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FINANCIAL ECONOMICS | RESEARCH ARTICLE

Banks and economic growth in developing countries: What about Islamic banks?

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Abstract: Islamic banks (IBs) have a significant role in the growth of gross domestic product of the developing countries. The Islamic participatory schemes integrate the assets of lenders and borrowers. They allow enable IBs to lend on a longer term basis to create projects with higher risk-return profiles and, thus, to support economic growth. Our investigation examines the contribution of Islamic finance in economic growth. Using a panel data-set, we compare between IBs and conventional banks in their adding to economic growth. We studied a sample of 120 banks between 2005 and 2012. By means of three ordinary least-square regressions, our empirical investigation reveals that the development of non-usurious banks supports economic growth. Moreover, the cooperation between the two financing modes improves economic growth. The integration of this new funding never neglected the role of the conventional method of financing. The practice of IBs is also away from their theoretical mode in terms of participation results.

Subjects: Development Studies; Development Studies, Environment, Social Work, Urban Studies; Economics, Finance, Business & Industry

Keywords: Islamic banks; conventional banks; economic growth; ordinary least square

1. Introduction

During the last two decades, Islamic banking has seen a rapid growth. The liberalization of financial regulations, financial globalization, changes in technology, product innovation, the birth of several new Islamic markets, and the most notable of them is the financial crises stimulate the spread of the IF (Rosman, Wahab, & Zainol, 2014). Consequently, academics and industries from different parts of



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PUBLIC INTEREST STATEMENT

Our research area focuses primarily on economics and Islamic finance. It is a discipline that reflects the ethical values. In some studies, it has been shown that there is no much difference between Islamic and conventional banks in terms of stability and efficiency. However, Islamic banks financing principles attach to the real economy which leads us to compare their effects on economic growth. Islamic finance also aims to promote the well-being and sustainable development. In this context, the subject was treated renewable energy to study later the relationship that can exist between these two study fields.

the globe have started to envision Islamic finance-driven future world in the quest for an ethical and sustainable economic system. Islamic finance is growing rapidly across the world. According to *Banker* (2013), the first Top 500 Islamic Financial Institution (TIFI) listing shows that the total of Shariah-compliant assets, based on the latest official figures, have grown by 29.7% over the past year (2011) to reach \$500,482 m. Although this is relatively small compared with the \$74,232.2bn in total assets amassed by the Top 1,000 *World Banks in The Banker's* latest global listing (see 7/07, p. 172), the massive growth taking place in Islamic institutions is unassailable and can be expected to accelerate. The 29.7% growth shown in the TIFI listing, despite being above the top 1,000 latest asset growth of 16.3%, appears to vastly under-report the true figure, as many institutions operating in the sector failed to provide even basic data. According to The National Bureau of Asian Research (2013), Islamic finance emerged as a rapidly growing industry. Through the use of instruments that respect the Islamic law, it tried to promote inclusive growth, equitable risk-sharing and social justice. Although industry represents less than 2% of the banking assets worldwide, it now holds about \$1.6 trillion of the global assets. The same bureau highlights that “globally, the Islamic finance market was growing by between 10% and 15% annually, from 2000 to 2012.” Shariah-compliant assets rose by more than 160% between 2009 and 2011. Islamic finance investments are now worth \$1.6 trillion and are expected to reach \$2.5 trillion by 2015.

Gheeraert (2014) found that the development of a new Shariah-compliant banking industry, which does not crowd out the conventional banking system in the Muslim countries, leads to a higher banking sector development, as measured by the amount of private credit or bank deposits scaled to GDP. Some developing economies, such as Egypt, Jordan, Kuwait, Malaysia, Saudi Arabia ... have already started to introduce this new mode of financing in their economic system. Consequently, a deeper understanding of this new mode of finance is crucial for the following benefits: absence of speculative trading, reduced uncertainty and doubt, no excessive leverage, and profiteering (reasonable markups), ensuring equal bargaining power of the parties; attachment to the real activity, etc. Hence, Islamic banks (IBs) are engaged to achieve their operations in a more reliable and more certain economic framework. According to the XL Groupe (2014), the estimated value of the global Islamic finance service industry is expected to be US\$4 trillion by 2020 with the total value of Islamic assets expected to grow from an estimated value of US\$1.8 trillion, in 2013, to US\$6.5 trillion by that time. The Dubai Chamber (2014) also suggests that, globally, Islamic banking profit pool is projected to reach US\$ 30.5 billion by 2018 driven especially by higher retail focus. Economist Newspaper (2014) anticipates that Islamic banking assets grew at an annual rate of 17.6% between 2009 and 2013, and will grow by an average of 19.7% a year up to 2018. Khalid Howladar¹ of Moody's, a rating agency, calls this “a landmark year” for Islamic finance, in that it is moving from “a very esoteric asset class to more ... global one.”

The rapid growth of Islamic banking and finance, as a financial system that respects the Islamic standards, has captured much interest (e.g. El-Komi & Croson, 2013; Fasih, 2012; Gheeraert, 2014; Huda, 2012; Karim & Ali, 2014 etc.). Fasih (2012) focuses on the Indian economic context. This context has been growing; although the rate of poor people is also on the rise. The author explains this gap by the refusal of some Indian citizens' access to conventional credit. The present banking system is not conducive for protecting the interests of all sections of the population. In the present case, the Islamic banking system which is based on the Islamic law (Shariah), can be a solution to overcome the failures. Fasih highlights several advantages of this method of financing: Islamic banking is an interest-free banking system founded on real assets and the risks are shared between the lender and borrower under the mechanisms of partnership, joint ownership, lease, and sale. Unlike the conventional banking, where dealing with interest is a main product, implies that money is traded as a commodity and measured only as a tool of exchange. Islamic banking can uplift the vulnerable groups, such as farmers and small and medium enterprises (SMEs) and can support inclusive economic growth. Moreover, based on Islamic rules, Islamic banking is considered as an interest-free finance that may attract investment from the Gulf region. What is important is that interest-free finance provides impetus to the socialist goal envisaged by the constitution. Huda (2012) performed an analysis of the SMEs situation in the Indonesian context. In order to grow and

contribute more significantly to the economy, SMEs face some constraints the main of which is the funding lack. The Islamic participatory schemes, such as *mudharabah*² and *musharakah*³ may help to solve this problem. The participative modality of Islamic finance enables IBs to provide longer term basis to projects with higher risk-return profiles and, thus, maintain economic growth. Using data from Indonesia's National Agency of Statistics and its Central Bank and reviews key literature and secondary data on Indonesian SMEs and IBs, the study provides an adequate framework in which Islamic financing scheme could be used to solve financing gaps faced by SMEs in the context of the developing countries. El-Komi and Croson (2013) described and experimentally test Islamic-compliant microfinance products in the information asymmetry case and costly state verification. They found extensively higher compliance rates for the Islamic-compliant contracts (profit-sharing and joint venture) than for the conventional contract (interest-based). We believe that there is a great promise for these types of loans in the microfinance framework, for both Muslims and non-Muslims. Karim and Ali (2014) examined and compared IBs and conventional banks (CBs) in 14 Organizations of Islamic Conference countries from 1999 to 2009. Their sample consists of 52 IBs and 186 CBs. The empirical evidence emphasized that capital requirements have a significant impact on the deposit and lending behaviors in their study sample. They also suggested that there is a strong positive relationship between capital requirements and deposit and loan growth for both IBs and CBs. Gheeraert (2014) further investigated the relationship between the development of Islamic banking and the development of the banking sector. Because of data lack, Gheeraert used a database from "IFIRST" of data, covering Islamic commercial banks worldwide over the period 2000–2005. He found strong and consistent empirical evidence that the development of Islamic banking in Muslim countries leads to a higher banking sector development. In this case, banking sector development is measured by the amount of private credit or bank deposits scaled to GDP. This result occurs by the new banking practice Shariah-compliant which does not crowd out the conventional banking system. The investigation of recommends that Islamic project finance holds a better promise for the financing of future PF2 projects. In addition, it is interest-free, and entails the sharing of losses, if they should occur traditional project financiers, who are highly averse to carry out projects.

By reference to the previous analysis, the theoretical and empirical motivation behind the development of Islamic banking is the enhancement of both economic and social welfare, for instance, through allowing more people to contribute to a "fairer" banking system (see, e.g. Karich, 2002, 2004). A stream of the literature highlights the welfare-enhancing role of Islamic finance through the encouragement of ethical values and an alternative financial behavior (see, e.g. Saleem, 2008; Usmani, 2002 and also the reference of the present study). Conversely, at the same time, some findings believe that the Islamic finance practice has detrimental economic consequences, e.g. due to the role of the same ethics or requirement restrictions on finance and economics (see, e.g. Cobham, 1992; Kuran, 1995, 2004; Volker, 2006 and the references in this investigation). The conflicts on the impacts of Islamic finance are far from being settled. It is, however crucial, for the policy-maker to know whether allowing Islamic financial institutions to operate has desirable, or, possibly, detrimental outcomes for the economy. In this context, we develop our research.

In this research, our focus is on the influence of Islamic banking practices on economic growth for a global panel consisting of 10 countries (Bahrain, Egypt, Jordan, Kuwait, Pakistan, Qatar, Saudi Arabia, Sudan, Türkiye, and the United Arab Emirates (UAE)). By referring to 120 banks (54 IBs and 66 CBs), the aim of our study is to compare the contribution of each bank type to economic growth. In order to appreciate the contribution of each bank type, we investigated this interrelationship for the 54 IBs and the 66 CBs, each alone. In this way, we used three OLS regressions. The first is a general overview in which we test the contribution of 120 banks to economic growth in those 10 countries of our sample. To distinguish the effect of each type, we included a dummy variable which takes the value 1 if the bank is Islamic and 0 if it is conventional (If we are interested in the effect of IBs) and vice versa if we are interested in the effect of CBs. Compared to previous studies, such as that of (Abduh & Chowdhury, 2012; Abduh & Omar, 2012; Furqani & Mulyany, 2009; Johnson, 2013), we did not focus only on the effect of IBs on economic growth, but we introduced a comparative study

between the two types of banks (Islamic and conventional). All the variables in a growth form model are stationary, while cointegration (long-run impacts) demands that all the variables, as a pre-requisite, need to be non-stationary. Our approach in this study is to estimate the short-run and not the long-run elasticity that circumvents the lack of data. There is a strong motivation for us to apply a growth form approach to analyze the role of IBs on economic growth. Islamic finance is one of the most important events over the last decade in the banking industry in several Islamic and non-Islamic countries. In spite of the substantial size and growth of this recent segment, the role of Islamic banking in the economy is still heavily debated and very little empirical work is available. In particular, Islamic banking has many characteristics that may trigger economic growth; however, little empirical evidence exists in this context.

The algorithm of the article is as follows: Section 2 emphasizes the related literature, followed by Section 3 that summarizes the econometric method, while Section 4 presents the used data and depicts the empirical findings. Finally, Section 5 contains the concluding annotations and presents some policy implications.

2. Literature review

2.1. CBs and economic growth

Several researches have focused on the role played by banks on economic growth (see, e.g. Bernanke, 1983; Brunner & Meltzer, 1963; Chang, Jia, & Wang, 2010; Cole, Moshirian, & Wu, 2008; Hondroyannis, Lolos, & Papapetrou, 2005; Kashyap & Stein, 2000; Naceur & Ghazouani, 2007; Ueda, 2013 etc.). There is a general controversy of these studies about the relationship that links banks and economic growth. Bernanke (1983), Brunner and Meltzer (1963) and Kashyap and Stein (2000) have investigated the role of banks in the transmission of monetary policy and economic fluctuations down to the local level. They confirmed that local financial development matters. Their investigation also showed that if capital markets are segmented, there will be a variation of the output due to the variation of bank lending and this is what Becker suggests. Using VAR models, Hondroyannis et al. (2005) empirically considered the long-run relationship between the development of the banking system and the stock markets, and economic performance for the case of Greece during the period (1986–1999). The empirical results emphasize that both banks and stock markets financing can stimulate economic growth in the long-run even though its effect is not significant. Furthermore, Hondroyannis et al. (2005) highlighted that the contribution of bank finance in funding economic growth appears to be superior compared to that of the stock markets. Naceur and Ghazouani (2007) examined the relationship between financial development and economic growth using unbalanced panel data from 11 MENA countries over the period (1980–1990). Their empirical study is based on the estimation of a dynamic panel model with GMM estimators. The empirical results reinforce the idea of no significant relationship between banking, stock market development, and growth. The absence of this relationship may be related to underdeveloped financial systems in the MENA region that hamper economic growth. Then, more needs to be done to maintain the institutional environment and develop the functioning of the banking sector in the MENA region. In the same vein, Cole et al. (2008) studied the relationship between banking industry stock returns and future economic growth. They used dynamic panel techniques to analyze panel data from 18 developed and 18 emerging markets covering the period from 1973 to 2001. The empirical study showed a positive and significant relationship between bank stock returns and future GDP. This relationship is independent from the previously documented relationship between market index returns and economic growth. Cole et al. (2008) also found that much of the informational content of bank stock returns is captured by country-specific and institutional characteristics, such as bank accounting disclosure standards, banking crises, enforcement of insider trading law and government ownership of banks. Huda (2012) formulated a standard growth model with externality a two-period version of Romer (1986) as a game among consumers, firms, and intermediaries. The results showed that the Walrasian equilibrium with an auctioneer, does not achieve the social optimum. Ueda stressed that with several banks strategically intermediating capital, a Nash equilibrium emerges with a realistic institution, i.e an interbank market. The equilibrium outcome is uniquely determined and socially optimal.

Conversely, other studies such as (Bolbol & Fatheldin, 2005; Chang et al., 2010; Driscoll, 2004) found a negative association between banking and economic growth. Driscoll (2004) used the loan-deposit ratio (LDR) at the regional level as a proxy for fund reallocation in China during the period from 1991 to 2002. His study found that, in general, there is no correlation between bank fund reallocation and economic growth at the provincial branch level in China during the period of study. Nevertheless, Driscoll stresses, as China undertakes market-oriented reforms of the banking sector, positive effects of fund reallocation, and bank loans on local economic growth start to emerge. Bolbol and Fatheldin (2005) investigated the relationship between Egypt's financial system and the total factor productivity (TFP) over the period (1974–2002). This study is the first published paper in the MENA region that analyses the simultaneous effect of the development of stock markets and banking sector on economic growth. They found that bank-based indicators have a negative effect on TFP unless they are associated with a threshold level of per capita income; whereas, the effect of market-based indicators is positively reinforced by private net resource flows. Chang et al. (2010) considered the effect of bank fund reallocation on growth based on 1991–2005 provincial-level data of four state-owned commercial banks of China that practice fund reallocation nationwide. Focusing on their empirical results, they found no association between bank fund reallocation and regional economic growth or between bank loans and regional economic growth but they found a positive correlation between bank deposits and growth. Moreover, as China's market-oriented reforms deepen, fund reallocation, and loans start to show a positive impact on growth even though banks are government-owned.

2.2. IBs and economic growth

The relationships between IBs and economic activities or economic growth at the local level have been the focus of many researchers in recent years. Despite the favorable views on Islamic banking and finance floating in finance circles, these views have not received much systematic and empirical treatment. It is only recently that some literature has emerged to seriously and empirically look at the Islamic banking and finance.

Unlike classical banking, where dealing with interest is a key product and money is traded as a commodity, Islamic banking is interest-free banking system founded on real asset. The risks, in this system, are shared between the lender and the borrower according to the principle of partnership, joint ownership, lease, and sale. Under the principles of Islamic finance, the money is qualified only as tool of exchange. According to Fasih (2012) and Huda (2012), Islamic banking has the prospective to support the vulnerable groups, such as farmers and SMEs and can stimulate inclusive economic growth. In this case, some studies focused on this link (for instance, Abduh & Chowdhury, 2012; Abduh & Omar, 2012; Barlow, 1982; Bhalla, 2002; Collins & Bosworth, 1996; Furqani & Mulyany, 2009; Guiso, Sapienza, and Zingales (2006); Kuran, 1997; Nafissi, 1998; Siddiqi, 1980).

Nafissi (1998) and Siddiqi (1981) explained the Muslim countries' delay by the existence of Islamic institutions only and economic practices associated in particular with the interest prohibition which justifies the link between religious affiliation and economic performance at an aggregate level. Barlow (1982), for the period 1950–1972, showed that the Islamic countries of the Middle East registered a faster growth than the other developing countries during the same period. In addition, Collins and Bosworth (1996) suggested that the estimate of total factor productivity (TFP) over the period (1960–1973) (before the rise of oil prices) showed that Islamic countries registered a growth rate of TFP higher than that of other developing countries. In this analysis, which treats the link between economic growth and religion, especially the Islamic one, we can mention the study of Kuran (1997). Based on Islam, he stressed that Islamic practices, such as succession rules, have hindered the development of commercial institutions similar to those that were developed in the West during the Renaissance. As a result, these practices are unfavorable to Islamic merchants which are competing with their Western counterparts. Using national capital measures, Bhalla (2002) highlighted that Muslims are relatively poor. He believes that this situation is attributed to Islam itself. In the same context, based on an analysis of the World Value Survey data, Guiso et al. (2006) argued that Islam is negatively associated with attitudes that promote growth. They added that Muslims are

among believers who appear the most “anti market.” Using the cointegration test and vector error correction model (VECM) to see whether the financial system influences growth and transforms the operation of the financial system in the long run. Furqani and Mulyany (2009) studied the dynamic interactions between Islamic banking and economic growth. They employed time data series of total IB financing (IBFinancing) and real GDP per capita (RGDP), fixed investment (GFCF), and trade activities (TRADE) to represent real economic sectors. The empirical results showed that in the short run only fixed investment that granger causes IB to develop for 1997:1–2005:4. In the long run, as there is evidence of a bidirectional relationship between Islamic banking and fixed investment to support “demand following” hypothesis of GDP and IBs, where the increase of GDP causes Islamic banking to develop and not vice versa. The study of Abduh and Chowdhury (2012) investigated the long run and dynamic relationship between Islamic banking development and economic growth in the case of Bangladesh. In this study, the authors used the quarterly time series data of economic growth, total financing and total deposit of Islamic banking from Q1:2004 to Q2:2011. By employing cointegration and Granger’s causality method, he found that IB financing has a positive and significant relationship with economic growth both in the long and short runs. This result implies that the development of Islamic banking is one of the crucial policies which should be taken care of by the government to improve their income. The aim of Abduh and Omar (2012) investigation is to examine the short-run and the long-run association between Islamic banking development and economic growth in Indonesia. Quarterly data (2003:1–2010:2) are used in this study. The empirical investigation demonstrates a significant relationship in the short- and long-run periods between Islamic financial development and economic growth. However, this relationship is neither Schumpeter’s supply-leading nor Robinson’s demand-following. It appears to be a bidirectional relationship.

A large number of studies have focused on the relationship between the Islamic financial system and economic growth (see, e.g. Johnson, 2013; Warde, 2000; Yazdan & Hossein, 2012). The general consensus of these researches is that the respect of the Islamic economic precepts promotes harmonization, synchronization, and compatibility between the financial and productive sphere. Therefore, the practice of Islamic finance principles can overcome some conventional system lacunas in terms of information asymmetry and interest conflicts. Goaid and Sassi (2010) have also investigated the relationship between financial development and economic growth in 16 MENA countries. They attempted to verify the specific effect of Islamic sector on economic growth using the amount of credit issued to the private sector by IB as an Islamic financial development measure. Their results are based on GMM system estimation of a dynamic panel model. The empirical results showed no significant relationship between IBs and economic growth in those 16 countries. These results support the idea that the Islamic finance system does not stimulate economic growth. Finally, these authors pointed out that the relationship between financial development and growth is heterogeneous between the MENA countries where the relationship is negative for oil-exporting MENA and positive but insignificant in the MENA countries without oil wealth.

However, only few of these studies have linked between IBs and economic growth in a comparative context. The purpose of this study is to fill this research gap by introducing a comparative analysis between those two financial models. The comparative study clarifies the advantages and disadvantages of each of them.

3. Econometric method

3.1. Data and model development

Our goal in this paper is to compare the contribution to economic growth between IBs and CBs. Using data from 2005 to 2012 for 10 countries, we compare this contribution between 66 CBs and 54 IBs. The bank data-set is extracted from the basis of Bankscope (2013) provided by Bureau van Dijk (2013) and Financial Institution Information (IBIS). Macroeconomic variables, such as the inflation rate and the GDP, are extracted from the World Bank Development Indicators. The Worldwide Governance Indicators (WGI) represent our data source of government variables (The State’ Role: Control of Corruption (CC), Role of Law (RL), Regulatory Quality (RQ), Government Effectiveness (GE),

Political Stability and Absence of Violence/ Terrorism (PS) and Voice and Accountability (VA)). We employ annual time series data for the variables of IBs and CBs. Return on assets (ROA) and return on equity (ROE) are used in this study in order to measure economic profitability. We use total deposit (T_Dep), total investments (T_INVM), total incomes (TI), number of branches (NBR_BRAN), and number of employers (NBR_EMPL) as indicators of the bank development. The control variables used in this research are total assets (T_ASS), market share (MS), income diversity (ID), and inflation rate (IR). We also use interest variables (IV) such as interest rate deposits and gross fixed capital formation (GFCF). In addition, we used VA, PS, GE, RG, RL, and CC as the variables which measure the role of the state. In general, studies about growth use GDP as the principal variable reflecting economic growth. The data are collected about the period 2005–2012 and the variables used in this investigation are chosen on the basis of economic theory and data availability.

The empirical research focuses on countries with a substantial (at least 60%) Muslim population and where there are both IBs and CBs operating in the financial system. These include 10 countries (Bahrain, Egypt, Jordan, Kuwait, Pakistan, Qatar, Saudi Arabia, Sudan, Türkiye, and the United Arab Emirates (UAE)). Islamic banking has already had a strong presence in this sample. According to the Central Bank of Bahrain CBB (2012), in recent years, Bahrain has quickly become a worldwide leader in Islamic finance. It is the host of the largest concentration of Islamic financial institutions in the Middle East. Currently, there are seven Islamic insurance companies (Takaful) and two retakaful companies working in the Kingdom. Additionally, Bahrain is at the forefront in the market of Islamic securities (sukuk), counting short-term government sukuk, and leasing securities. In this case, we note that the Central Bank has played a leading role in the insertion of this innovative financial industry. In particular, the growth of Islamic banking has been notable, in Bahrain with total assets in this segment jumping from US\$1.9 billion in 2000 to US\$25.4 billion by August 2012, a rise of over 12 times. The market share of IBs correspondingly increased from 1.8% of total banking assets, in 2000, to 13.3%, in August 2012. In addition to the various Islamic financial institutions operating in its financial sector, this country is a center of the organizations to the development of Islamic finance such as the AAOIFI⁴; the LMC⁵; the IIFM,⁶ the IIRA⁷ and the SRB.⁸ By reference to data from the *Thomson Reuters* (2014), “Islamic banking assets in Egypt are expected to reach around EGP 128 billion (USD 18.4 billion) in 2014, realizing an average a growth of 10% to 12%. Islamic banking assets were valued at EGP 114 billion in 2013, 11% up compared to from the previous year, according to data from the Egyptian Islamic Finance Association (2014). Islamic financing extended by banks rose 6% to EGP 76.4 billion in 2013, while deposits grew by 13% to EGP 103 billion in the same period. Islamic banking assets in Egypt are expected to realize growth of between 10 and 12% in 2014. The Islamic banking sector accounts to 7% of total banking assets in Egypt. There are 14 banks licensed to provide Shariah-compliant products—three full-fledged IBs, including Faisal Bank, and 11 CBs with Islamic branches.” Although applied Islamic banking activity is considered currently in Jordan, the asset of the four IBs operating there is \$4.6 billion and forms 5% of total banking assets. With an annual growth of 13%, those IBs are better than traditional banks in growth of deposits and financing. Those figures illustrated high demand for transactions; particularly they offer different unique services and products, *Saudi Gazette* (2012). Moreover, in accordance with a *Global Financial Development Report* (2014), Jordan Islamic bank (JIB) is chosen among more than 300 Islamic financial institutions that either deal with Islamic transactions fully or partially and according to extensive consultations with bankers and analysts throughout the world and factors that range from the quantitative to the informed subjective offered in the bank. As it has been done in many parts of the world, the Islamic banking system in Kuwait has gone solid. The strong increase reflects the strong demand in the country for Islamic products and services that comply with Shariah rules, and further growth is expected in 2014. Referring to *Banker* (2014), Kuwait’s Islamic banking assets grew by 8.7% in the first nine months of 2013, to reach a total of Kd22.5bn (\$37.6bn) and Islamic financing rose by 11.2% to reach Kd13.5bn in the same period. Islamic deposits grew by 8.4% to Kd14.6bn. This growth exceeded that of the overall banking sector in Kuwait, which recorded 7.1% growth in assets, 7.5% growth in loans, and a 7.2% growth in deposits during the same period. Moreover,

Islamic banking assets accounted for 45.2% of total Kuwaiti banking assets in the third quarter of 2013, up from 43.5% in 2012, the second highest proportion among the Gulf Co-operation Council (GCC) countries, and a clear indicator that the industry is making important progress in Kuwait. By referring to *Tribune* (2014), a London-based Islamic financial advisory company, Edbiz Consulting, constructed the Islamic Finance Country Index (IFCI), which ranks about 50 countries of the world in terms of their role in developing, promoting and advocating Islamic banking and finance. Pakistan comes in the eighth position. According to the Global Islamic Finance Report (2014), many Islamic financial institutions appear among the top five banks in their respective countries. In Pakistan, the largest IB is Meezan Bank, which is the fast assuming mainstream prominence. In the last few years, Islamic banking growth in the country has been over 30%, which is certainly above the average global growth rate of Islamic banking and finance. If this trend continues, then one should expect that in the next three years, Islamic banking assets will at least double from their current size of Rs926 billion. The Qatar Central Bank (QCB) emphasizes that the combined assets of the country's four IBs had topped \$56bn by the end of September 2013, corresponding to almost one-third of those held by the eight conventional lenders and up from 13% in 2006. In addition, the segment posted better results than the overall banking sector when it comes to compound annual increase rates for domestic loans (46% ahead of 31%) and resident deposits (40% compared to 23%) between 2006 and 2012. This reflects that IBs in Qatar are gaining strength, with Shariah-compliant lenders outperforming their conventional counterparts in many areas during 2013, despite the confines of a progressively more competitive market. According to *Thomson Reuters* (2013), Turkey's IBs have seen their assets grow sixfold over the last decade as their combined branch network has more than tripled. In addition, last year IBs reached a combined \$36 billion in assets, representing a 5% share of total banking assets. This illustrates a 25% rise than a year earlier, compared to 13% growth for CBs. The strong growth of IB assets estimates could reach between \$80 billion and \$120 billion by 2017; a lower estimate would give them a 9% share of total banking assets, on track to meet the government target of 15% by 2023. Saudi Arabia has the second largest Islamic finance sector, after Malaysia. Islamic finance assets of Saudi Arabia are in excess of \$270 billion in 2012. This consists principally of Islamic banking assets of \$217 billion, Sukuk of \$22 billion and Islamic funds of \$18 billion. Furthermore, this country was among top 10 countries for educational infrastructure, with 7 universities offering degrees and 22 institutions offering courses on Islamic finance. Al Rajhi Bank, Islamic Development Bank, and Bank AlJazira are the largest IBs in Saudi Arabia, Islamic Finance Development Islamic Finance Development Indicator (2013). The banking system in Sudan has experienced a dramatic development since its independence. In fact, Islamic financial industry has attracted the Sudanese population. Al-Haqj and Shatah (1987) emphasized that the comparison of the total amount of current accounts deposited in both the IBs and CBs showed that more depositors were attracted by IBs than by commercial banks. For example in 1987, the total amount of current accounts of only 6 IBs reached 86,4 Million Dinars, while it reached 248,4 Million Sudanese Dinars in 18 commercial banks. This indicates that IBs succeeded in attracting more deposits than commercial banks on in other hand. The Islamic banking sector, in Turkey, has experienced a decade of solid growth to reach a total of 6.1% of the country's total lending market in 2013. In fact, by referring to *Today's Zaman Newspaper's*, (2014), Turkey's Islamic banking assets were estimated at around \$36 billion in 2012, the growth was between 15 and 20% over the last decade. A recent report by Thomson Reuters (2013) suggested that the rate of growth far outstripped conventional lending growth in Turkey, grew by just 13% between 2011 and 2012. Reuters estimated that Islamic lenders could underwrite anywhere between \$80 billion and \$120 billion in assets by the end of 2017. According to a report by *Dubai Chamber of Commerce and Industry* (DCCI) (2014), the UAE is trying to be an active player in the Islamic banking market with total Islamic banking assets growing to about \$95 billion (Dh348.9 billion) in 2013 compared to \$83 billion in 2012. The report also mentioned that the compound annual growth rate (CAGR) for Islamic banking assets in the UAE is expected to be about 17% over the period 2013–2018. At the end of last year, the total assets of IBs in the UAE rose to 13%, from 4% in 2003. The UAE Islamic banking assets in 2013 represented an almost 7% of the global Islamic banking assets (Ernst and Young's Global Consumer Banking Survey, 2013).

Several studies attempted to assess the efficiency measured by the ROA and the ROE of IB (Darrat, Topuz, & Yousef, 2002; Goaid & Sassi, 2010; Hassan, 2005; Johnes, Izzeldin, & Pappas, 2014; Muharrami, 2008; Sufian & Akbar Noor Mohamad Noor, 2009). Darrat et al. (2002), Hassan (2005), Muharrami (2008) and Sufian and Akbar Noor Mohamad Noor (2009) claimed that IBs are significantly more efficient than conventional ones. In this case, Goaid and Sassi (2010) showed that IBs are more efficient in maintaining economic system stability, reducing the moral hazard, and adverse selection problems and more conducive to poverty alleviation. All those IB advantages allow them to promote economic growth. However, using data envelopment analysis (DEA) and meta-frontier analysis (MFA), Johnes et al. (2014) compared the efficiency of IBs and CBs during the period 2004–2009. They found that IBs are typically on a par with conventional ones in terms of gross efficiency.

Similarly, for Abduh and Chowdhury (2012), the variables to be employed in this work to measure the development of IBs are the total deposit (T-Dep), total investments (T-INVM), total incomes (T-INCOM), number of branches (NBR_BRAN), and number of employees (NBR_EMPL) as indicators of the bank development. The authors confirmed that the Islamic banking development has a positive and significant relationship with economic growth. Like Abduh and Omar (2012), we used gross fixed capital formation (GFCF) as a representation of investment because it is an economic indicator of the level. Based on the research of Johnson (2013), we introduced the state role which is measured by means of six indicators of broad dimensions of governance Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and CC. 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, Kaufmann (2010).

GDP is a universal statistics to characterize the income level of a particular country within a certain time range. Studies about growth always use GDP as the main variable measuring economic growth.

The empirical model we developed in this research is consistent with the broader theoretical and empirical literature on the association between banks and economic growth and takes the following form:

$$GDP_i = \alpha_0 + \sum_{i=1}^k \beta_i X_{it} + \varepsilon_i \quad (1)$$

This equation can be rewritten as follows:

$$GDP_{i,t} = \alpha_0 + \beta_1 BP_{i,t} + \beta_2 BD_{i,t} + \beta_3 CV_{i,t} + \beta_4 IV_{i,t} + \beta_5 SR_{i,t} + \beta_6 DV + \varepsilon_{it} \quad (2)$$

where the subscript $i = 1, \dots, N$ denotes the bank (in our work, we have 120 banks) and $t = 1, \dots, N$ the time period (our time frame is 2005–2012); BP Indicates the bank profitability (ROA and ROE); BD denotes the 5 indicators of bank development (T-Dep, T-INVM, T-INCOM, NBR_BRAN, and NBR_EMPL); CV designates the control variables (T_ASS, MS ID, and RI); IV (DIR, GFCF); SR indicates the state role which is measured with the six governance variables (CC, RL, RQ, GE, PS, and VA). NV is the nominal variables (dummy variables). We employed, in our three estimates, the static panel estimation techniques. Therefore, for the pooled data, we used the OLS regression model.

Ordinary least squares (OLS) or linear least squares are a method for estimating the unknown parameters in a linear regression model. This statistic tool allows minimizing the sum of squared vertical distances between the observed responses in the data-set and the responses predicted by the linear approximation. The resulting estimator can be expressed by a simple formula as follows:

$$GDP_{i,t} = \alpha_0 + \sum_{j=1}^6 \beta_j X_{i,t} + \varepsilon_{i,t} = 1, \dots, 120; \quad t = 2005, \dots, 2012 \quad (3)$$

Table 1. Descriptive statistics

Indicators		Variables		All banks						Conventional Banks						Islamic banks					
				Obs	Mean	St.Dv	Min	Max	Obs	Mean	St.Dv	Min	Max	Obs	Mean	St.Dv	Min	Max			
PB	ROA	960	2.004	5.35	-69.71	53.08	528	2.046	2.126	-17.82	14.699	432	1.952	5.352	-69.71	53.08					
	ROE	960	13.95	27.46	-61.11	736.66	528	15.640	11.946	-39.38	123.325	432	11.893	27.464	-61.11	736.66					
DB	T_DEP	960	7.278	2.380	-3.123	13.003	528	14030.6	45030.75	19.795	443931.6	432	6.223	2.554	-3.123	13.003					
	T_INV	960	6.260	1.697	1.160	11.734	528	6.658	1.653	2.111	11.734	432	5.773	1.624	1.160	11.734					
CV	T_INCOM	960	7.548	2.247	.741	13.588	528	18260.34	65633.66	-836	797201.8	432	7237.27	17572.88	.741	13.588					
	NBR_BRAN	960	123.594	236.90	1	1540	528	175.772	296.560	1	1540	432	59.821	99.624	1	1540					
IV	NBR_EMPL	960	2314.61	3505.16	7	17213	528	3225.16	4200.59	20	17213	432	1201.70	1872.21	7	17213					
	LT_ASS	960	8.050	1.911	2.121	13.588	528	8.682	1.642	3.301	13.588	432	7.279	1.911	2.121	13.588					
SR	ID	960	.513	.439	-3.257	3.333	528	.576	.296	-3.257	1	432	.436	.439	-3.257	3.333					
	RI	960	5.751	4.600	-4.863	20.286	528	6.030	1.718	-4.863	5.286	432	5.410	4.600	-4.863	20.286					
SR	DIR	960	37.595	93.013	-8.5	1622.2	528	30.11	18.774	-7.56	99.4	432	46.743	93.013	-8.5	1622.2					
	GFCF	960	21.814	5.474	12.514	39.642	528	21.81	5.554	12.514	39.642	432	21.819	5.474	12.514	39.642					
SR	CC	960	-0.016	.776	-1.506	1.722	528	-0.025	.757	-1.506	1.722	432	-0.005	.776	-1.506	1.722					
	RL	960	.024	.678	-1.598	1.032	528	.032	.654	-1.598	1.032	432	.015	.708	-1.598	1.032					
SR	RQ	960	.035	.678	-1.512	.795	528	.025	.595	-1.512	.795	432	.047	.633	-1.512	.795					
	GE	960	-0.004	.664	-1.457	1.137	528	-0.019	.635	-1.457	1.137	432	.014	.699	-1.457	1.137					
SR	PS	960	-5.97	1.181	-2.81	1.212	528	-5.89	1.158	-2.81	1.212	432	-6.07	1.210	-2.81	1.212					
	VA	960	-9.60	.451	-1.856	-0.42	528	-9.58	.447	-1.856	-0.42	432	-9.62	.110	-1.856	-0.42					

With GDP_{it} is the growth rate of per capita GDP of country I at time t , α_0 is the parameter to be estimated, X is a vector of the core explanatory variables used to model economic growth (Bank Profitability, Bank Development, CV, IV, State Role, and Nominal Variables), and ε is the error term.

Like Guo, Jiang, Kim, and Xu (2014), we used the OLS regression model to estimate our three static panel data models which also allow the correlation between the variable to be explained (GDP) and all the explanatory variables of economic growth.

3.1. Descriptive statistics

We started the results with a descriptive analysis. In Table 1, we report descriptive statistics of the variables used in our analysis for the whole sample, for the sample of CBs and for the sample of IBs. All balance sheet data are collected yearly from Bank Scope, and cover the period 2005–2012. In the whole sample, there are 120 banks among which 54 are IBs in “Islamic” countries (countries that host both Islamic and non-IBs). Macroeconomic variables are all from the World Bank. Governmental variables are all from WGI.

Table 1 indicates that the global banking situation in our sample is generally in degradation during the study period, except for a few relatively small improvements. This is explained in large part, by the subprime crisis which affected the world economy. In fact, during this crisis, although IBs showed their performance, Bashir (2000), their profitability Bashir and Hameed (2003), and their stability Cihak and Hesse (2008), Čihák and Hesse (2010), some studies quote that IBs do not have any advantages in efficiency and stability (Kuran, 2004). The relative efficiency of those non-usurious banks is appreciated by the following studies (Abdul-Majid, Saal, & Battisti, 2010; Darrat et al., 2002; El-Gamal & Inanoglu, 2005; Hassan, 2005; Sufian & Akbar Noor Mohamad Noor, 2009; Srairi (2010). Moreover, as shown in recent research, Ben Khediri, Charfeddine, and Ben Youssef (2014) found that the financial crisis has a negative impact on both IBs and CBs but time shifted. This means that similar to classical banks, the non-usurious banks did not escape to recent crisis effects.

From Table 1, there is a significant disparity between the IB at the economic and financial profitability ($\text{Min}_{\text{ROA}} = -69,716$; $\text{Max}_{\text{ROA}} = 53,086$) and ($\text{Min}_{\text{ROE}} = -61,11$; $\text{Max}_{\text{ROE}} = 736,66$). Besides, this disparity characterizes the CB context with a minimum of -39.38 and a maximum of 123.32 . However, based on the average values of the ROA and the ROE, we noted that there is not much difference between the two bank types in terms of financial profitability. This is in line with the finding of (Ben Khediri et al., 2014) who stated that banks may be differentiated in terms of credit and insolvency risk, operating leverage and off-balance sheet activities, but not in terms of profitability and liquidity. The same observation also characterizes the total investment variable (T_INV), total assets (T_Ass), income diversity (ID), and deposit interest rate (DIR). However, to Ernst and Young (E&Y), in their latest World Islamic Banking Competitiveness report, showed that the assets of IBs grew at an average rate of 17% per year between 2008 and 2012. This is about two to three times faster than the rate at which CBs grew over the same period, due, in part, to the global financial crisis. Our research emphasizes a small difference in the mean value of this variable. This rapprochement between the values of these variables highlights some similarity between the two bank categories. This leads us to believe that there is not much difference between the two bank samples in contributing to economic growth. Table 1 shows a large difference in the average value between the IB and CB of certain variables, in particular, those which measure the bank development. In fact, the mean value of the variables T_INCOM, NBR_BRAN, and NBR_EMPL in the CB context is two times more than it is in the IB framework. The average value of T_Dep within the conventional financing framework model is 2,254 times more than that of the Islamic financial context. It shows a large difference between the two bank types. This difference can be explained by the IBs delay in their appearance compared to their counterparts, the CBs (Čihák & Hesse, 2010). Although Islamic finance has developed as a fast-growing industry with an estimated one trillion dollars in assets, El-Komi and Croson (2013) noted that this industry remains a niche market compared to conventional finance.

3.2. Panel unit root tests

Panel unit root tests have become one of the key tests among economists, particularly econometricians though testing unit roots on panel data is more recent. They are much more powerful compared to the normal unit root tests for individual time series. Im, Pesaran, and Shin (2003) and Levin, Lin, and James Chu (2002) are the most common among panel unit root tests developed in the literature. These two tests are based on the ADF principle. However, LLC assumes homogeneity in the dynamics of the autoregressive coefficients for all the panel members. Nevertheless, since it allows for heterogeneity in these dynamics, the IPS is more general. For that reason, it is described as a “Heterogeneous Panel Unit Root Test.” It is mainly reasonable to allow for such heterogeneity in choosing the lag length in ADF tests when imposing uniform lag length which is not appropriate. Additionally, in the case where cross-country data are used, slope heterogeneity is more logical. In this context, heterogeneity arises because of divergence in economic conditions and degree of development in each country.

Levin et al. (2002) consider the following basic ADF specification:

$$\Delta y_{i,t} = \alpha_i + \beta_i y_{i,t-1} + \sum_{j=1}^{p_i} \mu_{ij} \Delta y_{i,t-j} + \varepsilon_{i,t} \quad (4)$$

where $y_{i,t}$ ($i = 1, 2, \dots, N; t = 1, 2, \dots, T$) is the series for panel member (country) i over period t , μ_i is the number of lags in the ADF regression, and the error terms $\varepsilon_{i,t}$ is a white-noise disturbance with a variance of σ_i^2 . Both β_i and the lag order μ in Equation (4) are allowed to vary across sections (countries). Hence, they assumed

$$\begin{cases} \beta_i = 0 & ; \text{ where the alternative hypothesis corresponds to } Y_i, t \text{ being stationary.} \\ \beta_i = < & \end{cases}$$

Levin et al. (2002) suggest that the panel approach is a substantially augmented power in finite samples when compared with the single-equation ADF test. They also anticipated a panel-based version of Equation (5) that restricts $\hat{\beta}_i$ by keeping it identical across cross-countries as follows:

$$\Delta Y_{i,t} = \alpha_i + \beta Y_{i,t-1} + \sum_{j=1}^{p_i} \mu_{ij} \Delta Y_{i,t-j} + \varepsilon_{i,t} \quad (5)$$

Consequently, Levin et al. (2002) also supposed

$$\begin{cases} H_0: \beta_1 = \beta_2 = \dots = \beta = 0 & \text{ where the statistic of test is } t_{\beta} = \frac{\hat{\beta}}{\sigma(\hat{\beta})}, \hat{\beta} \text{ is the OLS} \\ H_1: \beta_1 = \beta_2 = \dots = \beta < 0 & \end{cases}$$

estimate of β in Equation (5) and $\sigma(\hat{\beta})$ is its standard error.

Thus, in this work, we used the ADF test in order to test the stationary of the panel data obtained for the 120 banks. The panel unit root test proposed by Im et al. (2003) has as on basic objective to test the null hypothesis. The results of this test are summarized in Table 2 for the three different regressions (Conventional and Islamic banks, Conventional banks and Islamic banks). In all the three panels, the null hypothesis of a unit root (Series contains a unit root) is rejected in favor of the stationary alternative (Series is stationary). As a result, the study variables are stationary and integrated of order zero because there is no differentiation for the first stationary.

3.3. Autocorrelation test

The correlation matrix among the selected variables related to all banks, CBs and IBs is represented in Tables 3–5. In this panel, we report the Pearson correlation coefficients. A star indicates statistical significance at 5% level and above.

Table 2. Unit root test based on levels of variables for all four panels

Augmented Dickey-Fuller ADF

Indicators	Variables	Conventional and Islamic banks				Conventional banks				Islamic banks			
		t-statistic		Critical values		t-statistic		Critical values		t-statistic		Critical values	
		Statistic	Probability	Statistic	Probability	Statistic	Probability	Statistic	Probability	Statistic	Probability	Statistic	Probability
PB	ROA	-8.957	0.000	-2.864	0.05	-6.462	0.000	-2.866	0.05	-5.180	0.000	-2.868	0.05
	ROE	-7.274	0.003	-2.864	0.05	-5.712	0.000	-2.864	0.05	-4.022	0.000	-2.868	0.05
DB	T_DEP	-8.002	0.000	-3.414	0.05	-5.062	0.000	-2.866	0.05	-4.588	0.000	-2.868	0.05
	T_INV	-7.429	0.002	-3.212	0.05	-3.201	0.000	-2.862	0.05	-5.062	0.000	-2.868	0.05
	T_INCOM	-6.151	0.001	-3.414	0.05	-3.201	0.000	-1.626	0.05	-6.400	0.000	-2.868	0.05
	NBR_BRAN	-6.748	0.000	-2.741	0.05	-4.324	0.000	-2.866	0.05	-6.766	0.000	-2.868	0.05
	NBR_EMPL	-3.558	0.007	-3.414	0.05	-6.201	0.000	-2.866	0.05	-5.746	0.000	-2.868	0.05
CV	LT_ASS	-7.264	0.004	-2.864	0.05	-5.693	0.000	-2.866	0.05	-5.272	0.000	-2.868	0.05
	ID	-6.599	0.008	-2.864	0.05	-7.510	0.000	-2.866	0.05	-8.800	0.000	-2.868	0.05
IV	RI	-3.512	0.006	-1.614	0.05	-6.150	0.000	-2.864	0.05	-7.166	0.000	-2.868	0.05
	DIR	-8.821	0.000	-2.439	0.05	-2.837	0.000	-1.866	0.05	-7.921	0.000	-2.868	0.05
	GFCF	-4.173	0.041	-2.173	0.05	-7.418	0.000	-2.866	0.05	-3.092	0.02	-2.868	0.05
SR	CC	-9.148	0.038	-6.361	0.05	-2.866	0.008	-2.620	0.05	-8.126	0.008	-2.868	0.05
	RL	-3.5	0.006	-2.362	0.05	-6.848	0.000	-2.866	0.05	-6.210	0.000	-2.866	0.05
	RQ	9.509	0.007	-3.41	0.05	-7.064	0.000	-2.866	0.05	-6.466	0.000	-2.868	0.05
	GE	-3.811	0.002	-3.414	0.05	-6.763	0.000	-2.866	0.05	-6.367	0.000	-2.866	0.05
	PS	-3.517	0.006	-3.397	0.05	-6.763	0.000	-2.866	0.05	-6.079	0.000	-2.866	0.05
	VA	-3.989	0.001	-3.414	0.05	-2.983	0.03	-2.866	0.05	-3.896	0.04	-2.866	0.05

Table 3. Person correlation coefficients (All banks)

	roa	roe	lt_ass	dr	inf	dir	Gfcf	cc	rl	reg_qual	gov_eff	stability	voice	lt_dep	ltinv	lnet_incom	nbr_bran	effectif
roa	1.0000																	
roe	-0.0785*	1.0000																
lt_ass	0.0405	0.0319	1.0000															
dr	-0.1340*	0.0197	0.0442	1.0000														
	0.0000	0.5411	0.1707															
inf	0.0097	0.0636*	0.0170	-0.0601	1.0000													
	0.7652	0.0488	0.5995	0.0627														
dir	0.0341	0.1177*	0.0838*	-0.1664*	0.0072	1.0000												
	0.2913	0.0003	0.0094	0.0000	0.8235													
gfcf	0.0000	-0.0208	0.0643*	0.1142*	0.2374	0.0032	1.0000											
	0.9996	0.5201	0.0463	0.0004	0.0000	0.9221												
cc	0.0511	-0.0666	0.3064*	0.0208	-0.4407*	0.1199*	0.4178*	1.0000										
	0.1134	0.0392	0.0000	0.5197	0.0000	0.0002	0.0000											
rl	0.0221	-0.0814*	0.3426*	-0.0005	-0.3846*	0.1278*	0.3949*	0.9165*	1.0000									
	0.4937	0.0117	0.0000	0.9879	0.0000	0.0001	0.0000	0.0000										
reg_qual	0.0010	-0.0820*	0.3030*	-0.0114	-0.3599*	0.1326*	0.3446*	0.8948*	0.9300*	1.0000								
	0.9765	0.0110	0.0000	0.7232	0.0000	0.0000	0.0000	0.0000	0.0000									
gov_eff	-0.0077	0.0730*	0.3035*	0.0037	-0.4292*	0.1292*	0.3597*	0.9513*	0.8870*	0.9432*	1.0000							
	0.8118	0.0237	0.0000	0.0000	0.9094	0.0000	0.0001	0.0000	0.0000	0.0000								
stability	0.0467	-0.0500	0.2885*	0.0403	-0.4359*	0.0955*	0.4318*	0.8815*	0.8641*	0.7450*	0.8043*	1.0000						
	0.1484	0.1219	0.0000	0.2124	0.0000	0.0031	0.0000	0.0000	0.0000	0.0000								
voice	-0.0008	-0.0082	0.2552*	0.0004	0.1259*	0.1646*	-0.0372	0.4576*	0.4851*	0.4935*	0.4861*	0.3185*	1.0000					
	0.9812	0.8007	0.0000	0.9896	0.0001	0.0000	0.2500	0.0000	0.0000	0.0000								
lt_dep	0.0069	0.0582	0.9333*	0.0553	0.0571	0.0789*	0.0236	0.2793*	0.3023*	0.2526*	0.2714*	0.2737*	0.2675*	1.0000				
	0.8308	0.0712	0.0000	0.0867	0.0768	0.0144	0.4649	0.0000	0.0000	0.0000								
ltinv	0.0682*	0.0200	0.9203*	-0.0142	-0.0708*	0.0516	0.1001*	0.3898*	0.4327*	0.3838*	0.3745*	0.3738*	0.2497*	0.8224*	1.0000			
	0.0345	0.5360	0.0000	0.6592	0.0282	0.1098	0.0019	0.0000	0.0000	0.0000								
lnet_incom	0.0561	0.1345*	0.7073*	0.0734*	0.0871*	0.0648*	0.0197	0.2456*	0.2109*	0.1403*	0.1928*	0.2694*	0.2517*	0.7283*	0.6340*	1.0000		
	0.0821	0.0000	0.0000	0.0229	0.0070	0.0448	0.5427	0.0000	0.0000	0.0000								
nbr_bran	0.0037	0.0590	0.3506*	-0.0558	0.2939*	0.0483	0.2752*	0.2004*	-0.1763*	0.1046*	-0.1327*	-0.2849*	0.1932*	0.3663*	0.3088*	0.3292*	1.0000	
	0.9098	0.0677	0.0000	0.0842	0.0000	0.1351	0.0000	0.0000	0.0000	0.0012	0.0842	0.0000	0.0000	0.0000	0.0000	0.0000		
effectif	0.0026	0.0762*	0.4919*	-0.0537	0.2717*	0.0801*	0.2472*	0.1615*	-0.1327*	-0.0575	-0.0833*	-0.2344*	0.1679*	0.5043*	0.4285*	0.4478*	0.8920*	1.0000
	0.9362	0.0183	0.0000	0.0965	0.0000	0.0131	0.0000	0.0000	0.0000	0.0750	0.0098	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	

*Two variable are autocorrelated.

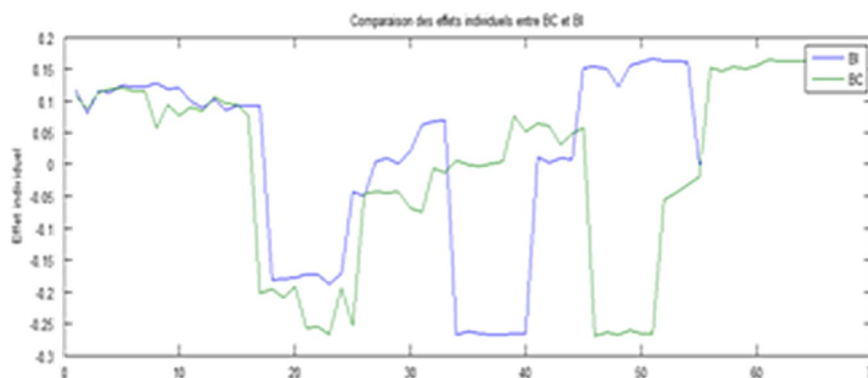
Table 4. Person correlation coefficients (Conventional banks)

	roa	roe	lt_ass	dr	inf	dir	Gfcf	cc	rl	reg_qual	gov_eff	stab	voice	t_dep	ltinv	net_Inc.	nbr_bran	eff
roa	1.0000																	
roe	0.6104*	1.0000																
lt_ass	-0.0456	0.0022	1.0000															
dr	0.0534	0.0896*	0.0187	1.0000														
inf	-0.1042*	0.0564	0.0576	-0.1143*	1.0000													
dir	0.0166	0.1958	0.1860	0.0086	0.0000	1.0000												
gfcf	-0.0085	0.0658	0.1665*	0.0664	0.1610*	0.0000	1.0000											
	0.8446	0.1311	0.0001	0.1277	0.0002	0.0000	0.0000											
	-0.0063	0.0941*	-0.0004	0.1472*	-0.2345*	-0.0894*	0.0000											
	0.8847	0.0306	0.9923	0.0007	0.0000	0.0400	0.0000											
cc	0.0331	0.1237*	0.2853*	0.0547	-0.4460*	-0.1243*	0.4493*	1.0000										
	0.4472	0.0044	0.0000	0.2097	0.0000	0.0042	0.0000	0.0000										
rl	-0.0616	0.1748*	0.3685*	0.0005	-0.3854*	-0.1499*	0.4201*	0.9129*	1.0000									
	0.1574	0.0001	0.0000	0.9902	0.0000	0.0006	0.0000	0.0000										
reg_qual	-0.0797	0.1910*	0.3544*	0.0004	-0.3592*	-0.0878*	0.3706*	0.8969*	0.9256*	1.0000								
	0.0674	0.0000	0.0000	0.9920	0.0000	0.0437	0.0000	0.0000	0.0000									
gov_eff	-0.0417	0.1718*	0.3047*	0.0141	-0.4293*	-0.0701	0.3884*	0.9497*	0.8782*	0.9412*	1.0000							
	0.3388	0.0001	0.0000	0.7466	0.0000	0.1077	0.0000	0.0000	0.0000	0.0000								
stab	0.0319	0.1051*	0.2366*	0.0637	-0.4377*	-0.1562*	0.4466*	0.8818*	0.8739*	0.7555*	0.8078*	1.0000						
	0.4648	0.0157	0.0000	0.1441	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000							
voice	-0.0900*	-0.0580	0.3030*	-0.1430*	0.1066*	-0.0560	-0.0299	0.4358*	0.4499*	0.4637*	0.4608*	0.2895*	1.0000					
	0.0387	0.1834	0.0000	0.0010	0.0143	0.1989	0.4934	0.0000	0.0000	0.0000	0.0000	0.0000						
t_dep	0.0243	0.0353	0.4653*	0.0119	0.0420	0.0947*	0.0021	0.0625	0.0711	0.1164*	0.1080*	0.0148	0.2085*	1.0000				
	0.5782	0.4176	0.0000	0.7853	0.3360	0.0295	0.9609	0.1512	0.1027	0.0074	0.0130	0.7339	0.0000					
ltinv	0.0405	-0.0412	0.9412*	-0.0290	-0.0300	0.1471*	0.0264	0.3586*	0.4286*	0.3896*	0.3541*	0.3232*	0.2964*	0.5094*	1.0000			
	0.3531	0.3444	0.0000	0.5062	0.4914	0.0007	0.5456	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
net_Inc.	0.0421	0.0611	0.4482*	0.0095	0.0457	0.0639	-0.0152	0.0592	0.0635	0.0920*	0.0926*	0.0276	0.2021*	0.8470*	1.0000			
	0.3339	0.1612	0.0000	0.8276	0.2949	0.1426	0.7269	0.1742	0.1452	0.0345	0.0335	0.5263	0.0000	0.0000				
nbr_bran	-0.0107	0.1248*	0.3330*	-0.1158*	0.3580*	0.0729	-0.3421*	-0.2817*	0.2795*	-0.1627*	-0.1850*	-0.4059*	0.2521*	0.3042*	0.2821*	1.0000		
	0.8055	0.0041	0.0000	0.0077	0.0000	0.0943	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000			
eff	-0.0322	0.1410*	0.4505*	-0.1000*	0.3847*	0.1265*	-0.3411*	-0.2924*	0.2698*	-0.1429*	-0.1779*	-0.4111*	0.2454*	0.3895*	0.3787*	0.3433*	0.9104*	1.0000
	0.4598	0.0012	0.0000	0.0216	0.0000	0.0036	0.0000	0.0000	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	

*Two variable are autocorrelated.

Figure 1. Individual effect of Islamic and conventional bank on economic growth.

Notes: IBs with blue color. CBs with green color. The vertical caption is: individual effect.



In statistics, the autocorrelation of a random process describes the correlation between the values of the process at different times, as a function of the two times or of the time lag. Autocorrelation, also known as a serial correlation, is the cross-correlation of a signal with itself. Informally, it is the similarity between observations as a function of the time lag between them. It is a mathematical tool for finding repeating patterns, such as the presence of a periodic signal obscured by noise, or identifying the missing fundamental frequency in a signal implied by its harmonic frequencies. It is often used in signal processing for analyzing functions or series of values, such as the time domain signals.

If the value of the correlation between the two explanatory variables A and B is ($\zeta_{A/B} \geq 0.5$), we will include, in our estimation only A or B . The effects of one of these two explanatory variables can be destroyed by the effect of the other variables. By analogy, Table 3 shows the result of this test for the total sample (120 banks). We note that $\zeta_{T_ASS/T_Dep} = 0.933, p = 0\%$, $\zeta_{T_ASS/T_INVM} = 0.920, p = 0\%$ and $\zeta_{T_ASS/T_INCOM} = 0.9203, p = 0\%$. Therefore, the total asset variable is strongly and positively correlated with the three variables of total deposit, total investments, and total income. In our initial estimate, we will choose the total asset variable. The effect of this variable in the studied phenomenon (economic growth) also reflects the effect of these three variables. Similarly, we remark that $\zeta_{RL/CC} = 0.916, p = 0\%$, $\zeta_{RL/GE} = 0.887, p = 0\%$, and $\zeta_{RL/PS} = 0.864, p = 0\%$, so the CC, GE, and PS impacts can be deduced from the effect of the variable RL. The same estimation will be made for the other two estimations (for 66 CBs and 54 IBs).

3.4. Hausman test

The Hausman test is a statistical hypothesis test in econometrics named after James Durbin, De-Min Wu, and Jerry A. Hausman. This test evaluates the significance of an estimator versus an alternative estimator. It helps evaluate if a statistical model corresponds to the data. With this test, we concluded that the value of χ^2 is very high with a very small probability $\text{Prob.} > \chi^2 = 0.0000$. These two values allow us to choose the fixed effect.

4. Regression results

The results from Table 6 show a strong adjustment for the three regressions since the R^2 values are, respectively, 98; 91 and 89%.

The authors also indicated that all the Durbin–Watson values (1.833; 1.639; 1.737) are approximate to 2. This means that there is no the autocorrelation in the sample. In order to test and compare the effects of conventional and IBs on economic growth, we used some preliminary tests, such as the autocorrelation test, Hausman test, descriptive statistic test, and augmented Disky–Fuller (ADF) test to apply our technique including cross-section pooled ordinary least squares (OLS). We employ the Breusch–Pagan Lagrange Multiplier (LM) test to examine the null hypothesis of no random effects. The augmented Disky–Fuller is used to verify the stationarity of the variables used in our

Table 6. Estimation results for the three samples (CBs 66, 54, IBs and 120 banks)

Indicators	All banks					Conventional banks					Islamic banks				
	Ind vbles	β	Std. Error	T	Sig	β	Std. Error	T	Sig	β	Std. Error	T	Sig		
Bank profitability: BP	ROA	-.004	.001	-2.806	.005*	.061	.004	-2.088	.523	.437	.307	-4.65	.002**		
	ROE	.007	.002	-3.098	.002*	.006	.022	-2.027	.601	.024	.043	-2.02	.031*		
Bank development: DB	T_INC	-.036	.034	-1.055	.291	.057	.0002	-1.005	.002**	.340	.540	-1.12	.061		
	T_INV	.11	.023	4.901	.000***	.001	.032	5.120	.004**	.110	.005	4.117	.084		
	NBR_BRAN	.009	.001	5.825	.000***	.052	.070	4.826	.003**	.042	.007	3.418	.000***		
Control variables: CV	LT_ASS	.077	.040	1.930	.053	.365	.031	3.390	.000***	.820	.010	4.521	.070		
	RI	-.003	.021	-1.165	.868	-.360	.012	-0.614	.090	-.36	.012	-0.61	.005**		
	ID	.008	.001	4.218	.000***	.800	.009	3.549	.000***	.270	.016	2.061	.067		
Interest variables: IV	GFCF	.006	.002	-2.591	.009*	.062	.008	-4.451	.008*	.600	.010	-5.05	.064		
	DIR	-.005	.001	-4.242	.000***	.050	.004	-3.849	.002**	.543	.009	-5.96	.070		
State rate: SR	CC	-.363	.055	-6.525	.000***	-.373	.505	-7.259	.010*	-.44	.169	-6.52	.020*		
	RL	-.379	.076	-4.933	.000***	-.924	.066	-3.938	.009**	-.542	.404	-6.57	.001**		
	REG_QUAL	.805	.086	9.293	.000***	.857	.086	9.293	.097	.659	.075	8.343	.010*		
	VOICE	-.168	.064	-2.609	.009*	-.173	.063	-2.946	.079	-.821	.540	-3.10	.002		
Dummy variables: DV	IBS	.478	.239	2.001	.046*	.314									
	CBS	.110	.199	0.56	.579										
	C	7.682	.122	62.891	.000***										
	Observations	960	960	960	960	528	528	528	432	432	432	432	432		
	No. countries	10	10	10	10	10	10	10	10	10	10	10	10		
	R2	.987				.917				.891					
	Breusch-Pagan LM test (p-value)	629.36 (0.000)				332.97(0.000)				149.11(0.000)					
	Hausman test (p-value)	13101.86 (0.000)				2289.60(0.000)				1453.42 (0.000)					
	Durbin-Watson DW	1.833				1.639				1.737					
	Prob (F-stat)	.000				.000				.000					

Note: Breusch-Pagan LM test for random effect. Hausman test is the Hausman specification test.

*Significance at the 1% level.

**Significance at the 5% level.

***Significance at the 10% level.

study. The ADF test shows that all the variables are stationary and integrated of first order. These tests imply that the cross-section OLS technique is appropriate.

According to the three regressions (For all banks, CBs and IBs), the Breusch–Pagan LM test rejects the null hypothesis of no random effect. The Hausman statistics specification test, which rejects the null hypothesis of RE models, is appropriate and more efficient. In this context, we can say that the results of FE models are more appropriate than the RE models.

In all the banks, we found that the indicator profitability (ROA and ROE), the control variables (LT_ASS and ID), the interest variables (DIR and GFCF) have a positive and significant impact excepting the variable ROA which has a significant but negative effect. Due the strong correlation between the government variables, we can emphasize that all those government variables are significantly and negatively associated with GDP. We note the same affects of the three variables; ROA, IR, and DIR. Table 6 indicates that the development of bank indicators; T_Dep, T_INVM, and T_INCOM, which are highly correlated with LT_ASS, NBR_BRAN, and NBR_EMPL, have a positive and significant impact on economic growth in our sample. The findings indicate that a 1% increase in NBR_BRAN, NBR_EMPL, ID, increases economic growth, in our work over (2005–2012), by around 0.9, 11.5, and 0.8% in branch number (NBR_BRAN), employee number (NBR_EMPL), and Income Diversity (ID), respectively. By contrast, a 1% increases in the government variables and DIR, decreases economic growth by around 3 and 0.5%, respectively. In addition, a magnitude of 0.6 implies that a 10% increase in GFCF, increases economic growth by around 0.6%. Furthermore, the finding indicates that ROA has a negative and significant impact on economic growth at 10% for the countries of our study.

These results indicate that bank profitability measured by the ROE, the bank development considered by T-INVM, T-INCOM, NBR_BRAN, NBR_EMPL, the control variables precised by ID and interest variables identified by GFCF, have a statistically significant impact on economic growth. However, the variables which measured the State rate have a significant and negative effect on GDP. This means that the institutional framework requires some changes to improve economic growth. In fact, the government sector played a crucial role in promoting economic growth. This result is consistent with the findings of Reinert (1999) and Tornell (1997). For the dummy variables, the findings stated that IBs' score (IBS) is found to have a positive and statistically significant impact on growth at 5% level. In contrast, the conventional banks' score (CBS) does not seem to have a significant impact in promoting economic growth. This means that, in our sample case, IB contribute better to economic growth than CB.

Regarding to the individual effect, as it is shown in Figure 1, we see that the individual effect evolution of each bank type is characterized by a significant volatility with both negative and positive tendency throughout the study period. Furthermore, we noted that in some periods, CBs support growth, while in other periods, the IBs are those which support it.

The average of this individual effect shows that the IB with a 0.136 value have an effect on economic growth more importantly than the CB which have a negative average (0.128). However, the difference between the two averages is small. It is 0.264. This minimal difference between the two average values combined with the instability of the two curves and the effect of the dummy variables makes the effect comparison of each bank type on economic growth ambiguous.

In order to appreciate the effects of each bank type on economic growth, we will study the relationship between the bank and economic growth for each sample separately. Next, we divide the sample into two subsamples according to the bank type (64 CBs and 56 IBs). This leads us to the following questions: What is the role of classical bank in economic growth in the context of our sample of countries? Similarly, what is the role of IB in economic growth?

As shown in Table 6, in the CB framework, the bank development indicators measured by total incomes (T_INC), total investment (T_INV), and branch number (NBR_BRAN) have all a positive and

significant effect on the studied context (at 5% level). This link is anticipated although the banking system plays a key role in the savings allocation and financing of investment projects. This result is somewhat consistent with the study of Boot (2000); Demirgüç-Kunt and Maksimovic (1998) and Hoshi, Kashyap, and Scharfstein (1990). In contrast, these findings suggest that only NBR_BRAN has a positive and significant impact on economic growth in the case of the Islamic finance model. Indeed, the magnitude of 0.042 indicates that a 10% increase in the branch number of IBs increases economic growth by around 0.042%. However, the IB development indicators measured either in total income (T_INC) or in total investment (T_INV) appears to be insignificant in the determination of growth in the case of 10 developing countries in our sample. Few studies focused on the relationship between Islamic banking development and economic growth. Abduh and Omar (2012), Furqani and Mulyany (2009) and Majid and Kassim (2010) are among the limited articles in this area. Abduh and Omar (2012) pointed out that the relationship is bidirectional. On the contrary, using no different time span of quarterly data, studies of Furqani and Mulyany (2009) and Majid and Kassim (2010) are different in terms of the direction of the relationship. On the one hand, Furqani and Mulyany (2009) showed that the relationship between Islamic banking development and economic growth is following the view of “demand-following,” which means that growth in the real economic sector stimulates Islamic banking institutions to change and develop. However, the finding of Majid and Kassim (2010) is in favor of the supply-leading view.

With regard to the relationship between profitability bank and economic growth, the finding states that this relationship is significant in the context of Islamic financing model. By contrast, the two variables ROA and ROE, which measure the bank profitability, have no effect on economic growth in the case of CBs. This result can be explained by the difference in the profitability and efficiency between IBs and CBs, especially in our study period, which integrates the period of the last Subprime crisis. The results are consistent with the findings of Goaid and Sassi (2010) and Johnes et al. (2014).

Concerning the control variables, the findings indicate that a 1% increase in the total assets (T_ASS) and income diversity (ID) increases economic growth by around 0.36 and 0.80%, respectively, in the CB framework. On the contrary, they highlight that a 5% increase in income diversity (ID) decreases economic growth by around 0.36% in a funding framework that respects the percepts of Islam. We note, in this last framework, that (T_ASS) and (ID) have no significant effect on growth. The impact of the total assets (T_ASS) on growth is found to be statistically insignificant in the case of IBs. This implies that the IB size is still limited. Abduh and Omar (2012) found similar results when analyzing this linkage for the Indonesian experience.

Our study revealed that GFCF and DIR have a positive and significant impact on economic growth at 5% if the financing model is conventional. However, the same variables do not have any effect if the financing model is based on Islamic financial principles.

For both financing modes (Islamic and conventional), we note that the institutional framework is unfavorable for the two types of funding. Existing studies regarding growth tend to focus more on the quality of institutions (e.g. Apergis & Payne, 2014; Law, Azman-Saini, & Ibrahim, 2013; Perera & Lee, 2013; Young & Sheehan, 2014). Law et al. (2013) examined whether the growth effect of financial development in countries with distinct levels when of institutional development differs. The results demonstrate that the impact of finance on growth is positive and significant only after a certain threshold level of institutional development has been attained. Furthermore, Perera and Lee (2013) recommend that measures are taken to improve the level of institutional quality (corruption, democratic accountability, and bureaucratic quality) in the developing countries, in East and South Asia, and should address the problems of poverty and income distribution. Similarly, Apergis and Payne (2014) provided a study that re-examines the impact of oil abundance on economic growth in a number of MENA (Middle East and North African) countries for the period 1990–2013. The results revealed that better institutional quality reduces the unfavorable effect of oil reserves on the performance of the real economy. Young and Sheehan (2014) using a panel of up to 116 countries from 1970 to 2010, found that for controlling institutional quality, aid flows are not otherwise significantly related to growth.

To sum up the outcome in the table, we can say that the results indicate that both conventional and Islamic financing modes play an influential role in economic growth. The bank profitability indicators, the control variables, and interest variables are favorable to growth if the funding mode is conventional. By contrast, the bank development indicators play a key role in funding a framework characterized by IBs. Both models contribute to economic growth. Hence, there is not a more advantageous funding model than the other. Both models (conventional and Islamic) combine to create an economic environment conducive to economic growth. This indicates that economic policies that speed economic growth require the intervention of both models. The results are confirmed by the findings of Gheeraert (2014) who pointed out that the Islamic banking sector acts as a complement to conventional banking in Muslim countries, when both systems co-exist and the Islamic sector reaches a medium penetration in the total banking sector.

Our finding shows that the market share of IBs has insignificant impacts on economic growth. This can be explained by the backwardness of IBs in the emerging countries. They are still in a preliminary phase compared to non IBs. Moreover, as it is highlighted by Huda (2012), compared to participatory technical or “Profit and Loss Sharing” modes, such as *mudahraba* and *musharaka*, financing products such as *murabaha*,⁹ *Istisn’a*¹⁰ and *Salem*,¹¹ are the most used in the IBs. In this situation, customers don’t find a divergence between the two types of banks because the practices of non usurious banks are similar to those in the conventional ones. Indeed, there is no interest for those customers to move toward IB particularly because participative products are based on the principle of Sharing the Profit and Loss (SPL). In line with this, Kuran (2004) argues that conventional and IBs might be different in form but are similar in substance and/or IBs do not have any advantages in efficiency and stability. In the same context, Siddiqi (2006) has been extensively used by Islamic institutions as its permissibility is beyond doubt. One of the explanations of the low use by IBs of the “Profit and Loss Sharing” modes of finance relative to “mark-up” modes is the difficulty to deal with the agency problems (moral hazard and adverse selection).

By referring to our analysis in this research and the various remarks which we have outlined, our study seems important. Indeed, in line with the increased attention in Islamic finance, the literature on Islamic banking has been growing fast. The main sizeable body of studies has explained the general Islamic principles and the product used in Islamic banking (Bashir, 1983; Khan, 1985; Siddiqi, 2006; Sundararajan & Errico, 2002). Current researches have discussed the management, regulatory and supervisory challenges associated with Islamic banking (Daly & Frikha, 2015; Jobst, 2007; Murjan & Ruza, 2002; Sole, 2007) the efficiency of IBs using frontier analysis approaches such as data envelopment analysis and stochastic frontier analysis (Abdul-Majid et al., 2010; Belanes & Hassiki, 2011; Srairi, 2010), the characteristics and profitability of IBs (Abedifar, Molyneux, & Tarazi, 2013; Beck et al., 2013; Ben Khediri & Ben-Khedhiri, 2009; Karim & Ali, 1989; Srairi, 2008), and whether it is possible to distinguish between IBs and CBs (Iqbal, 2001; Metwally, 1997; Olson & Zoubi, 2008). Another strand of literature studied the soundness, resilience and financial stability of IBs during the global financial crisis (Abedifar, Philip, & Amine, 2013; Beck et al., 2013; Bourkhis & Nabi, 2013; Caby & Boumediene, 2013; Čihák & Hesse, 2010; Daly, Ghorbel-Zouari, & Frikha, 2013; Hasan & Dridi, 2010). Other works focused on the performance of IBs (Beck et al., 2013; Hasan & Dridi, 2010; Jaouadi, Ben Jazia, & Ziadi, 2014). However, the impacts of non usurious banks on growth are far from being examined. Thus, our research attempts to fill the gap in the empirical literature on Islamic banking and economic growth. To our knowledge, it is among the few studies that provide an empirical analysis of the IBs role on economic growth in a comparative context between those non usurious banks and their western counterparts.

5. Conclusion and policy implications

Over the recent years, Islamic banking has become one of the fastest growing segments in the international financial system. Analysts expect it to maintain its rapid double-digit growth. Little is, however, known about the link between Islamic banking and economic growth. This study tackles this issue by using OLS estimation over the period 2005–2012. Specifically, we examine the impacts of some bank indicators, such as (bank profitability, bank development, control variables, interest

variables, state rate, and dummy variables). We go a step further and not only estimate this relationship for one type of bank but also we examine this relationship in a comparative context between 54 IBs and 66 CBs in 10 developing countries; namely Bahrain, Egypt, Jordan, Kuwait, Pakistan, Qatar, Saudi Arabia, Sudan, Türkiye, and the United Arab Emirates (UAE).

By referring to the dummy variables, the empirical results show that IBs contribute better to economic growth than CBs. For all the three regressions (All banks, CBs and IBs), the impact of bank development indicator measured by NBR-BRAN is statistically significant but the same indicator has a statistically significant effect on economic growth for both regressions of all the banks and CBs when it is measured by total investment (T_INV). However, when it is measured by the total income, it positively affects growth only in the case of usurious banks. Bank profitability indicators are found to have a statistically significant impact in the case of 120 banks and 54 IBs. The effect of control variables indicators measured by income diversity (ID) is statistically significant in the case of all banks and classical banks. We notice the same impact in the same context for the interest variables precised by (GFCF and DIR). These interest variables don't have any effect if the funding model is based on the principles of Islam. Our research also indicates that the inflation rate (IR) has a negative impact on growth if the funding strategy is based on the precepts of Shariah. It is widely known that the Muslim doctrine incites entrepreneurship and trade, encourages profit and focuses more on the real economy. Hence, inflation seems like a hamper for this funding as it is for conventional finance. Certainly, the findings have a number of policy implications. Firstly, the empirical evidence indicates that the economic and financial profitability (ROA and ROE), interest rate ... are significant on economic growth in Islamic financing model. Other variables, for example, total income (T_INC), total investment (T_INV), and total assets (L_TASS), have a positive effect on growth in the CB case. Therefore, both usurious and non usurious banks play a fundamental role in economic society. Consequently, they are expected to be responsive to the needs of different stakeholders. Due to their religious identity and ethical character, banks which respect Islamic precepts, are expected to be more socially responsible than their classical counterparts whose functions and services are principally based on profit maximization. The Islamic banking sector acts as a complement to the conventional banking in Muslim countries, when both systems co-exist and the Islamic sector reaches a medium penetration in the total banking sector. Secondly, our empirical evidence suggests that despite the success of IBs in recent years to record considerable progress in terms of efficiency, performance, stability, and resistance dealing with financial failures, the market share of these banks is still far-fetched from the conventional. In fact, the current practices of IB deviate from their theoretical model. The "niche" markets of Islamic finance and banking can be explained by the imitation strategy of these banks to conventional, especially in their debt products. IBs should focus on investment products with which they participate with clients in the loss as in this profit. They continue to encourage them to cross the phase of a simple financial intermediation and to intervene with investments products and its operations. Additionally, the use of diverse branch models must be explored, depending on the target segment desires, ranging from light, kiosk-style sales outlets focusing on retail mass customers to full-service branches covering all the customer segments. Alternative branch models have the supplementary advantage of potentially reducing investments, operating costs and setup times, and are principally powerful if coupled with alternative channels.

A modern customer-centric image that accentuates ethical and moral values and social or environmental efforts will reach the widest audience of both Muslim and non Muslim customers. Moreover, there is the need for education programs on Islamic banking products and structures. Furthermore, even though, the above analysis reveals that a structural complementarity and cooperation exists between the two sectors, counter balancing impacts can also intervene in unfavorable financial conditions (e.g. IBs may be subject to a higher systemic risk due to their stronger exposure to specific types of investments, specially the participation investment in the bank's profit and loss sharing). Complementary studies are also required to further understand the sources of the effects. The current essay does not allow disentangling between the three main channels through which non usurious banking can affect the overall banking development, such as banking penetration, financial innovation, and banking sector competitive structure. Each of these channels is an evenly

pertinent piece of the research focus. In this case, a logical extension of this research consists in the study of the link between Islamic banking and economic growth. In particular, can Shariah-compliant financial sector sustain the same contribution to macro-economic growth, as the conventional banking sector?

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Notes

1. He is a global head of Islamic Finance at Moody's during the IMF and World Bank meetings held in Washington, DC—View from IMF 2014.
2. A pre-Islamic, Arabic type of finance in which one individual provides start-up capital to another individual who will do the actual work. As a financial agreement between the financier and an entrepreneur, a one-tired mudaraba exists; a two mudaraba modifies this by introducing an intermediary between these two principles.
3. A joint enterprise or partnership structure with profit/loss sharing implications that is used in Islamic finance instead of interest-bearing loans. Musharakah allows each party involved in a business to share in the profits and risks. Instead of charging interest as a creditor, the financier will achieve a return in the form of a portion of the actual profits earned, according to a predetermined ratio. However, unlike a traditional creditor, the financier will also share in any losses.
4. According to Wikipedia: Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) is a Bahrain based not-for-profit organization that was established to maintain and promote Shariah standards for Islamic financial institutions, participants, and the overall industry.
5. Liquidity Management Centre (LMC) was established for the purpose of facilitating the investment of the surplus funds of IBs and financial institutions into quality short- and medium-term financial instruments structured in accordance with the Shariah principles.
6. The International Islamic Financial Market (IIFM) is the global standard setting body for the Islamic Capital & Money Market segment of the Islamic finance industry. Its primary focus lies in the standardization of Islamic products, documentation, and related processes.
7. Islamic International Rating Agency (IIRA) has been set up to provide independent assessments to Islamic financial institutions and capital market instruments globally. IIRA's special focus is on development of capital markets in Islamic countries with a rating spectrum that encompasses the full array of financial transactions and institutions.
8. Shariah Review Bureau (SRB) is a Middle East-based Shariah advisory company. Licensed by the Central Bank of Bahrain, SRB's scholarly landscape is global in its scope, and entails 28 reputable Shariah scholars from diverse geographical locations covering the

world's major Shariah-compliant markets from.

9. An Islamic financing structure, where an intermediary buys a property with free and clear title to it. The intermediary and prospective buyer then agree upon a sale price (including an agreed upon profit for the intermediary) that can be made through a series of installments, or as a lump sum payment.
10. In Islamic law, a contract in which a buyer purchases an item for deferred delivery. The item must be described in detail and construction must fit the specifications. There is no set delivery date for the item. Usually, an istisna contract is made for specially made items. For example, one may make a contract to build a custom table for a client. Payment may be made in lump sum or in installments.
11. Advance payment for goods which are to be delivered at a specified future date. Under normal circumstances, a sale cannot be affected unless the goods are in existence at the time of the bargain. However, this type of sale is an exception, provided the goods are defined and the date of delivery is fixed. The objects of sale must be tangible goods that can be defined as to quantity, quality, and workmanship.

References

- Abduh, M., & Chowdhury, N. T. (2012). Does Islamic banking matter for economic growth in Bangladesh? *Journal of Islamic Economics, Banking and Finance*, 3, 105–113.
- Abduh, M., & Omar, M. A. (2012). Islamic banking and economic growth: The Indonesian experience. *International Journal of Islamic and Middle Eastern Finance and Management*, 5, 5–47.
- Abdul-Majid, M., Saal, D. S., & Battisti, G. (2010). *Efficiency in Islamic and conventional banking: An international comparison*, 34, 25–43.
- Abedifar, P., Molyneux, P., & Tarazi, A. (2013). Risk in Islamic banking. *Review Finance*, 17, 2035–2096.
- Abedifar, P., Philip, M., & Amine, T. (2013). Risk in Islamic banking. *Review of Finance*, 6, 17–32.
- Al-Hajj, I. S., & Shatah, J. A. (1987). *Sudanese Islamic bank. Facts and figures*. Khartoum: Bank of Sudan.
- Apergis, N., & Payne, J. E. (2014). The oil curse, institutional quality, and growth in MENA countries: Evidence from time-varying cointegration. *Energy Economics*, 46, 1–9.
- Banker. (2013, November). Top Islamic financial institutions. *The Banker, global finance intelligence since 1929, 2014*. Retrieved from www.thebanker.com/IMF
- Banker. (2014). *Global financial intelligence since 1926*.
- Bankscope. (2013). *Global database of banks' financial statements, ratings and intelligence*. Retrieved from <https://bankscope2.bvdep.com>
- Barlow, R. (1982). Economic growth in the Middle East, 1950–1972. *International Journal of Middle East Studies*, 14, 129–157. <http://dx.doi.org/10.1017/S0020743800000623>
- Bashir, A. H. (1983). Portfolio management of Islamic banks—Certainty model. *Banking & Finance*, 3, 339–354.
- Bashir, B. A. (2000). Portfolio management of Islamic banks: Certainty model. *Journal of Banking and Finance*, 7, 339–354.
- Bashir, M., & Hameed, A. (2003). Determinants of profitability in Islamic banks: Some evidence from the Middle East. *Islamic Economic Studies*, 11, 31–60.
- Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and

- stability. *Journal of Banking and Finance*, 37, 433–447.
- Belanes, A., & Hassiki, S. (2011). A comparative analysis of efficiency in Islamic and conventional banks of the MENA region, Istanbul. In *Conference of Economics and Finance*.
- Ben Khediri, K., & Ben-Khediri, H. (2009). Determinants of Islamic bank profitability in the MENA region. *International Journal of Monetary Economics and Finance*, 2, 409–426.
- Ben Khediri, K., Charfeddine, L., & Ben Youssef, S. (2014). Islamic versus conventional banks in the GCC countries: A comparative study using classification techniques. *Research in International Business and Finance*, 33, 75–98.
- Bernanke, B. S. (1983). Nonmonetary effects of the financial crisis in the propagation of the great depression. *American Economic Review*, 73, 257–276.
- Bhalla, S. S. (2002). Imagine there's no country: Poverty, inequality and growth in the era of globalization. *Institute for International Economics*, 288 p.
- Bolbol, A. A., & Fatheldin, A. (2005). Financial development, structure, and economic growth: The case of Egypt, 1974–2002. *Research in International Business and Finance*, 19, 171–194. <http://dx.doi.org/10.1016/j.ribaf.2004.10.008>
- Boot, A. (2000). Relationship banking: What do we know? *Journal of Financial Intermediation*, 9, 7–25. <http://dx.doi.org/10.1006/jfin.2000.0282>
- Bourkhis, K., & Nabi, M. S. (2013). Islamic and conventional banks' soundness during the 2007–2008 financial crisis. *Review of Financial Economics*, 22, 68–77.
- Brunner, K., & Meltzer, A. H. (1963). Predicting velocity: Implications for theory and policy. *Journal of Finance*, 18, 319–354.
- Bureau van Dijk. (2013). *Company information and business intelligence*.
- Caby, J., & Boumediene, A. (2013). *The financial stability of Islamic banks during the subprime crisis*. Retrieved from <http://www.scribd.com/doc/48152306/>
- Chang, P. C., Jia, C., & Wang, Z. (2010). Bank fund reallocation and economic growth: Evidence from China. *Journal of Banking & Finance*, 34, 2753–2766.
- Cihak, M., & Hesse, H., (2008). *Islamic banks and financial stability: An empirical analysis*. [Online] Retrieved from www.imf.org/external/pubs/ft/wp/2008/wp0816.pdf.
- Čihák, M., & Hesse, H. (2010). Islamic banks and financial stability: An empirical analysis. *Journal of Financial Services Research*, 38, 95–113. <http://dx.doi.org/10.1007/s10693-010-0089-0>
- Cobham, D. (1992). Finance for development and Islamic banking. *Intereconomics*, 27, 241–244. <http://dx.doi.org/10.1007/BF02928053>
- Cole, R. A., Moshirian, F., & Wu, Q. (2008). Bank stock returns and economic growth. *Journal of Banking & Finance*, 32, 995–1007.
- Collins, S. M., & Bosworth, B. P. (1996). Economic growth in East Asia: Accumulation versus assimilation. *Brooking Paper on Economic Activity*, 2, 91–135.
- Daly, S., & Frikha, M. (2015). Variety in the rules of Islamic financial institutions. *Arabian Journal of Business and Management Review*, 5, 1. doi:10.4172/2223-5833.1000103
- Daly, S., Ghorbel-Zouari, S., & Frikha, M. (2013). Islamic financial stability during the US sub-prime crisis: Using from data panel. *Journal of Behavioural Economics, Finance, Entrepreneurship, Accounting and Transport*, 1, 1–12.
- Darrat, A. F., Topuz, C., & Yousef, T. (2002, January 15–17). *Assessing cost technical efficiency of banks in Kuwait*. In Proceedings of the Economic Research Forum 8th Annual Conference, Cairo.
- Demirgüç-Kunt, A., & Maksimovic, V. (1998). Law, finance, and firm growth. *The Journal of Finance*, 53, 2107–2137. <http://dx.doi.org/10.1111/0022-1082.00084>
- Driscoll, J. C. (2004). Does bank lending affect output? Evidence from the U.S. states. *Journal of Monetary Economics*, 51, 451–471. <http://dx.doi.org/10.1016/j.jmoneco.2004.01.001>
- Dubai Chamber. (2014). *Dubai Chamber of commerce & industry* (9th ed.). Dubai: Egyptian Islamic Finance Association. Retrieved from <http://www.eifa.co>
- Economist Newspaper. (2014). *An English-language weekly newspaper owned by the Economist Group and edited in offices based in London*.
- Egyptian Islamic Finance Association. (2014). *A Cairo-based Islamic banking organisation*.
- El-Gamal, M., & Inanoglu, H. (2005). Inefficiency and heterogeneity in Turkish banking: 1990–2000. *Journal of Applied Econometrics*, 20, 641–664. [http://dx.doi.org/10.1002/\(ISSN\)1099-1255](http://dx.doi.org/10.1002/(ISSN)1099-1255)
- El-Komi, M., & Croson, R. (2013). Experiments in Islamic microfinance. *Journal of Economic Behavior & Organisation*, 95, 252–269.
- Fasih, F. (2012). Inclusive growth in India through Islamic banking. *Procedia - Social and Behavioral Sciences*, 37, 97–110. <http://dx.doi.org/10.1016/j.sbspro.2012.03.278>
- Furqani, H., & Mulyany, R. (2009). Islamic banking and economic growth: Empirical evidence from Malaysia. *Journal of Economic Cooperation and Development*, 30, 59–74.
- Gheeraert, L. (2014). Does Islamic finance spur banking sector development? *Journal of Economic Behavior & Organization*, 103, 4–20.
- Global Financial Development Report. (2014). *The most comprehensive report yet on the topic*. The World Bank.
- Global Islamic Finance. (2014). *Leading Islamic intelligence since 2007*.
- Goaied M., & Sassi S. (2010). Financial development and economic growth in the MENA region: What about Islamic banking development, working paper.
- Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes? *Journal of Economic Perspectives*, 20, 23–48. <http://dx.doi.org/10.1257/jep.20.2.23>
- Guo, D., Jiang, K., Kim, B. Y., & Xu, C. (2014). Political economy of private firms in China. *Journal of Comparative Economics*, 42, 286–303. <http://dx.doi.org/10.1016/j.jce.2014.03.006>
- Hasan, M., & Dridi, J. (2010). *The effects of the global crisis on Islamic and conventional banks: A comparative study* (IMF Working Paper 10/201).
- Hassan, M. (2005). *The cost, profit and X-efficiency of Islamic banks*. International Seminar on Islamic Banking: Risk Management, Regulation and Supervision, Jakarta
- Hondroyannis, G., Lolos, S., & Papapetrou, E. (2005). Financial markets and economic growth in Greece, 1986–1999. *International Financial, Markets, Institutions & Money*, 15, 173–188.
- Hoshi, T., Kashyap, A., & Scharfstein, D. (1990). The role of banks in reducing the costs of financial distress in Japan. *Journal of Financial Economics*, 27, 67–88. [http://dx.doi.org/10.1016/0304-405X\(90\)90021-Q](http://dx.doi.org/10.1016/0304-405X(90)90021-Q)
- Huda, A. N. (2012). The development of Islamic financing scheme for SMEs in a developing country: The Indonesian case. *Procedia - Social and Behavioral Sciences*, 52, 179–186. <http://dx.doi.org/10.1016/j.sbspro.2012.09.454>
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115, 53–74. [http://dx.doi.org/10.1016/S0304-4076\(03\)00092-7](http://dx.doi.org/10.1016/S0304-4076(03)00092-7)
- Iqbal, M. (2001). Islamic and conventional banking in the nineties: A comparative Study. *Journal of Islamic*

- Economic Studies*, Islamic Development Bank, 8, 1–27.
- Islamic Finance Development Indicator. (2013). Thomson Reuters. Dubai: Author.
- Jaouadi, S., Jazia, R., & Ziadi, A. (2014). *Examining the efficiency and the effectiveness of Islamic and conventional banking: Evidence from Indonesia*, 3, 29–41. Retrieved from http://scholar.google.com/scholarhl=en&q=said+jaouadi+bank&btnG=&as_sdt=1%2C5&as_sdt#1
- Jobst, A. (2007). *The economics of Islamic finance and securitization* (IMF Working paper 07/117).
- Johnes, J., Izzeldin, M., & Pappas, V. (2014). A comparison of performance of Islamic and conventional banks 2004–2009. *Journal of Economic Behavior and Organization*, 103, S93–S107.
<http://dx.doi.org/10.1016/j.jebo.2013.07.016>
- Johnson, K. (2013). The role of Islamic banking in economic growth. *Journal of Finance Services of Research*, 38, 95–113.
- Karich, I. (2002). *Le système financier islamique: De la Religion à la Banque* [Knowledge editions]. Bruxelles: Larcier.
- Karich, I. (2004). *Finances & Islam*. Bruxelles: Le Savoir Editions.
- Karim, R., & Ali, A. (1989). Determinants of the financial strategy of Islamic banks. *Journal of Business Finance and Accounting*, 16, 193–212.
- Karim, R., & Ali, A. (2014). Determinants of the financial strategy of Islamic banks. *Journal of Business Finance and Accounting*, 16, 193–212.
- Kashyap, A., & Stein, J. (2000). What do a million observations on banks say about the transmission of monetary policy? *American Economic Review*, 90, 407–428.
<http://dx.doi.org/10.1257/aer.90.3.407>
- Kaufmann, D. (2010). *The worldwide governance indicators: Methodology and analytical issues*. Global Economy and Development.
- Khan, A. (1985). Adjustment mechanism and the money demand function in Pakistan. *Pakistan Economic and Social Review*, 20, 257–261.
- Kuran, T. (1995). Islamic economics and the Islamic subeconomy. *Journal of Economic Perspectives*, 9, 155–173. <http://dx.doi.org/10.1257/jep.9.4.155>
- Kuran, T. (1997). Islam and underdevelopment: An old puzzle revisited. *Journal of Institutional and Theoretical Economy*, 153, 41–71.
- Kuran, T. (2004). *Islam and mammon*. Woodstock: Princeton University Press.
<http://dx.doi.org/10.1515/9781400837359>
- Law, S. H., Azman-Saini, W. N. W., & Ibrahim, M. (2013). Institutional quality thresholds and the finance—Growth nexus. *Journal of Banking & Finance*, 37, 5373–5381.
- Levin, A., Lin, C. F., & James Chu, C. S. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108, 1–24.
[http://dx.doi.org/10.1016/S0304-4076\(01\)00098-7](http://dx.doi.org/10.1016/S0304-4076(01)00098-7)
- Majid, S. A., & Kassim, S. (2010, August 2–5). *Islamic finance and economic growth: The Malaysian experience*. Paper presented in Kuala Lumpur Islamic Finance Forum, Kuala Lumpur.
- Metwally, M. M. (1997). Economic consequences of applying Islamic principles in Muslim societies. *International Journal of Social Economics*, 24, 941–957.
- Muharrami, S. (2008). An examination of technical, pure technical and scale efficiencies in GCC banking. *American Journal of Finance and Accounting*, 1, 152–166.
<http://dx.doi.org/10.1504/AJFA.2008.019950>
- Murjan, W., & Ruza, C. (2002). The competitive nature of the Arab Middle Eastern banking markets. *International Advances in Economic Research*, 8, 267–274.
- Naceur, S., & Ghazouani, S. (2007). Stock markets, banks, and economic growth: Empirical evidence from the MENA region. *Research in International Business and Finance*, 21, 297–315.
<http://dx.doi.org/10.1016/j.ribaf.2006.05.002>
- Nafissi, M. (1998). Reframing orientalism: Weber and Islam. In R. Schroeder (Ed.), *Max Weber, Democracy and Modernisation*. New York, NY: St. Martin's Press.
- National Bureau of Asian Research. (2013). *Policy Q&A*. Seattle, WA: Author.
- Olson, D., & Zoubi, T. (2008). Using accounting ratios to distinguish between Islamic and conventional banks in the GCC region. *The International Journal of Accounting*, 43, 45–65.
- Perera, L. D. H., & Lee, G. H. Y. (2013). Have economic growth and institutional quality contributed to poverty and inequality reduction in Asia? *Journal of Asian Economics*, 27, 71–86.
- Reinert, E. S. (1999). The role of the state in economic growth. *Journal of Economic Studies*, 26, 268–326.
<http://dx.doi.org/10.1108/01443589910284903>
- Romer, P. M. (1986). Increasing returns and long-run growth. *The Journal of Political Economy*, 94, 1002–1037.
- Rosman, R., Wahab, N. A., & Zainol, Z. (2014). Efficiency of Islamic banks during the financial crisis: An analysis of Middle Eastern and Asian countries. *Pacific-Basin Finance Journal*, 28, 76–90.
<http://dx.doi.org/10.1016/j.pacfin.2013.11.001>
- Saleem, S. (2008). *Role of Islamic banks in economic development*. Retrieved from <http://ssrn.com/abstract=989055>
- Saudi Gazette. (2012). *Economy*. Saudi: Author.
- Siddiqi, M. A. M. (1980). Riba-usury and interest: Quran's verdict is clear. *Islamic Order*, 5, 25–42.
- Siddiqi, M. N. (1981). *Muslim economic thinking*. Leicester: Islamic Foundation.
- Siddiqi, N. M. (2006). Islamic banking and finance in theory and practice: A survey and state of the art. *Islamic Economic Studies*, 13, 1–48.
- Sole, J. (2007). *Introducing Islamic banks into conventional banking systems* (IMF Working Paper, 07/175).
- Srairi, S. (2008). A comparison of the profitability of Islamic and conventional banks: The case of GCC countries. *Bankers, Markets and Investors*, 98, 16–24.
- Srairi, S. A. (2010). Cost and profit efficiency of conventional and Islamic banks in GCC countries. *Journal of Productivity Analysis*, 34, 45–62.
<http://dx.doi.org/10.1007/s11123-009-0161-7>
- Sufian, F., & Akbar Noor Mohamad Noor, M. A. N. M. (2009). The determinants of Islamic banks' efficiency changes. *International Journal of Islamic and Middle Eastern Finance and Management*, 2, 120–138.
<http://dx.doi.org/10.1108/17538390910965149>
- Sundararajan, V., & Luca, E. (2002). *Islamic financial institutions and products in the global financial system: Key issues in risk management and challenges ahead* (IMF Working Paper, 02/192).
- Thomson Reuters. (2013). *Islamic Finance gateway*.
- Thomson Reuters. (2014). *Islamic Finance gateway*.
- Today's Zaman Newspaper. (2014, October). Turkey. *Seized Turkish daily' now pro-government*, BBC News.
- Tornell, A. (1997). Economic growth and decline with endogenous property rights. *Journal of Economic Growth*, 2, 219–250.
<http://dx.doi.org/10.1023/A:1009749908420>
- Tribune. (2014). *The express with the international new work times*.
- Ueda, K. (2013). Banks as coordinators of economic growth and stability: Microfoundation for macroeconomy with externality. *Journal of Economic Theory*, 148, 322–352.
<http://dx.doi.org/10.1016/j.jet.2012.09.003>
- Usmani, M. T. (2002). *Islamic finance in the global economy*. The Hague: Kluwer Law International.
- Volker, N. (2006). *Islamic Economic system – A Threat to Development?*. (MPRA Paper No. 6449).
- Warde, I. (2000). *Islamic finance in the global economy*.

Edinburgh: Edinburgh University Press.
<http://dx.doi.org/10.3366/edinburgh/9780748612161.001.0001>
XL Groupe. (2014). London.
Yazdan, G. F., & Hossein, S. S. M. (2012). Analysis of Islamic

bank's financing and economic growth: Case study Iran and Indonesia. *Journal of Economic Cooperation and Development*, 33, 1–24.
Young, A. T., & Sheehan, K. M. (2014). Foreign aid, institutional quality, and growth. *Social Science Research Network*, 41.



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