

Financial Deepening, Economic Growth and Corruption: The Case of Islamic Banking

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Abstract: As Islamic banking is becoming popular among bank customers, attempts are made in this study to examine the relationship between the corruption level and financial market deregulation, which causes financial deepening, using data for Islamic banks in 14 countries. This study employs a panel data analysis and uses three variables to represent the corruption level: the World Bank's control of corruption index (Cor), Transparency International's corruption perception index (Cor-per) and Heritage Foundation's corruption perception data (Cor-hf). Using fixed effect regression, the results of this study support the viewpoint that there is no significant positive relationship between the corruption level and financial deepening in countries where Islamic banking is dominant. This finding could help policy makers and regulators to implement further deregulatory measures in these countries.

Keywords: Islamic banking; Deregulation; Financial deepening; Corruption; panel data analysis; Economic growth

JEL Classifications: A10, G10, D73, G18

1. Introduction

The growth of Islamic banking has been astonishing during the last few decades and presently, many countries' banking systems are offering Islamic banking products. Global Islamic banking assets are now more than 1.7trillion dollars and are annually growing at the rate of more than 17% (Earnest and Young (EY) World Islamic Banking Competitiveness Report 2013–14). The growth of the Islamic banking industry is parallel to the deregulation of financial markets around the world. The broad objective of implementing such policies is to improve the efficiencies of financial institutions and thus produce financial deepening. Financial deepening refers to the ability of economic sectors and agents to use a range of financial markets for savings and investment decisions, of financial intermediaries and markets to deploy larger volumes of capital, and of the financial sector to create a broad menu of assets for risk-sharing purposes (see King and Levine, 1993; Rajan and Zingales, 1998; Chami *et al.* 2009; Goswami and Sharma, 2011; Goyal *et al.* 2011 for more details). Over the years, new economic policies (deregulated) along with the free movement of capital have benefited many countries (Levine, 2005).

As a result, Islamic banking sector too received a significant boost from global financial market deregulation. Financial sector reforms introduced by many countries, including those countries where Islamic banking is prominent, were specifically directed toward making their banking sector more competitive. Financial development indicators such as deposit money bank assets to GDP, private credit by deposit money banks to GDP, and bank deposits to GDP for many countries show

significant improvements, indicating financial deepening. These countries also have been benefitting from financial deepening by achieving higher economic growths. However, some studies have argued that irrespective of bringing positive impacts such as higher economic growth due to financial deepening, it also could bring negative impacts such as increase in the level corruption owing to more liberalized policies (Ahlin and Pang, 2008). In fact, the evidence linking higher economic growth and corruption is inconclusive. For example, many studies opine that corruption hinders economic growth (Brunetti, 1997; Johnson *et al.*, 1999; Fisman and Svensson, 2007; Hellman *et al.*, 2003; Beck *et al.*, 2005) while at the same time some argue that corruption has positive impacts on economic growth (De Soto, 1989, Frye and Shleifer, 1997, Berkowitz and Li, 2000, Svensson, 2003).

When we examine the level of perceived corruption in countries where a significant number of banks operating in accordance to Islamic laws (Shariah) we have noticed that the corruption perception indicators have been increasing in some cases but decreasing in some countries. It is noticeable that a large number of countries where Islamic finance is growing fast are appearing as lower ranking (higher level of corruption) countries in the Transparency International's corruption perception index (Mevliyar, 2008, Arshad and Rizvi, 2013). On the other hand, according to Shariah principles, Islamic banks cannot engage in corrupt practices. This means Islamic banking institutions should have a negative relationship between banking activities and corruption. This raises a research question for us to examine whether there is any impact on the level of corruption due to financial deepening with fast growing Islamic banking products. As economies grow due to financial deepening (McKinnon, 1973 and Shaw, 1973), undoubtedly, increasing Islamic banking activities may have some impact on the level of corruption in these countries. With an inquisitive mind and based on the above, we attempt to investigate whether the growth of Islamic banks actually has a negative or positive relationship with corruption in countries where Islamic banking is prominent.

Rest of the paper is as follows: Section 2 provides a comprehensive literature survey followed by a discussion on the growth of Islamic finance in section 3. Section 4 provides data, methodology and the model. Section 5 discusses the results of our empirical study, and section 6 concludes.

2. Literature Survey

Corruption is a very broad term. In general, we could say that corruption is relating to deceitful acts done for personal gains. Our intention here is to focus more on the link between corruption and financial deepening rather than explaining what exactly corruption is. As we focus on Islamic banking, we need to know whether there is any significant difference between conventional banking model and Islamic banking model. Using a sample comprises of 141 and 2,956 banks for the period of 1995 to 2010, out of which 99 are Islamic banks, Beck *et al.* (2013) find that little significant differences between Islamic and conventional banks relating to their business models. However, irrespective of the similarity in their business models Islamic banks are different by way of operating on profits rather than interest income and accepting money as not a commodity and follow basic Islamic laws (Shariah). The Shariah law in principle prohibits corrupt activities and as result financial deepening should not have any positive impact with the level of corruption in countries where Islamic banking products are widely used. We intend to focus our literature review on two main areas. One is the relationship between economic growth and corruption and the other, the relationship between financial deregulation or financial deepening and corruption.

Though many have examined the relationship between economic growth and corruption, few have specifically attempted to examine the link between market deregulation and corruption. Specifically, we could not find any study examining Islamic banking related financial deepening and

its impact on corruption. We are motivated to bridge this gap by examining the link between Islamic banking related financial deepening and corruption. As per our broad definition of corruption, which is not limited to government corruption but overall dishonest activities, including the paying and receiving of bribes in various sectors in any economy, banking products could have a strong link with these economic activities. Among many studies examining the link between economic growth and corruption, early studies mainly focused on government corruption using the principal-agent model (Shleifer and Vishny, 1993). Shleifer and Vishny (1993) identified two broad reasons for the close link between corruption and economic growth: the weakness of the central government, allow for corrupt practices including bribery; and the encouragement of certain unimportant investment projects owing to the demand for secrecy in corrupt activities. Ehrlich and Lui's (1999) empirical findings suggest that the relationships among the government, corruption, and economic growth are nonlinear. Blackburn *et al.* (2008) found strong evidence of a negative interaction between corruption and seigniorage, as it is consistent with the idea that corruption tends to aggravate the harmful effects of inflationary finance.

Many studies have supported the view that corruption has a negative impact on the economic growth of a country. Mauro's (1995) pioneering study showed a significant negative relationship between corruption and investments that lead to economic growth. Mauro (1995) examined the relationship between investment and corruption in 58 countries and found that corruption has a significant negative effect on the ratio of investment to GDP. Brunetti *et al.* (1998) and Mo (2001) reported similar findings. Mo (2001) estimated that a one-unit increase in the corruption index reduces the growth rate by 0.545 percentage points. In addition, Li *et al.* (2000) found cross-country examples supporting the same view. Similarly, Fisman and Svensson (2007), Johnson *et al.* (1999), Hellman *et al.* (2003), and Beck *et al.* (2005) showed firm-level evidence supporting this view. M'Éon and Sekkat (2005) examined the relationship between the impact of corruption on growth and investment and the quality of governance in a sample of 63–71 countries between 1970 and 1998 and found a negative effect of corruption on both growth and investment.

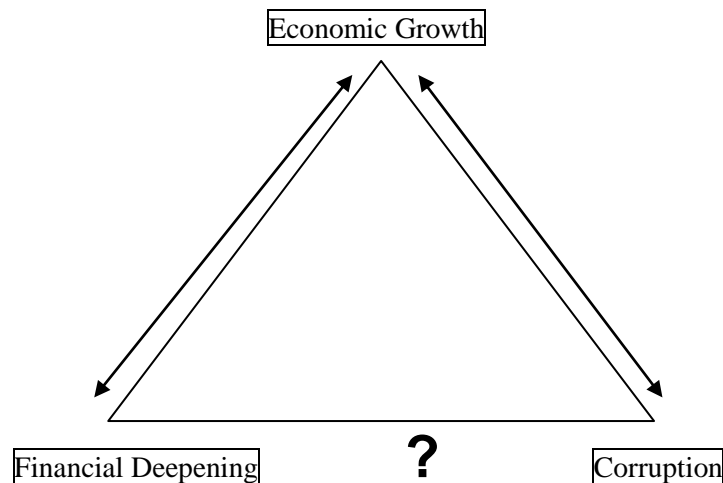


Figure 1. Relationship among economic growth, financial deepening, and corruption

Among those who reported no significant negative impact of corruption on economic growth, some empirical evidence shows that higher corruption is associated with higher public investment (Tanzi and Davoodi, 1997). Bardhan (1997) reported examples from the history of Europe and the US where corruption may have favored development by allowing entrepreneurs to grow out of bribers.

From the viewpoint of efficiency, studies such as Beck and Maher (1986) and Lien (1986) argue for increased efficiency owing to corruption. Many studies have also examined the theoretical link between economic growth and a well-functioning financial system (Greenwood and Jovanovic, 1990, Bencivenga and Smith, 1991, Aghion *et al.*, 2005). There are many more studies empirically examined the same issue (King and Levine, 1993, Rajan and Zingales, 1998, Rousseau and Wachtel, 1998, and Levine *et al.*, 2000) showing that the importance of this area of study. In a recent study, Hasan *et al.* (2009) presented further evidence supporting the fact that financial deepening, legal environment, and awareness of property rights are associated with higher economic growth in China.

As shown in Figure 1, many studies have attempted to examine the link between either economic growth and corruption or economic growth and financial deepening; however, few studies have attempted to examine the link between financial deepening and corruption, particularly, using Islamic bank related financial deepening. Majeed and MacDonald (2011) examined the relationship between corruption and financial intermediation using a cross section of 120 economies. They divided this sample into nine regions. They focused only on financial intermediation, and they took M2 as a percentage of GDP and credit to private sector as a percentage of GDP. They found one standard deviation increase in financial intermediation with a 0.20 point decrease in corruption, implying a negative and statistically significant impact of financial intermediation on corruption.

We extend Majeed and MacDonald (2011) by going beyond financial intermediation. Recently, Altunbaş and Thornton (2012) used data from 107 developed and developing countries to estimate the impact of bank credit to the private sector on corruption and found that bank credit to the private sector reduces corruption. This study also uses only one indicator for financial sector development. Continuous financial deepening does not always reduce the corruption level. Izibili and Aiya (2007) found that increased financial deregulation had a positive impact on corruption in Nigeria. In fact, the so-called “grease the wheel” hypothesis is supported by many such as Huntington (1968), Lui (1985), Beck and Maher (1986), and Lien (1986). They argue that in a rigid economy where corrupt officials control economic activities, corruption could enhance efficiency in many ways. Using evidence from China, Gong and Zhou (2014) have established that liberalisation has, in fact, increased the corruption level in the country. With regard to bank profitability, Mongid and Tahir (2011) have discovered that in Southeast Asian countries the level of corruption has a positive and significant impact on bank profitability.

There are not many studies examining the corruption issue using Islamic banks. Arshad and Rizvi (2013) have examined the link between corruption and bank profitability using Islamic banks. They conclude that there is positive link between the level of corruption and bank profitability. Patrick and Kpoder (2015), using a sample of low and middle income countries, examined the link between Islamic banks and economic growth to find that Islamic banks are positively associated with economic growth. As Islamic banks follow specific religious related philosophy, it may be interesting to know how these banks’ role is impacting on corruption. While the above review is proving some conflicting outcomes relating to conventional banks, the case of Islamic banks may be of interest to many policy makers, researchers and other interested parties. As noted before, this has encouraged us to fill this void by studying the issue in a broader way but using specific financial institutions. In our study, we specify a broader definition that goes beyond financial intermediation and use many indicators pertaining to financial deepening, including financial institution depth as well as financial market depth using data from Islamic banks.

3. Growth of Islamic Finance

Irrespective of the Global Financial Crisis and the continuing political and economic issues in some of the leading Islamic financial market countries, the annual growth rate of Islamic banking assets passed 17.5% (out of total) reaching \$1.7 trillion in 2013, during the last four years, according to the World Islamic Banking Competitiveness Report 2013-14. Another important point to note is that over the years, number of sharia-compliant global financial institutions has increased substantially. ‘The Banker’ Special Report 2013-14 on Islamic financial institutions indicates that this number has increased from 225 in 2012 to 245 in 2014 irrespective of economic and political problems in some predominantly Islamic countries. Total Shariah profits of standalone banks reach more than \$14.5 billion in 2013 (The Banker, 2013). The growth of Shariah compliant assets and Islamic financial institutions significantly help financial deepening in these countries ultimately enhancing economic growth. Number of factors has been identified for the notable growth in Islamic finance (Hasan and Dridi, 2010).

Among them, (i) strong demand in many Islamic countries for *Shariah*-compliant products; (ii) progress in strengthening the legal and regulatory framework for Islamic finance; (iii) growing demand from conventional investors, including for diversification purposes; and (iv) the capacity of the industry to develop a number of financial instruments that meet most of the needs of corporate and individual investors are the most significant (Hasan and Dridi, 2010). As Islamic banks becoming important day by day for financial deepening and economic growth, it is worth shedding more lights on the issue by examining whether this has some influence on the level of corruption due to the fact that some research concluding a appositive relationship between corruption and growth. This is particularly important as the level of corruption appears to be higher in countries where Islamic banking is growing at a faster rate. Figure 2 shows the Transparency International Corruption Perception indicators for the period 2003-2012 for selected countries.

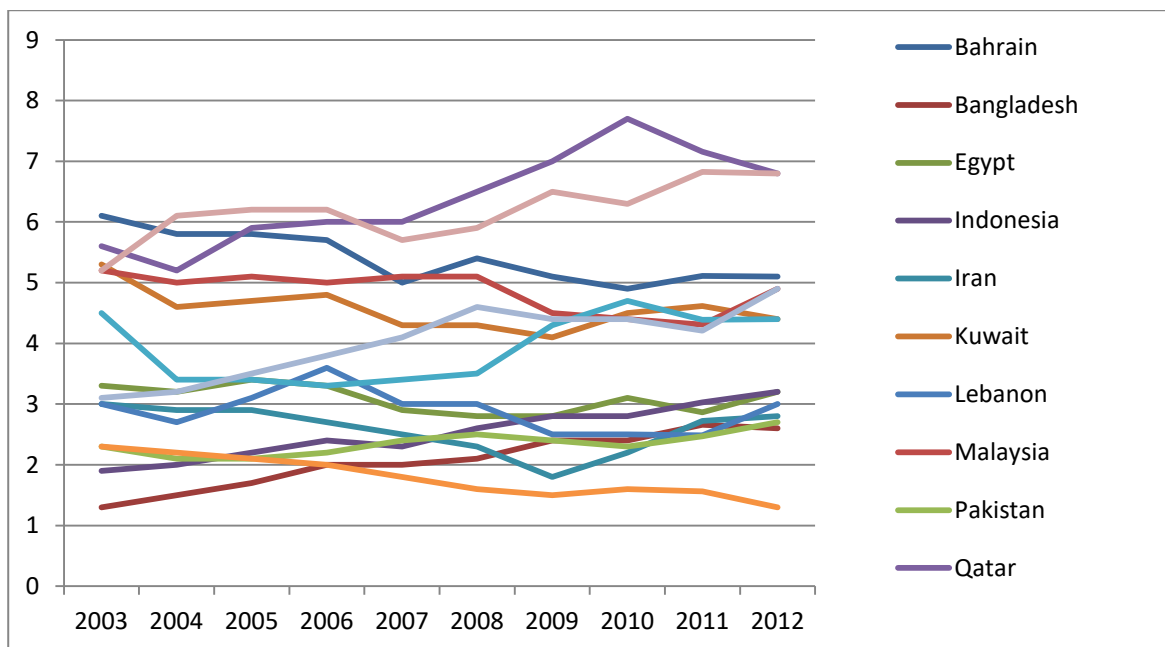


Figure 2. Corruption Perception indicators, 2003-2012 (Source: Transparency International)

4. Data, Methodology, and Model

The Banker's 2013 Special Report on Islamic banking has ranked top Islamic banks in the world and we have selected our sample based on top 13 countries. The only country which was outside the Report's ranking is Lebanon but has one of the fastest growing Islamic banking customer bases. For our sample we selected 14 countries where Islamic banking products are very dominant. These are Bahrain, Bangladesh, Egypt, Indonesia, Iran, Kuwait, Lebanon, Malaysia, Pakistan, Qatar, Saudi Arabia, Sudan, Turkey and United Arab Emirates. In these countries, the majority of population is Muslim (Bahrain: 70.3%, Bangladesh: 89.8%, Egypt: 94.9%, Indonesia: 87.2%, Iran: 99.5%, Kuwait: 74.1%, Lebanon: 59.7%, Malaysia: 63.7%, Pakistan: 96.4%, Qatar: 67.7%, Saudi Arabia: 93%, Sudan: 90.7%, Turkey: 98% and United Arab Emirates: 76.9%) and likely to use Islamic banking products compared to the conventional banking products. To examine the relationship between financial deepening and corruption, we used many data sources to collect data for the sample countries. Our sample period is 17 years and is from 1996 to 2012 and there are 238 observations.

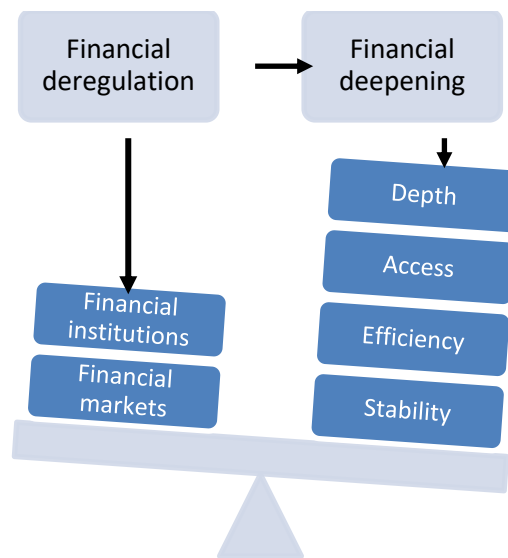


Figure 3. Financial deepening impact (Based on Čihák *et al.*, 2013)

The World Bank has broadly defined financial deepening indicators based on financial market access, financial market depth, financial market stability, and a few other macroeconomic variables. Čihák *et al.* (2013) recently measured financial development in a matrix and described financial depth in a broader way by covering financial institution depth and financial market depth (Figure 3). The variables selected to explain financial institution depth include private credit to GDP, financial institutions' assets to GDP, M2 to GDP, deposits to GDP, and gross value-added of the financial sector to GDP. They identified the financial market depth indicators as stock market capitalization plus outstanding domestic private debt securities to GDP, private debt securities to GDP, public debt securities to GDP, international debt securities to GDP, stock market capitalization to GDP, and stocks traded to GDP. Accordingly, we selected many variables covering all areas of financial deepening indicators and GDP indicators from various World Bank databases. Corruption data were collected from the Transparency International Web site, Heritage Foundation Web site and the World Bank database. Other data were collected from the Asian Development Bank and the International Monetary Fund web sites. We used the panel data analysis methodology. In comparison with other

methodologies, panel regressions are better for analyzing time-series and cross-section data. Furthermore, panel data are better for studying the dynamics of adjustments (Baltagi, 2005).

Following Becker's (1968) leading work, we developed our corruption model as follows:

$$Cor_{it} = \alpha + \beta_1(GR_{it}) + \beta_2(FD_{it}) + \beta_3(X_{it}) + V + u_{it} + \varepsilon_{it} \quad (1)$$

where *Cor* is the control of corruption value (-2.5 to +2.5) given for each country (*i*) for various time periods (*t*); *GR*, the GDP growth rate; *FD*, the financial deepening; *X*, the number of control variables; *V*, the time-specific factors; μ , the unobservable effect; and ε , the disturbance term. The lower values imply higher level of corruption.

In the second model, we use *Cor-per* as the dependent variable. Here, we use the Transparency International Corruption Perception Index data to measure the corruption level in each country.

$$Cor-per_{it} = \alpha + \beta_1(GR_{it}) + \beta_2(FD_{it}) + \beta_3(X_{it}) + V + u_{it} + \varepsilon_{it} \quad (2)$$

In the third model, we use Heritage Foundation's freedom from corruption index data as the dependent variable. We have not found any corruption related studies using Heritage Foundation data previously. We collected these data from the Heritage Foundation Website.

$$Cor-hf_{it} = \alpha + \beta_1(GR_{it}) + \beta_2(FD_{it}) + \beta_3(X_{it}) + V + u_{it} + \varepsilon_{it} \quad (3)$$

We attempt to obtain comprehensive results by using three corruption variables in our estimate. There could be two questions one could ask regarding the methodologies and data. One question could be the reliability of corruption data. Almost all studies on the issue of corruption have used either the Transparency International Corruption Perception Index data or the World Bank's control of corruption data (Gallup's corruption measures are another set of global corruption indicators. However, they do not have a long series.). The Transparency International data are well known and widely used to indicate corruption levels in each country based on their surveys. Obviously, it is a corruption perception index. Therefore, we cannot ignore them. On the other hand, World Bank data show a much broader corruption measure (World Bank control of corruption indicator refers to 25 sources with 40 indicators). As both indices are based on perception on corruption one cannot ignore some criticism. In addition to these two sources, we also use Heritage Foundation's freedom from corruption index data. As these are the only most commonly available data on corruption, we use all three sources in our study.

It is also the case that the Transparency International data are not available for the entire sample period for all countries. The second question is the endogeneity issue (Swaleheen, 2011). As it is likely that corruption itself causes financial deepening, this may lead to potential endogeneity and identification issues. Olson *et al.* (2000) has discussed on this issue and they argue that the endogeneity of corruption is not a serious problem and that their cross-sectional estimates using panel data are free of bias. In this study, the authors find that corruption has a significant negative effect on the rate of growth of productivity. Their econometric methodology is comparable to a cross-sectional regression of the rate of growth of productivity on corruption. Furthermore, while agreeing to Olson *et al.* (2000), Swaleheen (2011) finds that corruption has a significant effect on the growth rate of real per capita income. Initially, we conducted number of estimates using pooled regressions, fixed effect regressions, and random effect regressions. Based on Huasman test statistics (>0.05), we selected a fixed effect model after failing to reject the null hypothesis, which is that the fixed model is appropriate. Irrespective of the above, one may believe that endogeneity could still be a problem in our findings. To address this, we used instruments in addition to our panel data regressions as a robustness check. We believe this procedure could overcome remaining endogeneity issues. We omitted Heckman correction procedure purposely as it has few weaknesses discussed in details using Monte Carlo studies in Puhani (2000).

5. Empirical Results

Table 1 shows descriptive statistics for the variables used in this study; Table 2, Table 3 and Table 4 show our results using different dependent variables. Results reported in Table 2, Table 3, and Table 4 are based on the World Bank corruption indicators, on the Transparency International Corruption Perception Index, and on the Heritage Foundation's freedom from corruption index data, respectively. As noted before we use panel data methodology for our analysis, we used logged data for all estimates except for the control of corruption variable. As the control of corruption data range from -2.5 to +2.5, we could not obtain logged values.

Table 1. Summary descriptive statistics

| Variables | Mean | Standard Deviation | Minimum | Maximum | Observations |
|------------------|-----------|--------------------|---------|-----------|--------------|
| <i>Cor</i> | -0.240 | 0.713 | -1.507 | 1.723 | 238 |
| <i>Cor-prs</i> | 0.292 | 0.169 | 0.000 | 0.667 | 238 |
| <i>Cor-hf</i> | 3.630 | 1.514 | 0.400 | 7.700 | 173 |
| <i>bdgdp</i> | 48.683 | 33.537 | 4.898 | 212.959 | 206 |
| <i>bpcgdp</i> | 40.084 | 29.043 | 1.680 | 155.172 | 204 |
| <i>mgrowth</i> | 57.201 | 34.220 | 8.224 | 220.769 | 193 |
| <i>fsd</i> | 50.024 | 34.276 | 4.898 | 212.958 | 193 |
| <i>smcgdp</i> | 52.795 | 45.630 | 1.997 | 262.192 | 174 |
| <i>smtrgdp</i> | 31.817 | 45.950 | 0.940 | 349.244 | 173 |
| <i>noit</i> | 36.647 | 15.274 | 13.415 | 84.045 | 192 |
| <i>roa</i> | 1.153 | 2.357 | -21.631 | 4.570 | 184 |
| <i>roe</i> | 15.316 | 35.433 | -97.918 | 408.266 | 184 |
| <i>offshore</i> | 55.669 | 103.054 | 3.457 | 714.277 | 188 |
| <i>percapita</i> | 11938.405 | 15423.498 | 306.801 | 55526.159 | 218 |

Table 2. Panel regression results - Dependent variable: *Cor*

| Independent Variables | Model 1 | Model 2 | Model 3 | Model 4 |
|-----------------------|-----------------------|------------------------|------------------------|-------------------------|
| <i>C</i> | -1.022*** (-8.742) | -0.865*** (-10.921) | -0.811*** (-19.727) | -1.03155*** (-8.874) |
| <i>bpcgdp</i> | -0.015*** (-8.307) | | | -0.014*** (-10.431) |
| <i>bdgdp</i> | -0.028*** (-3.958) | | | 0.026 (0.006) |
| <i>fsd</i> | 0.032*** (4.387) | 0.010*** (2.632) | | 0.033*** (4.586) |
| <i>mgrowth</i> | 0.010*** (3.278) | 0.008** (2.245) | | 0.009*** (3.083) |
| <i>roa</i> | 0.104** (2.124) | 0.028 (1.669) | | 0.044 (1.87)* |
| <i>roe</i> | -0.009 (-0.067) | -0.005 (-0.525) | | -0.002 (-0.102) |
| <i>noit</i> | 0.003 (0.200) | | | 0.001 (0.900) |
| <i>offshore</i> | 0.007*** (3.313) | 0.004* (1.831) | | 0.007*** (3.328) |

| | | | | |
|---------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|
| <i>percapita</i> | 3.410 ^{***} (13.869) | 3.150 ^{***} (11.163) | 3.340 ^{***} (14.547) | 3.280 ^{***} (14.816) |
| <i>smcgdp</i> | 0.001 (1.148) | 0.005 ^{***} (4.464) | 0.006 ^{***} (8.220) | |
| <i>smtrgdp</i> | 7.140 (0.101) | 6.710 (0.796) | -0.001 ^{***} (-2.640) | |
| R-squared | 0.857 | 0.767 | 0.740 | 0.856 |
| F-statistics | 68.34 ^{***} | 54.97 ^{***} | 161.83 ^{***} | 94.15 ^{***} |

Notes: *t* statistics are in parenthesis; *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 3. Panel regression results - Dependent variable: *Cor-per*

| Independent Variables | Model 1 | Model 2 | Model 3 | Model 4 |
|-----------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| <i>C</i> | 2.252 ^{***} (8.034) | 2.263 ^{***} (11.354) | 2.419 ^{***} (21.711) | 2.350 ^{***} (8.360) |
| <i>bpcgdp</i> | -0.100 ^{***} (-4.295) | | | -0.029 ^{***} (-9.441) |
| <i>bdgdp</i> | -0.033 ^{***} (-7.973) | | | -0.112 ^{***} (-4.709) |
| <i>fsd</i> | 0.085 ^{***} (3.275) | 0.013 (1.123) | | 0.115 ^{***} (4.570) |
| <i>mgrowth</i> | 0.005 (0.648) | -0.011 (-0.944) | | -0.010 (-1.337) |
| <i>roa</i> | 0.375 ^{***} (3.282) | 0.024 (0.587) | | 0.200 ^{**} (1.895) |
| <i>roe</i> | -0.014 ^{**} (-2.315) | -0.001 (-0.435) | | -0.009 (-1.544) |
| <i>noit</i> | -0.013 ^{**} (-2.491) | | | -0.014 ^{**} (-2.745) |
| <i>offshore</i> | 0.003 ^{***} (4.213) | 0.002 ^{***} (2.287) | | 0.003 ^{***} (4.447) |
| <i>percapita</i> | 6.360 ^{***} (10.874) | 6.160 ^{***} (8.540) | 6.090 ^{***} (10.410) | 6.050 ^{***} (11.598) |
| <i>smcgdp</i> | -0.001 (-0.573) | 0.013 ^{***} (5.046) | 0.015 ^{***} (8.264) | |
| <i>smtrgdp</i> | -0.005 ^{***} (-3.205) | -0.007 ^{***} (-3.224) | -0.006 ^{***} (-3.769) | |
| R-squared | 0.847 | 0.711 | 0.694 | 0.838 |
| F-statistics | 51.67 ^{***} | 33.95 ^{***} | 99.36 ^{***} | 65.56 ^{***} |

Notes: *t* statistics are in parenthesis; *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

It is a fact the statistically, regression assumes that the errors, as estimated by the residuals, are normally distributed. When they are positively skewed (long right tail) taking logs can sometimes help and It is also the case that the meaning of a change in a variable is more multiplicative than additive and taking log values are useful. We estimated four models (Models 1–4) using the numerous

variables available to us. We used the World Bank’s control of corruption (Cor), Transparency International’s corruption perception index (Cor-per) and Heritage Foundation’s free from corruption index (Cor-hf) as the dependent variables in each 4 models given in Tables 2-4 covering a combination of financial institutional depth variables as well as financial market depth variables. In Model 1, we use all selected variables covering financial institution depth as well as financial market depth. In model 2, we obtain results by dropping bank-lending- and deposit-related variables and non-interest income related variable. When estimating the Model 3, we used only financial market depth indicators covering stock market related activities only. In the final model (Model 4) we dropped financial market depth related variables and used all other variable.

Table 4. Panel regression results - Dependent variable: *Cor-hf*

| Independent Variables | Model 1 | Model 2 | Model 3 | Model 4 |
|------------------------------|-----------------------|-----------------------|----------------------|-----------------------|
| <i>C</i> | 26.453*** (6.841) | 19.855*** (8.228) | 0.231*** (11.498) | 26.993*** (7.095) |
| <i>bpcgdp</i> | -0.251*** (-4.077) | | | -0.225*** (-4.983) |
| <i>bdgdp</i> | -1.101*** (-4.646) | | | -1.024*** (-4.276) |
| <i>fsd</i> | 0.770*** (3.050) | 0.310** (2.643) | | 0.842*** (3.374) |
| <i>mgrowth</i> | 0.275** (2.576) | 0.355*** (3.012) | | 0.116 (1.150) |
| <i>roa</i> | 0.608 (0.372) | 0.161 (0.313) | | -1.223 (-0.830) |
| <i>roe</i> | 1.010 (0.108) | 0.012 (0.409) | | 0.105 (1.160) |
| <i>noit</i> | -0.230*** (-3.567) | | | -0.143** (-2.437) |
| <i>offshore</i> | 5.190*** (7.139) | 0.050*** (6.282) | | 0.054*** (7.783) |
| <i>percapita</i> | 7.700*** (9.486) | 0.007*** (8.471) | 1.960 (1.745) | 0.007** (10.539) |
| <i>smcgdp</i> | 0.013 (0.341) | 0.124*** (3.775) | 0.008** (2.341) | |
| <i>smtrgdp</i> | -6.250** (-2.699) | -0.084*** (-3.278) | 5.100 (0.153) | |
| <i>R-squared</i> | 0.771 | 0.678 | 0.101 | 0.745 |
| <i>F-statistics</i> | 37.98*** | 34.76*** | 6.34*** | 45.90*** |

Notes: *t* statistics are in parenthesis; *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

By checking each variable, bank private credit to GDP and bank deposits to GDP appears to have negative and significant relationships with the corruption level in all estimated models. This finding is important as Islamic banking products appear to have no link between the comparatively higher levels of corruption prevailing in the countries where Islamic banking is dominant. This also supports the notion that financial deepening in general, including in these countries, has rather benefits but not contributing to the corruption level. Another financial deepening variable such as the financial

system deposits to GDP appears to have a positive impact on the level of corruption. This is justifiable as the GDP grows financial system deposits also grow allowing for positively impacting on the level of corruption. On the other hand, variables such as non-interest income to total income also shows a negative impact on the level of corruption in all models except in Table 2 where we used World Bank's control of corruption as the dependent variable. However, in this case results are insignificant. This finding has some meaning as Islamic banks do not have interest income, non-interest income are one of the substantial income sources for them and still not positively linking with the corruption level. The variable off-shore bank deposits to domestic bank deposits show significant positive impacts on all models. Off-shore bank accounts are, we believe, in many occasions being highly controversial in many countries irrespective of whether country is dominated by Islamic banking or not. There are allegations relating to possible money laundering activities using off-shore banking facilities in many occasions (Young, 2013). Under this assumption, it may be possible to have a positive link between off-shore banking activities and the level of corruption in these Islamic banking dominant countries. Another variable appears to have positive link with corruption is the GDP per capita. All models with all three dependent variables show highly significant positive impact on corruption. This implies that when economies are growing, there is a possibility that the level of corruption could increase due to a number of reasons. These are not specifically relating to financial deepening.

All estimates show similar results irrespective of data sources used as the dependent variables. This is important as the corruption perception data of different databases are mainly based on number of surveys. For example, compared to the Transparency International surveys the World Bank indicator reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. This means the World Bank measure of corruption appears a "broader" variable to measure the corruption level. While non-interest income to total income showing a significant negative impact, we find significant positive results for the money growth to have on the level of corruption. This could be similar to impact of offshore-bank deposit variable as money growth is a very broad measure. We added stock market capitalisation to GDP variable to this model and found that it has a positive significant impact on the corruption level in the countries where Islamic banking products are dominant. However, stock market total value traded to GDP shows significant negative impact on the level of corruption.

When estimating model 3, we used only financial market depth indicators. In this estimate we find the same results that are stock market capitalisation to GDP shows positive significant impact on the level of corruption while stock market total value traded to GDP shows significant negative impact on the level of corruption. In model 4, we specifically attempted to use financial institution depth variables to determine the impact on corruption. Similar to our other model estimates, negative and significant relationships were observed between the corruption level and financial institution depth variables. Return on assets and return on equities appear to show inconclusive results. In many models, results were not significant but return on equity appears to show negative relationship with relating to the level of corruption while return on assets having a positive relationship. As both variables are not directly related to the banking sector, we ignore them. All F statistic results are significant. Table 5 has our results for the instrumental variable regression. The well-known problem using OLS in estimates which suffers from endogeneity is that the error term and the explanatory variables become correlated ($\text{Cov}(x_i, e_i) \neq 0$). IV regression is designed to correct the estimates in the main equation as an effect of the unobserved. In this robustness check, our results show all important variables have a negatively and significant relationship with the level of corruption.

Table 5. Endogeneity tests – 2SLS estimates

| Independent Variables | Dependant variable: <i>cor</i> | Dependent variable: <i>Cor-per</i> | Dependent variable: <i>Cor-hf</i> |
|-----------------------|--------------------------------|------------------------------------|-----------------------------------|
| <i>C</i> | -1.015*** (-8.805) | 2.252*** (8.034) | 29.630*** (7.030) |
| <i>bpcgdp</i> | -0.015*** (-8.621) | -0.033*** (-7.973) | |
| <i>bdgdp</i> | -0.029*** (-4.236) | -0.100*** (-4.295) | |
| <i>fsd</i> | 0.036*** (4.867) | | 0.257* (2.196) |
| <i>mgrowth</i> | 0.011*** (3.610) | 0.005 (0.648) | 0.298** (2.507) |
| <i>roa</i> | 0.109* (2.243) | 0.375*** (3.282) | -1.459 (-0.829) |
| <i>roe</i> | -0.004 (-0.152) | | 0.084 (0.816) |
| <i>noit</i> | | -0.013* (-2.491) | -0.221*** (-3.093) |
| <i>offshore</i> | 0.007*** (3.520) | 0.003*** (4.213) | 0.051*** (6.517) |
| <i>percapita</i> | 3.390*** (13.994) | 6.360*** (10.874) | 0.007*** (8.134) |
| <i>smcgdp</i> | -0.001 (-1.305) | -0.001 (-0.573) | 0.118*** (3.653) |
| <i>smtrgdp</i> | 0.001 (0.199) | -0.005*** (3.205) | -0.079*** (-3.056) |
| <i>R-squared</i> | 0.862 | 0.847 | 0.705 |
| <i>F-statistics</i> | 70.55*** | 51.67*** | 33.60*** |

Notes: *t* statistics are in parenthesis; *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

6. Conclusion

Most studies on the relationship between the corruption level and financial deregulation have shown a positive relationship between the two, whereas some others have shown negative relationships. Only a few recent studies have also contradicted the common belief by arguing that there exists a negatively correlated relationship (Gurgur and Shah, 2005, Iwasaki and Suzuki, 2012). We attempted to examine the relationship between the corruption level and financial market deregulation, which causes financial deepening, using data for Islamic banks in 14 countries, one of the fast growing banking sectors of the world. In our panel data analysis, we used three variables to represent the corruption level: the World Bank's control of corruption (Cor), Transparency International's corruption perception index (Cor-per) and Heritage Foundation's corruption perception data. We obtained similar results for models for all three dependant variables. Our results support the viewpoint that there is no significant positive relationship between the corruption level and financial deepening in countries where Islamic banking is dominant. These findings are important, as some

believe that continuous market deregulation programs in many parts of the world could increase the corruption level.

There could be a natural expansion of corruption when countries experience economic growth irrespective of whether Islamic banking or conventional banking is present. For example, countries such as China, which is experiencing unprecedented economic growth rates in recent years, should show a positive link between the corruption level and economic growth (Gong and Zhou, 2014). Irrespective of higher economic growth rates while financial markets are expanding, we did not find any conclusive evidence to support the hypothesis that there is a positive link between Islamic banking driven financial deepening and corruption. It is obvious that the corruption level in these countries is higher compared to many other countries. We believe that gradual deregulation may result in achieving lower corruption levels subject to an improvement in transparency, disclosure, and institutional developments. As mentioned before, a lack of transparency, lower level of disclosure and weaknesses in institutional settings are the main reason for increasing corruptions rather than banking practices. Policy implications of our study are that these findings support continued market deregulations allowing the banking sector to introduce more and more different products that could be beneficial for any nation. Results of this analysis may help policy makers to continue with ongoing market reform measures with other important and necessary developments to achieve better economic and social objectives. These measures could deliver financial deepening as well as higher economic growth to many countries.

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