FINANCIAL INCLUSION:
THE ROLE OF FINANCIAL SYSTEM
AND OTHER DETERMINANTS

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Ph.D. Thesis **2016**

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Submitted in Fulfilment of the Requirements of the Degree of
Doctor of Philosophy, September 2016

Acknowledgements

In the Name of God, the Most Gracious, the Most Merciful. Praise be to God for His mercy which has enabled me possible to complete this thesis.

This thesis is the outcome of my doctoral research at the Salford Business School, University of Salford, Greater Manchester. I am grateful for the financial support from the Ministry of Higher Education (Malaysia) and Universiti Sains Islam Malaysia (USIM).

My special words of appreciation go to my supervisor, Dr Nazam Dzolkarnaini for the opportunity to research in the area of financial inclusion and Islamic finance while constantly providing me with insightful comments and invaluable suggestions. I remain extremely grateful for his boundless and tremendous personal and moral supports throughout my Ph.D study. I am also sincerely grateful for the time he spent on reading and correcting the manuscript as well as improving my style of writing. The list of his contribution towards my Ph.D journey is endless. I could not have imagined having a better supervisor and mentor for my Ph.D study.

I would like to acknowledge the following persons and organisations without which this thesis could not be realised in its current form: Salford Business School which organizes a series of Doctoral training programmes and PGR symposiums and forums, where I gained lots of useful knowledge and information; Dr Rasol Eskandari, Mr Roland Fox, Dr Jia Liu and Ms Eileen Roddy for their invaluable feedbacks and suggestions during the internal assessments; Salford's

English Language Centre for their English for the Academic Purposes (EAP) programme where I benefited a lot in writing my thesis, and all the staff at the Salford University library for their kind cooperation in supplying the required materials. I also must thank the IT Services department of Salford University for their approval to supply STATA software, which helped me in speeding up my data analysis.

My doctoral research has also benefited considerably from comments and suggestions made by a number of participants at several doctoral colloquiums/seminars. Notably, these participants were individuals at the 2014 Seminar/Workshop on Developing a Framework for Maqasid al-Shariah Based Index of Socio-Economic Development at the Islamic Development Bank, Jeddah, Kingdom of Saudi Arabia, the 2014 BAFA Doctoral Conference at the London School of Economics and Political Science and the 2015 Salford Postgraduate Annual Research Conference (SPARC) at the MediaCityUK, University of Salford.

I remain indebted to my beloved husband, Ahmad Shakir bin Salleh, for his unconditional love and support throughout this learning journey. I am also eternally grateful for the presence of the apples of my eyes, Dzulqarnain and Dzul Ihsan who being an important source of motivation for me along the way and sharing all the joy and bitter moments. Without their presence, it would not be possible for me to complete this research.

I also would like to take this opportunity to thank my fellow Malaysian Community of Cheetham Hill (MCCH) for the friendship and assistance throughout our short yet

meaningful life in Manchester. May God bless and strengthen this friendship forever.

Finally, I dedicate this piece of work to my father Abu Seman Saad and my mother Normah Lazim. Their prayers are the most precious thing that I have ever had. My sisters, brothers, nephews, nieces and family in law will undoubtedly share the happiness of completing this thesis.

Abstract

The promotion of access to finance is considered as a top priority agenda in many countries. Finding the related and strong factors to enhance financial inclusion is therefore becoming crucial. Despite many studies on the factors associated with financial inclusion, the role of financial system has not been well explored. Leyshon & Thrift (1995) shed new lights on this issue by stating that "Although the criteria for exclusion may vary over time, the *financial system* has an inherent tendency to discriminate against poor and disadvantaged groups".

This thesis, therefore investigates the role of financial system and other determinants in shaping financial inclusion, based on institutional theory. The design of the study takes account two lacunae in our current understanding of this topic.

Firstly, despite the fact that the financial inclusion literature is voluminous, it is perhaps surprising that relatively little research has been carried out on the effect of Islamic finance on financial inclusion, given its possible significant role as one of the contributing factors that creating and shaping financial inclusion. Empirically testing for the effect of Islamic financial sector (as proxied by Islamic banking presence) is challenging because the data on Islamic banking are imperfect since there is no single accepted definition of an Islamic bank nor is there a single and comprehensive database on it. To this juncture, our understanding in this field remains incomplete.

Secondly, besides the role of financial system, empirical evidence on the other financial inclusion determinants is relatively lacking and far from conclusive.

Notably, a direct or indirect relationships and significance levels are commonly observed. Under the notion of institutional theory, the institutional settings are heterogeneous, and therefore affect the institutional differences and in turn increased structure of the financial inclusion level.

In response to these two major issues, this study employs empirical research methods, namely cross-sectional pooled regression, panel data regression, and quantile regression to analyze a set of samples consisting of 80 countries, drawn from the Financial Access Survey (FAS, 2011) over the years 2007 through 2011. The financial inclusion levels are estimated using the cumulative index of financial inclusion (CIFI) which is constructed based on Sarma (2008, 2010) method while the Islamic banking presence variables (i.e., the number, size and profitability of Islamic banks) are used to proxy for the countries' type of financial system.

Although not largely prevalent, using the Islamic banking presence as the proxy for Islamic financial sector has found some empirical support on its relationship with the incidence of financial inclusion. To a certain extent, this thesis presents fresh empirical evidence and renewed interpretation of the role of institutional settings in shaping financial inclusion.

As far as the institutional theory is concerned, the use of quantile regression method in the present study represents a novel approach in further investigating the effects of the institutional settings on the levels of financial inclusion. The results reveal that the determinants of financial inclusion, particularly the institutional settings, are heterogeneous across the whole distribution of countries, consistent with the notion of

heterogeneity as purported by Zucker (1987) and further extend the view that heterogeneity only evidenced within the organizational level. The findings demonstrate twofold; firstly, institutional settings are shaped and designed to be consistent with financial inclusion enhancement for both at lower and higher level of financial inclusion. Secondly, the quantile regression does not only further supports financial inclusion is institutionally-driven, but more importantly offers renewed insights on the heterogeneity aspect of the institutional theory.

Table of Contents

List of Appendices

List of Figures

List of Tables

Abbreviations

APACS	Association for Payment Clearing Services
ATM	Automated teller machine
B.C.E	Before common era
BAFIA	Banking and Financial Institutions Act 1989
CAR	Capital asset ratio
CFS	Conventional financial system
CGAP	Consultative Group to Assist the Poor
CIFI	Composite index of financial inclusion
DD	Demand draft
FAI	Financial access index
FAS	Financial Access Survey
FII	Financial inclusion index
FRS	Family Resource Survey
FSA	Financial Services Authority
FSA	Financial Services Act 2013
FSC	Federal Shariat Court
GDI	Gender-related development index
GDP	Gross domestic product
GNP	Gross national product
HDI	Human development index
HPI	Human poverty index
IA	Insurance Act 1996
IB	Islamic banking
IFI	Index of financial inclusion
IFS	Islamic financial system
IFSA	Islamic Financial Services Act 2013
IMF	International Monetary Fund
LST	Linear scaling technique
MENA	Middle East & North Africa
MFP	Microfinance provider
MIFC	Malaysia International Islamic Financial Centre
MPPI	Mortgage payment protection insurance
NPA	Non-performing asset
OIC	Organisation of Islamic Cooperation
OLS	Ordinary least squares
ONS	Office for National Statistics
PCA	Principal component analysis
PLS	Profit and loss sharing
SAB	Shariat Appellate Bench
SAC	Shariah Advisory Council
SHG	Self- help groups
UK	United Kingdom
UNDP	United Nations Development Programme
US	United States of America

Chapter 1

INTRODUCTION

1.1 Background

In 1980s, retail financial markets grown and more people have the ability to access to a broader range of financial products. In general, a considerable number of people have benefited from these developments especially those who enjoy stable income. On the other hand, there are minority of groups that lack even the most basic of financial products, for instance a current account or insurance. There is also rising concern that this group of people is the most underserved market in society and has limited participation in financial services which adding to the more general issue of social exclusion (Kempson & Whyley, 1999). Since it is a problem of financial as well as social, financial exclusion has emerged as a major concern in both the US and the Europe (Zhijun, 2007).

It is clear that financial inclusion is a multidimensional phenomenon. In order to get an idea of how bad financial exclusion (or how good financial inclusion) is in a particular country, measurement of financial inclusion is introduced in 2007 (Beck, Demirguc-Kunt, & Martinez Peria, 2007). The study measures banking sector outreach (i.e., demographic and geographic banking penetration as well as information on credit and deposit accounts) and investigates its determinants. Later in 2008, Sarma (2008) formulates an index of financial inclusion to provide an aggregate picture of banking activities using outreach and usage dimensions, which followed by other the studies to include other dimensions such as ease and cost (Arora, 2010;

Gupte, Venkataramani, & Gupta, 2012). However, a single measurement of financial inclusion that can be applied across countries is simply does not exist. Besides limited data on the use of basic financial services by households and firms (Claessens, 2006), this constraint is also due to the continuous modifications that are being made to provide a more comprehensive measure of financial inclusion. Admittedly, the index of financial inclusion is important as a tool to investigate factors associated with financial inclusion.

With regard to prior discussion and analysis concerning causes of financial exclusion, among others, Leyshon & Thrift (1995) note that "although the criteria for exclusion may vary over time, the financial system has an inherent tendency to discriminate against poor and disadvantaged groups" (p.314). In the similar vein, Demirgüç-Kunt, Beck, & Honohan (2008, p.2) mention that financial sector reforms that promote inclusive access to financial services is still at the core of the development agenda. Taking from the institutional perspective, it is very much true that the financial system, which is part of the institutional settings, could influence financial inclusion. Institutional creation and diffusion happen, where top-down processes allow higher level structures to shape the structure and action of lower levels, while bottom-up processes shape, reproduce and change the context within, in which they operate (Scott, 2008, p. 190). In other words, an institution found at one level of analysis often affects behaviour on the level below (Bjorck, 2004), where macro structures in society are bridged by organizational fields to micro structures in organizations or even "down" to the individual actor level (Svejvig, 2009).

Given the unprecedented growth of Islamic banking and fnance sector since the last decade, it is much interesting to know how Islamic and conventional-based financial system interact with financial inclusion. To some extent, comparing between Islamic and conventional financial systems is not something new. There are voluminous of literature differentiating the two systems on different areas (e.g., Samad, 2004; Olson & Zoubi, 2008; Ariss, 2010; Beck, Demirgüç-Kunt, & Merrouche, 2013). However, these studies are focusing more on the firm-level analysis, i.e., comparisons are made between particular Islamic and conventional financial institutions per se [e.g., banks (see for examples Rashwan, 2012; Beck et al., 2013; Johnes, Izzeldin, & Pappas, 2014), insurance providers (see for examples Mushtaq Hussain & Tisman Pasha, 2011; Abdou, Ali, & Lister, 2014; Tahira & Arshad, 2014) and unit trusts (see for example Saad, Majid, Kassim, Hamid, & Yusof, 2010)]. Some studies even employed cross-country analysis (see for examples Yudistira, 2004; Rashwan, 2012; Beck et al., 2013; Johnes et al., 2014) but the basis of the comparison is similar, i.e., to explain on what aspects of the Islamic banks are different from their counterparts.

In analyzing the role of Islamic-based financial system on financial inclusion, it is essential to recap the functions of Islamic finance per se in inclusive financial system. As stated in many studies pertaining to the role of Islamic finance in promoting financial inclusion (e.g., Mirakhor & Iqbal, 2012; Mohieldin, Iqbal, Rostom, & Fu, 2012: El-Zoghbi & Tarazi, 2013; MIFC, 2015), Islamic finance could contribute to greater inclusion in two essential ways, namely promoting risk-sharing contracts that provide a viable alternative to conventional debt-based financing, and the other

through specific instruments of redistribution of the wealth (e.g., through *zakat*[1], *waqaf*[2], *sadaqah*[3], etc) among the society. Among all the channels, Islamic banks are considered as the powerful tools to achieve *maqasid al-shariah*[4] in which elements of emancipation and empowerment are embedded hence improving financial inclusion.

The next milestone in the Islamic finance industry, particularly in Islamic banking operation, is therefore to expand its products and services within this ambit of *maqasid al-shariah*. However, to what extent financial inclusion has improved as a result of Islamic banking operation is an interesting empirical question.

Using information from 209 banks in 62 countries, prior study on the determinants of financial inclusion by Beck et al., (2008) shows that the effectiveness of creditor rights, contract enforcement mechanisms, and credit information systems are weakly correlated with barriers to bank access. On the other hand, they signify strong associations between barriers and measures of restrictions on bank activities and entry, bank disclosure practices and media freedom, as well as development of physical infrastructure. Specifically, barriers are higher in countries where there are

[1] Zakat, or almsgiving, is one of the five pillars of Islam, along with prayer, fasting, pilgrimage and belief in Allah and His Messenger. The literal meaning of Zakat is 'to cleanse' or 'purification'. In the Islamic faith, Zakat means purifying your wealth for the will of Allah SWT; to acknowledge that everything we own belongs to Allah SWT and to work towards the betterment of the Muslim Ummah. According to Islamic regulations, Zakat is 2.5% of one year's total cumulative wealth. This amount is then distributed to the poor.

[2] Literally waqf means to stop, contain, or to preserve. In shari'ah, a Waqf is a voluntary, permanent, irrevocable dedication of a portion of ones wealth – in cash or kind- to Allah. Once a waqf, it never gets gifted, inherited, or sold. It belongs to Allah and the corpus of the waqf always remains intact. The benefit of the waqf may be utilized for shari'ah complient purpose.

[3] In Islamic terminology, the word Sadaqah means to voluntarily give charity out of the goodness of one's heart. This is not an Islamic obligation, but rather a practice conducted to help those in need or the deprived. This act goes to show the strength of the believer's faith and increases it further.

[4] *Maqaṣid* (singular: *maqṣid*) refers to the goals and purposes of the *Shariah* (i.e., the Islamic Law) either generally (i.e. *al-maqaṣid al-ʿammah*), or in reference to its particular themes and subjects (*al-maqaṣid al-khaṣṣah*). Three other Arabic words that occur in the relevant literature of *uṣul al-fiqh* and convey similar meanings to *maqaṣid* are *ḥikmah* (wisdom), *ʿillah* (effective cause/ratio legis), and *maṣlaḥah* (interest, benefit) respectively. For details, refer Kamali (2011). Further discussion on *maqasid al-shariah* are given in section 3.2.2 in Chapter 3 and in section 9.3 in Chapter 9.

more stringent restrictions on bank activities and entry (i.e., based on bank regulatory on bank activities and entry), less disclosure and media freedom (i.e., less of transparency), and poorly developed physical infrastructure. However, the link is not much related to credit services. The study also reports that there is no consistent relationship between market structure (i.e., bank concentration, government-owned banks and foreign-owned banks) and credit barriers.

As "the great challenge before us is, to address the constraints that exclude people from full participation in the financial sector" (Annan, 2003)[5] and "the agenda on access to finance is still unfinished" (Beck & Demirguc-Kunt, 2008), this research therefore, aims at exploring these issues in detail.

1.2 Aims, Objectives and Research Questions

Within the framework of institutional theory, this research is aimed to explore and analyse the role of financial system as an institutional setting on financial inclusion. In addition, it aims to further investigate the other factors especially the institutional settings in driving financial inclusion. As the aim suggests, the research will unveil the impact of Islamic-based financial system in particular, as well as the other pertinent factors on inclusive financial system. However, in investigating the influence of Islamic finance on financial access, it has to be understood that there are specific and unique channels that Islam already outlined in taking care of its human well-being, i.e., through; firstly risk-sharing or asset-linked financing through banking and/or non-banking financial institutions and secondly wealth distribution (for example through *zakat*, *waqaf* and *sadaqah*). With the exponential growth of Islamic

[5]Comments made on the "International Year of Microfinance" on 29th December 2003.

banking in the past few years, this sector is expected and hoped to promote greater financial inclusion as compared to the other channels since Islamic banking is claimed as a powerful tool in realization of *maqasid al-shariah*. It is on this premise that the research will need to be assessed.

In order to fulfil the identified aims, the following objectives are developed:

1. Exploring the type of financial system which has positive association with financial inclusion.
2. Further investigating the relationship of other determinants, especially the institutional settings and financial inclusion.

In explaining the relationship between financial inclusion and financial system, the classification of financial system based on Islamic and conventional is far from conclusive. Apart from that, while the importance of broader access is becoming crucial in addressing financial inclusion, there is relatively lacking, inconclusive and mixed evidence on the determinants to financial inclusion. There are a few reasons that might explain the limitations. Firstly, bearing in mind that the issue of financial inclusion is a complex issue in nature[6], there could be just simply too many issues that need to be studied. This is commonly referred to as 'an unfinished agenda' (Beck and Demirguc-Kunt, 2008). Secondly, it could be due to limited data on access to financial services and therefore a proper investigation of this issue is far from possible (Claessens, 2006; Beck et al., 2008; Sarma & Pais, 2011).

[6]There are many angles in the discussion of financial inclusion such as types of financial services involved (World Bank, 1995), financial services providers who responsible to it, different factors from different dimensions associated to it (demand, supply and economic factors), different perspectives of the study (micro and macro) and so on so forth.

Therefore, the following pertinent questions are posed to achieve the overall aims and objectives:

1. Does the Islamic financial sector (i.e., as proxied by the Islamic banking presence), has significant influence on financial inclusion?
2. Are the empirical effects between Islamic financial sector and financial inclusion consistent with the theoretical presumption (i.e., Islamic banking is positively related with financial inclusion)?
3. Do the financial inclusion determinants, especially the institutional settings that have been tested in prior studies remain significant in explaining factors associated with financial access?
4. Are the financial inclusion determinants heterogeneous across the whole distribution of countries?

1.3 Motivation and Rationale

Financial exclusion is a complex problem and classic global phenomenon [see, for example, US- (Jacobson, 1995; Hogarth & O'Donnell, 1999; Aizcorbe, Kennickell, & Moore, 2003). UK- (Budd & Campbell, 1998; Kempson et al., 2000; Hayton, 2001; Devlin, 2005). Scandinavia- (Hohnen, 2007). Canada- (J Buckland & Simpson, 2008). Australia- (Chant Link and Associates, 2004; Howell & Wilson, 2005)]. It is very much synonym with the lack of access to formal finance. Over the years, a strand of institutional theory has been used to explain the situation (e.g., North, 1990; Caskey, 1997; Barr & Sherraden, 2005). More specifically, Buckland (2012) suggests that financial exclusion is created and shaped by the institutional processes and structures. However, Ostrom (2005) argues that understanding 'institutions' is a serious endeavour given the dynamic and complexity of systems that embedded in an

institution. Our understanding remains incomplete and usually not well specified in respect to what impede financial inclusion. Despite many studies on the factors associated with financial exclusion, the role of financial system has not been well explored. Leyshon & Thrift (1995) shed light on this issue by stating that "Although the criteria for exclusion may vary over time, the *financial system* has an inherent tendency to discriminate against poor and disadvantaged groups" (p.314). Therefore, the present study revisits the institutional theory by investigating the role of financial system and other determinants of financial inclusion.

The limited focus on the role of financial system in the financial inclusion literature may be partly explained by the diverse understanding and perception on the different approaches in classifying the type of financial system. For example, bank-based and market-based types of financial system are prominent in the economic development literature. Several studies, however, argue that classifying countries using bank-based or market-based is not a very fruitful way to distinguish financial systems (La Porta, Silanes, Shleifer, & Vishny, 1998; Levine, 2002), not primarily important for policy-making activities (Demirgüç-Kunt & Maksimovic, 2002) and, to a certain extent, is even out-dated (Veysov & Stolbov, 2012). Due to those critiques, La Porta, Silanes, Shleifer, & Vishny (1998) classify a country's financial system based on legal origin (i.e., English, French, German and Scandinavian) since they argue that a country's legal system is a primary determinant of the effectiveness of its financial system. As far as the development and increase in the interest in Islamic finance are concerned, it is perhaps surprising that very little is known about the classification of financial system based on Islamic and conventional systems.

Understanding the determinants that promote financial inclusion is essential as stated by Annan (2003) "the great challenge before us is, to address the constraints that exclude people from full participation in the financial sector". Given its important, it is perhaps not surprising that relatively many research has been carried out on this subject. Since the early 1990s, there are many studies on the factors associated with financial exclusion (see, for example, Kempson & Whyley, 1999; Collard, Kempson, & Whyley, 2001; Carbo, Gardener, & Molyneux, 2007). However, the discussions of the factors are rather normative than positive. Only since year 2007, empirical studies on the determinants of financial inclusion have been carried out (see, for example, Beck, Demirguc-Kunt, & Martinez Peria, 2007, 2008; Sarma & Pais, 2011; Ben Naceur, Barajas, & Massara, 2015) but such empirical studies are still lacking. Therefore, our understanding on the determinants of financial inclusion remains incomplete.

The little empirical research on the determinants of financial inclusion may be partially explained by the issue of financial inclusion measurement. Empirically examining the determinants of financial inclusion is particularly challenging given uniform measure of financial inclusion across countries does not exist. Data constraint is the major problem in this issue (Claessens, 2006; Beck, Demirguc-Kunt, & Honohan, 2009). Building upon the work by Sarma (2008), other studies (e.g. Sarma, 2010; Arora, 2010; Beck, Chakravarty & Pal, 2010; Prathap, 2011; Gupte, Venkataramani, & Gupta, 2012) developed the indices of financial inclusion. With these indices, significant progress has been made in understanding the determinants of financial inclusion (see, for example, Sarma & Pais, 2011and Prathap, 2011).

The heterogeneity aspect of the institutional theory has not been investigated by many researchers, particularly in respect to the determinants of financial inclusion. Drawing from earlier work on the institutional theory of organization by Tolbert (1985), who found that the features of organizations affect its maintenance and transmission, Zucker (1987) argues that institutional environment is heterogeneous, hence reflects the impact of institutional processes on the organization. She claims that homogeneity of environment decreases the structure of internal organization, which contradicts to the environment-as-institution approach. By putting forward this argument, Zucker (1987) also acknowledges studies that seem contradict to her claim (i.e., Tolbert, (1987) and Rowan, (1982)). With this regard, examination of heterogeneity in financial inclusion determinants is warranted.

1.4 A Brief Research Methodology

Empirical analysis is employed to explain the relationship between financial inclusion and both financial system as well as other factors. The analyses use pooled cross-sectional, panel data and quantile regression methods. In the analyses, those determinants of financial inclusion are investigated assuming the institutional settings and other factors affect the level of financial inclusion. This enables the behaviour of the determinants to be clearly observed and provides evidence for comparison with earlier studies and subsequent analysis.

1.5 Overview of the Research

This thesis consists of nine chapters. Subsequently, in Chapter 2, the thesis will elaborate more on financial inclusion/exclusion; its definitions, key aspects as well as the underlying theories. It also reviews literature on relationship between financial

inclusion and financial system within the institutional theory perspective. The chapter also explains the background of financial system by highlighting the Islamic financial system and the role of Islamic finance on financial inclusion.

In Chapter 3, a detailed issue of financial inclusion measurement is discussed. Dimensions and indicators of financial inclusion as well as its computation are presented and discussed in greater detail. This chapter also highlights and discusses the determinants of financial inclusion.

Chapters 4, 5 and 6 describe the research methods adopted in the present study. In particular, Chapter 4 describes the basic structure of the research design and the methodology used to conduct the study, including variable definitions and the data collection procedure. Chapters 5 and 6 are more specifically describing the construction of financial inclusion index and financial system classification procedures, respectively, without which this thesis could not be realised.

In Chapter 5, computation of cumulative index of financial inclusion (CIFI) is presented in detailed, including the methodology and variable definitions. The index is further strengthened by conducting index justification and validity. Results of CIFI is also presented and discussed using both descriptive and empirical approaches.

In order to understand and to construct financial system variable, the classification of Islamic and conventional-based financial system is discussed in detail in Chapter 6. The basis of the classification as well as the conceptual framework for Islamic-based financial system are outlined, followed by variable definition and data collection

procedure. This chapter also presents and discusses the results of Islamic banking presence indicators as suggested in the study.

The results of the present study are presented in Chapters 7 and 8. The analysis is spread into two chapters given the nature of data analysis in the study. The former chapter reports the results of investigating the determinants of financial inclusion using cross-sectional and panel data regression while the results of examining the heterogeneity in the financial inclusion determinants are presented in the latter chapter using the quantile regression methods.

More specifically, Chapter 7 presents the findings on financial inclusion determinants using descriptive statistics as well as univariate and multivariate analysis. The results of multivariate analysis are discussed in detail, both for the institutional settings variables (i.e., which include Islamic banking presence) as well as the other explanatory variables. Robustness checks and regression diagnostics are also conducted and presented in this chapter. Chapter 8 further presents and discusses the heterogeneity in the determinants of financial inclusion, also for both the institutional settings variables and the other explanatory variables. Likewise, robustness checks are also shown in this chapter.

To end with, Chapter 9 provides an overall summary of the thesis, followed by the summary and conclusion on the research findings as well as implications of the study. The chapter also highlights the contribution to the knowledge and addresses limitations and delivers suggestions for further research.

Chapter 2

LITERATURE REVIEW I: FINANCIAL INCLUSION/EXCLUSION AND FINANCIAL SYSTEM – AN INSTITUTIONAL PERSPECTIVE

2.1 Introduction

This chapter presents a thorough review of existing literature of financial inclusion/exclusion and financial system to provide the context for the present study. The next section presents a review of background of financial inclusion/exclusion. Using the framework of institutional theory, further discussion on financial inclusion and financial system is presented in section 2.3. Discussion on the background of Islamic and conventional types of financial system and the role of Islamic finance in financial inclusion are presented in section 2.4 and section 2.5, respectively. Finally, section 2.6 summarises the chapter.

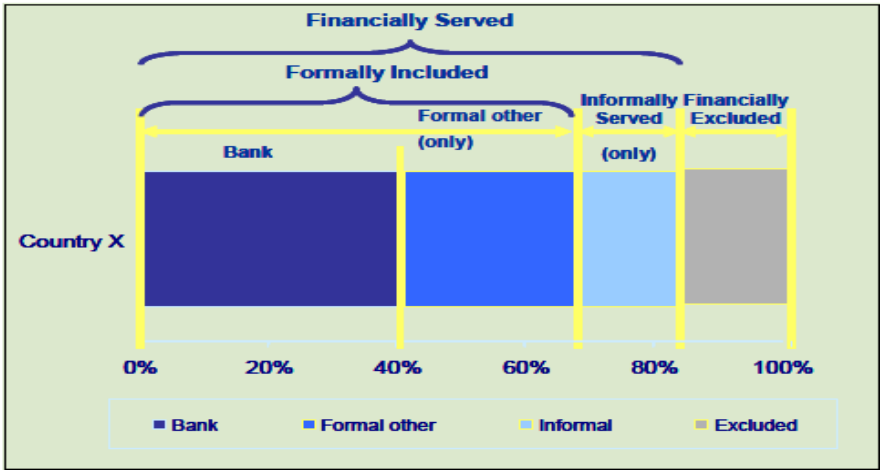
2.2 Background of Financial Inclusion/Exclusion

In 1980s, retail financial markets grown and more people have the ability to access to a broader range of financial products. Kempson (1994) reports that less than half of households in UK had a current account in the mid-1970s. Similarly, about a quarter of households have access to credit facilities in the early 1970s – a figure that had increased to seven out of ten in the period of two decades (Berthoud & Kempson, 1992). Kempson & Whyley (1999) identify two key reasons that influenced these developments: deregulation of the financial services sector and developments in the application of information technology for risk assessment.

In general, a considerable number of people have benefited from these developments especially those who enjoy stable income. On the other hand, there are minority of groups that lack even the most basic of financial products, for instance a current account or insurance. There is also rising concern that this group of people is the most underserved market in society and has limited participation in financial services which adding to the more general issue of social exclusion (Kempson & Whyley, 1999). Since it is a problem of financial as well as social, financial exclusion has emerged as a major concern in both the US and the Europe (Zhijun, 2007).

The World Bank has differentiated between those who are financially served, formally included and financially excluded as shown in the following Figure 2.1 (World Bank, 2005).

Figure 2.1 The access strand: financial access in the institutional dimension from formal to informal provider



Source: World Bank (2005, p. 4)

The *'formally served'* is those who have access to financial services from a bank and/or other formal providers (i,e., all other legal entities licensed to provide financial

services). The '*financially served'* includes those who formally served as well as people who use informal providers (i.e., other organized providers of financial services that are not registered as financial intermediaries and not subject to any oversight). In contrast, the term '*financially excluded*' is used to illustrate individuals who have no access at all (World Bank, 2005).

Furthermore, in their review of the issue, Leyshon & Thrift (1993) identify that the term financial exclusion was first used in 1993 by geographers who were concerned about limited physical access to banking services as a result of bank branch closures. During 1990s there was also a growing body of research relating to difficulties faced by some sections of societies in gaining access to conventional financial system.

It is worth noting that, the debate on financial exclusion has shifted from the geographical access aspect to include factors contributing to the problem (Hogarth & O'Donnell, 1999; Kempson, 2000). In addition, the European Commission has outlined the types of exclusion based on the financial services that are considered important and should be accessed by all in a society. These include banking, saving, credit and insurance exclusion (European Commission, 2008).

Furthermore, with approximately 2.5 billion people still excluded from financial services [Consultative Group to Assist the Poor (CGAP), 2009], this field of research has attracted many researchers around the world (see, for example, US- (Jacobson, 1995; Caskey, 1997; Hogarth & O'Donnell, 1999; Lee, 2002; Aizcorbe, Kennickell, & Moore, 2003). UK- (Budd & Campbell, 1998; Whyley, McCormick, & Kempson, 1998; Kempson & Whyley, 1998; Rowlingson, Whyley, & Warren, 1999; Kempson

et al., 2000; Hayton, 2001; Devlin, 2005). Scandinavia- (Hohnen, 2007). Canada- (J Buckland & Simpson, 2008). Australia- (Chant Link and Associates, 2004; Howell & Wilson, 2005). Despite that, Carbo, Gardener, & Molyneux (2007) conclude that many areas of financial exclusion in the developed world have similarities to those in the developing world. The discussions on financial exclusion are now shifting to promote financial inclusion (see for example Beck, Demirguc-Kunt, & Martinez Peria, 2008; Beck, Demirguc-Kunt, et al., 2007; Sarma & Pais, 2011).

With regard to prior discussion and analysis concerning causes of financial exclusion, among others, Leyshon & Thrift (1995) note that "although the criteria for exclusion may vary over time, the financial system has an inherent tendency to discriminate against poor and disadvantaged groups" (p.314). In the similar vein, Demirgüç-Kunt, Beck, & Honohan (2008, p.2) mention that financial sector reforms that promote inclusive access to financial services are still at the core of the development agenda. This could give an indication of the role of financial system in driving financial inclusion. However, little effort has been made to explore the outcome.

2.2.1 The context of definition

Many attempts have been made by previous studies to define both, financial exclusion as well as financial inclusion. As the phrase of 'financial exclusion' is quoted earlier as compared to 'financial inclusion', the definitions of the two phrases are presented in this study.

Providing a precise definition of financial exclusion is somewhat problematic (Devlin, 2005). The first definition of financial exclusion was given by Leyshon & Thrift

(1995). They referred financial exclusion as "*those processes that serve to prevent certain social groups and individuals from gaining access to the financial system*" (1995, p. 314). The authors explain this by the fact that some financial institutions are reluctant to move into certain geographical areas where groups of people with limited incomes and certain disadvantaged social groups live. Hence, it is primarily problems of physical (i.e., geographical access), which are discussed. The same problem of physical access also shared by Panigyrakis, Theodoridis, & Veloutsou (2002, p.55) when they study financial exclusion in isolated Greek Islands and they termed financial exclusion as ''inability of some financial services segments to access financial services in an appropriate form.''

In addition, Kempson & Whyley (1999) highlight that there are other causes exacerbate financial exclusion rather than merely physical access, namely access exclusion, condition exclusion, price exclusion, marketing exclusion and self-exclusion. These new factors are supported and further elaborated by Devlin (2005). Hence six factors of access limitations are added to the geographical exclusion put forward by Leyshon & Thrift (1995). The six factors are explained as follows:

i. *Access exclusion*: a restriction of access to financial services, which might be rooted by unfavourable risk assessments.
ii. *Condition exclusion*: some individuals cannot benefit from financial services due to conditions attached to the offered product/services.
iii. *Price exclusion:* the current price offered by the financial provider is not affordable for certain individuals.
iv. *Marketing exclusion*: people who are excluded from the financial provider's target market and sales.

v. *Self-exclusion*: people may hesitate applying for a financial product because they believe they would be refused.

vi. *Resource exclusion*: people may not have the discretionary income to save for the future.

By putting the five causes of access difficulties, Kempson and Whyley (1999) broadly define financial exclusion as simply as "constrained access to the mainstream financial services". As for Devlin (2005), by adding another cause of access difficulties (i.e., resource exclusion), he postulates financial exclusion as "it is all about those with few or no financial services holding".

Jointly, these different aspects of financial exclusion represent a complex set of constraints to accessing and using mainstream financial services for many people with limited incomes (Kempson, Whyley, Caskey, & Collard, 2000b). This implies that, studying financial exclusion should take into account both of difficulties; access and use of financial services. In addition, a recent report on financial exclusion in Australia by Chant Link and Associates (2004) defined financial exclusion as "the lack of access by certain consumers to appropriate low cost, fair and safe financial products and services from mainstream providers" (p. 61).

Taking into consideration all the attributes of financial exclusion, the European Commission came out with more comprehensive definition of financial exclusion as follows:

"*A process whereby people encounter difficulties accessing and/or using financial services and products in the mainstream market that are appropriate to their needs and enable them to lead a normal social life in the society in which they belong*" (European Commission, 2008, p.9).

The European Commission (2008) further stated that the constraints in accessing and/or using financial services are caused by:

i. the features of the products/services offered and the how they are put up for sale (supply side), and
ii. the situation and the financial capacity of the customer (demand side).

Alternatively, there have been financial inclusion definitions mentioned in the literature, for instance "access to financial services", "responsible and sustainable provision of financial services", "affordable delivery to disadvantaged and low-income segments of society" and "broad range of services of high quality, with attention to consumer protection". Sarma (2008) defines financial inclusion as "a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy". This definition highlights several dimensions of financial inclusion, namely accessibility, availability and usage of the financial system. In the latest study, Ben Naceur, Barajas, & Massara (2015) describe financial inclusion as "the share of the population who use financial services", which according to them, this definition allows for measurement on a comparable basis across countries.

2.2.2 Key aspects in financial inclusion

For further understanding on this complex issue, several institutions [e.g., the World Bank, Financial Services Authority (FSA) and European Commission] and researchers (e.g., Kempson & Whyley, 1999; Rowlingson, Whyley, & Warren, 1999; Chant Link and Associates, 2004) have provided some key aspects which need to be highlighted in studying this issue. These include:

i. Which financial services and institutions are involved?,
ii. Is there any difference between *access* to financial services and *use* of them?,
iii. Are there levels of financial exclusion and, if so, how to express these?, and
iv. What is the unit of analysis: the individual, the family, the household, the financial institution and financial system
v. Which channel is better in tackling financial exclusion?

The following sub sections discuss the aspects in details.

2.2.2.1 Types of financial services

Previous studies on financial inclusion are more concentrating on savings and credits (see, for example Strahan, 1999; Beck & Torre, 2007; Qian & Strahan, 2007; Honohan & King, 2009; Ghosh, 2012). Only a few discuss on the other financial services namely banking transactions and insurance (e.g., Beck, Demirguc-kunt, & Martinez Peria, 2006; Prathap, 2011). In considering which financial services considered essential, the World Bank (2005) has outlined four main types of services that individuals in society should have access, namely, banking transactions, savings, credit, as well as insurance. These four key areas are confirmed and further explained

by the work carried out by FSA (2000) and European Commission (2008). Each of the exclusion are now listed and briefed as follows:

i. Banking exclusion; transactions

There is a considerable number of literature on the issue of access to banking from different perspectives including individuals, households, communities and financial service providers (see, for example Pollard, 1996; Kempson & Whyley, 1999; Wallace & Quilgars, 2005).

In the UK, is is found that the top priority products for the financially excluded is an account to receive income and make payments, i.e., current account (Kempson and Whyley, 1999). For example, at the individual level, a survey by UK's Family Resource Survey (FRS) reveals that 23% of individuals are lacking of a current account. This somewhat consistent with surveys by Association for Payment Clearing Services (APACS) and ONS Omnibus which found that about 15% of individuals is without a current account (Kempson & Whyley, 1998; Office of Fair Trading, 1999).

In categorising the degree of 'financially included', Kempson, Atkinson, & Pilley (2004), Corr (2006) and Anderloni & Carluccio (2007) have considered three degrees of inclusion, namely, 'unbanked', 'marginally' banked and 'fully banked'. 'Unbanked' are generally people with no bank at all. 'Marginally' banked are people with a deposit account that has no electronic payment facilities and no payment card or cheque book. It can also be people who do have these facilities but make little or no use of them. In contrast, 'fully banked' are people that have access to a wide range of transaction banking services that are appropriate to their needs and socio-economic

status. In addition, the term "unbanked" is not widely used outside the US and UK. "Vulnerable" consumers have been a term used in Australia (Chant Link and Associates, 2004).

ii. Savings exclusion

In general, many people perceived that savings are essential in providing security (i.e., physical and psychological), acting as a safety net in the face of unanticipated events as well as providing cushion for one's budget during financial constraint. However, several studies suggest that relatively one third of people are without any formal savings. For example, in UK, a Gallup poll commissioned by Yorkshire Bank found that 32% of people had no savings at all (FSA, 2000). Based on statistics from the 1995/6 Family Resources Survey (FRS), Rowlingson et al. (1999) estimate about 37% of individuals has no savings.

In its report on saving exclusion, the European Commission (2008) argues that people might have lack of saving due to some reasons. This includes lack of money to save (i.e., low income, low pension), lack of habit to save money in bank as well as unwilling to deal with banks because of negative past experience.

iii. Credit exclusion

According to Kempson and Whyley (1999), credit is not usually recognised to be the main issue in the financial exclusion debates since borrowing is often viewed as something that exacerbates the problems faced by low-income households. Such view is perhaps well-supported since research has found that financially excluded households do not, in particular, prioritise credit as a financial product that they would

like to have an access. However, to a certain extent, the need for credit is unavoidable especially in a situation where essential household items need to be purchased (Kempson and Whyley, 1999). In the similar vein, the European Commission (2000) also argued that problems of access or use of credit are more difficult to define and contain, because of their multidimensional aspects (i.e., various products, various providers, various laws, various demands and various methodologies).

In contrast, this issue received the most mentions and was often assigned as the most importance of all financial exclusion issues in Australia (Chant Link and Associates, 2004). The discussion surrounding appropriate credit centred on three issues: major credit card exclusion, inappropriate access to or abuse of credit cards, and exclusion from personal loans.

iv. Insurance exclusion

Insurance exclusion was seen as a widespread and serious problem for those who could not afford it due to their income, health status, location or other reasons (Kempson et al., 2000; Chant Link and Associates, 2004; Carbo, Gardener, & Molyneux, 2007).

However, studies that are related to people without any kind of insurance are relatively very much lacking (Kempson and Whyley, 1999; European Commission, 2008). Based on prior studies in the UK, the numbers of households without particular types of insurance are relatively higher. Kempson et al., (2000) indicate that 26% of them did not have home contents insurance, 87% did not have mortgage payment protection insurance (MPPI), 91% had not taken out medical insurance, and 93% did

not have personal accident insurance. While in the case of Australia, home and contents insurance and motor vehicle third party property insurance are less accessed. For instance, there were 17% of people who owned their own homes, lacking building insurance, and 17% lacked contents insurance, suggesting a large group of consumers who potentially needed insurance, and who lacked any cover (Chant Link and Associates, 2004).

2.2.2.2 Access and/or use

The shift in policy focus to extend access to finance (World Bank, 2007) implies the need for empirical measurement of access and use of financial services. This signifies the important of access and use dimensions in measuring financial inclusion. Besides access and use dimensions, Arora (2010) suggests the other two basic dimensions namely, cost and ease dimension. However, most of the prior studies on measurement of financial inclusion are only using use and access dimension (e.g., Beck, Demirguc-Kunt, & Martinez Peria, 2007; Honohan, 2008; Sarma, 2008, 2012) except for Arora (2010) and Gupte, Venkataramani, & Gupta (2012). This would suggest that measurement of financial inclusion is not well developed. This primary issue is discussed further in detail in section 3.2 in Chapter 3.

2.2.2.3 Levels of financial inclusion

Basically, the discussion on the level of financial inclusion is varies and inconclusive. As mentioned earlier, the World Bank (2005) distinguishes between those who are '*formally served*' that is those who have access to financial services from a bank and / or other formal providers and those who are '*financially served*' who also include

people who use informal providers. Conversely, the term '*financially excluded*' is only used to describe those who have no access at all (World Bank, 2005). In the similar vein, Chant Link and Associates (2004) categorized it as 'included', 'limited access' and 'core exclusion'. On the other hand, referring to specific financial services, European Commission (2008) categorised the levels based on certain degrees as following:

i. bank transactions account category:
   - 'unbanked' who are generally people with no bank at all,
   - 'marginally' banked who are people with a deposit account that has no electronic payment facilities and no payment card or cheque book. It can also be people who do have these facilities but make little or no use of them, and
   - 'fully banked' are people that have access to a wide range of transaction banking services that are appropriate to their needs and socio-economic status.

ii. credit category:
   − credit excluded,
   − inappropriately served by alternative lenders,
   − inappropriately served by mainstream lenders,
   − appropriately served by alternative lenders, and
   − appropriately served by mainstream lenders.

However, it can be argue that such levels of financial inclusion is rather normative than positive because the levels are used to describe an appropriate level of financial

inclusion in general. Therefore, a few attempts have been made to compute financial inclusion index. Based on the index computation, the level of financial inclusion is classified as high, medium and low financial inclusion (Sarma, 2008; Prathap, 2011). Nevertheless, the indexes are still far from inconclusiveness. In this regard, it can be suggested that the measurement of financial exclusion are not very well supported. Detail discussion on this issue is presented in section 3.2 in Chapter 3.

2.2.2.4 Unit/Level of analysis: individual, family, household, institutions and financial system

In general, data for financial exclusion analysis is gathered through various categories. Despite some debates and limitations of the individual, family and household data (Kempson & Whyley, 1999; Anderloni & Carluccio, 2007), most of the country-specific surveys are using those data in analysing and reporting the issue (e.g., Kempson et al., 2000;Howell & Wilson, 2005; Devlin, 2005; Johnson & Nino-Zarazua, 2011). With regard to the analysis of supply side, data on financial institutions are employed in examining the factors associated with financial exclusion (e.g., Beck, Demirguc-Kunt, & Martinez Peria, 2008; European Commission, 2008; Sarma & Pais, 2011).

On top of that, Gimet & Lagoarde-Segot (2012) is considered as the first attempt in examining financial exclusion using financial system data, namely bank-based and market-based as factor contributing to financial exclusion. However, the study finds no significant different result between the two systems. This might due to the argument that classifying countries as bank-based or market is not a very fruitful way to distinguish financial systems (Levine, 2002) since it is not primarily important for

policy (Demirgüç-Kunt & Maksimovic, 2002) and even out-dated (Veysov & Stolbov, 2012). This would suggest that there is other classification of financial system that could explain and address the issue of financial inclusion. In addition, data availability is the main problem which has been addressed in many studies in examining financial inclusion in macro-level (e.g., Beck et al., 2006; Sarma, 2008; Arora, 2010).

2.2.2.5 Distribution channel in promoting financial inclusion: banking and non-banking institutions

With regard to the channel in tackling financial exclusion, previous studies do not make clear answers whether banking or non-banking institutions serve better result. On the one hand, some researchers opine that banking institutions provide better environment in promoting financial inclusion (e.g., Feldstein, 1991; Beck & Levine, 2002; Mehrotra, Puhazhendhi, Nair, & Sahoo, 2009). On the other hand, supporters of non-banking institutions favour this channel based on the impact showed by these institution particularly through microfinance (e.g., Park & Ren, 2001; Morris & Barnes, 2005; Siebel, 2005; Al-Mamun, Abdul Wahab, & Malarvizhi, 2010; Mokhtar, 2011; Saad, 2012).

2.2.3 Underlying theories of financial inclusion/exclusion

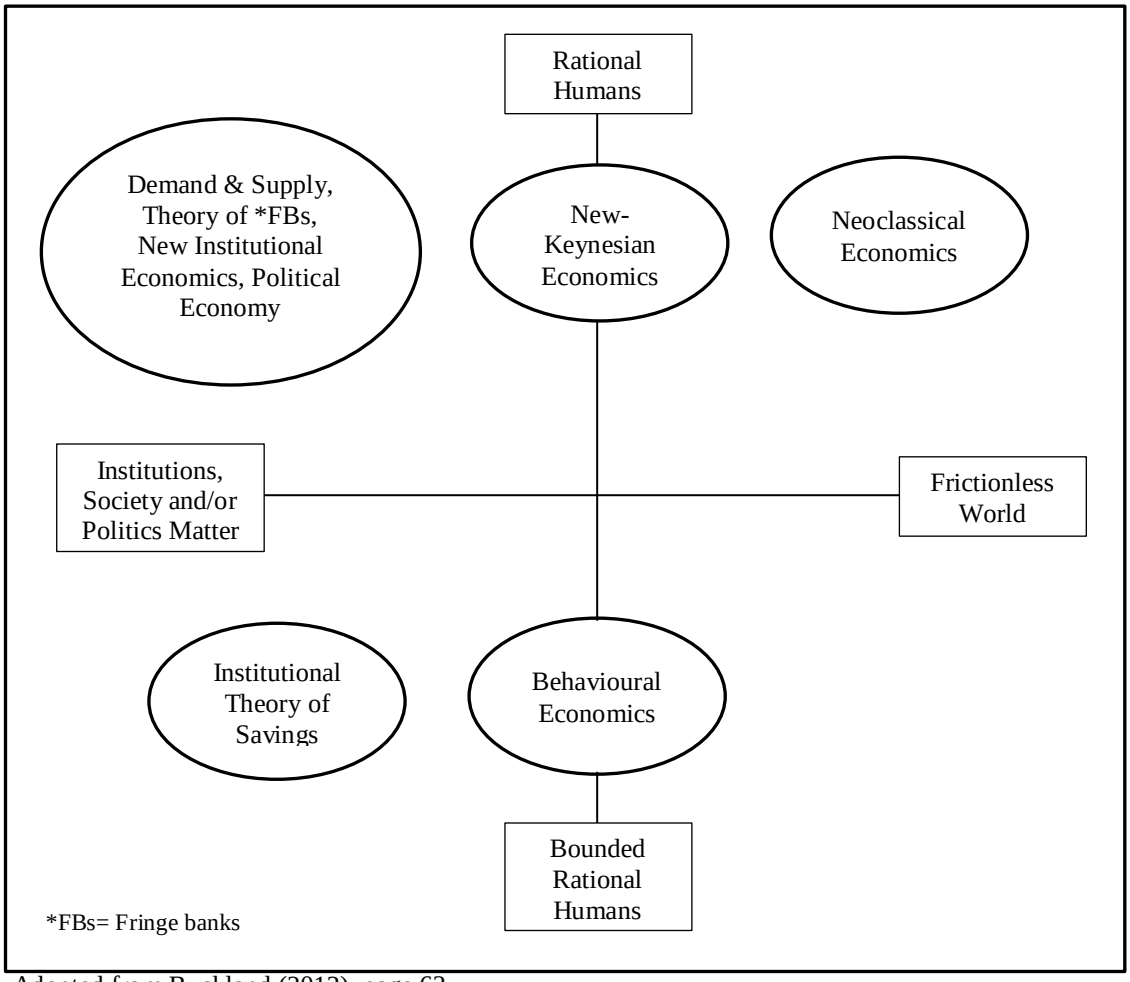
Financial inclusion is a complex problem and is constructed by several factors that range from psychological, sociocultural, geographical, economic to political issues. Variety of theories and methods are employed to describe and analyse this subject matter. Specifically, neoclassical economic theory, institutional theory and political

economy theory are among the theoretical perspectives that have been used to examine the complex financial exclusion phenomenon.

Buckland (2012) highlights the key theories that have been used to analyze financial exclusion. The theories can be determined by identifying the key assumptions that they make by placing them within two broad categories, namely economic (i.e., neoclassical economic theory and new-keynesian theory) and interdisciplinary theories (i.e., behavioural economics, institutional theories, political-economy theories, poverty and community-based analyses, geographic spatial analyses, and household economy). The two key assumptions are pertaining to human rationality and the role of institutions. Buckland (2012) mapped those theories onto 'rationalist-institutional' space as depicted in Figure 2.2.

Beginning with the north-west quadrant, we observe theories that assume that humans are rational and at the same time, institutions (i.e., whether they are rules, norms, clasess, genders or nations) play an essential role in explaining financial exclusion. Demand-and-supply theory, new institutional economics and political economy are included in this corner. Moving clockwise to the north-east, new-Keynesian economics can be seen where the human rationality assumption hold, however more concerned is also put in institutions. Further clockwise, there are theories that hold onto human rationality and assume that social reality is best acknowledged as a series of frictionless markets. In this category, neoclassical economics school fits well. Moving further clockwise, we find space for bounded rationality, starting from behavioural economics, which due to dropping the assumption of individual rationality, opens up the economy to sizeable social friction. Lastly, moving to the last

Figure 2.2 Financial exclusion/inclusion theories mapped onto rationality-institutions space



Adopted from Buckland (2012), page 63

corner is the institutional theory of savings which characterized by bounded rationality and a role for institutions (Buckland, 2012).

The aforementioned theories can be grouped into two broad categories, namely economic and interdisciplinary theories. Those theories are briefly discussed in the following sub-sections.

2.2.3.1 Economic Theories

Under economic theories, financial exclusion can be examined using both the neoclassical economic theory and new-Keynesian theory. The former theory concentrates on economic agents and places the state in secondary role. The primary economic agents are firms and consumers whose behaviour are assumed to be rationally self-interested, well-informed and competitive. With these assumptions, it concludes that financial exclusion is the result of consumer choice and/or mistaken government policy. As far as consumer choice is concerned, it is possible when they opt to use informal financial services instead of mainstream markets due to economic costs which lead to access limitations. It is also possible that government policy for example a usury ceiling creates distortions in credit markets that further lead to exclusion of disfavoured segment.

New-Keynesian analysis emphasizes on the market distortions embedded in the microeconomy, for instance information asymmetries. In relation to financial exclusion, it relates to the notion of credit constraints. Stiglitz & Weiss (1981) provide a compelling explanation on this issue by shedding lights on the effect of imperfect information about borrowers on credit exclusion, whereby creditors tend to depress interest rates and restrict credit in order to avoid risky borrowers. This alarming problem further reinforces income and asset inequality i.e., 'credit markets are no longer unified (if they ever were), but instead are fragmented and diverse; and financial exclusion grows as do the wealth/income and security/insecurity divides' (Dymski, 2005, page 454).

2.2.3.2 Interdisciplinary Theories

Bearing in mind that financial exclusion is interdisciplinary in nature, there are a number of approaches can be applied to understand this topic of interest. An interdisciplinary theory is one that is learned by insights from more than one discipline which include institutional theory, political economy and poverty-and-community analyses (Buckland. 2012). Each of these theories has been influenced by more than one discipline, consisting of economics, sociology, psychology as well as geography.

Under behavioural economics, the questions on the consumer side (i.e., behaviour of low-income people) of financial exclusion can be unfolded by relaxing the assumption about human rationality and using experimental methods. However, its scope is not as broad as that of some other indisciplinary approaches such as institutional analyses (Scott, 2008; Buckland, 2012) as it does not take into account the institutional barriers of financial exclusion.

Institutional analysis offers important insights about financial exclusion. It refers to analyses that seek to comprehend the broad context and the main institutions involved in the issue being studied. For example, under new institutional economics, it highlights the role of history as well as institutions in effective markets, governments, communities and societies in understanding financial exclusion (Buckland, 2012).

Political-economy theories are also useful theories for understanding financial exclusion. These theories refers to the examination of the social world, cognizant of social, state and political structures (Buckland, 2012). This political-economy

framework to financial exclusion is important in apprehending the role of bank bifurcation and financialization in segmentizing the most marginal customers in the least advantage services (i.e., with high and complicated fees) (Aitken, 2006; Buckland, 2012).

Other interdisciplinary theories are poverty and community-based analyses, geographic spatial analyses and household economy. Community-based analyses highlight the realities and experiences of the financially excluded by understanding the structures that reinforce inequality and poverty. Results show that low-income consumers usually behave in highly rational ways according to the relative costs and benefits of the variety types of financial services (Buckland & Martin, 2005). In relationship of geographical spatial analyses to financial exclusion, the studies seek to investigate if mainstream banks are under-located and fringe banks over-located in low-income neighbourhood (Buckland, 2012). With respect to household economy, it allows unpacking of the household especially on its decision making, resource allocation and gender relations. Several studies have provided support for the gender impact on credit inclusion (Hashemi, Schuler, & Riley, 1996; Kabeer, 2001)

Specifically, within the framework of institutional theory, most of the previous studies use economic approach in explaining financial inclusion (e.g., Caskey, 1997; North, 1990; Barr & Sherraden, 2005; Ostrom, 2005). However, Buckland (2012) argues that while the economic approach allows for high-level quantitative analysis, it is more abstract and lack of breadth that interdisciplinary theories can provide. With this regards, he uses institutional approach in analysing financial exclusion. However, it is worth noting that his research is somewhat broad in nature, which merely discussing

who are affected by financial exclusion (i.e., institutions and the lower income groups). Generally, his study analyses the individual and firm level, leaving ample space to examine this issue in macro level (i.e., financial system). Therefore, it can be suggested that there are a few areas within the framework of institutional theory that have not been analysed in examining financial inclusion.

2.3 Financial Inclusion and Financial System: An Institutional Theory Perspective

This study is particularly grounded on institutional theory. This theory rejects an analysis of financial exclusion which is based solely on consumer choice (i.e., associated with neo-classical approach), and yet serves a better picture of the structures and processes that are rooted in organizations, markets as well as policies (Buckland, 2012). Using this approach, a more complete understanding of financial inclusion can be gained through the role of institutional settings.

Principally, institutional theory attempts to describe the deeper and more resilient aspects of how institutions are created, maintained, changed and dissolved (Scott, 2004). In the context of the present study, it deals with the persistent influence of financial system on institutions. This includes the factors by which structures (e.g. rules, routines and norms) guide social behaviour that shaped financial inclusion. It is worth noted that the study of financial inclusion based on institutional theory involves general theory spanning economics, political science and sociology (Scott 2001) rather than a theory which specific to finance particularly. Therefore, within the framework of institutional theory, this present study would argue that financial system is one of the factor associated with financial inclusion. Specifically, a particular

financial system, which influenced by the institutional pillars (i.e., regulatory/coercive, normative and mimetic factors) as well as economic factor, has an essential role in shaping financial inclusion.

Principally, within some elements of institutional theory, financial inclusion can be described and discussed in certain areas. The following subsections discuss these areas in detail.

2.3.1 Financial system as a factor associated with financial inclusion

Principally, institutional creation and diffusion happen, where top-down processes allow higher level structures to shape the structure and action of lower levels, while bottom-up processes shape, reproduce and change the context within, in which they operate (Scott, 2008, p. 190). In other words, an institution found at one level of analysis often affects behaviour on the level below (Bjorck, 2004), where macro structures in society are bridged by organizational fields to micro structures in organizations or even "down" to the individual actor level (Svejvig, 2009). In this regard, it can be suggested that financial system (i.e., the higher level structures), plays an important role in shaping the institutions (i.e., the lower levels) towards financial inclusion. Scott (2008) also mentions that it is beneficial to look at multiple levels in a given study in order to enrich the understanding in institutional analysis, and this is exactly one of the powerful features of institutional theory i.e., its ability to operate at varying levels ranging from society, organizational field, organization to individual actor level (Scott 2008: 85-90). Table 2.1 describes the levels in institutional analysis with specific examples pertaining to this present study.

Table 2.1 Levels in institutional analysis

Level	*Characteristics*	*Example*
World system	Involve societal level at international level	Comparison of studies in different countries.
Societal	A population of organizations (e.g., exchange partners, competitors, funding sources and regulators) operating in the same domain as indicated by similarity of their services or products.	United Kingdom
Organizational field	Bounded by the presence of shared cultural-cognitive or normative frameworks or a common regulatory system so as to "constitute a recognized area of institutional life".	Financial system
Organizational population	A collection or aggregate of organizations that are "alike in some respect"; in particular, they are "classes of organizations that are relatively homogeneous in terms of environmental vulnerability".	Banking and non-banking sector
Organization	Specific organization within the organizational population.	Specific banking and non-banking institution
Organizational subsystem	Specific unit/department within the organization.	Management or Finance department
Individual	Individual or group of individual who affected the organization	Poor/Low income group

Source: Adapted and added from Scott (2001, p. 81-82)

Scott (2001) further mentions that level of organizational field (i.e., in this study is the financial system) is possibly the least recognizable although this level is the most significant in institutional theory. This is where Buckland's (2012) study is lacking of. In this regard, it can be suggested that financial system is associated with the financial inclusion.

2.3.2 Institutional and competitive pressures

Using the concept of isomorphism[7], the theory suggests that 'institutional pillars' (i.e., a regulatory/coercive pressure, normative influence and mimetic factors) and economic factor as well as competition, influence the top-bottom level of decisions. This would suggest that, within the framework of institutional theory, financial inclusion is the result of the configuration of institutional and competitive pressures within a financial system. These factors are discussed in turn.

A regulatory or coercive pressure is based on political and legislative influences. In other words, the regulatory factors are affected by politics and legislations (Scott, 2001). In this regard, it can be suggested that institutions actions and decisions are highly governed by the regulations adopted by the financial system.

A normative influence is motivated by norms that are prevalent and observed in the domain to which the institutions belong. Institutions are made up of many elements with processes through which structures are maintained and modified towards consistencies within or across organizations over time (Scott, 2001). The consistency often means upholding norms. Institution often take actions, not because of economic considerations, but because they are expected to follow the financial system norms. For example, interest is prohibited in Islamic financial system due to its norms and worldview.

[7]Isomorphism means "*a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions*" (DiMaggio and Powell, 1983, p. 149) or simply expressed as structural similarity.

A mimetic factor refers to copying other systems' practices (DiMaggio & Powell, 1983; Scott, 2001). It works when uncertainty is prevalent, at which point organizations are likely to model themselves on other organizations or refer to culturally presumed meanings and ideologies (Kim, Kim, & Lee, 2009).

While the lines of demarcation of these categories are not without controversy, these three basic categories in institutional theory are widely accepted (Bruton, Fried, & Manigart, 2005). Table 2.2 summarized the basic explanation of the three factors.

Table 2.2 Three pillars of institutions

	Regulative	*Normative*	*Cultural-Cognitive*
Mechanisms/Factors	Coercive	Normative	Mimetic
Basis of compliance	Expedience	Social obligation	Taken for granted, shared understanding
Basis of order	Regulative rules	Binding expectations	Constitutive scheme
Logic	Instrumentality	Appropriateness	Orthodoxy
Indicators	Rules, laws, sanctions	Certification, accreditation	Common beliefs, shared logics of action
Basis of legitimacy	Legally sanctioned	Morally governed	Culturally supported, conceptually correct

Source: Adopted from Scott, (2001, p. 52)

In addition, Scott (2001) also argues that isomorphism is an important consequence of both the three institutional pressures (i.e., coercive, normative and regulative) and competitive. Competitive pressures might assume a financial system emphasizes market competition where organizations compete for resources and customers, which in turn, product and services are expected to be produced in an effective and efficient way (Scott & Meyer, 1991).

Competitive and institutional pressures "live side by side" and dichotomous explanations must be avoided (Svejvig, 2009). Therefore, on top of those three categories, Hussain and Gunasekaran (2002) propose economic factor as another important category that further support the institutional analysis. This argument is based on two basic ideas of institutional isomorphism in institutional theory (Hussain and Gunasekaran, 2002, p. 519):

i. Environments are collectives and interconnected; and
ii. Organizations must be responsive to external demand and expectations in order to survive.

2.3.2 Financial exclusion evidence

Given the importance of understanding financial exclusion, it is perhaps unsurprising that many of potential factors have been identified in the literature. It is worth noting that, in 2008, European Commission has developed a new schema in explaining the issue financial exclusion that combines ideas from each of the existing reports and surveys. This schema is based on fourteen countries which comprises of Austria, Belgium, Bulgaria, France, Germany, Ireland, Italy, Lithuania, Norway, Poland, Slovakia, Spain, the Netherlands and the UK. This study is used in the present study to analyze financial exclusion based on the institutional theory. Table 2.3 in the next page describes the analysis of financial exclusion based on institutional theory.

The evidence supports Scott's (2001) argument that level of organizational field is possibly the least recognizable although this level is the most significant to institutional theory.

Table 2.3 Factors Associated with financial exclusion in European Commission (2008) and modified for the present study

Assessment	*Level of analysis involved*[1]	*The possible relationship*	*Type of service affected*
Economic factors			
Demographic changes: technological gap	Societal; Organizational population	The ageing population has difficulty in staying up-to-date with all the new ways of dealing with money	Banking; credit
Labour market changes	Societal; organizational population	Leading to a greater 'flexibility' and growing job insecurity (i.e., some countries are accompanied by high levels of youth unemployment which contribute to less stable incomes)	Banking; credit
Income inequalities	Societal; organizational population	Bring difficulties of access to financial services	Banking; credit
Liberalization of markets: less attention to marginal market segments	Societal; organizational population	Increased competition may result in less attention to marginal market segments	Banking
Liberalization of markets: disappearance institutions targeted to low income	Societal; organizational population	Increased competition may result in levelling the regulation of different banking/financial institutions generally resulted in the disappearance of types of financial institutions which traditionally served people on low incomes	Banking
Coercive factors			
Fiscal policy	Societal; organizational population	Duties and taxes on banking services may represent a heavy burden for people on low incomes people, reducing the convenience of using the services	Banking
Money laundering rules/Identity checks	Societal; organizational population	Preventing the use of the financial system for money laundering and financing of terrorism brings a greater bureaucracy to financial transactions	Banking
Demographic changes: over indebted	Societal; organizational population; individual	Risk of over-indebtedness is higher and may lead to exclusion	Banking; credit
Social assistance	Societal; organizational population	Paying social assistance in cash can deter people from opening a bank account	Banking

Assessment	*Level of analysis involved*	*The possible relationship*	*Type of service affected*
Risk assessment	Societal; organizational population; organization	Generally the risk assessment procedures are becoming more and more tight and thus create financial exclusion	Banking; credit
Normative factors			
Demographic changes: young	Societal; organizational population	Whereas younger people tend to use credit more often, in some countries they stay longer with their families and therefore find it less useful to open a bank account	Banking; credit
Religion	Societal; organizational population; organization	Religion can act as a barrier to use – especially in Muslim populations	Banking; credit; savings
Marketing	Societal; organizational population; organization	The methods used can be unclear and lead potential clients to abandon the request or to mistrust financial institutions and look for other alternatives	Banking; credit; savings
Geographical access	Societal; organizational population	Location of financial services providers are too far away from potential clients	Banking; savings
Product design (terms and conditions)	Societal; organizational population; organization	The terms and conditions are not clear and target public is not defined	Banking; credit
Service delivery (e.g. internet)	Societal; organizational population; organization	The financial service is delivered by inadequate means for the target public, e.g. Internet for older people	Banking; credit; savings
Complexity of choice	Societal; organizational population	It can be an education issue, too many products proposed, target public has trouble to choose	Savings
Price	Societal; organizational population	The price offered by financial services providers are high and cannot afford by certain group of people	Banking; credit
Mimetic factors			
Type of product	Societal; organizational population	The appropriate financial service is non-existent on the market	Banking; credit; savings
Demographic changes: migrants/minorities	Organizational population; individual	There can be cultural or languages barriers to using and / or accessing financial services	Banking; credit

Assessment	*Level of analysis involved*	*The possible relationship*	*Type of service affected*
Concern about costs	Organizational population; individual	Potential clients fear costs might be too high or lack information	Banking; credit
Belief that not for poor/low self esteem	Organizational population; individual	Customer perceived that the services are not offered to them.	Banking; credit; savings
Fear of loss of financial control	Organizational population; individual	Bank account feels intangible compared to cash, also some means are seen as "unsure" i.e. Internet hacking	Banking; credit
Mistrust of providers	Organizational population; individual	Fear of bankruptcy or lack of confidence with financial institutions	Banking; credit; savings
Preference for alternative providers and cultural factors	Organizational population; individual	Customers prefer to use other alternatives to access for the financial services.	Banking; credit; savings
Opposition to use	Organizational population; individual	Customers themselves are reluctant to use the services.	Credit
Bad past experience	Organizational population; individual	One refusal of a financial service in the past of a potential client is enough to become a barrier to any new trial	Banking; credit
Fear of seizures	Organizational population; individual	Some people might be afraid that creditors will seize their minimal guaranteed income	Banking; credit; savings
Cash is common	Organizational population; individual	It is not a stigma not to use sophisticated payments	Banking

Source: Adopted and added from European Commission (2008).

[1] The levels referred to; World system level (i.e., research comprises of 14 countries), societal level (i.e., individual countries involved in the research), organizational population level (i.e, banking institutions, credit institutions and savings institutions), organization level (i.e, particular banking, credit and savings institution involved in the previous studies), and individual level (i.e, an individual customer or a potential customer) .

2.4 Background of Financial System

2.4.1 Overview of financial system

The idea of classifying financial system is not something new. Generally, conventional wisdom holds that there are basically two types of financial systems, namely bank-based and market-based. Bank-based and market-based financial systems is concerning about financial structure in development economics which focus on the relation between a country's financial system (i.e., bank-based or market-based) and its economic development (see for example, Demirgüç-Kunt & Maksimovic, 2002; Levine, 2002; Beck & Levine, 2002). Principally, this classification is based on financial market structure (Veysov & Stolbov, 2012). Some research, however, argues that classifying countries using bank-based or market-based is not a very fruitful way to distinguish financial systems (La Porta, Silanes, Shleifer, & Vishny, 1998; Levine, 2002) since it is not primarily important for policy-making activities (Demirgüç-Kunt & Maksimovic, 2002) and, to a certain extent, is even out-dated (Veysov & Stolbov, 2012). With regard to financial inclusion in particular, Gimet & Lagoarde-Segot (2012) argue that rather than solely focusing on the banking sector, financial policy should also enhance other areas including developing appropriate macro-prudential safeguards and promoting capital market development. This would suggest that the concepts of bank-based and market-based are not very well accepted as the primary type of financial system.

Responding to the debate on bank-based and market-based financial system, La Porta et al. (1998) adds the law and finance perspective in classifying the system. Based on

legal origin, they argue that a country's legal system is a primary determinant of the effectiveness of its financial system. As mentioned by La Porta et. al (2000, p.19)"… bank-versus market-centeredness is not an especially useful way to distinguish financial systems". Therefore, these authors stress the role of the legal system in creating a growth-promoting financial sector. From this perspective, a well-functioning legal system facilitates the operation of both markets and intermediaries. By this, La Porta et. al (2000) clearly argue that laws and enforcement mechanisms are a more useful way to distinguish financial systems rather than focusing on whether countries are bank-based or market-based. With regard to financial inclusion, Qian & Strahan (2007) and Ge et al. (2012) confirm that legal differences shape the ownership and terms of bank loans across the world. Nevertheless, this present study is not mainly focus on the legal aspect in classifying the financial systems.

Due to the development and increased interest in Islamic finance, the present study focuses on the financial system based on Islamic and conventional. Despite voluminous studies on the comparison between the two, none of them are found to specifically examine the relationship between these types of financial system with financial inclusion. The idea of comparison between Islamic and conventional financial system is not something new. Even, there are voluminous of literature differentiating the two systems on different areas (e.g., Samad, 2004; Olson & Zoubi, 2008; Ariss, 2010; Beck, Demirgüç-Kunt, & Merrouche, 2013) However, it is worth noted that all the studies are more focused on the firm-level analysis, i.e., comparisons are made between particular Islamic and conventional financial institutions per se (e.g., banks, insurance providers, unit trusts). Although some of the studies are cross-country analysis, the basis is the same, i.e., to explain on what aspects of the Islamic

banks are different from its counterpart. Except for Ben Naceur et al., (2015), this would suggest that there is no attempt has been made so far in analyzing financial inclusion based on Islamic-based and conventional types of financial system.

In differentiating between conventional and Islamic financial systems, revisiting the meaning and scope of financial system is equally important. A financial system comprises of markets and institutions which are actively involved in the channelling of investable funds from the surplus-income units to deficit-income units. The main players in a financial system consist of four different types of economic agents: individuals, households, corporations (firms/institutions) and governments, who represent either surplus fund units (SFUs) or deficit fund units (DFUs). Hence, the principal objective of a financial system is to mobilise large amounts of relatively smaller savings and to pool them together as a channel for productive investments in the economy. This is accomplished either directly through financial markets (i.e., stock exchanges, over-the counter trading, etc.) or indirectly via financial intermediaries (i.e., bank and non-bank institutions) (International Shari'ah Research Academy for Islamic Finance (ISRA), 2016).

As far as the Islamic financial system is concerned, Shariah becomes the most important parameter in mobilising funds from SFUs, and subsequently, channelling those funds to DFUs. Essentially, this means that the behaviour and the operation of markets and financial institutions operating under the Islamic financial system will have to comply with the rules and principles of Shariah. Typically, the Islamic financial institutions can be in the forms of Islamic banks (commercial and investment banks), *takaful* companies (insurance with Islamic alternative), mutual funds and

other Islamic institutions that facilitate the operation between the SFUs and DFUs (International Shari'ah Research Academy for Islamic Finance (ISRA), 2016). On this note, it is reasonable to assume that a particular country is adopting an Islamic financial system if the country has both the markets and the institutions in which funds are mobilized within the parameters of Shariah.

Except for Iran, it is worth noting that countries adopting the so-called Islamic financial system per se are not yet present. However, there are several countries that already have the Islamic finance sector within their financial system; commonly in the form of Islamic banking. Based on the OIC member countries, Yakcop (2003) classifies OIC countries into four categories based on their approach in the implementation of Islamic banking. Table 2.4 summarises the classifications.

Table 2.4 Classification of countries based on Islamic banking implementation

Category	*Example of country*
Only Islamic banking system	Iran, Pakistan, Sudan
Dual system (Islamic banking system operating parallel with the conventional system)	Malaysia
"Conventional plus" system (the system is basically a conventional system with a few Islamic banking institutions operating on the fringe of the banking system).	Saudi Arabia, Bahrain, Bangladesh, Brunei, Egypt, Guinea and Indonesia
Only conventional system	Afghanistan, Albania, Algeria, Azerbaijan, Benin, Burkina Faso, Chad, Cameroon, Comoros, Djibouti, Gabon and Gambia.

Source: Adopted from Yakcop (2003)

2.4.2 Islamic and conventional financial systems: a comparison

With increased understanding on the importance of a just financial system to human welfare, some issues are worth discussing. These include the conceptual, ideological

and functional differences between the prevailing interest-based conventional financial system and equity-based Islamic financial system (Loqman, 1991). To document full understanding on this matter, an overview of the Islamic financial system is presented below, followed by a comparative assessment between the two types of financial system.

2.4.2.1 Overview of Islamic financial system

The term "Islamic financial system" is relatively new, appearing only in the mid-1980s. In fact, all the earlier references to commercial or mercantile activities in compliance to Islamic principles were made under the umbrella of either "interest free" or "Islamic banking". However, describing the Islamic financial system simply as "interest-free" does not provide a true picture of the system as a whole. Undoubtedly, prohibiting the receipt and payment of interest is the nucleus of the system, but it is supported by other principles of Islamic doctrine advocating risk sharing, individuals' rights and duties, property rights, and the sanctity of contracts. Similarly, the Islamic financial system is not limited to banking but also covers capital formation, capital markets, and all types of financial intermediation (Iqbal, 1997). In addition, Islamic financial system is also prohibits doubtful transactions, stocks of companies dealing in unlawful activities and unethical or immoral transactions such as market manipulations, insider trading and short-selling (Loqman, 1991).

The objectives of the Islamic financial system are based on Shariah[8] (Chapra, 1992; Iqbal, 1997; Loqman, 1991; Mills & Presley, 1999; Zaher & Kabir Hasan, 2001; Siddiqi, 2006), which is to be treated as an important driver to transfer funds from the

[8] Shariah literally means "the way" and is the Arabic term for Islamic Law as a way of life.

surplus to the deficit units. This is done to ensure equitable allocation of capital to sectors which would yield the best returns to the owners of capital, thereby contributing towards the overall growth and expansion of an economy.

Another important objective of the Islamic financial system is to ensure that the surplus fund is worthwhile investment in accordance with the owners' preference in terms of the extent of risk involvement, rate of return, as well as the period of investment. In addition, the Islamic financial system also plays significant role in assisting the fund owners to find sufficient opportunities to invest in the short term. Since it is contrary to the Shariah principles to hoard wealth, it is therefore necessary for the wealth owners to invest their funds in either short-term or long-term projects (Chapra, 1992; Loqman, 1991).

Practically, the Islamic financial system is commonly viewed by the Muslims as an alternative to the existing interest-based financial system whereas for the non-Muslims, they observed it as a healthy development that adds a variety version of financial system that would offer another source of competitiveness (Khan, 1992).

2.4.2.2 Differences between Islamic and conventional financial systems

The difference between Islamic and conventional finance can be viewed in two respects, namely based on ontology and operation. It is worth noted that the key difference between the two is the ontological difference. Islamic finance's advocates agree that the differences between the two systems emerge from the philosophical and ethical viewpoints. The philosophical foundation of an Islamic financial system (henceforth IFS) goes beyond the interaction of factors of production and economic

behaviour. While the conventional financial system (henceforth CFS) focuses primarily on the economic and financial aspects of transactions, the Islamic system places equal emphasis on the ethical, moral, social, and religious dimensions, to enhance equality and fairness for the good of society as a whole. The system can be fully appreciated only in the context of Islamic teachings on the work ethic, wealth distribution, social and economic justice and the role of the state (Loqman, 1991; Iqbal, 1997).

Loqman (1991) also added that the CFS recognises individual as the exclusive owner of his property with absolute rights to wealth. This principle contradicts the IFS. As mentioned earlier, the IFS is a product of Islamic principles and philosophy and is based on Sharia functions. With that note, IFS recognises man as the vicegerent of God on earth. For instance, Hassan (2007) argues that any wealth earned by a man is seen to be merely entrusted upon him, and therefore does not have absolute ownership of the wealth. As such, in IFS, freedom of enterprise as well as financial decisions made either by individuals or corporations should be on the basis of guidelines given by Islam. These do not prohibit profit making activities, as long as the interest of the society and the nation as a whole are protected and preserved (i.e., the profitable undertaking is permissible under Shariah).

The CFS is based purely on *riba* (interest), in which this is strictly prohibited in Islam (Chapra, 1992; Chong & Liu, 2009; Siddiqi, 2006). Moreover, IFS is purely based on reward/loss/compensation and charity instead of *riba*. It is increasingly argued that the *riba*-based financial system has resulted in concentration of income and economic power in few hands, while the financial system based on profit and loss sharing

principle has resulted in more equitable distribution of economic opportunities and productive social charge in the long- run (Chapra, 1992; Iqbal, 1997). It is also worth noting that economists such as Fisher (1945), Simons (1948) and Friedman, (1969) have all pointed out to this instability feature of the current interest-based financial system. Moreover, Islamic finance prohibit in any activities which involves *gharar* (uncertainty) matters and *maysir* (gambling).

With regard to financing, there are also differences between the CFS and the IFS. There are two types of financing which are necessary in both financial systems. In the CFS, equity financing takes place through the issuance of shares on which dividends are earned, while debt financing takes place by way of loans and borrowings on which interests are given or taken. The IFS on the other hand has its own unique norms and regulations with regards to both equity and debt financing.

Operational wise, in equity financing, the IFS is based on profit and loss sharing contracts (henceforth PLS). Two important contracts in this category are used; *mudarabah* (profit sharing) and *musharakah* (joint venture). Under the PLS paradigm, the assets and liabilities of Islamic banks for example, are integrated in the sense that borrowers share profits and losses with the banks, which in turn share profits and losses with the depositors. Advocates of Islamic banking, hence, argue that Islamic banks are theoretically better positioned than conventional banks to absorb external shocks because the banks' financing losses are partially absorbed by the depositors (Iqbal, 1997). In the similar vein, Chapra (1992) and Mills & Presley (1999) agree that the risk-sharing feature of the PLS concept allows Islamic banks to lend on a longer term basis to projects with higher risk-return profiles and consequently

promoting better economic growth. In addition, Hassan (2007) argues that Islamic banks are somewhat reasonably efficient in managing risk where risk identification as well as risk assessment and analysis are the most influencing variables in the risk management practices. Ali Al-Jarhi (2004) and Iqbal (2001) also indicate that some studies comparing profit sharing with interest-based systems have shown that the former has yielded superior results compared to the latter.

In the case of debt financing, Islam permits the contract of exchange which involves deferred payments and there are three important contracts in this category. Firstly, *bai muajjal* (sale on deferred payment), under which an entrepreneur of a project can buy the required goods and pay in instalments later on. Secondly, *ijarah* (leasing) under which the entrepreneur can lease the goods required for his project. Thirdly, *murabahah* or sale with price mark-up is commonly used in trade financing wherein the entrepreneur can purchase raw materials but settle the payments in cash at a later date. All these three types of contract provide profit margin to the financier through the cost plus pricing of sale and rental on leasing as agreed upon (Chapra, 1992; Iqbal, 1997; Cebeci, 2012). In sum, Table 2.5 summarizes the differences between CFS and IFS.

Table 2.5 Differences between conventional financial system and Islamic financial system

Type of difference		*Conventional financial system (CFS)*	*Islamic financial system (IFS)*
Ontology	Worldview	The individual as the exclusive owner of his property with absolute rights to wealth.	Man as the vicegerent of God on earth. Any wealth earned by a man is seen to be merely entrusted upon him. He holds the wealth as a trust from God, and does not have absolute ownership of the wealth.
	Philosophy	Economic and financial aspects of transactions are emphasized.	Beside economic and financial aspects of transactions, ethical, moral, social, and religious dimensions for human welfare are

Type of difference		*Conventional financial system (CFS)*	*Islamic financial system (IFS)*
			equally emphasized.
Operation	Basic principles	Based purely on *riba* (interest) and involves (gharar) uncertainty matters and maysir (gambling).	Based on reward, loss, compensation and charity. Prohibit (gharar) uncertainty matters and maysir (gambling).
	Business Operations	▪ Equity financing Issuance of shares on which dividends are earned. ▪ Debt financing Based on loans and borrowings on which interests are given or taken.	▪ Equity financing Based on profit and loss sharing contracts - *mudarabah* (profit sharing) *musharakah* (joint venture). ▪ Debt financing Permits the contract of exchange which involves deferred payments through contracts of *bai muajjal* (sale on deferred payment), *ijarah* (leasing) and *murabaha* (sale with price mark-up).

Empirically speaking, the evidence so far is mixed. For instance, the efficiency of Islamic banks is found to be quite similar to their conventional counterparts (e.g., Abdul-Majid, Mohammed Nor, & Said, 2005; Mokhtar, Abdullah, & Al-Habshi, 2006). Some studies do favour Islamic banks in terms of their business orientation and efficiency (see, for example (Abedifar, Molyneux, & Tarazi, 2013; Beck et al., 2013) but some do not share the same thought (see, for example Alshammari, 2003;Al-Jarrah & Molyneux, 2005; Hasan & Dridi, 2011; Rashwan, 2012). Perhaps, these could be better explained by the fact that Islamic banks are relatively inferior than their conventional counterparts in many aspects such as quantity, size, profitability and economies of scale (Wilson, 2004; Al-Maraj, 2009; Ahmed, 2013; Beck, Demirgüç-Kunt, & Merrouche, 2013). In other words, the major constraints of diseconomies of scale can be traced to the fact that the Islamic market is remains comparatively smaller and ghettoised (Wilson, 2004; Yudistira, 2004; Al-Maraj, 2009).

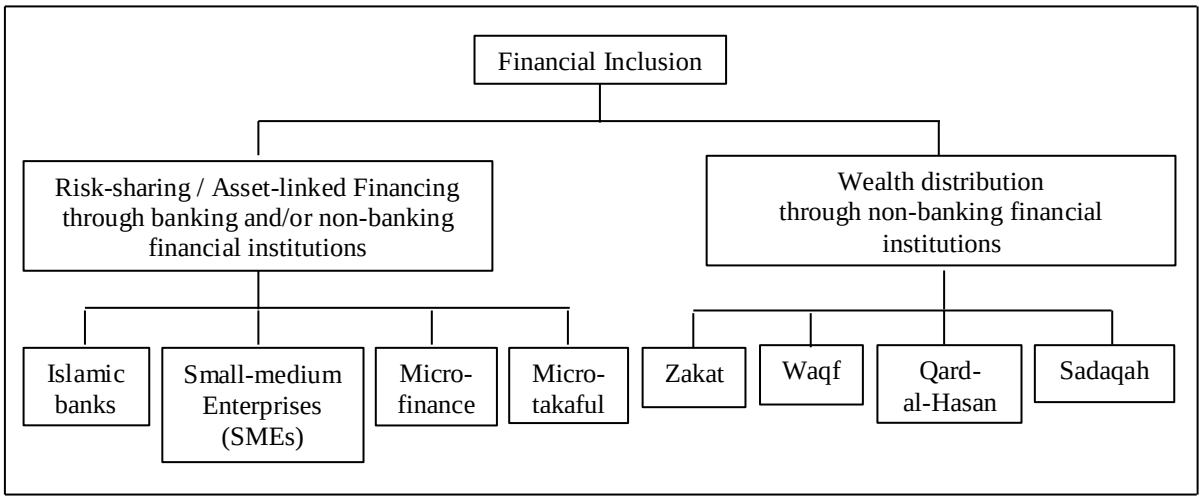
2.5 The Role of Islamic Finance towards Financial Inclusion

As discussed earlier, theoretically, the Islamic financial system plays an important role in promoting welfare in the society through its prohibition of *riba* (interest), speculation and gambling (Chapra, 1992). It places equal emphasis on the ethical, moral, social, and religious dimensions, to enhance equality and fairness for the good of society as a whole. With the application of the work ethic, wealth distribution, social and economic justice and the role of the state, Islamic financial system considers to be more welfare-based financial system as compared to its counterpart. In this regard, it can be suggested that an Islamic-based financial system is theoretically better in promoting financial inclusion.

As stated in many studies pertaining to the role of Islamic finance in promoting financial inclusion (e.g., Mirakhor & Iqbal, 2012; Mohieldin, Iqbal, Rostom, & Fu, 2012: El-Zoghbi & Tarazi, 2013; MIFC, 2015), Islamic finance could contribute to greater inclusion in two essential ways, namely promoting risk-sharing contracts that provide a viable alternative to conventional debt-based financing, and the other through specific instruments of redistribution of the wealth (e.g., through *zakat*, *waqaf, sadaqah*, etc) among the society. This is shown in Figure 2.3.

As non-banking financial institutions, the redistribution instruments complement the risk-sharing instruments to target the poor segment of the society so as to provide a holistic approach towards financial inclusion through reduction in poverty and building a healthy economy. For example, it is estimated that 20 out of 39 OIC countries have a large enough *zakat* collection to improve poverty for those living

Figure 2.3 Financial inclusion through Islamic finance



with income below USD1.25 per day. By estimating the share of *zakat* to GDP vis-à-vis the resources needed to support poverty reduction, half of the sample countries were reported to have enough *zakat* funds to cover for the resource shortfall (Mohieldin et al., 2012).

Except for Ben Naceur et al. (2015)[9], it is worth noted that although the discussion on the role of Islamic finance in financial inclusion is largely mentioned in the previous studies, those discussions are rather normative than positive. These studies are very much lacking in terms of empirical evidence to support their arguments. In this regard, it could be suggested that the evidence on how Islamic finance, especially the banking institution, deals with the financial inclusion remains unclear.

2.6 Chapter Summary

This chapter has presented a comprehensive literature review of financial inclusion/exclusion studies, including discussion of the type of financial systems. It

[9] Using the number and assets size of Islamic banks, the study finds tentative and relatively weak link between financial inclusion and Islamic banking.

can be observed that the empirical research on financial inclusion is somewhat limited and far from complete. Nevertheless, the richness of the financial inclusion literature highlights the importance of the issue and further research in the area is clearly warranted.

Chapter 3

LITERATURE REVIEW II: MEASUREMENT AND DETERMINANTS OF FINANCIAL INCLUSION

3.1 Introduction

This chapter extends the survey of financial inclusion literature on measurement issue as well as factors associated with financial inclusion. Section 3.2 presents the discussions on the measurement of financial inclusion. Section 3.3 extends the discussion on the determinants of financial inclusion. Section 3.4 summarises the chapter.

3.2 Measurement of Financial Inclusion

3.2.1 Current Measurement of Financial Inclusion

3.2.1.1 Overview

While numerous amounts of data are available on many aspects of the financial sector, systematic indicators in measuring financial inclusion are far from complete. Most of the evidence concerning the causal links between financial development, growth, and poverty comes from aggregate data using, for example, financial depth measures (size of finance) rather than outreach or access measures (number of participants) (e.g., Beck, Levine, & Loayza, 2000; Demirgüç-Kunt & Maksimovic, 2002; Klapper, Laeven, & Rajan, 2006; Beck, Demirgüç-Kunt, & Levine, 2007).

Moreover, despite a large developing literature on financial access, a single measurement of financial inclusion that can be applied across countries is simply does not exist. Besides limited data on the use of basic financial services by households and firms (Claessens, 2006), this constraint is also due to the continuous modifications that are being made to provide a more comprehensive measure of financial inclusion. This would suggests that the dimensions and indicators of financial inclusion that could explain and track the incidence of financial inclusion over the time are still far from conclusive.

The current finance literature on identifying barriers to financial inclusion is mainly focusing on the credit and saving services provided by the banking sectors. This has resulted in several papers discussing on the measurement of financial inclusion using banking indicators (e.g., Beck, Demirguc-Kunt, & Martinez Peria, 2007; Honohan, 2008; Sarma, 2008; Arora, 2010; Chakravarty & Pal, 2010; Gupte, Venkataramani, & Gupta, 2012). Some of the authors also attempt to derive an index for the level of financial inclusion by identifying valuable dimensions of financial access. However, it can be argued that such of the early research in the financial inclusion measurement is very limited to savings and credits data, while ignoring other essential financial services namely banking transactions and insurance. Moreover, empirical studies that use index of financial inclusion as the dependent variable are very much lacking.

The discussions on the measurement of financial inclusion entail two major aspects, namely (i) the dimensions and indicators, and (ii) the computation of the index. These main two aspects are discussed separately in the following sub-sections.

3.2.1.2 Dimensions and indicators of financial inclusion

While still far from conclusive, a limited number of studies suggests that the measurement of financial inclusion needs to take into account as many dimensions as possible to represent the financial inclusion. Apart from that, by including the four essential financial services as outlined by the World Bank (i.e., banking transaction, credit, saving and insurance), the comprehensiveness of the index could be improved.

Regarded as the first attempt in measuring financial sector outreach, Beck, Demirguc-Kunt, & Martinez Peria (2007) measure banking sector outreach and investigate its determinants. They report data on the following eight indicators of financial inclusion corresponding to the year 2003-2004:

1. Geographic branch penetration: number of bank branches per 1,000 sqkm.
2. Demographic branch penetration: number of bank branches per 100,000 people
3. Geographic ATM penetration: number of bank ATMs per 1,000 sqkm
4. Demographic ATM penetration: number of bank ATMs per 100,000 people
5. Credit accounts per capita: number of loans per 1,000 people
6. Credit-income ratio: average size of loans to GDP per capita
7. Deposit accounts per capita: number of deposits per 1,000 people
8. Deposit-income ratio: average size of deposits to GDP per capita

Indicators (1) through (4) measure the outreach dimension of the financial sector in terms of access to banks' physical outlets, while indicators (5) through (8) measure the usage dimension i.e., use of banking services (Beck et al. 2007). Regressing the

share of households with deposit accounts obtained from household surveys on their aggregate indicators of deposit accounts and branch penetration, Beck et al. (2007) show that the predicted share of households with deposit accounts resulting from this regression provides a reasonably accurate estimate of the actual share of households with deposit accounts obtained from household surveys. Following Beck et al. (2007), other studies have used the same dimensions and indicators to examine other factors that influence banking outreach (Ghosh, 2012) and barriers to banking outreach (Beck, Demirguc-Kunt, & Martinez Peria, 2008).

Honohan (2008) constructs estimates of the fraction of the households who have access to formal financial intermediaries and thereafter compared these estimates to poverty and inequality using the Gini coefficient[10]. To calculate the estimates, Honohan (2008) uses the ratio of microfinance accounts and bank accounts to the total population, household survey-based access and the average deposit size and the GDP per capita for more than 160 countries. Looking at how the access indicators varies across regions of the developing world, Latin America and the Caribbean have the highest mean and median percentages, but the variation within each region quite reasonable. The lowest mean and median are for Africa and for the developing countries of Eastern Europe and Central Asia.

[10] The Gini coefficient is a measure of statistical dispersion developed by the Italian statistician, Corrado Gini and published in his 1912 paper "Variability and Mutability" (Italian: *Variabilità e mutabilità*) (Gini, 1912).The Gini coefficient is a measure of the inequality of a distribution, a value of 0 expressing total equality and a value of 1 maximal inequality. It has found application in the study of inequalities in disciplines as diverse as economics, health science, ecology, chemistry and engineering. It is commonly used as a measure of inequality of income or wealth (Gini, 1997).

Sarma, (2008) in her concept note of 'Index of Financial Inclusion' considers three dimensions to measure the extent of inclusion namely:

i. Depth (penetration) of financial access (e.g., measured as the number of bank accounts per 1000 population);
ii. Availability of financial services (e.g., measured as the number of bank branches and number of ATMs per 1000 population), and
iii. Usage of financial services (e.g., measured as the number of loans per 1,000 people).

Using one variable for each dimension, Sarma (2008) adopts the concept used in the calculation the human development index (HDI)[11]. In her study of index of financial inclusion (IFI), equal weights have been appointed in each of the dimensions. Depending on the value of IFI, countries are categorized as high financial inclusion (an index of above 0.6), medium financial inclusion (an index of 0.4 to 0.6) and low financial inclusion (an index of less than 0.4). Finally, she ranks both the 45 countries (for which data on all three dimensions was available to her) and 100 countries (for which data on only two dimensions are available) in order of the IFI to indicate their relative position among other countries. Based on the distance from the ideal concept, Sarma (2008) makes improvement of the index by assigning weightage for each dimension (Sarma, 2010; Sarma & Pais, 2011), and later in 2012, further improvement is made by incorporating the distance from both the ideal and worst points[12].

[11]A tool developed by the United Nations to measure and rank countries' levels of social and economic development based on four criteria: Life expectancy at birth, mean years of schooling, expected years of schooling and gross national income per capita. The HDI makes it possible to track changes in development levels over time and to compare development levels in different countries. For more details, see Technical Note in UNDP's Human Development Reports at vwww.undp.org

[12] For detail, see Refer Sarma (2012).

Following Sarma (2008), several researchers compute the financial inclusion index for specific states in India (e.g., Kumar & Mishra, 2009; Kumar, 2011). Mehrotra, et al (2009) also construct an index for financial inclusion using the same kind of aggregate indicators such as number of rural offices, number of rural deposit accounts, volume of rural deposit and credit from banking data for sixteen major states of India. In addition, Sarma & Pais (2011) examine the relationship between financial inclusion index and development as well as its relationship with factors associated with financial inclusion (i.e., socioeconomic factors, characteristics of banks and physical infrastructure). Using a different approach, Dacanay, Nito, & Buensuceso (2011) employ Sarma's index to show the link between microfinance and financial inclusion in Philippine.

Adopting the axiomatic[13] measurement approach for the measurement of financial inclusion, index measurement by Chakravarty & Pal (2010) improves upon the IFI proposed by Sarma (2008). The objective is to use the axiomatic structure (i.e., boundedness, global monotonicity, global homogeneity, global lower difference in gain at higher levels of attainment difference and symmetry) for more efficient utilization of available data on banking services. The index can be used to monitor progress in performance of financial inclusion and can make recommendations on what more is required to be done for better performance. This demonstrates an important policy application of the index. Using indicators from both Beck, Demirgüç-Kunt, and Martinez Peria (2007) and Sarma (2008), Chakravarty & Pal's index can be utilized to determine the percentage contributions by the various factors.

[13]The axiomatic approach entails formal definitions of important postulates of an index (that is, the axioms) and then identifies the index using the postulates.

In addition, Arora (2010) computes the index of financial inclusion using the same reasoning as Sarma (2008) for two major groups of countries (i.e., advanced economies and developing and emerging economies). Compared to Sarma (2008), Arora includes more variables in the outreach dimension. She employs not only the demographic penetration but also geographic penetration. She also adds the dimensions of ease and cost of transactions, which are not included in the previous studies.

A very recent study by Gupte et al. (2012) adopt all the four dimensions (i.e., outreach, usage, east and cost) and indicators used by Sarma (2008) and Arora (2010) for the computation of financial inclusion index.

In the area of microfinance, Mersland & Øystein Strøm (2009) come out with microfinance outreach measurement using two indicators, namely average loan and number of credit clients. Apart from performance, they use outreach dimension to examine the relationship between the two dimensions and corporate governance in microfinance institutions.

Concentrating only on the usage dimension, Prathap (2011) takes into account all the four financial services which consider essential by the World Bank (World Bank, 1995) from various service providers. Using household data (i.e., the usage of banking transaction, savings, credit and insurance) from a particular state in India, Prathap (2011) attempts to compute and measure financial inclusion within the state. Table 3.1 summarizes the dimensions and indicators considered by the previous studies.

Table 3.1 Summary of studies associated with dimensions and indicators for the measurement of financial inclusion/exclusion

Authors	*Financial services*	*Dimension*				
		Outreach		*Usage*	*Ease*	*Cost*
		Penetration	*Availability*			
Beck, Demirguc-Kunt, & Martinez Peria (2007)	Banking	▪ Demographic branch penetration (number of bank branches per 100,000 people) ▪ Demographic ATM penetration (number of bank ATMs per 100,000 people)	▪ Geographic penetration (number of bank branches per 1,000 sq.km) ▪ Geographic penetration (number of bank ATMs per 1,000 sq.km)	▪ Credit indicators: i. Credit accounts per capita : number of loans per 1,000 people ii. Credit-income ratio: average size of loans to GDP per capita ▪ Deposit indicators: i. Deposit accounts per capita: number of deposits per 1,000 people ii. Deposit-income ratio: average size of deposits to GDP per capita	Not considered	Not considered
Honohan (2008)	Banking and Microfinance	▪ Demographic bank penetration (number of bank accounts per 100 adults) ▪ Demographic MFIs and alternative intermediaries penetration (number of accounts at MFIs and alternative intermediaries per 100 adults)	Not considered	▪ Average bank deposit size	Not considered	Not considered
Sarma (2008)	Credit; savings	▪ Demographic bank penetration (number of bank account per 1000 adults)	▪ Demographic branch availability (number of bank branches per 100,000 adults)	▪ Credit indicators: i. Domestic credit (as % of GDP)	Not considered	Not considered

		Outreach		*Usage*	*Ease*	*Cost*
		Penetration	*Availability*			
				▪ Deposit indicators: ii. Domestic deposit (as % of GDP)		
Mersland & Øystein Strøm (2009)	Credit	▪ Average loan ▪ Number of credit clients	Not considered	Not considered	Not considered	Not considered
Chakravarty & Pal (2010)	Credit; savings	Use dimensions and indicators stated in Beck, Demirguc-Kunt, & Martinez Peria (2007) and Sarma (2008)			Not considered	Not considered
Arora (2010)	Credit; savings	▪ Demographic branch penetration (number of bank branches per 100,000 people) ▪ Demographic ATM penetration (number of bank ATMs per 100,000 people)	▪ Geographic penetration (number of bank branches per 1,000 sq.km). ▪ Geographic penetration (number of bank ATMs per 1,000 sq.km)	Not considered	▪ Locations to open deposit account ▪ Minimum amount to open checking account ▪ Minimum amount to open savings account ▪ Minimum amount to be maintained in checking account ▪ Minimum amount to be maintained in savings account ▪ Number of documents to open checking account ▪ Number of documents to open savings account ▪ Locations to submit loan applications ▪ Minimum amount of consumer loan ▪ Minimum amount of mortgage loan ▪ Days to process consumer loan application	▪ Fees consumer loan (% of minimum loan amount) ▪ Fees mortgage loan (% of minimum loan amount) ▪ Annual fees checking account ▪ Annual fees savings account ▪ Cost of transfer funds internationally (% of $250) Amount of fees for using ATM cards (% of $100)

Authors	*Financial services*	*Dimension*				
		Outreach		*Usage*	*Ease*	*Cost*
		Penetration	*Availability*			
					▪ Days to process mortgage loan application	
Gupte, Venkataramani, & Gupta (2012)	Credit; savings	Integrate all four dimensions initiated by Sarma (2008) and Arora (2010) to compute Financial Inclusion Index for India				
Prathap (2011)	Banking transactions, savings, credit and insurance	Not considered	Not considered	▪ Banking transaction: usage of Cheque/DD, social security pension payments through banks/cooperatives, usage of ATM ▪ Savings: Savings account with institutional sources (commercial bank, cooperative bank or post office or SHG[14] bank linkage), Fixed Deposit or Recurring Deposit account with institutional agencies, Informal savings in an SHG ▪ Formal credit: From institutional sources or through SHG bank/MFP[15] linkage during 2007, 2008 and 2009 ▪ Insurance: Any source/type of insurance	Not considered	Not considered

[14] Self- help groups (SHGs), is one of policy under the Reserve Bank of India to provide channels of lending.
[15] Microfinance provider (MFP) includes all agencies that provide finance (credit/grants) to the SHGs as part of their financial assistance to poor.

3.2.1.3 Computation of financial inclusion index: comparison of past attempts

From Table 3.1 overleaf, we could observe that only after year 2007, some researchers attempt to come out with the access indicators in measuring financial inclusion. Based on their studies, different methods are employed to calculate the index of financial inclusion. It has been observed that the computation of the index is strongly motivated by the data availability, which seems to be the biggest constraint. Since data on deposit and credit in the banking sector can be accessed for a large number of countries, this banking data is mostly used in the computation of the index as compared to other services such as insurance, microfinance and cooperatives.

Sarma (2008) is considered as the first who come out with financial inclusion index for cross-country analysis. In calculating the index, she applies the similar approach that used by United Nations Development Programme (hereafter referred as UNDP) for computation of some well-known development indexes such as the Human Development Index (HDI), the Human Poverty Index (HPI), and the Gender-related Development Index (GDI)[16]. The Index of Financial Inclusion (IFI) by Sarma is computed by first calculating a dimension index for each dimension of financial inclusion. The dimension index for the i^{th} dimension, d_i, is computed by the following formula:

$$\boldsymbol{D_i = \frac{A_i - m_i}{M_i - m_i}} \qquad \textbf{(3.1)}$$

where

[16] For more details, see Technical Note in UNDP's Human Development Reports at vwww.undp.org

A_i = Actual value of dimension *i,*

m_i = minimum value of dimension *i,* and

M_i = maximum value of dimension *i*

Eq (3.1) ensures that $0 \leq D_i \leq 1$ where the higher the values of *Di,* the higher the country's achievement in dimension *i*. With regard to the dimension, Sarma (2008) states that the dimensions included are determined by the availablity of consistent data sets. Thus, using data pertaining to 2004, her study focuses on one variable for the three dimensions, namely penetration, availability and usage. The IFI for the country *i* is measured by the normalized inverse Euclidean distance of the point (p_i, a_i, u_i) from the ideal point (1,1,1). After givingequal weights to the dimensions, the index of financial inclusion (IFI) is computed as follows:

$$\boldsymbol{IFI = 1 - \sqrt{\frac{(1-p_i)^2 + (1-a_i)^2 + (1-u_i)^2}{3}}} \qquad \textbf{(3.2)}$$

where:

p_i= dimension indices for penetration,

a_i=dimension indices for availability, and

u_i =dimension indices for usage.

The IFI thus incorporates information on these dimensions in one single number lying between 0 and 1, where 0 denotes complete financial exclusion and 1 indicates the complete financial inclusion in an economy. In addition, depending on the value of IFI, countries are categorized into three categories, namely:

i. $0.5 < \text{IFI} \leq 1$:high financial inclusion

ii. $0.3 \leq$ IFI <0.5 :medium financial inclusion

iii. $0 \leq$ IFI <0.3 :low financial inclusion

Later, Sarma (2010) improves the IFI by adding weightage to the Eq (3.1) to capture the relative importance of the dimension *i* in quantifying the inclusiveness of a financial system:

$$\boldsymbol{d_i = w_i \ \frac{A_i - m_i}{M_i - m_i}} \quad \textbf{(3.3)}$$

where:

w_i = Weight attached to the dimension $_i$, $0 \leq w_i \leq 1$

A_i = Actual value of dimension $_i$,

m_i = minimum value of dimension $_i$,

M_i= maximum value of dimension $_i$.

By taking into consideration some aspects of data availability, Sarma (2010) gives weightage for each dimension, i.e., 1 for penetration and 0.5 for availability and usage. Thus, algebraically:

$$\boldsymbol{IFI = 1 - \sqrt{\frac{(1-p_i)^2 + (0.5-a_i)^2 + (0.5-u_i)^2}{1.5}}} \quad \textbf{(3.4)}$$

Taking into consideration both supply and demand side of financial inclusion, Kumar & Mishra (2009) compute the Financial Inclusion Index (FII) for banking outreach and households in India. They compute FII for banking outreach using distance-from-average method, where FII lies between zero (no inclusion) and unity (full inclusion).

First, for each of the six indicators, the actual value is divided by the overall average of that indicator, as following:

$$\boldsymbol{I_q} = \frac{\boldsymbol{X_{qs}^t}}{\boldsymbol{X_{qs*}^t}} \quad \textbf{(3.5)}$$

where:

X_{qs}^t = value of indicator q for the state *s* at time *t*,

X_{qs*}^t = mean value of indicator q for the state *s* at time *t*, and

q= 1, 2, … , 6

Subsequently, the average of all the indicators gives the proposed supply side composite index as below:

$$\boldsymbol{FII^B} = \frac{(\sum \boldsymbol{q\, I_q})}{\boldsymbol{6}} \quad \textbf{(3.6)}$$

Similarly, the demand side composite indices using household data for the formal and informal sector are computed as follows:

$$\boldsymbol{FII_F^H} = \frac{(\sum \boldsymbol{q\, X_{qs}^t})}{\boldsymbol{3}} \quad \textbf{(3.7)}$$

where:

X_{qs}^t = the value of indicator *q* for the state *s* at time *t*, and

q= the Formal saving, Formal credit and Formal insurance.

$$\boldsymbol{FII_I^H} = \frac{(\sum \boldsymbol{q\, X_{qs}^t})}{\boldsymbol{3}} \quad \textbf{(3.8)}$$

where:

X_{qs}^t = the value of indicator *q* for the state *s* at time *t*, and

q= the Informal saving and Informal credit.

Separate composite Financial Inclusion Indices (FIIs) using both the data sets are then calculated for the year 2002-2003.

Arora (2010) argues that the financial inclusion index should covers as many indicators as possible for each dimension in order to present a more accurate and comprehensive picture of access to finance. Therefore, in contrast to a single indicator in each dimension adopted by Sarma (2008), she adds the dimensions of ease of transactions (i.e., 12 indicators) and cost (i.e., 6 indicators) on top of the outreach dimension (i.e., 2 variables). However, she does not include the usage dimension that is one of the critical dimensions in financial inclusion (Kempson, Atkinson, & Pilley, 2004). The Financial Access Index (FAI) is computed for data pertaining to 2007 as follows:

Each dimension D_iI is defined as,

$$\boldsymbol{D_I I = \left(\frac{d_{i1} + d_{i2} + d_{i3} \ldots . d_n}{n}\right)} \quad \textbf{(3.9)}$$

and computation of *di* is the same as Eq (3.1).

Assigning weights of 2 to outreach and 1 to each, ease and cost of transactions, Arora's Financial Access Index (FAI) is derived as follows:

$$\boldsymbol{FAI = D_i I * w_i / D_i II * w_{ii} + D_i III * w_{iii}} \quad \textbf{(3.10)}$$

Intuitively, the Eq (3.10) implies that the FAI is directly (inversely) related to outreach (east and cost). The FAI is then converted into a normalized index by setting the country with the highest FAI equal to 1 and all other nations are relatively ranked.

In the most recent study, Gupte, Venkataramani, & Gupta (2012) computes the Financial Inclusion Index (FII) for India as a geometric mean using the four critical dimensions – outreach (penetration and accessibility), usage, ease of transactions and cost of transactions, following the methodology used by UNDP in computing the HDI in 2010[17]. Using the same argument by Arora (2010)[18], they manage to fill the gap from Sarma's and Arora's approaches by taking into account all the dimensions in their computation of FII. The computation of variables for each dimension is the same as Sarma (2008) and Arora (2010). Therefore each Dimension (D_j) is a simple average of all the d_i

$$\boldsymbol{D_j = \frac{\sum d_i}{n}} \quad \textbf{(3.11)}$$

and,

$$\boldsymbol{FII = (D1^{\frac{1}{5}}.D2^{\frac{1}{5}}.D3A^{\frac{1}{5}}.D3B^{\frac{1}{5}}.D4^{\frac{1}{5}})} \quad \textbf{(3.12)}$$

where:

D1 = the outreach dimension ($\Sigma d1i / n$) **(3.13)**

D2 = the usage dimension ($\Sigma d2i / n$) **(3.14)**

D3A= the ease of transaction dimension ($\Sigma d3ai / n$) **(3.15)**

[17] The methodology adopted by UNDP to calculate HDI prior to 2010 had attracted a lot of criticism and the technical note on HDI 2010 clarifies that the introduction of the geometric mean in this computation embodies imperfect substitutability across all the dimensions. It thus addresses one of the most serious criticisms of the linear aggregation formula, which allowed for perfect substitution across dimensions (UNDP, 2010).

[18] Any attempt to measure financial inclusion will have to take into consideration as many dimensions as possible that impact the inclusion factor (Arora, 2010).

D3B= the ease of transaction dimension $(1 - \frac{\sum d3bi/n}{n})$ **(3.16)**

D4 = the cost of transactions dimension $(1 - \frac{\sum d4i\ /\ n}{n})$ **(3.17)**

Unlike other studies, Prathap (2011) manages to fill the gap on the key limitation of previous studies in terms of types of financial services covered in the computation of his Financial Inclusion Index (FI Index). His computation takes into consideration all the four main types of services that individuals in society should have access, namely banking transaction, saving, credit and insurance, using only usage dimension. This is consistent with Kempson, Atkinson, & Pilley (2004) who emphasized on the usage dimension. Similar to Sarma (2008) and Gupte, Venkataramani, & Gupta (2012), Prathap (2012) also adopts the same method employed by UNDP (i.e., using a single composite rather than complementary composite) in calculating the index. The FI Index is calculated by aggregating responses in each variable. Using principal component analysis (PCA), the computation of the index is based on weighted average index numbers. The appropriate weights are assigned by using judgement method[19]. The value assigned to each variable are either 1 or 0 which denotes respondent having association with the source of finance and respondent having no association with the specified source of finance, respectively. With total weightage of 100, the computation of the index is as follows:

$$\sum_{1-n} \boldsymbol{X} = \sum(\boldsymbol{a1} * \boldsymbol{5})(\boldsymbol{b} * \boldsymbol{5})(\boldsymbol{c} * \boldsymbol{5})(\boldsymbol{d} * \boldsymbol{30})(\boldsymbol{e} * \boldsymbol{10})(\boldsymbol{f} * \boldsymbol{10})(\boldsymbol{g} * \boldsymbol{10})(\boldsymbol{h} * \boldsymbol{10})(\boldsymbol{i} * \boldsymbol{5})(\boldsymbol{j} * \boldsymbol{10}) \quad \textbf{(3.18)}$$

where:

[19] The weightage is evaluated by a panel of 30 experts from banking sectors, academicians and researchers.

(a) through (c) = banking transaction indicator,

(d) through (f) = formal credit indicator,

(g) through (i) = banking savings indicator, and

(j) = insurance indicator.

The FI Index varies between '0 and 100'. Value '100' signifies full inclusion while value '1' implies complete exclusion. Besides that, depending on the value of the index, level of inclusion can be identified as follows:

i. 1-29 : low financial inclusion

ii. 30-60 : medium financial inclusion

iii. 61 and above : low financial inclusion

Table 3.2 overleaf summarizes the index and computation considered by prior studies.

3.2.2 Review of Current Measurement of Financial Inclusion

Since the existing paradigm is based on neo-liberalism, one can argue that financial inclusion is very much explained through acces to banking, i.e., bank accounts, loans, etc. (i.e., all the measures are product of neo-classical and neo-liberal political economics). One of the reasons might lies on their basis that the banking sector has taken a lead role in promoting financial inclusion through the efficacy of financial system (Sarma & Pais, 2011).

Table 3.2 Summary of studies associated with computation of financial inclusion index

Author	*Name of Index*	*Formula*
Sarma (2008)	Index of Financial Inclusion (IFI)	$IFI = 1 - \sqrt{\frac{(1-p_i)^2 + (1-a_i)^2 + (1-u_i)^2}{3}}$
Sarma (2010)	Index of Financial Inclusion (IFI)	$IFI = 1 - \sqrt{\frac{(1-p_i)^2 + (0.5-a_i)^2 + (0.5-u_i)^2}{1.5}}$
Kumar & Mishra (2009)	Financial Inclusion Index (FII) for Banking	$FII^B = \frac{(\sum q\, I_q)}{6}$
	Financial Inclusion Index (FII) for Formal Sector	$FII_F^H = \frac{(\sum q\, X_{qs}^t)}{3}$
	Financial Inclusion Index (FII) for Informal Sector	$FII_I^H = \frac{(\sum q\, X_{qs}^t)}{3}$
Arora (2010)	Financial Access Index (FAI)	$FAI = D_i I * w_i / D_i II * w_{ii} + D_i III * w_{iii}$
Gupte, Venkataramani, & Gupta (2012)	Financial Inclusion Index (FII)	$FII = (D1^{\frac{1}{5}}.D2^{\frac{1}{5}}.D3A^{\frac{1}{5}}.D3B^{\frac{1}{5}}.D4^{\frac{1}{5}})$
Prathap (2011)	Financial Inclusion Index (FI Index)	$\sum_{1-n} X = \sum (a1*5)(b*5)(c*5)(d*30)(e*10)(f*10)(g*10)(h*10)(i*5)(j*10)$

However, looking from another perspective, financial inclusion is also worth to be observed under the purview of developmentalism (see for example, Schwittay (2014) and Kalpana, 2015)) and should therefore relate to emancipation and empowerment. It should be noted that, in the case of loans, the current debate on financial inclusion relates to 'indebting' people rather than empowering (see for example Lazzarato, (2012)). This empowerment aspect is much related to the human development itself. On this matter, Sarma & Pais (2011) attempts to compare their financial inclusion index in relation to the Human Development Index (HDI)[20]. They concluded that countries having high level of human development are also the countries with a relatively high level of financial inclusion. Nevertheless, the HDI simplifies and partially captures some aspects of human development. It does not reflect on the aspect of empowerment indicator (UNDP, 2017).

In the context of Islamic political economy, the empowerment paradigm is captured through *maqasid al-shariah*. It is regarded as the core of human life, without which the human's life will be uncertain and aimless. With its observance, human life will be directed objectively (Mohammad & Shahwan,

[20] The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions. The health dimension is assessed by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. The standard of living dimension is measured by gross national income per capita. The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing GNI. The scores for the three HDI dimension indices are then aggregated into a composite index using geometric mean. For details, refer http://hdr.undp.org/.

2013). With regards to socio-economic in Islamic perspective, *maqasid al-shariah* stands as its pillar and base while its development and issues are the manifestation of the pillar. Hence, Islam has taken into account the importance of "purpose" or in Arabic "*maqsud*" and in plural sense "*maqaasid*", to guide human life.

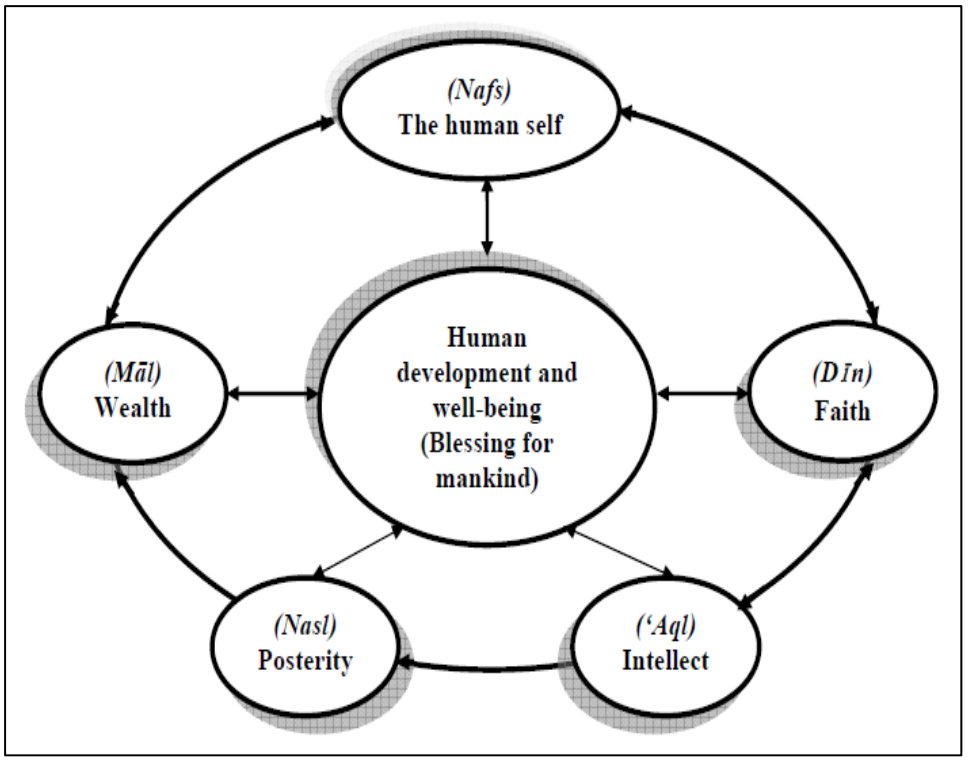
By referring to the *Quran*[21] and the *Sunnah*[22] as well as definitions and explanation from a number of scholars, Chapra (2007) concludes that all the *raison d'être* of the Shariah which, as recognized by almost all the jurists, is to serve the interests of all human beings and to save them from harm. These two essential aspects (i.e, to serve the interests of all human beings and to save them from harm) are the key elements for empowerment. With regards to financial inclusion, there are many areas of empowerment that can be considered as well as measured under the framework of *maqasid al-shariah*. For example, Imam Abu Hamid al-Ghazali, an eminent scholar, classified the *maqasid* into five major categories by stating that, "the very objective of the Shariah is to promote the well-being of the people, which lies in safeguarding their faith (*din*), their self (*nafs*), their intellect ('*aql*), their posterity (*nasl*), and their wealth (*mal*). Whatever ensures the safeguard of these five, serves public interest and is desirable, and whatever hurts them, is against public interest and its removal is desirable."(Chapra, 2000).

[21] The Arabic speech of Allah that was revealed to the Prophet Muhammad both in word and in meaning**.** It is collected between the two covers of the *mushaaf* **(**i.e., Quran), was narrated in *mutawaatir* (chains), and is a challenge to humankind.

[22] In brief, it is the tradition portion of Muslim law, based on words and acts of Prophet Muhammad and preserved in the traditional literature.

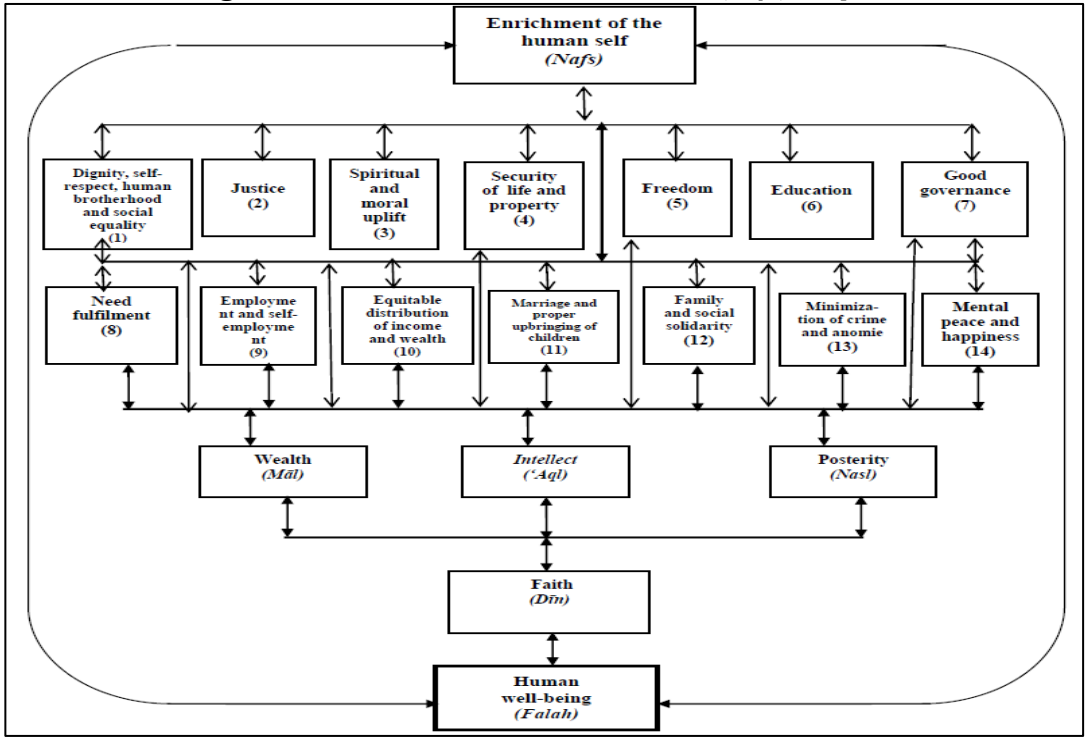
With respect to the study on *maqasid al-shariah* in socio-economic in general, Chapra (2007) and Mohammad & Shahwan (2013) have made a great contribution in shedding the light of connecting these two essential scopes, i.e., *maqasid al-shariah* and socio-economic. Based on the theory of five *maqasid* that has been mentioned earlier (i.e., primary *maqasid*), Chapra (2007) came out with the corollaries *maqasid* for each of the primary *maqasid*, respectively. Figure 3.1 shows the relationship between the five *maqasid*, human development and well-being, while Figures 3.2 to 3.6 present the corollaries for each of the five primary *maqasid*, namely the human self (*nafs*), faith (*din*), intellect (*'aql*), posterity (*nasl*) and wealth (*mal*).

Figure 3.1 Realizing human development and well-being through *maqasid al-shariah*



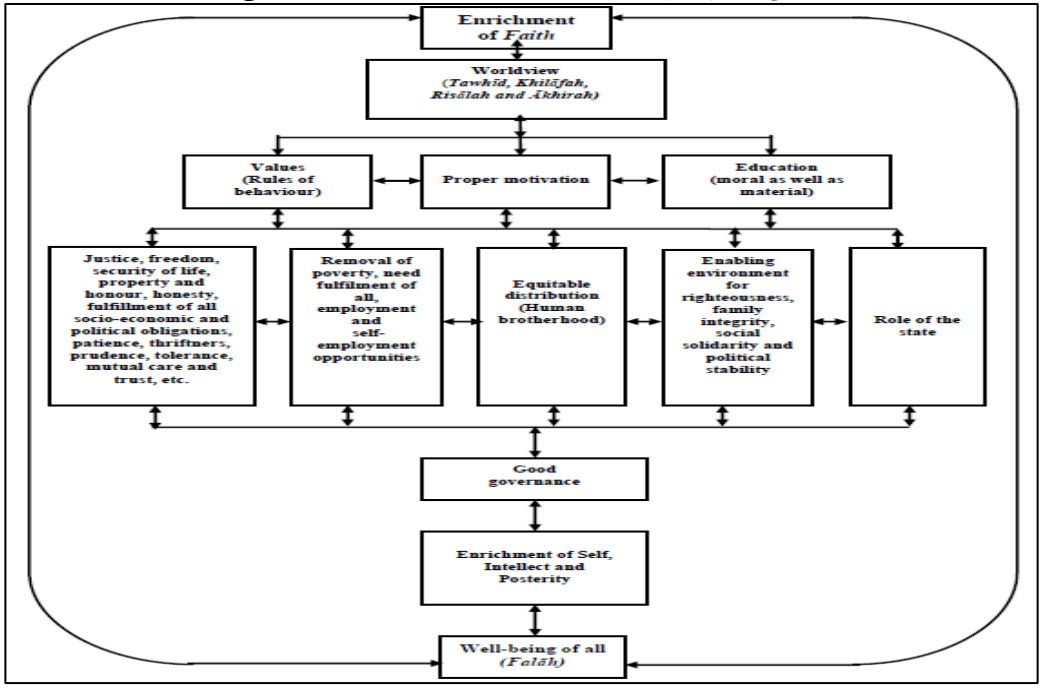
Source: Adopted from Chapra (2007, p. 9).

Figure 3.2 The corollaries of human self (*nafs*) *maqasid*



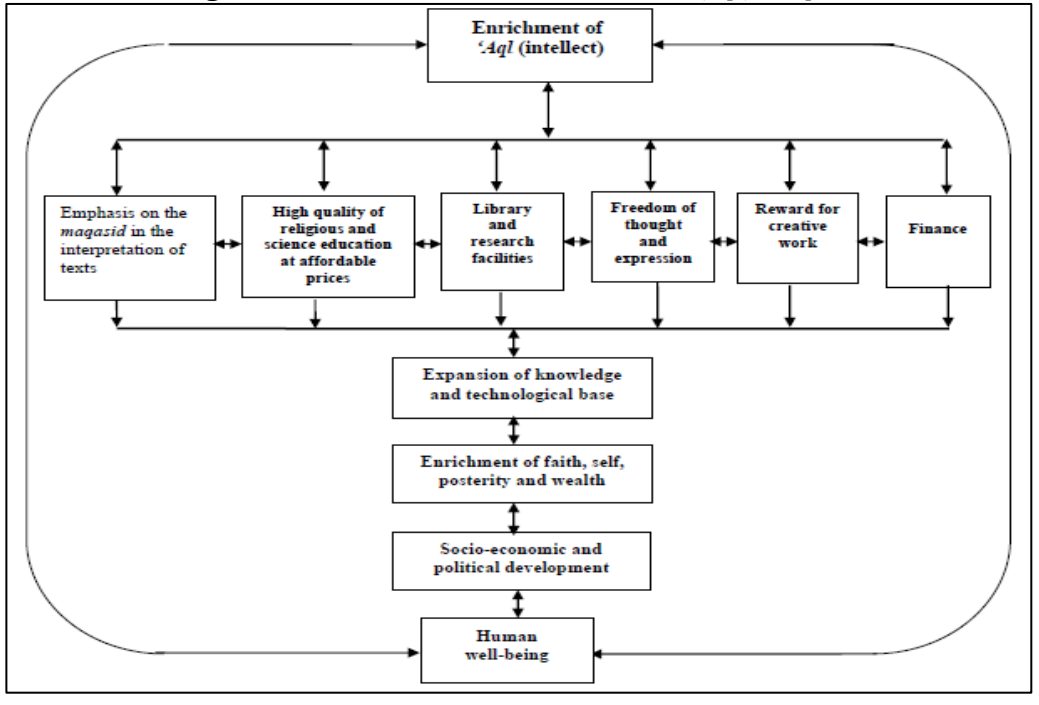
Source: Adopted from Chapra (2007, p. 11).

Figure 3.3 The corollaries of faith (*din*) *maqasid*



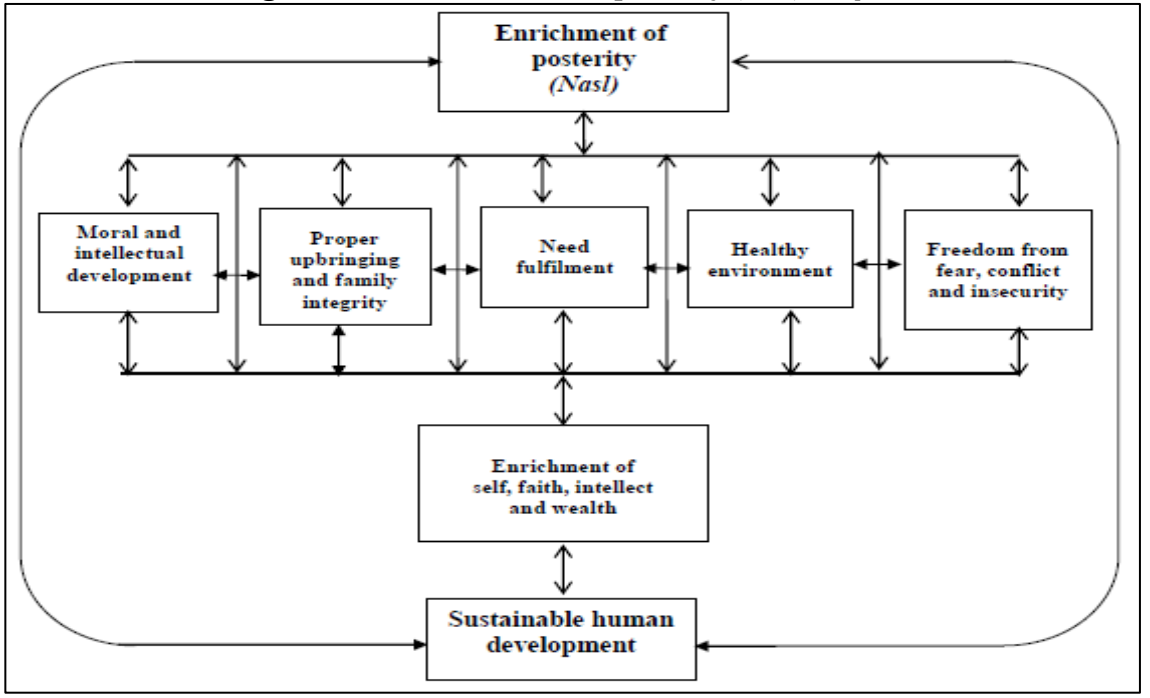
Source: Adopted from Chapra (2007, p. 32).

Figure 3.4 The corollaries of intellectual (*aql*) *maqasid*



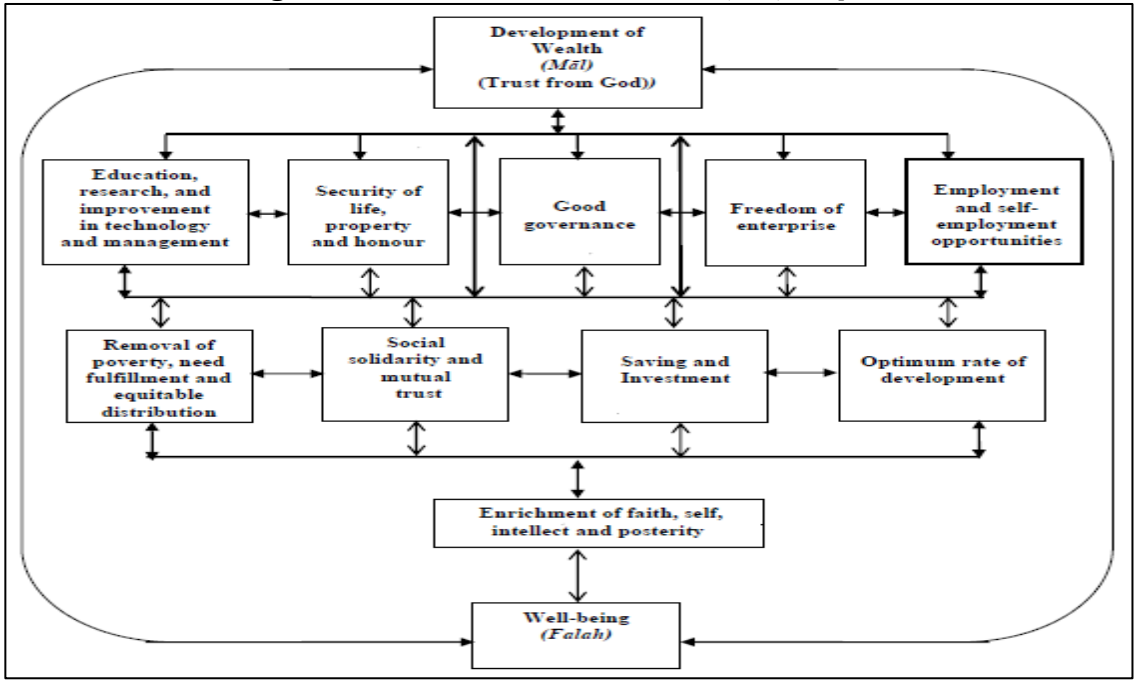
Source: Adopted from Chapra (2007, p. 40).

Figure 3.5 The corollaries of posterity (*nasl*) *maqasid*



Source: Adopted from Chapra (2007, p. 45).

Figure 3.6 The corollaries of wealth (*mal*) *maqasid*



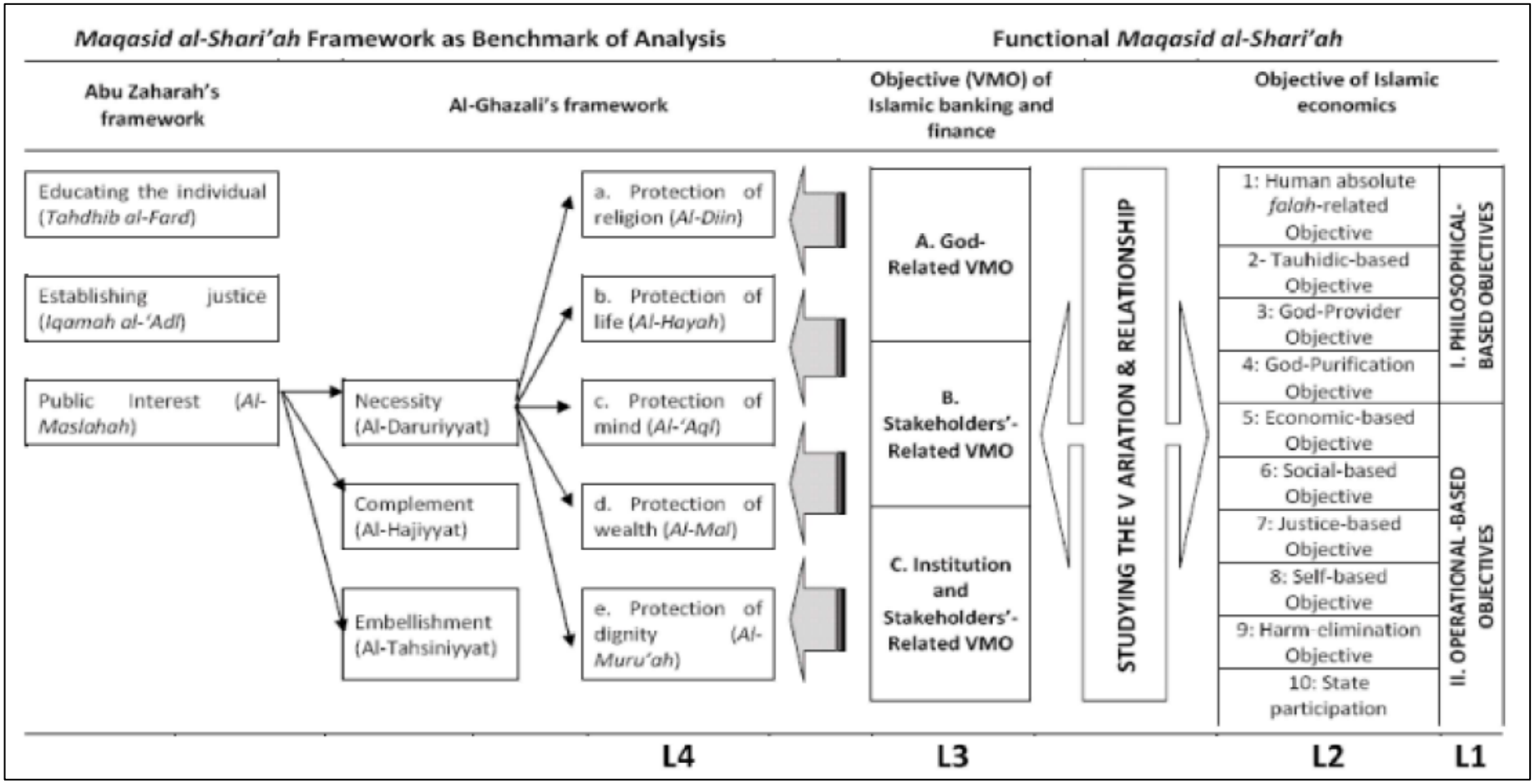
Source: Adopted from Chapra (2007, p. 49).

Mohammad & Shahwan (2013) analyse critically the conceptual association between the framework of *maqasid al-shariah* that rooted from both al-Ghazali and al-Zaharah[23] as well as the objectives of Islamic economics and Islamic banking and finance. Adopting content analysis and inductive method, they originated alternative version of the *maqasid al-shariah* framework as well as the objectives of Islamic banking and finance and Islamic economics. This is shown in Figure 3.7 overleaf. L1, L2, L3 and L4 represent the following title respectively: the two main types of objective; philosophical-based and operational-based objectives, objective of Islamic economics, VMO (i.e., vision, mission, objective) of Islamic Bank and the *maqasid* framework.

It is worth noting that there are increased interests in deliberating the realization of *maqasid al-shariah* in different areas that range from Islamic banking and Islamic economics (see, for example, al-Mubarak & Osmani, 2010; Eddy Yusof,

[23] For further details, refer Abu Zaharah (1997) and its brief explanation in Mohammad & Shahwan (2013).

Figure 3.7 The conceptual association between *maqasid al-shariah* framework and the objectives of Islamic banks and Islamic economics



Source: Adopted from Mohammad & Shahwan (2013, p. 80).

Kashoogie, & Kamal, 2010; Mohammad & Shahwan, 2013; Rosly, 2010), democracy and development (see, for example, Çizakça, 2007), capital market (see, for example, Dusuki, 2009, 2010) to social aspect (see, for example, (Laluddin et al., 2012). Some of these studies also highlight the important of risk-sharing element towards realization of *maqasid al-shariah*, or in other words, to promote Islamic finance development through empowerment.

However, these studies are rather normative than positive and have not specifically discussed the subject of *maqasid al-shariah* in relation to financial inclusion. Not to mention, the use of this maqasidic approach in measuring financial inclusion by incorporating the empowerment aspect is very limited. Therefore, our understanding of the comprehensive measurement of financial inclusion remains incomplete.

3.3 Factors Associated with Financial Inclusion

3.3.1 Overview

While the importance of broader access is becoming crucial in addressing financial inclusion, there is relatively lacking, inconclusive and mixed evidence on the determinants to financial inclusion. There are a few reasons that might explain the limitations. Firstly, bearing in mind that the issue of financial inclusion is a complex issue in nature[24], there could be just simply too many issues that need to be studied. This is commonly referred to as 'an unfinished agenda' (Beck and Demirguc-Kunt, 2008). Secondly, it could be due to limited data on access to financial services and

[24]There are many angles in the discussion of financial inclusion such as types of financial services involved (World Bank, 1995), financial services providers who responsible to it, different factors from different dimensions associated to it (demand, supply and economic factors), different perspectives of the study (micro and macro) and so on so forth.

therefore a proper investigation of this issue is far from possible (Claessens, 2006; Beck et al., 2008; Sarma & Pais, 2011).

Although the issue of financial inclusion has been discussed since early 1990s, the discussions on its factors have been commonly normative rather than positive. Possibly, prior studies are mainly interested in explaining and describing the factors associated with financial exclusion (e.g., Elaine Kempson & Whyley, 1999; Collard, Kempson, & Whyley, 2001; Carbo, Gardener, & Molyneux, 2007) rather than providing empirical evidence on what determines the financial inclusion. Such empirical evidence is important to identify the constraints that would contribute to policy-making activities in tackling financial exclusion (Beck et al., 2009). In the same spirit, it was once noted that "the great challenge before us is, to address the constraints that exclude people from full participation in the financial sector" (Annan, 2003).

The determinants of financial inclusion are now reviewed as following.

3.3.2 Determinants of financial inclusion

Literature on barriers to financial inclusion suggests that some areas of constraints do exist within the institutional settings. The determinants are now reviewed as follows.

Using the determinants of the depth of the financial sector, Beck et al. (2007) explore the factors associated with financial outreach which affect the access to credit. Despite having significant link with the overall level of economic development, the findings also reveal that both outreach and depth indicators are positively associated

with the quality of the institutional environment, the degree of credit information sharing, the level of initial endowments, and the development of the physical infrastructure. The importance of physical infrastructure in promoting financial access are also supported by other studies (e.g., Beck et al., 2008; Sarma & Pais, 2011). Apart from that, outreach and depth indicators are negatively correlated with the cost of enforcing contracts and the degree of government ownership of banks. However, only financial sector depth is positively associated with the level of creditor rights protection. Finally, historical variables such as legal origin and religion have less consistent impact on financial outreach relative to depth. In particular, economies based on a French legal origin seem to have lower levels of depth, but not consistently lower levels of outreach. Similarly, while predominantly Protestant societies appear to have deeper financial sectors than Catholic societies, the same cannot be said consistently about banking sector outreach.

Qian & Strahan (2007) argue that legal and institutional differences shape the ownership and terms of bank loans across the world. Using demand-side factors (i.e., firms characteristics), credit risk factors (i.e., loan characteristics), as well as country level factors (i.e., creditors rights, legal formalism, information sharing, legal origin), they show that under strong creditor protection, loans have more concentrated ownership, longer maturities, and lower interest rates. Moreover, the impact of creditor rights on loans depends on borrower characteristics such as the size and tangibility of assets. Apart from that, foreign banks appear more sensitive to the legal and institutional environment, with their ownership declining relative to domestic banks as creditor protection falls. The results support the reason underlying the law and finance literature, pioneered by La Porta, et al (1997, 1998), that some

environments are more conducive to operate financial contracts than others, and that better contracting leads to better outcomes[25]. Sharing the similar result, Ge et al. (2012) also find that the favourable effect of firm-level governance on some loan contracting terms is stronger in countries with strong legal institutions than in countries with weak legal institutions.

Using information from 209 banks in 62 countries, Beck et al., (2008) show that the effectiveness of creditor rights, contract enforcement mechanisms, and credit information systems, are weakly correlated with barriers. On the other hand, they signify strong associations between barriers and measures of restrictions on bank activities and entry, bank disclosure practices and media freedom, as well as development of physical infrastructure. Specifically, barriers are higher in countries where there are more stringent restrictions on bank activities and entry (i.e., based on bank regulatory on bank activities and entry), less disclosure and media freedom (i.e., less of transparency), and poorly developed physical infrastructure. However, the link is not much related to credit services. Apart from that, the study report no consistent relationship between market structure (bank concentration, government-owned banks and foreign-owned banks) and credit barriers.

Consultative Group to Assist the Poor (CGAP) (2009) argue that usury ceilings or interest rate cap may inhibit the expansion of credit and increase actual costs paid by consumers although it designed to protect consumers. Beside disclosure requirement, interest rate ceilings or usury rates are the oldest form of consumer protection. Introduced in Babylon in 1750 B.C.E., the interet rate are still used in many

[25] In this study, the result suggests that stronger investor protection and more efficient institutions are correlated with better access to credit.

countries. Throughout history, however, enforcement has proven problematic, with actual interest rates consistently exceeding the ceilings, sometimes by many multiples. In the Financial Access Survey, 39 countries have usury limits, while the other 97 countries do not. According to CGAP (2009), there is no clear pattern across regions and income groups in regulating interest rates and the overall interest rate in countries with usury ceilings does not differ systematically from that in countries without usury ceilings. Although interest is been considered as crucial aspect in credit barrier, evidence on its relationship is still lacking with exception of Sarma & Pais (2011)[26].

With respect to the health of banking system, Sarma & Pais (2011) use the non-performing asset (NPA) and capital asset ratio (CAR) to examine its barrier to financial inclusion. The result shows that the level of NPA of the banking system in an economy is found to be significantly and negatively associated with financial inclusion. They argue that high NPA of a banking system is that NPAs are a result of providing credit to the low income groups (who are more likely to default). If lending to the poor and consequent default on their part was in fact the cause for NPA, then higher levels of NPAs should be associated with higher levels of financial inclusion. Since the results show the opposite, it signifies higher level of NPA to be associated with lower level of financial inclusion. Thus, they suggest that efforts to include more people into the financial system are not the significant cause for the NPA. In another proxy for the health of the banking system, the capital asset ratio (CAR) is found to have a negative coefficient that is significant at 0.05 level. Hence, the study shed lights that highly capitalised banking systems seem to be less inclusive. It implies that

[26] The study found that the interest rate does not show any significant relationship with financial inclusion.

banking systems having high CAR tend to be more cautious in lending, thus negatively affecting financial inclusion.

Other than that, Gimet & Lagoarde-Segot (2012) suggest that adequate civil rights as well as support to entrepreneurship would help dealing with financial exclusion. This is based on the results of the study that show that there are significant relationship between the determinants of financial inclusion and the determinants of access to entrepreneurship (i.e., civil liberties rating, legal rights index and paid-in minimal capital requirement). In addition, Honohan (2008) in his study found that there is a robust and highly significant coefficient on the mobile phone variables which reliably associated with financial inclusion.

Looking at how the access indicators varies across regions of the developing world, Honohan (2008) find that some regions have some influence on access to finance. This study support the view of institutional approach in economic geography which tries to answer the question, "to what extent and in what ways are the processes of geographically uneven capitalist economic development shaped and mediated by the institutional structures?" (Martin, 2005, 79). In this regard, region could be a plausible factor in shaping financial inclusion.

3.4 Chapter Summary

This chapter has provided further related survey of the literature related to financial inclusion. Principally, it can be argued that there is no systematic and standard measurement on financial inclusion. Moreover, the chapter discusses the financial inclusion determinants arising from both institutional settings and others. While other

determinants are found to be typically associated with financial inclusion, factors like interest rate, legal origin and geographical region, to a certain extent, show little evidence.

Chapter 4

RESEARCH METHOD I: RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

The aim of this chapter is to describe the basic research design and methodology used to conduct the present study. It begins by summarizing the key research focus. Next, section 4.3 discusses the models and techniques of empirical research method employed to analyze the data followed by section 4.4 to describe the variables definitions. The data collections is discussed in section 4.5. The final section concludes this chapter.

4.2 Research Focus

The focus of the research is to examine the role of financial system in shaping financial inclusion, as well as recognising other determinants of financial inclusion. In explaining the relationship between financial inclusion and financial system, the classification of financial system based on Islamic and conventional is developed since there is no such categorization is made before. Given there is still no systematic and standard measurement on financial inclusion available, the financial inclusion index is constructed in the present study. The index is later used to investigate factors contributing to financial inclusion. Those factors are selected based on a number of prior financial inclusion studies.

Against the backdrop "the agenda on access to finance is still unfinished" (Beck & Demirguc-Kunt, 2008), the present study specifically seeks to answer the following main questions:

1. Does the Islamic financial sector (i.e., as proxied by the Islamic banking presence), has significant influence on financial inclusion?
2. Are the empirical effects between Islamic financial sector and financial inclusion consistent with the theoretical presumption (i.e., Islamic banking is positively related with financial inclusion)?
3. Do the financial inclusion determinants, especially the institutional settings that have been tested in prior studies remain significant in explaining factors associated with financial access?
4. Are the financial inclusion determinants heterogeneous across the whole distribution of countries?

In answering the above research questions, two parts of analyses are identified. The first part examines the relationship between the incidence of financial inclusion and the financial system. The second part deals with the other factors associated with financial inclusion.

4.3 Research Method

4.3.1 Financial inclusion determinants

To answer the first three research questions, individual country's composite index of financial inclusion (henceforth CIFI) is modelled as a function of several financial

inclusion determinants including the types of financial system. Specifically, the following linear model is estimated on CIFI measures:

$$\boldsymbol{Y_i = \alpha_0 + v_k X_{i,k} + u_{it}} \quad \textbf{(4.1)}$$

where:

Y = the logit function of country's CIFI,

vX = vector of all explanatory variables affecting financial inclusion,

α = constant term,

u = disturbance term,

i = individual countries,

t = time period of variables' measurements, and

k = quantity of explanatory variables.

4.3.2 Testing procedures

Principally, the testing procedures are divided into two parts. The objective of the first part is to answer the first three research questions, while the second part provides answer to the fourth research question. Univariate and multivariate statistical analyses are used to analyze the data. Detail discussions on the analyses are presented in the subsequent sub-sections.

4.3.2.1 Pooled cross-sectional regressions

Initially, the first and the second parts of the analysis are estimated using the pooled ordinary least squares (OLS) method which yields the best linear unbiased estimated (BLUE). The OLS estimation is common in financial inclusion literature. With regard to the results of OLS, it has been identified that heteroskedasticity has some

potentially serious implications for inferences. This problem can be solved using the White's (1980) correction for heteroskedasticity procedure when the heteroskedasticity problem is reported (i.e., when the Breusch-Pagan/Cook-Weisberg test is significant at 1%, 5% or 10% level). In this regard, the robust *t*-statistic is reported using the OLS regressions with robust option.

4.3.2.2 Analysis of panel data method

Since there are some arguments that OLS results may be biased due to the failure to control for country-specific, time-invariant heterogeneity [see, for example, Bevan & Danbolt (2004)], the panel data analysis is also conducted in the present study. In this regard, Eq. (4.1) is re-estimated using the analysis of panel data method. The method employs a one-way error component model for the disturbance, u_{it} , with

$$\boldsymbol{u_{it} = \mu_i + \gamma_{it}} \qquad \textbf{(4.2)}$$

where:

μ_i = countries fixed effects, and

γ_{it} = remainder disturbance.

Intuitively, Eq. (4.2) expands the disturbance term in Eq. (4.1) into two components and the countries' fixed effects become one of the parameter to be estimated. For the purpose of estimating the panel equation, the assumption of the μ_i can be in two forms, namely fixed effects and random effects. Nonetheless, it "is not as easy as a choice as it might seem" (Baltagi, 2005, p.19) to select between the fixed effects and the random effects. Hence, a formal Hausman specification test for fixed versus random effects panel estimation is performed to identify the suitable estimation

results with regard to the underlying assumption of μ_i . The test's null hypothesis is that the difference in coefficient is *not systematic* (or random).

A number of separate regressions are estimated as additional checks for robustness of the main results.

4.3.2.3 Quantile regression

Apart from the pooled OLS, quantile regression is used to examine the last research question (i.e., are the financial inclusion determinants heterogeneous across the whole distribution of countries?). Introduced by Koenker & Bassett (1978) and Koenker & Hallock (2001), the conditional quantile regression estimator can be employed to examine the entire distribution of a response variable, conditional on a set of covariates (i.e., explanatory variables). Particularly, this regression method estimates the coefficients of the inclusion barriers depending on the location (i.e., θth quantile) of the conditional distribution of CIFI.

Instead of running separate regressions, the quantile regression approach is used to segment the dependent variables into different subsets according to its conditional distribution. With regard to running separate regressions, Heckman (1979) argues that they have the tendency to produce inconsistent and biased estimates because of the sample selection bias. Furthermore, Gallant & Fuller (1973) and Ramsay (1988) also point out that running separate regressions are least-squares based and can be sensitive to the Gaussian assumption or to the presence of outliers. Montenegro (2001) also added that the quantile regression method could deal with the following issues:

i. frequently the error terms are not necessarily constant across a distribution thereby violating the axiom of homoscedasticity,

ii. by focusing on the mean as a measure of location, information about the tails of a distribution are lost,

iii. OLS is sensitive to extreme outliers that can distort the results significantly.

These are all the advantages that make the quantile regression approach robust especially to departures from normality and skewed tails (Mata & Machado, 1996).

In accordance with Eq. (4.1), the regression specification of the θth conditional quantile can be presented as follows:

$$\boldsymbol{Y_i = \alpha_{0\theta} + v_{k\theta} X_{it,k} + u_{it\theta}} \quad \textbf{(4.3)}$$

$$\boldsymbol{Quant_\theta\,(y_{it}|X_{it}) \equiv inf\,\{y :\, F_{it}\,(y|X)\theta\} = \alpha_{0\theta} + v_{k\theta} X_{it,k}} \quad \textbf{(4.4)}$$

where:

$Quant_\theta\,(y_{it}|X_{it})$ = θth conditional quantile of y_{it} on the regressor variable X_{it},

$v_{k\theta}$ = unknown parameters to be estimated for different values of θ in (0,1),

$F_{it}\,(y|X)$ = conditional distribution function of y, and

$u_{it\theta}$= disturbance term where it requires that $Quant_\theta\,(u_{it\theta}|X_{it}) = 0$.

From the regression, the entire distribution of y, condition on X, can be traced by placing the value of θ from 0 to 1. Regression for dependent variable is run simultaneously using the seven setting quantiles being examined in this study, namely 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th} and 95^{th}, which largely considers the whole distribution of the sample. As suggested by Efron (1980) and Buchinsky (1995, 1998), bootstrap

method is used to estimate the coefficients of the parameters. Particularly, 1,000 bootstrap replications[27] are employed and it is argued that the bootstrap estimate is evidence to be fairly robust (Buchinsky, 1995).

The robustness of the quantiles regression results is examined by conducting inter-quantile regression, where the disparity of the estimated coefficient between different quantiles is examined. The disparity is checked between the two extreme tails (95^{th} and 5^{th}), the right tail and the median (95^{th} and 50^{th}), the median and the left tail (50^{th} and 5^{th}) and the two quartiles (75^{th} and 25^{th}) respectively. The inter-quantile regression is modelled as higher quantile minus lower quantile, and the positive sign represents an ascending pattern of coefficients between the two quantiles while a negative sign indicates a descending pattern (Dzolkarnaini, 2009).

4.4 Variables Definitions

In general, the selection of variables is primarily based on the theoretical propositions of institutional theory as well as findings of prior empirical studies. Specifically, this study focuses on the determinants of the financial inclusion within the established institutional settings. Thus, the selected explanatory variables are those that seem plausible on a *priori* grounds and could explain the factors that affect financial inclusion.

[27] 1,000 bootstrap replications were applied in this study following Fattouh, Scaramozzino, & Harris (2005) and Chen, Kuan, & Lin (2007).

4.4.1 Dependent variable

4.4.1.1 Cumulative index of financial inclusion (CIFI)

Following Sarma & Pais (2011), index of financial inclusion is employed as the primary financial inclusion measure in all analyses. As argued by Sarma (2008, 2010), using indicators of financial access individually, provide only partial information on the inclusiveness of the financial system of an economy, which can lead to misleading understanding of the extent of financial inclusion in an economy. Therefore, a single measurement (i.e., in this case, index), is more appropriate in representing the inclusiveness of the financial system by taking into considerations some important aspects.

The use of inclusion index is not relatively straightforward (i.e., since there are several formula as well as modifications made in computing the index). In response to this, CIFI in computed in this study. Detail discussion on the construction of the composite index is presented in Chapter 5.

4.4.2 Explanatory variables

As far as institutional theory is concerned, institutional setting variables are primarily observed along with the other variables associated with financial inclusion. Table 4.1 overleaf provides a summary of description, definition and source of each other variable. The following variables are included by virtue of their potential to have indicatory power in explaining the factors associated with financial inclusion. The following sub sections further discuss the variables.

Table 4.1 Description of variables for investigating financial inclusion determinants

Variable	*Definition*	*Sources*	*Date*
Islamic banking variable			
IB quantity	Total number of Islamic banks divided by total number of banks in the banking system.	Based on author's calculation using data from Bankscope, Islamic Banking Database created by the World Bank as well as various Islamic banks and central banks of the corresponding countries.	
IB size	The average of natural logarithm of total assets of Islamic banks		
IB profitability	The average of profit before tax (and zakat) divided by total assets of the Islamic bank		
Macroeconomics variable			
GDP per capita	GDP in US dollars at market exchange rates/Total population	World Development Indicators, World Bank	2007-2011
Overall institutional environment			
Governance index	Average score on six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption). Higher score correspond to better governance.	Authors' calculations based on Aggregate Governance Indicators, World Bank	2007-2011
Contractual and Informational Framework			
Credit information index	Scored on zero to six scale; scores increasing with availability of credit information.	World Bank Doing Business Indicators	2007-2011
Legal rights index	Scored on a 0–10 scale, with scores increasing with legal rights. Index measures the degree to which collateral and bankruptcy laws facilitate lending.		
Costs of enforcing contracts	Total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt.		
Regulatory Restrictions			
Index of banking restrictions	Index captures government's control, regulations, and involvement in financial sector. Higher values indicate more banking restrictions.	Index of Economic Freedom. The Heritage Foundation/The Wall Street Journal	2007-2011
Physical Infrastructure			
Paved road	Paved roads (in km) per square km of land area (Sarma & Pais (2011) have repeated the same regression with paved roads per 1000 population and have obtained similar results)	World Development Indicators, World Bank	2007-2011
Phone	Logarithm of the number of telephone (land line and mobile)		
Internet	Number of internet users per 1000 subscription per 1000 population		

Variable	*Definition*	*Sources*	*Date*
Interest Rates			
Deposit interest rate	The rate paid by commercial or similar banks for demand, time or savings deposits.	World Development Indicators, World Bank	2007-2011
Lending interest rate	The bank rate that usually meets the short and medium-term financing needs of the private sector. This rate is normally differentiated according to creditworthiness of borrowers and objectives of financing.		
Legal Origin			
French legal origin	Dummy equal to 1 if a country legal system is of French Civil Law origin.	La Porta, Silanes, Shleifer, & Vishny (1998)	
British legal origin	Dummy equal to 1 if a country legal system is of British Common Law origin.		
German legal origin	Dummy equal to 1 if a country legal system is of German Civil Law origin.		
Scandinavian legal origin	Dummy equal to 1 if a country legal system is of Scandinavian Civil Law origin.		
Socialist legal origin	Dummy equal to 1 if a country legal system is of Socialist Law origin.	Siems (2006)	
Region			
Africa	Dummy equal to 1 if a country belong to Africa region	World Bank	
East Asia & Pacific	Dummy equal to 1 if a country belong to East Asia & Pacific region		
Europe & Central Asia	Dummy equal to 1 if a country belong to Europe & Central Asia region		
Latin America & Caribbean	Dummy equal to 1 if a country belong to Latin America & Caribbean region		
Middle East & North Africa	Dummy equal to 1 if a country belong to Middle East & North Africa region		
South Asia	Dummy equal to 1 if a country belong to South Asia region		

4.4.2.1 Institutional setting variables

In this study, several institutional setting variables are included, namely financial system (i.e., proxied by the Islamic banking presence), overall institutional environment, contractual and informational framework, regulatory restrictions, legal origin as well as region. The variables are discussed as following:

i. Financial system

In terms of financial system, the impact of Islamic financial sector is not well explored. Following Ben Naceur et al., (2015), Islamic banking presence, is employed as the primary proxy for type of financial system in all analyses. On top of the number and size of assets in Islamic banking[28] that has been suggested by Ben Naceur et al., (2015), this present study adds another indicator to gauge the Islamic banking presence, namely profitability of Islamic banking. Detail discussion on the classification of financial system (i.e., proxied by the Islamic banking presence) is presented in Chapter 6. Using the two indicators of Islamic banking, Ben Naceur et al., (2015) find that the empirical link between financial inclusion and Islamic banking is mixed, i.e., Islamic banking in OIC countries is associated with greater use of bank credit by households and by firms, primarily for investment purposes, but find no significant association with ownership of accounts by households.

ii. Overall institutional environment

[28] In Ben Naceur et al., (2015) study, both indicators are scaled by the adult population. Similar results were obtained when scaling by total population or as a share of total number of banks or total assets of the banking system.

Overall institutional environment variable is gauge using the governance index. This index consists of score on six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption). Higher score correspond to better governance. Considering the prediction of institutional theory, it is expected that countries with high level of governance index will have greater financial inclusion. The findings of Beck, et al., (2007) reveal that both outreach and depth indicators are positively associated with the quality of the institutional environment.

iii. Contractual and informational framework

Combining both studies by Beck, et al., (2007) and Gimet & Lagoarde-Segot (2012), three variables are employed to examine the impact of contractual and informational framework on financially excluded. The informational environment is captured through a credit information index from the World Bank Doing Business Database, which measures rules affecting the scope, accessibility, and quality of credit information available through either public or private bureaus. Higher values of the index (ranging from one to six) represent a better informational environment. The cost of contract enforcement (also from the Doing Business Database) measures the official cost of going through court procedures, including court costs and attorney fees where the use of attorneys is mandatory or common, or the costs of an administrative debt recovery procedure, expressed as a percentage of the debt value. Beck, et al., (2007) find that outreach indicators are correlated with the credit information environment and with the cost of contract enforcement, while Beck et al., (2008)

uncover a weak association between these two variable and the barrier indicators[29]. With regards legal rights in getting credit (i.e., scored on a 0–10 scale, with scores increasing with legal rights, legal right index measures the degree to which collateral and bankruptcy laws facilitate lending), Gimet & Lagoarde-Segot (2012) finds a positive and significant impact of this variable on those financially included.

iv. Regulatory restrictions

To capture regulatory restriction, index of banking restrictions is applied. This index captures government's control, regulations, and involvement in financial sector. Higher values indicate more banking restrictions. Beck et al., (2008) argue that bank regulations might have both a direct and indirect effect on financial inclusion. Their finding reveals that banks in economies with more restrictions on banking activities are found to discriminate those who are financially excluded in accessing deposit and lending services.

v. Interest rate

Both deposit and lending rates which are gathered from the World Development Indicators database, are used in this study. Consultative Group to Assist the Poor (CGAP) (2009) argue that usury ceilings or interest rate cap may inhibit the expansion of credit and increase actual costs paid by consumers although it designed to protect consumers. However, the evidence is remains lack and inconclusive. Sarma & Pais (2011) find negative sign for interest rate but found no significant association,

[29] The barrier indicators, among others are minimum balance to open checking account (percent of GDP per capita), annual checking account fees (percent of GDP per capita), minimum amount consumer loan (percent of GDP per capita) and fee for using ATM card (percent of $100).

whereas Gimet & Lagoarde-Segot (2012) report negative relationship between the interest spread and credit.

vi. Legal origin

Following Beck, et al., (2007), this study further investigates the link between legal origin and financial access since the literature finds that economies with legal institutions based on the French Civil Code tend to be less financially developed than those that originated from the British Common Law. Following Siems (2006), socialist origin is added on top of the four legal origin classified by La Porta, et al. (1997). Beck, et al., (2007) find that legal origin and religion have a less consistent impact on financial outreach.

vii. Region

Except for Honohan (2008), as far as financial inclusion literature is concern, there is no attempt has been made before to explore the affect of region on financial inclusion in particular. Following the note from Martin (2000), this study introduces region variable to further examine the impact of this institutional setting on financial access. Six geographic regions based on World Bank database are observed, namely Africa, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa and South Asia.

4.4.2.2 Other variables

i. Macroeconomics variable

Established in most of the financial development literature, GDP per capita variable is used to represent the macroeconomics aspect in examining the impact of this variable

on financial inclusion. On the one hand, Beck, et al., (2007) and Sarma & Pais (2011) find that access to finance is positively related to the GDP. On the other hand, Dabla-norris, Ji, Townsend & Unsal (2015) find that GDP is more responsive to a decrease in credit participation costs, demonstrating that limited credit availability or lower financial access is attributed by GDP in different dimension.

ii. Physical infrastructure

Following Beck, et al., (2007), Beck et al., (2008) and Honohan (2008), physical infrastructure is further examined in the present study to uncover the great impact of this variable in driving financial inclusion. Using the World Development Indicators database, paved road, phone and internet are employed to capture the development of country's physical infrastructure. The above studies concluded that countries with physical infrastructure development impose higher access to finance.

iii. Years of observation (2007 to 2011)

The period of study (i.e., 2007 to 2011) is chosen to take into consideration the financial crisis impact on the Islamic finance industry in general and Islamic banking in particular, by which could affect the level of financial inclusion. With regards to efficiency and profitability of Islamic banking, with a few exceptions, existing studies that predate the crisis indicate that there are no significant differences between Islamic and conventional banks as far as their business orientation and efficiency is concerned (both Beck, Demirgüç-Kunt & Merrouche (2013) and Abedifar, Molyneux & Tarazi (2012) are comprehensive studies that also contain excellent literature reviews). Whereas, most recent studies comprising data for the crisis period indicate that, during the financial crisis, Islamic banks had more difficulties as compared to

conventional banks in maintaining their efficiency and profitability (Hasan & Dridi, 2011; Rashwan, 2012).

With regard to the stability and resilience of Islamic banks during this crisis period, Hasan and Dridi (2011) find that Islamic banks' financing and asset growth performed better than that of conventional banks did in 2008 to 2009. In a country-specific study, using data from 2002-2010 in Pakistan, Zaheer & Farooq (2011) find that Islamic banks are more stable than conventional banks but that Islamic banking branches are not. Conversely, a within-bank comparison shows that the Islamic banking branches of conventional banks are more stable than their conventional branches, though this difference decreases with as conventional banks become larger. Having the changes of Islamic finance landscape within the study period, it is possible to know how this relate to financial inclusion debates.

4.5 Data Collections

Principally, three parts of data collections are involved. The first and the primary part encompasses data collections for the financial inclusion index computation, which is discussed further in detail in Chapter 5. Chapter 6 is designed to capture the second part of data collection, i.e., the financial system variable, which is proxied by Islamic banking presence. As for the third part of data collection, it involves data for the rest of the explanatory variables as summarized in Table 4.1 above. All these three parts are synchronised in the final stage of data collections. In the final stage, a balanced panel of 400 country-year obervations is used as the final sample in the present study, i.e., comprising of 80 countries, from year 2007 to 2011.

4.6 Chapter Summary

This chapter provides the fundamental research design of the present study. In particular, it has outlined the models and the empirical research techniques used in the analysis. The variables used are broadly defined while the data collections procedure is identified. With this research framework at hand, the next two chapters are specifically devoted to discuss the two major data construction, namely the financial inclusion index and the financial system classification, proxied by Islamic banking presence.

Chapter 5

RESEARCH METHOD II: FINANCIAL INCLUSION INDEX CONSTRUCTION

5.1 Introduction

This chapter presents the construction of financial inclusion index. The chapter starts by discussing the background and the model of index computation. Section 5.3 and 5.4 proceed by describing the variables used in the computation of the index as well as data and index justification, respectively. Results of the financial inclusion index are presented in section 5.5. Section 5.6 concludes the chapter.

5.2 Cumulative Index of Financial Inclusion (CIFI)

Sarma (2008, 2010) argues that any one single indicator is fails to adequately capture the extent of financial inclusion by giving statistical evidence. For instance, the number of bank accounts per 1000 adults is highest in Russia, followed by Thailand, Malaysia and Colombia. However, if we look at the number of bank branches per 100,000 adult people, Russia ranks the lowest. Looking at another dimension of an inclusive banking system, that is, usage of the banking system in terms of the volume of credit and deposit, Argentina seems to be having very low credit to GDP ratio in spite of moderate density of bank accounts and bank branches. In India, in spite of low density of bank branches, the usage of the banking system in terms of volume of credit and deposit seems to be moderately high.

Therefore, a comprehensive measure, such the index computes in this present study, is required. As suggested by Sarma, the index should be able to incorporate information on several aspects (dimensions) of financial inclusion preferably in one single number. The single index which measures the level of financial inclusion could contributes to the literature in three aspects (Sarma, 2008 and 2010), namely:

- Such a measure can be used to compare the levels of financial inclusion across economies and across states/provinces within countries at a particular time point. It also can be employed to monitor the progress of policy initiatives for financial inclusion in a country over a period of time.
- Such a measure would be of academic interest to address issues put forward in the growing literature on financial inclusion. For example, scholars have attempted to investigate the barriers to financial inclusion. In order to examine such questions empirically, a robust and comprehensive measure of financial inclusion is required.
- A good measure of financial inclusion should be constructed based on the following criteria: it should incorporate information on as many aspects (dimensions) of financial inclusion as possible; it should be easy and simple to compute and it should be comparable across countries.

Hence, this section outlines the development of financial inclusion index with reference to studies done by Sarma (2008), Sarma (2010) and Sarma & Pais (2011). As highlighted by those studies, the index computed in the present study, i.e., cumulative index of financial inclusion (henceforth CIFI), has merit in the following aspects:

i. Dimension indexes are combined to compute the final index.

ii. The index is based on a measure of the distance from the ideal[30].

iii. The min and max values for any dimension of the index may change for different points of time and if the number of countries in the set of countries change. By computing inclusion index in this manner, we are incorporating certain element of relativity in the inclusion index, i.e., it measures the extent of financial inclusion in an economy relative to the prevailing situation in all economies. Applying this, the index is a dynamic one.

The CIFI takes values between 0 and 1, where zero indicating lowest financial inclusion (complete financial exclusion) and 1 indicating complete financial inclusion.

5.2.1 Methodology

As mentioned earlier, basically, this study follows the similar methodology and reasoning (i.e., dynamic concept) as employed by Sarma (2008), Sarma, (2010) and Sarma & Pais (2011). Hence, for each dimension (i.e., outreach, usage), *n* numbers of variables are included:

$$\boldsymbol{D_i = x_1, x_2, x_{3.....}x_n} \qquad \textbf{(5.1)}$$

where:

D = inclusion dimension,

x = variable, and

$_i$ = individual countries.

[30] Distance-based approach satisfies several interesting and intuitive properties of a development index, viz. normalization, symmetry (or anonymity), monotonicity, proximity, uniformity and signalling (collectively termed NAMPUS).

For each variable, d_i is computed using the Linear Scaling Technique (LST) as shown in Eq. (5.2). A weight w_i such that $0 \leq w_i \leq 1$ is attached to the dimension *i*, indicating the relative importance of the dimension *i* in quantifying the inclusiveness of a financial system:

$$\boldsymbol{d_i = w_i \ \frac{A_i - m_i}{M_i - m_i}} \qquad \textbf{(5.2)}$$

where:

w_i = Weight attached to the dimension $_i$, $0 \leq w_i \leq 1$

A_i = Actual value of dimension $_i$,

m_i = minimum value of dimension $_i$,

M_i= maximum value of dimension $_i$.

Eq. (5.2) ensures that $0 \leq d_i \leq w_i$. Higher the value of d_i indicates higher achievement in dimension *i* of the country. If *n* dimensions of financial inclusion are considered, then, a country will be represented by a point $D = (d_1 , d_2 , d_3 , ...d_n)$ on the n-dimensional Cartesian space.

In the *n*-dimensional space, the point 0 = (0, 0, 0,…0) signifies the point indicating the worst situation while the point $W = (w_1, w_2 , ...w_n)$ denotes the highest achievement in all dimensions. The cumulative index of financial inclusion, CIFI, for a country, is then measured by the normalized inverse Euclidean distance of the point D from the ideal point $I = (w_1, w_2 , ...w_n)$. Thus, the formula is:

$$\textbf{CIFI} = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + .. + (w_n - d_n)^2}}{\sqrt{(w_1{}^2 + w_2{}^2 + \cdots w_n{}^2)}} \qquad \textbf{(5.3)}$$

where:

d= inclusion dimension, and

n = number of variable.

In Eq. (5.3), the numerator of the second component is the Euclidean distance of *D* from the ideal point *W*, normalizing it by the denominator and subtracting by 1 gives the inverse normalized distance. The normalization is done in order to make the value lie between 0 and 1 and the inverse distance is considered so that higher value of the CIFI corresponds to higher financial inclusion.

As an illustration, if we consider all dimensions to be equally important in measuring the inclusiveness of a financial system, then $w_i = 1$ for all *i*. In this case, the ideal situation will be represented by the point I = (1,1,1,…,1) in the *n*-dimensional space and the formula for CIFI will be:

$$\textbf{CIFI} = 1 - \frac{\sqrt{(1 - d_1)^2 + (1 - d_2)^2 + .. + (1 - d_n)^2}}{\sqrt{n}} \qquad \textbf{(5.4)}$$

Depending on the value of CIFI, countries can be classified into three levels of financial inclusion, namely:

i. $0.5 \leq \text{CIFI} \leq 1$: high

ii. $0.30 \leq \text{CIFI} \leq 0.49$: medium

iii. $0 \leq \text{CIFI} \leq 0.29$: low

The CIFI thus, can be employed to measure financial inclusion at different point of time and at different levels of economic aggregation (country, state, province, etc).

5.2.2 The present index

It is worth noting that an inclusive financial system should tackle all the basic financial services (i.e., savings, credit, insurance and banking transactions) in all dimensions (i.e., outreach, usage, ease and cost). However, due to data limitation, this present study covers only savings and credit in two dimensions, namely outreach and usage.

As far as assigning appropriate weights is concern, as highlighted in Sarma (2008 and 2010), the lack of sufficient data on important indicators that completely characterize the outreach and usage dimensions renders us to give less weight to these dimensions in the present index. With regards to outreach of banking services, many countries have moved towards internet banking, thus reducing the importance of physical bank outlets (i.e. bank branches and ATMs). Some countries also offer banking services through telephones as well as internet. Thus, using data only on bank branches and ATMs can give an incomplete picture of the outreach of banking services. Likewise, data on credit and deposit can only partly represent the usage of the financial system as other services of the banking system, such as payments, transfers and remittances are not taken into account. In the absence of such data, a complete characterization of these dimensions is not possible.

Unlike Sarma (2008 and 2010), the present index calculate the usage dimension index for both credit and deposit. Thus, for CIFI, the following weights are assigned, (i) 0.5

for the index of outreach, and (ii) 0.5 for the index of usage, both for credit and deposit. This allows for specific index for each financial service tracking purposes, if possible. Given these weights, the present index can represent a country *k* by a point (o_k , $uCredit_k$, $uDeposit_k$) in the two dimensional Cartesian space, such that $0 \leq a_k \leq 0.5$, $0 \leq uCredit_k \leq 0.5$, $0 \leq uDeposit_k \leq 0.5$where a_k, $uCredit_k$ and $uDeposit_k$ are the dimension indexes for country *k* computed using Eq. (5.2). In the three dimensional Cartesian space, the point (0,0,0) will indicate the worst situation (complete financial exclusion) and the point (0.5,0.5,0.5) will indicate the best or ideal situation (complete financial inclusion) in the present context.

The CIFI for the country *k* is measured by the normalized inverse Euclidean distance of the point (o_k , $uCredit_k$, $uDeposit_k$) from the ideal point (0.5, 0.5, 0.5). Algebraically,

$$\mathbf{CIFI=\ 1-\sqrt{\frac{(0.5-o_1)^2+(0.5-uCredit_i)^2+(0.5-uDeposit_i)^2}{0.75}}} \qquad \mathbf{(5.5)}$$

Following Sarma & Pais (2011), in the regression equations, the dependent variable is a logit transformation of the cumulative index of financial inclusion described earlier. Unlike the CIFI which lies between 0 and 1, the transformed variable lies between $-\infty$ and ∞. Applying this, classical OLS regression as well as panel data regression can be carried out. The transformed variable is a monotonically increasing function of CIFI, and thus it preserves the same ordering as CIFI. The transformed variable is a logit function of the original variable CIFI, as defined below:

$$\boldsymbol{\gamma = ln\left(\frac{CIFI}{1-CIFI}\right)} \quad \textbf{(5.6)}$$

The general form of the regression equation is as following:

$$\boldsymbol{\gamma = a_0 + a_1 X_1 + a_2 X_2 + \ldots + a_n X_n + \varepsilon} \quad \textbf{(5.7)}$$

where X_1, X_2, and so on are regressor variables, a_1, a_2 and so on are the parameters to be estimated from the data and ε is the error term following classical OLS assumptions. The rate of change of γ with respect to a unit change in the variable X_1 will be given by the derivative of *y* with respect to X_1, which is

$$\boldsymbol{\frac{d\gamma}{dX_1} = \frac{a_1 exp\,(a_1 X_1)}{(1+\exp(a_1 X_1)^2}} \quad \textbf{(5.8)}$$

Therefore, the direction of change in γ corresponding to a unit change in X_1 is determined by the sign of a_1 while the magnitude of the change depends on the value of a_1 as well as X_1.

5.3 Variables Definitions

This section describes the variables for each financial inclusion indicators (i.e., dimensions). Table 5.1 provides a summary of description, indicators and definition of each variable. Based on the basic dimensions, the following variables are included by virtue of their potential to have indicatory power in examining financial inclusion.

Table 5.1 Description of variables for inclusion index computation

Description	*Dimension/Indicator*	*Variable*
Cumulative Index of Financial Inclusion (CIFI)	Outreach (*o*)	▪ Number of bank branches per 1,000 km2 ▪ Number of bank ATMs per 1,000 km^2
	Usage (*uCredit*)	▪ Outstanding loans (% of GDP)
	Usage (*uDeposit*)	▪ Outstanding savings (% of GDP)

5.4 Data and Index Justification

5.4.1 Data collections

Ideally, one should take into consideration all the dimensions in all the financial services to capture the inclusiveness of financial system across countries. However, availability of data is always the challenge, as mentioned by prior research. Currently, a single database on all the four types of financial inclusion with all four dimensions is absent.

Due to data constraint and complexity of inclusion measurement, only data from the banking institution are taken. For the index computation, a few databases are referred to represent the two dimensions. Basically, data on usage and outreach dimensions for savings and deposit are gained from the International Monetary Fund (IMF) through Financial Access Survey (FAS) database[31]. Although data on usage for banking transaction is available from the World Bank through Global Financial

[31] The FAS is the sole source of global supply-side data on financial inclusion, encompassing internationally comparable basic indicators of financial access and usage. In addition to providing policy makers and researchers with annual geographic and demographic data on access to basic consumer financial services worldwide, the FAS is the data source for the G-20 Basic Set of Financial Inclusion Indicators endorsed by the G-20 Leaders at the Los Cabos Summit in June 2012. The FAS database currently contains annual data for 187 jurisdictions, including all G20 economies, covering an eight-year period (2004-2011), totaling more than 40,000 time series. For more detail, referhttp://fas.imf.org/.

Inclusion (Global Findex) database[32], only data in year 2011 is available. Additionally, only the World Bank (2007)[33] database provides ease and cost dimensions. The data, however, only covers year of 2007.

Initial sample was 213 countries (or 1,065 country-year observations). Countries with index variable not available were removed from the initial sample. A total of 132 countries (or 660 country-year observations) were removed due to the data availability constraint. The final sample contains a balanced panel of 80 countries or 400 country-year observations.

5.4.2 Index justification

Irrespective of which dimensions and formula employed in constructing the index, it has to ensure the validity and reliability of the index. Both issues have been considered in the present study in constructing CIFI. The following sub sections discuss these elements in detail.

5.4.2.1 Index validity

In brief, validity refers to 'a test of how well an instrument measures whatever concept it is measuring' (Sekaran, 2003). Specifically, two types of validity aspects are considered in the index construction, namely content and construct validity.

[32] Authored by Demirguc-kunt and Klapper (2012), the Global Findex indicators are drawn from survey data collected by Gallup, Inc. over the 2011 calendar year, covering more than 150,000 individuals in 148 economies and representing more than 97 percent of the world's adult population. The questionnaire was translated into 142 languages, and interviews were conducted face-to-face or via telephone. The complete set of Global Findex indicators will be collected again in 2014 and 2017. For more detail, refer http://microdata.worldbank.org and Demirguc-Kunt & Klapper (2012).

[33] The database is based on survey conducted by Demirguc-Kunt, Thorsten Beck and Patric Honohan under World Bank. They introduced east and cost barrier (i.e., dimension) for composite measure of access to financial services.

Content validity specifies whether the instrument 'adequately measures the concept of interest' (Sekaran, 2003), i.e., in this case, the formula and indicators used in the CIFI computation. As far as index formula is concern, for the purpose of the present study, the index is constructed using formula initiated by Sarma (2008, 2010). Apart from what has been stated earlier, this formula has some other advantage over the other formula used in the previous studies in a few aspects as highlighted by Sarma (2008, 2010) as following:

- The formula follows a multidimensional approach of index construction similar to the UNDP approach for computation of some well-known development indexes such as the HDI, the HPI, the GDI and so on[34].
- Instead of using average calculation approach (i.e., as used in the UNDP's indexes computation), this formula is based on a measure of the distance from the ideal approach which satisfies several interesting and intuitive properties of a development index, i.e., normalization, symmetry (or anonymity), monotonicity, proximity, uniformity and signalling (collectively termed NAMPUS).
- This measure can be used to compare the levels of financial inclusion across economies and across states/provinces within countries at a particular time point. It also can be employed to monitor the progress of policy initiatives for financial inclusion in a country over a period of time.
- Using the formula, information on many aspects (dimensions) of financial inclusion could be incorporated; thus CIFI is easy and simple to compute and it could be comparable across countries.

[34] Refer <www.undp.org> for more details.

In terms of indicators, CIFI is computed using the indicators constructed by Beck, Demirguc-Kunt, et al. (2007) as listed in section 5.3 above. The validity of the indicators has been verified by some robustness tests. The indicators even have been used in Gimet & Lagoarde-Segot (2012) study to examine the barriers to financial inclusion.

The CIFI computation is further verified using the construct validity. Construct validity examined 'how well the results obtained from the use of the measure fit the theories around which the test is designed' (Sekaran, 2003). In this case, following the approach done by Sarma & Pais (2011), CIFI is compared with human development index (HDI). Table 5.2 presents the CIFI mean value for 80 countries and corresponding HDI[35] mean value along with their rank.

Table 5.2 Cumulative index of financial inclusion (CIFI) and human development index (HDI), mean value

No.	*Country*	*Cumulative index of financial inclusion (CIFI)*		*Human development index (HDI)*	
		Mean	*Country rank*	*Mean*	*Country rank*
1	Albania	0.271	28	0.715	48
2	Algeria	0.171	50	0.714	49
3	Angola	0.152	55	0.493	72
4	Argentina	0.045	75	0.801	30
5	Armenia	0.091	66	0.713	50
6	Australia	0.313	20	0.923	2
7	Austria	0.166	52	0.871	17
8	Azerbaijan	0.054	72	0.724	47
9	Bangladesh	0.271	29	0.537	66
10	Belarus	0.170	51	0.767	33
11	Belgium	0.377	13	0.878	14
12	Bosnia and Herzegovina	0.253	36	0.710	51
13	Botswana	0.123	61	0.660	58
14	Bulgaria	0.343	17	0.766	34
15	Burundi	0.033	79	0.370	80
16	Cambodia	0.122	62	0.523	68
17	Canada	0.365	14	0.901	8
18	Chile	0.255	35	0.808	28
19	Costa Rica	0.229	41	0.743	38
20	Croatia	0.338	18	0.801	31

[35] Before 2010, HDI data is reported once in five years' time. Therefore, the mean value for HDI is calculated by the author using data in year 2005 (i.e., to represent data in 2007 to 2009), 2010 and 2011.

No.	*Country*	*Cumulative index of financial inclusion (CIFI)*		*Human development index (HDI)*	
		Mean	*Country rank*	*Mean*	*Country rank*
21	Czech Republic	0.405	10	0.859	22
22	Dominican Republic	0.078	68	0.694	55
23	Egypt	0.300	23	0.670	56
24	France	0.191	48	0.877	16
25	Georgia	0.117	63	0.729	41
26	Germany	0.129	59	0.901	7
27	Greece	0.402	11	0.861	20
28	Honduras	0.237	38	0.602	63
29	Hungary	0.245	37	0.815	25
30	India	0.276	27	0.574	65
31	Indonesia	0.154	54	0.657	59
32	Iran	0.206	45	0.728	42
33	Ireland	0.205	46	0.904	5
34	Israel	0.463	3	0.880	12
35	Italy	0.424	5	0.866	19
36	Jamaica	0.134	57	0.728	43
37	Japan	0.508	2	0.881	11
38	Jordan	0.424	6	0.740	39
39	Kenya	0.200	47	0.515	69
40	Korea	0.463	4	0.878	15
41	Kuwait	0.288	24	0.805	29
42	Kyrgyz Republic	0.038	76	0.629	61
43	Latvia	0.266	30	0.810	27
44	Lebanon	0.222	44	0.749	36
45	Lesotho	0.078	69	0.463	75
46	Macedonia	0.237	39	0.496	71
47	Madagascar	0.021	80	0.401	78
48	Malawi	0.072	70	0.758	35
49	Malaysia	0.408	8	0.739	40
50	Mexico	0.064	71	0.667	57
51	Moldova	0.190	49	0.602	64
52	Morocco	0.388	12	0.388	79
53	Mozambique	0.124	60	0.906	4
54	Netherlands	0.405	9	0.902	6
55	New Zealand	0.266	31	0.612	62
56	Nicaragua	0.145	56	0.937	1
57	Norway	0.349	16	0.515	70
58	Pakistan	0.132	58	0.710	52
59	Peru	0.107	64	0.822	23
60	Poland	0.223	43	0.812	26
61	Portugal	0.309	21	0.774	32
62	Russian Federation	0.162	53	0.436	77
63	Rwanda	0.034	77	0.880	13
64	Singapore	0.851	1	0.817	24
65	Slovak Republic	0.226	42	0.870	18
66	Slovenia	0.334	19	0.636	60
67	South Africa	0.288	25	0.861	21
68	Spain	0.262	32	0.899	10
69	Sweden	0.282	26	0.918	3
70	Switzerland	0.258	33	0.485	74
71	Tanzania	0.082	67	0.707	53
72	Thailand	0.349	15	0.706	54
73	Tunisia	0.300	22	0.725	46
74	Turkey	0.230	40	0.459	76
75	Uganda	0.047	74	0.728	44
76	Ukraine	0.256	34	0.899	9
77	United Kingdom	0.412	7	0.745	37
78	Venezuela	0.100	65	0.489	73
79	Yemen	0.034	78	0.537	67
80	Zambia	0.054	73	0.726	45

Note: The HDI mean value is calculated based on data in year 2005, 2010 and 2011. The HDI ranks are re-ranks based on the HDI mean value for the set of 80 countries.

A comparison of CIFI with HDI shows that most of the countries with high and medium CIFI values belong to the group that is categorized by the UNDP as countries with high human development (i.e., HDI > 0.7). Germany, a high HDI country is reported to have a low CIFI value. Other countries having a high or medium HDI value but a low CIFI are Lebanon, Argentina and Mexico, the same as reported in Sarma & Pais (2011). Apart of these exceptions, CIFI and HDI seem to move in the same direction. As seen in Table 5.2, the CIFI and HDI for the set of 80 countries move closely with each other. This is again, consistent with Sarma & Pais (2011) findings.

Additionally, the correlation coefficient between CIFI and HDI mean values is found to be about 0.30 and is statistically significant[36]. Hence, this can be generally concluded that countries belong to high level of human development are also countries that relatively have medium to high level of financial inclusion, which in this case, the CIFI is consistent with the index of financial inclusion (IFI) constructed by Sarma (2008, 2010).

5.4.2.2 Reliability of the index

Very briefly, the reliability of a measure indicates 'the extent to which it is without bias and thus warrants consistent measurement which indicate the stability and consistency of the measurement' (Sekaran, 2003).

To ensure the reliability of the index, firstly, we compare the outcome of index constructed in the present study with other studies. The detail of the comparison is

[36] The calculated value is significant at 1% level of significance.

made in section 5.5.1 below under the general description of CIFI results. In sum, if compared the composite index with previous studies, the results are tend to show the consistency. Secondly, we also consider the findings of most of financial inclusion studies especially Beck, et al., (2007) and Sarma & Pais (2011) regarding its relationship with one of the main determinants of financial inclusion, i.e., the GDP per capita. It is establishes that this variable, which represent the income levels, is one of the important factor in explaining financial inclusion (Sarma & Pais, 2011).

Therefore, the CIFI variable (i.e. the transformed CIFI[37]) is regressed over GDP per capita. As observed in Table 5.3 overleaf, the result of regression shows that the coefficient for GDP per capita is positive and highly significant with financial inclusion. Thus, this can be generally concluded that CIFI computed in the present study could be used as measurement for level of financial inclusion in a particular country.

Table 5.3 Realibility test for CIFI

Variable	*Coef.*	*Std. Err.*	*t*	$p > \|t\|$
ln(GDP)	0.17***	0.01	12.53	0.00

The full sample consists 400 country-year observations (i.e., 80 countries with year observations from 2007 to 2011). The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

5.5 Results of Financial Inclusion Index Computation

This section presents the outcome of the index computation. General descriptive statistics of the index are presented, followed by the empirical distribution of the

[37] Fore detail, refer section 4.3.1 in Chapter 4.

index (i.e., based on level of inclusion and marginal changes) in order to gain a better understanding on the index.

5.5.1 General descriptive statistics of financial inclusion index

Table 5.2 presents the countries' CIFI values for various countries for the years 2007 – 2011. The numbers of countries for the index computation are the same for different years since balanced panel data is used based on the availability of data on the component of dimensions and type of financial services that are considered in computing the index. As evident from Table 5.4 and as expected, different countries around the world are relatively at different levels of financial inclusion. With regard to CIFI, among 80 countries in the year of 2007 to 2011, Singapore, Korea, Malaysia, Czech and Greece are those among the highest ranked countries, whereas Madagascar, Kyrgyz Republic, Uganda, Georgia and Armenia are among the countries that fall under the countries ranked at the bottom of the list.

If compared the composite index with previous studies, the results are tend to show the consistency. With two sets of composite indexes computation [i.e., using data on two (100 countries) and three dimensions (55 countries) of financial inclusion, respectively) in year 2004, results of study by Sarma (2008) show that Malaysia, Greece and Czech are also among the highest ranked countries. Similarly, Madagascar, Uganda and Georgia appear under the countries ranked at the lower of the list. Moreover, results in study by Arora (2010) also show the same tendency. Using data in year 2007 [i.e., with inclusion of three dimensions (i.e., outreach, ease and cost)], the results show that Korea, Italy and Greece are among those countries

within the high ranked index, while Madagascar and Uganda are among the low ranked index.

Table 5.4 CIFI values for various countries, 2007-2011

Country	*2007*	*2008*	*2009*	*2010*	*2011*	*Overall Mean*	*Country rank*
Singapore	0.979	0.894	0.858	0.848	0.674	0.851	1
Japan	0.513	0.515	0.510	0.505	0.498	0.508	2
Israel	0.464	0.468	0.465	0.457	0.464	0.463	3
Korea	0.442	0.465	0.466	0.465	0.478	0.463	4
Italy	0.418	0.438	0.440	0.414	0.413	0.424	5
Jordan	0.423	0.426	0.421	0.425	0.426	0.424	6
United Kingdom	0.411	0.440	0.431	0.396	0.379	0.412	7
Malaysia	0.426	0.431	0.404	0.394	0.385	0.408	8
Netherlands	0.409	0.435	0.416	0.382	0.385	0.405	9
Czech Republic	0.388	0.403	0.406	0.408	0.418	0.405	10
Greece	0.414	0.433	0.428	0.379	0.359	0.402	11
Morocco	0.381	0.390	0.390	0.389	0.393	0.388	12
Belgium	0.267	0.328	0.389	0.431	0.467	0.377	13
Canada	0.348	0.352	0.363	0.369	0.394	0.365	14
Thailand	0.350	0.358	0.346	0.337	0.354	0.349	15
Norway	0.343	0.361	0.356	0.337	0.346	0.349	16
Bulgaria	0.332	0.341	0.342	0.348	0.349	0.343	17
Croatia	0.326	0.328	0.331	0.350	0.356	0.338	18
Slovenia	0.326	0.331	0.339	0.335	0.339	0.334	19
Australia	0.310	0.328	0.329	0.288	0.312	0.313	20
Portugal	0.324	0.336	0.314	0.277	0.295	0.309	21
Tunisia	0.279	0.286	0.290	0.313	0.332	0.300	22
Egypt	0.336	0.319	0.290	0.282	0.274	0.300	23
Kuwait	0.279	0.257	0.339	0.310	0.254	0.288	24
South Africa	0.297	0.306	0.288	0.273	0.275	0.288	25
Sweden	0.309	0.270	0.281	0.265	0.286	0.282	26
India	0.250	0.275	0.278	0.281	0.298	0.276	27
Albania	0.245	0.256	0.260	0.285	0.311	0.271	28
Bangladesh	0.238	0.247	0.272	0.286	0.310	0.271	29
Latvia	0.270	0.255	0.264	0.273	0.269	0.266	30
New Zealand	0.276	0.275	0.266	0.240	0.271	0.266	31
Spain	0.250	0.285	0.279	0.224	0.272	0.262	32
Switzerland	0.256	0.315	0.275	0.223	0.220	0.258	33
Ukraine	0.249	0.271	0.257	0.254	0.248	0.256	34
Chile	0.244	0.268	0.255	0.247	0.260	0.255	35
Bosnia and Herzegovina	0.249	0.248	0.246	0.258	0.266	0.253	36
Hungary	0.228	0.247	0.248	0.248	0.251	0.245	37
Honduras	0.251	0.242	0.232	0.231	0.230	0.237	38
Macedonia	0.207	0.228	0.229	0.254	0.267	0.237	39
Turkey	0.185	0.214	0.225	0.258	0.269	0.230	40
Costa Rica	0.211	0.240	0.236	0.225	0.234	0.229	41
Slovak Republic	0.201	0.223	0.226	0.236	0.245	0.226	42
Poland	0.182	0.221	0.221	0.236	0.254	0.223	43
Lebanon	0.221	0.216	0.215	0.229	0.230	0.222	44
Iran	0.183	0.210	0.225	0.203	0.211	0.206	45
Ireland	0.147	0.157	0.164	0.249	0.307	0.205	46
Kenya	0.169	0.188	0.181	0.219	0.242	0.200	47
France	0.170	0.178	0.183	0.206	0.218	0.191	48
Moldova	0.196	0.190	0.183	0.178	0.204	0.190	49
Algeria	0.164	0.161	0.185	0.173	0.171	0.171	50
Belarus	0.121	0.130	0.166	0.197	0.234	0.170	51
Austria	0.169	0.165	0.167	0.165	0.166	0.166	52

Country	*2007*	*2008*	*2009*	*2010*	*2011*	*Overall Mean*	*Country rank*
Russian Federation	0.143	0.147	0.166	0.168	0.187	0.162	53
Indonesia	0.154	0.149	0.138	0.155	0.174	0.154	54
Angola	0.082	0.109	0.205	0.174	0.190	0.152	55
Nicaragua	0.146	0.140	0.134	0.148	0.159	0.145	56
Jamaica	0.140	0.141	0.130	0.126	0.131	0.134	57
Pakistan	0.169	0.156	0.118	0.113	0.103	0.132	58
Germany	0.124	0.128	0.128	0.128	0.135	0.129	59
Mozambique	0.077	0.097	0.137	0.157	0.149	0.124	60
Botswana	0.125	0.117	0.137	0.117	0.119	0.123	61
Cambodia	0.089	0.095	0.113	0.139	0.173	0.122	62
Georgia	0.099	0.113	0.104	0.127	0.141	0.117	63
Peru	0.084	0.112	0.101	0.114	0.123	0.107	64
Venezuela	0.108	0.092	0.102	0.085	0.112	0.100	65
Armenia	0.039	0.054	0.088	0.114	0.159	0.091	66
Tanzania	0.063	0.079	0.074	0.089	0.104	0.082	67
Dominican Republic	0.078	0.069	0.070	0.081	0.091	0.078	68
Lesotho	0.075	0.069	0.069	0.078	0.097	0.078	69
Malawi	0.029	0.060	0.064	0.073	0.134	0.072	70
Mexico	0.054	0.060	0.060	0.067	0.077	0.064	71
Azerbaijan	0.041	0.044	0.062	0.062	0.062	0.054	72
Zambia	0.052	0.062	0.042	0.049	0.063	0.054	73
Uganda	0.025	0.047	0.036	0.057	0.072	0.047	74
Argentina	0.050	0.036	0.032	0.045	0.061	0.045	75
Kyrgyz Republic	0.047	0.038	0.040	0.031	0.033	0.038	76
Rwanda	0.026	0.043	0.024	0.030	0.047	0.034	77
Yemen	0.043	0.037	0.041	0.027	0.021	0.034	78
Burundi	0.028	0.021	0.025	0.041	0.052	0.033	79
Madagascar	0.016	0.020	0.018	0.022	0.028	0.021	80

The CIFI values in this table are based on author's calculation using formula initiated by Sarma (2008 and 2010).
Source of data: Financial Access Survey (FAS) database of IMF.

5.5.2 Empirical distribution of the inclusion index

This section endeavours the understanding of the inclusion index through the empirical distribution based on two aspects, namely level of inclusion index and marginal differences (i.e., percentage of changes in the inclusion index values between years).

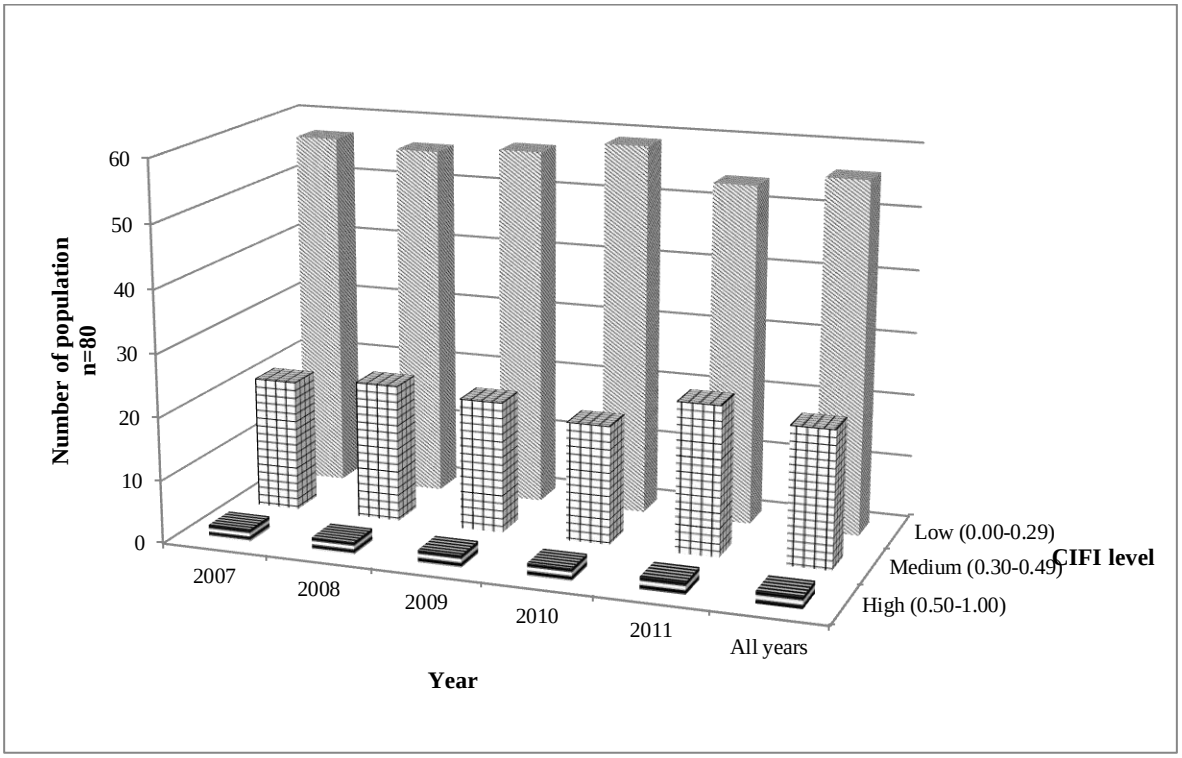
5.5.2.1 Distribution based on level of inclusion index

In this brief discussion of the computed CIFI results, countries are categorized into three levels of financial inclusion depending on their index values, namely (i) index values between 0.49 and 1 are categorized as high CIFI countries, (ii) 0.39 and 0.5 as

medium CIFI countries and (iii) CIFI values less than 0.29 are classified as low CIFI countries.

The empirical distribution of CIFI based on level of inclusion is depicted in Figure 5.1.

Figure 5.1 Empirical distribution of CIFI



This shows that the distribution is highly left-skewed (i.e., the mass of the distribution is concentrated on the low level of CIFI) but substantial (little) variation in the CIFI across countries (through time) is noticeable. A cross-sectional comparison shows that, only around 3% of the countries belong to high level of CIFI, about 65%-75% have low level of CIFI and about 25%-30% are in medium level of CIFI. Over the periods, there is a gradual decrease in the percentage of countries with low level of CIFI which symmetrically resulted in a gradual increase of countries with medium level of CIFI. If compared the aggregate level of composite index with previous

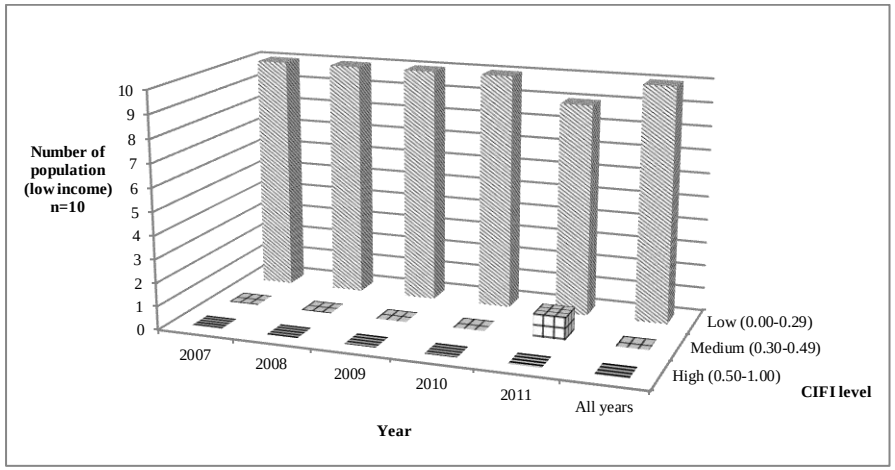
studies, the results are consistent in some aspects of study. Result in a recent study by Sarma (2012) shows that the proportion of low index of financial inclusion (IFI) is decreasing from year 2004 to 2010. Likewise, the proportion of low CIFI in this study demonstrates the same result where the percentages are declining from year 2007 through 2011 but report gradual increase within the years.

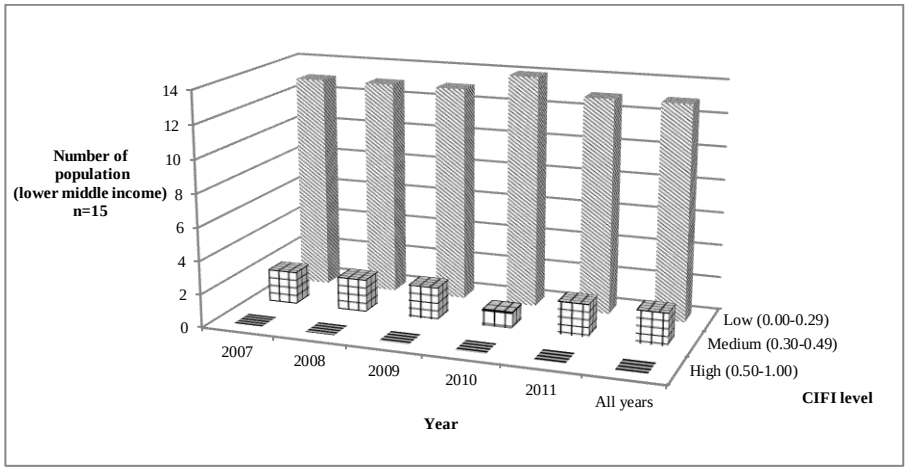
The cross-sectional small variation in the countries' CIFI, to a certain extent, can be explained by the fact that the issue of financial inclusion is still unresolved and unfinished agenda as mentioned by Beck & Demirguc-Kunt (2008). Possible explanations for this could be, the various factors contributing to financial inclusion are far from conclusive to be translated into possible policies in order increase and promote financial inclusion.

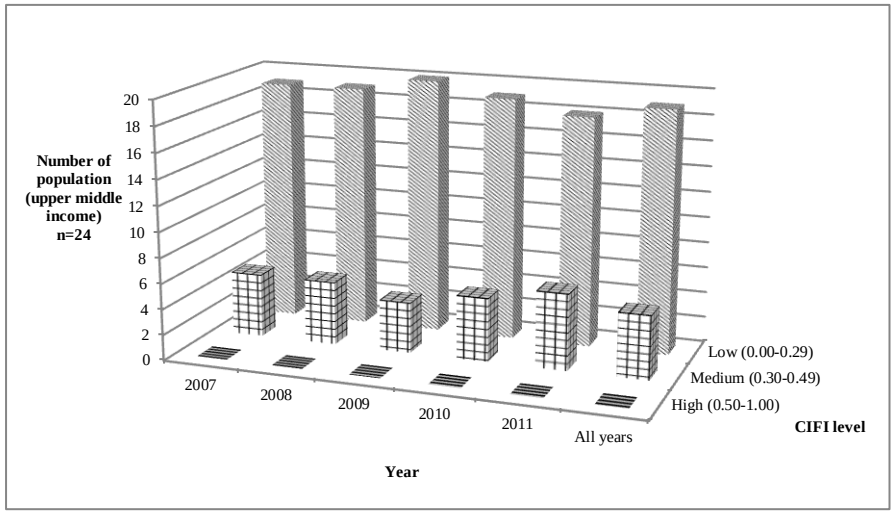
Figures 5.2 and 5.3 overleaf further illustrate the CIFI distribution according to countries' income level (i.e., based on GNP per capita[38]) and types of financial system (Islamic and pure conventional system[39]).

[38] As of 1 July 2012, the World Bank income classifications by GNI per capita are: Low income: $1,025 or less; Lower middle income: $1,026 to $4,035; Upper middle income: $4,036 to $12,475; High income: $12,476 or more.
[39] Islamic banking presence is used as the main proxy to distinguish the two types of financial system. For more details, refer Chapter 6.

Figure 5.2 Empirical distribution of CIFI based on GNP per capita







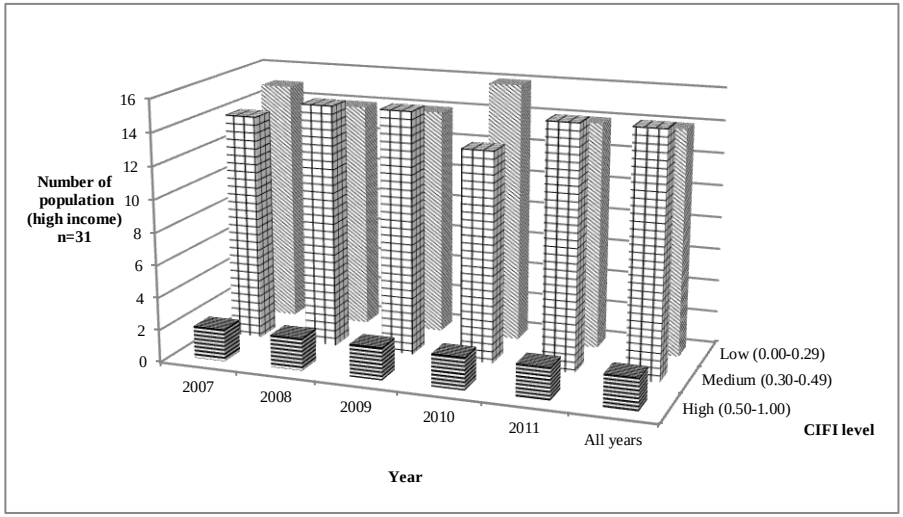
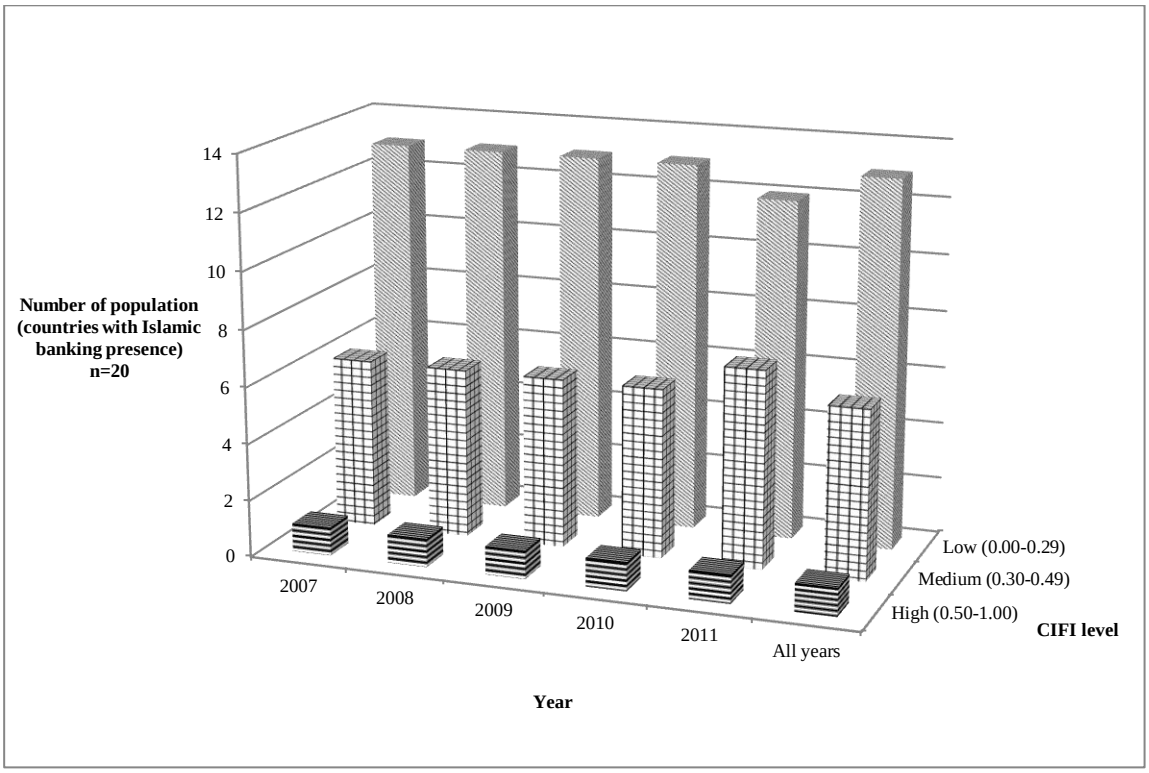
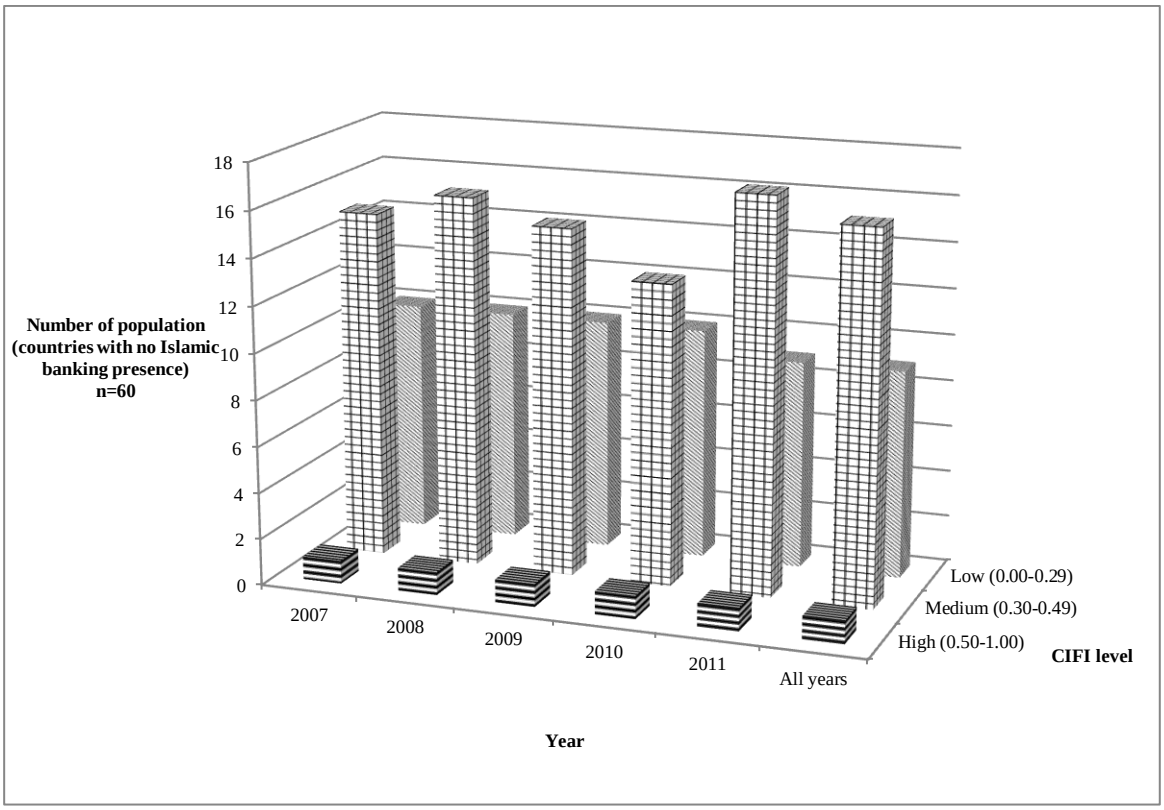


Figure 5.3 Empirical distribution of CIFI based on classification of financial system





With respect to CIFI, as compared with the study by Sarma (2012), the results are as expected, i.e., as the level of countries' income level increase, the inclusion level is higher. Putting it differently, the proportion of low inclusion level is smaller in high income countries and vice versa. Moreover, except for high income countries, CIFI results show that the trend is relatively the same for all levels of countries' income, i.e., the percentages of countries under the low inclusion level are still dominant. However, the level of inclusion is improving for upper middle and high income countries.

With regards to the types of financial system, the distributions show interesting results. The proportions of low inclusion levels are striking (i.e., in the countries with Islamic banking presence as compared to its counterpart). In contrast, in countries without Islamic banking presence, the proportion of medium CIFI level is higher. This relatively illustrates the type of financial system affect financial inclusion.

5.5.2.2 Distribution based on marginal differences

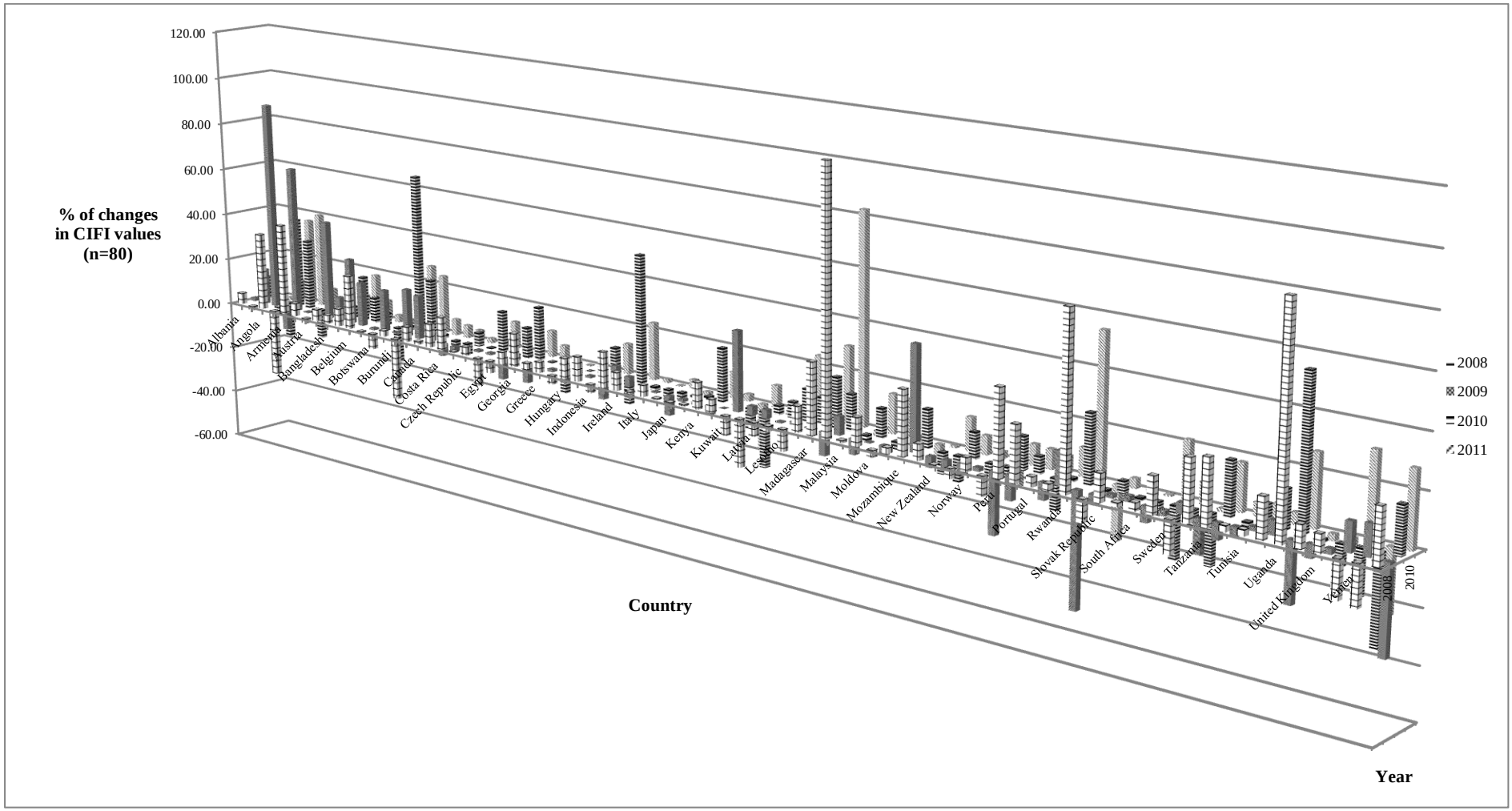
Empirical distribution based on marginal differences is added in the present study. Bearing in mind that financial inclusion is a complex issue[40], there are too many issues that need to be studied. Hence, changes over years is considered an important matter to gauge the progress of financial inclusion rather than examining this issue based on solely on the level of inclusion.

[40]There are many perspectives in the discussion of financial inclusion - types of financial services affected (World Bank, 1995), financial services providers who responsible to it, different factors from different dimensions associated to it (demand, supply and economic factors), both households and small firms affected from it, different approach of the study (i.e., micro and macro) and so on so forth.

The empirical distribution of CIFI based on marginal differences is described in Figure 5.4. This illustrates that the distribution is mixed and various, despite the distribution between year 2008 and 2010 shows substantial variation with more countries experienced more than 5% decline in CIFI values. The variation, both in terms of the CIFI values across countries and the changes of CIFI values, is noticeable. A cross-sectional assessment shows that thecountries' CIFI values decrease considerably from year 2008 to 2010 with the percentages of decline almost 30%. It also appears that majority of the countries have more than 25% increase in CIFI values in the year 2011. Over the countries, there is a disparity in the positive percentage of change in CIFI values in the year 2011 as opposed to negative percentages changes in CIFI values in year 2008. The cross-sectional variation in the percentage changes of CIFI values can better be explained by the various factors which are further examined in Chapter 7 and 8 (e.g., regulatory restrictions, physical infrastructure, interest rates and legal origin).

Figures 5.5 further depicts the percentage changes of CIFI values based on countries' income level (i.e., based on GNP per capita). Both low income and lower middle income countries show considerable striking changes in CIFI values throughout the year of study as opposed to upper middle and high income countries, which recorded relatively marginal changes in the CIFI values in the same year. Overall, these results indicate that lower income countries are prone to any changes in the economy, which in turn affect the level of financial inclusion.

Figure 5.4 Empirical distribution of marginal differences in CIFI values

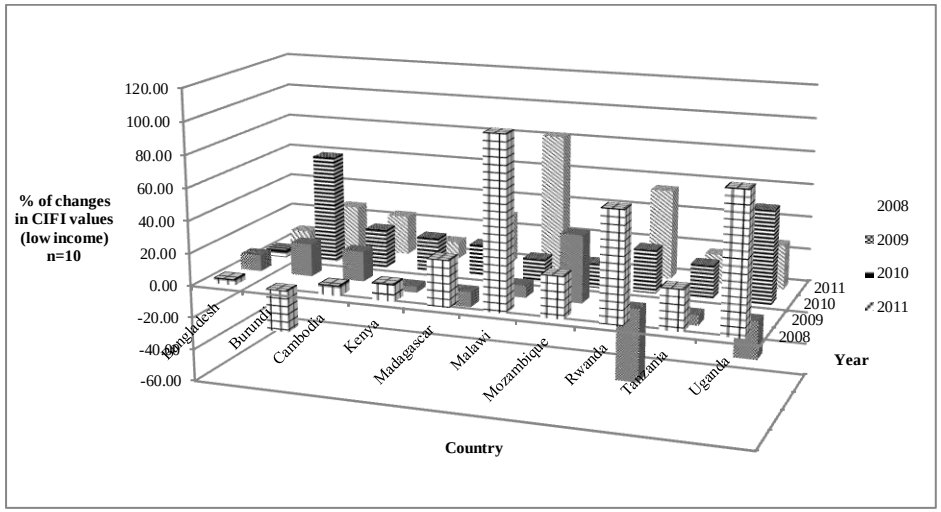


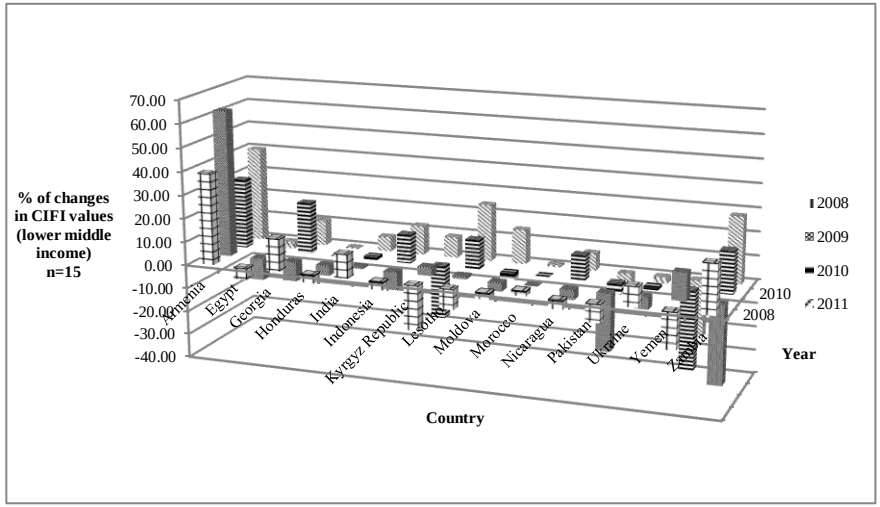
As far as the types of financial system are concern, the variation of indices values over years is also interesting to be examined. This is due to the fact that the growth of the Islamic financial sector between the year of 2006 and 2010 has surpassed the growth of the conventional financial sector in all segments of the market in several Muslim-majority countries (Iqbal & Mirakhor, 2013). Figure 5.6 illustrates the marginal differences of CIFI values according to type of financial system classified in this study. This shows that there is some significant difference in terms of the variation between the two types of financial system. The cross-sectional comparison shows that countries without Islamic banking presence experienced more increasing in CIFI values in between year 2008 to 2011 as compared to countries with Islamic banking presence. This suggests that the growth of Islamic finance industry is not necessarily drive financial inclusion.

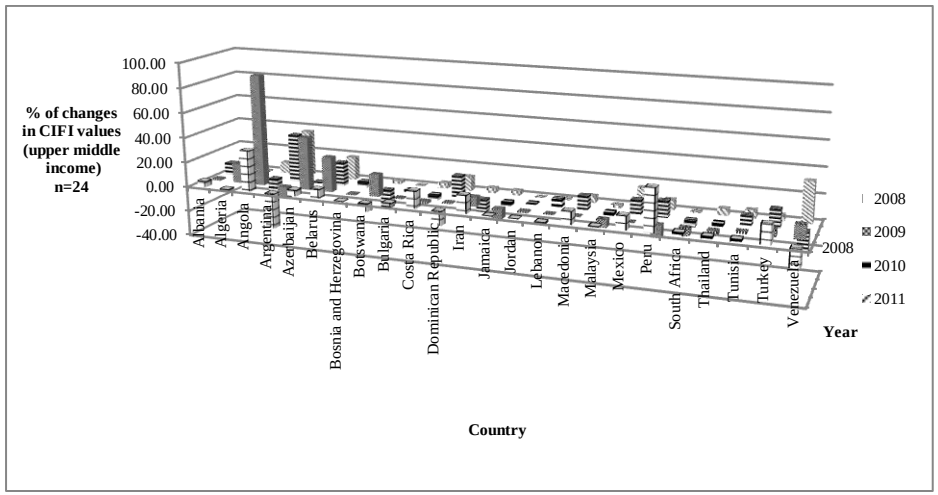
5.6 Chapter Summary

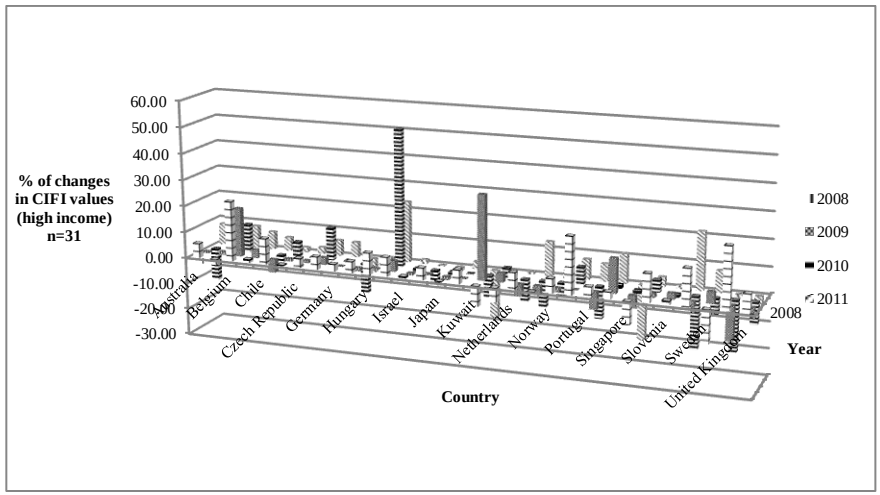
This chapter provides methodology in the computation of financial inclusion index. Due to data constraints, out of the four basic types of financial services put forward by the World Bank, only two are included i.e., credits and deposits, with the outreach and usage dimensions. Apart from the index validity and reliability, results of the index computation are also discussed in detail. All areas of the index's discussions play an important role in conducting the present study.

Figure 5.5 Empirical distribution of marginal differences in CIFI values based on GNP per capita









Chapter 6

RESEARCH METHOD III: ISLAMIC AND CONVENTIONAL-BASED FINANCIAL SYSTEM

6.1 Introduction

This chapter describes the procedures and method of identifying indicators to proxy for the Islamic type of financial system. This chapter starts by discussing the basis of existing classification of financial system in section 6.2. Next, the comprehensive conceptual framework concerning the financial system classification is presented in section 6.3. In this section, Islamic banking presence indicators and the context of definition for the Islamic and conventional-based financial system are described. Variables and data collections are further discussed in section 6.4 and section 6.5, respectively. The outcome of financial system based on Islamic and purely conventional approach is presented in section 6.6. Section 6.7 summarizes the chapter.

6.2 Basis of Financial System Classification

The idea of classifying financial system is not something new. Generally, conventional wisdom holds that there are basically two types of financial systems, namely bank-based and market-based. Bank-based and market-based financial systems is concerning about financial structure in development of economics which focus on the relation between a country's financial system (i.e., bank-based or market-based) and its economic development (see for example, Demirgüç-Kunt &

Maksimovic, 2002; Levine, 2002; Beck & Levine, 2002). Principally, this classification is based on financial market structure (Veysov & Stolbov, 2012). Some research, however, argues that classifying countries as bank-based or market is not a very fruitful way to distinguish financial systems (Levine, 2002), since it not primarily important for policy-making activities (Demirgüç-Kunt & Maksimovic, 2002) and, to a certain extent, even out-dated (Veysov & Stolbov, 2012). In this regard, this can be suggested that to certain extent, the bank-based and market-based classification are not very well accepted.

Apart from that, La Porta et.al (1997, 1998) add the law and finance perspective on top of the bank-based versus market-based debate. Based on legal origin, they argue that a country's legal system is a primary determinant of the effectiveness of its financial system. As mentioned by La Porta et. al (2000, p. 19), "… bank-versus market-centeredness is not an especially useful way to distinguish financial systems". Therefore, these authors stress the role of the legal system in creating a growth-promoting financial sector. From this perspective, a well-functioning legal system facilitates the operation of both markets and intermediaries. Hence, La Porta et. al (2000) clearly argued that laws and enforcement mechanisms are a more useful way to distinguish financial systems rather than focusing on whether countries are bank-based or market-based. With regard to financial inclusion, Qian & Strahan (2007) and Ge et al. (2012) confirm that legal differences shape the ownership and terms of bank loans across the world. However, La Porta et.al (1997, 1998) method of classification is merely focusing on law.

Based on the development and increased attention of Islamic finance, the present study focuses on the Islamic and conventional types of financial system classification. Despite voluminous studies on the comparison between the two, there is a dearth of studies carried out on the relationship between financial inclusion and Islamic based financial systems. The idea of comparison between Islamic and conventional financial system is not something new. In fact, there is voluminous of literature differentiating the two systems on different aspects (e.g., Samad, 2004; Olson & Zoubi, 2008; Ariss, 2010; Beck, Demirgüç-Kunt, & Merrouche, 2013). However, it is worth noted that all the studies are more focused on the firm-level analysis where comparisons are made between particular Islamic and conventional financial institutions per se (e.g., banks, insurance providers, unit trusts). Although some of the studies are cross-country analysis, the basis is the same, i.e., to explain which aspects of the Islamic banking sector are different from its counterpart. This would suggest that there is no attempt has been made so far in classifying countries based on the Islamic and conventional-based financial system. These considerations warrant a tractable framework that allows for a systematic approach in classifying financial system using Islamic versus conventional-based financial systems.

6.3 Conceptual Framework of Islamic-based Financial System

This section outlines the conceptual framework in categorizing financial system using Islamic-based approach. Proxy is set up, followed by putting the definition for both types of financial system.

6.3.1 Islamic banking presence as proxy for Islamic financial sector

Islamic banking presence is the main proxy used in this present study to gauge the type of Islamic-based and conventional types financial system. Islamic finance is generally associated with Islamic banking practice. As a matter of fact, all the earlier references to commercial or mercantile activities conforming to Islamic principles were made under the umbrella of Islamic banking (Iqbal, 1997). This would suggest that Islamic banking practices could give an indication of the implementation of Islamic finance.

In addition, the role of banking activity as the first main institution in financial system is also highlighted in the history of banking. In the ancient world, the history of banking begins with the first prototype banks of merchants that made grain loans to farmers and traders who carried goods between cities. This commenced around 2000 before centuries in Assyria and Babylonia. This followed by ancient Greece and during the Roman Empire, where lenders based in temples made loans and added two fundamental innovations; they established deposits and changed money. On top of that, during the ancient China and India, money lending activity is also proved exist by archaeology from this period. These indicate the role of banking activity as the first main institution in financial system before the emergence of other type of financial intermediaries and capital market[41].

In general, a number of financial ratios are used to assess banking activity and performance. The financial ratios usually provide a broader understanding of the

[41]This is in line with the context of the study which focusing on retail financial services offered by formal financial institution especially banking whereby individuals should access to its basic products and services.

bank's financial condition since they are constructed from accounting data obtained from the bank's balance sheet and financial statement. Specifically, Islamic banking presence can be assessed through three main indicators: the number of Islamic banks operating in the country, the size of the Islamic banks' assets as well as the profitability of these banks. Except for the number of Islamic banks indicator [i.e., employed in Ben Naceur et al., (2015)], the size and profitability of Islamic banks are the common indicators used in Islamic banking and finance literature in measuring efficiency and profitability (e.g., Abdul-Majid, Saal, & Battisti, 2010; Čihák & Hesse, 2010; Haron, 2004; Metwally, 1997).

In short, countries where Islamic banking institution or Islamic banking service does not exist would signify adopting purely conventional financial system and automatically report as "0" in Islamic banking presence variables.

6.3.2 The context of definitions for Islamic and conventional-based financial system

Applying the above proxy, (i.e., using Islamic banking presence indicators), definition of each type of financial system is formulated in order have a better understanding on the subject matter. The definitions are discussed as follows:

6.3.2.1 Islamic financial system

Islamic financial system in this present study is defined as a financial system which fully conducts financial transactions and runs operations accordance to the ordinances and values of the Islamic laws.

From the above definition, there are some features that can be observed. The word 'fully' implies only Islamic banks/institutions are exist in the country, with no conventional forms of transactions are operating in the system. In other words, there is no conventional institution as well as Islamic window operates within the system.

There are three prominent examples of the trajectory fully Islamic financial system, namely Iran, Sudan, and Pakistan (see for example, Chapra & Khan, 2000; Zaher &Hasan, 2001; Solé, 2008). Iran pursued the full Islamization of its financial system with the proclamation of the 1983 Usury Free Banking Law, which abolished interest-based banking operations. Likewise, Sudan's transition towards a fully Islamic financial system started with the enactment of the 1992 Banking Law, which aimed at eliminating interest from banking, as well as from all government transactions[42]. In Pakistan, although efforts towards full Islamization can be dated back to the 1960s, a key development took place in 1999, when the Shariat Appellate Bench (SAB) of the Supreme Court ruled that all laws allowing interest should be eliminated before June 30, 2001. Nevertheless, because of some appellations and petitions, the process was ceased in 2002 and Federal Shariat Court (FSC) was been requested by SAB to re-examine the case. As of today, the FSC has not issued a decision on the status of riba-based banking in Pakistan (Nienhaus, 2007; Solé, 2008).

Admittedly, except for Iran, there is no other country adopting a fully fledged Islamic financial system. However, as many countries have made significant progress in the

[42] However, the landscape of its financial system is changed when the new promulgation of Bank of Sudan Act 2002 is enacted. This matter is clearly stated in the Chapter II of the Act: The Sudanese banking system shall consist of dual banking system; one of which is Islamic, in Northern Sudan, and the other Conventional, in Southern Sudan. In addition, since the signature of the Comprehensive Peace Agreement in January 2005 between the Government of Sudan and the Sudan People's Liberation Movement (SPLM), conventional banks have been allowed to operate in this country (Solé, 2008).

Islamic finance practices, it is therefore reasonable for the present study to use the term 'countries with Islamic finance sector' to define the practices of Islamic banking operation in dual financial sector and conventional financial system with Islamic windows. The practices are explained and discussed as follows:

i. Dual financial sector

In this study, dual financial system is referred to the two parallel systems prevailing simultaneously or coexist, namely the conventional and Islamic financial systems. Both systems conducting their financial transactions and operations according to conventional and Islamic form, respectively.

It is worth mentioning that both systems are complete in their own right, in the sense that each can exist independent of the other. The two systems, despite being different, continue to interact with each other, although such interactions are less than mutual. They both complement and substitute each other in different areas especially in matters pertaining to Shariah compliance transactions (Salleh & Che Hamat, 1997; Bakar, 2003). Significantly, these give positive impacts in terms of the cost and speed up the Islamic banking system practice. The Islamic finance products and services offered in dual system which cover wider range as well as much more comprehensive and sophisticated as compared to products and services offered in conventional-plus system[43] (Bakar, 2003). In addition, in dual financial system, all conventional banks have the opportunity to open Islamic windows (Nienhaus, 2007).

[43] Description on this type of financial system is discussed in the next sub-section.

In short, there are a few advantages of dual financial system as follows (Bakar, 2003):

a. As Islamic banks in a dual banking system have to provide all the services offered by conventional counterpart, the scope of Islamic banking services in this system tends to be wider as compared to the products and services in a single Islamic system.

b. It also expected that the Islamic banking products in the dual system are more sophisticated as compared to the Islamic banking products in the single Islamic system.

Malaysia and Bahrain are the two examples of countries that are referred in many literature adopting dual financial system (see, for example, Kaleem, 1999; Zaher & Hasan, 2001; Samad, 2004; Samad, Gardner, & Cook, 2005; Solé, 2008; Abduh, Brahim, & Omar, 2012). These two countries have separate regulations for both Islamic and conventional banking system. As previously mentioned, in the case of Malaysia for example, Financial Services Act 2013 (FSA) and Islamic Financial Services Act 2013 (IFSA) are the two separate regulations govern by the Malaysian government to serve the needs of the two systems. The FSA and IFSA amalgamate several separate laws to govern the financial sector under a single legislative framework for the conventional and Islamic financial sectors respectively, namely, the Banking and Financial Institutions Act 1989 (BAFIA), Islamic Banking Act 1983, Insurance Act 1996 (IA), Takaful Act 1984, Payment Systems Act 2003 and Exchange Control Act 1953. On top of that, the Shariah Advisory Council of Central Bank of Malaysia (SAC) was established in May 1997 as the highest Shariah

authority in Islamic finance in Malaysia.[44]

ii. Conventional financial system with Islamic windows

This system is described in this present study as a conventional banking with a few Islamic finance products/services offered within the fringe of the conventional banking (Bakar, 2003; Yakcop, 2003).

As opposed to dual financial sector, the services offered in Islamic institutions are neither as comprehensive nor as sophisticated as the conventional system (Bakar, 2003). Furthermore, this system is also associated with the Islamic window. Setting up Islamic window, according to Solé (2007), is the first phase in introducing Islamic bank within the conventional system. An Islamic window is simply a window within a conventional bank via which customers can conduct business utilizing only Shariah compatible instruments. At the beginning of the Islamic window, the products that typically offered are safekeeping deposit (i.e., on the liability side of the bank) and Islamic trade-finance products for small and medium companies. Establishing appropriate firewalls are essential upon opening Islamic window to prevent the commingling of Islamic and conventional funds (Solé, 2007).

Among countries that adopting this type of financial system are Bangladesh,

[44] The SAC has been given the authority for the ascertainment of Islamic law for the purposes of Islamic banking business, takaful business, Islamic financial business, Islamic development financial business, or any other business, which is based on Shariah principles and is supervised and regulated by Bank Negara Malaysia. As the reference body and advisor to Bank Negara Malaysia on Shariah matters, the SAC is also responsible for validating all Islamic banking and takaful products to ensure their compatibility with the Shariah principles. In addition, it advises Bank Negara Malaysia on any Shariah issue relating to Islamic financial business or transactions of Bank Negara Malaysia as well as other related entities. For more detail, refer http://www.bnm.gov.my/.

Indonesia, Jordan, Tunisia, Turkey and United Arab Emirates (Bakar, 2003).

6.3.2.2 Conventional financial system

Conventional financial system in this present study means a financial system, which conducts financial transactions based on conventional customs, other than by Islamic form. In the sphere of purely conventional financial system, there is no Islamic financial institution is operated nor Islamic product and service is offered. Argentina, France, Greece, Japan, Mexico, Spain and Sweden are examples of countries, which fall under this type of financial system category. Table 6.1 overleaf summarizes the definition and features of the financial system classification.

6.4 Variables Definitions

This section describes the variables for Islamic banking presence indicators as the proxy for Islamic financial system. Table 6.2 provides a summary of description, indicators and definition of each variable. Based on the basic indicators, three main variables are included by virtue of their potential to have indicatory power in examining Islamic banking presence.

Table 6.2 Descriptions of variables for Islamic banking presence indicators

Description	*Indicator*	*Variable*
IB quantity	Number of Islamic banks	▪ Total number of Islamic banks divided by total number of banks in the banking system
IB size	Size of Islamic banks	▪ Average of natural logarithm of total assets of Islamic banks
IB profitability	Profitability of Islamic banks	▪ Average of profit before tax (and *zakat*) divided by total assets of the Islamic bank

Table 6.1 Definition and features of the financial system classification

Type of financial system		*Definition*	*Feature/Description*		*Examples of countries*
			General	*Islamic banking presence*	
Islamic financial system	Purely Islamic	Fully conducts financial transactions and runs operation accordance to the ordinances and values of the Islamic laws.	▪ Only Islamic banks/institutions are exist, with no conventional forms of transactions are operating in the system	▪ Only Islamic bank/institution	Iran, Sudan and Pakistan
Country with Islamic financial sector	Dual	Two parallel systems prevailing simultaneously or coexist, that is the conventional and Islamic financial systems.	▪ Both systems conducting their financial transactions and operations according to conventional and Islamic form, respectively. ▪ Both systems are complete in their own right, in the sense that each can exist independent of the other. ▪ The scope of Islamic banking services in dual system tends to be wider when compared to the products and services in a single Islamic system. ▪ Islamic banking products in the dual system are more sophisticated as compared to the Islamic banking products in the single Islamic system.	▪ Sophisticated conventional bank/institution ▪ Sophisticated Islamic bank/institution ▪ Islamic windows	Malaysia and Bahrain
	Conventional financial system with Islamic windows	A conventional system with a few Islamic finance institutions operated within the fringe of the conventional system	▪ The services offered in Islamic institutions are neither as comprehensive nor as sophisticated as the conventional system. ▪ Usually begins with the establishment of Islamic windows within its conventional system.	▪ Sophisticated conventional bank/institution ▪ Less sophisticated Islamic bank/institution with less comprehensive services offered. ▪ Islamic windows	Bangladesh, Indonesia, Jordan, Tunisia, Turkey and United Arab Emirates
Purely conventional financial system		A financial system, which conducts financial transactions based on conventional customs, other than by Islamic forms.	▪ There is no Islamic finance service offered within the system.	▪ Only conventional bank/institution	Argentina, France, Greece, Japan, Mexico, Spain and Sweden

The presence of Islamic banking can be assessed, firstly by the number of Islamic banks operating in the country. This indicator is scaled by total assets of the banking system. This indicator measures the effect of Islamic banking quantity to the banking system's activity. This variable could give a raw idea of how the existence of Islamic bank could give an impact on financial inclusion.

Secondly, is the size of Islamic banking assets. The total assets of Islamic banks measure the Islamic banking size in a particular country. Due to data availability constraint (i.e., not all the Islamic banks in the sample of the study specifically report asset under profit and loss sharing through mudharabah or musharakah), total assets of the Islamic banks are employed to gauge how the Islamic-based contracts/transactions under the banks' operation in general, give an influence to financial inclusion.

Thirdly, Islamic banking profitability is also employed to gauge to what extent those who are financially excluded could benefit from Islamic banking profitability under its social welfare paradigm. There could be two possibilities in gauging the impact of Islamic banking profitability on financial inclusion. On the one hand, the low profitability of Islamic banking might be caused by the utilization of potential assets in providing impactful deals with its clients. By providing those deals by aiming social well-being and empowerment, Islamic banks might experienced lower profitability in their operations as compared to the other profit-making financial institution. On the other hand, by having higher profitability, Islamic banks are assumed to utilize and make use of the profit in providing better financial and social welfare. Both situations could certainly lead to inclusive financial system. This

indicator is measured by the average before tax profit (and *zakat*), i.e., ratio of average before tax profit to total assets. This ratio measures the effect of total expenditure on an Islamic bank's profitability. It is worth noted that, to my knowledge, the use of Islamic banking profitability as potential determinant of financial inclusion is the first of its kind in the literature.

6.5 Data Collection

The Islamic banking presence data used in this present study is cross-country bank-level data, compiled from income statements and balance sheets of the Islamic banks in 20 countries for each year in the 2007 to 2011. Sharing the similar situation, as mentioned in Ben Naceur et al. (2015), the data on Islamic banking are relatively inadequate since there is no single accepted definition of an Islamic bank as well as databases that specifically and comprehensively measuring Islamic banking. Therefore, this study calibrates the indicators using data from three main sources as following:

i. Bankscope, which provides balance sheet and income statement information for Islamic banks[45].

ii. The Islamic Banking Database created by the World Bank[46], which lists a wider coverage of Islamic financial institutions (i.e., 55 countries), including banks that offer both conventional and Islamic banking products and services (i.e., Islamic windows). However, the database does not cover yearly data.

[45] As of December 2015, there are 35 countries reported in the Bankscope which have Islamic banks. In order to avoid double count subsidiaries of international banks, we use unconsolidated data when available. However, consolidated is used if unconsolidated data are not available.

[46] See http://go.worldbank.org/AE0U8AYQ20. The version consulted for this present study had been updated as of February, 2014.

iii. Whenever possible, various Islamic banks and central banks of the corresponding countries are also examined to minimize the gap[47]. The data are extracted in US dollars (USD) having been converted from own currencies by end of accounting year exchange rates. The exchange rate values are drawn from the International Financial Statistics, International Monetary Fund (IMF).

The Islamic Banking Database is employed to check and balance the information extracted from the Bankscope. All the Islamic banks listed in the Bankscope are also listed in the Islamic Banking Database. Out of 80 countries in the sample of present study, 20 countries are reported having Islamic banking. In short, the following Table 6.3 summarized the Islamic banking presence data used in the present study.

Table 6.3 Summary of data selection for Islamic banking presence

Item	*2007-2011*	
Number of Islamic banks in Bankscope	178	
Number of countries with Islamic banks in Bankscope	35	
Number of Islamic financial institutions in Islamic Banking Database	394	
Number of countries with Islamic banks in Islamic Banking Database	55	
Less: Data to fit the sample country of the present study		35
Less: Data on Islamic banks which is not available		240
Total balanced panel sample:		
Number of Islamic banks	154	
Number of countries with Islamic banks	20	

[47] Similar to Ben Naceur et al. (2015), two aspects of data imperfections are identified. First, although the Bankscope data is rich in the sense that the income statement and balance sheet information is available for almost all the reporting institutions, it might underestimate the number, total assets as well as profit before tax of Islamic banks because of non-reporting Islamic banks or because of the narrow definition of Islamic banks. Second, although the World Bank Islamic Database seems to list all the Islamic financial institutions more accurately (i.e., in terms of the number of Islamic financial institutions in a particular country that offers Islamic financial services), the data on the total assets and profit before tax on yearly basis is absent. Therefore, an effort was made to supplement these two sources with official country data and bank level data, but gaps remain.

6.6 Results of Islamic Banking Presence Indicators

This section presents the results of the Islamic banking presence variables. General descriptive statistics of the variables is presented.

Table 6.4 presents the summary of Islamic banking presence indicators for the years 2007-2011 while Figure 6.1 present the mean distribution of countries based on Islamic banking presence indicators. As evident from the table and figure, as expected, different countries relatively report different levels of number, size and profitability of Islamic banks. Basically, in countries where Muslim is the majority, the number of Islamic banks is higher, for example in Indonesia and Malaysia, there are 37 and 20 Islamic banks respectively in 2011.

However, when compared to the rest of the banks in the banking system, the ratio of Islamic banks in the countries is relatively still low. With regards to the size of Islamic bank, Iranian banks are reported to have the biggest size of assets with average amount of 309 million USD. To a certain extent, this explain the practice of pure Islamic banking system operated in the country. Overall, the size of Islamic banks in the countries has increase from year to year, indicating that the Islamic banks are progressing well across countries. Profitability wise, Islamic banks in all 20 countries relatively not making much money and some of them even making loss. As the sample of present study is between 2007 to 2011, to a certain extent, this could be explained by the impact of the global financial crisis on the performance of Islamic banks as mentioned by Hasan & Dridi (2011). They found that Islamic banks experienced a significant decline in profitability during the global financial crisis period.

Table 6.4 Summary of Islamic banking presence variables

No	*Country*	*Item*	*Year*					
			2007	*2008*	*2009*	*2010*	*2011*	*Mean*
1.	Albania	Number of Islamic banks	1	1	1	1	1	1
		Total assets (mil USD)	40.424	36.771	37.358	37.531	51.071	40.631
		IB quantity	0.053	0.053	0.053	0.053	0.053	0.053
		IB size	3.699	3.605	3.621	3.625	3.933	3.697
		IB profitability	-0.009	-0.020	-0.078	-0.089	-0.047	-0.049
2.	Bangladesh	Number of Islamic banks	9	9	9	9	9	9
		Total assets (mil USD)	1,837.701	6,083.888	7,574.526	9,638.752	12,013.481	7,429.670
		IB quantity	0.184	0.184	0.184	0.184	0.184	0.184
		IB size	5.175	5.870	6.032	6.188	6.562	5.965
		IB profitability	0.041	0.030	0.028	0.031	0.022	0.030
3.	Bosnia and Herzegovenia	Number of Islamic banks	1	1	1	1	1	1
		Total assets (mil USD)	90.032	112.392	139.921	177.497	193.809	142.730
		IB quantity	0.029	0.029	0.029	0.029	0.029	0.029
		IB size	4.500	4.722	4.941	5.179	5.267	4.922
		IB profitability	0.009	0.008	0.008	0.016	0.007	0.010
4.	Egypt	Number of Islamic banks	7	7	7	7	7	7
		Total assets (mil USD)	38,484.361	43,127.499	47,878.262	54,051.337	54,138.756	47,536.043
		IB quantity	0.184	0.184	0.184	0.184	0.184	0.184
		IB size	6.497	6.571	9.309	5.738	5.770	6.777
		IB profitability	0.009	0.023	0.122	0.123	0.135	0.083
5.	Germany	Number of Islamic banks	1	1	1	1	1	1
		Total assets (mil USD)	1,320.024	1,955.645	2,330.517	3,280.988	4,970.089	2,771.453
		IB quantity	0.001	0.001	0.001	0.001	0.001	0.001
		IB size	7.185	7.578	7.754	8.096	8.511	7.825
		IB profitability	0.022	0.020	0.024	0.021	0.019	0.021
6.	Indonesia	Number of Islamic banks	32	32	34	37	37	34.4
		Total assets (mil USD)	17,305.714	8,066.230	1,1160.175	1,5741.161	24,563.302	15,367.316
		IB quantity	0.232	0.232	0.246	0.268	0.268	0.249
		IB size	4.393	4.038	4.486	4.783	5.455	4.631
		IB profitability	-0.022	0.018	0.006	0.019	0.029	0.010

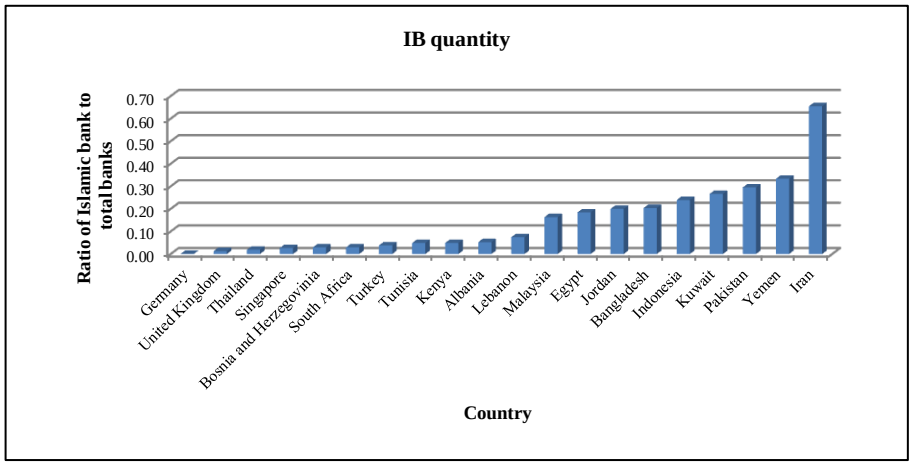
No	*Country*	*Item*	*Year*					
			2007	*2008*	*2009*	*2010*	*2011*	*Mean*
7.	Iran	Number of Islamic banks	16	16	16	16	16	16
		Total assets (mil USD)	274,587.158	286,176.567	294,557.979	341,999.915	347484.556	308,961.235
		IB quantity	0.842	0.842	0.842	0.842	0.842	0.842
		IB size	9.050	9.162	9.489	9.749	9.690	9.428
		IB profitability	0.017	0.015	0.015	0.018	0.016	0.016
8.	Jordan	Number of Islamic banks	5	5	5	5	5	5
		Total assets (mil USD)	3,077.496	4,179.621	5,040.755	5,589.462	6,163.660	4,810.199
		IB quantity	0.227	0.227	0.227	0.227	0.227	0.227
		IB size	7.221	6.901	6.579	7.162	7.295	7.032
		IB profitability	0.024	0.022	0.029	0.014	0.014	0.021
9.	Kenya	Number of Islamic banks	2	3	3	3	3	2.8
		Total assets (mil USD)	28.171	64.340	102.201	118.810	151.822	93.069
		IB quantity	0.035	0.053	0.053	0.053	0.053	0.049
		IB size	3.338	4.164	4.627	4.778	5.023	4.386
		IB profitability	-0.155	-0.076	-0.021	0.005	0.012	-0.047
10.	Kuwait	Number of Islamic banks	10	10	10	11	11	10.4
		Total assets (mil USD)	56,353.372	63,725.793	63,123.399	64,812.893	70,141.271	63,631.346
		IB quantity	0.256	0.256	0.256	0.282	0.282	0.267
		IB size	7.730	7.762	7.658	7.618	7.466	7.647
		IB profitability	0.068	-0.022	-0.081	-0.022	0.001	-0.011
11	Lebanon	Number of Islamic banks	5	5	5	5	5	5
		Total assets (mil USD)	397.178	356.363	450.205	456.176	241.260	380.237
		IB quantity	0.075	0.075	0.075	0.075	0.075	0.075
		IB size	4.359	4.399	4.491	4.544	4.362	4.431
		IB profitability	0.003	-0.009	-0.015	-0.027	-0.006	-0.011
12.	Malaysia	Number of Islamic banks	19	19	20	20	20	19.6
		Total assets (mil USD)	39,209.974	49,027.485	58,951.935	65,296.845	86,956.226	59,888.493
		IB quantity	0.174	0.174	0.183	0.183	0.183	0.180
		IB size	7.158	7.398	7.647	7.597	7.980	7.556
		IB profitability	0.061	0.027	0.029	0.030	0.014	0.032

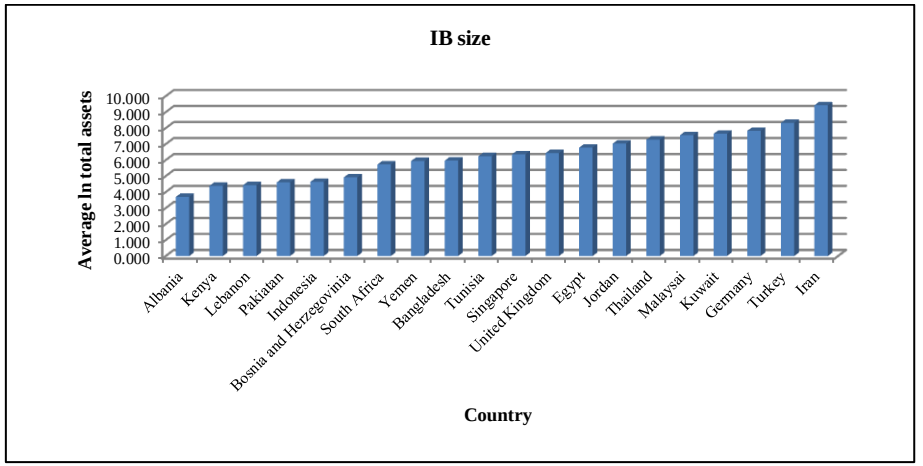
No	*Country*	*Item*	*Year*					
			2007	*2008*	*2009*	*2010*	*2011*	*Mean*
13.	Pakistan	Number of Islamic banks	19	19	19	19	19	19
		Total assets (mil USD)	3,200.254	3,767.837	4,876.022	6,530.036	8,032.345	5,281.299
		IB quantity	0.311	0.311	0.311	0.311	0.311	0.311
		IB size	4.176	4.419	4.564	4.800	5.055	4.603
		IB profitability	0.019	0.017	0.013	-0.009	0.021	0.012
14.	Singapore	Number of Islamic banks	1	1	1	1	1	1
		Total assets (mil USD)	618.000	735.000	725.000	532.000	366.000	595.200
		IB quantity	0.013	0.013	0.013	0.013	0.013	0.013
		IB size	6.426	6.600	6.586	6.277	5.903	6.358
		IB profitability	0.006	0.013	-0.106	-0.084	0.031	-0.028
15.	South Africa	Number of Islamic banks	2	2	2	2	2	2
		Total assets (mil USD)	248.000	201.042	322.575	425.991	398.593	319.240
		IB quantity	0.029	0.029	0.029	0.029	0.029	0.029
		IB size	5.513	5.304	5.776	6.054	5.988	5.727
		IB profitability	0.016	0.017	0.008	0.006	0.008	0.011
16.	Thailand	Number of Islamic banks	1	1	1	1	1	1
		Total assets (mil USD)	497.820	682.985	1360.841	3277.769	4162.297	1996.342
		IB quantity	0.016	0.016	0.016	0.016	0.016	0.016
		IB size	6.210	6.526	7.216	8.095	8.334	7.276
		IB profitability	-0.017	0.000	0.008	0.012	0.004	0.001
17.	Tunisia	Number of Islamic banks	1	1	2	2	2	1.6
		Total assets (mil USD)	418.30	461.31	523.26	597.10	592.30	518.455
		IB quantity	0.027	0.027	0.054	0.054	0.054	0.043
		IB size	6.036	6.134	6.260	6.392	6.384	6.241
		IB profitability	0.018	0.034	0.032	0.029	0.030	0.029
18.	Turkey	Number of Islamic banks	5	5	5	5	5	5
		Total assets (mil USD)	15,259.350	16,770.180	22,231.350	28,386.978	32,160.898	22,961.751
		IB quantity	0.038	0.038	0.038	0.038	0.038	0.038
		IB size	7.918	8.063	8.319	8.575	8.737	8.323
		IB profitability	0.029	0.027	0.024	0.021	0.017	0.024

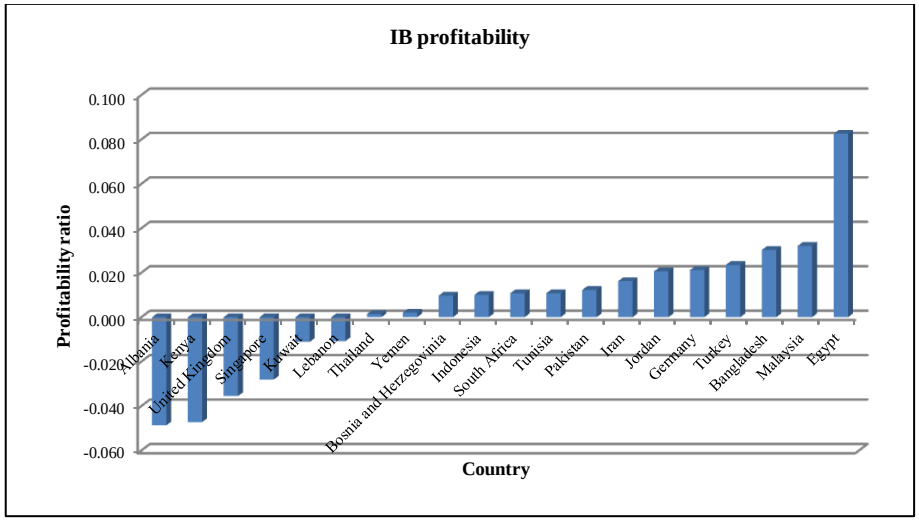
No	*Country*	*Item*	*Year*					
			2007	*2008*	*2009*	*2010*	*2011*	*Mean*
19.	United Kingdom	Number of Islamic banks	7	9	9	9	9	8.6
		Total assets (mil USD)	29,591.414	31,315.801	30,645.626	33,256.866	35,312.595	32,024.460
		IB quantity	0.013	0.017	0.017	0.017	0.017	0.016
		IB size	6.775	6.345	6.340	6.248	6.482	6.438
		IB profitability	-0.007	-0.030	-0.076	-0.040	-0.024	-0.035
20.	Yemen	Number of Islamic banks	4	4	4	4	4	4
		Total assets (mil USD)	1,669.951	2,297.267	2,628.716	2,742.652	2,592.441	2,386.205
		IB quantity	0.333	0.333	0.333	0.333	0.333	0.333
		IB size	5.889	5.714	5.868	6.399	5.838	5.942
		IB profitability	0.011	-0.003	0.004	0.006	-0.007	0.002

Source: Data on the countries' Islamic banking is ccompiled from Bankscope database, Islamic banking database (World Bank), websites of respective central banks/monetary authorities as well as bank-specific annual reports which can be publicly accessed via the websites of the particular Islamic bank. IB quantity, IB size and IB profitability are figures based on author's calculation using the databases. *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank.

Figure 6.1 Summary of Islamic banking presence, by mean







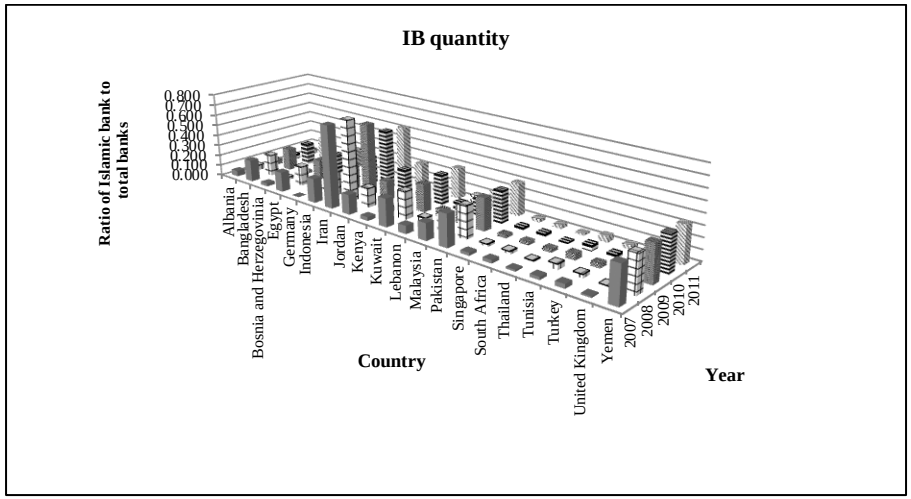
In addition, the descriptive summary for Islamic banking variables is also presented in bar charts for ease of comparison. Figure 6.2 overleaf presents the Islamic banking presence indicators for country comparison from year 2007 to 2011.

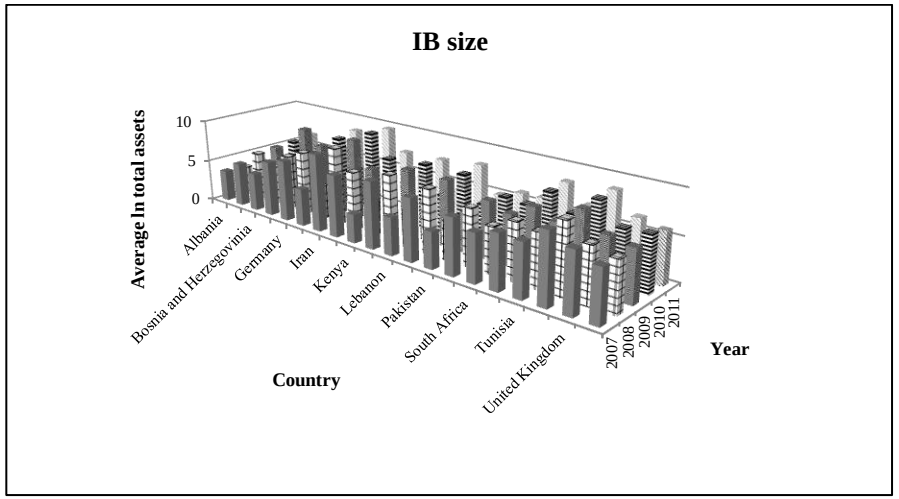
Apart from this, comparison of mean Islamic banking presence indicators based on region and legal origin can be viewed in Figure 7.5 for legal origin comparison and Figure 7.6 for regional comparison in Chapter 7.

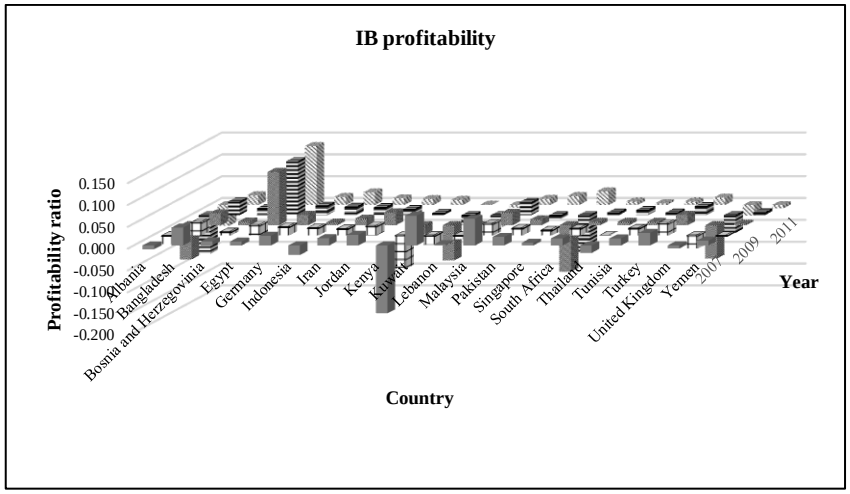
6.7 Chapter Summary

This chapter discussed the methodology in classification of Islamic and conventional-based financial system. Basis of financial system classification is reviewed and conceptual framework of Islamic-based financial system classification is developed. Lastly, the results of the Islamic banking presence as the proxy for Islamic financial system are presented. Islamic banking presence as the proxy for Islamic financial system is important in conducting the present study.

Figure 6.2 Summary of Islamic banking presence from year 2007 to 2011







Chapter 7

RESULTS OF FINANCIAL INCLUSION DETERMINANTS

7.1 Introduction

This chapter presents empirical evidence on the determinants of financial inclusion within the institutional settings as well as other factors. As far as the determinants of financial inclusion are concerned, there are voluminous of literature in this area (e.g., Kempson & Whyley, 1999; Claessens, 2006; Beck, Demirguc-Kunt, et al., 2007; Qian & Strahan, 2007; Sarma & Pais, 2011; Gimet & Lagoarde-Segot, 2012). However, the understanding of the factors remains mixed and incomplete with respect to their impact on financial inclusion. Apart from the existing barriers studied by previous research, this chapter particularly investigates another important institutional variables, namely the Islamic banking presence (i.e., the proxy for countries with Islamic financial sector), as one of the important determinants in shaping financial inclusion.

A balanced sample of countries over the period of 2007 through 2011 is used in the investigation. Initial sample was 213 countries (or 1,065 country-year observations). Countries with index variable not available were removed from the initial sample. A total of 132 countries (or 660 country-year observations) were removed due to the

data availability constraint[48]. The final sample contains a balanced panel of 80 countries or 400 country-year observations.

The chapter proceeds as follows: Section 7.2 presents the descriptive statistics of the key variables, followed by a brief description of the univariate results in Section 7.3. The main results based on the multivariate analysis are discussed in Section 7.4. The robustness checks and regression diagnostics are explained in Section 7.5 and 7.6, respectively. Section 7.7 summaries the chapter.

7.2 Descriptive Statistics

Descriptive statistics for the key variables are presented in Table 7.1. The overall mean (median) level of CIFI is 0.2324 (0.2309). The close mean-median difference of the index reflects the approximately normal distribution of countries in the sample. Putting this figure into perspective, the mean (median) of inclusion index (i.e., CIFI) stands at low level i.e., between 0.00 to 0.29[49]. Panel B of Table 7.1 gives clear example to support this case. In the group of 80 countries, 70% countries are reported belong to low CIFI mean values. For example, Algeria (0.17), Cambodia (0.12), Iran (0.21) and Zambia (0.05). Even, this can be further supported by mean values of CIFI based on legal origin and region as shown in Panel C and D, respectively, of Table 7.1. As for the legal origin, English, French and Socialist origin are at the low level of inclusion which are 0.24, 0.21 and 0.13 respectively. Except for East Asia & Pacific

[48] This issue is presents in many studies (for example Claessens, 2006; Beck et al., 2008; Sarma & Pais, 2011). Following this, about 38% data is chosen because of data consistency for the period of study.

[49] These levels of CIFI are defined in section 5.2.1, with further explanation of empirical distribution in section 5.5.2.1 of Chapter 5.

Table 7.1 Summary statistics of key variables

Panel A: Overall sample description

Variable	n_c	n_f	*Mean*	*Median*	*Std. Dev.*	*Min*	*Max*	*Skewness*	*Kurtosis*
Financial Inclusion Index									
CIFI	400	-	0.2324	0.2309	0.1431	0.0156	0.9791	1.0967	3.2988
Islamic banking variables									
IB quantity (number)	100	-	7.5200	5.0000	8.0220	1.0000	35.0000	1.7820	3.0419
IB quantity (of total banks in banking system)	100	-	0.1461	0.0643	0.1588	0.0005	0.7619	1.8390	4.1824
IB size (ln TA)	100	-	6.2602	6.2540	1.5499	3.3383	9.7491	0.2182	-0.6111
IB size (USD million)	100	-	45.2550	4.9701	0.09511	0.0282	425.9907	2.7015	6.3336
IB size (of total assets in banking system)	100	-	0.0863	0.0181	0.1438	0.0001	0.6970	2.2903	5.3816
IB profitability	100	-	0.0051	0.0121	0.0404	-0.1555	0.1352	-0.5742	4.4689
IB size (ln TA)	-	675	6.3293	6.4799	2.3161	-0.4363	11.1192	-0.0996	-0.7326
IB size (USD billion)	-	675	4.2818	0.6579	9.734	0.0065	67.4535	3.6543	14.5079
IB profitability	-	667	0.0148	0.0129	0.0859	-0.9295	0.8832	0.9318	58.0119
Macroeconomics variable									
GDP per capita (ln GDP)	400	-	8.7477	8.6744	1.5304	5.0927	11.5038	-0.2545	2.1376
GDP per capita (USD mill)	400	-	15.7011	5.8510	19.1360	162.8275	99.0911	1.5507	2.0503
Overall institutional environment variable									
Governance index	400	-	0.1433	-0.1393	0.8717	-1.3719	1.8474	0.4016	1.9807
Contractual and informational framework variables									
Legal rights index	400	-	5.8938	6.0000	2.4467	0.0000	10.0000	-0.0494	1.9261
Credit information index	400	-	3.8519	4.0000	1.9160	0.0000	6.0000	-0.8899	2.6432
Cost of enforcing contracts	400	-	0.3267	0.2650	0.2459	9.9000	142.500	2.9979	12.6409
Regulatory restrictions variable		-							
Banking restrictions index	400	-	54.7654	50.0000	17.0978	0.0990	90.0000	-0.2366	3.0280
Physical infrastructure variables									
Paved road (in km)	400	-	60.9152	70.2000	32.8827	6.2900	100.0000	-0.2839	1.5257
Phone (land line and mobile subscription)	400	-	23.4892	20.3225	18.4473	0.1676	65.5523	0.4578	2.0633
Internet (users per 1000 people)	400	-	38.0800	34.3300	27.7664	0.4900	94.0000	0.3153	1.7772
Interest rates variables									
Deposit interest rate	400	-	0.0549	0.0453	0.0405	-0.0012	0.2291	1.1157	4.5605
Lending interest rate	400	-	0.1152	0.1031	0.0747	0.0050	0.5250	1.6293	8.4305
Legal origin variables									
English origin	400	-	0.2840	0.0000	0.4515	0.0000	1.0000	0.9583	1.9183
French origin	400	-	0.4074	0.0000	0.4920	0.0000	1.0000	0.3769	1.1420
German origin	400	-	0.1852	0.0000	0.3889	0.0000	1.0000	1.6209	3.6273
Scandinavian origin	400	-	0.0247	0.0000	0.1554	0.0000	1.0000	6.1258	38.5253
Socialist origin	400	-	0.0988	0.0000	0.2987	0.0000	1.0000	2.6897	8.2346
Region variables									
Africa (AF)	400	-	0.1605	0.0000	0.3675	0.0000	1.0000	1.8499	4.4219
East Asia & Pacific(EAP)	400	-	0.0988	0.0000	0.2987	0.0000	1.0000	2.6897	8.2346

Variable	n_c	n_f	*Mean*	*Median*	*Std. Dev.*	*Min*	*Max*	*Skewness*	*Kurtosis*
Europe & Central Asia (ECA)	400	-	0.4074	0.0000	0.4920	0.0000	1.0000	0.3769	1.1420
Latin America & Caribbean (LAC)	400	-	0.1358	0.0000	0.3430	0.0000	1.0000	2.1262	5.5208
Middle East & North Africa (MENA)	400	-	0.1235	0.0000	0.3294	0.0000	1.0000	2.2893	6.2408
South Asia (SA)	400	-	0.0741	0.0000	0.2622	0.0000	1.0000	3.2527	11.5800

Panel B: Financial inclusion and country-level data: mean by country

	Country	No. of IB	Region	Legal origin	CIFI	IB quantity (of total banks in banking system)	IB size (ln TA)	IB size (USD bill)	IB size (of total assets of banking system)	IB profit-ability	GDP per capita (ln GDP)	GDP per capita (USD mill)	Gover-nance index	Legal rights index	Credit infor-mation index	Cost of enforcing contracts	Financial restrictions index	Paved road	Phone	Internet	Deposit interest rate	Lending interest rate
1	Albania	1	ECA	French	0.27	0.05	3.70	0.04	0.00	-0.05	8.20	4.19	-0.21	9.00	3.00	38.10	70.00	39.00	10.51	34.82	0.06	0.13
2	Algeria	0	MENA	French	0.17	0.00	0.00	0.00	0.00	0.00	8.25	4.40	-0.84	3.00	2.00	21.90	28.00	74.38	8.42	11.47	0.02	0.08
3	Angola	0	AF	French	0.15	0.00	0.00	0.00	0.00	0.00	8.14	4.28	-1.06	3.00	3.00	44.40	40.00	10.40	1.19	7.72	0.08	0.17
4	Argentina	0	LAC	French	0.04	0.00	0.00	0.00	0.00	0.00	9.03	10.65	-0.28	4.00	6.00	16.50	36.00	30.00	24.32	36.81	0.10	0.14
5	Armenia	0	ECA	Socialist	0.09	0.00	0.00	0.00	0.00	0.00	8.03	3.29	-0.28	6.00	4.60	19.00	70.00	92.06	19.58	16.91	0.08	0.18
6	Australia	0	EAP	English	0.31	0.00	0.00	0.00	0.00	0.00	10.62	49.46	1.61	9.00	5.00	20.70	90.00	42.34	46.63	74.17	0.04	0.08
7	Austria	0	ECA	German	0.17	0.00	0.00	0.00	0.00	0.00	10.72	47.05	1.59	7.00	6.00	15.88	70.00	100.00	40.00	74.13	0.01	0.03
8	Azerbaijan	0	ECA	Socialist	0.05	0.00	0.00	0.00	0.00	0.00	8.26	5.48	-0.78	6.00	4.60	18.50	36.00	50.60	15.76	31.00	0.12	0.20
9	Bangladesh	10	SA	English	0.27	0.20	6.02	0.88	0.19	0.03	6.15	0.60	-0.87	7.00	2.00	66.80	20.00	9.50	0.82	3.22	0.09	0.15
10	Belarus	0	ECA	Socialist	0.17	0.00	0.00	0.00	0.00	0.00	8.46	5.68	-0.92	2.20	4.20	23.40	10.00	87.30	40.93	28.31	0.10	0.10
11	Belgium	0	ECA	French	0.38	0.00	0.00	0.00	0.00	0.00	10.67	44.82	1.30	6.00	4.00	17.70	76.00	78.20	44.11	70.69	0.01	0.03
12	Bosnia and Herzegovina	1	ECA	German	0.25	0.03	4.92	0.14	0.01	0.01	8.28	4.46	-0.39	5.00	5.00	32.40	60.00	92.10	26.81	42.46	0.03	0.07
13	Botswana	0	AF	English	0.12	0.00	0.00	0.00	0.00	0.00	8.65	6.26	0.67	6.00	4.00	39.80	70.00	32.60	7.11	6.34	0.07	0.14
14	Bulgaria	0	ECA	German	0.34	0.00	0.00	0.00	0.00	0.00	8.63	6.55	0.20	9.00	5.80	23.80	60.00	98.48	29.90	43.11	0.04	0.11
15	Burundi	0	AF	French	0.03	0.00	0.00	0.00	0.00	0.00	5.09	0.20	-1.13	3.00	1.00	38.60	30.00	10.44	0.38	0.90	0.08	0.15
16	Cambodia	0	SA	French	0.12	0.00	0.00	0.00	0.00	0.00	6.44	0.75	-0.84	4.80	0.00	103.12	50.00	6.29	1.44	1.18	0.02	0.16
17	Canada	0	LAC	English	0.37	0.00	0.00	0.00	0.00	0.00	10.70	46.15	1.61	7.00	6.00	22.30	78.00	39.87	54.56	78.70	0.01	0.04
18	Chile	0	LAC	French	0.25	0.00	0.00	0.00	0.00	0.00	9.25	11.68	1.16	4.00	5.00	28.60	70.00	22.46	20.51	42.40	0.04	0.09
19	Costa Rica	0	LAC	French	0.23	0.00	0.00	0.00	0.00	0.00	8.68	7.07	0.54	3.00	5.00	24.30	46.00	25.74	30.01	34.73	0.05	0.16
20	Croatia	0	ECA	German	0.34	0.00	0.00	0.00	0.00	0.00	9.50	14.16	0.37	6.80	2.80	13.80	60.00	89.58	41.76	50.49	0.02	0.10
21	Czech Republic	0	ECA	German	0.40	0.00	0.00	0.00	0.00	0.00	9.77	19.53	0.89	6.40	5.00	33.00	80.00	100.00	23.21	64.22	0.01	0.06
22	Dominican Republic	0	LAC	French	0.08	0.00	0.00	0.00	0.00	0.00	8.37	4.85	-0.37	3.00	6.00	40.90	40.00	49.40	10.04	27.24	0.08	0.16
23	Egypt	7	MENA	French	0.30	0.18	7.63	6.79	0.24	0.09	7.47	2.43	-0.56	3.00	4.60	26.20	44.00	89.52	13.02	26.20	0.06	0.12
24	France	0	ECA	French	0.19	0.00	0.00	0.00	0.00	0.00	10.61	41.37	1.24	6.80	4.00	17.40	68.00	100.00	61.31	73.61	0.02	0.04
25	Georgia	0	ECA	Socialist	0.12	0.00	0.00	0.00	0.00	0.00	7.75	2.70	-0.10	5.80	5.00	29.90	62.00	94.10	19.44	20.36	0.11	0.23
26	Germany	1	ECA	German	0.13	0.00	7.82	2.77	0.00	0.02	10.61	41.91	1.45	7.40	6.00	14.40	58.00	100.00	63.57	79.43	0.02	0.07
27	Greece	0	ECA	French	0.40	0.00	0.00	0.00	0.00	0.00	10.22	27.81	0.49	4.00	4.40	14.40	52.00	69.24	50.09	42.78	0.03	0.10
28	Honduras	0	LAC	French	0.24	0.00	0.00	0.00	0.00	0.00	7.44	1.98	-0.58	6.00	5.80	35.20	62.00	20.40	9.83	11.16	0.09	0.18
29	Hungary	0	ECA	German	0.24	0.00	0.00	0.00	0.00	0.00	9.51	13.61	0.76	7.00	5.00	15.00	68.00	37.90	30.63	62.26	0.07	0.09
30	India	0	SA	English	0.28	0.00	0.00	0.00	0.00	0.00	6.97	1.24	-0.26	7.80	4.80	39.60	36.00	49.24	3.02	6.20	0.04	0.11
31	Indonesia	33	EAP	French	0.15	0.24	4.44	0.52	0.04	0.01	7.53	2.55	-0.48	5.00	3.40	139.40	40.00	56.56	13.78	8.76	0.08	0.14
32	Iran	16	MENA	English	0.21	0.66	9.42	20.88	0.57	0.02	8.29	5.30	-1.12	4.00	3.20	17.00	10.00	77.14	34.99	13.30	0.12	0.12
33	Ireland	0	ECA	English	0.20	0.00	0.00	0.00	0.00	0.00	10.99	52.57	1.51	9.00	5.00	26.90	84.00	100.00	48.74	67.99	0.04	0.05

	Country	No. of IB	Region	Legal origin	CIFI	IB quantity (of total banks in banking system)	IB size (ln TA)	IB size (USD bill)	IB size (of total assets of banking system)	IB profit-ability	GDP per capita (ln GDP)	GDP per capita (USD mill)	Gover-nance index	Legal rights index	Credit infor-mation index	Cost of enforcing contracts	Financial restrictions index	Paved road	Phone	Internet	Deposit interest rate	Lending interest rate
34	Israel	0	MENA	English	0.46	0.00	0.00	0.00	0.00	0.00	10.10	28.93	0.57	9.00	5.00	25.30	64.00	100.00	45.56	61.41	0.02	0.05
35	Italy	0	ECA	French	0.42	0.00	0.00	0.00	0.00	0.00	10.50	36.60	0.54	3.00	5.00	29.90	60.00	100.00	37.11	48.93	0.01	0.05
36	Jamaica	0	LAC	English	0.13	0.00	0.00	0.00	0.00	0.00	8.48	4.94	-0.01	8.00	0.00	45.60	58.00	73.30	11.17	26.83	0.06	0.18
37	Japan	0	SA	German	0.51	0.00	0.00	0.00	0.00	0.00	10.44	40.17	1.20	7.00	6.00	32.20	50.00	78.22	46.91	76.99	0.01	0.02
38	Jordan	4	MENA	English	0.42	0.20	6.99	1.60	0.04	0.02	8.01	3.98	-0.01	2.00	2.00	31.20	60.00	100.00	8.45	26.22	0.05	0.09
39	Kenya	3	AF	English	0.20	0.05	4.39	0.09	0.00	-0.05	6.58	0.78	-0.71	10.00	3.60	39.40	50.00	14.38	1.24	13.73	0.05	0.14
40	Korea	0	EAP	German	0.46	0.00	0.00	0.00	0.00	0.00	10.05	21.64	0.76	8.00	5.60	10.30	62.00	78.94	55.13	81.78	0.05	0.06
41	Kuwait	10	MENA	English	0.29	0.27	7.65	6.77	0.27	-0.01	10.71	45.62	0.20	3.00	3.80	18.80	50.00	85.00	19.92	52.64	0.04	0.06
42	Kyrgyz Republic	0	SA	Socialist	0.04	0.00	0.00	0.00	0.00	0.00	6.58	0.91	-0.89	8.20	3.60	37.00	50.00	91.10	9.36	17.03	0.05	0.28
43	Latvia	0	ECA	German	0.27	0.00	0.00	0.00	0.00	0.00	9.48	13.18	0.62	10.00	4.40	18.84	60.00	20.70	25.16	65.90	0.05	0.11
44	Lebanon	5	MENA	French	0.22	0.07	4.44	0.11	0.00	-0.01	8.69	7.80	-0.70	3.00	5.00	30.80	64.00	84.90	18.89	33.42	0.07	0.09
45	Lesotho	0	AF	English	0.08	0.00	0.00	0.00	0.00	0.00	6.71	0.962	-0.19	6.00	0.00	31.30	44.00	53.00	1.92	3.77	0.05	0.13
46	Macedonia	0	ECA	German	0.24	0.00	0.00	0.00	0.00	0.00	8.27	4.48	-0.11	7.00	3.60	29.66	60.00	57.10	21.33	48.54	0.06	0.10
47	Madagascar	0	AF	French	0.02	0.00	0.00	0.00	0.00	0.00	5.94	0.43	-0.54	2.00	0.40	42.40	50.00	14.34	0.76	1.51	0.12	0.47
48	Malawi	0	AF	English	0.07	0.00	0.00	0.00	0.00	0.00	5.58	0.33	-0.31	7.00	0.00	132.74	50.00	45.02	1.00	1.67	0.04	0.25
49	Malaysia	18	EAP	English	0.41	0.16	7.56	3.36	0.19	0.03	8.88	8.35	0.29	10.00	6.00	27.50	44.00	84.20	16.12	56.94	0.03	0.05
50	Mexico	0	LAC	French	0.06	0.00	0.00	0.00	0.00	0.00	9.13	9.03	-0.17	5.00	6.00	32.00	60.00	35.16	17.80	26.97	0.02	0.07
51	Moldova	0	ECA	Socialist	0.19	0.00	0.00	0.00	0.00	0.00	7.12	1.61	-0.40	8.00	0.00	18.32	50.00	85.94	31.49	28.33	0.13	0.18
52	Morocco	0	MENA	French	0.39	0.00	0.00	0.00	0.00	0.00	7.79	2.79	-0.33	3.00	2.80	25.20	50.00	67.02	10.23	40.18	0.04	0.06
53	Mozambique	0	AF	French	0.12	0.00	0.00	0.00	0.00	0.00	5.89	0.42	-0.29	3.00	3.60	128.40	50.00	20.38	0.36	2.72	0.11	0.18
54	Netherlands	0	ECA	French	0.41	0.00	0.00	0.00	0.00	0.00	10.77	49.11	1.65	6.00	5.00	24.40	84.00	90.00	43.90	89.18	0.03	0.03
55	New Zealand	0	EAP	English	0.27	0.00	0.00	0.00	0.00	0.00	10.37	32.04	1.76	10.00	5.00	22.16	80.00	65.98	42.21	78.10	0.06	0.07
56	Nicaragua	0	LAC	French	0.15	0.00	0.00	0.00	0.00	0.00	7.20	1.50	-0.59	3.00	5.00	26.80	52.00	12.22	4.56	7.42	0.05	0.13
57	Norway	0	ECA	Scandinavian	0.35	0.00	0.00	0.00	0.00	0.00	11.33	88.48	1.69	6.00	4.00	9.90	56.00	80.62	36.65	91.39	0.03	0.04
58	Pakistan	18	SA	English	0.13	0.30	4.60	0.29	0.09	0.01	6.83	1.03	-1.10	6.00	4.00	23.80	38.00	69.44	3.18	7.66	0.07	0.14
59	Peru	0	LAC	French	0.11	0.00	0.00	0.00	0.00	0.00	8.19	4.57	-0.29	7.00	6.00	35.70	60.00	13.90	11.34	31.59	0.03	0.21
60	Poland	0	ECA	German	0.22	0.00	0.00	0.00	0.00	0.00	9.32	12.41	0.70	8.40	5.40	19.00	58.00	69.10	22.47	57.58	0.03	0.06
61	Portugal	0	ECA	French	0.31	0.00	0.00	0.00	0.00	0.00	10.00	22.44	0.98	3.00	5.00	13.72	56.00	86.00	40.78	49.11	0.01	0.03
62	Russia	0	ECA	Socialist	0.16	0.00	0.00	0.00	0.00	0.00	9.12	10.70	-0.73	3.00	3.60	13.40	40.00	67.40	31.48	34.50	0.06	0.11
63	Rwanda	0	AF	French	0.03	0.00	0.00	0.00	0.00	0.00	5.92	0.48	-0.37	4.00	2.40	78.70	40.00	19.00	0.29	5.86	0.07	0.16
64	Singapore	2	EAP	English	0.85	0.03	6.36	0.60	0.00	0.03	10.58	43.39	1.49	10.00	3.20	22.60	52.00	100.00	39.42	69.98	0.00	0.05
65	Slovak Republic	0	ECA	German	0.23	0.00	0.00	0.00	0.00	0.00	9.66	16.79	0.76	8.00	3.80	27.42	74.00	87.06	21.92	69.60	0.02	0.15
66	Slovenia	0	ECA	German	0.33	0.00	0.00	0.00	0.00	0.00	10.06	24.38	0.97	4.40	3.40	16.24	50.00	100.00	46.52	63.55	0.03	0.06
67	South Africa	2	AF	English	0.29	0.03	5.73	0.32	0.00	0.01	8.67	6.41	0.28	7.00	5.80	33.20	60.00	17.30	8.71	16.89	0.08	0.12
68	Spain	0	ECA	French	0.26	0.00	0.00	0.00	0.00	0.00	10.37	31.75	0.86	6.00	5.00	17.20	80.00	99.00	44.37	62.10	0.02	0.03
69	Sweden	0	ECA	Scandinavian	0.28	0.00	0.00	0.00	0.00	0.00	10.83	50.61	1.77	7.40	4.00	31.26	78.00	25.30	54.20	89.40	0.01	0.03
70	Switzerland	0	ECA	German	0.26	0.00	0.00	0.00	0.00	0.00	11.00	69.49	1.72	8.00	5.00	22.88	78.00	100.00	62.30	81.36	0.00	0.03
71	Tanzania	0	AF	English	0.08	0.00	0.00	0.00	0.00	0.00	6.04	0.50	-0.36	7.00	0.00	14.30	50.00	12.15	0.37	9.84	0.08	0.15
72	Thailand	1	EAP	English	0.35	0.02	7.28	2.00	0.00	0.00	8.23	4.37	-0.30	5.00	5.00	15.00	60.00	98.50	10.26	20.89	0.02	0.07
73	Tunisia	2	MENA	French	0.30	0.05	6.24	0.52	0.01	0.03	8.24	4.16	-0.15	3.00	4.00	21.80	30.00	73.64	12.16	30.92	0.02	0.04
74	Turkey	5	ECA	French	0.23	0.04	8.32	4.60	0.03	0.02	9.14	9.81	-0.04	4.00	5.00	27.42	50.00	88.90	23.32	36.46	0.19	0.14
75	Uganda	0	AF	English	0.05	0.00	0.00	0.00	0.00	0.00	5.99	0.44	-0.57	7.00	0.80	44.90	64.00	23.00	0.83	9.37	0.10	0.21
76	Ukraine	0	ECA	Socialist	0.26	0.00	0.00	0.00	0.00	0.00	8.03	3.21	-0.50	9.00	2.00	43.80	40.00	97.84	28.31	17.49	0.10	0.17

	Country	No. of IB	Region	Legal origin	CIFI	IB quantity (of total banks in banking system)	IB size (ln TA)	IB size (USD bill)	IB size (of total assets of banking system)	IB profit-ability	GDP per capita (ln GDP)	GDP per capita (USD mill)	Gover-nance index	Legal rights index	Credit infor-mation index	Cost of enforcing contracts	Financial restrictions index	Paved road	Phone	Internet	Deposit interest rate	Lending interest rate
77	United Kingdom	7	ECA	English	0.41	0.01	6.43	4.71	0.00	0.07	10.75	40.21	1.39	10.00	6.00	40.40	86.00	100.00	54.45	81.78	0.04	0.02
78	Venezuela	0	LAC	French	0.10	0.00	0.00	0.00	0.00	0.00	9.03	11.07	-1.23	2.00	0.60	43.70	30.00	33.60	23.03	31.40	0.15	0.19
79	Yemen	4	MENA	English	0.03	0.33	5.92	0.66	0.18	0.00	7.10	1.30	-1.19	2.00	0.80	26.50	30.00	8.70	4.37	9.82	0.15	0.21
80	Zambia	0	AF	English	0.05	0.00	0.00	0.00	0.00	0.00	6.86	1.15	-0.33	9.00	1.60	38.70	50.00	22.00	0.75	7.65	0.07	0.20

Panel C: Financial inclusion and country-level data: mean by legal origin

	Legal origin	No. of IB	*CIFI*	IB quantity (of total banks in banking system)	IB size (ln TA)	IB_size (USD bill)	IB size (of total assets in banking system)	IB profit-ability	GDP per capita (ln GDP)	GDP per capita (USD mill)	Governance index	Legal rights index	Credit information index	Cost of enforcing contracts	Banking restrictions index	Paved road	Phone	Internet	Deposit interest rate	Lending interest rate
1	English origin	8.08	0.24	0.20	6.76	6.39	0.12	0.02	8.37	14.64	0.17	7.51	3.34	35.50	55.13	54.16	19.02	31.58	0.06	0.12
2	French origin	8.00	0.21	0.14	5.63	2.61	0.08	0.13	8.60	12.83	-0.07	4.05	3.87	38.59	52.44	53.28	19.26	31.47	0.06	0.12
3	German origin	1.00	0.29	0.01	6.37	1.46	0.00	0.02	9.76	23.32	0.77	7.29	4.85	21.65	63.20	80.61	37.17	64.09	0.03	0.07
4	Scandinavian origin	0.00	0.32	0.00	0.00	0.00	0.00	0.00	11.11	4.20	1.73	6.70	4.00	20.58	67.00	52.96	45.42	90.40	0.02	0.03
5	Socialist origin	0.00	0.13	0.00	0.00	0.00	0.00	0.00	8.09	69.54	-0.57	6.03	3.45	25.42	44.75	83.29	24.55	24.24	0.09	0.18

Panel D: Financial inclusion and country-level data: mean by region

	Region	No. of IB	*CIFI*	IB quantity (of total banks in banking system)	IB size (ln TA)	IB_size (USD bill)	IB size (of total assets in banking system)	IB profit-ability	GDP per capita (ln GDP)	GDP per capita (USD mill)	Gover-nance index	Legal rights index	Credit information index	Cost of enforcing contracts	Banking restrictions index	Paved road	Phone	Internet	Deposit interest rate	Lending interest rate
1	Africa	2.40	0.10	0.04	5.06	0.21	0.00	-0.02	6.77	1.74	-0.38	5.69	2.02	54.37	49.85	22.74	1.92	6.77	0.08	0.19
2	East Asia & Pacific	13.50	0.40	0.11	5.66	1.58	0.06	0.02	9.58	23.11	0.73	8.14	4.74	36.81	61.14	75.22	31.94	55.80	0.04	0.07
3	Europe & Central Asia	3.00	0.26	0.03	6.88	3.91	0.01	0.04	9.64	28.86	0.58	6.50	4.38	22.95	61.94	81.32	36.12	55.08	0.05	0.09
4	Latin America & Caribbean	0.00	0.16	0.00	0.00	0.00	0.00	0.00	8.81	10.32	-0.02	4.73	4.67	31.96	53.82	32.37	19.74	32.30	0.06	0.14
5	Middle East & North Africa	6.94	0.28	0.28	7.54	10.10	0.19	0.18	8.64	10.67	-0.41	3.50	3.32	24.47	43.00	76.03	17.60	30.56	0.06	0.09
6	South Asia	14.00	0.22	0.25	5.05	0.48	0.14	0.02	7.41	7.45	-0.46	6.80	3.40	50.42	40.67	50.63	10.79	18.71	0.04	0.14

The full sample consists 400 country-year observations (i.e., 80 countries with year observations from 2007 to 2011) which denoted as n_c. For Islamic banking variables, the sample consists of 100 country-year observations (i.e., 20 countries with Islamic banking presence, with year observations from 2007 to 2011) which also indicated as n_c. The sample of Islamic banking variables is also presented based on firm-year observations (i.e., Islamic banks and Islamic banking windows, with year observations from 2007 to 2011) which presented as n_f. The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity (number)* is the number of Islamic bank in a particular country. *IB quantity (of total banking system)* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size (ln TA)* is the average of natural logarithm of total assets of Islamic banks. *IB size (of total banking system)* is equal to total assets of Islamic banks divided by the total assets of banks in the banking system. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is

number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank.

region (i.e., belong to medium CIFI with value 0.40), other regions can be classified under low level of inclusion.

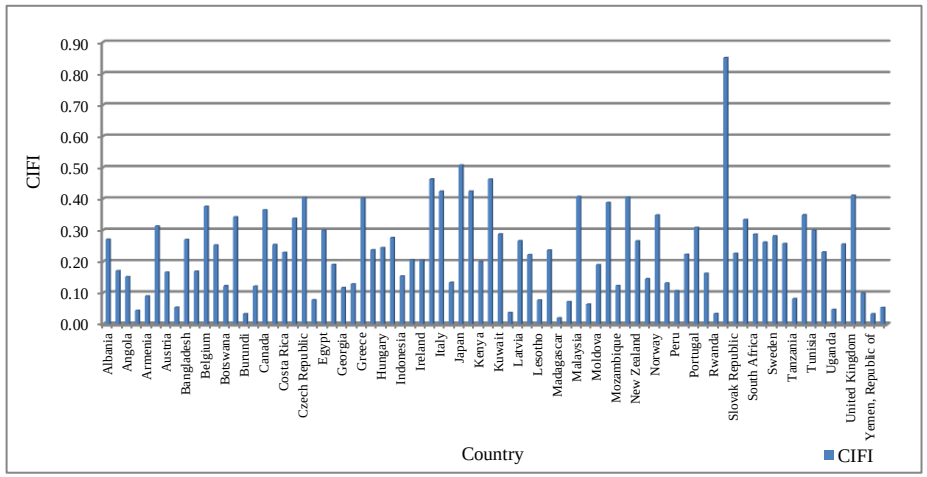
Compared to other prior studies which propose inclusion indexes, the level of financial inclusion of the sample countries is relatively similar (i.e., at the lower level). Arora's (2010) study found that the countries' inclusion index level in 2007 is relatively the same i.e., 0.1437. In contrast, estimates in a recent study by Sarma (2012) of cross-country analysis show that the mean of inclusion index are at the medium level - 0.373, 0.402, 0.421, 0.433, 0.421, 0.423 and 0.478 for years 2004 to 2010 respectively. Apart from the sample period's difference, the difference is also due to the dimensions used in computing the index where the author also added cost and ease dimensions. Despite using different dataset (i.e., using different set of countries and period of years) and applying different index computation (i.e., computed using different type of financial services, dimensions and formula), the results are considerably similar.

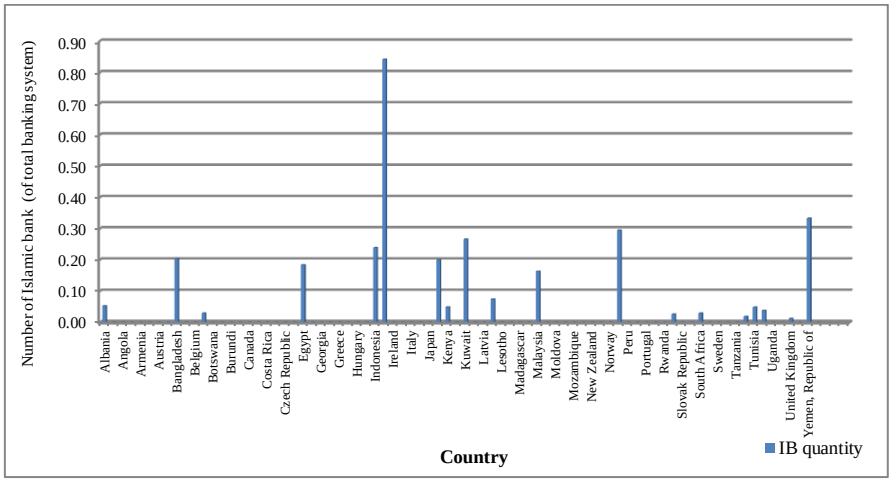
Beside that, the descriptive statistics for CIFI and Islamic banking variables are presented in bar charts for ease of comparison. These are presented in Figure 7.1 for country comparison, Figure 7.2 for legal origin comparison and Figure 7.3 for regional comparison.

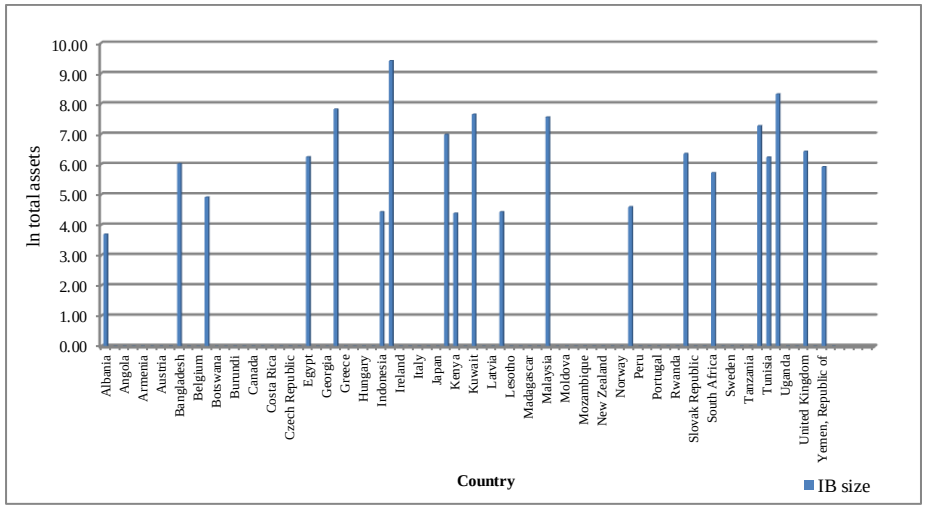
7.3 Univariate Results

Table 7.2 further examines the aggregate correlation between all variables. As far as Islamic banking variables are concerned, the correlation coefficient between *IB size* and inclusion index has the predicted positive and highly significant, with relatively

Figure 7.1 Cumulative index of financial inclusion (CIFI) and Islamic banking presence indicators, mean by country







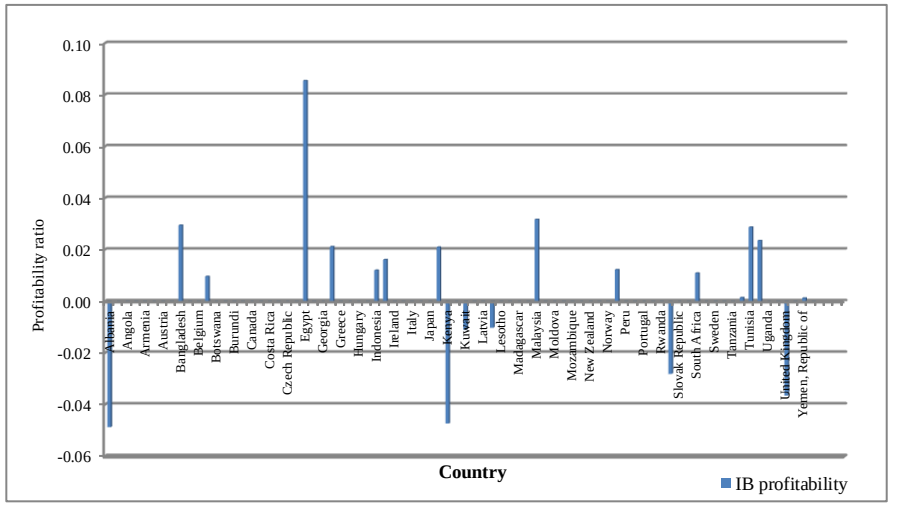
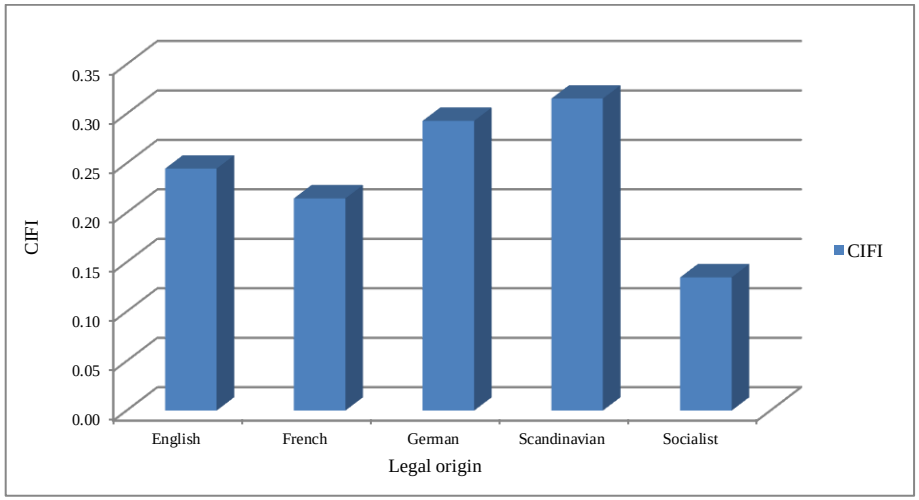
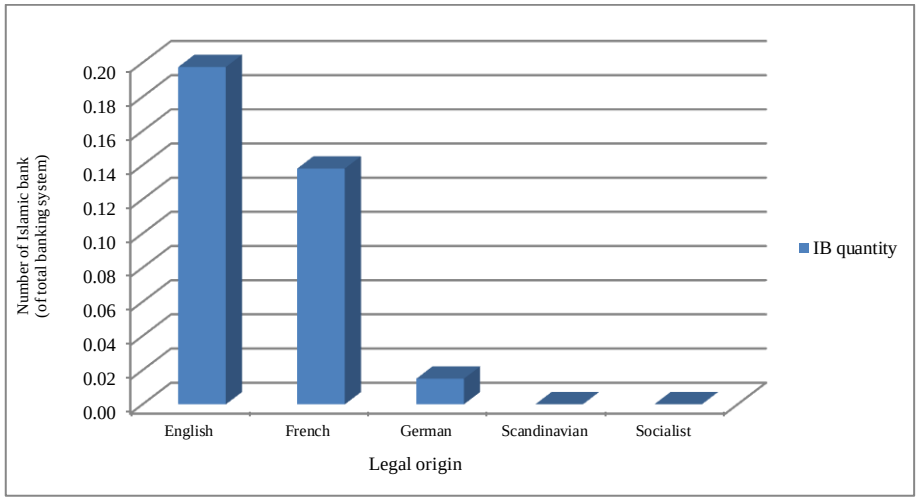
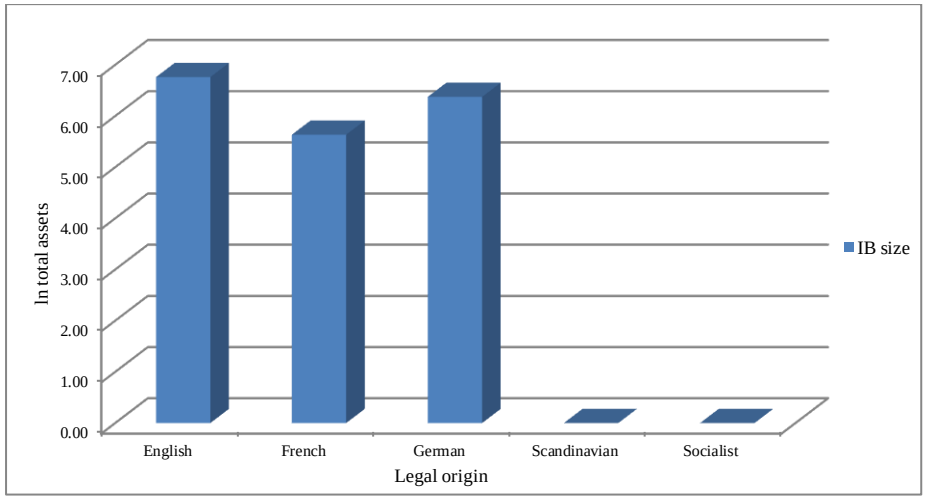


Figure 7.2 Cumulative index of financial inclusion (CIFI) and Islamic banking presence indicators, mean by legal origin







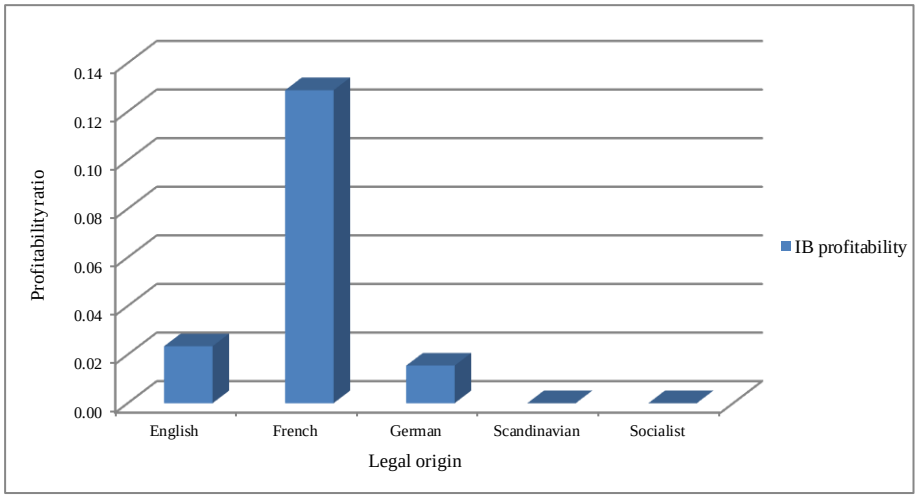
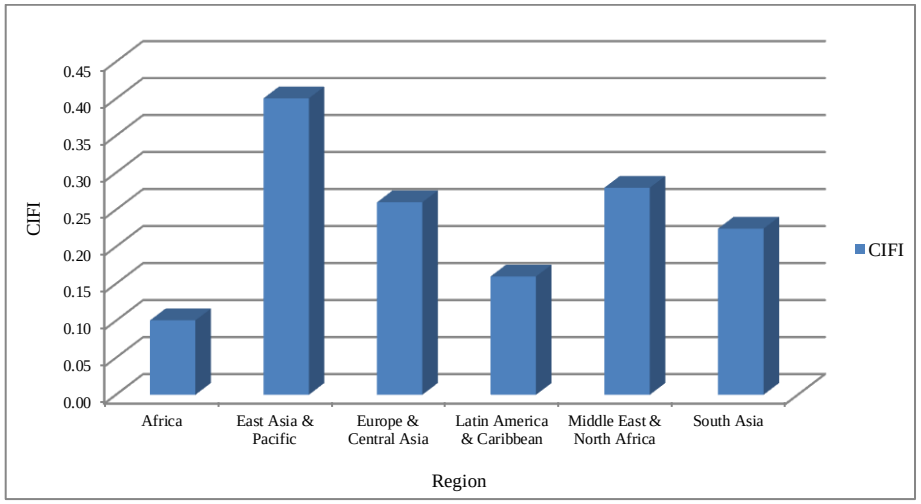
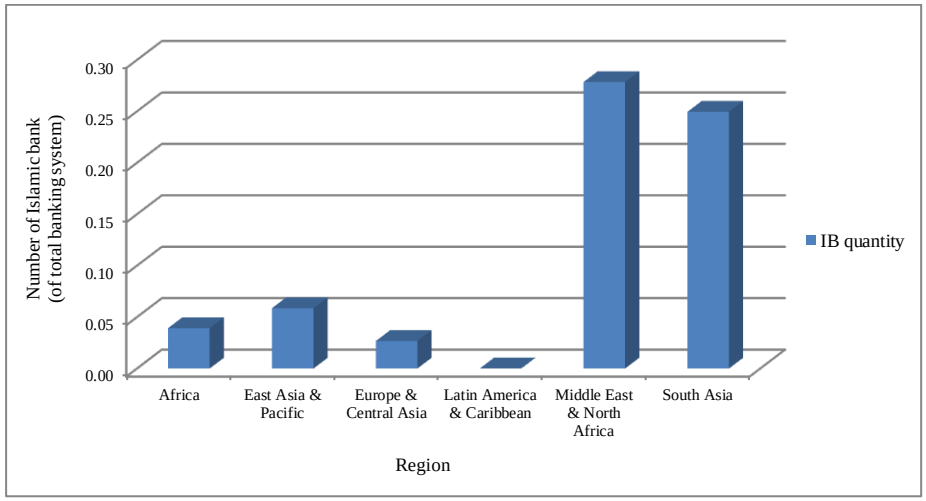
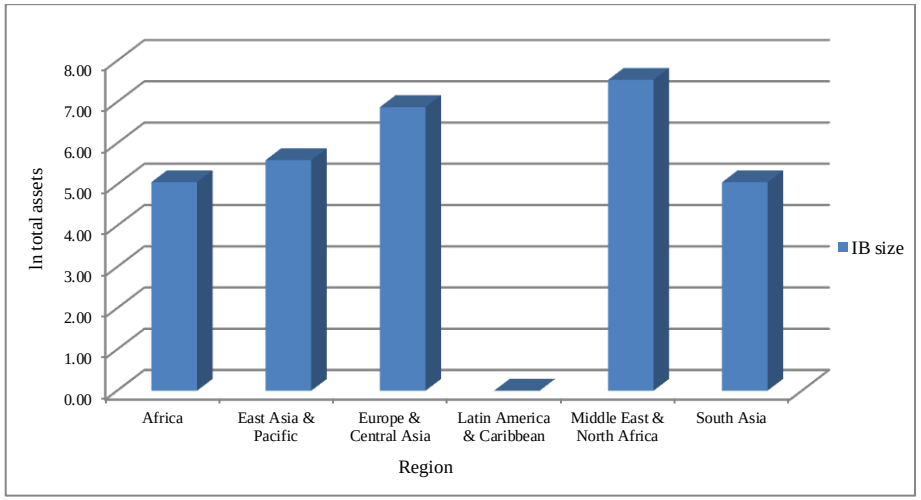


Figure 7.3 Cumulative index of financial inclusion (CIFI) and Islamic banking presence indicators, mean by region







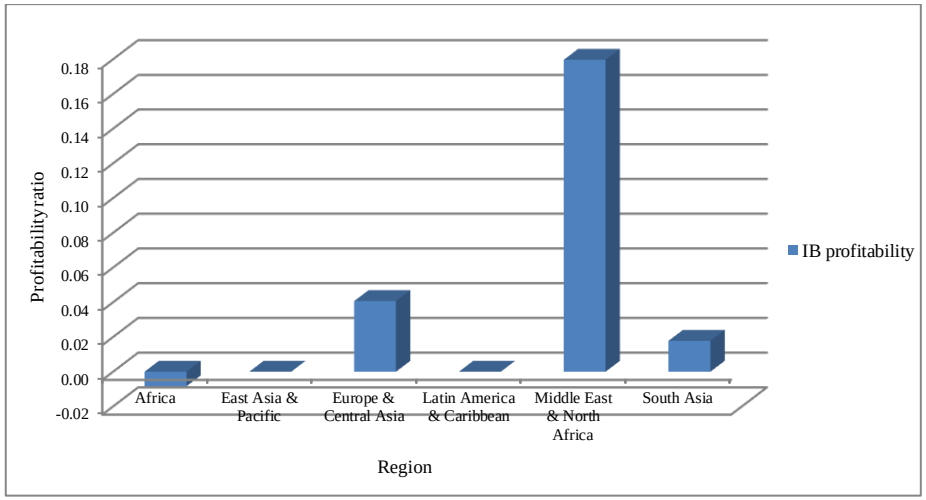


Table 7.2 Pearson correlation coefficients for key variables for CIFI

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) CIFI	1												
(2) IB quantity	-0.0043	1											
(3) IB size	0.2396***	0.6677***	1										
(4) IB profitability	0.0615	0.2373***	0.2645***	1									
(5) GDP	0.5318***	-0.1366***	-0.0180	-0.0660	1								
(6) Governance	0.5037***	-0.3181***	-0.1535***	-0.0969*	0.8018***	1							
(7) Legal rights	0.2661***	-0.1957***	-0.0664	-0.2094***	0.2143***	0.4279***	1						
(8) Credit information	0.2812***	-0.1034**	0.0775*	0.0534	0.5574***	0.4393***	0.1525***	1					
(9) Cost contracts	-0.2621***	0.0530	-0.0161	-0.0022	-0.5135***	-0.3083***	-0.0771	-0.3316***	1				
(10) Banking restrictions	0.2426***	-0.4076***	-0.2294***	-0.1781***	0.5144***	0.7172***	0.4432***	0.3418***	-0.1734***	1			
(11) Paved road	0.4450***	0.0276	0.1937***	0.0863*	0.5401***	0.3785***	0.1478***	0.2850***	-0.3578***	0.2320***	1		
(12) Phone	0.4550***	-0.1477***	-0.0859*	-0.0582	0.8528***	0.7489***	0.2642***	0.4444***	-0.4453***	0.4387***	0.5707***	1	
(13) Internet	0.5345***	-0.2163***	-0.0692	-0.0791	0.8842***	0.8458***	0.3724***	0.5194***	-0.4591***	0.5836***	0.4940***	0.8341***	1
(14) Deposit interest rate	-0.4436***	0.2618***	0.1306***	0.0937*	-0.4735***	-0.5656***	-0.2576***	-0.2933***	0.1692***	-0.4206***	-0.3227***	-0.3817***	-0.5170***
(15) Lending interest rate	-0.5540***	0.0213	-0.1294***	0.0107	-0.6980***	-0.6092***	-0.1632***	-0.4563***	0.3658***	-0.3287***	-0.4589***	-0.6009***	-0.6662***
(16) English	0.0798	0.2580***	0.2713***	-0.0535	-0.1631***	0.0116	0.4137***	-0.1729***	0.0705	0.0113	-0.1511***	-0.1626***	-0.1554***
(17) French	-0.1070**	-0.0160	-0.0118	0.0580	-0.0869*	-0.2030***	-0.6225***	0.0027	0.1927***	-0.1135**	-0.2075***	-0.1984***	-0.2028***
(18) German	0.1681***	-0.1637***	-0.1219**	0.0129	0.3124***	0.3385***	0.2698***	0.2475***	-0.2159***	0.2343***	0.2813***	0.3508***	0.4452***
(19) Socialist	-0.2045***	-0.1202**	-0.1851***	-0.0247	-0.1462***	-0.2771***	0.0146	-0.0715	-0.0991**	-0.1955***	0.2227***	0.0147	-0.1696***
(20) Scandinavian	0.0770	-0.0577	-0.0889*	-0.0118	0.2451***	0.2894***	0.0512	0.0114	-0.0789	0.1135**	-0.0423	0.1887***	0.3001***
(21) Africa	-0.3658***	-0.1326***	-0.1230**	-0.0924*	-0.5722***	-0.2668***	-0.0405	-0.4231***	0.3853***	-0.1277**	-0.5270***	-0.5219***	-0.5014***
(22) East Asia & Pacific	0.3851***	0.0831*	0.2334***	0.0110	0.1644***	0.2060***	0.2813***	0.1418***	0.0508	0.1139***	0.1300***	0.1380***	0.1945***
(23) Europe &Central Asia	0.1249**	-0.2685***	-0.1842***	-0.0989*	0.4811***	0.4074***	0.2003***	0.2263***	-0.3326***	0.3471***	0.5089***	0.5641***	0.5045***
(24) Latin America & Caribbean	-0.1837***	-0.1440***	-0.2217***	-0.0295	0.0124	-0.0780	-0.1940***	0.1682***	-0.0128	-0.0234	-0.3581***	-0.0865*	-0.0873*
(25) Middle East & North Africa	0.0998**	0.5219***	0.4271***	0.2094***	-0.0310	-0.2448***	-0.3730***	-0.1066**	-0.1268**	-0.2602***	0.1681***	-0.1258*	-0.1063***
(26) South Asia	-0.0194	0.1313***	0.0198	0.0781	-0.2514***	-0.1993***	0.1026**	-0.0685	0.2035***	-0.2347***	-0.0956*	-0.2002***	-0.2016***

Variable	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
(14) Deposit interest rate	1												
(15) Lending interest rate	0.6411***	1											
(16) English	0.0482	0.0228	1										
(17) French	0.0470	0.0687	-0.5187***	1									
(18) German	-0.2968***	-0.2682***	-0.3052***	-0.3922***	1								
(19) Socialist	0.3035***	0.2924***	-0.2117***	-0.2722***	-0.1601***	1							
(20) Scandinavian	-0.1284**	-0.1731***	-0.1017**	-0.1307***	-0.0769	-0.0534	1						
(21) Africa	0.2476***	0.4384***	0.3191***	-0.0138	-0.2116***	-0.1468***	-0.0705	1					
(22) East Asia & Pacific	-0.1239**	-0.1706***	0.2920***	-0.1625***	-0.0354	-0.1032**	-0.0496	-0.1364***	1				
(23) Europe &Central Asia	-0.1399***	-0.2998***	-0.4201***	-0.2177***	0.4432***	0.3132***	0.1911***	-0.3691***	-0.2595***	1			
(24) Latin America & Caribbean	0.0638	0.1349***	-0.0932*	0.3408***	-0.1918***	-0.1331***	-0.0639	-0.1759***	-0.1236**	-0.3346***	1		
(25) Middle East & North Africa	0.0305	-0.1161**	0.0104	0.2315***	-0.1816***	-0.1260**	-0.0605	-0.1665***	-0.1170**	-0.3167***	-0.1509***	1	
(26) South Asia	-0.0742	0.0989**	0.1337***	-0.1356***	-0.0152	0.0633	-0.0456	-0.1254**	-0.0882*	-0.2386***	-0.1137**	-0.1076**	1

The correlations are based on 400 country-year observations (i.e., 80 countries with year observations from 2007 to 2011). The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP

in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa*, *East Asia & Pacific*, *Europe & Central Asia*, *Latin America & Caribbean*, *Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank.

moderate association (0.2396). Notwithstanding, its association with the other two Islamic banking variables (i.e., *IB quantity* and *IB profitability)* are not significant. The correlation coefficient between inclusion index and other variables (i.e., macroeconomics, overall institutional environment, contractual and informational framework, regulatory restrictions and physical infrastructure) generally has the predicted positive/negative signs and significant. In general, the correlations among all independent variables are reasonably modest. The highest correlation of 0.8842 between GDP and internet variables is relatively moderate. These suggest that multicollinearity is unlikely to be a major issue in the regressions.

A moderate significant correlation between the inclusion index and *IB size* as well as low insignificant correlation between inclusion index and the other two Islamic banking variables (i.e., *IB quantity* and *IB profitability)* may infer the presence of heterogeneity in the sample thereby justifying a further examination on the sub sample of countries with Islamic banking presence (i.e., discussed further in Chapter 8). Using a single central tendency measure (i.e., mean) in an analysis is argued to be misleading and inadequate. Principally, institutional theory attempts to describe the deeper and more resilient aspects of how institutions are created, maintained, changed and dissolved (Scott, 2004). This suggests that the incidence of financial inclusion involves institutional processes and structures (Buckland, 2012) that created and shaped various levels of financial inclusion. Given the complex nature of financial inclusion, comprehending it processes would require good understanding of the dynamic of the factors at different levels of financial inclusion. In particular, we are interested in understanding the differences between the determinants of lower and

higher financial inclusion, especially the role of institutional settings in creating and shaping those difference levels of inclusion.

Further, *t*-tests of differences in means are computed to specifically observe differences across a few groups of variables. Table 7.3 shows that there is statistically significant difference of inclusion index between countries with and without Islamic banking.

While Islamic banking coefficient is significant; it does have zero (0) coefficient. This could suggest that there is relatively no difference in terms of the contribution between

Table 7.3 Differences in means comparisons

Variable		*Tests of means (P-values)*
Islamic banking presence	Country with Islamic banking vs. country without Islamic banking	0.0000***
Legal origins	English origin vs. other legal origins	0.1109
	French origin vs. other legal origins	0.0324**
	German origin vs. other legal origins	0.0007***
	Socialist origin vs. other legal origins	0.0000***
	Scandinavian origin vs. other legal origins	0.1242
Regions	Africa vs. other region	0.0000***
	East Asia & Pacific vs. other region	0.0000***
	Europe &Central Asia vs. other region	0.0124**
	Latin America & Caribbean vs. other region	0.0002***
	Middle East & North Africa vs. other region	0.0460**
	South Asia vs. other region	0.6984
Year	2007 vs. 2008	1.0000
	2008 vs. 2009	1.0000
	2009 vs. 2010	1.0000
	2010 vs. 2011	1.0000
Income level	Low vs. other level	0.0000***
	Lower middle vs. other level	0.0000***
	Upper middle vs. other level	0.0213**
	High vs. other level	0.0000***

***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

Islamic banking and conventional banking towards financial inclusion. With a few exceptions, the results also demonstrate that there are statistically significant

difference of financial inclusion with respect to legal origins and regions. Meanwhile, there is no significant difference across the time periods, hence suggesting that financial exclusion is a natural phenomenon which could not be cured within short periods of time. In addition, the results indicate that there is also statistically significant difference of inclusion index with regards to income level. This further suggests that there is the relationship between income level and financial inclusion.

7.4 Multivariate Results

Table 7.4 presents the analysis of panel data (i.e., fixed effects and random effects) and OLS results of the investigation of the determinants of financial inclusion. Since there are arguments that OLS results may be biased due to the failure to control time-invariant heterogeneity [see, for example, Bevan & Danbolt (2004)], the results of panel data analysis is therefore conducted for the present study. This argument is confirmed where, based on the fixed effects estimate, it is showed that one can reject the null hypothesis of no unobservable time-invariant country-specific effects (i.e., $\mu_i = 0$) in the sample, at less than 1% level [F-statistic = 29.59, 31.73, 29.37 and 32.13 for Models 1, 2, 3 and 4, respectively]. This is a clear indicator that bias and inefficacy may appear in the concurrently reported OLS estimates, which indicate its estimation is no longer the best linear unbiased estimator (BLUE). Hence, the results of panel data analysis are adopted for the present study.

Nonetheless, it "is not as easy as a choice as it might seem" (Baltagi, 2005, p.19) to select between the fixed effects and the random effects. The formal Hausman specification test for fixed versus random effects panel estimation cannot reject the null hypothesis that difference in coefficients is *not systematic* (or random) and thus

Table 7.4 Multivariate results of the determinants of financial inclusion

Independent variables	*Exp. sign*	*Fixed Effects*				*Random Effects*				*OLS*			
		(1)	*(2)*	***(3)***	***(4)***	***(5)***	***(6)***	***(7)***	***(8)***	*(9)*	*(10)*	*(11)*	*(12)*
IB quantity	?	2.2497	-1.8082			**-1.4518**	**-1.2955**			-2.4956***	-1.3151***		
		(0.71)	(-1.08)			**(-0.99)**	**(-1.03)**			(-5.02)	(-2.69)		
IB size	?	0.1284**		0.0870***		**0.0378****		**0.0396****		0.0478***		0.0328**	
		(2.22)		(2.6)		**(1.99)**		**(2.26)**		(3.11)		(2.05)	
IB profitability	?	1.7283			1.3638	**2.1249**			**1.0335**	2.1781			-1.4744
		(0.94)			(0.94)	**(1.33)**			**(0.73)**	(1.14)			(-1.08)
IB quantity x size	?	-0.3034	0.2130	-0.0386		**0.1167**	**0.1328**	**-0.0606**		0.1449***	0.1065**	-0.0814**	
		(-0.78)	(1.06)	(-0.53)		**(0.67)**	**(0.88)**	**(-1.17)**		(2.88)	(2.03)	(-2.46)	
IB quantity x profitability	?	-0.6475	-0.9922		-12.7070*	**-3.0036**	**-1.9143**		**-11.6287**	31.4982***	2.4615		-0.6703
		(-0.07)	(-0.27)		(-1.72)	**(-0.36)**	**(-0.55)**		**(-1.62)**	(2.67)	(0.93)		(-0.05)
IB size x profitability	?	-0.2883		-0.0222	0.1488	**-0.2945**		**-0.0207**	**0.1339**	-1.1677**		-0.0923	0.2314
		(-0.66)		(-0.22)	(0.49)	**(-0.79)**		**(-0.22)**	**(0.45)**	(-2.37)		(-1.03)	(0.53)
GDP	+	-0.1697	-0.1620*	-0.1782*	-0.1525*	**-0.0782**	**-0.0707**	**-0.0725**	**-0.0690**	0.0436	0.0386	0.0382	0.0348
		(-1.84)	(-1.74)	(-1.95)	(-1.66)	**(-1.42)**	**(-1.28)**	**(-1.33)**	**(-1.25)**	(1.63)	(1.43)	(1.42)	(1.28)
Governance	+	0.1233	0.1144	0.1091	0.1213	**0.1494***	**0.1262**	**0.1578***	**0.1287**	0.1730***	0.1321**	0.1578***	0.1472***
		(0.95)	(0.88)	(0.85)	(0.94)	**(1.77)**	**(1.5)**	**(1.89)**	**(1.53)**	(3.32)	(2.4)	(2.88)	(2.9)
Legal rights	+	0.0228*	0.0204	0.0225*	0.0205	**0.0213***	**0.0199***	**0.0206***	**0.0211***	0.0225**	0.0266**	0.0278***	0.0281**
		(1.81)	(1.6)	(1.78)	(1.62)	**(1.87)**	**(1.75)**	**(1.82)**	**(1.85)**	(2.04)	(2.53)	(2.75)	(2.54)
Credit information	+	-0.0071	-0.0071	-0.0071	-0.0068	**-0.0055**	**-0.0043**	**-0.0066**	**-0.0042**	-0.0233*	-0.0100	-0.0196	-0.0120
		(-0.6)	(-0.59)	(-0.6)	(-0.57)	**(-0.5)**	**(-0.39)**	**(-0.6)**	**(-0.39)**	(-1.76)	(-0.84)	(-1.44)	(-1.03)
Cost contracts	-	-1.0481***	-0.9650***	-1.0025***	-1.0222***	**-0.4936*****	**-0.4688*****	**-0.4914*****	**-0.5020*****	-0.0975	-0.0859	-0.1218*	-0.1172*
		(-4.16)	(-3.84)	(-4.02)	(-4.05)	**(-3.07)**	**(-2.9)**	**(-3.07)**	**(-3.1)**	(-1.6)	(-1.33)	(-1.71)	(-1.66)
Banking restrictions	-	-0.0045**	-0.0039**	-0.0044**	-0.0040**	**-0.0041*****	**-0.0040****	**-0.0041*****	**-0.0040****	-0.0057**	-0.0058**	-0.0056**	-0.0055**
		(-2.56)	(-2.19)	(-2.49)	(-2.27)	**(-2.59)**	**(-2.53)**	**(-2.62)**	**(-2.55)**	(-2.43)	(-2.13)	(-2.29)	(-2.19)
Paved road	+	0.0027	0.0029	0.0028	0.0027	**0.0024***	**0.0028***	**0.0025***	**0.0028***	0.0017***	0.0025***	0.0020***	0.0027***
		(1.31)	(1.38)	(1.34)	(1.33)	**(1.63)**	**(1.92)**	**(1.69)**	**(1.92)**	(2.62)	(3.31)	(3.04)	(3.71)
Phone	+	0.0023	0.0022	0.0022	0.0024	**0.0008**	**0.0005**	**0.0013**	**0.0009**	-0.0026	-0.0033	-0.0015	-0.0031
		(0.62)	(0.59)	(0.6)	(0.65)	**(0.27)**	**(0.18)**	**(0.43)**	**(0.3)**	(-1.05)	(-1.42)	(-0.59)	(-1.34)
Internet	+	0.0061***	0.0060***	0.0062***	0.0059***	**0.0056*****	**0.0052*****	**0.0053*****	**0.0052*****	0.0017	0.0026	0.0020	0.0027
		(3.01)	(2.96)	(3.11)	(2.99)	**(3.1)**	**(2.88)**	**(2.98)**	**(2.93)**	(0.96)	(1.44)	(1.11)	(1.5)
Deposit interest rate	?	0.0749	-0.0253	0.0054	-0.0009	**-0.0309**	**0.0574**	**-0.0424**	**0.0231**	-0.6962	-0.5454	-0.9942	-0.8411
		(0.1)	(-0.03)	(0.01)	(0)	**(-0.05)**	**(0.09)**	**(-0.06)**	**(0.04)**	(-1.08)	(-1)	(-1.57)	(-1.48)
Lending interest rate	?	-0.2466	-0.2456	-0.2387	-0.3134	**-0.3894****	**-0.4322**	**-0.3575**	**-0.4685**	-0.6915**	-0.8453***	-0.7238**	-0.8397***
		(-0.47)	(-0.47)	(-0.46)	(-0.6)	**(-0.84)**	**(-0.94)**	**(-0.78)**	**(-1.01)**	(-2.1)	(-2.57)	(-2.06)	(-2.6)
English	?					**0.0639**	**0.1138**	**0.0476**	**0.1132**	0.1112	0.1718*	0.1120	0.1489
						(0.21)	**(0.37)**	**(0.16)**	**(0.37)**	(1.2)	(1.73)	(1.23)	(1.44)
French	?					**0.1973**	**0.2050**	**0.1854**	**0.2142**	0.1969**	0.2179**	0.2019**	0.2320**
						(0.67)	**(0.69)**	**(0.63)**	**(0.72)**	(2.17)	(2.3)	(2.27)	(2.46)
German	?					**-0.0159**	**-0.0210**	**-0.0060**	**-0.0137**	0.0918	0.0605	0.0776	0.0739
						(-0.06)	**(-0.07)**	**(-0.02)**	**(-0.05)**	(1.4)	(0.94)	(1.14)	(1.16)
Socialist	?					**-0.1301**	**-0.2015**	**-0.1078**	**-0.1681**	0.0183	-0.0467	0.0355	0.0126
						(-0.39)	**(-0.6)**	**(-0.32)**	**(-0.5)**	(0.15)	(-0.44)	(0.3)	(0.12)
Africa	?					**0.0131**	**0.0154**	**0.0193**	**0.0405**	-0.0431	-0.0001	-0.0070	0.0201
						(0.07)	**(0.08)**	**(0.11)**	**(0.22)**	(-0.73)	(0)	(-0.12)	(0.32)

Independent variables	*Exp. sign*	*Fixed Effects*				*Random Effects*				*OLS*			
		(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
East Asia & Pacific	?					**0.4880****	**0.5983*****	**0.4443****	**0.5521*****	0.4817***	0.5351***	0.4170***	0.4815***
						(2.32)	**(2.93)**	**(2.16)**	**(2.74)**	(4.52)	(4.6)	(4.09)	(4.36)
Europe & Central Asia	?					**0.0568**	**0.1206**	**0.0221**	**0.0963**	0.0653	0.1197*	0.0317	0.0711
						(0.32)	**(0.7)**	**(0.13)**	**(0.56)**	(0.93)	(1.82)	(0.44)	(1.14)
Middle East & North Africa	?					**0.1612**	**0.2568**	**0.1299**	**0.2092**	0.2571***	0.2883***	0.2008**	0.2085***
						(0.83)	**(1.35)**	**(0.68)**	**(1.17)**	(3.07)	(3.92)	(2.45)	(3.26)
South Asia	?					**0.3076**	**0.3451**	**0.2610**	**0.3076**	0.2631***	0.2677***	0.1950***	0.2153***
						(1.46)	**(1.64)**	**(1.26)**	**(1.47)**	(3.44)	(3.5)	(2.59)	(2.97)
2007		0.0281	0.0149	0.0231	0.0179	**0.0366**	**0.0261**	**0.0289**	**0.0290**	0.0000	0.0177	0.0053	0.0170
		(0.64)	(0.34)	(0.53)	(0.41)	**(1.02)**	**(0.73)**	**(0.81)**	**(0.81)**	(0)	(0.26)	(0.08)	(0.24)
2008		0.0403	0.0302	0.0387	0.0303	**0.0393**	**0.0308**	**0.0344**	**0.0317**	0.0118	0.0229	0.0142	0.0234
		(1.19)	(0.89)	(1.15)	(0.9)	**(1.29)**	**(1.02)**	**(1.14)**	**(1.05)**	(0.23)	(0.45)	(0.28)	(0.45)
2009		0.0030	-0.0036	-0.0011	-0.0010	**0.0128**	**0.0076**	**0.0099**	**0.0090**	0.0102	0.0136	0.0065	0.0121
		(0.09)	(-0.11)	(-0.04)	(-0.03)	**(0.47)**	**(0.28)**	**(0.37)**	**(0.33)**	(0.22)	(0.29)	(0.14)	(0.25)
2010		-0.0070	-0.0106	-0.0092	-0.0100	**-0.0043**	**-0.0067**	**-0.0059**	**-0.0068**	-0.0088	-0.0083	-0.0134	-0.0104
		(-0.28)	(-0.43)	(-0.37)	(-0.4)	**(-0.19)**	**(-0.29)**	**(-0.26)**	**(-0.3)**	(-0.19)	(-0.18)	(-0.29)	(-0.22)
CONSTANT		1.1377	1.2492	1.2725	1.1868	**0.1989**	**0.1160**	**0.1684**	**0.0963**	-0.5277**	-0.6312***	-0.5448*	-0.6005**
		(1.4)	(1.52)	(1.58)	(1.48)	**(0.33)**	**(0.19)**	**(0.28)**	**(0.16)**	(-2.3)	(-2.77)	(-2.36)	(-2.55)
Adj. R^2		-	-	-	-		-	-	-	0.5481	0.4913	0.5154	0.5011
Joint test statistic (regression)		2.34***	2.18***	2.55***	2.37***	**108.68*****	**100.22*****	**105.61*****	**101.59*****	38.20***	28.70***	36.84***	27.96***
Corr (μ_i, x)		-0.5530	-0.2928	-0.3822	-0.2965	**0.0000**	**0.0000**	**0.0000**	**-0.2560**	-	-	-	-
F-statistic (all μ_i= 0)		29.59***	31.73***	29.37***	32.13***	-	-	-	-	-	-	-	-
Hausman test FE vs RE		23.65	11.90	16.63	12.78	-	-	-	-	-	-	-	-
R^2 within		0.1411	0.1151	0.1319	0.1239	**0.1167**	**0.1007**	**0.1106**	**0.1095**	-	-	-	-
R^2 between		0.2045	0.1772	0.2176	0.2028	**0.5244**	**0.5137**	**0.5193**	**0.5046**	-	-	-	-
R^2 overall		0.1971	0.1718	0.2101	0.1962	**0.4963**	**0.4854**	**0.4911**	**0.4774**	-	-	-	-

The full sample consists 400 country-year observations (i.e., 80 countries with year observations from 2007 to 2011). The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank. All estimates include observation year dummies. White's (1980) heteroskedasticity-consistent covariance matrix estimation is used to correct for heteroskedasticity in OLS. *t*-statistics in parentheses for fixed effects and OLS models and *z*-statistics in parentheses for random effects model. Joint test statistic for fixed effects and OLS models is the F-statistic. Joint test statistic for random effects model is the Wald χ^2. Random effects estimate is preferred based on Hausman test. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

the random effects methods are adopted for all regression tests (i.e., Models 5, 6, 7 and 8).

7.4.1 Institutional setting variables

7.4.1.1 Islamic banking presence

On the possible empirical relationship between Islamic banking presence and financial inclusion, the evidence is mixed. The magnitude of the coefficients suggest that the influence of Islamic banking presence on financial inclusion is relatively moderate, with mixed signs and generally not significant except for *IB size* variable. Table 7.4 reports a positive significant link between inclusion level and Islamic banking size (at the 5% level), indicating that the presence of Islamic banking as an institutional setting, in general, shapes financial inclusion. There is no other prior study that could be appropriately compared with, except for the study done by Ben Naceur et al. (2015). They found that Islamic banking has positive relationship with the use of credit by households and firms. However, this present results lends supports to Čihák & Hesse (2010) and Beck, Demirgüç-Kunt, & Merrouche, (2013) studies which argues that differences between Islamic and conventional banks are driven by the size of Islamic banks (i.e., small Islamic banks are appears more stable). Remarkably, though, there is no significant association with Islamic banking quantity and its profitability as well as all the interaction terms.

Although the impact of Islamic banking is marginal, this finding helps to improve our understanding on the theoretical prediction of a positive association between financial inclusion and Islamic banking presence as an institutional setting. Practically,

compared with its counterpart, Islamic bank has relatively less advantage in some aspects (i.e., in terms of quantity, size and profit) due to economies of scale (Wilson, 2004; Al-Maraj, 2009; Ahmed, 2013; Beck, Demirgüç-Kunt, & Merrouche, 2013). Despite having less advantage in terms of size specifically, this study purports that the size of Islamic banking matter to improve level of financial inclusion. The case can be exemplified by countries of Kuwait and Pakistan (refer panel B of Table 7.1). With share of Islamic banking asset of total banking system in Kuwait is 27%, its level of inclusion is 0.29, as compared to Pakistan that only has 9% share, its level of inclusion is lower, i.e., 0.13. Referring to the view put forward by Gimet & Lagoarde-Segot (2012), on the one hand i.e., at the macro level, this implies that Islamic bank needs to have bigger size of assets to exert financial inclusion. With larger size, Islamic bank can be better positioned to take advantage of scale economies and therefore could contribute more to the society and simultaneously, impose lower barrier to access financial services. On the other hand, i.e., at the micro level, smaller banks (i.e., in this case, the majority of Islamic banks), can better promote access to finance with strong proximity to their customers and offering microfinance to the riskier clients. All in all, these results indicates that the institutional setting created by Islamic banking system has the potential in driving financial inclusion, both at the macro and micro level. However, the affect is mixed. This, to a certain extent, reflects on what Demirgüç-Kunt, Beck, & Honohan (2008, p.2) note that 'financial sector reforms that promote inclusive access to financial services are still at the core of the development agenda'.

7.4.1.2 Other institutional setting variables

As for the remaining institutional variables, they behave as predicted. This study observes a positive relationship between financial access and governance level, but significant only at 10%. However, this is in line with the study by Beck et al., (2007), which argues that the quality of the overall institutional environment is important for financial outreach. This proves that good institutional environment leads to better access in financial system.

As far as contractual and informational framework is concerned, the findings seem to support the important of this determinant on financial inclusion. Although have less significant (i.e., at 10%), this significant relationship between inclusion index and legal rights supports the previous evidence [i.e., Beck, et al., (2007), Qian & Strahan (2007), Beck, et al., (2008) and Gimet & Lagoarde-Segot (2012)] that country with adequate legal rights could help better in access to finance. While, the highly significant negative relationship between financial inclusion and contractual framework is consistent with the findings of Ge et al. (2012) and Beck et al. , (2007). This finding supports the notion that cost for enforcing contracts is certainly affect the financially excluded. Altogether, these findings imply that the contractual and informational framework triggers financial inclusion.

The strongly negative significant coefficient for banking restrictions is supports the evidence that barriers for financial inclusion are higher in countries where there are more stringent restrictions on bank activities and entry (Beck et al., 2008). This suggests that regulatory restriction never drives financial inclusion.

With regard to interest rates, the coefficient of lending rate is negatively and significantly (i.e., at 5%) correlated with level of financial inclusion. Apart of complementing Sarma & Pais (2011) study (i.e., find the same negative sign for interest rate but found no significant association), this finding not only support the hypothetical argument that interest rate may inhibit the expansion of credit and increase actual costs paid by consumers (Consultative Group to Assist the Poor (CGAP), 2009), but also support Gimet & Lagoarde-Segot (2012) study which found negative relationship between the interest spread and credit. This result indicates that, countries that impose higher lending rate inhibit financial inclusion.

Turning to the role of legal origin, it appears that the OLS estimate shows statistically significant correlation between inclusion and legal origin (i.e., French). However, the effect of the legal origin variable is not significant under the panel data method. The relatively small influence of this variable is consistent with the findings of Beck et al., (2007), suggesting a less impact of the legal history on financial inclusion.

It is evidenced that that East Asia & Pacific region exerts a positive influence on the degree of least-advantaged people and statistically significant for both, OLS estimate and panel data method. As for Middle East & North Africa and South Asia, only OLS estimate shows the effect of these regions on level of inclusion with statistically significant. This finding helps to better understand Kušar (2011) who mentioned that "the institutional approach in economic geography is the notion that differences in economic development between regions are actually the result of interregional differences in institutions". Specifically, we could say that financial inclusion is regionally-specific.

The above findings on the other institutional setting variables seem to support the general notion that institutional framework plays an essential role in expanding financial access as remarked by Beck & Torre (2007) and Beck & Demirguc-Kunt (2008).

7.4.2 Other explanatory variables

The other variables enter with the expected signs in Table 7.4 regressions. The significant positive relationship between inclusion level and both paved road and internet are consistent with studies by Beck et al., (2008), Beck, Demirguc-Kunt, et al., (2007) and Sarma & Pais (2011). This finding further support the importance of physical infrastructure in promoting financial access.

7.5 Robustness Checks

A number of tests are conducted to examine the robustness of the results obtained in this chapter as follows:

7.5.1 Financial inclusion indicators regression specifications

In the earlier analyses, this study employs index of financial inclusion (i.e., CIFI) to identify the determinants of financial access. This index is computed using four variables representing two dimensions, i.e., use and outreach. Considering that the measurement/index are not very well supported[50], it is worth to examine this present study using the conventional method as initiated by Beck et al., (2007). For robustness

[50] Continuous modifications are being made to find a comprehensive measure of financial inclusion since there is no single measurement of financial inclusion can be applied cross-country. For detail, refer Chapter 3.

purpose, in this section, individual financial inclusion indicator specifications are employed. The regression models similar to those in Table 7.4 are rerun with these alternative financial inclusion indicators as the dependent variables. These indicators regression specifications, which focus on individual outreach and usage dimensions, are useful for specifically explaining the impact of country's institutional setting on its banking facilities (i.e., bank's branches and ATMs) and financial services (i.e., deposits and loans). However, to the extent that Islamic banking presence affects individual banking facilities and financial services, the indicator specifications will underestimate the true impact of Islamic banking environment as institutional setting as a whole on financial inclusion. The results are reported in Table 7.5.

With regards to overall institutional settings variables, with a few exceptions, we continue to find statistically significant impact of institutional settings on financial inclusion using these specifications with the main results. However, for *IB size* variable specifically, the results are mixed (i.e., with mixed signs and generally not significant). It appears that most of the OLS estimates of *IB size* are statistically significant. However, the effect of this variable is not significant under the panel data method. Interesting though, the impact of profitability is found to be positively significant with the level of financial inclusion for both deposits and loans. This supports the notion of risk-sharing in promoting financial inclusion (see, for examples, Mirakhor & Iqbal, 2012; Mohieldin, Iqbal, Rostom, & Fu, 2012; Mohieldin, 2012; El-Zoghbi & Tarazi, 2013; Martowardojo, 2015; MIFC, 2015).

Furthermore, the link between level of financial access with other variables that are governance, legal rights, cost contracts, banking restrictions and physical

Table 7.5 Multivariate results of the determinants of financial inclusion using financial inclusion indicators as dependent variables

Independent variable	*Bank branches*				*ATMs*				*Outstanding deposits*				*Outstanding loans*			
	(1)	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***	***(7)***	***(8)***	***(9)***	***(10)***	***(11)***	***(12)***	***(13)***	***(14)***	***(15)***	***(16)***
	RE	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*FE*	*RE*	*RE*	*RE*	*RE*	*RE*
IB quantity	-69.26	7.02			-236.59	537.68			-181.90***	-26.47			-228.91***	-50.16		
	(-1.19)	(0.22)			(-0.31)	(1.08)			(-2.67)	(-0.57)			(-2.88)	(-0.82)		
IB size	-0.76		-0.17		-18.20		-16.94*		0.26		0.84		-1.08		-0.71	
	(-0.73)		(-0.26)		(-1.48)		(-1.86)		(0.23)		(0.88)		(-0.94)		(-0.72)	
IB profitability	23.73			-3.08	-226.53			-122.04	140.76***			56.82	156.44**			70.66
	(0.67)			(-0.11)	(-0.41)			(-0.27)	(2.84)			(1.38)	(2.28)			(1.19)
IB quantity x size	9.86	0.75	1.65		34.02	-64.15	8.36		20.31**	2.32	-0.11		25.65***	4.00	-1.15	
	(1.37)	(0.19)	(1.17)		(0.37)	(-1.07)	(0.39)		(2.43)	(0.42)	(-0.05)		(2.65)	(0.54)	(-0.44)	
IB quantity x profitability	109.09	-156.05**		77.95	1273.06	-1024.98		3152.64	498.93*	-282.01***		90.14	412.16	-389.50***		80.21
	(0.6)	(-2.24)		(0.55)	(0.45)	(-0.92)		(1.38)	(1.93)	(-2.73)		(0.43)	(1.14)	(-2.65)		(0.27)
IB size x profitability	-11.63		-5.14***	-6.43	-33.50		-37.07	-109.46	-45.31***		-9.35***	-20.42**	-48.27***		-12.07***	-25.85**
	(-1.38)		(-2.62)	(-1.1)	(-0.25)		(-1.19)	(-1.17)	(-3.76)		(-3.21)	(-2.36)	(-2.91)		(-2.97)	(-2.08)
GDP	8.90***	9.06***	9.17***	8.89***	34.25	35.13	36.66	33.23	-11.25***	-10.38***	-13.81***	-10.04***	-2.99	-2.22	-1.72	-1.72
	(5.05)	(5.13)	(5.26)	(5.11)	(1.33)	(1.36)	(1.44)	(1.31)	(-4.81)	(-4.38)	(-5.28)	(-4.32)	(-1.03)	(-0.76)	(-0.59)	(-0.6)
Governance	-0.21	-0.52	-0.34	0.01	27.39	32.18	28.47	32.99	14.17***	13.15***	11.94***	13.97***	14.76***	14.67***	15.08***	15.72***
	(-0.09)	(-0.21)	(-0.14)	(0.01)	(0.74)	(0.87)	(0.78)	(0.9)	(4.21)	(3.88)	(3.23)	(4.15)	(3.43)	(3.43)	(3.54)	(3.68)
Legal rights	0.14	0.15	0.13	0.13	-5.20	-4.74	-5.15	-4.88	0.13	0.12	0.08	0.08	-0.25	-0.22	-0.29	-0.26
	(0.57)	(0.63)	(0.55)	(0.55)	(-1.34)	(-1.22)	(-1.33)	(-1.26)	(0.37)	(0.34)	(0.22)	(0.21)	(-0.49)	(-0.43)	(-0.58)	(-0.53)
Credit information	0.27	0.27	0.27	0.26	0.99	0.93	1.05	0.86	-0.57*	-0.57*	-0.63*	-0.59*	0.58	0.56	0.54	0.53
	(1.19)	(1.19)	(1.18)	(1.13)	(0.27)	(0.25)	(0.29)	(0.23)	(-1.71)	(-1.67)	(-1.86)	(-1.74)	(1.24)	(1.17)	(1.14)	(1.12)
Cost contracts	9.94**	9.50**	10.13**	10.30**	192.32***	172.61**	184.14**	185.55**	-10.19	-9.48	-6.93	-9.37	-9.14	-9.50	-8.56	-9.77
	(2.06)	(1.98)	(2.11)	(2.14)	(2.63)	(2.38)	(2.54)	(2.55)	(-1.54)	(-1.42)	(-0.97)	(-1.4)	(-1.08)	(-1.12)	(-1.01)	(-1.15)
Financial restrictions	0.11***	0.10***	0.10***	0.10***	1.43***	1.31**	1.42***	1.37**	0.09*	0.08	0.07	0.09*	0.31***	0.30***	0.31***	0.31***
	(3.1)	(2.88)	(3)	(3)	(2.65)	(2.44)	(2.64)	(2.56)	(1.79)	(1.58)	(1.32)	(1.77)	(4.6)	(4.35)	(4.51)	(4.56)
Paved road	0.02	0.02	0.02	0.02	0.49	0.44	0.49	0.46	0.13**	0.13**	0.13**	0.14**	-0.36***	-0.36***	-0.35***	-0.35***
	(0.6)	(0.58)	(0.61)	(0.52)	(0.8)	(0.71)	(0.8)	(0.76)	(2.34)	(2.36)	(2.25)	(2.43)	(-4.87)	(-4.8)	(-4.71)	(-4.76)
Phone	-0.03	-0.03	-0.03	-0.03	1.53	1.65	1.56	1.56	0.48***	0.51***	0.50***	0.51***	0.45	0.50***	0.49***	0.49***
	(-0.48)	(-0.36)	(-0.4)	(-0.43)	(1.36)	(1.46)	(1.39)	(1.38)	(4.72)	(4.92)	(4.69)	(4.94)	(3.21)	(3.52)	(3.53)	(3.52)
Internet	0.02	0.02	0.01	0.01	-1.52**	-1.46**	-1.52**	-1.46**	-0.01	-0.02	-0.06	-0.03	0.04	0.03	0.01	0.02
	(0.57)	(0.45)	(0.36)	(0.34)	(-2.48)	(-2.39)	(-2.51)	(-2.42)	(-0.11)	(-0.4)	(-1.03)	(-0.61)	(0.48)	(0.39)	(0.1)	(0.2)
Deposit interest rate	17.55	18.64	19.17	19.72	105.74	104.87	108.44	103.77	18.27	18.91	24.97	21.56	48.52*	46.03	49.92*	48.96*
	(1.26)	(1.34)	(1.38)	(1.42)	(0.48)	(0.47)	(0.49)	(0.47)	(0.91)	(0.92)	(1.22)	(1.06)	(1.71)	(1.6)	(1.74)	(1.71)
Lending interest rate	-6.73	-8.17	-7.34	-7.06	-17.96	-22.78	-23.20	-0.70	-28.92**	-32.75**	-31.11**	-31.16**	-26.94	-29.03	-27.89	-26.91
	(-0.67)	(-0.81)	(-0.73)	(-0.7)	(-0.11)	(-0.14)	(-0.15)	(0)	(-1.99)	(-2.21)	(-2.09)	(-2.12)	(-1.32)	(-1.41)	(-1.36)	(-1.31)
English	62.38	59.70	60.10	60.36	142.62	97.88	140.94	94.43	-25.01	-25.37		-25.76	20.32	17.33	18.04	16.20
	(1.14)	(1.09)	(1.11)	(1.1)	(0.5)	(0.34)	(0.5)	(0.33)	(-0.98)	(-1.01)		(-1.03)	(0.96)	(0.82)	(0.86)	(0.77)
French	63.78	61.63	61.99	61.72	84.90	62.21	87.05	61.10	-18.92	-20.52		-19.99	17.65	15.30	15.74	15.86
	(1.2)	(1.17)	(1.19)	(1.17)	(0.31)	(0.23)	(0.32)	(0.22)	(-0.77)	(-0.84)		(-0.82)	(0.86)	(0.75)	(0.77)	(0.78)
German	42.66	41.99	42.31	42.25	163.29	158.30	166.32	155.73	-39.44	-39.36		-38.40	-10.16	-10.05	-9.07	-8.83
	(0.82)	(0.81)	(0.82)	(0.81)	(0.6)	(0.58)	(0.62)	(0.58)	(-1.63)	(-1.64)		(-1.6)	(-0.5)	(-0.5)	(-0.45)	(-0.44)
Socialist	29.83	29.69	29.97	29.86	98.45	120.23	109.33	110.46	-63.63**	-63.32**		-61.59**	-14.65	-11.61	-11.14	-9.23
	(0.54)	(0.54)	(0.55)	(0.54)	(0.33)	(0.41)	(0.38)	(0.37)	(-2.41)	(-2.41)		(-2.35)	(-0.64)	(-0.51)	(-0.49)	(-0.41)
Africa	13.73	13.53	13.63	12.67	17.84	22.63	26.33	15.07	-10.47	-9.74		-8.88	-0.43	0.82	1.39	2.32
	(0.46)	(0.45)	(0.46)	(0.42)	(0.11)	(0.14)	(0.16)	(0.09)	(-0.72)	(-0.67)		(-0.62)	(-0.03)	(0.07)	(0.11)	(0.19)
East Asia & Pacific	93.16**	88.94**	89.65**	89.56**	586.48***	510.13***	575.13***	525.77***	46.66***	42.92***		42.37**	72.06***	63.12***	64.32***	61.83***
	(2.58)	(2.49)	(2.54)	(2.51)	(3.05)	(2.74)	(3.11)	(2.83)	(2.72)	(2.59)		(2.57)	(4.94)	(4.53)	(4.55)	(4.49)
Europe & Central Asia	38.50	36.44	36.63	36.75	16.42	-28.33	8.37	-21.94	22.66*	21.08		20.16	60.51***	55.30***	55.49***	53.63***
	(1.34)	(1.28)	(1.3)	(1.29)	(0.11)	(-0.19)	(0.06)	(-0.15)	(1.65)	(1.57)		(1.51)	(5.1)	(4.79)	(4.78)	(4.69)
Middle East & North Africa	18.74	13.73	14.71	16.28	129.32	43.87	117.71	53.70	51.45***	48.54***		47.61***	58.01***	50.22***	51.69***	47.49***
	(0.61)	(0.45)	(0.49)	(0.54)	(0.76)	(0.27)	(0.73)	(0.34)	(3.38)	(3.37)		(3.38)	(4.41)	(4.01)	(4.05)	(3.97)

Independent variable	*Bank branches*				*ATMs*				*Outstanding deposits*				*Outstanding loans*			
	(1)	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***	***(7)***	***(8)***	***(9)***	***(10)***	***(11)***	***(12)***	***(13)***	***(14)***	***(15)***	***(16)***
	RE	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*FE*	*RE*	*RE*	*RE*	*RE*	*RE*
South Asia	51.52	47.55	48.12	48.01	101.77	52.24	96.63	65.15	30.61*	25.89		25.31	46.89***	39.96***	39.49***	38.52***
	(1.38)	(1.28)	(1.31)	(1.3)	(0.52)	(0.27)	(0.51)	(0.34)	(1.74)	(1.5)		(1.48)	(3.17)	(2.75)	(2.74)	(2.68)
2007	1.89**	1.88**	1.80**	1.71**	-39.25***	-36.21***	-38.30***	-36.85***	-7.73***	-8.02***	-9.42***	-8.18***	-4.92***	-4.97***	-5.45***	-5.18***
	(2.23)	(2.24)	(2.15)	(2.05)	(-3.01)	(-2.8)	(-2.96)	(-2.87)	(-6.53)	(-6.72)	(-7.54)	(-6.94)	(-3.07)	(-3.09)	(-3.39)	(-3.25)
2008	1.11*	1.09*	1.02	0.99	-35.52***	-33.35***	-35.29***	-33.44***	-5.06***	-5.33***	-6.15***	-5.54***	-1.75	-1.80	-2.25*	-2.08
	(1.7)	(1.68)	(1.57)	(1.54)	(-3.45)	(-3.26)	(-3.45)	(-3.31)	(-5.41)	(-5.65)	(-6.39)	(-5.96)	(-1.34)	(-1.37)	(-1.72)	(-1.6)
2009	1.85***	1.84***	1.82***	1.79***	-20.86**	-19.35**	-20.23**	-19.67**	-2.59***	-2.76***	-3.67***	-2.73***	-0.10	-0.17	-0.29	-0.13
	(3.01)	(3)	(2.98)	(2.92)	(-2.19)	(-2.04)	(-2.14)	(-2.08)	(-3)	(-3.15)	(-4.03)	(-3.14)	(-0.08)	(-0.15)	(-0.24)	(-0.11)
2010	1.12**	1.09**	1.09**	1.07**	-8.27	-7.63	-8.00	-7.52	-1.76**	-1.90***	-2.36***	-1.87***	-0.74	-0.85	-0.89	-0.80
	(2.35)	(2.3)	(2.3)	(2.26)	(-1.1)	(-1.01)	(-1.06)	(-1)	(-2.57)	(-2.73)	(-3.35)	(-2.71)	(-0.77)	(-0.87)	(-0.91)	(-0.83)
CONSTANT	-148.33**	-146.77**	-148.47**	-145.63**	-479.95	-453.62	-500.38	-443.49	147.60***	142.10***	162.60***	138.63***	29.88	26.10	21.07	21.15
	(-2.5)	(-2.49)	(-2.54)	(-2.47)	(-1.25)	(-1.18)	(-1.32)	(-1.16)	(4.28)	(4.12)	(7.08)	(4.05)	(0.86)	(0.75)	(0.61)	(0.61)
Joint test statistic (regression)	77.07 ***	72.22***	75.91***	74.54***	62.94***	57.07***	62.67***	60.70***	239.68***	218.41***	9.80***	226.94***	261.63***	246.57***	251.38***	252.01***
Corr (μ_i, *x*)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.1699	0.0000	0.0000	0.0000	0.0000	0.0000
F-statistic (all μ_i*= 0)*	-	-	-	-	-	-	-	-	-	-	313.48***	-	-	-	-	-
Hausman test FE vs RE (χ^2)	4.01	3.78	7.44	3.66	23.21	20.24	10.50	19.15	16.95	17.46	26.39*	24.44	18.06	22.19	23.04	21.68
R^2 *within*	0.1658	0.1527	0.1613	0.1580	0.1396	0.1140	0.1359	0.1238	0.3852	0.3521	0.3688	0.3637	0.3048	0.2794	0.2859	0.2890
R^2 *between*	0.2034	0.2053	0.2042	0.2059	0.1787	0.2077	0.1832	0.2062	0.4283	0.4366	0.0051	0.4368	0.6643	0.6579	0.6593	0.6550
R^2 *overall*	0.2034	0.2053	0.2042	0.2059	0.1787	0.2066	0.1826	0.2053	0.4278	0.4356	0.0073	0.4359	0.6571	0.6503	0.6518	0.6477

The full sample consists 400 country-year observations (i.e., 80 countries with year observations from 2007 to 2011). The dependent variables are the financial inclusion indicators (i.e., as stated in the first row). Bank branches is commercial bank branches per 1,000 km2. ATMs is referred to ATMs per 1,000 km2. Outstanding deposits is outstanding deposits from commercial banks (% of GDP). Outstanding loans is defined as outstanding loans from commercial banks (% of GDP). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and zakat) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank. All estimates include observation year dummies. White's (1980) heteroskedasticity-consistent covariance matrix estimation is used to correct for heteroskedasticity in OLS (results are not reported). *t*-statistics and *z*-statistics are in parentheses for fixed effects and random effects models, respectively. Joint test statistic for fixed effects model is the F-statistic. Joint test statistic for random effects model is the Wald χ^2. Fixed effects estimate is preferred if the Hausman test is significant, otherwise random effects estimate is adopted. Hausman test result is reported in each column. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

infrastructure, are largely consistent with the main results, indicating the importance of these elements in promoting greater use of financial services. Taken together, these results support the notion that institutional settings give impact on financial inclusion.

Since it is argued that comprehensive measure of financial inclusion is better in examining the barriers (Sarma & Pais, 2011), the results of this alternative financial inclusion specification will not invalidate the main results.

7.5.2 Sub-samples analyses

For robustness purposes, this study also employs sub-sample analyses. In the main analysis, we pooled all the financial inclusion determinants in one single regression to identify the effect of these variables on financial inclusion. This study included one new institutional setting variables i.e., Islamic banking presence. The pooled model in Table 7.4 generally supports the notion of institutional settings which have influence on financial inclusion. However, apart from governance, contractual and informational framework and regulation restrictions, the regression coefficients for Islamic banking presence, legal origin and regions are mixed, both in sign and significance. These warrant for sub sample analyses to shed lights for potential reasons and statistical influence.

The results and discussions are explained in the following sub-sections.

7.5.2.1 Islamic banking presence in countries with Islamic Financial Sector

A concern with our earlier analysis is that, by looking specifically into the countries with Islamic banking presence only, it might better explain the influence of Islamic banking existence on the level of financial inclusion. To address whether this is the case, this study investigates whether financial inclusion in countries with Islamic banks tend to have better coincide with Islamic banking presence. This study finds that, this appears to be the case. The results are shown in Table 7.6. The sub-sample analysis is largely consistent with the main results; it supports the notion that size matters in financial inclusion.

By only examining countries with Islamic banking presence (hence controlling potential bias in the full sample where Islamic banks are relatively less profitable than their conventional counterparts), the impact of profitability is also found to be positively significant with financial inclusion. This supports the importance of financial capacity of the Islamic banks in promoting financial inclusion (see, for examples, Mirakhor & Iqbal, 2012; Mohieldin, Iqbal, Rostom, & Fu, 2012; Mohieldin, 2012; El-Zoghbi & Tarazi, 2013; Martowardojo, 2015; MIFC, 2015). Overall, this implies that Islamic finance has room in supporting financial inclusion.

Other variables, that are cost contracts and internet yield consistent results with the main analysis. As far as the period of study (i.e., year 2007 to 2017) is concerned, we find statistically significant impact on Islamic banking landscape during financial crisis on financial inclusion. In other words, Islamic banking sector through its

Table 7.6 Multivariate results of the determinants of financial inclusion for countries with Islamic banking presence

Independent variables	*Exp. sign*	*Fixed Effects*				*Random Effects*				*OLS*			
		(1)	***(2)***	***(3)***	***(4)***	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
IB quantity	?	**2.5812**	**-4.1813**			-11.9851***	-5.8631***			-11.9851***	-5.8631***		
		(0.41)	**(-1.2)**			(-5.77)	(-2.86)			(-5.37)	(-4.93)		
IB size	?	**0.3270****		**0.2184*****		-0.3611***		-0.1675***		-0.3611***		-0.1675**	
		(2.6)		**(3.01)**		(-5.15)		(-2.56)		(-3.46)		(-2.38)	
IB profitability	?	**7.6812****			**5.2522***	4.8566			5.2609	4.8566			5.2609
		(2.09)			**(1.8)**	(1.2)			(1.12)	(1.52)			(1.19)
IB quantity x size	?	**-0.3408**	**0.5429**	**-0.0298**		1.5261***	0.5246**	0.0063		1.5261***	0.5246***	0.0063	
		(-0.44)	**(1.3)**	**(-0.22)**		(5.55)	(2.15)	(0.07)		(4.67)	(3.58)	(0.1)	
IB quantity x profitability	?	**3.5069**	**-0.9362**		**-29.1261****	-14.6684	7.8306		7.1405	-14.6684	7.8306		7.1405
		(0.2)	**(-0.12)**		**(-2.04)**	(-0.69)	(0.81)		(0.32)	(-0.74)	(0.96)		(0.5)
IB size x profitability	?	**-1.3654**		**-0.0269**	**0.0806**	0.0571		0.4449	-0.8076	0.0571		0.4449	-0.8076
		(-1.6)		**(-0.13)**	**(0.14)**	(0.06)		(1.61)	(-0.81)	(0.07)		(1.59)	(-1.05)
GDP	+	**-0.0128**	**-0.1722**	**-0.1009**	**-0.1517**	-0.1581	0.0971	0.0383	-0.0734	-0.1581	0.0971	0.0383	-0.0734
		(-0.04)	**(-0.45)**	**(-0.28)**	**(-0.42)**	(-1.05)	(0.59)	(0.23)	(-0.53)	(-1.07)	(0.61)	(0.26)	(-0.61)
Governance	+	**-0.6007**	**-0.4731**	**-0.8574**	**-0.2478**	0.7072***	0.2128	0.5320**	0.3527	0.7072***	0.2128	0.5320***	0.3527*
		(-1)	**(-0.75)**	**(-1.43)**	**(-0.41)**	(3.44)	(1.03)	(2.22)	(1.54)	(4.48)	(1.21)	(3.26)	(1.7)
Legal rights	+	**-0.0622**	**-0.0905**	**-0.0552**	**-0.0756**	-0.0937	0.0761	0.0765	0.1026*	-0.0937***	0.0761	0.0765	0.1026*
		(-0.26)	**(-0.34)**	**(-0.23)**	**(-0.3)**	(-1.45)	(1.15)	(1.13)	(1.66)	(-1.22)	(1.29)	(1.21)	(1.81)
Credit information	+	**-0.0098**	**-0.0106**	**-0.0009**	**-0.0197**	-0.1786***	-0.1918***	-0.1929***	-0.1986***	-0.1786	-0.1918**	-0.1929**	-0.1986**
		(-0.23)	**(-0.22)**	**(-0.02)**	**(-0.43)**	(-4.21)	(-3.89)	(-3.88)	(-3.78)	(-2.87)	(-2.57)	(-2.6)	(-2.49)
Cost contracts	-	**-4.2019****	**-2.8809**	**-2.6694**	**-4.8313*****	-0.1969	0.2539	-0.5033	-0.6020	-0.1969	0.2539	-0.5033	-0.6020
		(-2.42)	**(-1.63)**	**(-1.59)**	**(-2.68)**	(-0.5)	(0.59)	(-1.15)	(-1.42)	(-0.45)	(0.56)	(-0.96)	(-1.28)
Financial restrictions	-	**-0.0078**	**-0.0019**	**-0.0072**	**-0.0024**	-0.0023	-0.0024	-0.0069	0.0021	-0.0023	-0.0024	-0.0069	0.0021
		(-0.93)	**(-0.21)**	**(-0.85)**	**(-0.29)**	(-0.36)	(-0.34)	(-0.98)	(0.35)	(-0.46)	(-0.49)	(-1.47)	(0.48)
Paved road	+	**0.0010**	**0.0018**	**-0.0009**	**-0.0002**	0.0088**	0.0106**	0.0109**	0.0066	0.0088**	0.0106**	0.0109**	0.0066
		(0.09)	**(0.13)**	**(-0.07)**	**(-0.01)**	(2.04)	(2.15)	(2.18)	(1.44)	(2.29)	(2.45)	(2.47)	(1.7)
Phone	+	**0.0264**	**0.0353**	**0.0335**	**0.0400**	-0.0113	-0.0145	-0.0094	-0.0038	-0.0113	-0.0145	-0.0094	-0.0038
		(0.9)	**(1.12)**	**(1.13)**	**(1.34)**	(-1.06)	(-1.22)	(-0.78)	(-0.31)	(-0.85)	(-1.01)	(-0.67)	(-0.24)
Internet	+	**0.0184*****	**0.0147****	**0.0165****	**0.0147****	0.0216***	0.0096	0.0012	0.0057	0.0216*	0.0096	0.0012	0.0057
		(2.82)	**(2.1)**	**(2.51)**	**(2.24)**	(2.73)	(1.08)	(0.15)	(0.71)	(1.79)	(0.87)	(0.12)	(0.57)
Deposit interest rate	?	**6.5571**	**1.8413**	**3.8842**	**4.4571**	2.5583	1.4577	5.4568	4.7861	2.5583	1.4577	5.4568*	4.7861
		(1.57)	**(0.42)**	**(0.94)**	**(1.05)**	(0.83)	(0.41)	(1.51)	(1.27)	(1.09)	(0.55)	(1.95)	(1.63)
Lending interest rate	?	**-6.3104***	**-3.3455**	**-5.0071**	**-5.5565**	1.6317	1.3715	-4.6386	-4.1772	1.6317	1.3715	-4.6386*	-4.1772
		(-1.8)	**(-0.9)**	**(-1.44)**	**(-1.54)**	(0.52)	(0.37)	(-1.34)	(-1.2)	(0.64)	(0.55)	(-1.79)	(-1.61)
English	?					0.6825*	0.1991	0.1993	-0.1130	0.6825*	0.1991	0.1993	-0.1130
						(1.7)	(0.49)	(0.47)	(-0.24)	(2.04)	(0.62)	(0.6)	(-0.3)
French	?					0.5280	0.0354	0.1243	0.1691	0.5280	0.0354	0.1243	0.1691
						(1.45)	(0.09)	(0.31)	(0.41)	(1.17)	(0.08)	(0.29)	(0.36)
East Asia & Pacific	?					0.2942	0.0987	0.0125	0.1181	0.2942	0.0987	0.0125	0.1181
						(1.02)	(0.3)	(0.04)	(0.34)	(1.49)	(0.36)	(0.05)	(0.42)
Europe & Central Asia	?					-0.6494*	-0.5656	-0.5895	-0.8350*	-0.6494	-0.5656	-0.5895	-0.8350
						(-1.75)	(-1.33)	(-1.37)	(-1.91)	(-1.27)	(-0.94)	(-1.02)	(-1.37)
Middle East & North Africa	?					-0.5816	0.0411	-0.2897	-0.3693	-0.5816	0.0411	-0.2897	-0.3693
						(-1.22)	(0.08)	(-0.52)	(-0.7)	(-0.89)	(0.07)	(-0.43)	(-0.57)

Independent variables	*Exp. sign*	*Fixed Effects*				*Random Effects*				*OLS*			
		(1)	***(2)***	***(3)***	***(4)***	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
South Asia	?					0.4393	0.2627	-0.3353	-0.1978	0.4393**	0.2627	-0.3353	-0.1978
						(1.49)	(0.77)	(-1.09)	(-0.62)	(2.45)	(1.25)	(-1.2)	(-0.77)
2007		**0.6148*** **	**0.3442**	**0.5181** **	**0.3280***	0.0657	0.0988	-0.1450	0.0160	0.0657	0.0988	-0.1450	0.0160
		(3.01)	**(1.62)**	**(2.46)**	**(1.69)**	(0.41)	(0.53)	(-0.78)	(0.09)	(0.28)	(0.42)	(-0.64)	(0.07)
2008		**0.3995** **	**0.2315**	**0.3603** **	**0.1881**	0.0335	0.0607	-0.1475	-0.0195	0.0335	0.0607	-0.1475	-0.0195
		(2.61)	**(1.44)**	**(2.28)**	**(1.29)**	(0.22)	(0.34)	(-0.84)	(-0.11)	(0.21)	(0.43)	(-0.92)	(-0.13)
2009		**0.2572***	**0.1152**	**0.1879**	**0.1158**	0.1221	0.1106	-0.0030	0.0619	0.1221	0.1106	-0.0030	0.0619
		(2.01)	**(0.85)**	**(1.43)**	**(0.91)**	(0.92)	(0.72)	(-0.02)	(0.38)	(1.01)	(0.95)	(-0.02)	(0.46)
2010		**0.1876***	**0.0982**	**0.1458**	**0.0969**	0.0884	0.0885	0.0183	0.0596	0.0884	0.0885	0.0183	0.0596
		(2.02)	**(0.99)**	**(1.53)**	**(1.03)**	(0.74)	(0.63)	(0.13)	(0.41)	(0.92)	(0.88)	(0.17)	(0.52)
CONSTANT		**-1.0329**	**1.9341**	**-0.0809**	**2.5000**	3.6148**	-1.2046	1.3217	0.8609	3.6148*	-1.2046	1.3217	0.8609
		(-0.29)	**(0.57)**	**(-0.02)**	**(0.81)**	(2.24)	(-0.76)	(0.72)	(0.59)	(1.89)	(-0.81)	(0.74)	(0.68)
Adj. R^2		-	-	-	-	-	-	-	-	0.7120	0.6039	0.5940	0.5550
Joint test statistic (regression)		**1.98** **	**1.06*** **	**1.67***	**1.54**	271.72***	174.95***	168.87***	147.48***	21.60***	20.32***	8.46***	9.88***
Corr (μ_i, x)		**-0.9307**	**-0.8779**	**-0.8846**	**-0.9271**	0.0000	0.0000	0.0000	0.0000	-	-	-	-
F-statistic (all μ_i= 0)		**11.14*** **	**10.36*** **	**12.00*** **	**12.38*** **	-	-	-	-	-	-	-	-
Hausman test FE vs RE		**115.58*** **	**35.04*** **	**55.98*** **	**86.84*** **	-	-	-	-	-	-	-	-
R^2 within		**0.4140**	**0.2349**	**0.3262**	**0.3090**	0.0005	0.0026	0.0005	0.0106	-	-	-	-
R^2 between		**0.0087**	**0.0077**	**0.0014**	**0.0294**	0.9534	0.8343	0.8433	0.7829	-	-	-	-
R^2 overall		**0.0112**	**0.0094**	**0.0002**	**0.0306**	0.7905	0.6999	0.6925	0.6629	-	-	-	-

The full sample consists of 100 country-year observations (i.e., 20 countries with Islamic banking presence, with year observations from 2007 to 2011). The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *Africa*, *East Asia & Pacific*, *Europe & Central Asia*, *Latin America & Caribbean*, *Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank. All estimates include observation year dummies. White's (1980) heteroskedasticity-consistent covariance matrix estimation is used to correct for heteroskedasticity in OLS. *t*-statistics in parentheses for fixed effects and OLS models and *z*-statistics in parentheses for random effects model. Joint test statistic for fixed effects and OLS models is the F-statistic. Joint test statistic for random effects model is the Wald χ^2. Fixed effects estimate is preferred based on Hausman test. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

capability and capacity, manage to increase financial inclusion during the period of financial crisis and post-crisis.

7.5.2.2 Legal origins

As far as historical (evolutionary) institutionalism is concern (refer Hall & Taylor, 1996), further robustness test is also examined for legal origins. This test examines the link between financial access and historical variable as posited by Steinmo (2008) when argues that this historical institutionalism should answer "why a certain choice was made and/or why a certain outcome occurred". Despite having no country with Islamic banking, these results include Socialist origin but omit Scandinavian origin due to insufficient data. Table 7.7 presents the results.

After splitting the sample based on legal origins, the results show some differences in the correlation of legal origin with determinants of financial inclusion especially the institutional setting variables. With respect to Islamic banking variables, we continue to find a statistically significant impact of Islamic banking size on financial inclusion in countries adopting English origin. Additionally, the German legal origin is never significant in any of the regressions for Islamic banking presence. This finding, to a certain extent, also helps to better understand Grassa & Gazdar (2014)[51] who finds that Islamic financial industry is more developed in countries adopting a mixed legal system based on Common Law (i.e., English origin) and Shariah Law, whereas countries adopting a mixed legal system based on both Civil Law (French and

[51] In their study, legal origins of 30 countries are reclassified to incorporate the Islamic legal system (i.e., Shariah Law) adopt by the countries, if any. Their study examines how Shariah legal origin matter for Islamic finance development.

Table 7.7 Multivariate results of the determinants of financial inclusion by legal origins

Independent variables	*English*				*French*				*German*				*Socialist*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*
	RE	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*FE*	*FE*	*FE*	*FE*	*FE*
IB quantity	-2.58*	-2.10			-1.29	0.23							
	(-1.66)	(-0.57)			(-0.61)	(0.2)							
IB size	0.21***		0.16***		0.01		0.01		0.01		0.02		
	(8.41)		(4.14)		(0.48)		(0.4)		(0.15)		(0.34)		
IB profitability	-1.33			0.37	-0.01			-0.96	-2.13			-1.19	
	(-0.23)			(0.07)	(-0.00)			(-0.74)	(-0.09)			(-0.08)	
IB quantity x size	0.08	0.23	-0.19**		0.16	0.01	0.02		-4.52	-3.77	-4.67		
	(0.42)	(0.53)	(-2.13)		(0.61)	(0.11)	(0.21)		(-1.08)	(-1.22)	(-1.22)		
IB quantity x profitability	-50.66	-2.07		-30.67	7.08	-4.09**		1.89					
	(-1.64)	(-0.1)		(-1.23)	(0.84)	(-2.15)		(0.3)					
IB size x profitability	1.04		0.05	0.71	-0.35		-0.14**	-0.05	0.59		0.23	-0.22	
	(0.84)		(0.14)	(0.59)	(-0.95)		(-2.42)	(-0.27)	(0.15)		(0.26)	(-0.09)	
GDP	-0.03	0.04	-0.14	0.00	-0.08	-0.07	-0.07	-0.06	-0.30**	-0.30***	-0.30***	-0.30***	-0.49*
	(-0.24)	(0.17)	(-0.77)	(0.01)	(-1.50)	(-1.40)	(-1.38)	(-1.32)	(-2.68)	(-2.80)	(-2.74)	(-2.70)	(-2.09)
Governance	0.68***	0.03	0.68**	-0.01	0.23***	0.24***	0.24***	0.23***	0.29**	0.30**	0.30**	0.29**	0.28
	(2.66)	(0.08)	(2.01)	(-0.01)	(3.30)	(3.51)	(3.61)	(3.53)	(2.36)	(2.44)	(2.41)	(2.33)	(1.32)
Legal rights	0.04	0.05	0.05	0.06	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	-0.04
	(1.06)	(0.53)	(1)	(0.72)	(0.89)	(0.74)	(0.76)	(0.69)	(0.38)	(0.26)	(0.40)	(-0.01)	(-1.6)
Credit information	-0.08***	0.00	-0.03	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.01
	(-2.85)	(-0.1)	(-0.99)	(-0.23)	(-0.25)	(0.14)	(-0.01)	(-0.15)	(0.22)	(0.27)	(0.23)	(0.61)	(-0.76)
Cost contracts	-0.85***	-0.62	-0.58	-0.67	-0.29	-0.23	-0.25	-0.23	0.01	0.03	0.01	-0.02	-0.81
	(-3.04)	(-1.42)	(-1.62)	(-1.54)	(-1.44)	(-1.20)	(-1.28)	(-1.22)	(0.02)	(0.06)	(0.03)	(-0.04)	(-0.39)
Financial restrictions	-0.01***	-0.01**	-0.01**	-0.01**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01***
	(-2.36)	(-2.18)	(-2.44)	(-2.29)	(-0.98)	(-1.28)	(-1.13)	(-0.97)	(1.43)	(1.5)	(1.43)	(1.26)	(3.33)
Paved road	0.00	0.01	0.01**	0.01	0.00**	0.00**	0.00**	0.00**	0.00	0.00	0.00	0.01	-0.01
	(2.39)	(0.9)	(2.04)	(0.92)	(2.17)	(1.97)	(2.04)	(2.08)	(0.14)	(0.13)	(0.11)	(0.53)	(-0.77)
Phone	0.02*	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(1.67)	(-0.1)	(0.57)	(0.18)	(-0.26)	(-0.16)	(-0.16)	(-0.23)	(0.88)	(0.96)	(0.97)	(0.71)	(-0.02)
Internet	0.00	0.02*	0.01	0.01*	0.00	0.00	0.00	0.00	0.01**	0.01**	0.01**	0.00*	0.00
	(0.22)	(1.95)	(1.06)	(1.83)	(-1.08)	(-1.42)	(-1.38)	(-1.53)	(2.16)	(2.29)	(2.29)	(1.96)	(-1.09)
Deposit interest rate	-6.10***	0.44	-0.56	0.66	-0.27	-0.35	-0.34	-0.29	-0.71	-0.67	-0.71	-0.53	1.96
	(-2.71)	(0.16)	(-0.22)	(0.25)	(-0.49)	(-0.66)	(-0.63)	(-0.54)	(-0.87)	(-0.86)	(-0.89)	(-0.67)	(1.69)
Lending interest rate	5.67***	-1.10	0.84	-1.78	-0.08	-0.11	-0.10	-0.13	0.41	0.41	0.42	0.35	-0.78
	(2.75)	(-0.49)	(0.39)	(-0.8)	(-0.22)	(-0.31)	(-0.27)	(-0.34)	(0.62)	(0.64)	(0.64)	(0.53)	(-1.41)
Africa	0.42	0.49	0.34	0.49	-0.19	-0.18	-0.18	-0.18					
	(1.58)	(0.73)	(0.83)	(0.72)	(-1)	(-1.05)	(-1.00)	(-1.06)					
East Asia & Pacific	-0.11	0.28	-0.26	0.22	0.31	0.13	0.14	0.19					
	(-0.61)	(0.48)	(-0.73)	(0.38)	(0.71)	(0.34)	(0.42)	(0.60)					
Europe & Central Asia	-0.62***	-0.39	-0.98**	-0.39	0.31*	0.32**	0.30*	0.31**					
	(-2.74)	(-0.54)	(-2.23)	(-0.53)	(1.76)	(2.14)	(1.88)	(2.1)					
Middle East & North Africa	0.59***	0.08	0.31	0.02	0.32*	0.33**	0.30*	0.36***					
	(2.71)	(0.11)	(0.78)	(0.03)	(1.78)	(2.15)	(1.99)	(2.69)					

Independent variables	*English*				*French*				*German*				*Socialist*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*
	RE	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*FE*	*FE*	*FE*	*FE*	*FE*
South Asia	1.06***	0.64	0.51	0.48	0.11	0.10	0.11	0.09					
	(3.28)	(0.88)	(1.2)	(0.65)	(0.35)	(0.33)	(0.36)	(0.33)					
2007	0.10	0.24*	0.11	0.23*	-0.12***	-0.12***	-0.12***	-0.12***	-0.01	-0.01	-0.01	-0.04	-0.45***
	(0.73)	(1.86)	(0.97)	(1.92)	(-3.77)	(-4.06)	(-4.00)	(-4.17)	(-0.21)	(-0.28)	(-0.16)	(-0.86)	(-4.11)
2008	0.05	0.16	0.07	0.15	-0.07***	-0.08***	-0.07***	-0.08***	0.04	0.04	0.04	0.02	-0.29***
	(0.4)	(1.51)	(0.71)	(1.5)	(-2.74)	(-2.99)	(-2.95)	(-3.11)	(1.28)	(1.24)	(1.28)	(0.78)	(-4.32)
2009	0.01	0.11	0.03	0.10	-0.05**	-0.06***	-0.06***	-0.06***	-0.02	-0.02	-0.02	-0.03	-0.32***
	(0.08)	(1.08)	(0.35)	(1.02)	(-2.42)	(-2.68)	(-2.62)	(-2.7)	(-0.76)	(-0.91)	(-0.77)	(-1.4)	(-4.51)
2010	-0.02	0.07	0.02	0.05	-0.04**	-0.04**	-0.04**	-0.05**	-0.03	-0.03*	-0.03	-0.04*	-0.16***
	(-0.24)	(0.84)	(0.25)	(0.68)	(-2.4)	(-2.52)	(-2.52)	(-2.59)	(-1.54)	(-1.76)	(-1.66)	(-1.97)	(-3.41)
CONSTANT	-0.67	-0.91	0.27	-0.65	0.49	0.42	0.41	0.37	1.61	1.95	1.89	1.69	4.84
	(-0.62)	(-0.44)	(0.17)	(-0.32)	(1.06)	(0.98)	(0.94)	(0.89)	(0.89)	(1.14)	(1.1)	(0.97)	(1.57)
Number of observation	115	115	115	115	160	160	160	160	75	75	75	75	40
Joint test statistic (regression)	501.55***	28.93	89.86***	30.84	104.68***	104.68***	110.30***	111.36***	2.33**	2.87***	2.66***	2.48***	7.26***
Corr (μ_i, x)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.9636	-0.5035	-0.6067	-0.5406	-0.8970
F-statistic (all μ_i= 0)	-	-	-	-	-	-	-	-	74.42***	112.20***	78.08***	89.99***	12.85***
Hausman test FE vs RE	9.45	7.84	22.75	5.39	5.99	2.87	23.33	5.98	49.54***	52.73***	50.56***	52.65***	19.19***
R^2 within	0.0517	0.1445	0.1240	0.1694	0.3672	0.3672	0.3775	0.3545	0.5379	0.5312	0.5331	0.5152	0.8649
R^2 between	0.9543	0.6003	0.8630	0.6008	0.6439	0.6439	0.3211	0.6588	0.2008	0.0002	0.0095	0.0077	0.1761
R^2 overall	0.8507	0.5565	0.7925	0.5594	0.6345	0.6345	0.3229	0.6485	0.1933	0.0000	0.0064	0.0046	0.1106

The samples are country-year observations for country of legal system origins used in this study: English (115), French (160), German (75) and Socialist (40). *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *Africa, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank. All estimates include observation year dummies. White's (1980) heteroskedasticity-consistent covariance matrix estimation is used to correct for heteroskedasticity in OLS (results are not reported). *t*-statistics and *z*-statistics are in parentheses for fixed effects and random effects models, respectively. Joint test statistic for fixed effects model is the F-statistic. Joint test statistic for random effects model is the Wald χ^2. Fixed effects estimate is preferred if the Hausman test is significant, otherwise random effects estimate is adopted. Hausman test result is reported in each column.. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

German origins) and Shariah Law thwarted the development of the Islamic financial industry. As far as an Islamic banking presence is concerned, these findings continue to support the notion that Islamic financial system has an impact on financial inclusion.

With regards to other institutional settings variables, except for Socialist legal origin, level of financial inclusion is continue to show significantly correlated with the measure of governance. However, when it comes to legal rights, level of credit information and banking restriction, only English legal origin enters significantly for all the variables. These regressions further support findings by Beck et al., (2007) which finds that the economies with legal institutions originated from the British Common Law tend to be more financially developed than those based on the French Civil Code.

Furthermore, GDP enters significant with negative sign for German legal origin. This finding is inconsistent with the findings of Beck et al. (2007) and Sarma & Pais (2011). However, this finding helps to better understand Dabla-norris, Ji, Townsend, & Unsal (2015) who find that GDP is more responsive to a decrease in credit participation costs, demonstrating that limited credit availability or lower financial access is attributed by GDP in different dimension. Other variables that are internet and lending interest rate yield consistent results with the main analysis for English legal origin.

On the whole, these findings suggest that institutional settings based on different legal origins shape financial inclusion.

7.5.2.3 Regions

Again, to gauge the robustness of the results, we also employ regional analysis as one of the important institutional approach in understanding its association with financial inclusion. The test further answers the question, "to what extent and in what ways are the processes of geographically uneven capitalist economic development shaped and mediated by the institutional structures?" (Martin, 2000, page 79). The results are presented in Table 7.8. The results include Latin America & Caribbean which country with Islamic banking is absent.

Similarly, this particular sub-sample analysis is largely consistent with the main result which supports the notion that Islamic banking size matters in dealing with financial inclusion particularly in South Asia. This indicates the important role played by the Islamic bank in less developed countries, namely Bangladesh and Pakistan, in serving financially excluded. Moreover, the impact of profitability is also found to be positively and significantly with the level of financial inclusion in Europe and Central Asia. This further supports the role of financial capability of the Islamic banks in promoting greater financial inclusion.

Equally important, *governance* and *cost contracts* are significant for Africa and East Asia & Pacific region while Europe & Central Asia and MENA are reported to have more banking restrictions as compared to other regions. Internet yield consistent results with the main analysis for both, Europe & Central Asia and MENA regions.

Above all, our results seem to further support the notion that institutional settings are regionally-specific.

Table 7.8 Multivariate results of the determinants of financial inclusion by region

Independent variable	*Africa*				*East Asia & Pacific*				*Europe &Central Asia*			*Middle East & North Africa*					*South Asia*				*Latin America*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*	*(17)*	*(18)*	*(19)*	*(20)*	*(21)*
	FE	*FE*	*FE*	*FE*	*RE*	*RE*	*RE*	*RE*	*FE*	*RE*	*RE*	*RE*	*FE*	*FE*	*FE*	*FE*	*RE*	*RE*	*RE*	*RE*	*FE*
IB quantity	-208.53**	4.06			-5.95	9.22				-7.40			-1.10	-0.18			-3.40	-1.25			
	(-2.13)	(0.17)			(-0.22)	(0.38)				(-0.81)			(-0.47)	(-0.35)			(-0.58)	(-0.45)			
IB size	-1.83**		-0.19		0.31		0.34		0.20*		-0.03		0.05		0.01		2.19**		1.46***		
	(-2.41)		(-1.01)		(1.21)		(1.58)		(1.71)		(-0.93)		(0.59)		(0.55)		(2.13)		(3.28)		
IB profit -ability	-5.59			-1.05	58.15			46.04	65.10**			38.17***	3.27			0.14	66.50			-25.22	
	(-0.41)			(-0.35)	(0.74)			(0.7)	(2.01)			(2.69)	(1.26)			(0.08)	(0.77)			(-1.06)	
IB quantity x size	51.13**	-1.38	0.42		0.64	0.07	-0.24		-6.68	0.28	0.07		0.14	0.04	0.01		-8.48**	0.20	-6.25***		
	(2.35)	(-0.32)	(0.23)		(0.28)	(0.03)	(-0.18)		(-1.17)	(0.19)	(0.06)		(0.48)	(0.54)	(0.48)		(-2.43)	(0.44)	(-3.24)		
IB quantity x profitability	-259.51	45.07		60.10	-63.96	36.93		-16.83	-588.71*	-4.22		-336.5**	5.66	-1.32		0.01	-118.91	-8.09		56.21	
	(-1.46)	(1.29)		(1.16)	(-0.44)	(0.97)		(-0.14)	(-1.94)	(-0.18)		(-2.42)	(0.71)	(-0.88)		(0)	(-0.67)	(-0.64)		(0.44)	
IB size x profitability	3.20		0.63*	-0.06	-7.53		0.03	-5.97	-9.33**		-0.14	-5.60***	-0.64*		-0.05	-0.05	-7.31		-0.67	1.33	
	(1.31)		(1.83)	(-0.05)	(-0.76)		(0.02)	(-0.7)	(-2.06)		(-0.74)	(-2.85)	(-1.75)		(-1.13)	(-0.44)	(-0.69)		(-1.34)	(0.19)	
GDP	-0.17	-0.20	-0.20	-0.20	-0.15	0.50	0.20	0.45	-0.12	-0.11	-0.09	-0.08	-0.39***	-0.32***	-0.31***	-0.34***	0.35	0.06	0.28	0.14	-0.09
	(-1.41)	(-1.64)	(-1.61)	(-1.64)	(-0.19)	(0.82)	(0.34)	(0.73)	(-1.14)	(-1.45)	(-1.18)	(-1.11)	(-4.37)	(-3.76)	(-3.81)	(-4.04)	(0.94)	(0.14)	(0.99)	(0.36)	(-1.17)
Governance	0.21	0.29**	0.29**	0.29**	-1.48	-1.79	-1.45*	-2.70***	0.18	0.01	0.02	0.05	0.18	0.09	0.10	0.14	-1.39*	0.11	-1.21**	-0.03	0.17
	(1.67)	(2.33)	(2.27)	(2.34)	(-0.76)	(-0.96)	(-1.16)	(-3.04)	(1.33)	(0.08)	(0.24)	(0.52)	(1.53)	(0.82)	(0.87)	(1.29)	(-1.88)	(0.2)	(-2.17)	(-0.05)	(1.43)
Legal rights	-0.02	-0.02*	-0.02*	-0.02*	0.19	0.36	0.12	0.77**	0.01	0.01	0.00	-0.01					0.02*	0.02*	0.02**	0.02*	
	(-1.5)	(-1.79)	(-1.76)	(-1.82)	(0.26)	(0.54)	(0.25)	(2.37)	(0.48)	(0.45)	(0.13)	(-0.41)					(1.67)	(1.72)	(2.38)	(1.71)	
Credit information	-0.01	-0.01	-0.01	-0.01	-0.34	-0.66**	-0.26	-0.57***	-0.01	-0.01	-0.01	-0.01	0.00			0.00	0.07	0.05	0.07	0.08	-0.01
	(-1.15)	(-1.27)	(-1.47)	(-1.19)	(-0.83)	(-2.43)	(-0.89)	(-2.59)	(-1.11)	(-0.7)	(-0.87)	(-0.91)	(-0.03)	(0.31)	(0.25)	(0.26)	(0.88)	(0.5)	(1.13)	(0.92)	(-0.56)
Cost contracts	-0.32***	-0.30**	-0.29**	-0.30**	-11.89 *	-17.76 ***	-12.89 **	-18.20 ***	-0.18	0.19	0.19	0.33					-6.40	-3.27	-3.57*	-1.22	
	(-2.92)	(-2.6)	(-2.57)	(-2.6)	(-1.7)	(-3.64)	(-2.47)	(-3.46)	(-0.3)	(0.45)	(0.45)	(0.81)					(-1.13)	(-1.01)	(-1.83)	(-0.31)	
Banking restrictions	0.00	0.00	0.00	0.00	-0.02	0.00	-0.01	-0.01	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00	0.00	0.00	0.00	0.00
	(1.22)	(1.11)	(1.19)	(1.12)	(-0.72)	(-0.17)	(-0.93)	(-0.64)	(-2.29)	(-2.2)	(-2.25)	(-2.27)	(-2.3)	(-2.26)	(-2.08)	(-2.17)	(-0.49)	(0.47)	(-0.57)	(0.37)	(1.2)
Paved road	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00*	0.00***	0.00***	0.00***	0.00	0.00	0.00	0.00	0.01	-0.03*	0.01	-0.02	0.00
	(0.02)	(0.31)	(0.23)	(0.29)	(0.11)	(1.63)	(0.4)	(0.96)	(1.9)	(2.67)	(2.76)	(2.83)	(1.16)	(1.29)	(1.33)	(1.12)	(0.54)	(-1.67)	(0.42)	(-1.19)	(-0.28)
Phone	0.10***	0.11***	0.10**	0.11***	0.09**	0.07**	0.08**	0.07**	0.00	0.00	0.00	0.00	0.01	0.01*	0.01*	0.01*	0.01	0.00	0.01	0.00	0.01*
	(2.87)	(3.18)	(2.93)	(3.08)	(2.23)	(2.16)	(2.53)	(2.05)	(-0.15)	(-0.57)	(-0.32)	(-0.35)	(1.54)	(1.94)	(1.83)	(1.82)	(1.27)	(-0.1)	(1.32)	(0.21)	(1.83)
Internet	0.00	0.00	0.00	0.00	0.05	0.01	0.05	0.01	0.01**	0.01**	0.00**	0.00**	0.00**	0.00**	0.00**	0.00**	-0.02	-0.01	-0.02	-0.01	0.00
	(0.71)	(-0.08)	(0.54)	(-0.37)	(1.09)	(0.33)	(1.28)	(0.27)	(2.49)	(2.5)	(2.35)	(2.16)	(-2.51)	(-2.71)	(-2.68)	(-2.77)	(-0.92)	(-0.31)	(-1.12)	(-0.32)	(0.01)
Deposit interest rate	-0.23	-0.25	-0.26	-0.25	1.77	-2.20	7.70	-8.31	0.77	0.65	0.70	1.05	0.02	0.48	0.61	0.37	-4.76	0.58	-3.67	-0.23	0.10
	(-0.33)	(-0.36)	(-0.38)	(-0.36)	(0.11)	(-0.17)	(0.6)	(-0.64)	(0.96)	(0.89)	(0.97)	(1.47)	(0.02)	(0.49)	(0.61)	(0.35)	(-1.25)	(0.19)	(-1.48)	(-0.06)	(0.21)
Lending interest rate	-0.25	-0.10	-0.14	-0.09	13.25	12.85	3.07	18.90	-0.08	-0.36	-0.35	-0.16	-1.65	-2.23*	-2.29*	-1.95	0.26	-0.95	0.03	-0.83	-0.44
	(-0.47)	(-0.19)	(-0.26)	(-0.16)	(0.56)	(0.69)	(0.18)	(0.97)	(-0.13)	(-0.6)	(-0.59)	(-0.29)	(-1.36)	(-1.97)	(-2.01)	(-1.57)	(0.32)	(-1.37)	(0.06)	(-1.02)	(-1.55)
English					3.24**	3.26**	3.38***	3.43***		-0.07	-0.02	-0.11					1.86	-0.85	1.40*	-0.48	
					(2.18)	(2.34)	(2.84)	(2.65)		(-0.26)	(-0.07)	(-0.44)					(1.51)	(-1.18)	(1.68)	(-0.5)	
French					17.01*	21.58***	19.05***	23.59***		0.04	0.04	0.05				0.362***	5.65	-0.20	3.20***	-0.65	
					(1.67)	(2.59)	(2.82)	(3.51)		(0.2)	(0.17)	(0.23)				(2.65)	(1.59)	(-0.27)	(2.65)	(-0.49)	
German										-0.24	-0.18	-0.18					3.50*	0.63	3.37**	0.66	
										(-1.09)	(-0.86)	(-0.92)					(1.82)	(0.33)	(2.24)	(0.38)	
Socialist										-0.64**	-0.57**	-0.58**									
										(-2.11)	(-2)	(-2.23)									
2007	-0.16***	-0.19***	-0.18***	-0.19***	0.54	0.19	0.62	0.10	-0.03	-0.03	-0.04	-0.05	-0.23***	-0.19***	-0.19***	-0.21***	0.04	-0.04	0.02	0.02	-0.08**
	(-3.03)	(-3.38)	(-3.2)	(-3.49)	(0.95)	(0.42)	(1.27)	(0.22)	(-0.59)	(-0.78)	(-0.98)	(-1.29)	(-4.11)	(-3.6)	(-3.58)	(-3.76)	(0.25)	(-0.19)	(0.16)	(0.13)	(-2.18)
2008	-0.10**	-0.12***	-0.12***	-0.12***	0.10	-0.19	0.27	-0.35	0.02	0.01	0.00	-0.01	-0.13***	-0.12***	-0.12***	-0.13***	0.00	-0.05	-0.03	-0.01	-0.05
	(-2.63)	(-2.91)	(-2.95)	(-2.91)	(0.19)	(-0.51)	(0.61)	(-0.87)	(0.45)	(0.38)	(0.1)	(-0.23)	(-3.78)	(-3.51)	(-3.47)	(-3.61)	(-0.03)	(-0.33)	(-0.27)	(-0.08)	(-1.53)
2009	-0.09**	-0.12***	-0.11***	-0.12***	0.19	0.19	0.32	0.04	0.00	-0.01	-0.02	-0.02	-0.10***	-0.09***	-0.09***	-0.09***	-0.07	-0.05	-0.08	-0.04	-0.07**
	(-2.55)	(-3.14)	(-3.01)	(-3.21)	(0.48)	(0.57)	(1)	(0.11)	(-0.05)	(-0.39)	(-0.56)	(-0.71)	(-3.36)	(-3.11)	(-3.02)	(-3.09)	(-0.86)	(-0.48)	(-1.24)	(-0.41)	(-2.28)

Independent variable	*Africa*				*East Asia & Pacific*				*Europe &Central Asia*				*Middle East & North Africa*				*South Asia*				*Latin America*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*	*(17)*	*(18)*	*(19)*	*(20)*	*(21)*
	FE	*FE*	*FE*	*FE*	*RE*	*RE*	*RE*	*RE*	*FE*	*RE*	*RE*	*RE*	*FE*	*FE*	*FE*	*FE*	*RE*	*RE*	*RE*	*RE*	*FE*
2010	-0.05 (-2.1)	-0.06** (-2.33)	-0.06** (-2.38)	-0.06** (-2.27)	0.11 (0.47)	0.00 (0.01)	0.14 (0.69)	-0.03 (-0.16)	-0.01 (-0.61)	-0.02 (-1.21)	-0.03 (-1.26)	-0.02 (-1.06)	-0.06*** (-3.06)	-0.05** (-2.49)	-0.05** (-2.53)	-0.05** (-2.59)	-0.08 (-1.39)	-0.05 (-0.74)	-0.08* (-1.71)	-0.04 (-0.68)	-0.04** (-2.7)
CONSTANT	1.80 (1.69)	0.89 (0.98)	0.99 (1.09)	0.89 (0.96)	-4.10 (-0.42)	-7.86 (-0.98)	-7.38 (-1.11)	-8.63 (-1.23)	0.66 (0.71)	0.89 (1.13)	0.66 (0.87)	0.60 (0.82)	3.19*** (3.38)	2.68*** (3.07)	2.55*** (3.01)	2.96*** (3.63)	-2.98 (-0.54)	2.88 (0.55)	-2.78 (-0.77)	0.52 (0.1)	0.41 (0.53)
Number of observation	65	65	65	65	35	35	35	35	165	165	165	165	50	50	50	50	30	30	30	30	55
Joint test statistic (regression)	4.58***	4.58***	4.60***	4.60***	301.39 ***	313.68 ***	362.80 ***	316.29 ***	3.25***	73.91***	76.71***	86.37***	3.94***	4.16***	4.25***	4.12***	2619.59 ***	1599.86 ***	3666.30 ***	1776.27 ***	2.73 ***
Corr (μ_i, x)	-0.9987	-0.7745	-0.9264	-0.7584	0.0000	0.0000	0.0000	0.0000	-0.8304	0.0000	0.0000	0.0000	-0.7159	-0.5395	-0.5247	-0.5460	0.0000	0.0000	0.0000	0.0000	0.3655
F-statistic (all μ_i= 0)	10.86***	10.94***	10.05***	22.97***	-	-	-	-	42.02***	-	-	-	11.76***	15.14***	15.41***	19.97***	-	-	-	-	43.92 ***
Hausman test FE vs RE (χ^2)	72.05***	75.82***	36.10***	63.62***	1.41	3.60	1.74	3.17	13.49*	13.56	19.43	8.64	22.04***	491.44 ***	153.16 ***	333.03 ***	0.11	0.00	0.14	0.05	953.72 ***
R^2 within	0.7564	0.7080	0.7090	0.7089	0.7747	0.7288	0.7623	0.7303	0.3676	0.3146	0.3066	0.3308	0.7810	0.7352	0.7393	0.7333	0.8968	0.7304	0.8820	0.7571	0.5335
R^2 between	0.6807	0.0159	0.2935	0.0550	1.0000	1.0000	1.0000	1.0000	0.0007	0.4593	0.5053	0.5397	0.0029	0.0051	0.0043	0.0022	1.0000	1.0000	1.0000	1.0000	0.7345
R^2 overall	0.6152	0.0263	0.2282	0.0696	0.9648	0.9573	0.9628	0.9576	0.0017	0.4497	0.4923	0.5260	0.0017	0.0074	0.0065	0.0038	0.9981	0.9950	0.9978	0.9955	0.7316

The samples are country-year observations for regions used in this study: Africa (65), East Asia & Pacific (35), Europe & Central Asia (165), Middle East & North Africa (50), South Asia (30) and Latin America (55). The classification of geographic regions based on World Bank. The dependent variable is the country's cumulative index of financial inclusion (CIFI) calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. All estimates include observation year dummies. White's (1980) heteroskedasticity-consistent covariance matrix estimation is used to correct for heteroskedasticity in OLS (results are not reported). *t*-statistics and *z*-statistics are in parentheses for fixed effects and random effects models, respectively. Joint test statistic for fixed effects model is the F-statistic. Joint test statistic for random effects model is the Wald χ^2. Fixed effects estimate is preferred if the Hausman test is significant, otherwise random effects estimate is adopted. Hausman test result is reported in each column. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

7.6 Regression Diagnostics

Although the results of pair-wise correlation coefficients in section 7.3 show that the multicollinearity is less likely, this issue of multicollinearity is further tested using the variance inflation factor (VIF) approach. The VIF values are reported in Table A1.1 in Appendix 1. The VIF is interpreted based on the rule of thumb; the larger the value of VIF, the more collinear the variable. The suggested cut-off point is at 10 (Gujarati, 2003, p. 362). Generally, it is found that the VIF values for most of the variables are below the cut-off point with an overall mean of 7.27 and thus, multicollinearity is not an issue.

With respect to the heteroskedasticity problem, the Breusch-Pagan/Cook-Weisberg test is conducted and it is found that the problem is present in each regression. To correct this problem, the White's (1980) heteroskedastic-consistent covariance matrix estimation is used. The robust standard errors are used for all estimates but the results are not reported.

In addition, using graphical devices, i.e., the Kernel and normal density estimates and the normal probability plot (NPP) of the residuals, the normality assumption of the regression's residuals is checked. If the NPP is approximately a straight line, one can say that the residuals are generally normally distributed (Gujarati, 2003, p. 147). It is reported that the residuals are generally normally distributed for most of the observations and the NPP is not largely deviated from the straight line. Refer Figure A1.1 and A1.2 in Appendix 1. Therefore, there is sufficient evidence to suggest that the normality assumption does hold in this study.

7.7 Chapter Summary

This chapter has presented an empirical analysis of the predictions of institutional theory on financial inclusion. The results of the analysis are robust in respect of central tendency measure (mean) was analysed using both pooled cross-sectional and panel data methods.

To conclude, the chapter draws the following findings:

i. Islamic banking size and profitability are positively related to the level of financial inclusion.

ii. The relationships between level of financial access and governance, legal rights, cost contracts, banking restrictions, regions, paved road and internet are consistent with previous studies, which indicate the importance of these factors in shaping financial inclusion.

It is worth noted that, to my knowledge, the empirical findings of relationships between financial inclusion and the Islamic financial system as proxied by the Islamic banking presence, is the first of its kind that using the inclusion index as the dependent variable. Although not largely prevalent, the evidence, to a certain extent, seems to support the notion of the positive impact of Islamic finance in shaping financial inclusion, as mentioned in many studies (see, for example, Mirakhor & Iqbal, 2012; Mohieldin, Iqbal, Rostom, & Fu, 2012; Mohieldin, 2012; El-Zoghbi & Tarazi, 2013; Martowardojo, 2015; MIFC, 2015).

Chapter 8

RESULTS OF HETEROGENEITY IN THE DETERMINANTS OF FINANCIAL INCLUSION

8.1 Introduction

This chapter presents empirical evidence on the heterogeneity in the determinants of financial inclusion using the quantile regression method developed by Koenker & Bassett (1978) and Koenker & Hallock (2001). Drawing from earlier work on the institutional theory of organization by Tolbert (1985), Zucker (1987) purports that institutional environment is heterogeneous, hence reflects the impact of institutional processes on the organization. She argues that homogeneity of environment decreases structure of internal organization, in which contradicting the environment-as-institution approach. In response to this, this chapter further investigates heterogeneity in the determinants of financial inclusion using the quantile regression method. The quantile regression approach, which has also been suggested as a form of robust regression (R. W. Koenker & Bassett, 1978; Rogers, 1993), could provide appropriate insights on the heterogeneous effects of the variables of interest across different levels of financial inclusion. It examines how the explanatory variables shape different segments of the financial inclusion index distribution. By doing this, we could empirically observe the dynamic impacts of the key driver (i.e., the institutional settings). This will shed more lights on how financial inclusion emerge as a product of institutional processes and structures, which could be created and shaped at various levels, as highlighted by Scott (2004).

For this purpose, the same full sample (i.e., 400 country-year observations) is further employed in this analysis.

The chapter proceeds as follows: Section 8.2 presents the results of quantile regressions in examining the determinants of financial inclusion, followed by robustness checks in Section 8.3. Section 8.4 summarizes the chapter.

8.2 Heterogeneity in the Determinants of Financial Inclusion

In analysing the data using the quantile regression method, bootstrapped standard errors are used. The bootstrap procedure of Efro (1979) provides interesting method to simultaneously test the regression coefficients. The idea is to rectify inferior statistical properties with data of a larger number of estimates, each based on different subsamples of data (Guiot, 1991). 1000 bootstrap replications are used in this study in order to minimize the randomness and to increase the accuracy of the approximation (Guiot, 1991; Rogers, 1993). The bootstrapped regression coefficients are judged significant at the 95% level if they are twice, in absolute value of their standard deviation (Guiot, 1991).

Table 8.1 presents the results of quantile regressions for the financial inclusion determinants. Results in Colums 1 through 7 for each regression are for the 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th} and 95^{th}, respectively. The significant coefficients are boxed for ease of exposition. Following the table, a compact summary of the plotted estimated coefficients across all quantiles, for each explanatory variable, is presented in Figure 8.1. Note that the solid line with marker in the figure indicates the estimated

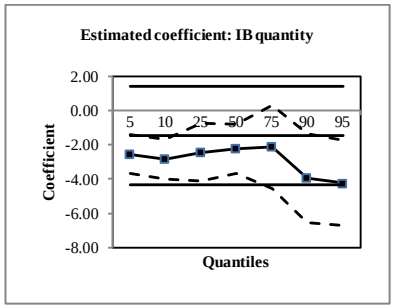
Table 8.1 Quantile regression estimates for CIFI

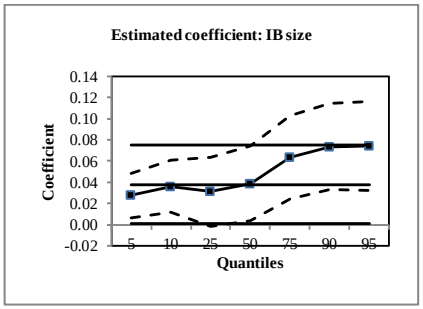
Variable	*with all IB variables*							*IB Quantity*							*IB Size*							*IB Profitability*						
	5th	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*
IB quantity	-2.54***	-2.84***	-2.44***	-2.25***	-2.14*	-3.97***	-4.25***	-2.22***	-2.53***	-2.23***	-1.86**	0.15	0.11	-0.07														
	(-4.48)	(-4.91)	(-2.86)	(-3.08)	(-1.73)	(-3.01)	(-3.36)	(-4.57)	(-5.14)	(-3.4)	(-2.27)	(0.09)	(0.06)	(-0.04)														
IB size	0.03**	0.04***	0.03*	0.04**	0.06***	0.07***	0.07***								0.02	0.02	0.04*	0.03*	0.04***	0.03**	0.03							
	(2.54)	(2.88)	(1.88)	(2.16)	(3.19)	(3.55)	(3.5)								(1.49)	(0.96)	(1.93)	(1.79)	(2.82)	(1.98)	(1.52)							
IB profitability	-1.36	2.77	-0.58	-1.92	1.63	5.43	5.65															-5.01*	-4.64	-3.62	-2.44	0.67	1.33	1.20
	(-0.29)	(0.57)	(-0.13)	(-0.53)	(0.41)	(0.95)	(0.87)															(-1.68)	(-1.55)	(-1.07)	(-0.77)	(0.22)	(0.39)	(0.33)
IB quantity x size	0.26***	0.27***	0.21**	0.17*	0.05	0.22	0.28**	0.29***	0.29***	0.25***	0.17*	-0.07	-0.11	-0.08	-0.08	-0.09	-0.02	-0.03	-0.10***	-0.12***	-0.10**							
	(4.13)	(3.88)	(2.11)	(1.88)	(0.37)	(1.5)	(2.01)	(5.06)	(5.41)	(3.12)	(1.74)	(-0.34)	(-0.5)	(-0.33)	(-1.37)	(-1.24)	(-0.35)	(-0.74)	(-2.7)	(-2.95)	(-2.15)							
IB quantity x profitability	35.64**	41.99***	33.50**	27.68*	36.33	42.01	36.78	2.60	11.52*	9.26*	3.35	6.90	11.16	15.28								7.96	12.50	13.75	7.28	3.29	-21.88	-23.46
	(2.47)	(2.88)	(2.14)	(1.82)	(1.47)	(1.38)	(1.17)	(0.35)	(1.75)	(1.66)	(0.72)	(0.73)	(0.86)	(1.11)								(0.7)	(1.07)	(0.86)	(0.62)	(0.15)	(-0.91)	(-0.92)
IB size x profitability	-0.53	-1.54	-0.68	-0.42	-0.90	-1.95	-1.87								0.13	0.19	-0.03	-0.04	0.06	0.13	0.21	0.74	0.61	0.34	0.13	-0.25	0.05	0.21
	(-0.56)	(-1.65)	(-0.76)	(-0.51)	(-0.82)	(-1.22)	(-1.06)								(0.45)	(0.64)	(-0.17)	(-0.3)	(0.3)	(0.46)	(0.67)	(1.16)	(0.82)	(0.4)	(0.2)	(-0.33)	(0.05)	(0.21)
GDP	0.02	0.00	0.01	-0.02	0.03	0.11***	0.12***	0.01	-0.02	0.03	-0.01	0.05	0.11***	0.09**	0.03	0.03	-0.03	-0.04	0.02	0.12***	0.09**	0.05	0.03	-0.03	-0.04	0.05	0.08**	0.09**
	(0.57)	(0.03)	(0.18)	(-0.55)	(0.66)	(3.05)	(3.51)	(0.24)	(-0.49)	(0.66)	(-0.19)	(1.19)	(3.17)	(2.33)	(0.58)	(0.69)	(-0.67)	(-1)	(0.48)	(3.37)	(2.54)	(1.26)	(0.56)	(-0.57)	(-1.04)	(1.05)	(2.39)	(2.39)
Governance	-0.03	0.02	0.03	0.14**	0.13*	0.04	0.01	-0.08	-0.05	-0.05	0.06	0.11*	0.14*	0.18**	-0.01	-0.02	0.10	0.08	0.15**	0.13	0.11	-0.06	-0.04	0.06	0.11**	0.10	0.15**	0.12
	(-0.43)	(0.26)	(0.4)	(2.36)	(1.8)	(0.47)	(0.07)	(-1.34)	(-0.75)	(-0.57)	(1.04)	(1.7)	(1.92)	(2.4)	(-0.15)	(-0.29)	(1.24)	(1.28)	(1.98)	(1.41)	(1.14)	(-0.88)	(-0.54)	(0.58)	(2.01)	(1.64)	(2.12)	(1.64)
Legal rights	0.01	0.01	0.00	0.00	0.04***	0.04***	0.03**	0.01	0.01	0.00	0.00	0.04***	0.04***	0.03***	0.01	0.01	0.00	0.02	0.04***	0.05***	0.04***	0.01	0.01	0.00	0.02	0.04***	0.04***	0.04***
	(1.22)	(1.34)	(0.27)	(0.14)	(3.1)	(3.39)	(2.45)	(1.09)	(0.97)	(-0.1)	(0.12)	(3.78)	(3.42)	(2.63)	(0.52)	(0.64)	(-0.26)	(1.15)	(3.65)	(3.84)	(2.92)	(0.56)	(0.46)	(0.02)	(1.26)	(3.86)	(3.01)	(3.22)
Credit information	-0.02	-0.01	0.00	0.00	0.01	0.00	0.00	-0.01	0.01	0.01	0.02*	0.01	0.01	0.02*	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.02*	0.02	0.01	0.02
	(-1.42)	(-0.45)	(-0.31)	(0.09)	(0.43)	(-0.19)	(-0.31)	(-0.5)	(0.94)	(0.42)	(1.73)	(0.93)	(1.03)	(1.86)	(-0.24)	(0.01)	(0.27)	(1.05)	(0.38)	(0.32)	(1.1)	(0)	(-0.28)	(0.29)	(1.7)	(1.28)	(0.75)	(1.62)
Cost contracts	-0.11	-0.09	-0.04	-0.06	-0.05	0.11	0.16	-0.13	-0.07	0.03	-0.01	-0.18	-0.08	-0.19	-0.16**	-0.16	-0.13	-0.17*	-0.11	0.07	0.00	-0.15*	-0.19**	-0.10	-0.10	-0.12	-0.13	-0.10
	(-1.58)	(-1.19)	(-0.49)	(-0.9)	(-0.64)	(0.95)	(1.29)	(-1.56)	(-0.81)	(0.36)	(-0.16)	(-1.63)	(-0.61)	(-1.43)	(-2.02)	(-1.63)	(-1.53)	(-1.87)	(-1.25)	(0.55)	(-0.01)	(-1.81)	(-2.01)	(-0.9)	(-1.11)	(-1.08)	(-1.01)	(-0.67)
Banking restrictions	0.00	0.00	0.00	0.00	0.00*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.67)	(0.35)	(0.61)	(-1.13)	(-1.76)	(-0.73)	(-0.23)	(-0.41)	(0.21)	(1.37)	(-1.07)	(-1.36)	(-0.16)	(-0.43)	(0.76)	(1.21)	(0.41)	(-0.86)	(-1.92)	(-1.41)	(-0.64)	(0.66)	(0.38)	(0.55)	(-1.5)	(-1.37)	(-0.28)	(-0.32)
Paved road	0.00***	0.00**	0.00	0.00	0.00**	0.00***	0.00**	0.00***	0.00***	0.00*	0.00*	0.00***	0.00***	0.00***	0.00**	0.00	0.00	0.00*	0.00**	0.00**	0.00	0.00**	0.00***	0.00	0.00***	0.00***	0.00***	0.00**
	(3.41)	(2.28)	(1.02)	(1.5)	(2.31)	(2.98)	(2.15)	(3.35)	(2.94)	(1.92)	(1.87)	(3.08)	(3.49)	(2.33)	(2.43)	(1.64)	(-0.01)	(1.92)	(2.47)	(2.1)	(1.64)	(2.29)	(2.65)	(1.22)	(3.15)	(3.29)	(2.74)	(2.45)
Phone	-0.01***	-0.01***	0.00	0.00	0.01**	0.00	0.00	-0.01***	-0.01***	-0.01*	0.00	0.00	0.00	0.00	-0.01***	-0.01***	0.00	0.00	0.01*	0.00	0.00	-0.01***	-0.01***	0.00	0.00	0.00	0.00	0.00
	(-4.52)	(-4.08)	(-1.42)	(0.49)	(2.07)	(0.62)	(-0.22)	(-5)	(-4.48)	(-1.95)	(0.74)	(1.45)	(0.22)	(-0.48)	(-4.06)	(-3.54)	(-0.28)	(1.56)	(1.85)	(0.33)	(-0.11)	(-2.66)	(-3.68)	(-1.22)	(0.67)	(1.28)	(-0.23)	(-0.36)
Internet	0.00	0.00**	0.00	0.00	0.00	0.00	0.00	0.00**	0.00**	0.00	0.00	0.00	-0.01***	-0.01	0.01***	0.01***	0.00	0.00	0.00	0.00	0.00	0.00*	0.00**	0.00	0.00	0.00	0.00**	0.00*
	(3.1)	(2.44)	(0.92)	(1.23)	(-0.51)	(-0.51)	(0.21)	(2)	(2.21)	(1.27)	(1.19)	(-0.95)	(-2.73)	(-2.76)	(3.1)	(2.78)	(0.9)	(1.03)	(-0.59)	(-1.07)	(-0.53)	(1.96)	(2.32)	(1.12)	(0.58)	(-0.46)	(-2.04)	(-1.78)
Deposit interest rate	-0.37	-0.09	-0.52	-0.38	-0.15	0.08	-0.08	-1.11**	-0.63	0.13	-0.18	-0.11	0.22	-0.54	-0.68	-0.71	-1.39*	-1.03	-0.57	0.33	0.09	-0.94	-0.97	-0.93	-0.20	-0.77	-0.13	-0.25
	(-0.68)	(-0.14)	(-0.66)	(-0.55)	(-0.23)	(0.11)	(-0.09)	(-2.02)	(-1.22)	(0.2)	(-0.27)	(-0.17)	(0.28)	(-0.7)	(-1.16)	(-1.01)	(-1.82)	(-1.36)	(-0.76)	(0.41)	(0.11)	(-1.43)	(-1.24)	(-0.99)	(-0.29)	(-1.1)	(-0.17)	(-0.32)
Lending interest rate	-0.15	-0.20	-0.59	-0.90*	-0.89***	-0.67**	-0.77**	0.14	-0.10	-1.10	-1.20*	-1.26***	-1.04***	-1.17***	-0.10	-0.12	-0.15	-0.75	-1.09***	-0.76**	-0.87**	-0.04	-0.10	-0.46	-1.10*	-0.93**	-1.18***	-1.02***
	(-0.52)	(-0.58)	(-1.08)	(-1.9)	(-2.69)	(-2.12)	(-2.27)	(0.41)	(-0.24)	(-1.48)	(-1.77)	(-3.09)	(-3.09)	(-3.33)	(-0.32)	(-0.3)	(-0.24)	(-1.33)	(-2.98)	(-2.26)	(-2.48)	(-0.14)	(-0.27)	(-0.7)	(-1.77)	(-2.11)	(-3.13)	(-2.66)
English	-0.25***	-0.25**	-0.13	-0.01	-0.04	0.15	0.25**	-0.32***	-0.28***	-0.07	0.09	0.11	0.13	0.11	-0.22*	-0.20	0.09	-0.06	-0.03	0.20	0.25*	-0.35***	-0.23*	-0.02	-0.09	0.08	0.18	0.20
	(-2.96)	(-2.42)	(-0.87)	(-0.07)	(-0.32)	(1.3)	(2.31)	(-3.86)	(-2.7)	(-0.51)	(0.67)	(0.91)	(1.17)	(0.99)	(-1.99)	(-1.5)	(0.58)	(-0.41)	(-0.26)	(1.59)	(1.96)	(-3.28)	(-1.75)	(-0.13)	(-0.62)	(0.69)	(1.52)	(1.62)

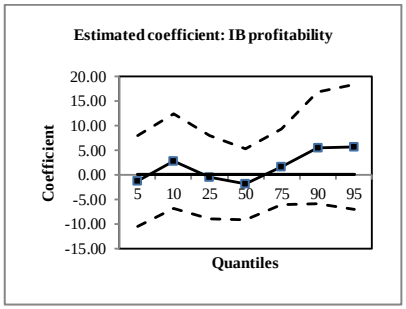
Variable	*with all IB variables*							*IB Quantity*							*IB Size*							*IB Profitability*						
	5th	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*
French	-0.16**	-0.18*	-0.11	0.08	0.27**	0.34***	0.44***	-0.31***	-0.29***	-0.12	0.09	0.32***	0.25**	0.24*	-0.12	-0.10	0.03	0.06	0.28***	0.43***	0.46***	-0.26***	-0.16	-0.06	0.08	0.34***	0.31***	0.33**
	(-2.04)	(-1.94)	(-1.01)	(0.72)	(2.6)	(3)	(3.41)	(-4.09)	(-3.41)	(-1.09)	(0.93)	(3.49)	(2.37)	(1.85)	(-1.09)	(-0.89)	(0.26)	(0.53)	(2.7)	(3.38)	(3.04)	(-2.58)	(-1.37)	(-0.47)	(0.82)	(3.57)	(2.77)	(2.38)
German	-0.36***	-0.36***	-0.20	0.11	0.13	0.13	0.21*	-0.43***	-0.43***	-0.20*	0.06	0.13	0.09	0.11	-0.38***	-0.35***	-0.02	0.06	0.16	0.25**	0.26**	-0.42***	-0.31***	-0.19	0.03	0.13	0.11	0.13
	(-4.99)	(-3.68)	(-1.62)	(1.11)	(1.26)	(1.24)	(1.93)	(-5.99)	(-5.05)	(-1.87)	(0.64)	(1.24)	(0.82)	(0.88)	(-4.61)	(-3.35)	(-0.14)	(0.59)	(1.4)	(2.02)	(1.99)	(-4.55)	(-2.82)	(-1.62)	(0.32)	(1.32)	(0.98)	(1.04)
Socialist	-0.59***	-0.60***	-0.41**	0.01	-0.03	-0.05	0.11	-0.82***	-0.80***	-0.46***	-0.13	-0.06	-0.07	0.05	-0.52***	-0.52***	-0.16	-0.07	0.01	0.06	0.15	-0.60***	-0.53***	-0.34*	-0.19	0.00	0.01	0.01
	(-4.92)	(-4.15)	(-2.17)	(0.08)	(-0.22)	(-0.34)	(0.65)	(-7.27)	(-6.16)	(-2.67)	(-0.93)	(-0.5)	(-0.48)	(0.33)	(-3.8)	(-3.21)	(-0.86)	(-0.42)	(0.08)	(0.38)	(0.79)	(-4.84)	(-3.75)	(-1.8)	(-1.46)	(-0.02)	(0.1)	(0.09)
Africa	-0.07	-0.08	-0.07	-0.04	0.07	-0.09	-0.12	-0.11	-0.08	0.00	-0.03	0.20*	0.08	0.04	0.04	0.05	-0.11	0.00	0.12	0.01	0.01	0.16	0.07	-0.09	-0.01	0.17	0.06	0.06
	(-0.62)	(-0.69)	(-0.64)	(-0.41)	(0.82)	(-0.96)	(-1.32)	(-0.85)	(-0.62)	(0.03)	(-0.24)	(1.88)	(0.87)	(0.49)	(0.3)	(0.41)	(-0.87)	(0.04)	(1.34)	(0.13)	(0.08)	(1.42)	(0.56)	(-0.67)	(-0.11)	(1.63)	(0.64)	(0.71)
East Asia & Pacific	0.49***	0.48***	0.41***	0.24**	0.22	1.20**	1.70*	0.61***	0.60***	0.47***	0.32**	0.33*	1.59**	2.06**	0.50***	0.54***	0.26**	0.12	0.20	1.36**	1.85*	0.53***	0.53***	0.35***	0.27*	0.36*	1.62**	1.96**
	(6.67)	(6.05)	(3.41)	(2.09)	(1.08)	(1.97)	(1.81)	(8.37)	(7.49)	(3.67)	(2.37)	(1.93)	(2.28)	(2.09)	(5.4)	(4.84)	(2)	(0.92)	(1.11)	(2.1)	(1.95)	(5.96)	(5)	(2.58)	(1.95)	(1.77)	(2.28)	(2.05)
Europe & Central Asia	0.31**	0.34***	0.31**	-0.06	0.02	-0.01	0.04	0.38***	0.44***	0.34**	0.04	0.09	0.06	0.09	0.33***	0.35***	0.26*	-0.12	0.01	0.03	0.09	0.27***	0.28***	0.33**	-0.02	0.07	0.11	0.12
	(4.29)	(3.94)	(2.11)	(-0.54)	(0.21)	(-0.12)	(0.37)	(5.36)	(5.48)	(2.44)	(0.29)	(0.98)	(0.73)	(1.06)	(4.11)	(3.66)	(1.82)	(-0.95)	(0.05)	(0.26)	(0.93)	(3.46)	(3.2)	(2.35)	(-0.16)	(0.79)	(1.24)	(1.39)
Middle East & North Africa	0.15**	0.25***	0.25**	0.15	0.41***	0.33**	0.23*	0.11	0.25***	0.25*	0.19	0.28**	0.44***	0.40***	0.22***	0.26***	0.25**	0.00	0.37***	0.39***	0.36***	0.22***	0.14*	0.28**	0.10	0.27**	0.38***	0.40***
	(2.27)	(3.49)	(2.17)	(1.08)	(3.51)	(2.45)	(1.81)	(1.32)	(3.01)	(1.9)	(1.62)	(2.28)	(3.49)	(3.24)	(2.93)	(3.11)	(2.07)	(-0.01)	(2.81)	(2.62)	(2.61)	(3.04)	(1.73)	(2.27)	(0.91)	(2.57)	(3.09)	(3.31)
South Asia	0.17*	0.20**	0.19	0.34***	0.38***	0.36***	0.33***	0.15*	0.20**	0.32**	0.28**	0.36***	0.45***	0.41***	0.19	0.26**	0.08	0.24**	0.33***	0.29**	0.33***	0.17	0.13	0.12	0.23**	0.32***	0.47***	0.42***
	(1.85)	(1.97)	(1.32)	(3)	(3.82)	(2.99)	(2.8)	(1.71)	(2.12)	(2.34)	(2.23)	(3.25)	(3.78)	(3.31)	(1.6)	(2.18)	(0.66)	(2.04)	(3.51)	(2.29)	(2.58)	(1.36)	(1.04)	(0.91)	(2.01)	(2.95)	(3.94)	(3.59)
CONSTANT	-0.68**	-0.52	-0.49	-0.19	-0.66*	-1.43***	-1.58***	-0.43	-0.33	-0.86**	-0.41	-0.86**	-1.26***	-0.76*	-0.82**	-0.94**	-0.23	-0.15	-0.51	-1.51***	-1.31***	-0.98***	-0.75*	-0.28	-0.15	-0.92**	-0.97**	-1.10**
	(-1.86)	(-1.33)	(-1.17)	(-0.55)	(-1.69)	(-3.7)	(-3.89)	(-1)	(-0.73)	(-2.04)	(-1.1)	(-2.1)	(-3.15)	(-1.72)	(-2.07)	(-2.17)	(-0.53)	(-0.41)	(-1.33)	(-3.88)	(-2.93)	(-2.61)	(-1.84)	(-0.63)	(-0.4)	(-2.39)	(-2.5)	(-2.44)
Pseudo R^2	0.4486	0.4341	0.4105	0.4041	0.4326	0.4777	0.5545	0.4289	0.4207	0.3906	0.3857	0.4125	0.4544	0.5383	0.4052	0.3892	0.3841	0.3861	0.4240	0.4616	0.5449	0.4061	0.3914	0.3750	0.3793	0.4083	0.4511	0.5367

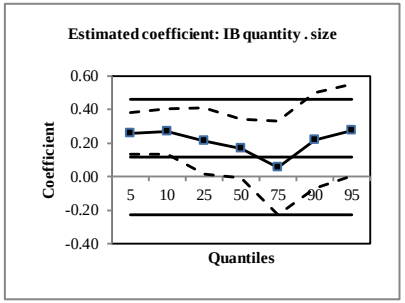
The full sample consists 400 country-year observations (i.e., 80 countries with year observations from 2007 to 2011). The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat)* divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to the creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank. All estimates include observation year dummies (not reported). Bootstrapped standard errors are used (not reported) and they were obtained using 1,000 bootstrap replications. *t*-statistics in parentheses.***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

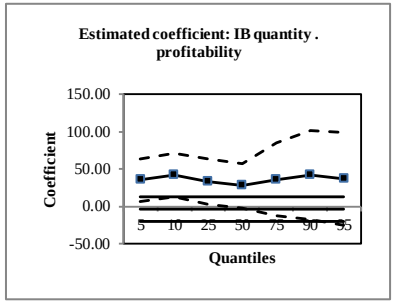
Figure 8.1 Estimated coefficient and 95% confidence intervals

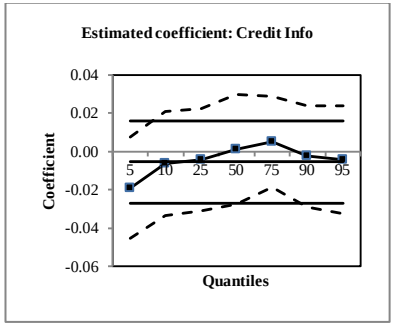


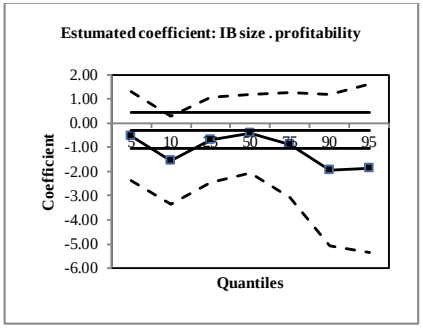


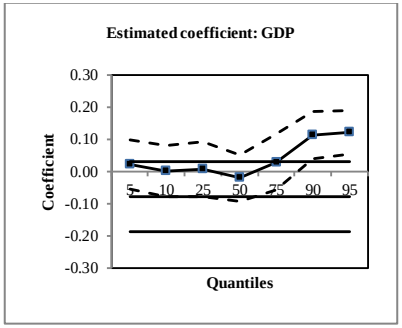


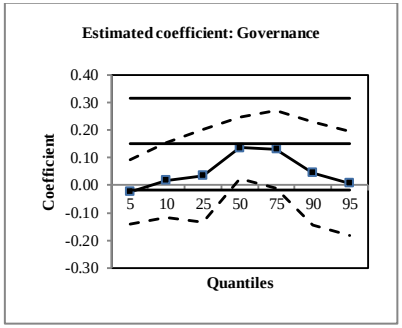


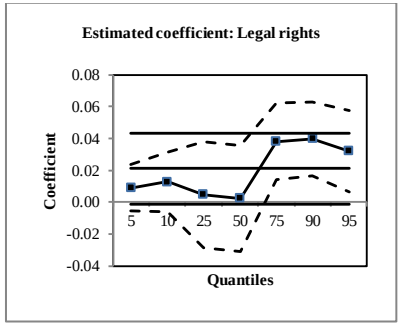


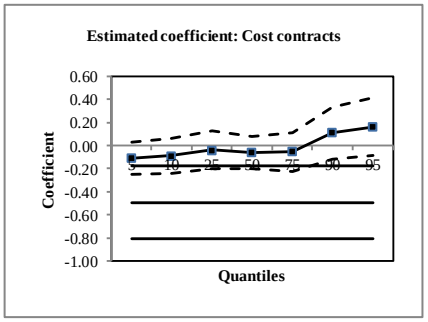


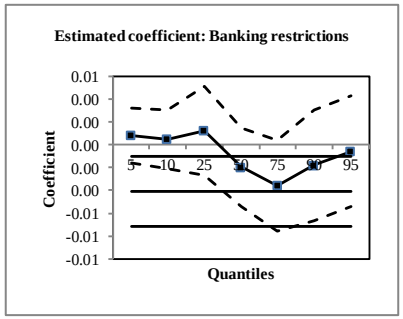












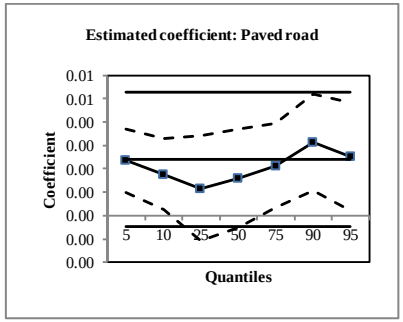
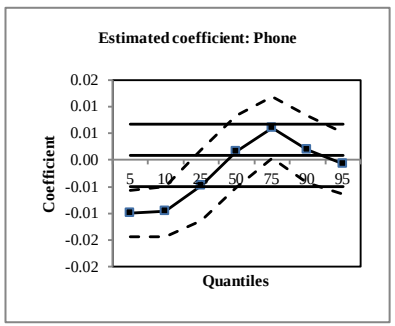
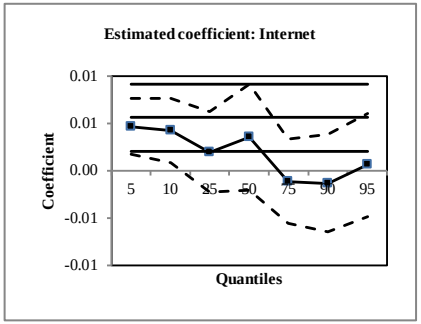
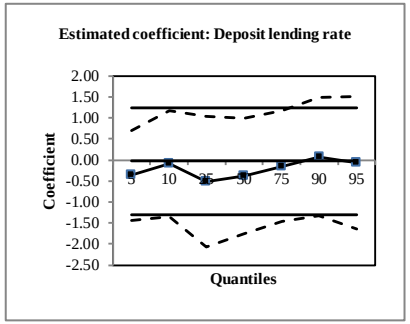
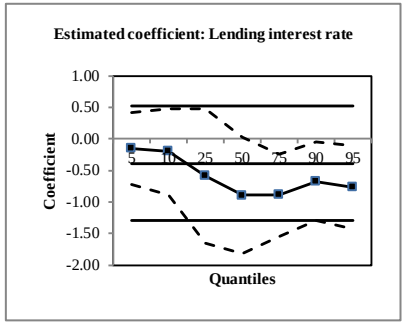


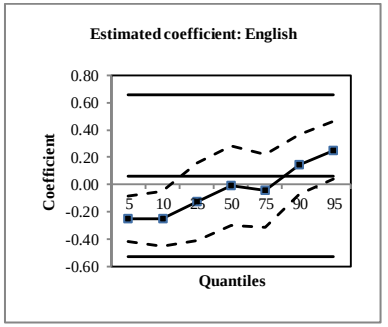
Figure 8.1 Estimated coefficient and 95% confidence intervals (cont'd)

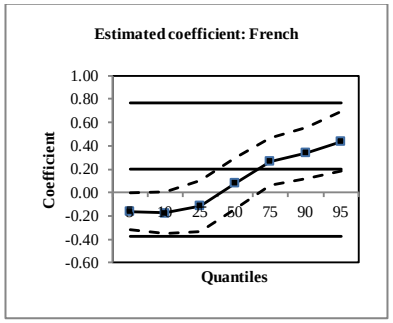


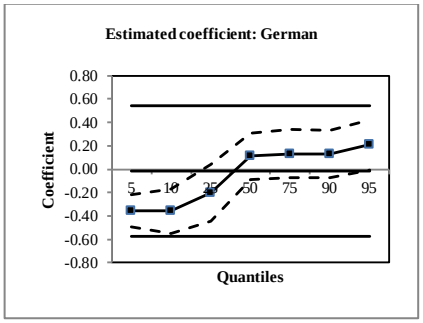


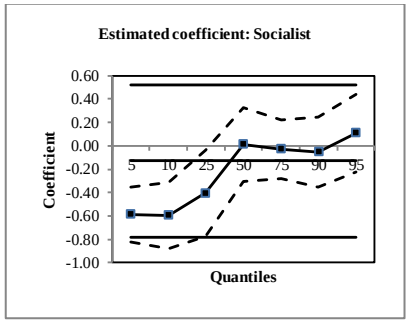


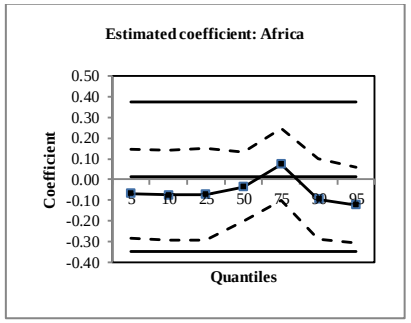


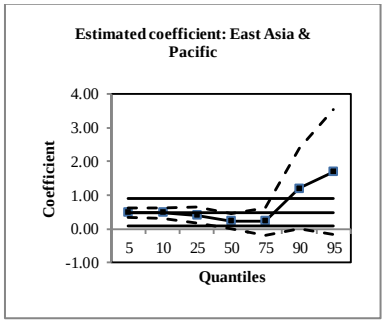


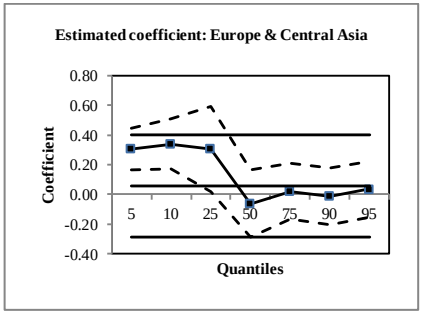


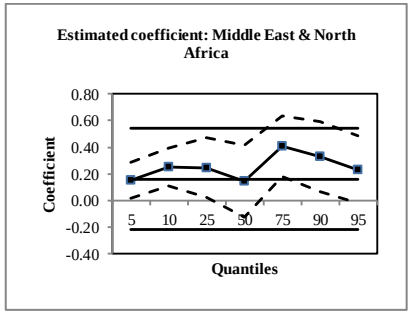


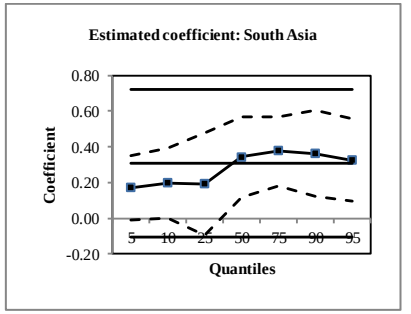












coefficients and the two dashed lines, side by side, signify the upper and lower bounds of the 95% confidence intervals. The horizontal lines in Figure 8.1 represent the random effects estimate and the 95% confidence intervals.

8.2.1 Institutional setting variables

8.2.1.1 Islamic banking presence

Table 8.1 reports the quantile regression results for Islamic banking presence determinants using CIFI as the dependent variable. Overall, heterogeneity in the Islamic banking determinants of financial inclusion is mixed. The quantity of Islamic banks is negative and significant at all financial inclusion distribution, indicating that higher number of Islamic banks dampen the level of financial inclusion both for lower level (i.e., negative and significant at the left tail) and higher level of financial inclusion (i.e., negative and significant at the right tail). However, looking at the reality of the number of Islamic banks operated in the countries (i.e., relatively very few, refer Table 6.4 in Chapter 6), this result could be interpreted in the other way around. On one hand, having less number of Islamic banks could contribute to lower financial inclusion (i.e., negative and significant at the left tail). On the other hand, having less number of Islamic banks but truly operating based on the essential aspect of Islamic banking through emancipation and empowerment, this could promote better financial inclusion (i.e., negative and significant at the right tail).

This is consistent with observations that there could be many Islamic banks in presence (mainly of smaller size) but yet the level of financial inclusion remains low. The case can be exemplified by Indonesia and Pakistan which has 33 and 18 Islamic

banks, respectively but yet their inclusion index is relatively low (i.e., only 0.15 and 0.13, respectively). This reflects the 'bottom-up' Islamic banking model[52] in those countries (Akkizidis & Khandelwal, 2008; Ismal, 2011; Fitriasari, 2012; Sari et al., 2014). It is not surprising that the results are reversed when the quantity is weighted against the banking size (i.e., *IB quantity x size*) and the profitability (i.e., *IB quantity x profitability*). The signs are as expected, i.e., as the larger the size and more profitable of the bank, the better the inclusion is and the effect is only observed at the lower level of financial inclusion (i.e., positive and significant for the 5th, 10th, 25th and 50th with degrees of sensitivity are 0.17-0.27 and 33.50-41.99, respectively). As for the size of Islamic banking, the results continue to support the importance of Islamic banking size in improving financial inclusion at all levels (i.e., positive and significant for the all financial inclusion distribution). These imply that, both factors of Islamic banking size and profitability do exert some influences in the process of shaping the financial inclusion.

In sum, while theory suggests significant repercussions of Islamic finance sector for financially included, the presented evidence in the present study is mixed. This is very much consistent with Demirguc-Kunt, Klapper, & Randall (2013) and Ben Naceur, Barajas, & Massara (2015). On the one hand, this could be due to the different preferences of Muslims towards banking services. The case can be exemplified by little use of Islamic banking products by the Muslim themselves (Ismal, 2011; Demirguc-Kunt, Klapper, & Randall, 2013) and even some of them do not deal with the products (Naser & Jamal, 1999). Some Muslims opine that religious motives do not stand out as being the only significant reason in choosing Islamic bank (Erol &

[52] In this model, the need for the Islamic banking industry is largely motivated by the consumer-side. In the opposite direction, the 'top-down' model is originated from the government who is promoting the Islamic banking industry (e.g., Malaysia).

El-Bdour, 1989; Gait & Worthington, 2008; Rashid & Hassan, 2009) and they also do not differentiate between the services offered by conventional and Islamic banks (Erol, Kaynak, & El-Bdour, 1990; Beck, Demirgüç-Kunt, & Merrouche, 2013). With regard to financial access in particular, Gait & Worthington (2008) find that the increase in Islamic banks' branches do not necessarily improve financial inclusion. All the above reasons, to a certain extent, reflect the argument made by Asutay (2007) that '"the Islamic banking has failed to internalise the social dimension and social justice into its own operational function" (p. 184).

On the other hand, as mentioned by Ben Naceur et al. (2015), the deficiency in the empirical findings may also be partly due to data issues. A better uniformity of Islamic banking definitions as well as a wider coverage of database representing Islamic banking presence are crucial to uncovering statistically reliable link between Islamic financial sector and financial inclusion.

8.2.1.2 Other institutional setting variables

The measure of overall institutional environment variable, i.e., *Governance* has a positive and significant effect at the medium level of inclusion (i.e., in the 50^{th} and 75^{th} percentiles). This situation appears in line with the view put forward by Beck & Demirguc-Kunt (2008) who stated that the broad institutional framework plays an important role in expanding financial outreach and inclusion. This suggests that, governance factor can be an important enabler in shaping financial inclusion especially at the medium to higher levels of inclusion. From the policy making perspective, this implies that although the institutional reform (i.e., in this case the improvement of governance's quality) is a long-term process, this action needs to be

emphasized as asserted by Beck et al. (2009). Prioritizing some institutional reforms over other policies could help in focusing the reform efforts and produce impact on financial inclusion in the short- to medium-term (Beck et al., 2009).

The strength of *legal rights* index has a positive and increasing effect as the level of inclusion increases. Interestingly, this variable is only significant at the higher levels of financial inclusion. This suggests that countries with relatively higher level of financial inclusion is influenced by the role of legal support. This finding complements previous study by Gimet & Lagoarde-Segot (2012) who observed the importance of legal rights in improving access to finance. Overall, this suggests that countries with higher level of financial inclusion are shaped and maintained by a decent contractual and informational frameworks.

It is also found that there is a negative and significant effect of lending interest rate at the higher inclusion levels. This indicates that the lending interest rate becomes more sensitive in countries which have greater access to finance. This is in line with the Keynesian theory and suggests that the cost of debt (i.e., in this case through lending interest rate) is a significant driver for financial intermediations that would have an impact on the levels of financial inclusion (Gimet & Lagoarde-Segot, 2012). By implication, this result suggests that the lending interest rate should be kept as low as possible if countries are to support access to finance. In other words, the lending interest rate plays an important impact in shaping countries to have higher level of inclusion.

Similar to legal rights, the legal origins indicators are also significant at several quantiles of financial inclusion. The coefficients of the legal origin variables show an upward pattern. Except for *Socialist* origin (i.e., which only show negative and significant coefficients at the lower levels of inclusion), the other legal origins exhibit similar finding as well as becomes significantly positive at the 75^{th} quantiles. The results suggest that countries with higher levels of inclusion is shaped and mediated by the *English* and the *French* origins.

This study further examines whether the institutional setting are regionally-specific. Except for Africa, the coeeficients for all other regions are positive and significant at both lower and higher levels of financial inclusion. Such evidence suggests the role of region in shaping the countries of both with the lower and higher level of financial inclusion. This appears in line with the view put forward by Martin (2000) who argues that the processes of geographically uneven capitalist economic development are shaped and mediated by the differences in the institutional structures.

To this juncture, this evidences lend a support to the theoretical prediction of the presence of heterogeneity in the institutional settings, consistent with Zucker (1987).

8.2.2 Other explanatory variables

One of the important determinants of financial inclusion is *GDP*. This variable is positive and significant only at the higher levels of financial inclusion. This is not surprising given the importance of economic condition in shaping financial inclusion especially in countries with higher levels of financial inclusion. This finding is

consistent with many previous studies (i.e., Beck, Demirguc-Kunt, & Martinez Peria, 2006; Beck et al., 2007; Sarma & Pais, 2011).

As far as the physical infrastucture is concerned, the findings reveal that paved road, phone and internet are among the important determinants in the process of shaping financial inclusion. The role of internet is only significant at the lower levels of financial inclusion, while paved road and phone appear to be an important enabler for financial access at lower and higher levels of inclusion. With regard to the role of phone specifically, it is quite sensible to observe in the Sub-Saharan African region, that only a third of account holders have access to the mobile money account. The mobile money account is increasingly used in the Sub-Saharan Africa to extend financial services beyond bank branches. With such convenient and affordable financial services offered by the mobile money accounts, it manages to reach the unbanked adults who are typically excluded from the formal financial system – such as women, poor people, young people, and those living in the rural areas. An example is the M-PESA[53], that can be found in Kenya, Tanzania, Afghanistan, South Africa, India and Eastern Europe (MIFC, 2015). In summary, it is evidenced that physical insfrastucture is an important enabler in the process of shaping financial inclusion, both at the lower and higher level, thus supporting Beck et al., (2007), Beck et al., (2008), Sarma & Pais (2011) and Gimet & Lagoarde-Segot (2012).

[53] M-Pesa is a mobile-phone based money transfer and microfinancing service, launched in 2007 by Vodafone for Safaricom and Vodacom, the largest mobile network operators in Kenya and Tanzania. M-Pesa allows users to deposit, withdraw, transfer money and pay for goods and services easily with a mobile device.

8.3 Robustness Checks

Two additional tests were conducted to examine the robustness of the results obtained in this chapter as follows:

8.3.1 Sub-sample of countries with Islamic financial sector

Table 8.2 presents the result of quantile regressions for the financial inclusion determinants in countries with Islamic banking presence (i.e., *n*=100). Following the table, a compact summary of the plotted estimated coefficients across all quantiles, for each explanatory variable, is presented in Figure 8.2.

Overall, the results are broadly consistent with the main quantile regressions results. Except for *IB size* and *IB quantity x profitability*, both *IB quantity* and *IB quantity x size* of Islamic bank's variables explain some variations at different level of inclusion. Although the degrees of sensitivity are quite similar across the lower levels of inclusion (especially for *IB quantity x size* i.e., 0.85-0.95), it does suggest that the role of Islamic banking size in shaping financial inclusion level is heterogenous.

Other variables that are governance, region and phone yield consistent results with the main analysis.

Table 8.2 Quantile regression estimates of CIFI for countries with Islamic banking presence

Variable	*with all IB variables*							*IB Quantity*							*IB Size*							*IB Profitability*						
	5th	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*
IB quantity	-7.85***	-7.85***	-6.92***	-7.72***	-6.18	-5.72	-7.37	-4.88***	-4.88***	-5.28***	-5.69***	-2.08	-2.08	0.12														
	(-4.11)	(-4.11)	(-3.44)	(-2.78)	(-1.54)	(-0.96)	(-1.12)	(-3.26)	(-3.29)	(-4.21)	(-3.63)	(-0.76)	(-0.57)	(0.03)														
IB size	-0.07	-0.07	-0.06	-0.13	-0.20	-0.13	-0.23								0.00	0.00	-0.06	-0.07	-0.08	-0.09	-0.18							
	(-0.81)	(-0.81)	(-0.71)	(-1.05)	(-1.30)	(-0.60)	(-0.94)								(-0.01)	(-0.01)	(-0.59)	(-0.66)	(-0.63)	(-0.55)	(-0.99)							
IB profitability	3.60	3.60	2.68	3.75	2.15	3.96	2.48															2.01	2.01	1.90	0.10	1.85	0.29	5.02
	(0.93)	(0.93)	(0.68)	(0.66)	(0.25)	(0.32)	(0.19)															(0.46)	(0.46)	(0.44)	(0.02)	(0.23)	(0.03)	(0.40)
IB quantity x size	0.95***	0.95***	0.84***	0.93**	0.74	0.66	0.79	0.58***	0.58***	0.63***	0.66***	0.21	0.20	-0.11	0.07	0.07	0.07	0.03	0.05	0.06	-0.02							
	(3.79)	(3.79)	(3.19)	(2.64)	(1.45)	(0.86)	(0.93)	(3.21)	(3.23)	(3.83)	(3.32)	(0.65)	(0.46)	(-0.22)	(0.68)	(0.68)	(0.68)	(0.29)	(0.45)	(0.42)	(-0.13)							
IB quantity x profitability	13.12	13.12	9.39	8.04	-2.64	6.77	17.30	1.20	1.20	4.58	4.85	12.65	13.59	24.24								2.71	2.71	3.23	3.46	10.82	19.90	17.13
	(0.84)	(0.84)	(0.65)	(0.40)	(-0.09)	(0.15)	(0.35)	(0.16)	(0.16)	(0.63)	(0.52)	(1.03)	(0.89)	(1.39)								(0.21)	(0.21)	(0.24)	(0.23)	(0.54)	(0.75)	(0.54)
IB size x profitability	-0.77	-0.77	-0.62	-0.65	0.12	-0.45	-0.15								-0.02	-0.02	-0.05	-0.01	0.22	0.22	0.70	-0.48	-0.48	-0.49	-0.24	-0.33	-0.34	-0.73
	(-0.93)	(-0.93)	(-0.77)	(-0.53)	(0.06)	(-0.18)	(-0.05)								(-0.08)	(-0.09)	(-0.23)	(-0.04)	(0.52)	(0.42)	(1.20)	(-0.59)	(-0.60)	(-0.61)	(-0.23)	(-0.25)	(-0.2)	(-0.35)
GDP	-0.09	-0.09	-0.05	-0.03	-0.09	-0.10	0.01	0.05	0.05	-0.03	0.01	0.01	-0.03	0.08	-0.05	-0.05	0.06	0.10	-0.05	-0.17	-0.02	0.01	0.01	0.06	0.10	-0.04	-0.12	0.01
	(-0.90)	(-0.90)	(-0.47)	(-0.22)	(-0.43)	(-0.31)	(0.02)	(0.33)	(0.33)	(-0.19)	(0.06)	(0.03)	(-0.08)	(0.16)	(-0.30)	(-0.30)	(0.34)	(0.45)	(-0.17)	(-0.46)	(-0.05)	(0.09)	(0.09)	(0.49)	(0.57)	(-0.19)	(-0.38)	(0.03)
Governance	0.49***	0.49***	0.49***	0.59***	0.65***	0.68*	0.77*	0.39**	0.39**	0.37**	0.33	0.54*	0.58	0.67	0.52**	0.52**	0.50**	0.52**	0.66**	0.72**	0.81**	0.29	0.29	0.33*	0.45**	0.58**	0.64*	0.69*
	(3.01)	(3.03)	(3.07)	(3.08)	(2.54)	(1.74)	(1.76)	(2.11)	(2.12)	(2.19)	(1.58)	(1.8)	(1.58)	(1.52)	(2.21)	(2.23)	(2.32)	(2.28)	(2.42)	(2.09)	(2.04)	(1.51)	(1.53)	(1.96)	(2.33)	(2.23)	(1.84)	(1.73)
Legal rights	0.01	0.01	0.02	0.03	0.03	0.03	0.04	0.01	0.01	0.04	0.04	0.14	0.14	0.25	0.03	0.03	0.06	0.09	0.14	0.11	0.15	0.08*	0.08*	0.09*	0.11	0.16	0.16	0.27
	(0.19)	(0.19)	(0.41)	(0.45)	(0.32)	(0.19)	(0.19)	(0.13)	(0.13)	(0.85)	(0.53)	(1.13)	(0.86)	(1.28)	(0.65)	(0.66)	(1.13)	(1.33)	(1.33)	(0.76)	(0.89)	(1.83)	(1.83)	(1.90)	(1.40)	(1.32)	(0.96)	(1.38)
Credit information	-0.04	-0.04	-0.01	-0.04	-0.16	-0.19	-0.33	0.01	0.01	0.00	0.00	-0.14	-0.18	-0.32**	0.00	0.00	0.03	0.00	-0.13	-0.17	-0.33**	-0.04	-0.04	0.00	0.02	-0.14	-0.19	-0.31**
	(-0.70)	(-0.70)	(-0.19)	(-0.54)	(-1.59)	(-1.34)	(-2.23)	(0.13)	(0.13)	(0.00)	(-0.06)	(-1.42)	(-1.35)	(-2.13)	(0.00)	(0.00)	(0.45)	(-0.02)	(-1.24)	(-1.25)	(-2.19)	(-0.64)	(-0.64)	(0.07)	(0.29)	(-1.4)	(-1.51)	(-2.25)
Cost contracts	0.38	0.38	0.47	0.40	-0.77	-1.35	-2.16	0.58	0.58	0.63	0.70	-1.03	-1.40	-2.63	0.00	0.00	0.15	0.29	-1.16	-1.82	-2.72*	0.18	0.18	0.29	0.38	-1.26	-1.82	-2.79*
	(0.87)	(0.87)	(1.02)	(0.68)	(-0.89)	(-1.12)	(-1.64)	(1.09)	(1.10)	(1.14)	(0.91)	(-0.95)	(-0.99)	(-1.58)	(0.00)	(0.00)	(0.23)	(0.34)	(-1.10)	(-1.35)	(-1.83)	(0.33)	(0.33)	(0.50)	(0.48)	(-1.27)	(-1.39)	(-1.94)
Banking restrictions	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
	(1.19)	(1.19)	(0.86)	(0.30)	(0.00)	(0.03)	(-0.30)	(-0.85)	(-0.85)	(1.18)	(0.65)	(0.39)	(0.32)	(0.20)	(-0.65)	(-0.65)	(-0.40)	(-0.47)	(0.16)	(0.43)	(-0.12)	(-0.94)	(-0.94)	(-0.72)	(-0.74)	(0.74)	(0.89)	(0.59)
Paved road	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	-0.01	0.01	0.01	0.01*	0.01*	0.00	0.00	0.00	0.01***	0.01***	0.01***	0.01**	0.00	0.00	-0.01
	(1.40)	(1.40)	(1.67)	(1.49)	(0.66)	(0.04)	(0.02)	(1.09)	(1.10)	(1.33)	(1.04)	(0.01)	(-0.08)	(-0.37)	(1.61)	(1.62)	(1.86)	(1.68)	(0.38)	(-0.06)	(-0.11)	(2.74)	(2.76)	(2.67)	(2.00)	(0.00)	(-0.39)	(-0.62)
Phone	-0.02*	-0.02*	-0.03**	-0.03*	0.01	0.02	0.04	-0.03	-0.03	-0.03	-0.03	0.01	0.02	0.04	-0.02	-0.02	-0.03	-0.03	0.00	0.03	0.05	-0.02	-0.02	-0.03	-0.03	0.01	0.02	0.03
	(-1.72)	(-1.72)	(-2.17)	(-1.73)	(0.31)	(0.62)	(0.97)	(-1.59)	(-1.6)	(-1.53)	(-1.28)	(0.19)	(0.37)	(0.70)	(-1.06)	(-1.06)	(-1.47)	(-1.22)	(0.15)	(0.66)	(1.00)	(-1.20)	(-1.21)	(-1.38)	(-1.25)	(0.27)	(0.49)	(0.61)
Internet	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	0.00
	(1.11)	(1.11)	(0.56)	(0.42)	(0.15)	(0.18)	(0.43)	(0.24)	(0.25)	(0.16)	(0.40)	(-0.29)	(-0.12)	(-0.24)	(-0.72)	(-0.72)	(-1.72)	(-1.69)	(-0.66)	(-0.41)	(-0.29)	(-0.65)	(-0.65)	(-1.31)	(-1.45)	(-0.93)	(-0.55)	(-0.03)
Deposit interest rate	2.42	2.42	1.86	2.59	2.32	0.59	1.76	-2.17	-2.17	1.23	0.52	2.85	2.70	6.16	-2.05	-2.05	0.38	2.27	4.27	4.41	4.84	0.22	0.22	0.46	0.83	3.93	5.49	7.66
	(1.09)	(1.10)	(0.78)	(0.81)	(0.50)	(0.09)	(0.24)	(-0.93)	(-0.94)	(0.57)	(0.18)	(0.58)	(0.42)	(0.78)	(-0.78)	(-0.78)	(0.14)	(0.66)	(0.91)	(0.71)	(0.67)	(0.09)	(0.09)	(0.17)	(0.21)	(0.72)	(0.77)	(0.96)
Lending interest rate	-0.87	-0.87	-0.61	-0.72	0.61	3.44	6.38	0.80	0.80	-1.35	-0.49	-0.60	0.55	-0.33	0.89	0.89	-1.18	-2.61	-2.34	-1.88	0.43	-0.99	-0.99	-0.92	-0.97	-2.62	-3.55	-2.09
	(-0.34)	(-0.34)	(-0.23)	(-0.21)	(0.13)	(0.48)	(0.81)	(0.34)	(0.35)	(-0.66)	(-0.19)	(-0.14)	(0.0)	(-0.04)	(0.32)	(0.32)	(-0.44)	(-0.88)	(-0.61)	(-0.36)	(0.07)	(-0.35)	(-0.35)	(-0.33)	(-0.28)	(-0.59)	(-0.63)	(-0.32)
English	0.09	0.04	0.00	0.08	-0.15	-0.60	-0.99	0.57	0.56	0.06	0.13	-1.07	-1.26	-2.38*	0.60	0.60	0.18	0.17	-0.89	-1.16	-1.47	0.27	0.27	0.13	0.14	-1.20	-1.67*	-2.53**
	(0.26)	(0.12)	(-0.01)	(0.17)	(-0.20)	(-0.54)	(-0.78)	(1.40)	(1.36)	(0.14)	(0.23)	(-1.22)	(-1.11)	(-1.75)	(1.25)	(1.26)	(0.39)	(0.26)	(-1.05)	(-1.07)	(-1.20)	(0.56)	(0.56)	(0.25)	(0.19)	(-1.56)	(-1.88)	(-2.60)
French	0.02	-0.03	-0.23	-0.21	0.16	0.17	0.17	0.17	0.16	-0.22	-0.21	-0.45	-0.38	-0.79	0.45	0.45	-0.10	-0.28	-0.38	-0.22	-0.15	0.05	0.05	-0.16	-0.26	-0.50	-0.56	-0.80
	(0.04)	(-0.07)	(-0.47)	(-0.40)	(0.25)	(0.20)	(0.18)	(0.27)	(0.25)	(-0.35)	(-0.29)	(-0.61)	(-0.48)	(-0.84)	(0.62)	(0.62)	(-0.14)	(-0.38)	(-0.54)	(-0.27)	(-0.16)	(0.07)	(0.07)	(-0.22)	(-0.33)	(-0.64)	(-0.64)	(-0.82)

Variable	*with all IB variables*							*IB Quantity*							*IB Size*							*IB Profitability*						
	5th	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*	*5th*	*10th*	*25th*	*50th*	*75th*	*90th*	*95th*
East Asia & Pacific	0.24	0.24	0.26	0.35	0.39	0.50	0.71	0.09	0.09	0.14	0.17	0.70	0.71	1.25	-0.10	-0.10	-0.10	-0.06	0.55	0.73	0.83	-0.15	-0.15	-0.16	-0.16	0.76	0.96	1.43*
	(1.19)	(1.19)	(1.26)	(1.25)	(0.84)	(0.70)	(0.90)	(0.38)	(0.39)	(0.56)	(0.40)	(0.94)	(0.70)	(1.04)	(-0.34)	(-0.34)	(-0.34)	(-0.15)	(0.96)	(0.93)	(0.96)	(-0.57)	(-0.57)	(-0.58)	(-0.37)	(1.47)	(1.32)	(1.76)
Europe & Central Asia	-0.07	-0.07	0.22	0.23	-0.52	-0.87	-1.61	0.60	0.60	0.33	0.36	-0.59	-0.90	-1.67	0.32	0.32	0.37	0.37	-0.58	-1.05	-1.58	0.20	0.20	0.32	0.40	-0.61	-1.07	-1.65
	(-0.18)	(-0.18)	(0.57)	(0.47)	(-0.75)	(-0.81)	(-1.36)	(1.15)	(1.16)	(0.65)	(0.61)	(-0.78)	(-0.82)	(-1.29)	(0.60)	(0.61)	(0.68)	(0.57)	(-0.81)	(-1.15)	(-1.52)	(0.37)	(0.37)	(0.56)	(0.58)	(-0.86)	(-1.11)	(-1.54)
Middle East & North Africa	0.31	0.31	0.54	0.61	-0.19	-0.48	-1.07	0.36	0.36	0.59	0.66	0.21	-0.04	-0.23	0.11	0.11	0.36	0.62	0.11	-0.30	-0.72	0.27	0.27	0.47	0.64	0.22	-0.02	-0.18
	(0.82)	(0.83)	(1.42)	(1.25)	(-0.25)	(-0.43)	(-0.86)	(0.88)	(0.89)	(1.44)	(1.27)	(0.28)	(-0.04)	(-0.18)	(0.22)	(0.22)	(0.72)	(0.98)	(0.14)	(-0.28)	(-0.57)	(0.59)	(0.59)	(0.97)	(1.04)	(0.26)	(-0.02)	(-0.14)
South Asia	0.56**	0.56**	0.54**	0.57**	0.50	0.61	0.70	0.31	0.31	0.44**	0.47	0.64	0.62	0.82	-0.52	-0.52	-0.53	-0.24	0.57	0.69	0.67	-0.61**	-0.61**	-0.50	-0.26	0.62	0.71	0.87
	(2.41)	(2.42)	(2.45)	(2.19)	(1.40)	(1.06)	(1.10)	(1.22)	(1.23)	(2.23)	(1.64)	(1.25)	(0.89)	(0.99)	(-1.29)	(-1.29)	(-1.19)	(-0.50)	(1.20)	(1.14)	(0.98)	(-2.15)	(-2.14)	(-1.53)	(-0.71)	(1.38)	(1.19)	(1.26)
CONSTANT	0.63	0.68	0.25	0.58	2.64	2.91	3.59	-1.03	-1.02	-0.57	-0.96	0.79	1.47	1.95	-0.39	-0.39	-0.68	-0.93	1.64	3.38	3.84	-0.89	-0.89	-1.37	-1.56	1.40	2.83	2.39
	(0.63)	(0.68)	(0.24)	(0.37)	(1.03)	(0.76)	(0.87)	(-0.87)	(-0.87)	(-0.47)	(-0.50)	(0.25)	(0.35)	(0.39)	(-0.26)	(-0.26)	(-0.44)	(-0.45)	(0.59)	(0.95)	(0.93)	(-0.83)	(-0.83)	(-1.13)	(-0.82)	(0.52)	(0.77)	(0.56)
Pseudo R^2	0.7713	0.7261	0.6706	0.5908	0.6112	0.7096	0.8060	0.7155	0.6592	0.6140	0.5357	0.5626	0.6892	0.7877	0.6850	0.6227	0.5387	0.4401	0.5483	0.6811	0.7921	0.6841	0.6216	0.5340	0.4368	0.5454	0.6785	0.7855

The sub sample consists 100 country-year observations (i.e., 20 countries with Islamic banking presence, with year observations from 2007 to 2011). The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa*, *East Asia & Pacific*, *Europe & Central Asia*, *Latin America & Caribbean*, *Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank. All regressions include year dummies, i.e., for 2007 to 2010 (not reported). Bootstrapped standard errors are used (not reported) and they were obtained using 1,000 bootstrap replications. *t*-statistics in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

Figure 8.2 Estimated coefficient and 95% confidence intervals for countries with Islamic banking presence

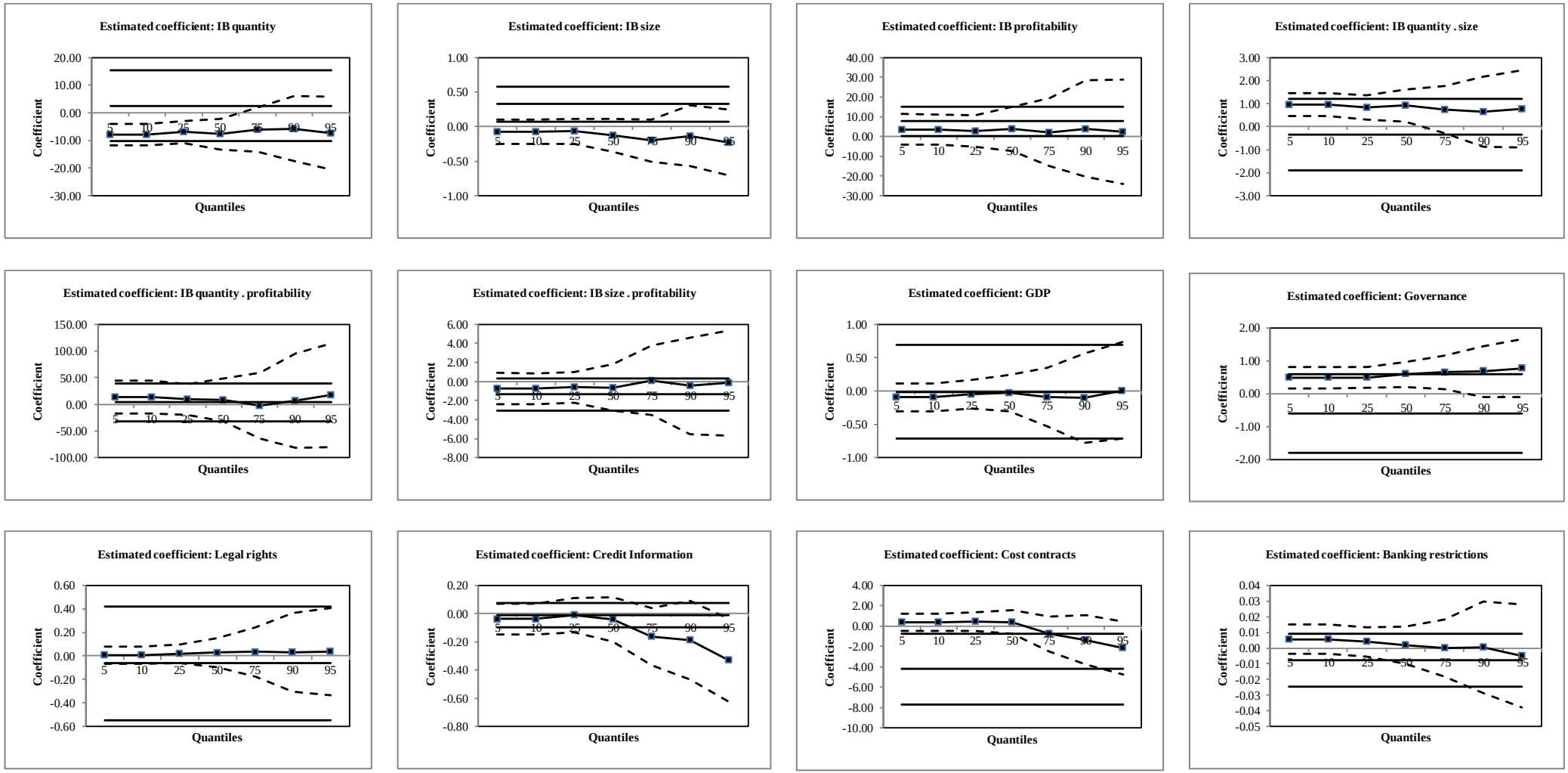
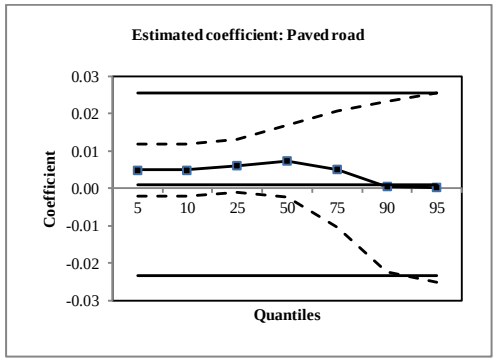
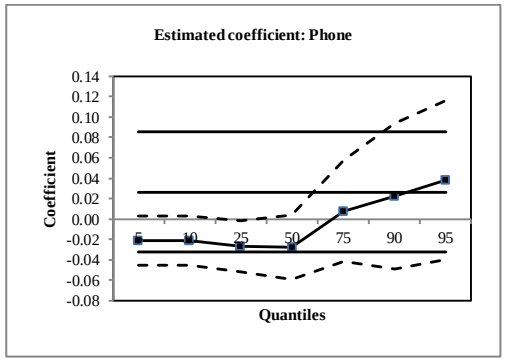
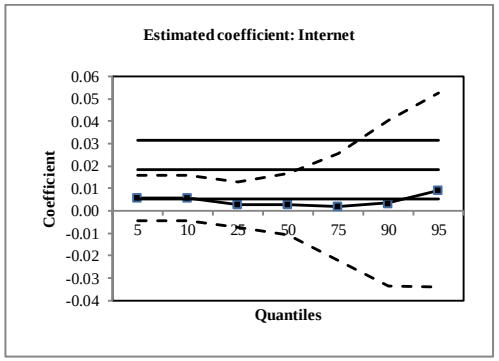
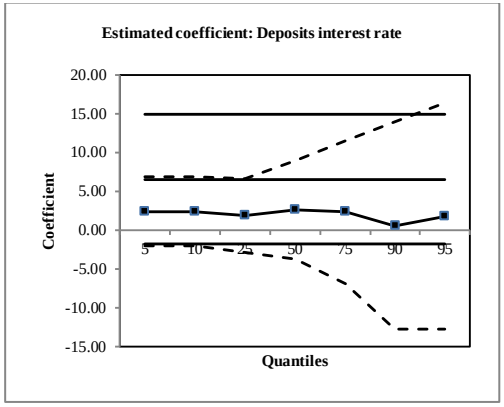


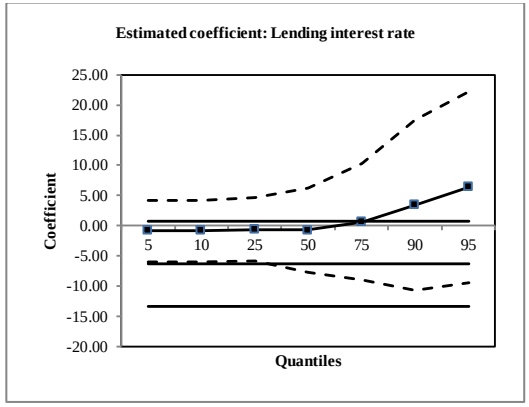
Figure 8.2 Estimated coefficient and 95% confidence intervals for countries with Islamic banking presence (cont'd)











8.3.2 Inter-quantile regressions

The robustness of the quantiles regression results is also checked by conducting inter-quantile regression, where the disparity of the estimated coefficient between different quantiles is examined. The disparity is tested between the two extreme tails (95^{th} and 5^{th}), the right tail and the median (95^{th} and 50^{th}), the median and the left tail (50^{th} and 5^{th}) and the two quartiles (75^{th} and 25^{th}) respectively. The inter-quantile regression is modelled as higher quantile minus lower quantile, and the positive sign represents an ascending pattern of coefficients between the two quantiles while a negative sign indicates a descending pattern (Dzolkarnaini, 2009).

The results are reported in Tables A2.1 and A2.2 in Appendix 2 for the full sample and the sub sample of countries with Islamic banking presence, respectively. Generally speaking, the results demonstrate that the explanatory variables exert some different effects on level of financial inclusion at different points of the distribution, thus confirming the visual inspection of Figures 8.1 and 8.2. The different effects of the independent variables at the different quantiles of the distribution suggest that there is an evidence of heterogeneity in the sample of countries, particularly the institutional settings variables. With regard to the Islamic banking variables, the presence of heterogeneity is not largely prevalent.

8.4 Chapter Summary

This chapter has further presented an empirical examination of heterogeneity aspect of institutional theory. The results of the analysis are robust in which the

heterogeneity of the determinants was addressed by examining the entire distribution of sample using the quantile regression method.

The chapter offers the following findings; firstly, although not largely prevalent, the determinants are found to be heterogenous and they differ in terms of relative strength and significance across the whole distributions of financial inclusion index. Secondly, more specifically, the Islamic banking presence is found to have a mixed influence on the process and structure of financial inclusion.

By further examining the distribution of financial inclusion, it is found that heterogeneity in the financial access determinants is evident. This supports the notion of heterogeneity in institutional theory as put forward by Zucker (1987) on the role of institutional settings' processes and structures in creating and shaping the various levels of financial inclusion. It shows that the determinants (Islamic banking presence, in particular), are not homogeneous across the whole distribution of countries' financial inclusion levels, which contradicts to the earlier studies done by Benson (1975) and Rowan (1982). In other words, financial inclusion index distribution is not only heterogenous with significantly different institutional settings, but also with significantly different state of Islamic banking development and efficiency.

Admittedly, these findings demonstrate that institutional settings are shaped and designed to be consistent with financial inclusion enhancement for both at lower and higher level of financial inclusion. For example, in countries with lower financial inclusion, the presence of Islamic banking (i.e., based on its asset size) would facilitate fuller participation by the vulnerable groups such as weaker sections and low

income groups by offering customized service and products (with empowerment element) to freeing themselves from financial burdens. Whereas, in countries with higher financial inclusion, stronger and better policies (such as contractual and informational frameworks and regulatory restriction) are more crucial to achieve and sustain in order to promote greater financial inclusion.

It should also be noted that, to my knowledge, the empirical findings on the heterogeneity of the determinants of financial inclusion is the first of its kind in the literature. Therefore, this chapter further contributes to this field of study by examining the financial inclusion index distribution.

Chapter 9

SUMMARY AND CONCLUSIONS

9.1 Introduction

In this chapter, a summary of the whole thesis is provided for an overall and comprehensive picture of the entire study. It is the most important chapter of the whole thesis as it reflects the justification of the study by highlighting the extent to which the aims and objectives of the study have been obtained. It begins by summarizing the chapters which give the background knowledge of the thesis and explains why this study is useful. The methodologies of the research and the tools employed are also briefly mentioned to provide a logical flow of the thesis.

Next, section 9.3 briefly presents the findings and analysis of the results to conclude the whole thesis, followed by elaboration of the implications of the study. Contributions to the body of knowledge is presented in Section 9.4. The final section discusses the limitations of the study and suggestions for further research that resulting from potential bias in the results that can be avoided in future research studies.

The thesis consists of two major components; the first six chapters are foundational chapters which give the background of the study and the last two chapters constitute the empirical work.

9.2 Overall Summary

This thesis investigates the determinants of financial inclusion, while recognising the heterogeneous impacts of those determinants across different levels of financial inclusion based on institutional theory. The thesis is divided into seven main chapters.

Chapters 2 and 3 present the review of the relevant literatures. Chapter 2 looks at the main topic of financial exclusion studies and highlights the role of financial system in shaping financial inclusion. The chapter also discusses the different type of financial systems with major concern on the role of Islamic banking and finance in driving financial inclusion. It deserves special mention because the present study considers the Islamic banking presence as one of the bases for explaning the determinants of access to finance. This is in response to the view put forward by Mirakhor & Iqbal (2012) and Mohieldin, Iqbal, Rostom, & Fu (2012) who claim that Islamic finance can play an important role in enhancing financial inclusion.

Chapter 3 provides a detailed survey of literature related to the measurement and determinants of financial inclusion. Amongst others, the chapter discusses the measurement of financial inclusion which entail two major aspects, namely the dimensions and indicators as well as formula used in the index computation. Further, the chapter presents the empirical evidence on the financial access determinants. As far as the Islamic banking determinant is concerned, and despite the relatively little research being carried out on the possible link between Islamic bank and financial inclusion, the evidence is relatively weak and inconclusive (Demirguc-Kunt, Klapper, & Randall, 2013; Ben Naceur, Barajas, & Massara, 2015).

Chapters 4, 5 and 6 are devoted to the research methods of the present study. Chapter 4 designates the basic structure of the research design and the methodology employed to conduct the study, comprising variable definitions and the sample selection procedure.

Chapter 5 describes the construction of financial inclusion index using method initiated by Sarma (2008, 2010). The index computation is vital given that the measurement of financial inclusion is not previously well-developed and not uniform enough to make cross-country analysis possible. It is learned from this chapter that in order to produce a better and comprehensive financial inclusion index, all the following three important aspects need to be considered:

- inclusion of as many dimensions as possible: outreach, usage, ease and cost of the financial services.
- comprises all the four basic financial services: savings, credits, insurance and banking transactions. However, one may also include microfinance or microcredit as more concerns are placed on the role of these financial services in promoting financial inclusion.
- uses a well supported formula/approach, particularly the one used by the United Nations Development Programme (UNDP).

However, the issue of data availability remains to be the major constraint as pointed by Claessens (2006) and Beck & Demirguc-Kunt (2008). The chapter further presents the empirical distribution of the countries based on level of financial inclusion and marginal differences throughout the periods. It is generally shown that the mass of the

distribution is concentrated on the low level of financial inclusion and the substantial variation through time is not largely noticeable.

Chapter 6 describes the procedure for measuring the Islamic banking presence. For the present study, the Ben Naceur et al. (2015) approach is modified to produce the indicators of Islamic banking – the number of Islamic banks operating in the country, the size of the Islamic banks' assets and the profitability of these banks - which is used as the main Islamic banking proxy in all regression analyses. This chapter further presents the empirical distribution of Islamic banking indicators and it is generally shown that, in terms of quantity and profitability, the Islamic bank are still far behind but it is not the case in terms of size.

The next two chapters report the results of the present study. Chapter 7 presents the results of investigating the determinants of financial inclusion. It is found that the size of Islamic banking, governance, legal rights, paved road, internet and East Asia & Pacific are positively related to the level of financial access while the cost of enforcing contracts, regulatory restrictions and lending interest rate are negatively related. The relationships between financial inclusion and the Islamic banking quantity and profitability, GDP, phone, deposit interest rate and legal origins are less clear. As far as the institutional theory is concern, these findings support the general notion that the institutional framework plays an essential role in creating and shaping financial inclusion as remarked by Beck & Torre (2007) and Beck & Demirguc-Kunt (2008).

Finally, Chapter 8 presents empirical evidence on the heterogeneity in the determinants of financial inclusion. The quantile regression results show that the financial inclusion determinants are heterogenous across the whole distribution of CIFI. Overall, it is found that physical infrastructure, legal origins and regions have impacts on financial inclusion at both, lower and higher levels. It is also documented that the internet becomes an important enabler for access to finance in the countries where the level of inclusion is lower while GDP and legal rights are the key drivers for countries with higher levels of financial inclusion. The evidence of heterogeneity in the Islamic banking presence determinants is mixed and inconclusive.

To summarize, this thesis offers the following answers to the research questions outlined in Chapter 4:

1. *Does the Islamic financial sector (i.e., as proxied by the Islamic banking presence) have significant influence on financial inclusion?*

   The use of Islamic banking presence to proxy for the country's Islamic financial sector status have shown that there are tentative, mixed and relatively weak link between financial inclusion and Islamic financial system. More specifically, it is evident that Islamic banking size does exert financial inclusion whereas the influences of number of Islamic banks and their profitability level are somewhat unclear.

2. *Are the empirical effects between the Islamic financial sector and financial inclusion consistent with the theoretical presumption (i.e., Islamic banking is positively related with financial inclusion)?*

Using the Islamic banking presence indicators, it is evident that the empirical relationship between the Islamic financial system factor and the financial inclusion is less consistent with the theoretical presumption. This finding suggests that the Islamic financial sector, as proxied by the Islamic banking presence is not necessarily removing the high barriers of access to finance.

3. *Do the financial access determinants, especially institutional settings, that have been tested in prior studies remain significant in explaining factors associated with financial access?*

There is significant evidence to support the view that most of the usual financial inclusion determinants remain significant in explaining factors associated with access to finance. More specifically, countries with better level of governance and legal rights index are more likely to prevent exploitation of the least-advantaged group in the financial system, whereas access to finance could be distorted when countries impose higher cost of enforcing contracts and banking restrictions. In sum, all these evidences are consistent with the institutional theory. Countries with higher level of financial inclusion also portray as having good physical infrastructure in terms of paved road and internet. The contention that cost of debt is a powerful driver of financial intermediation levels through the demand-side effects (and hence placing

more burden to those disfavoured people) is also supported as higher lending rate inhibits the expansion of credit access. In contrast with prior studies, little evidence is found between the level of financial inclusion and GDP as well as the legal origin. As far as the effect of geographical region on financial access is concerned, the evidence is generally supporting the view of Martin (2000) who argues that the processes of geographically uneven capitalist economic development are shaped and mediated by the institutional structures, and consequently affecting the level of financial inclusion. Overall, the evidence supports the view that institutional settings affect financial inclusion.

4. *Are the financial access determinants heterogeneous across the whole distribution of countries?*

The heterogeneity in the financial inclusion determinants is evident in the quantile regression analysis. It shows that the determinants are not homogenous across the whole distributions of countries. This further supports that financial inclusion is institutionally-driven and the sheer size of impacts varies across countries and geographical regions.

9.3 The Research Findings and Implications of the Study

The findings and the results of the research have been presented in a more empirical and analytical way in Chapters 7 and 8. As a matter of reflection, recent development of Islamic banking is briefly presented, followed by the summary of research findings.

Islamic finance has grown rapidly in recent years, but remains concerted in a few jurisdictions. Islamic finance assets grew at double-digit rates during the past decade, from about US$200 billion in 2003 to an estimated US$1.88 trillion at the end of 2015 (Ernst & Young, 2014; IFSB, 2016; Oliver Wyman, 2002). Nevertheless, despite this growth, Islamic finance assets are still concentrated in the Gulf Cooperation Council (GCC) countries, Iran, and Malaysia, and represent less than 1 per cent of global financial assets. Islamic finance now encompasses a wide range of services. Nonetheless, banking still dominates and represented about four-fifths of total Islamic finance assets in 2013 (IFSB, 2014).

The growth of Islamic banking, in particular, outperformed conventional banking over the past decade. Islamic banking has thus increased its penetration in many countries, crossing the threshold of 15% as a share of banking system assets in 10 countries (i.e., Iran and Sudan with a full-fledged Islamic financial sector, Bangladesh, Brunei, Kuwait, Malaysia, Qatar, Saudi Arabia, the United Arab Emirates, and Yemen) (IFSB, 2014). Islamic banking represents about 1.25% of global banking assets. During the recent global financial crisis, Islamic banks were less exposed to the toxic assets that contaminated the conventional banking world, but suffered from second-round effects, notably through the real estate slump. Asset quality and capitalization are still better on average than for conventional banks, while profitability remains lower (IFSB, 2014).

With Islamic banking currently dominates and represented about 80% of total Islamic finance assets, we should expect that the impact of such developments could be

considered having some positive impact on financial inclusion, particularly in countries with Islamic banking sector.

Theoretically speaking, it is evident that the institutional settings' environment are essential in shaping access to finance. However, in many cases, it can be observed that the impact of countries' policies on the incidence of financial inclusion is hardly taking any effect. In the specific context of Islamic banking presence, although the effect is not largely prevalent, it is well-documented in this study that it does exert some influences on the levels of financial inclusion to some extent. This in turn reinforces the importance to recognize other institutional factors that could facilitate access to finance, namely sound contractual frameworks, regulatory restrictions, physical infrastructures and lower lending interest rate.

Building on institutional theory, these findings on the institutional setting variables show the important of having a good institutional framework in expanding financial access as remarked by Beck & Torre (2007) and Beck & Demirguc-Kunt (2008). As there are number of challenges that Islamic finance faces, the role of institutional settings become more crucial. Despite the efforts of Islamic finance standard setters such as AAOIFI and IFSB, in many countries the industry is governed by regulatory and supervisory frameworks that are developed primarily for conventional finance. Hence, it does not fully take into account of the special nature of Islamic finance. Furthermore, the Islamic finance industry is still largely a nascent one, lacking economies of scale, and operating in an environment where legal and tax rules, financial infrastructure, and access to financial safety nets and central bank liquidity are either absent or, if available, do not appropriately take into account the special

characteristics of Islamic finance. Additionally, large differences in practice across countries and limited standardization and securitization create additional uncertainty for Islamic finance clients. Scarcity of Shariah scholars with financial sector expertise and a slow pace of innovation are also weighing on the industry. These challenges may not only be hindering its development, but could also encourage practices and products that are complex, thus carrying heightened risks (Kammer et al, 2015). Therefore, by providing a specific and unique institutional setting for Islamic finance, this industry has the potential to contribute to higher and more financial inclusiveness.

Empirically speaking, despite the other factors associated with financial inclusion, the results in Chapter 7 are very important in understanding theimpact of Islamic banking on financial inclusion. In general, the presence of Islamic banking sector has only minimal influence in enhancing financial inclusion. While Islamic banking coefficient is significant; it does have zero (0) coefficient (refer Table 7.3). This constitutes an important substance for the so-called 'social failure of Islamic finance', as there is relatively no difference in terms of the contribution of Islamic banking and conventional banking towards financial inclusion. Further findings (refer Tables 7.4 and 7.6) support this idea as only the size of Islamic banks are found to give an impact on the level of financial inclusion. Furthermore, not having English legal origin is rather meaningful for the Islamic finance related inclusiveness debate. This is because of Islamic financial development has been predominantly facilitated by the English legal system, and therefore, London as well as Malaysia remain as important centres for contractual agreements and disputes.

As mentioned earlier, the significant but rather zero coefficient perhaps therefore is an indication of religious inclusiveness in terms of provision of Shariah compliant financial instruments. In addition, most of the previous studies are looking into the perspective of financialization in financial inclusion debates. Only a few are discussing this subject matter from the perspective of developmentalism. On the one hand, as financial inclusion relates to developmentalism, the zero coefficient perhaps is an indication that financial inclusivity (in terms of developmentalism) is not affected by Islamic banks. This would suggests that the progress of Islamic banks so far in enhancing financial inclusion is still below par as compared to its conventional counterparts.. Again, this reflects the problem of 'too small to make a contribution'. On the other hand, this subject is very much related to the issue of *substance over form* as claimed by some scholars in Islamic finance. Products and services offered by Islamic banks are merely a replication of those in conventional banks in which the social impact is hardly observed. This concern (i.e., not really promoting Islamic finance objectives) could lead to twofold scenarios; firstly impeding the growth of Islamic banking since the true nature of Islamic finance is lacking in its operation. Secondly, Islamic banking is lacking of capability in driving financial inclusion. These findings reflect an important aspect of how the essence of Islamic finance can contribute to financial inclusion through the realization of *maqasid al-shariah*. As in *tawhid*[54], being the complementarity and unitarity axiom under *maqasid al-shariah*, the interest of all stakeholders is deliberately considered through the Islamic banking operations for human well-being. Under *maqasid al-shariah*, greater financial inclusion in terms of emancipation and empowerment could be directly observed

[54] Tawhid means the oneness of God. Tauhid also is defined as the indivisible oneness concept of monotheism in Islam. Tawhid is the religion's most fundamental concept and holds that God (Allah), literally Al-Ilāh "the God") is One (*Al-ʾAḥad*) and Single (*Al-Wāḥid*) because of the "principle of Tawhid the Islamic belief in God is considered Unitarian.

through the utilization of the assets of Islamic bankwhich comprises of the risk sharing and profit and loss sharing contracts. This element of empowerment is absent in the conventional banking as its underlying principle of operation is interest-based system. Sadly, the reality of Islamic banks mimicking conventional banks' interest-based practice by preferring murabahah-based over profit-sharing based instruments (Aggarwal & Goodell, 2009; Khan, 2010; Beck, et.al, 2013) is far from contributing to empowerment agenda. The present study is therefore proposing that there will be an incredible acceptance and growth for Islamic banking worldwide which will result in greater financial inclusiveness once the unique characteristics of Islamic finance are clearly observed and experienced by all the stakeholders.

9.4 Contributions to the Knowledge

Prior financial inclusion research has made attempts in developing indices to measure financial inclusion (e.g., Sarma, 2008; Sarma, 2010; Arora, 2010; Beck, Chakravarty & Pal, 2010; Prathap, 2011; Gupte, Venkataramani, & Gupta, 2012). The approach taken is mainly incorporating some dimensions and indicators that could quantify and describe the level of financial inclusion. However, to certain extent, the indices are not well supported and remain incomplete. Thus, this present study replicates the work of Sarma (2008, 2010) to compute a more updated index.

With such replication in place, empirical examination of the determinants of financial inclusion can be carried out. Despite the important notes made by Leyshon & Thrift (1995) on the role of financial system in shaping financial inclusion, there exist very few studies dealing with the issue. To a certain extent, those studies are far from being comprehensive. Apart from examining the other determinants of financial inclusion,

the present study therefore investigates the role of financial system in greater details by focusing on to what extent Islamic-based financial system, as one of the institutional settings, shapes financial inclusion.

While it is still far from well-developed and well-accepted, the debate on the classification of financial system continues. Therefore, acknowledging the development and increased interest of Islamic finance, this present study develops a systematic classification of financial system using Islamic banking presence as the proxy to differentiate between Islamic and conventional financial systems. To the best of my knowledge, the present study is the first of its kind to develop such a classification system.

Empirical evidence on the factors felt likely to be important in explaining countries' financial inclusion level is lacking and far from conclusive. Notably, a direct or indirect relationships and significance levels are commonly observed. Such inconclusive findings are perhaps due to the notion of institutional theory. Based on study done by Tolbert (1985), Zucker (1987) argues that institutional environment is heterogeneous, hence reflects the impact of institutional processes on the organization. She claims that homogeneity of environment decreases structure of internal organization, in which contradicting the environment-as-institution approach. The conditional quantile regression method developed by Koenker & Bassett (1978) and Koenker & Hallock (2001) is therefore used in the present study to further explore the heterogeneity aspect of the institutional theory. Also, to the best of my knowledge, the present study is the first of its kind to investigate the issue of heterogeneity in the determinants of financial inclusion using this approach.

Empirically investigating heterogeneity in the financial inclusion determinants has the potential to enable better understanding of the determinants of financial inclusion, and more importantly provides renewed insights on the heterogeneity aspect of the institutional theory. To the best of my knowledge, the present study is the first to document the evidence of heterogeneity in the financial access determinants.

Above all, the present study has made a number of significant contributions to the understanding of financial inclusion and Islamic finance literature particularly in terms of the role of Islamic financial system. Firstly, it improves our understanding of the extent of the relationship between financial inclusion and Islamic financial system. Although the issue has been previously mentioned in many studies, this present study documents rich and vast empirical evidence on the influence of Islamic financial system on the level of financial inclusion, which was previously thought as very lacking and inconclusive. Secondly, the use of quantile regression method to investigate the heterogeneity issue of financial inclusion determinants is considered as making a novel contribution to the body of knowledge.

9.5 Limitations of the Study and Suggestions for Further Research

This study is subject to some limitations. The results of the study are based on a relatively small sample of countries (i.e., 400 country-year observations) where data on both financial access indicators as well as Islamic banking indicators are required to be available. Although the financial access indicators data are readily available from several standard databases, the full and wider data coverage is largely absent which limits the present study to compute a better and more comprehensive financial inclusion index (i.e., to include more dimensions and more type of financial services).

Similarly, the Islamic banking data are not much available in the standard databases, hence manual data collection from the banks' financial statements was required. In addition, as suggested by Casu & Molyneux (2003), all variables are required to be deflated by the Consumer Price Index of each country. This is to take account for macroeconomic differences across countries during the period of the study.

Due to data limitation, it was not possible in the present study to investigate separately the determinants of financial services inclusion (i.e., deposits, loans/credits, insurance, banking transactions, etc). These areas offer more room for improvement on the robustness of the present study's results. However, this is only possible if the databases on those financial services are readily available and reliable or further manual data collection of the required data items can be undertaken.

The ability of the Islamic banking presence to proxy for the countries' Islamic financial sector is somewhat debatable and inconclusive. As stated in many prior studies pertaining to the role of Islamic finance in promoting financial inclusion, Islamic finance could contribute to greater inclusion in two essential ways, namely (i) promoting risk-sharing contracts that provide a viable alternative to conventional debt-based financing, and (ii) through specific instruments of wealth redistribution (e.g., through *zakat*, *waqaf, sadaqah*, etc) among the society. To examine the influence of Islamic financial system on countries' level of financial inclusion in greater details, the measurements of risk-sharing contracts and wealth redistribution are clearly required. These measurements of Islamic financial system are more appropriate in investigating the impact of Islamic finance to financial access. This

offers a fruitful area for further research which will make significant contribution to the research method.

On top of having the Islamic banking presence (i.e., IB quantity, IB size and IB profitability) as the variables for the Islamic banking factor, the risk-sharing and profit-and-loss sharing type of factors (i.e., the share of such instruments and financing in Islamic banking financing) should also have been considered as variables. This is due to the fact that, a developmentalist orientation of financial inclusion would require a financial paradigm based on risk-sharing and sharing economy of participation through profit-and-loss sharing financing paradigm as opposed to financialisation to the conventional and Islamic banking sector. The inclusion of the risk-sharing and profit-and-loss sharing variable could shed more lights on the effect of Islamic finance on financially included.

In addition, while this study focused on the role of Islamic bank on having inclusive financial participation in the society, the role of other non-banking financial institutions should also be recognised (see Figure 2.3 in Chapter 2). Microfinance is considered as one of the powerful tools for poverty alleviation and empowerment of the poor and it is not really a new concept in Islam in particular. Islamic microfinance is not only including financial inclusion to provide various Islamic financial products and services needed by underserved segments of the society, but also providing a more holistic framework to enhance financial inclusion, eradicate poverty and a healthy economy. This can be done by promoting microfinance, micro and small enterprises financing as well as micro insurance, using redistributive instruments from social funds, such as *zakat, waqf* and *sadaqah,* as well as risk sharing

instruments from commercial funds, such as microfinance and micro takaful (Mohieldin, *et al.*, 2012; Iqbal and Mirakhor, 2012 and 2013; Iqbal, 2014). *Baitul Maal wat Tamwil* (house of wealth and business) or BMT[55] in Indonesia is a well-known example of institution adopting Islamic microfinance institution. As far as the developmentalism aspect is concerned, BMT as a non-banking Islamic financial institution provides an ideal channel which could carry out the holistic mission of financial inclusion, rather than solely focusing on the role of Islamic banks themselves.

To end the present study, we could conclude that Islamic banking is not necessarily removing the high barriers of access to finance. It seems that the notion of "unfinished agenda" as purported by Beck & Demirguc-Kunt (2008) remains to be valid for many years to come.

[55] *Baitul Maal* (*Bait* means house, *al-Maal* means wealth) focuses on collecting compulsory and voluntary charities, such as *zakat, infaq, sadaqah, waqf* and optimizing their distribution by applying *Shariah* based management. Meanwhile, *Baitut Tamwil* (*at-Tamwil* means finance/capital) focuses on developing productive businesses as well as investment to enhance the quality of human economic life especially for those in the micro and small scale economy, by promoting funding and financing activities (Ascarya & Tanjung, 2016). As 'a community-based financial institution' which helps SMEs through training and social development programmes, the feature of BMT is distinctive as it is not just a financial institution but it is also a social enterprise for two reasons- firstly, BMT started as a cooperative; thus, it has a cooperative nature with the advantage of providing a more flexible and faster financing approval process than banks. Secondly, BMT offers entrepreneurial skills and the promotion of Islamic values in a practical way (Riwajanti & Asutay, 2015).

References

Abdou, H. A., Ali, K., & Lister, R. J. (2014). A comparative study of Takaful and conventional insurance: Empirical evidence from the Malaysian market. Insurance Market and Companies: Analyses and Actuarial Computations, 4(1), 23–35.

Abduh, M., Brahim, S., & Omar, M. A. (2012). A study on finance-growth nexus in dual financial system countries: Evidence from Bahrain. World Applied Sciences Journal, 20(8), 1166–1174.

Abdul-Majid, M., Mohammed Nor, N., & Said, F. (2005). Efficiency of Islamic banks in Malaysia. In M. Iqbal & A. Ahmad (Eds.), Islamic finance and economic development (pp. 94–115). Palgrave Macmillan, New York.

Abdul-Majid, M., Saal, D. S., & Battisti, G. (2010). Efficiency in Islamic and conventional banking: An international comparison. Journal of Productivity Analysis, 34(1), 25–43.

Abedifar, P., Molyneux, P., & Tarazi, A. (2013). Risk in Islamic banking. Review of Finance, 17(6), 2035–2096.

Abu Zaharah, M. (1997). Usul al-Fiqh. Cairo: Dar al-Fikr al- 'Arabi.

Aggarwal, R., & Goodell, J. W. (2009). Markets and institutions in financial intermediation: National characteristics as determinants. Journal of Banking and Finance, 33(10), 1770–1780.

Ahmed, H. (2013). Financial inclusion and Islamic finance: Organizational formats, products, outreach and sustainability. In Iqbal & Mirakhor (Eds.), Economic development and Islamic Finance: Directions in development (p. 204). Washington, DC: World Bank.

Aitken, R. (2006). Capital at Its Fringes. New Political Economy, 11(4), 479–498.

Aizcorbe, A. M., Kennickell, A. B., & Moore, K. B. (2003). Recent changes in US family finances: Evidence from the 1998 and 2001. Survey of Consumer Finances. Fed. Res. Bull., 89, 1.

Akkizidis, I., & Khandelwal, S. K. (2008). Financial risk management for Islamic banking and finance. New York: Palgrave Macmillan.

Ali Al-Jarhi, M. (2004). Islamic finance and development. Seminar on the prospects of Arab economic cooperation to boost savings and investment, organized by The Arab Academy for Sciences and Technology in collaboration with the Islamic Research and Training Institute (Member of Islamic Development Bank Group), Alexandria, Egypt June 16-18, 2004

Al-Jarrah, I., & Molyneux, P. (2005). Efficiency in Arabian banking. In M. Iqbal & R. Wilson (Eds.), Islamic perspectives on wealth creation (pp. 97–117). Edinburgh

University Press, Edinburgh.

Al-Mamun, A., Abdul Wahab, S., & Malarvizhi, C. . (2010). Impact of Amanah Ikhtiar Malaysia's microcredit schemes on microenterprise assets in Malaysia. International Research Journal of Finance and Economics, (60).

Al-Maraj, R. M. (2009). Islamic finance amid the global financial turmoil – its implication for Japan. Address in Islamic Finance Symposium, Nikkei Conference Room, Tokyo, Japan on 11 November 2009. [Available at https://www.cbb.gov.bh/page-p-islamic_finance_symposium,_nikkei_conference_room,_tokyo,_japan.htm]

Al-mubarak, T., & Osmani, N. M. (2010). Applications of Maqasid al- Shari ' ah and Maslahah in Islamic Banking Practices: AnAanalysis. Paper presented at International Conference on Islamic Finance in Kochi, India.

Alshammari, S. (2003). Structure-conduct-performance and efficiency in gulf co-operation council. Thesis. University of Wales, Bangor.

Anderloni, L., & Carluccio, E. (2007). Access to bank accounts and payment services. New Frontiers in Banking Services, 5–105.

Annan, K. (2003). Comments during General Assembly Green Lights Programme for the International Year of Microcredit 2005. [Available at http://www.un.org/press/en/2003/dev2452.doc.htm]

Ariss, R. T. (2010). Competitive conditions in Islamic and conventional banking: A global perspective. Review of Financial Economics, 19(3), 101–108.

Arora, R. U. (2010). Measuring Financial Access. Discussion papers Economics (No. 2010–7)

Ascarya, & Tanjung, H. (2016). Design and Determine Holistic Financial Inclusion Index for Baitul Maal wat Tamwil. Paper Presented at "2nd International Conference on IPAFEM, Yogyakarta, Indonesia, August 17-19, 2016.

Asutay, M. (2007). Conceptualisation of the second solution in overcoming the social failure of Islamic banking and finance : Examining the overpowering of homoislamicus. IIUM Journal of Economics and Management 15, 15(2), 167–195.

Bakar, M. D. (2003). Contracts in Islamic commercial and their application in modern Islamic financial system. Iqtisad Journal of Islamic Economics, 1–42.

Baltagi, B. H. (2005). Econometric analysis of panel data (3rd ed.). Chichester: John Wiley & Sons.

Barr, M. S., & Sherraden, M. (2005). Institutions and Inclusion in Saving Policy (No. 44). University of Michigan Law School.

Beck, T., & Demirguc-Kunt, A. (2008). Access to finance: An unfinished agenda. The World Bank Economic Review, 22(3), 383–396.

Beck, T., Demirguc-Kunt, A., & Honohan, P. (2009). Access to financial services: measurement, impact and policies. The World Bank Research Observer, 24(1), 119–145.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. Journal of Economic Growth, 12(1), 27–49.

Beck, T., Demirguc-kunt, A., & Martinez Peria, M. S. (2006). Banking services for everyone ? Barriers to bank access and use around the world (WPS4079).

Beck, T., Demirguc-Kunt, A., & Martinez Peria, M. S. (2007). Reaching out: Access to and use of banking services across countries. Journal of Financial Economics, 85(1), 234–266.

Beck, T., Demirguc-Kunt, A., & Martinez Peria, M. S. (2008). Banking services for everyone? Barriers to bank access and use around the world. The World Bank Economic Review, 22(3), 397–430.

Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. Journal of Banking and Finance, 37, 433–447.

Beck, T., & Levine, R. (2002). Industry growth and capital allocation: Does having a market- or bank-based system? Journal of Financial Economics, 64, 147–180.

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the sources of growth. Journal of Financial Economics, 58, 261–300.

Beck, T., & Torre, A. D. La. (2007). The basic analytics of access to financial services. Financial Markets, Institutions and Instruments, 16(2), 79–117.

Ben Naceur, S., Barajas, A., & Massara, A. (2015). Can Islamic banking increase financial inclusion? IMF Working Papers, 15(31), 1.

Berthoud, R., & Kempson, E. (1992). Credit and debt: The PSI report. Book, Policy Studies Institute London.

Bevan, a. a., & Danbolt, J. (2004). Testing for inconsistencies in the estimation of UK capital structure determinants. Applied Financial Economics, 14(1), 55–66.

Bjorck, F. (2004). Institutional theory : A new perspective for research into IS / IT security in organisations. Paper presented at the 37th Hawaii International Conference on System Sciences.

Bruton, G. D., Fried, V. H., & Manigart, S. (2005). Institutional influences on the worldwide expansion of venture capital. Entreprenuership: Theory and Practice, 737–760.

Buchinsky, M. (1995). Estimating the asymptotic covariance matrix for quantile regression models a Monte Carlo study. Journal of Econometrics (Vol. 68).

Buchinsky, M. (1998). Recent advances in quantile regression models: A practical guideline for empirical research. The Journal of Human Resources, 33(1), 88–126.

Buckland, J. (2012). Hard choices: Financial exclusion, fringe banks, and poverty in urban Canada. University of Toronto Press.

Buckland, J., & Simpson, W. (2008). Analysis of credit constraint and financial exclusion with Canadian microdata. Paper presented at Canadian Economics Association, Congress of the Humanities and Social Sciences (Vol. 7). Conference Proceedings.

Budd, A., & Campbell, N. (1998). The roles of the public and private sectors in the UK pension system. In Privatizing social security (pp. 99–134). Book Section, University of Chicago Press.

Carbo, S., Gardener, E. P. M., & Molyneux, P. (2007). Financial exclusion in Europe. Public Money & Management, 27(1), 21–27.

Caskey, J. P. (1997). Lower income Americans, higher cost financial services. Filene Research Institute.

Casu. B., & Molyneux, P. (2003). A comparative study of efficiency in European banking. Applied Economics, 35(17), 1865–1876.

Cebeci, I. (2012). Integrating the social maslaha into Islamic finance. Accounting Research Journal, 25(3), 166–184.

Chakravarty, S. R., & Pal, R. (2010). Measuring financial inclusion: An axiomatic approach (WP-2010-003 No. 3).

Chant Link and Associates. (2004). A report on financial exclusion in Australia. ANZ, Melbourne. [available at http://www.anz.com/DC39549F-5389-466F-B684-24DD752C3DA1/FinalDownload/DownloadId-0A2B674134A761BA1C3B4C233700E6C2/DC39549F-5389-466F-B684-24DD752C3DA1/aus/aboutanz/community/programs/pdf/FinancialExclusion-FinalReport.pdf]

Chapra, M. U. (1992). Towards a just monetary system. The Islamic Foundation, Liecester.

Chapra, M. U. (2000). The Future of Economics: An Islamic Perspective. Leicester: The Islamic Foundation.

Chapra, M. U. (2007). The Islamic Vision of Development in the Light of Maqāsid Al-Sharī'ah.

Chapra, M. U., & Khan, T. (2000). Regulation and supervision of Islamic banks. Occasional Paper No. 3, Islamic Research and Training Institute, Islamic Development Bank, Jeddah, Saudi Arabia.

Chen, C., Kuan, C., & Lin, C. (2007). Saving and housing of Taiwanese households : New evidence from quantile regression analyses. Journal of Housing Economics, 16, 102–126.

Chong, B. S., & Liu, M.-H. (2009). Islamic banking: Interest-free or interest-based? Pacific-Basin Finance Journal, 17(1), 125–144.

Čihák, M., & Hesse, H. (2010). Islamic banks and financial stability: An empirical analysis. Journal of Financial Services Research, 38(2), 95–113.

Çizakça, M. (2007). Democracy , Economic Development and Maqasid Al-Shari'ah. Review of Islamic Economics, 11(1), 101–118.

Claessens, S. (2006). Access to financial services: A review of the issues and public policy objectives. The World Bank Research Observer, 21(2), 207–240.

Collard, S., Kempson, E., & Whyley, C. (2001). Tackling financial exclusion: An area-based approach. Bristol: Policy.

Consultative Group to Assist the Poor (CGAP). (2009). Financial Access 2009: Measuring access to financial services around the world. Washington.

Corr, C. (2006). Financial exclusion in Ireland: An exploratory study and policy review. Book, Combat Poverty Agency.

Dabla-norris, E., Ji, Y., Townsend, R., & Unsal, D. F. (2015). Identifying constraints to financial inclusion and their impact on GDP and inequality: A structural framework for policy. IMF Working Papers, WP/15/22, 1–49.

Dacanay, J. C., Nito, B., & Buensuceso, P. (2011). Microfinance, financial inclusion and financial development: An empirical investigation with an international perspective. In The International Conference on Managing Services in the Knowledge Economy, July 13-15 (pp. 153–173). Universidade Lusíada de Famalicão, Vila Nova de Famalicão , Portugal.

Demirgüç-Kunt, A., Beck, T., & Honohan, P. (2008a). Access to finance and development: Theory and measurement. In Finance for all? Policies and pitfalls in expanding access (pp. 21–54). The World Bank, Washington, DC.

Demirgüç-Kunt, A., Beck, T., & Honohan, P. (2008b). Finance for all? Policies and pitfalls in expanding access (Vol. 41792). Washington DC: World Bank Publications.

Demirguc-Kunt, A., & Klapper, L. (2012). Measuring financial inclusion: The Global Findex Database. World Bank Policy Research Paper 6025.

Demirguc-Kunt, A., Klapper, L., & Randall, D. (2013). Islamic Finance and financial inclusion: measuring use of and demand for formal financial services among Muslim adults. Policy Research Working Papers, October(October), 45.

Demirgüç-Kunt, A., & Maksimovic, V. (2002). Funding growth in bank-based and market-based financial systems: evidence from firm-level data. Journal of Financial Economics, 65(3), 337–363.

Devlin, J. F. (2005). A detailed study of financial exclusion in the UK. Journal of Consumer Policy, 28, 75–108.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. American Sociological Review, 48(2), 147–160.

Dusuki, A. W. (2009). Shariah Parameters on Islamic Foreign Exchange Swap as Hedging Mechanism in Islamic Finance. ISRA International Journal of Islamic Finance, (July), 1–25.

Dusuki, A. W. (2010). Do equity-based Sukuk structures in Islamic capital markets manifest the objectives of Shariah? Journal of Financial Services Marketing, 15(3), 203–214. http://doi.org/10.1057/fsm.2010.17

Dymski, G. (2005). Financial globalization, social exclusion and financial crisis. International Review of Applied Economics, 19(4).

Dzolkarnaini, M. N. (2009). Determinants of the use of debt and leasing in UK corporate financing decisions. Thesis. University of Stirling.

Eddy Yusof, E. F., Kashoogie, J., & Kamal, A. A. (2010). Islamic Finance: Debt versus Equity Financing in the Light of Maqasid al-Shari'ah. Research Paper, Munich Personal RePEc Archive (MPRA). Retrieved from http://mpra.ub.uni-muenchen.de/20722/

Efron, B. (1979). Bootstrap methods; another look at the jackknife. 7:1 -26. The Annals of Statistics, 7(1), 1–26.

Efron, B. (1980). The jackknife, the bootstrap, and other resampling plans. Technical Report No. 63, Department of Statistic, Stanford University.

El-Zoghbi, M., & Tarazi, M. (2013). Trends in Sharia-compliant financial inclusion. Focus Notes CGAP, 84(March), 1–12.

Ernst & Young. (2014). World Islamic Banking Competitiveness Report 2013-2014. The transition begins, 1–84. Retrieved from http://www.ey.com/Publication/vwLUAssets/World_Islamic_Banking_Competitiveness_Report_2013-14/$FILE/World Islamic Banking Competitiveness Report 2013-14.pdf

Erol, C., & El-Bdour, R. (1989). Attitudes, behaviour, and patronage factors of bank

customers towards Islamic banks. International Journal of Bank Marketing, 7(6), 31–37.

Erol, C., Kaynak, E., & El-Bdour, R. (1990). Conventional and Islamic banks: Patronage behaviour of Jordanian customers. International Journal of Bank Marketing, 8(2), 25–35.

European Commission. (2008). Financial services provision and prevention of financial exclusion. Report by the Director General for Employment, Social Affairs and Equal Opportunities, European Commission.

Fattouh, B., Scaramozzino, P., & Harris, L. (2005). Capital structure in South Korea: A quantile regression approach. Journal of Development Economics, 76, 231–250.

Feldstein, M. (1991). The Risk of economic crisis: Introduction. In The Risk of economic crisis. Chicago: University of Chicago Press.

Fisher, I. (1945). 100% money. New Haven: City Printing.

Fitriasari, F. (2012). The growth of Islamic banking in Indonesia. Ekonomika-Bisnis, 3(1), 1–10.

Friedman, M. (1969). The monetary theory and policy of Henry Simons. Journal of Law and Economics, 10(October), 1–13.

Gait, A., & Worthington, A. (2008). An empirical survey of individual consumer, business firm and financial institution attitudes towards Islamic methods of finance. International Journal of Social Economics, 35(11), 783–808.

Gallant, A. R., & Fuller, W. A. (1973). Fitting segmented polynomial regression models whose join points have to be estimated. Journal of the American Statistical Association, 68(341), 144–147.

Ge, W., Kim, J.B., & Song, B. Y. (2012). Internal governance, legal institutions and bank loan contracting around the world. Journal of Corporate Finance, 18(3), 413–432.

Ghosh, S. (2012). Determinants of banking outreach: An empirical assessment of Indian states. Journal of Developing Areas, 46(2), 269–295.

Gimet, C., & Lagoarde-Segot, T. (2012). Financial sector development and access to finance. Does size say it all? Emerging Markets Review, 13(3), 316–337.

Gini, C. (1912). Italian: Variabilità e mutabilità (Variability and Mutability). In E. Pizetti & T. Salvemini (Eds.), Metodologica Statistica. Rome: Libreria Eredi Virgilio Veschi.

Gini, C. (1997). Concentration and dependency ratios (translation from Italian). Rivista Di Politica Economica, 87, 769–789.

GOI. (2008). Report of the Committe of Financial Inclusion. [Available at www.nabard.org]

Grassa, R., & Gazdar, K. (2014). Law and Islamic finance: How legal origins affect Islamic finance development? Borsa Istanbul Review, 14(3), 158–166.

Guiot, J. (1991). The bootstrapped response function. Tree-Ring Bulletin, 51, 39–41.

Gujarati, D. N. (2003). Basic Econometric (4th ed.). New York: McGraw-Hill/Irwin.

Gupte, R., Venkataramani, B., & Gupta, D. (2012). Computation of financial inclusion index for India. Procedia - Social and Behavioral Sciences, 37, 133–149.

Hall, A., & Taylor, C. R. (1996). Political science and the three new institutionalisms. Political Studies, XLIV, 936–957.

Haron, S. (2004). Determinants of Islamic bank profitability. Global Journal of Finance and Economics., 1(1), 1–22.

Hasan, M., & Dridi, J. (2011). The effects of the global crisis on Islamic and conventional banks: A comparative study. Journal of International Commerce, Economics and Policy, 2(2), 163–200.

Hashemi, S. M., Schuler, S. R., & Riley, A. P. (1996). Rural Credit Programs and Women'S Empowerment in Bangladesh. World Development, 24(4), 635–653.

Hassan, Z. (2007). Introduction to microeconomics – An Islamic perspective. Pearson-Prentice Hall, Kuala Lumpur, Malaysia.

Hayton, K. (2001). The role of Scottish credit unions in tackling financial exclusion. Policy & Politics, 29(3), 281–297.

Heckman, J. J. (1979). Sample selection bias as a specification error. Econometica, 47(1), 153–161.

Hogarth, J. M., & O'Donnell, K. H. (1999). Banking relationships of lower-income families and the governmental trend toward electronic payment. Fed. Res. Bull., 85, 459. Journal Article.

Hohnen, P. (2007). Having the wrong kind of money. A qualitative analysis of new forms of financial, social and moral exclusion in consumerist Scandinavia. The Sociological Review, 55(4), 748–767.

Honohan, P. (2008). Cross-country variation in household access to financial services. Journal of Banking & Finance, 32(11), 2493–2500.

Honohan, P., & King, M. (2009). Cause and effect of financial access: Cross country evidence from the Finscope surveys. World Bank mimeo.

Howell, N., & Wilson, T. (2005). Access to consumer credit: The problem of financial exclusion in Australia and the current regulatory framework. Macquarie LJ, 5, 127.

Hussain, M. M., & Gunasekaran, a. (2002). An institutional perspective of non-financial management accounting measures: A review of the financial services industry. Managerial Auditing Journal, 17(9), 518–536.

IFSB. (2014). Prospects and Challenges in the Development of Islamic Finance for Bangladesh. Islamic Financial Services Board.

International Shari'ah Research Academy for Islamic Finance (ISRA). (2016). Introduction to the Islamic Financial System. In Islamic Financial Syatem: Principles & Operations (Second, pp. 3–32). ISRA.

Iqbal, M. (2001). Islamic banking and finance: Current developments in theory and practice. The Islamic Foundation, Liecester.

Iqbal, Z. (1997). Islamic financial systems. Journal of Finance & Development. (June).

Iqbal, Z., & Mirakhor, A. (2013). Economic Development and Islamic Finance. (Z. Iqbal & A. Mirakhor, Eds.). The World Bank.

Islamic Financial Services Board (IFSB). (2016). Islamic Financial Services Board Stability Report 2016. Islamic Financial Services Board (Vol. 1). Kuala Lumpur, IFSB.

Ismal, R. (2011). Islamic banking in Indonesia: Lesson learned. Multi-year expert meeting on services, development and trade: The regulatiory and institutional dimension. Geneva.

Jacobson, L. (1995). Bank failure: The financial marginalization of the poor. American Prospect, 6, 20.

Johnes, J., Izzeldin, M., & Pappas, V. (2014). A comparison of performance of Islamic and conventional banks 2004-2009. Journal of Economic Behavior and Organization, 103, S93–S107.

Johnson, S., & Nino-Zarazua, M. (2011). Financial access and exclusion in Kenya and Uganda. Journal of Development Studies, 47(3), 475–496.

Kabeer, N. (2001). Conflicts over credit: Re-evaluating the empowerment potential of loans to women in rural Bangladesh. World Development, 29(1), 63–84.

Kaleem, A. (1999). Modeling monetary stability under dual banking system: The case of Malaysia. International Journal of Islamic Financial Services, 2(1).

Kalpana, K. (2015). Economic Entitlements via Entrepreneurial Conduct? Women and Financial Inclusion in Neoliberal India 1. Journal of World - Systems Research, 21(1), 50–68.

Kamali, M. H. (2011). Maqasid Al-Shariah and Ijtihād As Instruments of Civilisational Renewal: A Methodological Perspective. Islam and Civilisational Renewal, 2(2), 245–271.

Kammer, A., Norat, M., Piñón, M., Prasad, A., & Towe, C. (2015). Islamic Finance: Opportunities, Challenges, and Policy Options. IMF Stff Discussion Note, (SDN/15/05), 1–38.

Kempson, E. (1994). Outside the banking system: A review of households without a current account. In Kempson, Elaine. Research paper (Great Britain. Social Security Advisory Committee). London : H.M.S.O.

Kempson, E., Atkinson, A., & Pilley, O. (2004). Policy level response to financial exclusion in developed economies: lessons for developing countries. University of Bristol: The Personal Finance Research Centre.

Kempson, E., & Whyley, C. (1998). Access to current accounts. London: British Bankers Association (Quoted in Financial services authority in or out).

Kempson, E., & Whyley, C. (1999). Kept out or opted out? Understanding and combating financial exclusion. The Policy Press. Bristol.

Kempson, E., Whyley, C., Caskey, J., & Collard, S. (2000). In or out?: Financial exclusion: a literature and research review. Financial Services Authority.

Khan, M. F. (1992). Financing development in Islam. In A simple model of income determination: growth and economic development in the perspective of interest-free economy (pp. 79–108). Seminar proceeding. Third International Conference on Islamic Economics, Kuala Lumpur, Malaysia, 28- 30 January, 1992.

Kim, S., Kim, H. J., & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption: The case of OPEN. Government Information Quarterly, 26(1), 42–50.

Klapper, L., Laeven, L., & Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. Journal of Financial Economics, 82(3), 591–629.

Koenker, R., & Bassett, G. (1978). Regression quantiles. Econometica, 46(1), 33–50.

Koenker, R., & Hallock, K. F. (2001). Quantile Regression. Journal of Economic Perspectives, 15(4), 143–156.

Koenker, R. W., & Bassett, G. (1978). Regression quantiles. Econometrica, 46(1), 33–50.

Kumar, C., & Mishra, S. (2009). Banking outreach and household level Access: Analyzing financial inclusion in India. Conference Paper, Mumbai: Indira Gandhi Institute of Development Research (IGIDR).

Kumar, N. (2011). Financial inclusion and its determinants : Evidence from state level empirical analysis in India. Money and Finance Conference, Mumbai: Indira

Gandhi Institute of Development Research (IGIDR).

Kušar, S. (2011). The institutional approach in economic geography: An applicative view. Hrvatski Geografski Glasnik, 73(1), 39–49.

La Porta, R., Silanes, F. L. De, Shleifer, A., & Vishny, R. W. (2000). Investor protection and corporate governance. Journal of Financial Economics, 58(1–2), 3–27.

La Porta, R., Silanes, F. L. De, Shleifer, A., & Vishny, R. W. (1998). Law and Finance. Journal of Political Economy, 106(6), 1113–1155.

Laluddin, H., Mohd. Nor, A. H., El-Seoudi, Ibrahim, I. A., Husni, A. M., Omar, A. F., … Mohamad, A. B. (2012). The Relationship between Islamic Human Rights and the Maqasidic Approach. The Social Sciences, 7(1), 111–116.

Lazzarato, M. (2012). The Making of the Indebyed Man. South Pasedena, CA: semiotext(e).

Lee, J. (2002). The poor in the financial market: Changes in the use of financial products, institutions, and services from 1995 to 1998. Journal of Consumer Policy, 25(2), 203–231.

Levine, R. (2002). Bank-based or market-based financial systems: Which one is better? (9138).

Leyshon, A., & Thrift, N. (1993). The restructuring of the UK financial services industry in the 1990s: A reversal of fortune? Journal of Rural Studies, 9(3), 223–241.

Leyshon, A., & Thrift, N. (1995). Geographies of financial exclusion: Financial abandonment in Britain and the United States. Transactions of the Institute of British Geographers, 312–341.

Loqman, M. (1991). A Brief Note on the Islamic Financial System, 25(5), 52–59.

Martin, R. (2000). Institutional approaches in economic geography. In E. Sheppard & T. J. Barnes (Eds.), A companion to economic geography (pp. 77–94). Blackwell Publishing, Malden.

Martowardojo, A. D. W. (2015). Agus D W Martowardojo: Enhancing financial inclusion through Islamic finance. Keynote Address at the IFSB Inclusion through Islamic Finance", Jakarta, International Seminar "Enhancing Financial 31 March 2015.

Mata, J., & Machado, J. a. F. (1996). Firm start-up size: a conditional quantile approach. European Economic Review, 40(6), 1305–1323.

Mehrotra, Puhazhendhi, Nair, & Sahoo. (2009). Financial inclusion: An overview. Occasionals Paper, Mumbai: Department of Economic Analysis and Research,

National Bank for Agriculture and Rural Development (NABRAD).

Mersland, R., & Øystein Strøm, R. (2009). Performance and governance in microfinance institutions. Journal of Banking & Finance, 33(4), 662–669.

Metwally, M. M. (1997). Differences between the financial characteristics of interest-free banks and conventional banks. European Business Review, 97(2), 92–98.

MIFC. (2015). Enhancing financial inclusion through Islamic finance. Bank Negara Malaysia (BNM), (July).

Mills, P. S., & Presley, J. R. (1999). Islamic Finance: Theory and practice. Macmillan, London.

Mirakhor, A., & Iqbal, Z. (2012). Financial inclusion: Islamic finance perspective. Journal of Islamic Business and Management, 2(1), 35–64.

Mohammad, M. O., & Shahwan, S. (2013). The Objective of Islamic Economic and Islamic Banking in Light of Maqasid Al-Shariah : A Critical Review. Middle-East Journal of Scientific Research 13 (Research in Contemporary Islamic Finance and Wealth Management), 13, 75–84.

Mohieldin, M. (2012). Realizing the potential of Islamic finance. Economic Premise, 77, 1–7.

Mohieldin, M., Iqbal, Z., Rostom, A., & Fu, X. (2012). The role of Islamic finance in enhancing financial inclusion in Organization of Islamic Cooperation (OIC) Countries. Islamic Economic Studies, 20(2), 55–120.

Mokhtar, H. S. A., Abdullah, N., & Al-Habshi, S. M. (2006). Efficiency of Islamic banking in Malaysia: A stochastic frontier approach. Journal of Economic Cooperation, 27, 37–70.

Mokhtar, S. H. (2011). Microfinance performance in Malaysia. Lincoln University.

Montenegro, C. (2001). Wage distribution in Chile: Does gender matter? A quantile regression approach. World Bank Working Paper (No. 20).

Morris, G., & Barnes, C. (2005). An assessment of the impact of microfinance: A case study from Uganda. Journal of Microfinance, 7(7), 39–54.

Naser, K., & Jamal, A. (1999). Islamic banking: A study of customer satisfaction and preferences in Jordan. International Journal of Bank Marketing, 17(3), 135–151.

Nienhaus, V. (2007). Governance of Islamic banks. In M. Hassan & M. Lewis (Eds.), Handbook of Islamic Banking (pp. 128–143). Edward Elgar Publishing.

North, D. C. (1990). Institutions, institutional change and economic performance. Cambridge University Press, Cambridge.

Norma, Md. Saad, M. Shabri Abd. Majid, Salina Kassim, Zarinah Hamid, Rosylin Mohd. Yusof, (2010) "A comparative analysis of the performance of conventional and Islamic unit trust companies in Malaysia", International Journal of Managerial Finance, Vol. 6 Issue: 1, pp.24-47.

Office of Fair Trading. (1999). Vulnerable Consumers and Financial Services: Is it Increasing?. Job Insecurity for the Vulnerable. Book, Office of Fair Trading.

Oliver Wyman. (2002). The Next Chapter in Islamic Finance: Higher Rewards but Higher Risks.

Olson, D., & Zoubi, T. a. (2008). Using accounting ratios to distinguish between Islamic and conventional banks in the GCC region. The International Journal of Accounting, 43(1), 45–65.

Ostrom, E. (2005). Understanding institutional diversity. Princeton University Press, Princeton.

Panigyrakis, G. G., Theodoridis, P. K., & Veloutsou, C. A. (2002). All customers are not treated equally: Financial exclusion in isolated Greek islands. Journal of Financial Services Marketing, 7(1), 54–66.

Park, A., & Ren, C. (2001). Microfinance with Chinese characteristics. World Development, 29(1).

Pollard, J. S. (1996). Banking at the margins: A geography of financial exclusion in Los Angeles. Environment and Planning, 28, 1209–1232.

Prathap, S. K. (2011). Financial inclusion of fisher households in Coastel Kerala-role of microfinance. Thesis. Cochin University of Science and Technology.

Qian, J., & Strahan, P. E. (2007). How laws and institutions shape financial contracts : The case of bank loans. The Journal of Finance, LXII(6), 2803–2834.

Ramsay, J. O. (1988). Monotone regression splines in action. Statistical Science, 3(4), 425–441.

Rashid, M., & Hassan, M. K. (2009). Customer demographics affecting bank selection criteria, preference, and market segmentation: Study on domestic Islamic banks in Bangladesh. International Journal of Business and Management, 4(6), 131.

Rashwan, M. H. (2012). How did listed Islamic and traditional banks performed: Pre and post the 2008 financial crisis? Journal of Applied Finance & Banking, 2(2), 149–175.

Riwajanti, N. I., & Asutay, M. (2015). The role of Islamic micro-finance institutions in economic development in Indonesia: A comparative analytical empirical study on pre-and post-financing states. Access to Finance and Human Development—Essays on Zakah, Awqaf and Microfinance, 1(January), 55.

Rogers, W. (1993). Quantile regression standard errors. Stata Technical Bulletin, 2(9), 133–137.

Rosly, S. A. (2010). Shariah parameters reconsidered. International Journal of Islamic and Middle Eastern Finance and Management, 3(2), 132–146.

Rowan, B. (1982). Organizational structure and the institutional environment: The case of public schools. Administrative Science Quarterly, 27(2), 259–279.

Rowlingson, K., Whyley, C., & Warren, T. (1999). Wealth in Britain: A lifecycle perspective (Vol. 864). Book, Policy Studies Institute London.

S.Zaher, T., & Kabir Hasan, M. (2001). A comparative literature survey of Islamic finance and banking. Financial Markets, Institutions & Instruments, 10(4).

Saad, N. M. (2012). Microfinance and prospect for Islamic microfinance products: The case of Amanah Ikhtiar Malaysia. Advances in Asian Social Sciences, 1(1), 27–33.

Saad, N. M., Majid, M. S. A., Kassim, S., Hamid, Z., & Yusof, R. M. (2010). A comparative analysis of the performance of conventional and Islamic unit trust companies in Malaysia. International Journal of Managerial Finance, 6(1), 24–47.

Salleh, M. S., & Che Hamat, A. F. (1997). Equity versus growth: The Malaysian experience of the Islamic financial system under the dual systems. Humanomics, 3(4), 174–214.

Samad, A. (2004). Performance of interest-free Islamic banks vis-a-vis interest-based conventional banks of Bahrain. IIUM Journal of Economics and Management, 12(2).

Sari, M., Bahari, Z. & Hamad, Z. (2014). What's up with Islamic Banking in Indonesia? Journal of Islamic Economics Banking and Finance, 10(1), 139–154.

Sarma, M. (2008). Index of financial inclusion. Working paper. Indian Council for Research on International Economic Relations. No. 215.

Sarma, M. (2010). Index of financial inclusion. Discussion Papers in Economics, Centre for International Trade and Development, 10–5.

Sarma, M. (2012). Index of financial inclusion – a measure of financial sector inclusiveness. Berlin Working Papers on Money, Finance, Trade and Development, (07/2012).

Sarma, M., & Pais, J. (2011). Financial inclusion and development. Journal of International Development, 23(5), 613–628.

Schwittay, A. (2014). Designing development: Humanitarian design in the financial inclusion assemblage. Political and Legal Anthropology Review, 37(1), 29–47.

Scott, W. R. (2001). Institutions and organizations (Second). Sage Publications, Thousand Oaks, Calif.

Scott, W. R. (2004). Institutional theory: Contributing to a theoretical research program. In K. . Smith & M. A. Hitt (Eds.), Great minds in management: The process of theory development. Oxford: Oxford University Press.

Scott, W. R. (2008). Institutions and organizations: Ideas and interests (Third). Thousands Oaks: Sage.

Scott, W. R., & Meyer, J. W. (1991). The organization of societal sectors: Propositions and early evidence. In W. W. Powell & P. J. DiMaggio (Eds.), The new institutionalism in organizational analysis (pp. 108–140). Chicago: University of Chicago Press.

Sekaran, U. (2003). Research methods for business: A skill-building approach. New York: John Wiley & Sons.

Siddiqi, M. N. (2006). Islamic banking and finance in theory and practice: A survey of state of the art, Islamic Economic Studies. 13(2).

Siebel, H. D. (2005). Does history matter? The Old and the new world of microfinance in Europe and Asia. In workshop of From moneylenders to microfinance: Southeast Asia's credit revolution in institutional, economic and cultural perspective and an interdisciplinary.

Siems, M. M. (2006). Legal origins: Reconciling law & finance and comparative law (No. 321) (Vol. 44). Cambridge.

Simons, H. C. (1948). Economic policy for a free society. University of Chicago Press.

Solé, J. (2007). Introducing Islamic banks into conventional banking systems. IMF Working Paper, 175, 1–28.

Solé, J. (2008). Introducing Islamic banks into conventional banking systems. Journal of Islamic Economics, Banking and Finance, 4(2), 9–34.

Steinmo, S. (2008). What is historical institutionalism? In D. Della Porta & M. Keating (Eds.), Approaches and methodologies in social sciences: A pluralist perspective (pp. 118–138). Cambridge University Press.

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. The American Economic Review, 71(3), 393–410.

Strahan, P. E. (1999). Borrower risk and the price and nonprice terms of bank loans. Working paper. Federal Reserve Bank of New York.

Svejvig, P. (2009). Literature review of enterprise systems research using institutional theory: Towards a conceptual model. Working paper. IS Research Group. (No. 2009–1).

Tahira, H., & Arshad, Z. (2014). Comparative performance of Islamic and conventional insurance companies in Pakistan. IOSR Journal of Business and Management, 16(6), 33–45.

UNDP. (2017). Human development Index (HDI). Retrieved February 27, 2017, from http://hdr.undp.org/en/content/human-development-index-hdi

Tolbert, P. S. (1988). Institutional Sources of Organizational Culture in Major Law Firms. Institutional Patterns and Organizations: Culture and Environment, 101–113.

Veysov, A., & Stolbov, M. (2012). Financial system classification: From conventional dichotomy to a more modern view. [Available at http://ssrn.com/abstract=2114842 or http://dx.doi.org/10.2139/ssrn.2114842]

Wallace, A., & Quilgars, D. (2005). Homelessness and financial exclusion: A literature review. London: Friends Provident/London Housing Foundation.

White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometica, 48(4), 817–838.

Whyley, C., McCormick, J., & Kempson, E. (1998). Paying for peace of mind: Access to home contents insurance for low-income households. Institute for Public Policy Research.

Wilson, R. (2004). Capital flight through Islamic managed fund. In C. W. Henry & R. Wilson (Eds.), The politics of Islamic finance (p. 129). Edinburgh University Press.

World Bank. (2005). Indicators of Financial Access: Household – Level Surveys. [Available at http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTFINANCIALSECTOR/0,,contentMDK:20700929~menuPK:282890~pagePK:148956~piPK:216618~theSitePK:282885,00.html]

World Bank. (2007). Finance for all? Policy Research Report: Database/Appendix Tables. [Available at http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:21546633~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html]

Yakcop, N. M. (2003). From moneylenders to bankers: Evolution of Islamic banking in relation to Judeo-christian and oriental banking traditions. Keynote Address in Developing an Islamic Banking System at International Islamic Banking Conference, PRATO, Italy 9 - 10 September 2003,

Yudistira, D. (2004). Efficiency in Islamic banking: An empirical analysis of eighteen banks. Islamic Economic Studies, 12(1), 1–19.

Zaheer, S., & Farooq, M. (2011). Comparing the Conventional and Islamic Banking Institutions: Evidence from an Emerging Economy. Presented at the 2nd

International Conference on Islamic Business, Islamabad.

Zhijun, W. (2007). Financial exclusion: The experiences of the United Kingdom [J]. World Economy Study, 2, 12.

Zucker, L. G. (1987). Institutional theories of organization. Annual Review of Sociology, 13(1987), 443–464.

Appendix 1

Supplementary results of regression diagnostics

Table A1.1 Variance inflation factor (VIF) of regression variables

Variable	VIF
IB quantity	26.54
IB size	3.12
IB profitability	12.74
IB quantity . IB size	22.02
IB quantity . IB profitability	6.58
IB size . IB profitability	19.78
GDP	9.73
Governance	9.32
Legal rights	2.96
Credit information	1.99
Cost contracts	1.81
Banking restrictions	2.98
Paved road	3.1
Phone	6.08
Internet	12.21
Deposit interest rate	2.71
Lending interest rate	3.46
English	14.33
French	14.83
German	8.72
Socialist	8.18
Africa	3.31
East Asia & Pacific	2.53
Europe & Central Asia	5.9
Middle East & North Africa	3.46
South Asia	2.22
2007	2.15
2008	1.95
2009	1.76
2010	1.64
Mean	7.27

IB quantity is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and *zakat*) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank. Year dummies for 2007 to 2010.

Figure A1.1 Kernel and normal density estimates of regression's residuals (checking for normality assumption in the analysis of CIFI determinants)

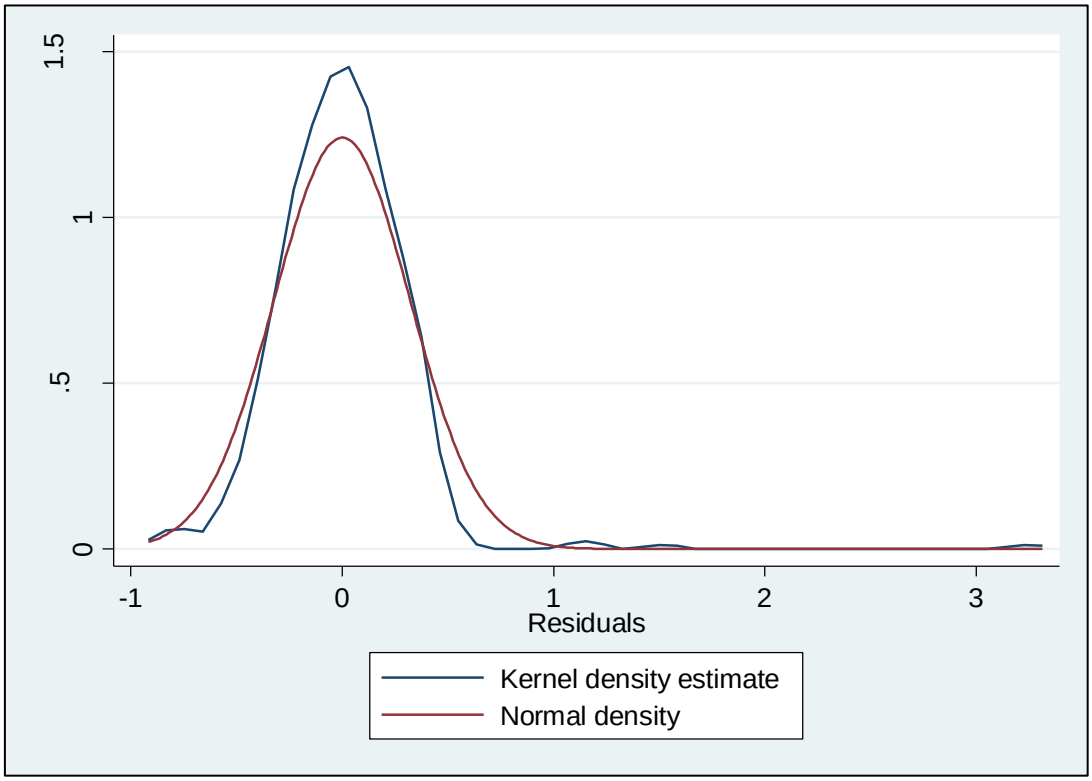
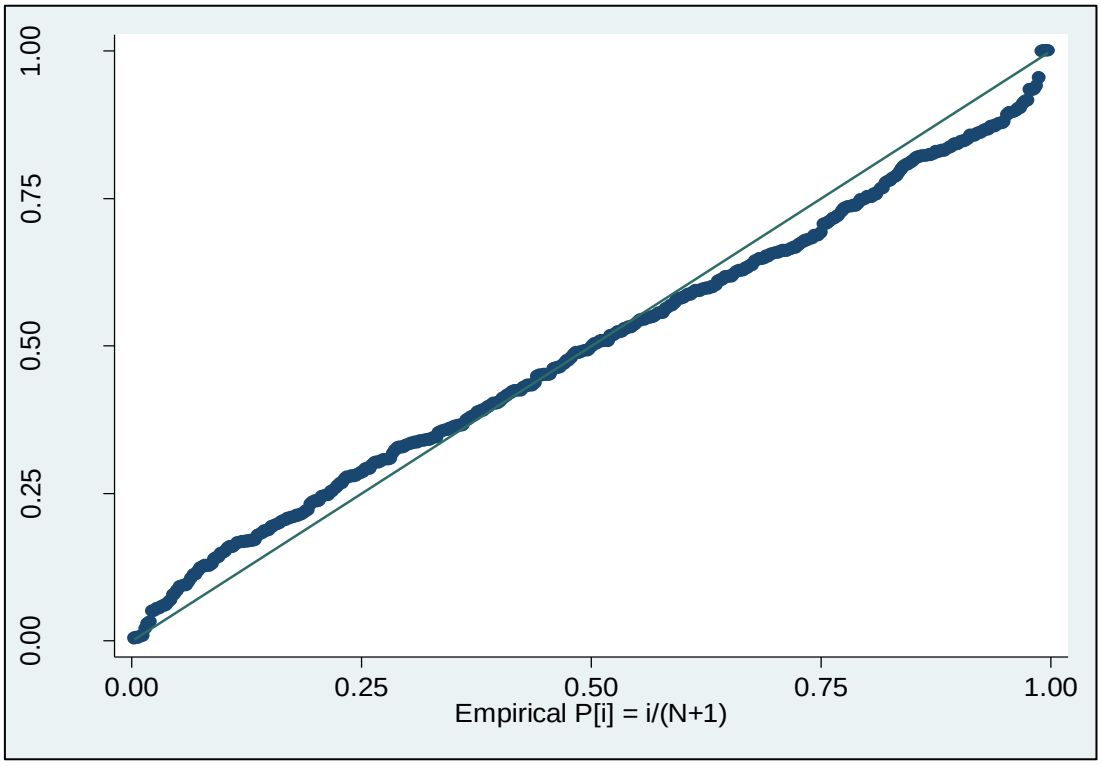


Figure A2.2 Normal probability plot (NPP) of regression's residuals (checking for normality assumption in the analysis of CIFI determinants)



Appendix 2

Supplementary results of robustness checks for quantile regressions

Table A2.1 Inter-quantile regression estimates for determinants of financial inclusion

Variable	*With all IB variables*				*IB Quantity*				*IB Size*				*IB Profitability*			
	95th-5th	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*
IB quantity	-1.710	-2.003	0.293	0.294	2.152	1.793	0.359	2.381								
	(-1.12)	(-1.43)	(0.32)	(0.22)	(1.1)	(1.01)	(0.41)	(1.42)								
IB size	0.047*	0.036	0.011	0.032					0.009	-0.004	0.013	0.006				
	(1.75)	(1.4)	(0.61)	(1.58)					(0.46)	(-0.19)	(0.23)	(0.32)				
IB profitability	7.011	7.569	-0.558	2.206									6.203	3.632	2.571	4.289
	(0.95)	(1.1)	(-0.1)	(0.42)									(1.25)	(0.87)	(0.68)	(1.05)
IB quantity x size	0.018	0.111	-0.092	-0.160	-0.369	-0.254	-0.115	-0.322*	-0.016	-0.067	0.051	-0.082				
	(0.1)	(0.69)	(-0.89)	(-1.09)	(-1.43)	(-1.09)	(-1.15)	(-1.69)	(-0.23)	(-1.24)	(0.26)	(-1.27)				
IB quantity x profitability	1.138	9.093	-7.955	2.829	12.675	11.924	0.752	-2.357					-31.424	-30.741	-0.684	-10.464
	(0.03)	(0.28)	(-0.39)	(0.1)	(0.73)	(0.84)	(0.1)	(-0.2)					(-1.15)	(-1.16)	(-0.04)	(-0.44)
IB size x profitability	-1.347	-1.448	0.101	-0.224					0.086	0.252	-0.166	0.095	-0.533	0.078	-0.611	-0.595
	(-0.67)	(-0.79)	(0.08)	(-0.17)					(0.18)	(0.72)	(-0.18)	(0.31)	(-0.47)	(0.07)	(-0.73)	(-0.6)
GDP	0.100*	0.142***	-0.042	0.021	0.075	0.093*	-0.018	0.022	0.068	0.130***	-0.062	0.051	0.034	0.123**	-0.089*	0.074
	(1.94)	(3.32)	(-0.95)	(0.4)	(1.25)	(2)	(-0.36)	(0.38)	(1.22)	(2.88)	(-0.18)	(0.91)	(0.64)	(2.53)	(-1.93)	(1.32)
Governance	0.032	-0.128	0.161**	0.096	0.259**	0.117	0.141*	0.159*	0.118	0.025	0.094	0.042	0.188*	0.014	0.175**	0.049
	(0.27)	(-1.13)	(2.18)	(0.96)	(2.51)	(1.29)	(1.9)	(1.67)	(0.95)	(0.22)	(0.4)	(0.41)	(1.74)	(0.15)	(2.19)	(0.48)
Legal rights	0.023	0.029	-0.007	0.034*	0.024	0.032	-0.007	0.041**	0.034*	0.020	0.014	0.045***	0.037**	0.021	0.015	0.042**
	(1.55)	(1.45)	(-0.39)	(1.84)	(1.56)	(1.48)	(-0.42)	(2.39)	(1.89)	(1.06)	(0.17)	(3.22)	(2)	(1.02)	(0.79)	(2.56)
Credit information	0.015	-0.006	0.020	0.009	0.031	0.000	0.031*	0.006	0.018	0.000	0.018	0.001	0.019	-0.004	0.023	0.012
	(0.71)	(-0.29)	(1.21)	(0.57)	(1.52)	(-0.02)	(1.67)	(0.32)	(0.91)	(0.03)	(0.13)	(0.07)	(1)	(-0.22)	(1.32)	(0.62)
Cost contracts	0.273*	0.226*	0.047	-0.014	-0.063	-0.177	0.114	-0.216	0.163	0.169	-0.006	0.016	0.051	0.001	0.050	-0.023
	(1.9)	(1.7)	(0.53)	(-0.12)	(-0.4)	(-1.21)	(1.12)	(-1.48)	(1.07)	(1.18)	(-0.01)	(0.14)	(0.29)	(0.01)	(0.46)	(-0.17)
Financial restrictions	-0.001	0.001	-0.003	-0.005**	-0.001	0.001	-0.001	-0.006**	-0.003	0.000	-0.003	-0.005**	-0.002	0.002	-0.003	-0.004
	(-0.47)	(0.53)	(-1.39)	(-2.02)	(-0.2)	(0.25)	(-0.64)	(-2.26)	(-0.82)	(-0.05)	(-0.43)	(-2.03)	(-0.57)	(0.57)	(-1.62)	(-1.61)
Paved road	0.000	0.001	-0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.002*	0.001	-0.001	0.001	0.002
	(0.13)	(0.65)	(-0.67)	(0.76)	(0.46)	(0.58)	(-0.17)	(0.65)	(-0.1)	(-0.1)	(0)	(1.9)	(0.45)	(-0.35)	(0.89)	(1.23)

Variable	*With all IB variables*				*IB Quantity*				*IB Size*				*IB Profitability*			
	95th-5th	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*
Phone	0.009**	-0.002	0.012***	0.011***	0.006*	-0.004	0.009***	0.010***	0.011**	-0.005	0.016	0.006	0.005	-0.003	0.009**	0.007**
	(2.49)	(-0.56)	(3.14)	(2.89)	(1.8)	(-0.99)	(2.9)	(2.76)	(2.55)	(-1.38)	(1.48)	(1.57)	(1.5)	(-0.87)	(2.27)	(2.04)
Internet	-0.004	-0.003	-0.001	-0.003	-0.009***	-0.009***	0.000	-0.005*	-0.007**	-0.004	-0.002	-0.003	-0.007***	-0.005*	-0.002	-0.004
	(-1.24)	(-0.81)	(-0.4)	(-1.11)	(-3.29)	(-2.88)	(-0.06)	(-1.77)	(-2.08)	(-1.17)	(-0.07)	(-1.19)	(-2.69)	(-1.74)	(-0.7)	(-1.31)
Deposit interest rate	0.293	0.305	-0.012	0.365	0.567	-0.362	0.929	-0.249	0.779	1.121	-0.343	0.815	0.688	-0.054	0.741	0.163
	(0.29)	(0.33)	(-0.02)	(0.37)	(0.57)	(-0.36)	(1.26)	(-0.27)	(0.74)	(1.14)	(-0.11)	(0.85)	(0.63)	(-0.05)	(0.87)	(0.15)
Lending interest rate	-0.619	0.126	-0.745	-0.302	-1.305***	0.037	-1.341**	-0.163	-0.777*	-0.124	-0.652	-0.934	-0.974**	0.081	-1.055*	-0.468
	(-1.48)	(0.24)	(-1.55)	(-0.54)	(-2.77)	(0.05)	(-2.11)	(-0.22)	(-1.78)	(-0.21)	(-0.87)	(-1.49)	(-2)	(0.12)	(-1.69)	(-0.68)
English	0.501***	0.260	0.241	0.083	0.435***	0.021	0.414***	0.174	0.471***	0.312*	0.160	-0.128	0.550***	0.292*	0.258	0.102
	(3.58)	(1.48)	(1.55)	(0.49)	(3.12)	(0.13)	(2.78)	(1.1)	(2.87)	(1.72)	(0.06)	(-0.76)	(3.54)	(1.71)	(1.6)	(0.6)
French	0.600***	0.358**	0.241*	0.382***	0.555***	0.149	0.406***	0.434***	0.577***	0.394**	0.182	0.253*	0.589***	0.246	0.343***	0.399***
	(3.73)	(2.14)	(1.91)	(2.87)	(3.56)	(0.93)	(3.52)	(3.33)	(3.02)	(2.17)	(0.07)	(1.85)	(3.46)	(1.59)	(2.59)	(2.85)
German	0.565	0.099	0.466***	0.332**	0.537***	0.048	0.489***	0.324**	0.638***	0.197	0.441	0.175	0.551***	0.103	0.448***	0.319**
	(4.21)	(0.7)	(3.92)	(2.3)	(3.74)	(0.32)	(4.4)	(2.51)	(4.14)	(1.21)	(0.17)	(1.16)	(3.81)	(0.73)	(3.84)	(2.39)
Socialist	0.698***	0.097	0.601***	0.378*	0.869***	0.182	0.687***	0.394**	0.661***	0.216	0.446	0.169	0.610***	0.207	0.403**	0.340
	(3.25)	(0.42)	(3.29)	(1.83)	(4.46)	(0.86)	(4.3)	(2.04)	(2.92)	(0.94)	(0.12)	(0.84)	(3.03)	(1.03)	(2.46)	(1.64)
Africa	-0.055	-0.087	0.032	0.144	0.146	0.065	0.081	0.193	-0.029	0.002	-0.031	0.233*	-0.107	0.069	-0.176	0.255*
	(-0.37)	(-0.74)	(0.27)	(1.14)	(0.97)	(0.53)	(0.57)	(1.4)	(-0.2)	(0.02)	(0)	(1.76)	(-0.79)	(0.59)	(-1.39)	(1.77)
East Asia & Pacific	1.211	1.460	-0.249*	-0.186	1.457	1.744*	-0.287**	-0.137	1.349	1.734	-0.385	-0.063	1.431	1.694*	-0.263*	0.001
	(1.25)	(1.6)	(-1.89)	(-0.94)	(1.47)	(1.84)	(-2.03)	(-0.59)	(1.36)	(1.85)	(0)	(-0.34)	(1.44)	(1.83)	(-1.76)	(0.01)
Europe & Central Asia	-0.271**	0.096	-0.368***	-0.286**	-0.291**	0.053	-0.344	-0.247*	-0.235*	0.217	-0.451	-0.253*	-0.151	0.139	-0.290**	-0.260*
	(-2.21)	(0.7)	(-3.02)	(-1.97)	(-2.56)	(0.35)	(-2.51)	(-1.66)	(-1.77)	(1.46)	(0)	(-1.81)	(-1.31)	(1.08)	(-2.17)	(-1.83)
Middle East & North Africa	0.078	0.083	-0.005	0.160	0.294*	0.206	0.088	0.032	0.140	0.365*	-0.224	0.124	0.182	0.304**	-0.122	-0.003
	(0.52)	(0.47)	(-0.04)	(1.1)	(1.89)	(1.27)	(0.65)	(0.2)	(0.92)	(1.93)	(0)	(0.82)	(1.26)	(2.07)	(-0.95)	(-0.02)
South Asia	0.156	-0.017	0.173	0.184	0.253	0.130	0.122	0.047	0.137	0.089	0.047	0.253*	0.249	0.189	0.060	0.207
	(0.99)	(-0.12)	(1.26)	(1.19)	(1.6)	(0.84)	(0.84)	(0.31)	(0.75)	(0.56)	(0)	(1.89)	(1.42)	(1.31)	(0.37)	(1.36)
CONSTANT	-0.897	-1.392***	0.495	-0.169	-0.338	-0.357	0.018	-0.004	-0.491	-1.163**	0.672	-0.279	-0.117	-0.949*	0.832*	-0.645
	(-1.64)	(-2.89)	(1.14)	(-0.34)	(-0.52)	(-0.65)	(0.04)	(-0.01)	(-0.84)	(-2.22)	(0)	(-0.52)	(-0.21)	(-1.67)	(1.82)	(-1.27)
Pseudo R^2	0.5545	0.5545	0.4041	0.4326	0.5383	0.5383	0.3857	0.4125	0.5449	0.5449	0.3861	0.3861	0.5367	0.5367	0.3793	0.4083

The full sample consists 400 country-year observations (i.e., 80 countries with year observations from 2007 to 2011). The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and zakat) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa, East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa* and

South Asia are the classification of geographic regions based on World Bank. All estimates include observation year dummies (not reported). Bootstrapped standard errors are used (not reported) and they were obtained using 1,000 bootstrap replications. *t*-statistics in parentheses.***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).

Table A2.2 Inter-quantile regression estimates for determinants of financial inclusion in countries with Islamic banking presence

Variable	*With all IB variables*				*IB Quantity*				*IB Size*				*IB Profitability*			
	95th-5th	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*
IB quantity	0.477	0.350	0.127	0.748	5.001	5.814	-0.813	3.207								
	(0.07)	(0.06)	(0.05)	(0.2)	(1.06)	(1.31)	(-0.48)	(1.13)								
IB size	-0.154	-0.100	-0.054	-0.137					-0.180	-0.114	-0.066	-0.020				
	(-0.67)	(-0.45)	(-0.54)	(-0.94)					(-0.92)	(-0.68)	(-0.69)	(-0.15)				
IB profitability	-1.124	-1.270	0.146	-0.529									3.011	4.924	-1.913	-0.058
	(-0.09)	(-0.11)	(0.03)	(-0.07)									(0.23)	(0.44)	(-0.34)	(-0.01)
IB quantity x size	-0.160	-0.141	-0.019	-0.097	-0.694	-0.768	0.074	-0.421	-0.088	-0.050	-0.039	-0.020				
	(-0.18)	(-0.18)	(-0.06)	(-0.21)	(-1.26)	(-1.48)	(0.36)	(-1.27)	(-0.49)	(-0.29)	(-0.37)	(-0.16)				
IB quantity x profitability	4.178	9.266	-5.088	-12.023	23.042	19.395	3.646	8.068					14.417	13.667	0.750	7.591
	(0.09)	(0.22)	(-0.26)	(-0.41)	(1.21)	(1.18)	(0.46)	(0.72)					(0.39)	(0.43)	(0.04)	(0.36)
IB size x profitability	0.617	0.496	0.121	0.737					0.715	0.710	0.006	0.270	-0.251	-0.486	0.234	0.159
	(0.23)	(0.21)	(0.1)	(0.43)					(1.15)	(1.28)	(0.02)	(0.65)	(-0.11)	(-0.26)	(0.22)	(0.12)
GDP	0.103	0.038	0.065	-0.043	0.028	0.064	-0.036	0.039	0.029	-0.117	0.146	-0.106	0.000	-0.083	0.083	-0.108
	(0.28)	(0.12)	(0.49)	(-0.2)	(0.06)	(0.15)	(-0.19)	(0.13)	(0.06)	(-0.3)	(0.73)	(-0.37)	(0)	(-0.25)	(0.57)	(-0.48)
Governance	0.286	0.187	0.099	0.159	0.278	0.342	-0.065	0.171	0.289	0.288	0.001	0.158	0.398	0.241	0.157	0.251
	(0.6)	(0.41)	(0.55)	(0.6)	(0.6)	(0.87)	(-0.3)	(0.57)	(0.62)	(0.73)	(0.01)	(0.51)	(0.89)	(0.58)	(0.71)	(0.84)
Legal rights	0.028	0.008	0.020	0.017	0.243	0.213	0.030	0.100	0.118	0.059	0.059	0.084	0.188	0.158	0.030	0.076
	(0.15)	(0.05)	(0.33)	(0.17)	(1.27)	(1.2)	(0.5)	(0.84)	(0.66)	(0.37)	(0.74)	(0.75)	(0.98)	(0.92)	(0.4)	(0.68)
Credit information	-0.290*	-0.286**	-0.003	-0.151	-0.326**	-0.313**	-0.013	-0.140	-0.332**	-0.330**	-0.002	-0.160	-0.272**	-0.331**	0.059	-0.142
	(-1.89)	(-2.14)	(-0.05)	(-1.59)	(-2.19)	(-2.28)	(-0.21)	(-1.46)	(-2.18)	(-2.34)	(-0.03)	(-1.49)	(-2.07)	(-2.5)	(0.84)	(-1.58)
Cost contracts	-2.533*	-2.552**	0.019	-1.241	-3.219**	-3.335**	0.116	-1.660	-2.726*	-3.010**	0.284	-1.310	-2.975**	-3.177**	0.202	-1.547
	(-1.87)	(-2.22)	(0.04)	(-1.6)	(-2.13)	(-2.39)	(0.2)	(-1.63)	(-1.76)	(-2.2)	(0.36)	(-1.21)	(-2.06)	(-2.32)	(0.3)	(-1.64)
Financial restrictions	-0.010	-0.007	-0.004	-0.004	0.007	-0.001	0.008	-0.002	0.002	0.002	0.001	0.004	0.010	0.009	0.000	0.008
	(-0.62)	(-0.43)	(-0.65)	(-0.42)	(0.51)	(-0.08)	(1.44)	(-0.22)	(0.14)	(0.12)	(0.08)	(0.41)	(1.04)	(1.02)	(0.09)	(1.08)
Paved road	-0.005	-0.007	0.002	-0.001	-0.011	-0.012	0.001	-0.006	-0.012	-0.015	0.003	-0.008	-0.021*	-0.021*	-0.001	-0.013
	(-0.36)	(-0.6)	(0.5)	(-0.11)	(-0.77)	(-0.99)	(0.24)	(-0.66)	(-0.74)	(-1.07)	(0.42)	(-0.74)	(-1.67)	(-1.75)	(-0.09)	(-1.57)
Phone	0.059	0.065*	-0.007	0.035	0.066	0.067	0.000	0.033	0.068	0.076*	-0.009	0.032	0.056	0.064	-0.009	0.036
	(1.48)	(1.87)	(-0.47)	(1.45)	(1.21)	(1.4)	(-0.02)	(0.99)	(1.28)	(1.71)	(-0.4)	(0.96)	(1.04)	(1.34)	(-0.43)	(1.07)
Internet	0.004	0.006	-0.003	-0.001	-0.005	-0.006	0.001	-0.004	0.001	0.007	-0.006	0.005	0.004	0.010	-0.006	0.001
	(0.17)	(0.37)	(-0.42)	(-0.1)	(-0.34)	(-0.48)	(0.15)	(-0.4)	(0.07)	(0.59)	(-0.85)	(0.54)	(0.28)	(0.84)	(-0.87)	(0.07)
Deposit interest rate	-0.657	-0.832	0.174	0.462	8.335	5.645	2.691	1.613	6.897	2.577	4.321	3.893	7.438	6.833	0.605	3.466
	(-0.09)	(-0.12)	(0.06)	(0.11)	(1.11)	(0.76)	(1)	(0.33)	(0.91)	(0.39)	(1.14)	(0.78)	(0.91)	(0.96)	(0.16)	(0.69)
Lending interest rate	7.246	7.104	0.142	1.222	-1.130	0.159	-1.289	0.756	-0.457	3.035	-3.492	-1.165	-1.100	-1.112	0.013	-1.700
	(0.91)	(1)	(0.04)	(0.28)	(-0.17)	(0.02)	(-0.52)	(0.19)	(-0.07)	(0.54)	(-1.02)	(-0.28)	(-0.17)	(-0.2)	(0)	(-0.4)

Variable	*With all IB variables*				*IB Quantity*				*IB Size*				*IB Profitability*			
	95th-5th	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*	*95th-5th*	*95th-50th*	*50th-5th*	*75th-25th*
English	-1.083	-1.071	-0.013	-0.151	-2.954**	-2.514**	-0.439	-1.127	-2.072	-1.644	-0.428	-1.075	-2.795***	-2.665**	-0.130	-1.333
	(-0.83)	(-0.94)	(-0.03)	(-0.21)	(-2.39)	(-2.16)	(-0.9)	(-1.36)	(-1.55)	(-1.39)	(-0.68)	(-1.18)	(-2.65)	(-2.5)	(-0.2)	(-1.68)
French	0.152	0.382	-0.230	0.386	-0.963	-0.576	-0.387	-0.229	-0.599	0.132	-0.731	-0.281	-0.844	-0.536	-0.308	-0.330
	(0.16)	(0.43)	(-0.5)	(0.65)	(-0.93)	(-0.58)	(-0.76)	(-0.32)	(-0.52)	(0.12)	(-1.15)	(-0.32)	(-0.77)	(-0.49)	(-0.51)	(-0.41)
East Asia & Pacific	0.476	0.367	0.110	0.124	1.161	1.086	0.075	0.569	0.931	0.899	0.032	0.651	1.581**	1.590*	-0.009	0.922*
	(0.57)	(0.47)	(0.38)	(0.26)	(1)	(1.04)	(0.22)	(0.86)	(1.09)	(1.13)	(0.08)	(1.17)	(2)	(1.88)	(-0.02)	(1.82)
Europe & Central Asia	-1.542	-1.836*	0.294	-0.740	-2.265*	-2.031*	-0.234	-0.916	-1.900	-1.948*	0.048	-0.944	-1.855*	-2.049**	0.193	-0.930
	(-1.32)	(-1.83)	(0.69)	(-1.15)	(-1.85)	(-1.95)	(-0.51)	(-1.2)	(-1.65)	(-1.94)	(0.09)	(-1.27)	(-1.8)	(-2.08)	(0.34)	(-1.37)
Middle East & North Africa	-1.379	-1.681	0.302	-0.731	-0.584	-0.886	0.301	-0.376	-0.829	-1.333	0.505	-0.253	-0.456	-0.826	0.369	-0.247
	(-1.14)	(-1.57)	(0.65)	(-1.07)	(-0.46)	(-0.81)	(0.69)	(-0.49)	(-0.63)	(-1.16)	(0.8)	(-0.31)	(-0.37)	(-0.71)	(0.65)	(-0.34)
South Asia	0.142	0.130	0.012	-0.047	0.518	0.353	0.165	0.198	1.196	0.918	0.278	1.096**	1.480**	1.135	0.345	1.122**
	(0.23)	(0.24)	(0.04)	(-0.13)	(0.62)	(0.51)	(0.55)	(0.41)	(1.56)	(1.27)	(0.58)	(2.03)	(2.11)	(1.6)	(0.93)	(2.34)
CONSTANT	2.963	3.014	-0.050	2.384	2.987	2.919	0.068	1.356	4.233	4.772	-0.540	2.326	3.280	3.947	-0.667	2.769
	(0.74)	(0.84)	(-0.04)	(1.03)	(0.64)	(0.69)	(0.04)	(0.45)	(0.92)	(1.19)	(-0.27)	(0.81)	(0.77)	(1.03)	(-0.38)	(1.09)
Pseudo R^2	0.8060	0.8060	0.6112	0.5908	0.7877	0.7877	0.5357	0.5626	0.7921	0.7921	0.4401	0.5483	0.7855	0.7855	0.4368	0.5454

The sub sample consists 100 country-year observations (i.e., 20 countries with Islamic banking presence, with year observations from 2007 to 2011). The dependent variable is the country's *cumulative index of financial inclusion (CIFI)*, calculated based on formula initiated by Sarma (2008, 2010). *IB quantity* is defined as total number of Islamic banks divided by total number of banks in the banking system. *IB size* is the average of natural logarithm of total assets of Islamic banks. *IB profitability* is the average of profit before tax (and zakat) divided by total assets of the Islamic bank. *GDP* is the natural logarithm of the country's value of GDP per capita (i.e., GDP in US dollars at market exchange rates divided by total population). *Governance* is an index of the average score of six governance indicators (voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption) which higher score correspond to better governance. *Legal rights* is an index measuring the degree to which collateral and bankruptcy laws facilitate lending, where scored on a 0–10 scale, with scores increasing with legal rights. *Credit information* is an index, scored on zero to six scale; scores increasing with availability of credit information. *Cost contracts* is total enforcement cost, including legal fees, assessment, and court fees expressed as a percentage of total debt. *Banking restriction* is an index capturing government's control, regulations, and involvement in financial sector, where higher values indicate more banking restrictions. *Paved road* is paved roads (in km) per square km of land area and per 1000 population. *Phone* is logarithm of the number of telephone (land line and mobile) subscription per 1000 population. *Internet* is number of internet users per 1000. *Deposit interest rate* is the rate paid by commercial or similar banks for demand, time or savings deposits. *Lending interest rate* is the bank rate that usually meets the short and medium-term financing needs of the private sector, where this rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. *English* is where a country legal system is of British Common Law origin. *French* is where a country legal system is of French Civil Law origin. *German* is where a country legal system is of German Civil Law origin. *Socialist* is where a country legal system is Socialist origin. *Scandinavian* is where a country legal system is of Scandinavian Civil Law origin. *Africa*, *East Asia & Pacific*, *Europe & Central Asia*, *Latin America & Caribbean*, *Middle East & North Africa* and *South Asia* are the classification of geographic regions based on World Bank. All regressions include year dummies, i.e., for 2007 to 2010 (not reported). Bootstrapped standard errors are used (not reported) and they were obtained using 1,000 bootstrap replications. *t*-statistics in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels, respectively (2-tail test).