Socioeconomic Development and Its Effect on Performance of Islamic Banks: Dynamic Panel Approaches

Chowdhury, M. Ashraful Ferdous and Haque, M. Mahmudul and Alhabshi, Syed Othman and Masih, Abul Mansur M.

INCEIF, Malaysia and Shahjalal University of Science and Technology, Sylhet, Bangladesh, INCEIF, Malaysia, INCEIF, Malaysia, INCEIF, Malaysia

26 May 2016

Chapter 14
Socioeconomic Development and Its Effect on Performance of Islamic Banks: Dynamic Panel Approaches

Mohammad Ashraful Ferdous Chowdhury, Md. Mahmudul Haque, Syed Othman Alhabshi, and Abul Mansur Mohammed Masih

Abstract Islamic banks are highly incorporated with social issues because of their rules and regulations. Profit not only depends on its own return and investment but also on trust, moral issues which may be more related to banking profitability. To test these gaps, this chapter attempts to investigate the socioeconomic factors along with bank-specific factors of global Islamic banks using dynamic GMM and Quantile regression. The dataset used in this study involves 55 full-fledged Islamic Banks from 24 countries across the globe. The results suggest that Return on Assets (ROA) is significantly positive to bank-specific factors such as credit risk has and statistically negative to cost-to-income ratio. It is also suggested that the relationship between risk and return is heterogeneous or dissimilar across different quantiles. Findings of the study tend to unravel that the socioeconomic factors especially political stability and investment freedom have positive and significant relation to the Islamic bank performance.

Keywords ROA • Socioeconomic factors • Credit risk • Dynamic GMM • Quantile regression

14.1 Introduction

Risk sharing is a unique characteristic in the Islamic financial system that provides the financial stability, enriched financial inclusion leading to sustainable development. However, the implementation of the risk-sharing concept depends on a few

M.A.F. Chowdhury (✉)
INCEIF and Shahjalal University of Science and Technology, Sylhet, Bangladesh
e-mail: ashraful_ferdous@yahoo.com

M.M. Haque • S.O. Alhabshi • A.M.M. Masih
INCEIF, Lorong Universiti A, Kuala Lumpur 59100, Malaysia

M. Zulkhibri et al. (eds.), *Macroprudential Regulation and Policy for the Islamic Financial Industry*, DOI 10.1007/978-3-319-30445-8_14

prerequisites such as transparency and accountability, good governance, contacts enforcement, effective monitoring, well-structured economic institutions, and efficient financial markets. Unfortunately, the current state of affairs shows that a majority of the Organization of Islamic cooperation (OIC) countries do not meet these prerequisites (Ng et al. 2015). It is now being increasingly realized that the Islamic banks may be an alternative to conventional banks particularly during the crisis periods as reflected in the rapid growth of Islamic banking since the recent financial crises. The amount of risk faced by banks is usually of great concern to the policymakers.

Unlike the conventional banks, Islamic banks promote risk-sharing principles by using many investment tools such as *Mudarabah* and *Musharakah*. Due to the dynamism of different contracts, it is generally perceived that the risk is comparatively higher in Islamic banks compared to their conventional counterparts. It is usually argued that Islamic Banks have higher degree of credit risks than interest-based banks mainly because of their nature of trade based investment. Up until now, the risk-return relationship examined by previous researchers was found to be positive, negative, or curvilinear (Nwude 2012). The robust growth in financing and investment activities across most jurisdictions in various real sectors has helped Islamic banks record generous asset growth rates in their balance sheets. However, the returns became subdued during the financial crisis of years of 2008–2009, reaching lows of ROA 0.74 % and ROE 6.16 % in 2009 (IFSB 2014). Since Islamic banks are participatory based, it could be said that this subdued Islamic banking performance is not only caused by the financial downturn but also by socioeconomic instability such as Arab Spring.

In any economy, socioeconomic freedom is a major dimension, which will affect bank performance. The role of socioeconomic freedom has assumed a developmental character in capital markets following the liberalization of stock markets. In a setting which reflects socioeconomic freedom fluctuating widely across countries, investors worldwide in equity markets perceive it as fascinating to spot attractive investment opportunities. Socioeconomic freedom particularly easing the regulatory framework helps international investors penetrate into domestic markets. It is broadly assessed that economic freedom is a crucial factor in determining the well-being at mass level. Countries with more economic freedom tend to be wealthy and their financial markets tend to be more stable, compared to the countries having a lower degree of economic freedom. Stock markets of the countries with higher economic freedom perform better and are more stable (Chen and Huang 2009). Meanwhile, Smimou and Karabegovic (2010) have the view that financial development is not determined by capitalism (proxy of economic freedom remarkably, free market system); rather it is a precondition for banking performance and development. More specifically, this growth literature points out that stable and predictable rule of law, good enforcement of contracts, protection of individual and investment freedom, labor movement and property rights, sound money, and so on are the keys to economic progress.

Despite the significant development of all Islamic banks worldwide, there were relatively few empirical works on Islamic bank's performance, which is quiet in its infancy. To date, empirical studies on the performance of the banking sector in both

the developed and developing countries are mostly focused on the conventional interest based banking system and there has been almost no conclusive research done on the performance of the Islamic banking sector from the point of view of bank-specific determinants and socioeconomic freedom determinants. This chapter seeks to fill in the gaps by addressing the following objectives: (1) to find the impact of bank-specific variables and socioeconomic freedom on Islamic banks' profitability and (2) to find whether risk-return relationship across different percentiles is similar or not in terms of bank-specific and socioeconomic freedom variables.

14.2 Literature Review

Traditionally studies on Islamic bank performance have focused on theoretical issues while empirical works have relied mainly on the analysis of the descriptive studies rather than rigorous statistical estimations (El-Gamal and Inanoglu 2005). Similar to conventional banks, researchers have focused on the determinants of bank performance in terms of profitability and efficiency. The majority of studies clusters the determinants of banks financial performance into two types (Haron 2004): firstly, the external or macroeconomic factors that are considered to be away from the control of bank administration such as gross domestic product, conventional banks interest rates, competition, regulation, concentration, market share, ownership, and inflation. In the literature, empirical studies on profitability of Islamic banks have paid attention on specific and some concentrated on the panel of countries. The studies used in the literature aimed at explaining the profitability of Islamic banks includes Malaysia (Asma et al. 2011; Ahmad and Ahmad 2004), Indonesia (Asutay and Izhar 2007), Bahrain, Egypt, Sudan, and Saudi Arabia (Al-Jarrah and Molyneux 2003). These studies inspect the profitability determinants of Islamic banks.

Secondly, there are internal factors or the bank-specific variable such as the liquidity, credit risk, operational efficiency, and capital adequacy of the banks are also considered in number of studies perspective. In Islamic banking industry, it is usually argued that banks have higher degree of credit risks than interest-based banks mainly because of their nature of trade based investment. The ratio of loan provisions to total loans (LLP/TL) is incorporated as an independent variable in the regression analysis as a proxy of credit risk. The coefficient of LLP/TL is expected to be negative because bad loans reduce bank profitability. In these directions, Miller and Noulas (1997) suggest that the greater the financial institutions exposure towards high risk loans, the higher would be the accumulation of unpaid loans resulting in a lower profitability. Moreover, the coefficient of LLP/TL is expected to be negative because bad loans are likely to decrease profitability.

In addition to this, the total cost of a bank can be divided into operating cost and other expenses (including taxes, depreciations, etc.). The cost-to-income ratio is used to provide information on the variation on the bank operating costs. This variable includes operating costs such as salary, wages, and branch operating expenses. The relationship between the costs to income is expected to be reverse, because

banks that are more productive and efficient should keep their operating cost low. Ben Naceur and Goaied (2008) and Hassan and Bashir (2003) have found a positive impact on the performance of the Islamic banks, whereas Kosmidou et al. (2005) have found a negative relation to the performance of the banks.

Moreover, a study conducted by Ahmad and Ahmad (2004) on Malaysian Islamic banks credit risk. The study concludes that assets size, risky assets ratio, and Islamic banks management efficiency effect were found statistically significant on Islamic banks credit risk. In the Middle East, a study conducted by Bashir (2003) examined the internal variables and economic environment impact on the performance of Islamic banks. The statistically significant and positive relationship was found between capital adequacy and profitability of Islamic banks. The researcher also concluded from the study that foreigners owned Islamic banks have ability to attain higher profit ratio then the banks locally owned. The positive impact and statistically significant relationship of inflation was also found on the profitability of Middle East Islamic banks.

From the socioeconomic perspectives, there have been a number of studies which explore that socioeconomic freedom influences economic growth (Heckelman and Knack 2009; Altman 2008; Powell 2002; Adkins et al. 2002; Reedom and Rowth 2000). The findings from most of the studies reveal that there exists a positive impact of various measures of economic freedom on economic growth. Remarkably absent in the literature is an examination of the links between economic freedom and bank performance. The limited research in this area is somewhat surprising given the importance of bank-specific factors in promoting economic development (Chinn and Ito 2007; Levine and Zervos 1998) and the impact of socioeconomic freedom is also likely to have effect on the banking sector. Additionally, on the economic freedom indexes, extensive empirical studies have been produced (Chortareas et al. 2013). While Sala-i-Martin et al. (2013) consider the effects of economic freedom on inequality, and consider income convergence aggregate productive efficiency. Indexes of economic freedom have also been used as explanatory variables in financial economics (Roychoudhury and Lawson 2010; Jones and Stroup 2010) characterizing the effects of the recent global recession (Giannone et al. 2011).

There have been an extensive number of researches that consider the effects of the economic freedom indexes on various aspects of the economy and found the evidence that economies enjoying a high degree of economic freedom can, on balance, achieve better economic outcomes. In the financial economics and banking literature, the indexes of economic freedom have been used as control variables in various contexts (Roychoudhury and Lawson 2010; Jones and Stroup 2010). A number of studies have already included indicators that examine the degree of financial liberalization. La Porta et al. (2000) does not directly account for banking sector's efficiency but include traditional indicators of common law, creditor rights, rule of law and find that countries with more robust investor protection (where agency costs are restricted by the law) have larger capital markets. The "rule of law" has been also used to capture the effects of severe enforcement practices for any given level of creditors or shareholders protection. In contrast, Fries and Taci (2005) consider the role of banking sector reform and liberalization in the transition countries to capture the effect on bank cost efficiency.

While most of the research has highlighted the growth of the Islamic financial industry and the determinants of such growth, robust further study is essential for the potential and growth of the industry. To that effect, there is a strong demand to put the future prospects for the industry's development within the overall context of financial and institutional development especially in the member states of the OIC countries. The findings of the study add new dimension in the Islamic banking industry.

14.3 Data and Methodology

14.3.1 Data Collection

To conduct this research work, data of 55 Islamic banks has been collected from 24 countries through Bankscope, World Bank, and IMF research database over the period 2005–2013. The financial statements of Islamic banks operating in these countries are collected form Bankscope database of Bureau Van Dijk Company. The socioeconomic data such as Rule of law, property rights, corruption, investment freedom, and political stability has been collected from World Bank and IMF financial statistics (IFS) database (Table 14.1).

14.3.2 Methodology

The methodologies applied in this study are both static model, which have been used in numerous studies, and the dynamic one based on Berger (1995) and more recently Goddard et al. (2004) and Athanasoglou et al. (2008). As Mamatzakis and Remoundos (2003) argue dynamic model uses more information and consequently the determinant factors will be estimated more efficiently. In this study both static and dynamic models are applied.

Table 14.1 Variable description

Variable	Definition	Description
PR	Profitability of banks	Return on assets (ROA)
CPI	Corruption perception index	Ranges from 1 to 100
SZ	Bank size	Natural log of total asset
LLRGL	Credit risk	Loan loss provision/Gross loan for each year averaged
POLS	Political stability	Ranges from −2.5 (weak) to 2.5 (strong)
IF	Investment freedom	The Investment freedom index (0–100)
PR	Property rights	The property rights index (0–100)
CIR	Cost-to-income ratio	It refers the operational efficiency of a firm

14.3.3 Static Models (Fixed and Random Effects)

The panel data is used in analyzing the bank's portability determinants. In the panel data, the used model consists n cross-sectional units, denoted by $n = 1, N$, observed at each of T time periods, $t = 1, \ldots, T$. In data set, the total observation is $n \times T$.

The basic framework for the panel data is defined as per the following regression model:

$$Y_{nt} = \alpha + \beta X_{nt} + \varepsilon_{nt} \tag{14.1}$$

where the dependent variable (Profitability) is denoted by y_{nt}. Intercept term used is denoted by α, on the explanatory variables, β is a $k \times 1$ vector of parameter to be estimated, and vector of observations is X_{nt} which is $1 \times k$, $t = 1, \ldots, T$; $n = 1, \ldots N$. The econometric specifications:

$$\begin{aligned} \text{ROA} = {} & \alpha + \beta 1\ \text{CIR} + \beta 2\ \text{LTA} + \beta 3\ \text{LLRGL} \\ & + \beta 4\ \text{COR} + \beta 5\ \text{IFL} + \beta 6\ \text{PR} + \varepsilon \end{aligned} \tag{14.2}$$

where Y is return on assets (ROA); CIR is cost-to-income ratio; LTA is natural log of total assets; LLRGL is loan loss reserve over gross loan; COR is corruption; POLS is political stability; IFI is investment freedom; PR is property rights; and ε is error term.

14.3.4 Dynamic GMM Models

In banking literature, fixed and random effects models are usually employed for panel data. However, it is argued that persistence of bank profitability over time could affect next year's profit (Athanasoglou et al. 2008). As a result a difficulty arises with these models when a lagged dependent variable (or possibly other regressor) is concerned, particularly in the context of very few time periods and many observations (Nickell 1981). To address this issue, Arellano and Bond (1991) develop the difference GMM model by differencing all regressors and employing GMM (Hansen 1982).

Arellano and Bover (1995) and Blundell and Bond (2000) augment the difference GMM model by developing the system GMM estimator which includes lagged levels as well as lagged differences. The system GMM estimator assumes that first differences of instrumental variables are uncorrelated with the fixed effects. It allows the introduction of more instruments, and can substantially improve efficiency. Roodman (2006), among others, argues that both difference and system GMM estimators are suitable for situations with "small T, large N" panels; independent variables that are not strictly exogenous; fixed individual effects; heteroskedasticity and autocorrelation among, in this study, individual banks. However, the difference GMM estimators can be subject to serious finite sample biases if the

instruments used have near unit root properties. Use of the system GMM results in notably smaller finite sample bias and much greater precision when estimating autoregressive parameters using persistent series (Bond 2002). In addition, The GMM system controls for unobserved heterogeneity and for persistence of the dependent variable. The following formula for GMM proposed by Athanasoglou et al. (2008) is used to conduct the empirical analysis:

$$II_t = C + \delta II_{i,t-1} + \sum_{j}^{j=1} \beta_j X^j{}_{it} + \sum_{m}^{m=1} \beta_j X^m{}_{it} + \varepsilon_{it} \tag{14.3}$$

where II_t is the probability of bank i at time t where $i = 1 \ldots N$, $t = 1$, C is the Constant Term. $II_{i,t-1}$ is the lag value of dependent variable, X_{it} is the explanatory variables and ε_{it} the disturbance term, with v_{it} the unobserved bank-specific effect and u_{it} the idiosyncratic error. This is a one-way component regression model, where $v_{et} \sim IIN(0, \sigma_v^2)$ and independent of $u_{it} \sim (0, \sigma_u^2)$. The X_{it} is grouped into bank-specific $X^j{}_{it}$ and macroeconomic variable $X^m{}_{it}$.

14.3.5 Quantile Regression (QR) Model

This study employs a QR model in which the parameter of explanatory variables can be expressed as a monotone function of a single, scalar random variable. The model captures systematic influences of conditioning variables on location, scale, and shape of the conditional distribution of the response. The model is thus significantly extended with a constant coefficient in which the effects of conditioning are confined to a location shift. Furthermore, this study reveals that traditional optimization techniques, including OLS and LAD, disregard different behaviors in the tail regions of bank profitability distributions and the risk–return relationships in banks change in the tail regions. Following this line of thought, a QR technique developed by Koenker and Bassett (1978) is used in this study to examine the dynamic relationship between the risk and bank profitability performance.

Assuming that the θth quantile of the conditional distribution of the explained variable is linear in x where Quant Xi, the conditional QR model can be expressed as follows:

$$\begin{aligned} &Y_i = x'_i \cdot \beta_\theta + u_{\theta i} \\ &\text{Quant}_\theta \left(y_i \mid x_i \right) = \inf \left\{ y : F_i \left(y \mid x \right) \theta \right\} = x'_i \cdot \beta_\theta \\ &\text{Quant}_\theta \left(u_{\theta i} \mid x_i \right) = 0 \end{aligned} \tag{14.4}$$

where $\text{Quant}_\theta (y_i \mid x_i)$ represents the θ the conditional quantile of y_i on the regressor vector x_i; β_θ is the unknown vector of parameters to be estimated for different values of θ in (0, 1); $u_{\theta i}$ is the error term assumed to be continuously differentiable c.d.f. (cumulative density function) of $F_i(y \mid x)\theta$ and a density function $F_i(y \mid x)\theta$.

The value $F_i(y \mid x)\theta$ denotes the conditional distribution of y conditional on x. Varying the value of u from 0 to 1 reveals the entire distribution of y conditional on x. The estimator for u is obtained from

$$\begin{aligned} &\min \sum_{n}^{i:u>=0} \theta^x \left|u\theta\right| + \sum_{n}^{i:u<=0} 1-\theta^x \left|u\theta i\right| \\ &= \sum_{i:yi-x'i.\beta>=0} \theta^x \left|yi - x'i \cdot \beta\theta\right| + \sum_{i:yi-x'i.\beta<=0} \left(1-\theta\right)^x \mid yi - x'i \cdot \beta\theta \end{aligned} \tag{14.5}$$

14.4 Results and Discussion

14.4.1 Descriptive Study

To analyze the result of the study, first it is useful to comment on some preliminary features of our data. Table 14.2 shows descriptive statistics for the profitability (ROA) and the bank-specific and macroeconomic variables used in our model. In average, the return on average asset of 55 Islamic banks used in this study is 1.07. The mean of all other independent variables are also positive except Political stability.

The mean of cost-to-income ratio is the largest (65.95) and varies greatly across banks (max = 668.75 and min = 10.5). The standard deviation is highest in the 77.44 in the cost-to-income ratio. The CIR and size (Log TA) of the sampled bank in GCC region is 8.57 % and 14.60, respectively. The variable LLRGL which is the proxy for credit risk is 8.57. From the risk perspective, i.e., standard deviation, the highest value lies in the CIR variable followed by LLRGL and ROA by 15.63 % and 3.39 %, respectively. From the socioeconomic perspective, over the average mean of the POLS is negative meaning that the political stability of the sampled countries is less than the standard level.

Table 14.2 Descriptive statistics

	ROA	CIR	LTA	LLRGL	COR	POLS	IF	PR
Mean	1.0786	65.9502	14.6055	8.57324	0.03972	–0.4854	45.500	45.863
Median	1.1750	50.8800	14.8930	3.55500	0.06000	–0.3700	45.000	50.000
Max.	17.7800	668.7500	18.1281	100.000	1.72000	1.36000	90.000	90.000
Min.	–23.6600	10.5000	10.7166	0.00000	–1.5700	–2.6900	0.0000	10.000
Std. Dev.	3.39320	77.4477	1.55505	15.6374	0.89593	1.14195	19.409	16.601
Skewness	–1.89712	5.23403	–0.2426	3.81701	0.01808	–0.3918	0.226	0.3597
Kurtosis	18.6766	33.4312	2.31794	18.7652	2.1168	2.0812	3.2703	3.8795
Obs.	220	220	220	220	220	220	220	220

Notes: The dependent variable ROA is calculated as net profit divided by total assets. CIR—the cost-to-income ratio is used as a proxy for operating efficiency. LLRGL is a measure of credit risk calculated as the ratio of total loan loss provisions by Gross loan. LOG TA is a proxy measure of size, calculated as a natural logarithm of total bank assets. POL measures the political stability. IF indicates the Investment freedom and PR refers the Property rights

14.4.2 Correlation Matrix

According to Table 14.3, the loan loss provision to gross revenues seems to be negatively correlated with the profitability measure, indicating that, when the loan loss provisions increase, profitability moves to the opposite direction by –0.0218. As expected cost-to-income ratio (overhead expenses) is negatively correlated with profitability with a correlation of –0.3246. Continuing to the correlations of between total assets and ROA is positively correlated with by 0.1936. On the other hand, socioeconomic variables such as Corruption, political stability, investment freedom, and property rights are negatively related to ROAA with –0.3246, –0.2519, –0.4327, and –0.3700, respectively. Finally, since there is no value more than 0.85, we can say that there should not be any multicollinearity.

14.4.3 Empirical Findings

Before estimating the static and dynamic model in panel techniques, this study examines the panel unit root test and panel co-integration test. It has been found that data are non-stationary at the level form and it becomes stationary after using first leg. It is also found that relationships among variables are not spurious.

Since the probability of Chi-square value (5.36) of Hausman test with P-value 0.27, this chapter will give more focus on random effect. Here, Table 14.4 provides the estimation results of the random effect model. We can see that although variables like corruption and property rights are insignificant, now exhibit more intuitively plausible positive direction of influence. Even though the overall Protecting Investors Index retains positive sign, three of its seven components now have negative effect. The next credit risk procedures exhibit positive sign, confirming the

Table 14.3 Correlation matrix

	ROAA	CIR	LTA	LLRGL	COR	POLS	IF	PR
ROAA	1.0000							
CIR	–0.6155	1.0000						
LTA	0.1936	–0.3550	1.0000					
LLRGL	–0.0218	0.2274	–0.3722	1.0000				
COR	–0.3246	0.2309	0.3664	–0.1318	1.0000			
POLS	–0.2519	0.0841	0.4364	–0.1295	0.8773	1.0000		
IF	–0.4327	0.4006	–0.1299	0.0211	0.3993	0.1686	1.0000	
PR	–0.3700	0.3699	0.0573	–0.0211	0.7426	0.5519	0.7450	1.0000

Notes: The dependent variable ROA is calculated as net profit divided by total assets. CIR—the cost-to-income ratio is used as a proxy for operating efficiency. LLRGL is a measure of credit risk calculated as the ratio of total loan loss provisions by Gross loan. LOG TA is a proxy measure of size, calculated as a natural logarithm of total bank assets. POL measures the political stability. IF indicates the Investment freedom and PR refers the Property rights

Table 14.4 Model estimations

Variables	Fixed effects	Random effects	First step differenced GMM	Second step differenced GMM
Intercept	8.3481*	1.1915	13.9455**	–0.4549
ROAA—lag of dependent variable	–	–	0.4476***	0.3786***
LTA	–0.2097	0.1466	–1.0332**	0.0655
LLRGL	0.0417**	0.0342**	0.0659**	0.0911***
CIR	–0.0275***	–0.0254***	–0.0456***	–0.0489***
COR	–0.2139	0.2645	–0.6410	–0.5020
POLS	–0.5398	–0.8140**	0.2260	1.2410**
PR	–0.0238	0.0188	0.0379	0.0412
IF	–0.0418**	–0.0470**	0.0534**	0.0300*
R-squared	0.4041	0.4735	–	–
Sagan test	–	–	$\chi^2=2.1841$, Prob$>\chi^2=0.9882$	$\chi^2=26.9584$, Prob$>\chi^2=0.126$
F-stat/Wald-χ^2	F stat$=22.68$***	182.05***	57.41***	135.12***
AR(1) test	–	–	$Z=0.1619$, $p=0.8713$	$Z=0.6151$, $p=0.5385$
AR(2) test	–	–	$Z=0.6449$, $p=0.5190$	$Z=1.1538$, $p=0.2486$
No. observations	220	220	220	220

Notes: The dependent variable ROA is calculated as net profit divided by total assets. CIR—the cost-to-income ratio is used as a proxy for operating efficiency. LLRGL is a measure of credit risk calculated as the ratio of total loan loss provisions by Gross loan. LOG TA is a proxy measure of size, calculated as a natural logarithm of total bank assets. POL measures the political stability. IF indicates the Investment freedom and PR refers the Property rights. Values in parenthesis are t statistics, (***), (**), and (*) indicate significance at 1, 5, and 10 % level, respectively

theoretical predictions. Finally, political stability and investment freedom of socio-economic freedom indicators reveal negative effects on banking performance.

On the other hand, cost-to-income ratio is highly negatively significant which is confirmed by the theoretical prediction. It is found negative and significant impact on the profitability of Islamic banks even at 1 % significant level in all the above models. A 1 % increases in the cost of the Islamic bank may reduce 0.025 % ROA of Islamic banks. Referring to the impact of credit risk, it is found positive and significant impact on the profitability of Islamic banks even at 5 % significant level in all the above models. This result implies that increase (decrease) in this credit risk increase (decrease) the profits of Islamic banks operating in the Islamic banking sector.

As already discussed, the estimators of this model still suffer from bias due to the lack of dynamic relationship between lagged dependent variable. Since GMM can solve only the "fixed effect" problem but fixing the problem of "correlation between the lagged dependent variable and the error term" and "the endogeneity of some explanatory variables" problems, this study applied the 1-step and 2-step differenced GMM. The next two columns of the table show findings of GMM estimations.

Column four describes results of difference GMM estimation. All of the indicators have significant explanatory power; moreover the signs of the estimates mostly conform to its theoretical predictions almost in every case.

These results confirm the thesis of positive influence of institutional variables on the financial sector. Therefore, we can infer that institutional quality, including specific bank determinants and broader socioeconomic freedom, indicators are significant determinants of bank performance level. It should also be mentioned that the estimators hardly remain in the boundary between Random Effects and Fixed Effects. In the next step, 2-step difference GMM estimations are used for more accurate results and inference. Overall, using both first difference and second difference GMM methods this chapter finds that the variables exhibit correct direction of influence. The magnitudes of which are not overly sensitive to change in specifications between first difference and second difference GMM.

14.4.4 Quantile Regression

Table 14.5 lists the estimation results of the QR model for the impact of the bank-specific variables and socioeconomic variables on the ROA. For comparison, the OLS estimates are also presented. Here, both OLS and the quantile regression at three different quantile have been studied. Interestingly, the result of OLS varies at different percentile especially loan-loss reserve and total assets, etc. The result indicates that as more risks are taken by a bank, more money could be made. However, the OLS estimator, by focusing only on the central tendency of the distributions,

Table 14.5 Quantile regression at different percentiles

	OLS _res	Q25_res	Q50_res	Q75_res
	b/se	b/se	b/se	b/se
LTA	0.305076**	0.2484167*	0.090	0.090
LLRGL	0.0257229**	0.000	0.0231***	0.0251023**
CIR	–0.0229395***	–0.0349813***	0.0318***	–0.0166553***
COR	0.052	–0.414	0.054	0.613
POLS	–1.042793***	–0.572	–0.5685768***	–0.9539279***
PR	0.0533228**	0.0502805**	0.023082*	0.030
IF	–0.0608303***	–0.0338887**	–0.0274277***	–0.0507418***
_cons	–2.271	–2.073	1.519	2.010
	$p<0.01$	***	$p<0.001$	

Notes: The dependent variable ROA is calculated as net profit divided by total assets. CIR—the cost-to-income ratio is used as a proxy for operating efficiency. LLRGLis a measure of credit risk calculated as the ratio of total loan loss provisions by Gross loan. LOG TA is a proxy measure of size, calculated as a natural logarithm of total bank assets. POL measures the political stability. IF indicates the Investment freedom and PR refers the Property rights. Values in parenthesis are t statistics, (***), (**), and (*) indicate significance at 1, 5, and 10 % level, respectively

does not allow the impact of the LLRGL on bank profitability to differ for more/less profitable banks. By contrast, the quantile-varying estimates of the LLRGL variable derived by the QR model, as shown in Table 14.3, reveal considerable variation in size, significance, and even in sign. In particular, by using the 5 % level of significance as a criterion, while the LLRGL variable is associated with an insignificant coefficient at the central quantiles, from 25 percentile, it becomes a significantly positive (negative) coefficient at higher (lower) quantile levels from 0.50 to 0.75 (0.05–0.25).

On the other hand, the bank size (LTA) varying at different percentile as shown in Table 14.5 reveals considerable variation in size, significance, and even in sign. In particular, by using 10 % level of significance as a criteration, it has been found that the co-efficient of LTA is statistically significant only at 25 percentile whereas OLS found that LTA has a positive impact on the performance of the Islamic banks at 5 % level of significance.

Subsequently, Figure 14.1 depicts the QR estimates and the OLS estimates. Apparently, as moving up the bank profitability quantiles levels, the QR estimates varies widely. Moreover, a comparison of the QR estimates with the traditional OLS estimates indicates that the OLS estimates underestimate the positive risk–return relationship at the higher quantile levels and obtain the wrong conclusion at the lower quantiles. Figure 14.1 presents the regression lines derived by the QR against the OLS methods. Here, it can be seen that the LLRGL, LTA, and CIR varies at different percentile.

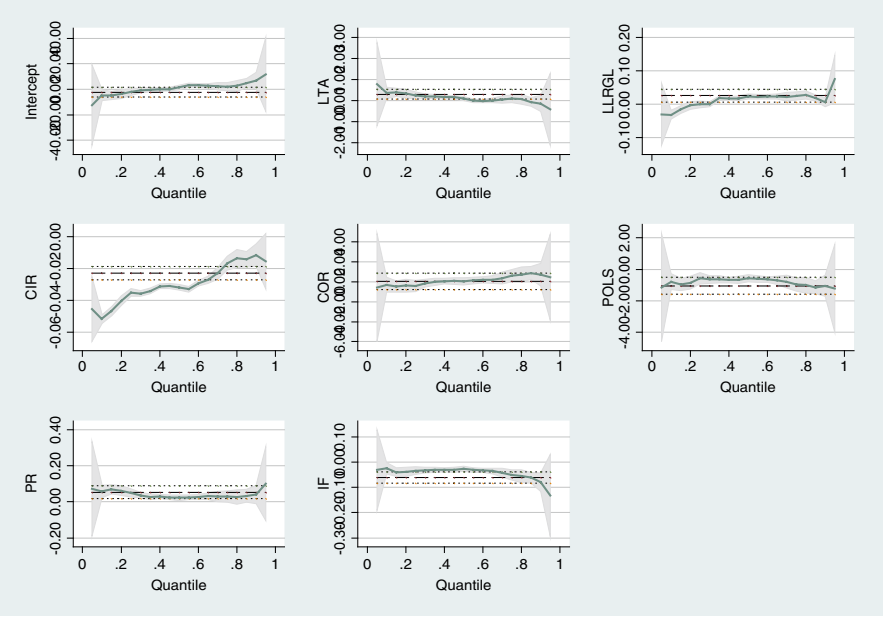

Fig. 14.1 Regression lines: QR vs. OLS for different variables

This finding requires some explanations. In theory, a bank taking a relatively high risk is supposed to earn high profits, but is also exposed to certain costs; therefore, its profitability might be reduced. In particular, bankruptcy costs may be relatively high for a bank maintaining higher risk exposure. A subsequent increase in risk taking should lead to a decrease in profitability by heightening insurance expenses on uninsured debt. Our empirical findings show that highly profitable banks can increase their profitability by taking more risks; by contrast, the superior policy in less-profitable banks is to decrease rather than increase their risk exposures. For bank size, it can explain that according to diseconomies of scale, the size of a bank could be negative related to the performance due to the marginal cost. Therefore, the size and the performance of Islamic banks are not linear at different percentile. From the socioeconomic perspectives, the results are consistent in most of the variables except political stability and property rights. The reasons for this variation at different scale could be due to its size and customer involvement since when the size of the bank at a small scale, the effect of the profitability might be less than a large scale bank.

14.5 Conclusion

Islamic finance is in a unique position to offer an alternative to the present interest-rate based debt-financing regime that has brought individual and global economies to a series of crisis and lopsided prosperity. The core principle of Islamic finance is risk sharing. Risk sharing is trust intensive. Trust is enhanced by effective institutions. Effective institutions are also key to sustained and just economic development and growth. Unfortunately, today's Muslim countries are institutionally deficient. However, the core principles of Islam provide better roadmap for reforms and institution building.

In this study, it has been examined that the level of economic freedom could matter strongly for banking performance and credit risk. To invest in potential market, the index of economic freedom can be applied to size up an economy. This study used 24 countries over 2008–2013 to see how banks could perform along with the index as well as a breakdown of its individual components. On the contrary, there were some sketchy evidences that showed that economic freedom exerts huge impact on bank performance. In addition, bank-specific determinants also exhibit measurable effects on bank performance.

In contrast, there is clear evidence that showed that less government intervention promotes bank performance stability in a Muslim country. This inference is supported by the results based on aggregate measurement of socioeconomic freedom and bank-specific variables. This study found that greater economic freedom delivers investors with better mean-variance investment efficiency. From the bank-specific variables, it has been found that the relationship between risk and return is heterogeneous or dissimilar across different quantiles meaning that if bank could take more risks then highly profitable banks can increase their profitability.

In contrast, a better policy in less-profitable banks is to decrease rather than increase their risk exposure. Finally, this chapter suggests that policy maker, such as bank management, regulators, and investors should follow the holistic approach such as considering both the socioeconomic factors and the bank-specific factors together.

References

Adkins LC, Moomaw RL, Savvides A (2002) Institutions, freedom and technical efficiency. South Econ J 69(1):92–108

Ahmad NH, Ahmad SN (2004) Key factors influencing credit risk of Islamic bank: a Malaysian case. J Muamalat Islam Financ Res 1(1):65–80

Al-Jarrah I, Molyneux P (2003) Efficiency in Arabian banking. Paper presented at the International Conference on Financial Development in Arab Countries, Abu Dhabi, UAE

Altman M (2008) How much economic freedom is necessary for economic growth? Theory and evidence. Econ Bull 15(2):1–20

Arellano M, Bond S (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Rev Econ Stud 58(2):277–297

Arellano M, Bover O (1995) Another look at the instrumental variable estimation of error-components models. J Econ 68(1):29–51

Asma I, Fadli A, Noor T (2011) Determinants of Islamic banking institution's profitability in Malaysia. Word Appl Sci J 12(1):34–54

Asutay M, Izhar H (2007) Estimating the profitability of Islamic banking: evidence from Bank Muamalat Indonesia. Rev Islam Econ 11(2):17–29

Athanasoglou PP, Brissimis SN, Delis MD (2008) Bank-specific, industry-specific and macroeconomic determinants of bank profitability. J Int Financ Mark Inst Money 18(2):121–136

Bashir A-HM (2003) Determinants of profitability in Islamic banks: some evidence from the Middle East. Islam Econ Stud 11(1):31–57

Ben Naceur S, Goaied M (2008) The determinants of commercial bank interest margin and profitability: evidence from Tunisia. Front Financ Econ 5(1):106–130

Berger AN (1995) The relationship between capital and earnings in banking. J Money Credit Bank 27(2):432–456

Blundell R, Bond S (2000) GMM estimation with persistent panel data: an application to production functions. Econ Rev 19(3):321–340

Bond SR (2002) Dynamic panel data models: a guide to micro data methods and practice. Port Econ J 1(2):141–162

Chen CR, Huang YS (2009) Economic freedom, equity performance and market volatility. Int J Account Inf Manag 17(2):189–197

Chinn MD, Ito H (2007) Current account balances, financial development and institutions: assaying the world "saving glut". J Int Money Financ 26(4):546–569

Chortareas GE, Girardone C, Ventouri A (2013) Financial freedom and bank efficiency: evidence from the European Union. J Bank Financ 37(4):1223–1231

El-Gamal MA, Inanoglu H (2005) Inefficiency and heterogeneity in Turkish banking: 1990–2000. J Appl Econ 20(5):641–664

Fries S, Taci A (2005) Cost efficiency of banks in transition: evidence from 289 banks in 15 post-communist countries. J Bank Financ 29(1):55–81

Giannone D, Lenza M, Reichlin L (2011) Market freedom and the global recession. IMF Econ Rev 59(1):111–135

Goddard J, Molyneux P, Wilson JO (2004) Dynamics of growth and profitability in banking. J Money Credit Bank 36(6):1069–1090

Hansen LP (1982) Large sample properties of generalized method of moments estimators. Econometrica 50(4):1029–1054
Haron S (2004) Determinants of Islamic bank profitability. Glob J Financ Econ 1(1):11–33
Hassan MK, Bashir AHM (2003) Determinants of Islamic banking profitability. In: 10th ERF annual conference, Morocco, pp 16–18
Heckelman JC, Knack S (2009) Aid, economic freedom, and growth. Contemp Econ Policy 27(1):46–53
Islamic Financial Services Board (2014) Annual report. http://www.ifsb.org/sec03.php. Accessed 30 Oct 2014
Jones SK, Stroup MD (2010) Closed-end country fund premiums and economic freedom. Appl Financ Econ 20(21):1639–1649
Koenker R, Bassett G Jr (1978) Regression quantiles. Econometrica 46(1):33–50
Kosmidou K, Tanna S, Pasiouras F (2005) Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995–2002. In: Money Macro and Finance (MMF) Research Group conference, vol 45, pp 1–27
Kosmidou K (2008) The determinants of banks' profits in Greece during the period of EU financial integration. Manag Financ 34(3):146–159
La Porta R, Lopez-De-Silanes F, Shleifer A, Vishny R (2000) Investor protection and corporate governance. J Financ Econ 58(1):3–27
Levine R, Zervos S (1998) Stock markets, banks, and economic growth. Am Econ Rev 88(3):537–558
Mamatzakis EC, Remoundos PC (2003) Determinants of Greek commercial banks profitability, 1989–2000. Spoudai 53(1):84–94
Miller SM, Noulas AG (1997) Portfolio mix and large-bank profitability in the USA. Appl Econ 29(4):505–512
Ng A, Ibrahim M, Mirakhor A (2015) On building social capital for Islamic finance. Int J Islam Middle East Financ Manag 8(1):2–19
Nickell S (1981) Biases in dynamic models with fixed effects. Econometrica 49(6):1417–1426
Nwude EC (2012) The crash of the Nigerian stock market: what went wrong, the consequences and the Panacea. Dev Country Stud 2(9):105–117
Powell B (2002) Economic freedom and growth: the case of the Celtic tiger. Cato J 22(3):431–448
Reedom CF, Rowth ECG (2000) Economic freedom and economic growth: a short run causal investigation. J Appl Econ 3(1):71–91
Roodman D (2006) How to do xtabond2: an introduction to difference and system GMM in Stata. Center for Global Development Working Paper (103). Center for Global Development, Washington, DC
Roychoudhury S, Lawson RA (2010) Economic freedom and sovereign credit ratings and default risk. J Financ Econ Policy 2(2):149–162
Sala-i-Martin X, Bilbao-Osorio B, Blanke J, Hanouz MD, Geiger TR, Ko C, Schwab K (2013) The global competitiveness index 2013–2014: sustaining growth, building resilience. The global competitiveness report, 2014, 3-52. World Economic Forum, Geneva
Smimou K, Karabegovic A (2010) On the relationship between economic freedom and equity returns in the emerging markets: evidence from the Middle East and North Africa (MENA) stock markets. Emerg Mark Rev 11(2):119–151