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The Role of Islamic Banking in Economic Growth

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Abstract

Islamic banking is currently one of the fastest growing segments of the financial market industry, operating in over 75 countries through 300 institutions. While past literature has established the development of financial institutions as a determinant of economic growth, research on the correlation of the diffusion of Islamic banking with economic growth is limited. This study seeks to add to the literature by empirically analyzing the economic growth determinative power of Islamic banks. Confirming past research, Muslim prevalence in a population is found to be the most significant determinant of the diffusion of Islamic banks. Using this exogenous instrument in 2SLS regressions, results show that Islamic banks are not significantly correlated with economic growth. Most notably, including the Islamic banking instrument affects the strength of beta-convergence. Basic Solovian specifications show that convergence occurs; countries with higher initial GDP per capita grow more slowly. After accounting for the intensity of Islamic banking, this effect becomes much less statistically significant, suggesting that some of the effect of convergence may operate through the propensity to adopt Islamic banking. Empirical analysis disaffirms the hypothesis that Islamic banks minimize the explanatory power of legal origin on economic growth due to their independent implementation of Shariah law; the results show that accounting for Islamic banks has no effect on the determinative power of legal origin. Finally, the correlation of Islamic banking and financial deepening is largely dependent on legal origin, resulting in negative effects for countries with British legal origin and positive for those with French legal origin.

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I. Introduction

Islamic finance and the Shariah-compliant[1] financial products that form the core of Islamic banking have become one of the fastest growing segments of the financial market industry, operating through more than 300 institutions in 75 countries (Cihak, Hesse 2008).[2] Economists view financial and legal systems as two prominent mechanisms through which economic growth can either be supported or suppressed (Levine 1998). However, empirical evidence regarding the effect of Islamic banking transactions on economic growth has yet to be analyzed in detail largely due to data limitations. Certain components of Islamic banking such as risk-sharing, stability, and innovation are proven stimulants of growth while others, including limited liquidity, may be detrimental to the economy.[3] Therefore, elements of Islamic banking likely impact economic growth, the net effect of which is undetermined and worthy of study.

Legal origin has been established as a substantial determinant of financial and economic growth. However, Islamic banking is derived from a legal origin, Shariah Law, frequently separate from that of the institutions in the countries where it operates. While researchers have hypothesized that this phenomenon could change the effect of legal origin on development (Imam et. al 2010), to the best of my knowledge, no empirical research has tested this theory.

The purpose of this study is to fill this gap in the literature. Specifically, this paper uses data from Bankscope and the World Bank to empirically test which factors (such as

[1] Shariah Law is the moral code and religious law of Islam, described as the infallible law of God. It deals with crime, politics, economics, and personal matters (Bashir 1999).
[2] Figures 2, 3, and 4 show this diffusion.
[3] Analysis based on a combination of hypotheses from the literature presented in the following literature review

legal origin, the prevalence of Islamic Banks, the savings rate, population growth rates, GDP per capita, financial inclusion, and other development indicators) contribute to a deepened Islamic banking system, the impact of an Islamic banking system on the effect of legal origin as a determinant of economic development, and changes in these effects over time (i.e., between 1960 and 2006).

Regression analysis reveals that the share of population that is Muslim is the strongest determinant of the diffusion of Islamic banks. Results also show that while the diffusion of Islamic banks has no significant impact on economic growth, it decreases the GDP growth determinative power of the initial GDP per capita, suggesting that some of the effect of convergence may operate through the propensity to adopt Islamic banking. Empirical analysis disaffirms the hypothesis that Islamic banks minimize the explanatory power of legal origin on economic growth due to their independent implementation of Shariah law; the results show that accounting for Islamic banks has no effect on the determinative power of legal origin. Finally, the correlation of Islamic banking and financial deepening is largely dependent on legal origin, resulting in negative effects for countries with British legal origin and positive for those with French legal origin.

This paper presents background information on the Islamic banking system and a review of the literature in Sections II and III, respectively. Section IV discusses the data employed and Section V presents the empirical strategy and results. Lastly, the conclusions and recommendations for further research are presented in the Section VI.

II. Background: Islamic Banking

In order to examine the impact of Islamic banking it is important to understand the historical origins of the banking system in predominantly Muslim countries and the evolving divergences from conventional banks. The modern conventional banking system in Islamic countries is a product of colonizers using the support of financial institutions for mining, agriculture, and manufacturing. The initial banks were predominantly used for the funds of foreigners and as a means to increase foreign-owned industries that spread through imperial rule. While these institutions were used to finance the expansion of the public sector in the Middle East and North Africa, huge portions of the population made up of devout Muslims were left out of the banking system altogether due to voluntary self-exclusion caused predominantly by their religious beliefs (Mohielden et. al 2011). A lack of the fulfillment of their banking needs has led to inefficient use of savings and a less powerful money multiplier, contributing to an overall liquidity problem.

In recent years, Islamic banks attempted to fulfill this economic need by providing products that are compliant with Shariah law. Such products are constructed around the philosophy that no person should profit from another's loss, thereby prohibiting *Riba* (interest). The entitlement of the return from assets must lie in one bearing the risk involved in creating the return. In fact, *Riba* is sometimes considered to be a greater sin for Muslims than eating pork, drinking alcohol, or committing adultery (according to an Islamic holy text, Sunan ibn Majah). See Table 1 for a description of basic Islamic banking products and Figure 1 for a product comparison with conventional banks.

In conventional banking, depositors transfer risk to the bank by sharing their assets in order to obtain a stated rate of return, regardless of what the bank is able to earn on the assets. Borrowers who use conventional banks retain the risk themselves since they are required to pay back both principle and interest independent of the success of their project. Islamic banks differ in the treatment of both kinds of customers—depositors and borrowers. Investors share both the risk and return with Islamic banks. The return on an account is performance dependent, rather than guaranteed, and is often paid out through *Hibah*, an unguaranteed gift. Islamic finance emphasizes risk sharing through an asset-based model, contrasting conventional finance which is largely debt-based, facilitating the transfer of risk (Imam et. al 2010).

Furthermore, Islamic banks share in the risk of *Mudaraba* and *Musharakah* (equity participation) contracts and credit default swaps are forbidden. Profit-sharing acts as an incomplete risk transfer in Islamic banks since the bank, theoretically, bears the entire burden of financial risk while the entrepreneur is solely responsible for the risk of wasted time and effort. Therefore, if a borrower's project is unsuccessful, the bank alone takes the loss on profit; the borrower is no longer obligated to pay back the loan. The degree to which these returns are kept genuinely risky varies across individual Islamic banks; not all operate in a pure profit-sharing model and the allocation of profits to the individual versus the bank varies depending on the riskiness of the project and the norm established by competing local banks. However, holistically, this profit- and loss-sharing model increases the degree of risk for banks because Islamic banks acquire the direct credit risk normally borne by equity investors rather than holders of debt (Cihak, Hesse

2008). Consequently, Islamic banks have an increased incentive to be incredibly selective in their loan processes and strict in the monitoring of projects thereafter.

Another key difference between Islamic banks and conventional banks is that Islamic institutions do not allow investment in toxic assets[4], derivatives, conventional financial institution securities, or other similar instruments that adversely affected the conventional banks during the 2007-08 financial crisis (Hasan, Dridi 2010). These investments are considered to be inappropriate gambling and generating revenue by speculating on the movement of money, also forbidden in Shariah law. As a result of these divergent practices, Islamic banks have higher capital adequacy ratios, are less leveraged (have higher capital-to-assets ratios), have smaller investment portfolios, and rely less on wholesale deposits.

III. Literature Review

This paper examines these divergent characteristics through the lens of the existing literature regarding legal origins, financial development, and Islamic banking. These three categories of economic development research reveal the potential effect of Islamic banking on the communities and countries in which it has taken root. I discuss each of these components of the literature in turn, as well as the potential limitations of the literature.

[4] Hasan and Dridi (2010) define the term "toxic assets" as certain financial assets whose value has fallen significantly and for which there is no longer a functioning market, rendering the price unsatisfactory to the holder. This definition includes collateralized debt obligations and credit default swaps, considered to be non-Shariah compliant.

III.1 Legal Origins and Economic Development

Many economists argue that understanding financial and legal systems is imperative in order to understand economic development (Levine 1998). Both have a major impact on how people are able to respond to and take advantage of economic opportunities. The protection of property rights, access to liquidity, and capacity to save contribute to a positive economic environment that increases investment, capital accumulation, and productivity growth, well-known determinants of economic growth.

Beck, Demirguc-Kunt, and Levine (2003) examine the effects of two institutional mechanisms related to economic development: 1) the power of the state and 2) the adaptability of its legal system and financial institutions. The political channel facilitates contract law and the protection of property rights, namely the strength of legal protection in a country, which can facilitate productive economic transactions. The enforcement of contracts, for instance, may encourage more individuals to actually engage in business transactions since they can trust that the terms of the agreement will be upheld. The adaptability channel addresses economic evolution and responsiveness to socioeconomic conditions. For example, when the World Trade Organization (WTO) issues new regulations, a country's ability to change its practices accordingly may be integral for it to be considered a viable trade partner and, consequently, for its economic success. Using cross-country regression analysis, Beck et. al (2003), find both channels to be significant in the development of the financial sector, revealing that both adaptability and legal strength are important factors in identifying pro-growth legal origins. Legal origin matters for financial development because certain systems are more likely to adapt efficiently to economic changes. The authors further find that the political mechanism of

Civil law is more protective of property rights and conducive to financial development, while Common law is inherently dynamic and, consequently, more adaptive.

Studies have also shown that countries with strong legal systems have more developed banks in part due to the enforcement of contracts and the legally defensible priority given to creditors. Specifically, Levine (1998) finds that the legal environment, the exogenous component of banking development, is a positive determinant of per capita growth, physical capital accumulation, and productivity growth. While Levine acknowledges that his findings do not dismiss the possibility of causality in both directions, he argues that his data show that the legal environment affects the banking sector and this exogenous component is strongly linked with long-run economic growth. The legal origins and enforcement of contracts are subsequently associated with banking development that stimulates growth.

III.2 Financial Development and Growth

Beyond a country's legal system, banking and financial institutions have also been connected with economic growth, albeit in a multitude of potentially contradictory ways. Three possible connections between financial development and economic growth exist: 1) financial development is a determinant of economic growth, 2) financial development follows economic growth, and 3) there is bidirectional causality between finance and growth (Furqani 2009). While it is difficult to isolate banking as an exogenous variable, attempts to do so have yielded results that show banking's function as a transmitter of financial legal obligations does, in fact, have an impact on growth.

It has been argued that banks that are better at identifying creditworthy firms, leveraging savings, providing liquidity, facilitating transactions, and pooling risk accelerate economic growth (Bagehot 1873). Furthermore, according to Beck, Levine, and Loayza (2000), banks alter the allocation of savings to various firms through loans and influence growth by raising domestic savings rates and attracting foreign capital. Beck et. al test the differences in the level of banking sector development as a component of the relatively ambiguous "total factor productivity" and find a significantly positive impact of financial development on real per capita growth and productivity per capita growth. One conclusion they draw from their analysis is that financial development stimulates economic growth.

There is also empirical evidence that the role of banking during the process of economic development evolves over time. Financial systems become more market-based as they deepen, with the growth of securities markets superseding that of the banking system. Demirguc-Kunt, Feyen, and Levine (2012) find that the association between economic activity and bank development decreases with economic development, while the association between economic activity and securities markets increases during growth. Specifically, their statistical analysis reveals that as log real GDP per capita increases, private credit rises as well, but the strength of their causal relationship declines. Therefore, while the level of bank development is still increasing, its effect on economic development decreases in terms of marginal returns, meaning it is a non-linear relationship. The empirical results show that the slope becomes negative after real GDP per capita reaches $1,032 in 2000 U.S. dollars (Demirguc-Kunt et. al 2012).

However, many economists question this causal assertion (Demirguc-Kunt, Feyen, Levine 2012). While financial development may contribute to economic growth, it is an endogenous variable, increased by economic growth itself. Therefore, it is difficult to determine the flow of causality. Demirguc-Kunt et. al argue that, while their model cannot specify a particular mechanism of causality, their results can refute stories of reverse causality.

III.3 Applications of Islamic Banking to Growth

As noted previously, the literature indicates that strong, adaptable legal origins and financial development contribute to economic growth. Islamic banking is based on an ancient legal structure and is quickly developing as a viable form for financial institutions. Therefore, using the findings of the literature regarding legal origins and financial institutions and applying it to the limited empirical analyses of Islamic banking, tentative hypotheses may be formed regarding the role of Islamic banking in economic growth.

The literature reveals that the strength of the legal origins of a nation is an important determining factor of growth. However, this may not be the case with Islamic banking. While legal institutions are typically evaluated and assessed on a country-by-country basis, the legal aspect of Islamic banking, Shariah law, operates across many borders. Imam, Patrick, Kpodar, and Kangni (2010 pg. 16) state:

> "Unlike studies that have found that institutions matter for financial development, we find that diffusion of Islamic banks appears impervious to the quality of the institutional environment. It may be that regardless of the institutional

> environment, the way Islamic banks are permitted to behave is driven by relatively strict Shariah law, making the institutional environment less important than for conventional banks."

Shariah law is protective of property rights and contract law, providing a solid basis on which banks can form, regardless of a country's underlying legal system. Islamic banks abide by both the law of the land and Islamic law, rendering a country's law less powerful than in the case of conventional banks in determining their financial development. Although the strictness of Shariah law is apparent, its power may be diluted in practice, especially if a bank is merely repackaging products without following the letter of the law (Imam et. al 2010).

Many economists, starting with Bagehot (1873), argue that banks that excel at identifying creditworthy firms and pooling risk accelerate economic growth. The risk-sharing model of Islamic banking in which risk cannot be transferred through financial markets may be more effective than the borrower-risk model dominating conventional banking. Since Islamic banks bear more of the burden of risk, theoretically I argue they should exercise more deliberation and prudence in their decisions to lend to firms; this effect could potentially lead to a more economically optimal distribution of liquidity. However, there is a lack of empirical evidence to support this claim.

Although Islamic banks may not solve the problem of imperfect information between lenders and borrowers, their lending system incentivizes financing more successful projects. Stiglitz and Weiss (1981) assert that conventional banks must ration credit as a result of the imperfect information in the lender-borrower relationship. Banks may attempt to transmit the potential risk of misinformation to borrowers through a

higher interest rate, but doing so results in an adverse selection effect; only borrowers pursuing riskier projects will take on higher interest because they have a low probability of actually paying it back (Stiglitz and Weiss 1981). Islamic banking rids borrowers of most financial risk, transferring risk to the lending institution. While this does not necessarily result in a better mechanism for information accrual, I argue this system theoretically incentivizes banks to exercise more prudence in their lending decisions.

Since Islamic banking links financial intermediaries' returns directly to the actual revenue of the borrower, Siddiqi (1999) argues that funds are allocated towards projects that are more innovative and expected to produce better results. Siddiqi asserts that the risk-sharing aspect of Islamic finance incentivizes banks and private lenders to be more prudent with their funds and, consequently, allocate liquidity more optimally than conventional banks. Since lenders would have a personal stake in the success of the project, any risk they undertook would reflect a true belief in the success of the borrowers' endeavors, unlike conventional lending in which risk can be bought and sold for profit primarily through credit default swaps. Siddiqi's argument is questionable, however, since Islamic banks may also exercise more caution in their investments, stimulating less innovation than conventional banks due to the increased burden of risk. Furthermore, entrepreneurs have less incentive to work hard to achieve success since they are bearing such a limited financial risk. It is unclear which of these hypotheses dominates empirically.

Absent of interest, some authors (see for example Siddiqi 1999, Hasan and Dridi 2010) argue that this characteristic of Islamic banking should increase stability, thereby stimulating growth. Shariah-compliant products align entrepreneurs' payment obligations

with revenue accrual, leading to a reduction of instability in financial markets. Islamic law prohibits the exchange of money for money or money for debt, which frequently degenerates into games of chance, creating instability through speculation (Siddiqi 1999). Siddiqi (1999) reasons that exchange rate fluctuations—indicative of volatile financial markets—are harmful to the growth of developing countries and, accordingly, the prohibition of interest can play an integral role in solving contemporary financial problems. Hasan and Dridi (2010) assert that stability became an apparent characteristic of Islamic banking during the recession, as Islamic banks experienced far less of an adverse economic impact than their conventional bank counterparts. However, it is important to note that they have also been less profitable in the recovery.

While very little empirical evidence exists based on examinations of the Islamic financial system, studies that have been conducted diverge in their findings regarding the stability and superiority of Islamic banking over conventional banking (Furqani et. al 2009). Using Islamic country data, Beck, Demirguc-Kunt, and Merrouche (2010) find that Islamic banks are more efficient than conventional banks and have higher capitalization ratios. However, they are not more stable, as previously hypothesized, and they have similar business models and asset quality. They justify their findings with anecdotal evidence that reveals significant differences across countries in Sharia-compliant banks. While some banks actually implement Sharia law, others merely re-label conventional banking products as Islamic products. Although business orientation is fairly similar, Islamic banks have much lower operating costs and cost-income ratios than conventional banks (a 6.4 percentage point difference). It remains unclear as to why this would be true, and the literature diverges on comparative conclusions. For example,

based on z-score analysis, Cihak and Hesse (2008), find that large Islamic banks are less stable than large commercial banks, but small Islamic banks are more stable than small commercial banks. The authors assert that their findings are largely driven by the difference in the ratio of loans to assets and the cost-income ratio.

The financial crisis that began in 2007 generated much attention regarding the potential superior stability of Islamic banks during the economic downturn. Hasan and Dridi (2010) show that although Islamic banks experienced more profitability than conventional banks from 2005-2007, as the crisis moved from the financial economy to the real economy, Islamic banks' profitability decreased. Islamic banks experienced higher returns on assets and equity before 2008 but became less profitable than conventional banks post-2008. Despite this finding, Hasan and Dridi assert that their data show that Islamic banks were not drastically less profitable post-2008, contradicting the implication that more risk-sharing would lead to less profitability in a recession.

In the long run, however, Bashir (1999) argues that Islamic banking stimulates innovation in the financial sector and amongst entrepreneurs, enhancing welfare. Since Islamic economics prohibits the use of certain mechanisms outlined in neoclassical and Keynesian economics (namely interest), Islamic central banks must find alternative means to manipulate the economy. The prohibition of fixed interest payments induces monetary authorities in Islamic economies to innovate alternative financial instruments without fixed nominal values or predetermined rates of interest. Bashir (1999) posits a model proving that financial innovation is welfare enhancing, while inflation reduces welfare and hampers growth.

Islamic banks may also stimulate growth simply through their existence. Countries with large Muslim populations that refuse to deposit their money in conventional banks would suffer from a low savings rate, limiting funds available for investment. Empirical studies show that the ratio of Muslims using financial services is much lower than their non-Muslim counterparts, although it is difficult to test the extent to which this impairs investment. However, the egalitarian objectives of Islam may remain largely unrealized because of lack of access to financial services for the poor in predominantly Muslim countries (Mohieldin et. al 2011). Consequently, an increase in participation in the banking system would increase the savings rate and access to liquidity, known factors of development. This effect may occur irrelevant of the bank's actual practices. Bahar (1999 pg. 1) states:

> "The Islamic finance and investment industry can be a valuable ingredient in the development of more efficient and capable capital markets in the Muslim world and can hence contribute toward creating a more efficient world economy. Islamic banking can provide a financial intermediation system that allows the global community to access the savings of Muslims worldwide and vice versa."

The very presence of Islamic banks may increase liquidity on a worldwide scale. However, this assertion is based on the assumption that there are many Muslims who choose not to keep their money in a bank due to religious practices, of which there is neither conformational nor contradictory empirical evidence.

Conversely, some researchers have found evidence that Islamic banking does not stimulate output and growth. Choudhury (1999) conducts an empirical analysis of the effect of Islamic banking on development and social well-being. He finds that for a

sample of Islamic banks (mainly based in Turkey, Dubai, Egypt, and Sudan), product and risk diversification remained low, inhibiting resources and dampening output. Consequently, he concludes that the development effect of Islamic capital markets and Islamic economic thought is ineffective. Choudhury attributes the absence of an empirical paradigmatic shift towards Islamic banking to the lack of strict Shariah-compliant institutions. A true implementation of Shariah law requires much more inter-sectoral and inter-institutional linkages than the data imply exist. Consequently, these empirical findings may reflect the impact of Islamic institutions as a theoretical presence, rather than the actual implementation of strict, Shariah law-complaint financial products.

In addition to Choudhury's assessment, the framework outlined by the literature on legal origins and financial development indicates some aspects of Islamic finance may inhibit economic growth. Although Shariah law provides a strong legal origin for Islamic banking, it is also known to be less flexible and adaptive than Common law or Civil law. As noted earlier, adaptability is one channel through which legal origins can contribute to economic growth. Implemented in practice, Shariah law may be more adaptable than it would seem from the strict text, however. Therefore, it is difficult to determine whether Shariah law actually promotes or inhibits financial development. Furthermore, Islamic banks' risk-sharing alleviates the borrower of any risk whatsoever and it is unclear as to whether this method is, in fact, a more optimal distribution of risk. Finally, Islamic banks may provide less liquidity than conventional banks since they must exercise more caution with their funds. Providing liquidity is an important aspect of the development contribution of banks. Whether Islamic banks distribute liquidity more optimally than

conventional banks or act to dampen liquidity through overly cautious lending is yet to be empirically demonstrated.

While Islamic banks' current contribution to growth is unclear, the literature argues that there is a large potential for Shariah financial products to play a role in growth in the future. Infrastructure development is known to influence economic development. Al Rajhi (1999) argues that there are many opportunities for Islamic banks to finance development projects in both the private and public sector in cooperation with global economic organizations such as the World Bank, IMF, IFC, and the Islamic Development Bank. Furthermore, Obaidullah (1999) asserts that the success of infrastructure programs depends largely on an optimal sharing of risks and rewards, a characteristic inherent to Islamic banking that could be leveraged.

III. 4 Potential Issues in the Literature

A common concern expressed by some researchers (see for example, Choudhury 1999) is the inconsistency of the actual applications of Islamic financial products. Across institutions, there exists a wide range of products with varying degrees of Shariah compliancy. In fact, anecdotal evidence exists of conventional banks simply labeling products as Shariah compliant without changing their conventional, interest-bearing characteristics. There are also discrepancies as to what is actually permitted under Shariah law. Therefore, it is difficult to measure the true effect of their financial intermediation.

Furthermore, an inherent endogeneity problem exists in the analysis of Islamic financial institutions. Imam et. al (2010) find that the greatest determinant of the

diffusion of Islamic banks is income per capita, followed by the share of Muslims in the population. Diffusion has been concentrated in high-Muslim population and high-growth areas, as shown in Figures 2, 3, and 4[5]. Accordingly, countries with Islamic banks present may already be experiencing relatively high growth rates due to natural Solovian convergence, resulting in higher per capita income. While Levine (1998) attempts to address this problem by using legal origin as the exogenous component of banking development, it is not entirely clear that this would solve the problem of endogeneity for testing the deepening of Islamic financial systems since they are based on a legal framework separate from countries' legal origins. Furthermore, Imam et. al. show that financial development, represented by legal origin, is not statistically significantly correlated with a higher share of Islamic bank assets. Financial intermediation neither hampers nor stimulates the growth of Islamic banking

Ultimately, Islamic banking has many characteristics that may benefit economic growth, but little empirical evidence exists. Strong legal origins and a risk-sharing framework may create a more responsible lending system, resulting in a more stable financial environment. However, limited access to liquidity and no risk on the part of borrowers may have negative effects on growth. This paper attempts to fill these gaps in the literature by testing these hypotheses through an empirical analysis of factors that affect the diffusion of Islamic banks and the concurrent effect of Islamic banking on the deepening of the financial system and, more broadly, economic growth.

[5] These maps were created using Bankscope data.

IV. Data

The data used for the analysis for all banking variables is from Bankscope, a part of Wharton Research Data Services (WRDS). Development indicator variables are compiled from Governance Matters and the World Development Indicators (WDI) Database, both a part of the World Bank. Variables on legal origin are from the National Bureau of Economic Research (NBER). These data sources provide a robust set of consistent variables that are commonly used in the literature to analyze economic and political growth. While the data covers between 190 and 211 countries from 1960 to 2006, resulting in roughly 9000 country-year observations, of these only 345 specifically specify the number of Islamic banks present.[6] Consequently, I construct two sets of data: data with 345 observations ranging from zero to sixteen Islamic banks and a dataset with the full 9000 observations, where I have replaced missing information on Islamic banks with a value of zero based on the inference that countries with missing data were, in fact, absent of Islamic banks. This assumption is based on qualitative research and checked for robustness in the empirical analysis presented below.[7] Such categorical distinctions are important since they allow for both narrow comparisons of countries that deepened their Islamic banking systems over time and a more robust comparison to countries that never procured Islamic banks in the tested time period.

The data includes legal origins that are based on the original country that influenced the legal system, most frequently in the early twentieth century. These legal origins include English, French, Socialist, German, and Scandanavian, each of which have defining attributes that may have an effect on contemporary institutions. La-Porta,

[6] All variable descriptions are included in Table 3.
[7] A complete list of countries with missing data replaced with "0" Islamic banks is included in Table 2.

Lopez-di-Silanes, Shleifer, and Vishny (1997) introduced these data and provide further discussion in their paper. The data also includes a Socialist binary variable, applied solely to countries that have not reverted to their pre-communist legal systems, and first applied by Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer (2005). Table 4 shows that the plurality of countries in the dataset have French legal origins, followed closely by those with British Common law tradition.

The Worldwide Governance Indicators (WGI) are also included in the data, comprised of six indicators of broad dimensions of governance described in Table 5: Voice and Accountability, Political Stability and Absence of Voiolence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. These variables are scores assigned by survey respondents, non-governmental organizations, private firms, and public sector organizations worldwide. The indicators range in value from -2.5 to 2.5 in the standard normal units of the governance indicator, meaning that a score of 1 represents 1 standard deviation above the mean. A higher score is indicative of a more positive assessment of government (Kauffman 2010).

Table 6 presents noteworthy patterns of WGI summary statistics by the presences of Islamic Banks. Countries that have Islamic banks receive significantly higher scores in government effectiveness, regulatory quality, and control of corruption. Their scores increase in value over time, meaning their governance indicators are becoming more positive, indicative of institutional growth. The all-inclusive category's results show that there is a large divergence in voice and accountability and political stability in countries with Islamic banks in comparison to countries without them, most of whom never

procured Islamic banks over the entire time series. Countries with Islamic banks have lower mean scores in all categories, indicative of the political demography of the countries in regions where Islamic banking tends to grow, namely the Middle East and Southeast Asia.

To explore the relationship between the growth of Islamic banking and economic growth, a range of growth indicators are included. Gross domestic product, the investment share of GDP, and the population growth rate are the traditional growth indicators. Various forms of domestic interest rates are included along with the percent Muslim share of the population.

The relevant banking variables include the real interest rate, the deposit interest rate, the lending interest rate, and the assets and loans of both Islamic banks and conventional banks. Furthermore, the number of each type of institution present in the country and relevant financial metrics (i.e. return on assets) are included. Two additional variables are created as a ratio of the assets of Islamic banks to conventional banks and the return on assets of Islamic banks to the return on assets of conventional banks. Finally, a variable is included that indicates financial depth, the ratio of total assets in banks to GDP. This variable is frequently used in the literature to represent the relative growth of the banking sector in cross-country comparisons.

Table 7 reveals that countries with Islamic banks have statistically significant divergences in physical capital savings rate, deposit interest rate, lending interest rate, and GDP per capita. This highlights the correlation of an increase of financial attributes with Islamic banking sectors. The savings rate is approximately seven percentage points

higher and GDP is five times greater in countries where Islamic banks are present. However, the differences in financial depth by the presence of Islamic banks are not statistically significant. This finding is surprising since it indicates that Islamic banks are not contributing significantly to financial depth in countries where they diffuse. However, when countries that never had Islamic banking during the time series are included in the comparison, population growth and financial depth become statistically significant. This shows that Islamic banks are generally taking root in countries that are relatively financially developed. On average, countries with Islamic banks have a much higher population growth rate, more Muslim share of the population, a deeper financial system, and greater GDP per capita than countries without Islamic banks. This confirms expectations that are in accordance with the demographic of the countries in which Islamic banks diffuse.

Table 8 shows the determinants of growth broken down by legal origin and prevalence of Islamic banks within French and British legal origin countries (there are no Islamic banking data points for Socialist, German, or Scandinavian legal origins). The savings rate is notably higher in French origin countries with Islamic banks than those without. In British legal origin countries, the population growth rate is statsitically significantly higher in countries with Islamic banks. In countries with either British or French origins, countries with Islamic banks have deeper financial systems and much higher GDP per capita than their counterparts. Table 9 similarly shows how countries with Scandanavian, German, or Soviet legal origin diverge in growth indicators, with a notably lower savings rate in Soviet countries.

The remainder of this paper formally analyzes the relationship between these variables, the deepening of the Islamic banking system, and economic growth.

V. Empirical Framework and Results

V.1 Determinants of Islamic Banking

In order to test the determinants of Islamic banking, I estimate an equation of the following form:

(1) $y = \alpha + \beta_1 Muslim_{c,t} + \beta_2\ oilp_{c,t} + \beta_3 impemp_{c,t} + \varepsilon$

where *Muslim* is the percent Muslim population, *oilp* is the oil price, and *impemp* represents the import-export ratio of goods to the Middle East. The y variable is one of two measures of Islamic banking diffusion: the ratio of the assets of Islamic banks to the assets of conventional banks and the number of Islamic banks. The subscript variables c and t represent country and time, respectively.

In order to conduct regression analysis, the five year average of the growth period is used, a method established by Hauk and Wacziarg (2009) to mitigate noise when testing intertemporal variation.[8] As shown by Tables 10 and 11, the percent of a country's population that identifies as Muslim holds significant explanatory power for the presence of Islamic banks and the ratio of Islamic banking assets to conventional banking assets. This finding is in accord with previous research establishing percent Muslim as the greatest determinant of the presence of Islamic banks (Imam, Kpodar 2010). The oil price is a signficant determinant of the number of Islamic banks present, but not the diffusion

[8] Time periods used consist of: 1960-1964, 1965-1969, 1970-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1994, 1995-1999, 2000-2004, and 2005-2006.

in terms of assets. This may be attributable to the possibility that the oil price also increases conventional banking assets, maintaining or even decreasing the categorical asset ratio.

V.2. Determinants of GDP per Capita: The Role of Islamic Banks

It has previously been determined that GDP is a significant explanatory variable of the diffusion of Islamic banking (Imam, Kpodar 2010). Consequently, equation (2) requires the application of a two stage least squares panel estimation (2SLS), the purpose of which is to create an exogenous variable, denoted as $\hat{x}$, which is correlated with the presence of Islamic banks but uncorrelated with GDP. As shown in Tables 10 and 11, the regressions of equation (1) determine *Muslim* to be a highly statistically significant explanatory variable of Islamic banking diffusion. If a country experiences a 10% growth in its Muslim population, the ratio of Islamic bank assets to conventional bank assets increases by 3.4 percentage points. These results render *Muslim* to be the most fitting exogenous variable in the 2SLS assessment. This regression technique uses instrumental variables to cut correlations between the error term and independent variables and requires a two stage regression process (Angrist, Imbens 1995).

In order to mitigate the issue of endogenaiety, the instrument representative of the Islamic banking diffusion determined purely by Muslim population ($\hat{x}$), is included in some of the regressons exhibited in Table 12. Standard OLS regressions revealing the determinant power of Islamic banking diffusion are compared to 2SLS results of the determinant power of the exogenous instrument of Islamic banking diffusion.

I examine the determinant power of Islamic banks on GDP per capita by estimating an equation of the following forms using OLS:

(2) $\Delta GDPgrowth_t = \alpha + \beta_1 initialGDP_c + \beta_2 n_{c,t} + \beta_3 s_{k_{c,t}} + \beta_4 legal_c + \beta_5 IB_{c,t} + \varepsilon$

where *intitialGDP* is the log of initial income at the beginning of each period, *n* and *s* represent the log of population growth rate and the physical capital savings rate, respectively, *legal* represents the legal origin, and *IB* is defined as the two different measures of Islamic banking depending on the specification of the regression. The equation represents the classic Solow growth model, inclusive of the ratio of Islamic banking assets to conventional banking assets or the number of Islamic banks. I then compare the OLS results with the 2SLS results procured from the following estimation:

(3a) $\Delta IB_{c,t} = \alpha + \beta_1 Muslim_{c,t}$

(3b) $\Delta GDPgrowth_t = \alpha + \beta_1 initialGDP_c + \beta_2 n_{c,t} + \beta_3 s_{k_{c,t}} + \beta_4 legal_c + \beta_5 \hat{x}_{c,t} + \varepsilon$

where $\hat{x}$ is the exogenous variable of Islamic banking determined by the percent Muslim of a population. All other variables are previously defined above.

Table 12 shows the results of the OLS and 2SLS regressions. The Solovian growth model (solely inclusive of population growth, savings rate, and initial GDP) confirms the significance of a percentage increase in the physical capital savings rate. Contrary to the predictions of the Solow model, percentage change in population growth

rate is insignificant in all regressions of this dataset. Both British and French legal origins are significant determinants of growth in this model, confirming past findings in the literature.

The presence of Islamic banks is an insignificant determinant of GDP per capita growth whether measured by the asset ratio or the number of banks and whether raw or instrumented. However, the inclusion of its exogenous instrument does have an effect on the strength of beta-convergence. The basic Solovian specification in columns 1, 2, and 3 of Table 12 show statistically significant convergence; countries with higher initial GDP per capita grow more slowly. After accounting for the intensity of Islamic banking by the instrument of percent Muslim population, this effect is halved and becomes much less statistically significant (column 4). This suggests that some of the effect of convergence may operate through the propensity to adopt Islamic banking.

The data provides no evidence of an Islamic banking effect on the determinative power of legal origin. Contrary to the hypothesis that Islamic banks are immune to legal origins of their local institutions and would consequently decrease the effect on growth, the addition of Islamic banking assets does not impact the high significance of legal origin. Accordingly, the data seems to disaffirm this hypothesis.

V.3 Financial Depth: Islamic Banking Determinant Power

I also test the effect of the presence of Islamic banks on the overall deepening of a country's financial system, represented by the ratio of total banking assets to GDP, by estimating an equation of the following form:

$$(4) findepth_t = \alpha + \frac{A_I}{A_{C_{c,t}}} + \left(\frac{A_I}{A_{C_{c,t}}}\right)(legal_c) + legal_c + \varepsilon$$

where *findepth* is the financial depth ratio of total banking assets to GDP ($\frac{A}{GDP_t}$), $\frac{A_I}{A_{C_{c,t}}}$ is the asset ratio of Islamic banks to conventional banks, and *legal* is legal origin. All other variables are previously defined.

Table 13 shows the effect of the Islamic banking asset ratio on financial deepening. The regression reveals a divergent relationship between the effect of Islamic banking assets on financial deepening in countries with British or French legal origin, impacted negatively and positively, respectively. The interacted variable results are significant and indicate that the effect of the growth of Islamic banking is dependent, in part, on the legal origins of the countries in which it takes root. The coefficient of the asset ratio reveals that the unique impact of that variable is negative when the country does not have legal French origin.

VII. Conclusion

Islamic banking is continuing to grow as a viable financial institution in areas with Muslim populations across the world, yet its effect on economic growth and the

deepening of financial systems was previously undetermined. This paper attempted to add to the literature on Islamic banks by empirically investigating the determinants of the diffusion of Islamic banking, the effect of that diffusion on economic growth, and its impact on financial deepening. Furthermore, the effect of the diffusion of Islamic banking on the explanatory power of legal origin as a determinant of growth and financial deepening was tested.

Confirming past research on the topic (see for example, Imam, Kpodar 2010), the most significant indicator of the diffusion of Islamic banks is the presence of a Muslim population. However, an increase in oil price also has a positive effect on the number of Islamic banks, but not on any relative increase in Islamic banking assets. This may be due to the impact of oil price on the growth of conventional banking assets, as well, rendering the ratio unchanged. This finding is supported by previous evidence that Islamic banking appears to be a complement to, rather than a substitute for, conventional banks (Imam, Kpodar 2010).

The results show that the diffusion of Islamic banks has no significant explanatory power for GDP growth. However, these financial institutions do affect the determinative power of other common growth variables. Namely, controlling for the presence of Islamic banks renders initial GDP per capita less important, dampening convergence and suggesting that adoption of Islamic banking is somehow relevant to the process of convergence. Furthermore, there is no impact of the Islamic banking asset ratio on the determinant powers of legal origins. This result may be due, in part, to the variation in actual implementation of Shariah law in these institutions. While the literature has argued that Islamic banks may be impervious to the institutions in the societies in which they

develop since disputes are settled by Islamic jurisprudence, this hyothesis would only apply if Shariah law is strictly implemented (Imam et. al 2010). Variation in this practice may be the characteristic that renders the impact of Islamic banks on the determinant power of legal origin insignificant.

This research unveils two topics for further exploration and analysis. First, Islamic banking may operate as a channel for the convergence process. Second, the degree to which Islamic banks render institutional environment, defined by legal origin, inconsequential is questionable in aggregate data. This finding implies the necessity for better measures of when Shariah laws are strictly enforced and actually constitute an alternate legal system.

The results also show that the effect of Islamic banking on financial deepening is dependent on the legal origin of the countries in which it operates. Islamic banks are negatively correlated with financial system development in countries of British legal origin and positively correlated in countries with French legal origin. This outcome indicates that Islamic banks may be more beneficial to development of the financial sector in French legal origin countries.

Muslim populations are underserved financially and predominantly come from less developed countries, rendering Islamic banking a potential tool for growth. Albeit a fairly new institution, Islamic banks are growing at a rapid rate and affecting the societies in which they take root. Consequently, their impact may become more apparent as the sector continues to grow. Further research, as more data becomes available, may reveal more conclusive results and provide answers to the financial communities that seek to abide by Islamic economics.

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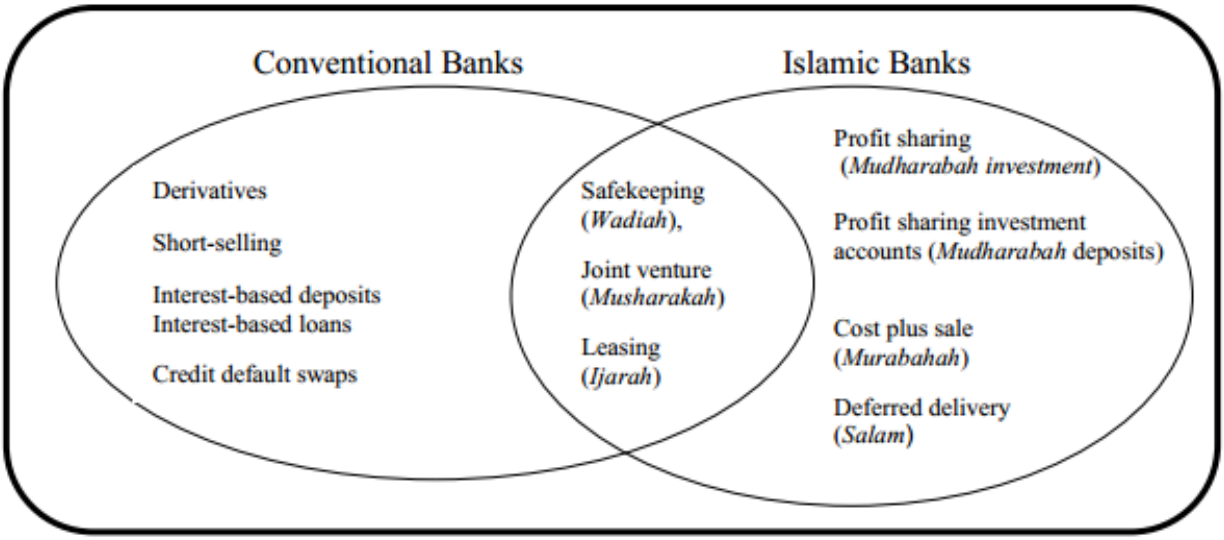
Figures and Tables

Figure 1



Source: Hasan, Dridi, "The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study

Figure 2:

Islamic Banking Diffusion 1992-1996

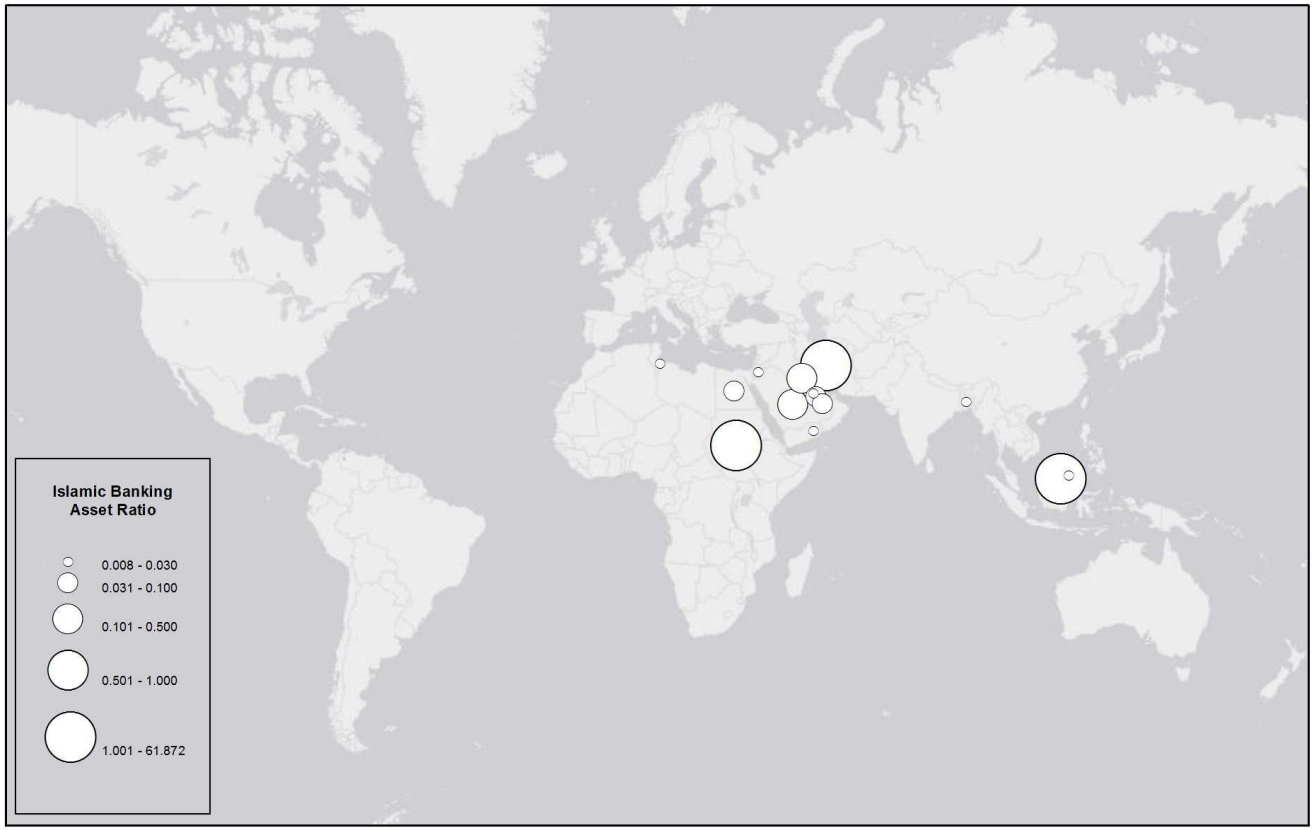


Figure 3:

Islamic Banking Diffusion 1997-2001

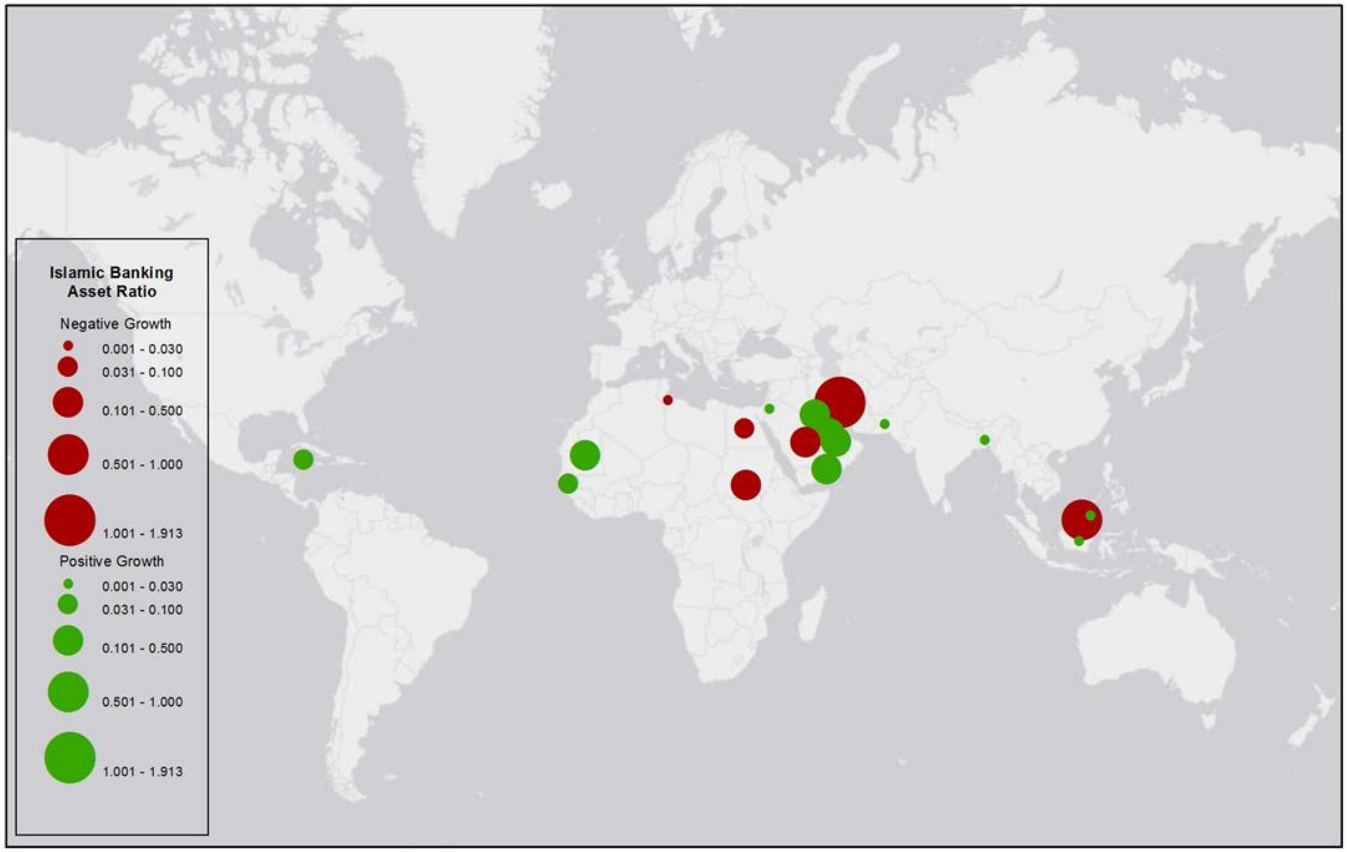


Figure 4:

Islamic Banking Diffusion 2002-2006

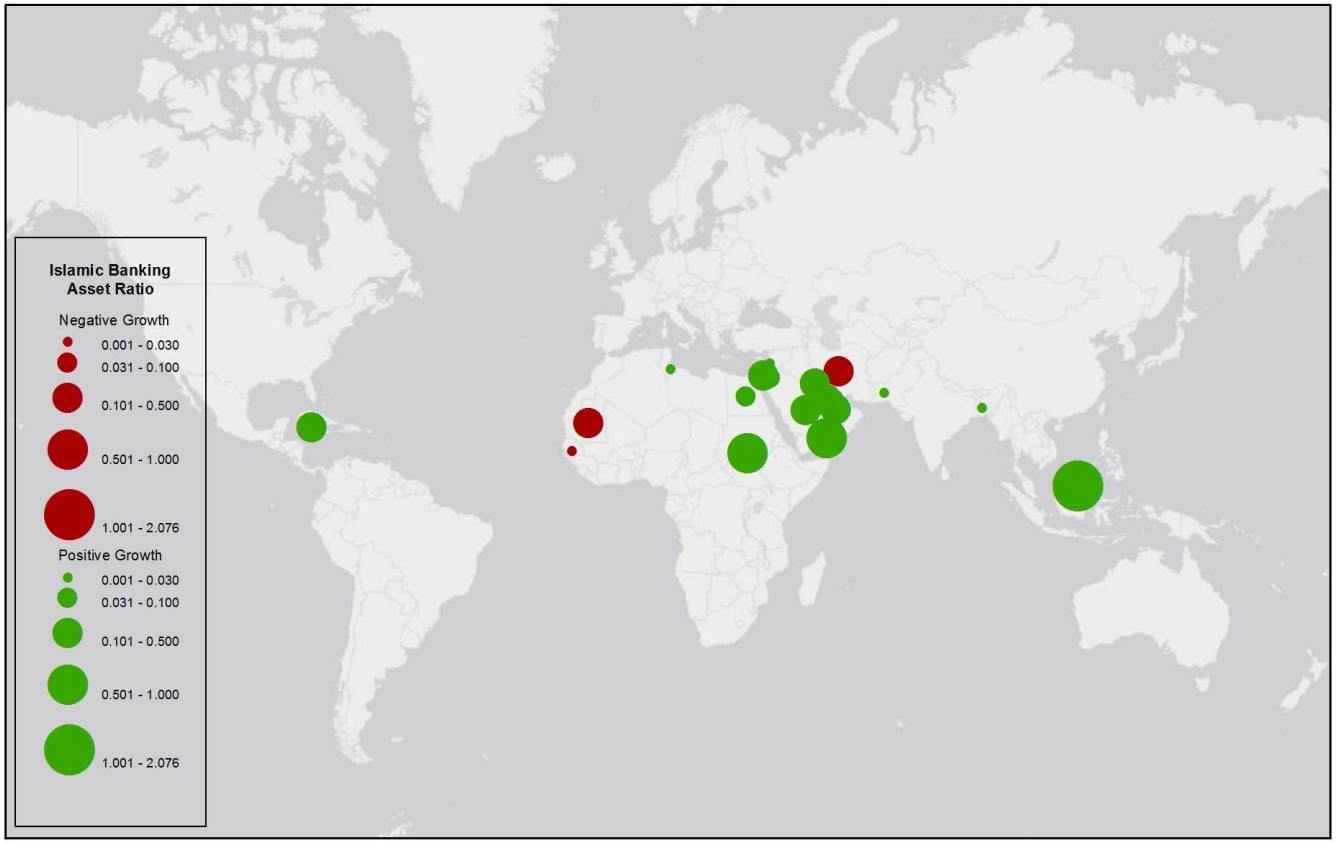


Table 1: Islamic Banking Basic Terminology

***Riba* (Interest)**	Defined as an unearned or unequally distributed income, forbidden in Islamic economic jurisprudence.
***Amana* (Demand Deposits)**	Deposits held at the bank which are guaranteed in capital value but earn no return.
***Hibah* (Gift)**	A token given voluntarily by a debtor to a debitor in return for a loan. Often used by banks when they voluntarily pay their customers a "gift" on savings account balances, representative of a portion of the profit made from those accounts. The gift cannot be guaranteed.
***Bay mu'ajal* (Pre-delivery, deferred payment)**	The seller can sell a product on the basis of a deferred payment, in installments or a lump sum. The price of the product is agreed upon by buyer and seller and cannot include any charges for deferred payment.
***Mudaraba* (Trustee finance contract)**	*Rabb-ul-mal* (capital's owner) provides the entire capital needed to finance a project while the entrepreneur offers his labor and expertise. Profits are shared between them at a certain fixed ratio, whereas financial losses are exclusively borne by *rabb-ul-mal*. The liability of the entrepreneur is limited only to his time and effort.
***Murabaha* (Mark-up financing)**	The seller informs the buyer of his cost of acquiring or producing a specified product. The profit margin is negotiated between them and the total cost is usually paid in installments.
***Musharaka* (Equity participation)**	The bank enters into an equity partnership agreement with one or more partners to jointly finance an investment project.
***Qard Hassana* (Beneficence loans)**	Zero-return loans that the Qur'an encourages Muslims to make to the needy. Banks are allowed to charge borrowers a service fee to cover the administrative expenses of handling the loan. The fee cannot be related to the loan amount or maturity.

Source: Cihak and Hesse, "Islamic Banks and Financial Stability: An Empirical Analysis," IMF Working Paper

Table 2: Countries Without IB Data (n=188)

Afghanistan	Czech Republic	Latvia	Romania
Albania	Denmark	Lesotho	Russian Federation
Algeria	Djibouti	Liberia	Rwanda
American Samoa	Dominica	Libya	Samoa
Andorra	Dominican Republic	Liechtenstein	San Marino
Angola	Ecuador	Lithuania	Sao Tome and Principe
Anguilla	El Salvador	Luxembourg	Senegal
Antigua and Barbuda	Equatorial Guinea	Macao, China	Serbia and Montenegro
Argentina	Eritrea	Macedonia, FYR	Seychelles
Armenia	Estonia	Madagascar	Sierra Leone
Aruba	Ethiopia	Malawi	Singapore
Australia	Faeroe Islands	Maldives	Slovak Republic
Austria	Fiji	Mali	Slovenia
Azerbaijan	Finland	Malta	Solomon Islands
Bahamas, The	France	Marshall Islands	Somalia
Barbados	French Polynesia	Mauritius	South Africa
Belarus	Gabon	Mayotte	Spain
Belgium	Georgia	Mexico	Sri Lanka
Belize	Germany	Micronesia, Fed. Sts.	St. Kitts and Nevis
Benin	Ghana	Moldova	St. Lucia
Bermuda	Greece	Monaco	St. Vincent and the Grenadines
Bhutan	Greenland	Mongolia	Suriname
Bolivia	Grenada	Montserrat	Swaziland
Bosnia and Herzegovina	Guam	Morocco	Sweden
Botswana	Guatemala	Mozambique	Switzerland
Brazil	Guinea	Myanmar	Taiwan, China
Bulgaria	Guinea-Bissau	Namibia	Tajikistan
Burkina Faso	Guyana	Nepal	Tanzania
Burundi	Haiti	Netherlands	Thailand
Cambodia	Honduras	Netherlands Antilles	Timor-Leste
Cameroon	Hong Kong, China	New Caledonia	Togo
Canada	Hungary	New Zealand	Tonga
Cape Verde	Iceland	Nicaragua	Trinidad and Tobago
Central African Republic	India	Niger	Turkey
Chad	Ireland	Nigeria	Turkmenistan
Channel Islands	Isle of Man	Northern Mariana Islands	Uganda
Chile	Israel	Norway	Ukraine
China	Italy	Oman	United Kingdom
Colombia	Jamaica	Palau	United States
Comoros	Japan	Panama	Uruguay
Congo, Dem. Rep.	Kazakhstan	Papua New Guinea	Uzbekistan
Congo, Rep.	Kenya	Paraguay	Vanuatu
Costa Rica	Kiribati	Peru	Venezuela, RB
Croatia	Korea, Dem. Rep.	Philippines	Vietnam
Ctte d'Ivoire	Korea, Rep.	Poland	Virgin Islands (U.S.)
Cuba	Kyrgyz Republic	Portugal	Zambia
Cyprus	Lao PDR	Puerto Rico	Zimbabwe

Table 3 **Category**	**Variable**	**Definition**
Rule of Law	british	English legal origin dummy
	french	French legal origin dummy
	social	Socialist legal origin dummy
	german	German legal origin dummy
	scandi	Scandinavian legal origin dummy
	va	Voice and Accountability
	ps	Political Stability and Absence of Violence
	ge	Government Effectiveness
	rq	Regulatory Quality
	rl	Rule of Law
	co	Control of Corruption
Banking	rint	Real interest rate (%)
	dint	Deposit interest rate (%)
	lint	Lending interest rate (%)
	asset_com	Assets Commercial Banks
	loan_com	Loan Commercial Banks
	asset_isl	Assets Islamic Banks
	loan_isl	Loan Islamic Banks
	isl	Number of Islamic Banks
	com	Number of Commercial Banks
	isl_b	Number of Islamic Banks
	idb	Islamic Development Bank member countries
	roa_com	ROA Commercial Banks
	roe_com	ROE Commercial Banks
	nbanks_com	Number of Commercial Banks
	nplratio_com	Commercial Banks NPL Ratio
	roa_isl	ROA Islamic Banks
	roe_isl	ROE Islamic Banks
	nbanks_isl	Number of Islamic Banks
	nplratio_isl	Islamic Banks NPL Ratio
Growth	muslim	Muslim Population Share
	oilp	Average Oil Price
	gdp_curr	GDP (current US$)
	Inc_10	Income share held by lowest 10%
	Inc_20	Income share held by lowest 20%
	sec1	School enrollment, primary (% gross)
	sec2	School enrollment, primary (% net)
	exp	Share of imports from Middle East
	imp	Share of exports to Middle East
	pop_growth	Population growth rate
	ci	Investment share of PPP converted GDP per capita
	rgdpch	PPP converted GDP per capita

Table 4: Legal Origin Observations

Legal Origin	Obs	Percentage
French	3807	44
British	3008	35
Socialist	1363	16
German	235	3
Scandinavian	235	3
Total	8648	

Table 5: WGI Descriptions

World Governance Indicator	Description
Voice and Accountability	Capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
Political Stability and Absence of Violence	Capturing perceptions of the likelihood that a government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.
Government Effectiveness	Capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
Regulatory Quality	Capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
Rule of Law	Capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
Control of Corruption	Capturing 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.

Source: Kaufmann, Daniel. (2010) "The Worldwide Governance Indicators: Methodology and Analytical Issues" Brookings Institute, The World Bank.

Table 6: WGI by Presence of Islamic Banks

	>0 Islamic Banks		0 Islamic Banks			0 Islamic Banks (all inclusive)		
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**	**Ttest[9]**	**Mean**	**Std. Dev.**	**Ttest**
WGI								
Voice and Accountability	-0.83	0.45	-0.83	1.00	0.07	0.04	1.01	10.31***
Political Stability	-0.43	0.98	-0.72	1.20	-1.50	-0.03	0.99	4.64***
Government Effectiveness	-0.08	0.68	-0.50	1.07	-2.94***	0.00	1.04	0.83
Regulatory Quality	-0.11	0.79	-0.66	1.14	-3.35***	-0.01	1.03	1.14
Rule of Law	-0.10	0.74	-0.31	0.88	-1.50	-0.05	1.02	0.54
Control of Corruption	-0.08	0.71	-0.43	0.76	-2.49**	-0.01	1.04	0.84
Observations	146^		37^			1390^		

^some vary due to missing data

**significant at 5% ***significant at 1%

[9] The T-tests test the mean difference between those countries without and with Islamic banks.

Table 7: Growth Indicators by Presence of Islamic Banks

	>0 Islamic Banks		0 Islamic Banks			0 Islamic Banks (all inclusive)		
	Mean	Std. Dev.	Mean	Std. Dev.	Ttest[10]	Mean	Std. Dev.	Ttest
Standard Controls								
Physical Capital Savings Rate (%)	27.45	11.19	20.39	11.30	-4.75***	23.32	11.65	-5.41***
Population Growth Rate (%)	2.72	2.01	2.99	1.04	1.26	1.90	0.02	-8.06***
Real Interest Rate (%)	6.67	9.07	7.02	11.18	0.21	6.01	19.97	-0.40
Deposit Interest Rate (%)	7.38	4.13	9.95	7.20	3.17***	52.07	1729.26	0.33
Lending Interest Rate (%)	13.22	6.22	16.99	8.38	3.41***	54.19	1989.13	0.26
Muslim Population Share (%)	86.00	0.90	89.72	0.90	2.33**	27.19	36.97	-24.74***
Dependent Variables								
IB Assets/CB Assets	0.57	4.03	0.00	0.00	-1.14	0.00	0.00	-5.74***
Financial Depth (Total Bank Assets/GDP) (%)	0.14	0.00	0.11	0.00	-1.07	0.06	0.00	-11.51***
GDP per Capita	17698.84	20889.34	3776.50	6683.17	-5.68***	7988.33	9995.84	-14.05***
Observations	240^		80^			9389^		

^some vary due to missing data

**significant at 5% ***significant at 1%

[10] The T-tests test the mean difference between those countries without and with Islamic banks.

Table 8: Growth Indicators by Legal Origin and Presence of Islamic Banks

	French without IBs		French with IBs			British without IBs		British with IBs		
Standard Controls	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Ttest**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Ttest**
Physical Capital Savings Rate (%)	22.65	11.42	29.43	10.65	-6.33***	23.74	22.8	25.34	11.88	-1.40
Population Growth Rate (%)	2.18	1.42	2.41	2.17	-1.63	2.10	1.91	2.93	1.91	-5.03***
Real Interest Rate (%)	6.75	15.22	6.95	8.40	-0.11	5.26	23.58	6.78	9.83	-0.50
Deposit Interest Rate (%)	41.51	512.47	8.30	3.37	0.58	87.49	2879.17	5.45	3.32	0.24
Lending Interest Rate (%)	24.66	130.11	13.78	5.76	0.75	101.26	3210.02	11.55	6.23	0.21
Muslim Population Share (%)	34.36	40.88	92.26	8.57	-15.30***	23.98	33.43	78.23	15.18	-17.07***
Dependent Variables										
IB Assets/CB Assets	0.00	0.00	0.80	5.82	-3.82***	0.00	0.00	0.35	0.84	-10.12***
Financial Depth (Total Bank Assets/GDP)	0.05	0.06	0.16	0.16	-14.21***	0.07	0.09	0.13	0.19	-5.30***
GDP per Capita	6159.16	7933.9	16050	20475.1	-12.16***	8719.26	11557.68	20954	21534.9	-10.38***
Observations	3360^		117^			2351^		112^		

^some vary due to missing data

**significant at 5% ***significant at 1%

Table 9: Growth Indicators by Legal Origin

	Socialist All^		German All^		Scandinavian All^	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
Standard Controls						
Physical Capital Savings Rate (%)	19.82	11.91	29.04	5.79	25.38	6.06
Population Growth Rate (%)	1.26	1.38	0.71	0.68	0.59	0.42
Real Interest Rate (%)	5.09	21.52	3.92	3.02	5.09	4.88
Deposit Interest Rate (%)	20.88	48.58	5.33	4.57	8.53	7.66
Lending Interest Rate (%)	31.03	52.33	7.45	3.21	12.95	7.77
Muslim Population Share (%)	22.75	34.58	2.29	1.99	1.78	1.54
Dependent Variables						
IB Assets/CB Assets	0.00	0.00	0.00	0.00	0.00	0.00
Financial Depth (Total Bank Assets/GDP) (%)	0.04	0.12	0.14	0.05	0.00	0.00
GDP per Capita	4388.53	3858.38	20914.9	10439.29	25128.2	8797.34
Observations						

^Socialist, German, and Scandinavian legal origin countries have no Islamic banking data points

Table 10: OLS Coefficients
IB/CB asset ratio

Muslim (%)	.0034***
	(.0012)
Oil Price	-.0020
	(.0027)
Imports/Exports to Middle East	0
	(.0001)
Constant	.0501
	(.1051)
R-Squared	.0224
Observations	414

Table 11: OLS Coefficients
Number of Islamic banks

Muslim (%)	.0049***
	(.0005)
Oil Price	.0074***
	(.0026)
Imports/Exports to Middle East	0
	(0)
Constant	-.1791***
	(.0877)
R-Squared	.0884
Observations	1268

Robust standard errors in parentheses

*significant at 10% **significant at 5% ***significant at 1%

Table 12: OLS and 2SLS Coefficients

GDP per Capita Growth

	1	2	3	4	5	6
Determinant						
Population Growth Rate (log)	-.0023 (.0015)	.0007 (.0016)	.0067 (.0016)	.0007 (.0015)	.0024 (.0079)	.0242 (.0423)
Physical Capital Savings Rate (log)	.0209*** (.0025)	.0216*** (.0025)	.0216*** (.0025)	.0179*** (.0023)	.0076 (.0083)	.0222 (.0450)
Initial GDP per Capita (log)	-.0045*** (.0014)	-.0044*** (.0014)	-.0044*** (.0014)	-.0024* (.0013)	-.0034 (.0036)	.0224 (.0642)
British Legal Origin		-.0137*** (.0055)	-.0137*** (.0055)	-.0123*** (.0046)	-.0159* (.0088)	.0276 (.1014)
French Legal Origin		-.0164*** (.0053)	-.0164*** (.0054)	-.0170*** (.0043)	.0120* (.0031)	.0134 (.0041)
IB/CB Asset Ratio			-.0008 (.0021)			
Exogenous Instrument: IB/CB Asset Ratio				-.0108 (.0280)		
Number of Islamic Banks					.0019 (.0021)	
Exogenous Instrument: Number of Islamic Banks						-.0497 (.1085)
Constant	-.0029 (.0122)	.0068 (.0127)	.0068 (.0127)	.0003 (.0120)	.0344 (.0300)	-.1726 (.5351)
R-Squared	.0386	.0558	.0559	.0594	.0826	.0054
Observations	1493	1440	1440	1276	80	80

*significant at 10% **significant at 5% ***significant at 1%

Table 13: OLS Coefficients
Financial Deepening
(dependent variable: Total Assets/GDP)

	1	2
IB/CB Asset Ratio	0	-.0001*
	(0)	(0.0001)
(IB/CB Asset Ratio)(British)	-.0001**	
	(.0001)	
British	.0002***	
	(0)	
(IB/CB Asset Ratio)(French)		.0001*
		(.0001)
French		-.0001***
		(0)
Constant	.0006***	.0007***
	(0)	(0)
R-Squared	.0123	.0068
Observations	2032	2032

Robust standard errors in parentheses

*significant at 10% **significant at 5% ***significant at 1%