFI is derived as the weighted average of the four indicators:

\[
IFI = w_1D_{i\text{account}} + w_2D_{i\text{save}} + w_3D_{i\text{debit}} + w_4D_{i\text{credit}}
\]  

(2)

Seven explanatory variables are tested in this study to determine which variable significantly impacts the IFI. The variables and its descriptions are listed in Table 1.
Table 1: Description of explanatory variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDPG</td>
<td>Gross Domestic Product growth</td>
<td>Annual percentage growth rate of GDP (constant 2010 U.S. dollars)</td>
</tr>
<tr>
<td>EMPLY</td>
<td>Total employment to population ratio</td>
<td>The proportion of a country's population (ages 15 and older) that is employed (in percentage)</td>
</tr>
<tr>
<td>MOBILE</td>
<td>Mobile cellular telephone subscriptions</td>
<td>Individuals who have mobile telephone service, which includes postpaid subscriptions and active prepaid accounts (in percentage)</td>
</tr>
<tr>
<td>IT</td>
<td>Internet subscriptions</td>
<td>Individuals who have used the Internet (from any location) in the last 3 months (in percentage)</td>
</tr>
<tr>
<td>LGNI</td>
<td>Gross National Income per capita</td>
<td>Gross national income divided by midyear population (constant 2010 U.S. dollars) in natural logarithm form</td>
</tr>
</tbody>
</table>

**IFI:**

The overall Islamic Finance Development Indicator is comprised of five sub-indicators:

1. Quantitative development
2. Knowledge
3. CSR
4. Governance
5. Awareness

To identify the impact of the explanatory variables on IFI, the following models are estimated:

\[
IFI_{i,t} = \beta_0 + \beta_1 LGDP_{i,t} + \beta_2 EMPLY_{i,t} + \beta_3 MOBILE_{i,t} + \beta_4 IT_{i,t} + \beta_5 LGNI_{i,t} + \beta_6 IFDI_{i,t}
\]  

\[
IFI_{i,t} = \beta_0 + \beta_1 LGDP_{i,t} + \beta_2 EMPLY_{i,t} + \beta_3 MOBILE_{i,t} + \beta_4 IT_{i,t} + \beta_5 LGNI_{i,t} + \beta_7 QD_{i,t}
\]
4.0 FINDINGS AND DISCUSSION

4.1 Descriptive Statistics

Table 2 shows the descriptive statistics of variables for 28 developing countries with presence of Islamic finance industry for the period of 2014 and 2017. It is important to highlight that the mean of financial inclusion is 50.69%, meaning that on average only half of the population in the countries is unbanked, while the remaining half is excluded from the formal financial system.

4.2 Collinearity Test

Correlation matrix is generated to observe the strength of association between the explanatory variables and the results are shown in Table 3. If the correlation between variables is more than 0.9, multicollinearity problem exists in the sample data (Asteriou & Hall, 2015). The highest correlation
is between IFDI and KNOW which is at 0.872163. Thus, it can be concluded that there is no multicollinearity issue in the data set.
Table 2: Descriptive statistics of variables for developing countries for year 2014 and 2017

<table>
<thead>
<tr>
<th></th>
<th>FII</th>
<th>GDPG</th>
<th>EMPLY</th>
<th>MOBILE</th>
<th>IT</th>
<th>LGNI</th>
<th>IFDI</th>
<th>QD</th>
<th>KNOW</th>
<th>CSR</th>
<th>GOV</th>
<th>AWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>89.71000</td>
<td>8.510000</td>
<td>79.36000</td>
<td>214.7300</td>
<td>98.00000</td>
<td>10.88361</td>
<td>128.8700</td>
<td>80.67000</td>
<td>197.3500</td>
<td>95.16000</td>
<td>108.4800</td>
<td>243.3600</td>
</tr>
<tr>
<td>Minimum</td>
<td>10.63000</td>
<td>-2.870000</td>
<td>33.26000</td>
<td>70.65000</td>
<td>12.00000</td>
<td>6.890518</td>
<td>0.020000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.040000</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>3.725226</td>
<td>1.524980</td>
<td>1.955217</td>
<td>5.650914</td>
<td>3.136707</td>
<td>2.185766</td>
<td>65.42190</td>
<td>45.24064</td>
<td>454.9063</td>
<td>8.008912</td>
<td>6.251438</td>
<td>155.4526</td>
</tr>
<tr>
<td>Probability</td>
<td>0.155266</td>
<td>0.466503</td>
<td>0.376210</td>
<td>0.059282</td>
<td>0.208388</td>
<td>0.335249</td>
<td>0.000000</td>
<td>0.000000</td>
<td>0.018234</td>
<td>0.043905</td>
<td>0.000000</td>
<td></td>
</tr>
</tbody>
</table>
Table 3: Correlation analysis of variables for developing countries for year 2014 and 2017

<table>
<thead>
<tr>
<th>Correlation</th>
<th>GDPG</th>
<th>EMPLY</th>
<th>MOBILE</th>
<th>IT</th>
<th>LGNI</th>
<th>IFDI</th>
<th>QD</th>
<th>KNOW</th>
<th>CSR</th>
<th>GOV</th>
<th>AWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDPG</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMPLY</td>
<td>0.135077</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOBILE</td>
<td>-0.332822</td>
<td>0.488301</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT</td>
<td>-0.414288</td>
<td>0.296081</td>
<td>0.648953</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGNI</td>
<td>-0.404649</td>
<td>0.308632</td>
<td>0.719184</td>
<td>0.864652</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>IFDI</td>
<td>-0.158093</td>
<td>0.205080</td>
<td>0.464603</td>
<td>0.459906</td>
<td>0.388740</td>
<td>1.000000</td>
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<td></td>
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</tr>
<tr>
<td>QD</td>
<td>-0.141857</td>
<td>0.128553</td>
<td>0.386972</td>
<td>0.397943</td>
<td>0.407311</td>
<td>0.826127</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNOW</td>
<td>-0.051929</td>
<td>0.034855</td>
<td>0.247262</td>
<td>0.304412</td>
<td>0.165890</td>
<td>0.872163</td>
<td>0.684581</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSR</td>
<td>-0.272680</td>
<td>0.000049</td>
<td>0.369221</td>
<td>0.344540</td>
<td>0.353270</td>
<td>0.671863</td>
<td>0.528919</td>
<td>0.403328</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOV</td>
<td>-0.127533</td>
<td>0.248394</td>
<td>0.412732</td>
<td>0.363068</td>
<td>0.369798</td>
<td>0.861617</td>
<td>0.675088</td>
<td>0.623537</td>
<td>0.652535</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>AWR</td>
<td>-0.122988</td>
<td>0.337532</td>
<td>0.502887</td>
<td>0.485067</td>
<td>0.379940</td>
<td>0.920065</td>
<td>0.689295</td>
<td>0.809697</td>
<td>0.441653</td>
<td>0.719084</td>
<td>1.000000</td>
</tr>
</tbody>
</table>
### Table 4: Tests for selection of best models

<table>
<thead>
<tr>
<th>Model</th>
<th>Redundant Fixed Effects Test</th>
<th>Hausman Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: IFDI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-section F</td>
<td>16.753788***</td>
<td></td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0000)</td>
<td></td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>171.970837***</td>
<td></td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0000)</td>
<td></td>
</tr>
<tr>
<td>Chi-Sq. Statistic</td>
<td></td>
<td>15.694087**</td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0155)</td>
<td></td>
</tr>
<tr>
<td>Model 2: QD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-section F</td>
<td>18.377112***</td>
<td></td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0000)</td>
<td></td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>176.921661***</td>
<td></td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0000)</td>
<td></td>
</tr>
<tr>
<td>Chi-Sq. Statistic</td>
<td></td>
<td>19.740141***</td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0031)</td>
<td></td>
</tr>
<tr>
<td>Model 3: KNOW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-section F</td>
<td>16.481801***</td>
<td></td>
</tr>
<tr>
<td>(P-value)</td>
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<td></td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>171.097097***</td>
<td></td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0000)</td>
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</tr>
<tr>
<td>Chi-Sq. Statistic</td>
<td></td>
<td>15.274872**</td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0182)</td>
<td></td>
</tr>
<tr>
<td>Model 4: CSR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-section F</td>
<td>16.502856***</td>
<td></td>
</tr>
<tr>
<td>(P-value)</td>
<td>(0.0000)</td>
<td></td>
</tr>
</tbody>
</table>
Cross-section Chi-square 171.165223***
(P-value) (0.0000)
Chi-Sq. Statistic 16.272632**
(P-value) (0.0124)

Model 5: GOV
Cross-section F 17.114252***
(P-value) (0.0000)
Cross-section Chi-square 173.108188***
(P-value) (0.0000)
Chi-Sq. Statistic 15.379516**
(P-value) (0.0175)

Model 6: AWR
Cross-section F 16.908625***
(P-value) (0.0000)
Cross-section Chi-square 172.462216***
(P-value) (0.0000)
Chi-Sq. Statistic 16.369570**
(P-value) (0.0119)

Notes: ***, ** denote significant at the 1%, 5% respectively.

4.3 Panel Data Analysis

In order to determine the best panel data model, firstly, Likelihood Ratio Test is conducted. As the p-values of cross-section F and cross-section Chi-Square statistics for all models are less than \( \alpha = 0.01 \), the statistics are significant. Thus, Fixed Effects model is preferred. Secondly, the Hausman Test is conducted. The p-value of Chi-Square statistic for all models are less than \( \alpha = 0.05 \), meaning that the statistics are significant. This implies that the Fixed Effects model is preferred. The results of these tests are summarized in Table 4.

Next, Fixed Effects panel regression model is constructed. The model has been adjusted for robust standard error (SE) and the results are summarized in Table 5. Six models were constructed to identify the determinants of financial inclusion. Five explanatory variables are included in all six models; GDP growth (GDPG), employment (EMPLY), mobile phone penetration (MOBILE), internet penetration (IT) and natural logarithm of Gross National Income (LGNI).
GDP growth is found to be positively significant at $\alpha = 0.05$ in Model 2 and 5 as well as at $\alpha = 0.10$ in Model 3, 4 and 6. This means that as GDP growth increases, financial inclusion will also increase. However, GDP Growth is not significant in Model 1. Mobile phone penetration is found to be consistently significant, either at $\alpha = 0.05$ or $\alpha = 0.01$, in all models. The coefficient is negative in all models, implying that an increase in mobile phone penetration will cause financial inclusion to decrease. Internet penetration is found to be significant in Model 2, but only at $\alpha = 0.10$. The positive coefficient means that financial inclusion will increase when internet penetration increases. GNI is consistently significant in all models except in Model 6. However, it is only significant at $\alpha = 0.10$, with exception in Model 5 where it is significant at $\alpha = 0.05$. The positive coefficient means that as GNI increases, financial inclusion increases. On the other hand, employment is not significant in all models, implying that it has no impact on financial inclusion.

Model 1 is developed to examine the impact of Islamic finance industry (IFDI) on the level of financial inclusion. It is found that Islamic finance industry, as a whole, failed to contribute significantly towards financial inclusion. However, since IFDI is comprised of five sub-indicators, the study develops five independent models, particularly to examine the impact of each sub-indicator of IFDI towards financial inclusion. In Model 2, quantitative development (QD) is regressed against financial inclusion and it was found that the variable is positively significant at $\alpha = 0.05$. This implies that a 1 unit increase in quantitative development of the Islamic finance industry leads to 0.221815 unit increase in financial inclusion. Next, knowledge (KNOW) indicator is regressed against financial inclusion in Model 2, but it was found to be not significant. The same goes to CSR indicator in Model 4, governance (GOV) indicator in Model 5 and awareness (AWR) indicator in Model 6, which are found to have no significant impact on financial inclusion as well.

Next, to determine whether the Fixed Effects models fit the data well, a Model Fit Test is conducted. The F-statistics generated for all models are significant at $\alpha = 0.01$, meaning that the Fixed Effects models are significant at 1 percent and fit the sample data well. The adjusted R-squared values for all models are more than 0.9, indicating that more than 90 percent of the variation in financial inclusion of the countries can be explained by the selected explanatory variables.

4.4 Discussion of Results

From the results, GDP growth is a statistically significant determinant of financial inclusion as evidenced across all models, except for Model 1. The positive coefficient establishes that an increase in GDP growth rate will lead to an increase in the level of financial inclusion. GDP growth rate represents the economic growth for a country. Higher the economic growth, higher is the financial inclusion. As growing economy generates economic prosperity, it is possible that the government allocates more budget to improve financial inclusion (Chikalipah, 2017). This finding is in line with the studies done by Cámara and Tuesta (2014), Clamara, Peña, and Tuesta (2015), Evans and Adeoye (2016), Fungáčová and Weill (2016) as well as Sarma and Pais (2011).
Table 5: Final FEM Model adjusted for robust SE

<table>
<thead>
<tr>
<th></th>
<th>Model 1:</th>
<th>Model 2:</th>
<th>Model 3:</th>
<th>Model 4:</th>
<th>Model 5:</th>
<th>Model 6:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFDI</td>
<td>-410.4510</td>
<td>-443.9713</td>
<td>-403.9895</td>
<td>-408.9525</td>
<td>-456.3853</td>
<td>-446.8576</td>
</tr>
<tr>
<td>GDPG</td>
<td>1.016209</td>
<td>1.206095**</td>
<td>1.168393*</td>
<td>1.193391*</td>
<td>1.366366**</td>
<td>1.038767*</td>
</tr>
<tr>
<td>EMPLOY</td>
<td>-0.059735</td>
<td>0.723989</td>
<td>-0.014840</td>
<td>-0.061396</td>
<td>0.376794</td>
<td>-0.025662</td>
</tr>
<tr>
<td>MOBILE</td>
<td>-0.195725**</td>
<td>0.197637***</td>
<td>0.181557***</td>
<td>0.180178***</td>
<td>0.189947***</td>
<td>-0.194255**</td>
</tr>
<tr>
<td>LGNI</td>
<td>54.39108*</td>
<td>52.87664*</td>
<td>53.35142*</td>
<td>54.17840*</td>
<td>57.40298**</td>
<td>58.633308</td>
</tr>
<tr>
<td>IFDI</td>
<td>-0.102642</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QD</td>
<td></td>
<td>0.221815**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNOW</td>
<td></td>
<td></td>
<td>0.015264</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSR</td>
<td></td>
<td></td>
<td></td>
<td>0.014676</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.136773</td>
<td></td>
</tr>
<tr>
<td>AWR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.038115</td>
</tr>
</tbody>
</table>

Notes: *significant at 10% level, **significant at 5% level, ***significant at 1% level.
R-squared | 0.978343 | 0.980453 | 0.978028 | 0.978039 | 0.978563
---|---|---|---|---|---
Adjusted $R^2$ | 0.945857 | 0.951132 | 0.945069 | 0.945097 | 0.946408
F-statistics | 30.11592*** | 33.43912*** | 29.67460*** | 29.68998*** | 4.032663*** | 30.43259***
(Probability) | (0.000000) | (0.000000) | (0.000000) | (0.001513) | (0.000000)

Notes: ***, **, * denote significant at the 1%, 5%, 10% respectively. Standard errors are given in parentheses.

Mobile phone penetration is found to have a highly significant impact on the level of financial inclusion but the coefficient is negative, indicating that a higher mobile phone penetration is lowering the financial inclusion level. This finding contradicts with previous studies. However, there exist barriers towards the adoption of mobile banking. For example, mobile banking requires knowledge to use it and it also attract additional charges. Some people, particularly older people, are also reluctant to use mobile banking as they prefer the traditional mode of banking (Brahim & Dridi, 2015; Iddris, 2013; Rumanyika, 2015). These barriers to mobile banking adoption further support the finding and prove that an increase in mobile phone penetration does not necessarily increase financial inclusion.

On the other hand, total employment to population ratio (EMPLY) is not a statistically significant determinant of financial inclusion. Formal employment also implies inclusion in formal financial system as wages and related employee benefits are transferred directly into the back account. However, total employment ratio accounts for both formal and informal employment. It is found to be insignificant because informal economy accounts for a larger portion of total employment in most of the developing countries and informal economy pays wages by cash (Blades, Ferreira, & Lugo, 2011). In this case, total formal employment ratio could be a better proxy of employment and a significant determinant of financial inclusion, but there is no complete and reliable cross-country data on this variable (Sarma & Pais, 2011).

In addition, internet penetration is found to have a positive coefficient but it is not a significant determinant of financial inclusion in the context of this study. The variable is found to have a low significant impact, at $\alpha = 0.10$, only in Model 2. This finding may be attributed by the low internet penetration in developing economies. Most of developing economies have strict regulatory policies regarding Internet Service Providers (ISP) which leads to higher internet access price and subsequently lower internet penetration (Wallsten, 2003). Thus, although widespread of internet use could significantly increases financial inclusion, financially excluded people cannot reap the benefits of internet banking as the cost of internet is not affordable for them.

This study also found that Gross National Income (GNI) per capita have a significant impact on financial inclusion. Although it is significant only at $\alpha = 0.10$, it is consistently significant across all models, with exception to Model 6, indicating the importance of this variable towards financial inclusion although the impact is rather small. The positive coefficient indicates that an increase in national income would increase the financial inclusion. GNI in general is a measure of wealth of the population and people with excess cash are more likely to be banked (Werff, Hogarth, & Peach, 2013). This finding is consistent with the studies by Chikalipah (2017), Park and Mercado (2018) as well as Rajput (2017).

This study mainly aims to examine the impact on Islamic finance industry on financial inclusion. From Model 1, it is found that IFDI is not a significant determinant of financial inclusion. This
means that, Islamic finance as a whole did not contribute towards financial inclusion. Financial inclusion still remains a challenge in these countries despite the strong presence of Islamic finance industry, the rapid industry development and positive growth prospects. In this sense, the presence of the industry does not contribute much to the development in social sector (Mohamad & Borhan, 2017; Mohamad, Lehner, & Khorsid, 2016). This finding is similar with the study done by Suseno and Fitriyani (2018) who used the Islamic Finance Country Index as a whole as the proxy of Islamic finance and found it to be insignificant. However, the IFDI is comprised of five sub-indicators which explains Islamic finance and these indicators are regressed individually against financial inclusion to examine which part of Islamic finance is actually making a difference towards financial inclusion.

Quantitative development (QD) indicator of the Islamic finance industry is found to have a strong positive impact on financial inclusion. QD indicator measure the growth and size of all subsections of Islamic finance, which are Islamic banking, takaful, other Islamic financial institutions, sukuk and Islamic funds. The positive coefficient of QD implies that as every subsections of the industry grow, financial inclusion will increase as well. This is consistent with the study done by Evans and Adeoye (2016) who found that countries with presence of Islamic banking would have higher financial inclusion. However, other IFDI sub-indicators such as knowledge, CSR, governance and awareness are found to be insignificant, meaning that these parts of Islamic finance are offering no difference towards financial inclusion.

5.0 CONCLUSION

To be true to its premise, Islamic finance should be able to contribute towards the global agenda on financial inclusion. However, despite the notable global presence of Islamic finance industry, financial inclusion still remains a major challenge, particularly for the developing Muslim countries which housed more than half of the global unbanked population. The developed FII indicates that the average level of financial inclusion in developing countries is still lower as compared to the global average. This low level of financial inclusion is caused by many factors. The Fixed Effects models show that GDP growth and GNI per capita have positive impacts on financial inclusion while mobile phone penetration provides strong negative influence. However, internet penetration offers very minimal impacts while total employment did not provide any significant contribution at all. On the other hand, the study also examines the impacts of Islamic finance industry as a whole and its individual sub-indicators towards financial inclusion. It was found that although Islamic finance industry as whole failed to provide any difference on financial inclusion, one of its sub-indicators, quantitative development, is a highly significant determinant of financial inclusion. As financial inclusion is a recent idea, particularly in the discourse of Islamic finance, this paper extends the scope of literature by providing empirical evidences on the contribution of Islamic finance towards the level of financial inclusion. The findings of this study support the needs of the policymakers to further promote Islamic finance as an avenue to improve financial inclusion. Future studies can extend the scope of this paper and contributes towards the development of a multidimensional Islamic Financial Inclusion Index which can be used to measure and compare the level of financial inclusion among countries with presence of Islamic finance. In addition, future studies could use other panel data modelling methods to further examine the contribution of every single indicators of Islamic finance.
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