Islamic *versus* Conventional Banking: An Empirical Assessment

By

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NUST Business School (NBS)

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بسم الله الرحمن الرحيم

Certificate of Approval

This is to certify that the research work presented in this thesis, entitled "**Islamic *versus* Conventional Banking: An Empirical Assessment"** was conducted by Ms. **Nosheen** under the supervision of **Dr. Ateeq-ur Rehman Irshad.**

No part of this thesis has been submitted anywhere else for any other degree. This thesis is submitted to the **Department of Finance and Investment, NUST Business School (NBS), National University of Sciences and Technology, Islamabad, Pakistan** in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Field of **Business Administration.**

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Annex L
Form PhD-7
DOCTORAL PROGRAM
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REPORT OF DOCTORAL THESIS DEFENCE

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Dedication

Dedicated to

My Parents, My Siblings,

My Husband Hassan Shahid and Daughter Aiyet Hassan

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May Allah grant them all with a blessed and healthy life. Ameen.

"And whoever fears Allah - He will make for him a way out. And will provide for him from where he does not expect. And whoever relies upon Allah - then He is sufficient for him…."

Surah At-Talaq (65: 2-3)

Nosheen
August 29, 2019

Abstract

Islamic banking has evolved as the focused area of research by policy makers, academicians and banking personnel following global financial crisis. Despite extensive research on Islamic banking, many aspects remained unfolded. Islamic banking is an emerging market which is flourishing day by day and ensuring its presence around the world. With the innovation and development of non-interest based products, the need for the research in this area is increasing. Apart from the studies comparing Islamic and conventional banks based on traditional performance analysis, we studied Islamic banking from three different perspective. Precisely, this dissertation comprises of three separate but interrelated essays. Each essay is based on a specific objective with respect to comparison of Islamic and conventional banks with regards to their response to different phases of business cycles, their ability to provide stability to the overall financial system, and their contribution in economic development of a country over the period 1995-2014. In first essay, we empirically investigate the difference between Islamic and conventional banks in terms of business dynamics, cost structure, credit quality, and stability. We also examine the difference in response of two types of banks during peak, expansion, contraction, and trough phases of the business cycle. The empirical findings of first essay reveal that Islamic banks are more involved in fee based business, are less cost efficient, have higher credit quality, and have higher capitalization than conventional banks. We also find that Islamic banks outperformed conventional banks with regards to their credit quality and stability indicators during trough phase of business cycle. This better performance seems to be due to the differences in the provisioning strategies of the two types of banks, the non-aggressive lending profile of Islamic banks, and due to their investment in real assets. The second essay examines the financial stability of the countries having both Islamic and conventional banks *versus* the countries having conventional banks only. The investigation reveals that dual banking system is more stable than single banking system, and higher stability of dual banking system is attributed to the presence of Islamic banks in the system. Furthermore, when only dual banking system is investigated, the results confirm greater stability of Islamic banks as compared to their conventional counterparts. Islamic banks are mimicking conventional banking practices, but due to their increased interaction to the real economy and limited exposures to the speculative activities are proved to be more resilient and protected. The third essays investigates the impact of Islamic banking development on economic growth and domestic investment and finds strong evidence that Islamic banking development has a significant impact on economic growth and domestic investment. Islamic banking stimulates growth and investment in the economy due to unique nature of their activities which are linked to the real economy and are based on physical transactions. Moreover, Shariah promotes social justice and equity, and prohibits Islamic banks from undertaking harmful products and activities. The findings of this study provides useful insights for regulators and policymakers regarding adoption and working of Islamic banking.

JEL Classification: E32; O1; O40; G20; G21; Z12

Keywords: Business Cycle; Islamic Banks; Dual Banking System; Islamic Banking Development; Economic Growth; Domestic Investment

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Acronyms

AAOIFI	Accounting and Auditing Organization for Islamic Financial Institutions
ARDL	Autoregressive Distributed Lag
ASEAN	Association of South-East Asian Nations
CB	Conventional Bank
CEE	Central and Eastern European countries
CPI	Consumer Price Index
DBS	Dual Banking System
ECB	European Central Bank
FD	Financial Development
FDI	Financial Development Indicators
FRED	Federal Reserve Economic database.
GCC	Gulf Cooperation Council
GFC	Global Financial Crisis
IAH	Investment Account Holders
IB	Islamic Bank
IFS	International Financial Statistics
IFSB	Islamic Financial Services Board
IMF	International Monetary Fund
IRR	Investment Rate Reserve
MENA	Middle East and North Africa
OIC	Organization of Islamic Cooperation countries
PER	Profit Equalization Reserve
PLS	Profit and Loss Sharing
PSIA	Profit sharing investment accounts.
SBS	Single Banking System
UIAH	Unrestricted Investment Account Holders
VAR	Vector Autoregressive
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Islamic banking has evolved as a prominent area of research after GFC. IBs remained protected during GFC due to their unique principles of risk and return sharing but they also undertook excessive risk during crisis period (Ibrahim and Rizvi, 2018). During the early stage of the crisis IBs performance remained better with regards to their liquidity, capitalization, and profitability (Alqahtani et al. 2016; Miah and Uddin, 2017; Bitar et al., 2017), but as crisis spread to the real economy, they noticeably underperformed CBs in terms of capitalization (Mahdi and Abbes, 2018), profitability (Rashid et al., 2018) and efficiency (Olson and Zoubi, 2016). IBs' stock experiences relatively lower return volatility as compared to CBs stocks. IBs also adopted better risk management practices during the crisis (Boumediene & Caby, 2009; Rahim & Zakaria, 2013; Mobarek & Kalonov, 2014; Mirza et al., 2015). IBs remained protected mainly due to their lack of exposure to the risky assets, risk sharing, and assets based financing.

Islamic banking is centered on Shariah based principles which involves risk and return sharing and linkages of transactions with the real economy. These features have been recognized as the basis of their superiority over their conventional equivalents. Increased volatility in the global financial arena as aftermath of recent financial crisis aroused a need for a strong and resilient financial system less influenced by volatility and external exposure. Disturbances in the financial markets have also increased the importance of financial

stability. IBs due to their inherent characteristics do possess the ability to reduce uncertainty and the ability to disseminate stability to the entire financial system (Cihak and Hesse, 2010). IBs aim to provide financial services to the people seeking for the Islamic avenues for their surplus funds. Apart from its popularity among people desirous of products consistent with their religious beliefs, Islamic banking is also adopted by non-Muslims. Undoubtedly, it is currently the fastest growing banking industry.

The underlying doctrine of the Islamic financial system is that the return earned from any investment should represent the overall productivity of the assets and should be justifiable considering the risk inherent in the investment. The practices of IBs have raised many questions regarding their similarity with conventional banking. The form of the Islamic contracts is in accordance with the Islamic principles, but in substance, they are mimicking conventional banking practices. This has led to conflicting views among the scholars regarding the compliance of their practices with Shariah principles (Dar & Presley, 2000; Obaidullah, 2005; Greuning & Iqbal, 2008; Chong & Liu, 2009; Baele et al., 2012). According to Zarrouk et al. (2016), IBs circumvent interest by replacing the interest rate element and discounting with fee and commission-based services. Venardos (2005) is also of the view that "IBs and CBs take different paths toward the same goal". The existing discussion on the comparison of IBs and CBs yields varying arguments from no difference to significant difference between their practices.

Proponents of Shariah-compliant finance argue unique and different business model and found higher cost-efficiency, stability and credit quality for IBs (Shahimi et al., 2006; Beck et al., 2013; Miah & Uddin, 2017; Brown et al., 2007; Pradiknas & Faturohman, 2015). The underlying principles of prohibition of interest and speculative activities contribute towards

their relative superiority in terms of stability and better assets quality. IBs are more profitable, more able to sustain shocks and more liquid and have higher capitalization than CBs (Kassim et al., 2009; Beck et al., 2013; Khediri et al., 2015; Bitar et al., 2017; Rashid et al., 2018; Yanikkaya et al., 2018; Hassan et al., 2018). They suffer less credit risk (Samad, 2004; Abedifar et al., 2013; Khediri et al., 2015; Rashid et al., 2018) due to risk sharing principle and dominance of Murabahah in their financing activities (Janice et al., 2005). The extra risk faced by IBs due to Shariah limitations and helps them achieve higher profitability. Islamic banks also enhance the stability of the financial system through diversification of assets (Ghassan and Taher, 2013). They are also a better option to induce promote economic activity (Furqani & Mulyany, 2012; Abduh & Chowdhury, 2012; Manap et al., 2012; Abduh & Omar, 2013; Yusof & Bahlous, 2013; Farahani & Dastan, 2013; Imam & Kapodar, 2016; Kassim, 2016; Abedifar et al., 2016; Tabash & Anagreh, 2017; Boukhatem & Moussa, 2018).

IBs performance during the crisis raises a question.

- If IBs are more stable during the crisis, do they have enough ability to improve the stability of the system in which they operate?
- Is Islamic banking more sustainable, more efficient, more stable and more useful for the economy?
- Being based on different theoretical background whether Islamic banks are truly the non-interest based substitute of conventional banks or they are considered to be an option for getting higher returns.

1.2 Motivation and Problem Statement

To what level IBs differs from CBs? How much IBs regards Shariah principles in their operations? How Shariah principles have predicted their behavior during changing macroeconomic conditions? How far Shariah principles are helpful for IBs in sustaining financial shock and maintaining their soundness? How Islamic banking development has contributed in the well-being of the society. These are the empirical questions that are of paramount importance these days and they form the basis for motivation of this study. Islamic banking provides financial services to the religious oriented people and undertake an obligation to eliminate interest element from the society.

Despite ample research on Islamic banking after subprime mortgage crisis, it is still an unanswered question that to what extent Islamic banking practices are different from CBs. No clear verdict has been established by the previous literature that Islamic banking practicing are truly Islamic. The reason behind this conflicting evidence is that it is an emerging market which is at its growing stage. Being based on different theoretical background and despite the problems that Islamic banking industry is facing in terms of not having a critical mass, not being able to manage their costs and non-availability of developed money market, it is spreading worldwide with considerable increase in market share. In order to be at a level playing field with CBS, they need time, skilled manpower, customer base, regulatory bodies, and Shariah experts. Due to this ambiguity in the practices of IBs, their regulatory requirements are different. This study presents new perspective into the Islamic banking literature primarily focused on investigating the similarity and difference in their practices with the CBs.

1.3 Introduction of the Study

In this dissertation, it is hypothesized that the difference in the theoretical background of IBs and CBs should be translated in their behavior. The underlying principles and business model of IBs should contribute towards their distinct performance. This hypothesis is tested in several ways. Apart from the traditional comparison studies, this analysis is focused on the difference in their behavior from three different perspectives.

In particular, first the behavior of IBs and CBs in terms of business dynamics, cost structure, credit quality, and stability during different phases of the business cycle is studied. This analysis is carried out considering the fact that IBs and CBs are centred on different theoretical models. Therefore, it is expected that IBs are noticeably different from CBs in terms of their business dynamics, cost structure, credit quality, and stability. The feature of Shariah principles also determines their response towards business cycle phases. This analysis extends methodology of Beck et al. (2013) by incorporating business cycle phases. Next, the financial stability of the countries having both IBs and CBs *versus* the countries having CBs only is compared to observe the additional stability that IBs provide to the system in which they are operating. We extend the empirical framework proposed by Cihak and Hesse (2010) to investigate the financial soundness in terms of Z-score, ROA, and EAR. Secondly, we also compares the stability of countries with SBS and DBS. However, Cihak and Hesse (2010) only compared stability of IBs and CBs. Third, the impact of Islamic banking development on economic growth and domestic investment is examined and also compared with the impact of conventional banking development. This analysis is carried our following the study by Narayan and Narayan (2013) and Ndikumana (2000) for economic growth model and domestic investment model respectively. The things that are

peculiar to this analysis are that the impact of banking development attributed to Islamic and conventional banking are examined individually.

Sample consists of 62 IBs and 218 CBs operating in 20 countries. Additionally, in analysis of comparison of stability of SBS and DBS, data of 136 CBs operating in 19 countries is used. Bank-specific variables has been extracted from Bankscope and Datastream and macroeconomic variables from World Bank and IMF database. Considering the nature of data set and the requirement of empirical models, "Two Step Robust System GMM" technique is applied for estimation purpose.

1.4 Objectives of the Study

This dissertation attempts to ascertain the areas where IBs can generate valuable impact on the investors, society and the economy. Specifically, this study intends to;

1. To investigate response of IBs during changing business cycle phases.
2. To investigate the difference in the stability between IBs and CBs.
3. To investigate the difference in the stability between the systems in which IBs and CBs are operating side by side and the system with only CBs.
4. To investigate the impact of Islamic banking development on economic growth and domestic investment in the economy.

1.5 Research Questions

Specifically, this dissertation answers the following research question:

What is the difference between IBs and CB in terms of, their behavior during changing economic conditions, their ability to provide stability to the financial system, and their ability to contribute in overall economic well-being of the society?

This research question incorporates sub questions which are addressed in three separate studies which are as follows;

1a. What is the behavior of IBs during business cycle phases in terms of business orientation, cost efficiency, assets quality, and stability?

1b. What is the difference in the behaviour of IBs and CBs during business cycle phases?

2a. Do IBs have the ability to provide stability to the overall financial system in which they are operating?

2b. What is the difference in the stability between the system in which IBs are operating along with CBs and the system in which there is only conventional banking?

3a. Does Islamic banking development have the ability to encourage economic growth and domestic investment in the economy?

1.6 Significance of the Study

This dissertation attempts to add valuable insight into the Islamic banking literature. The current study helps to identity the areas in which Islamic banking can be improved to get the long run benefits and highlights the role of IBs in terms of stabilizing the whole financial system from external shocks. Better understanding of their behavior during changing business cycle phases, their role in influencing the stability of the system, and their role in improving the economic activities may facilitate improvement of entire banking system.

The presence of IB increases access to banking services, allocation of resources into investment avenues, increases capital accumulation and improve economic activity. The study indicates that IBs are better able to mobilize idle funds from the savers and finance real economic activities than CBs. Countries with DBS can benefit from the resilience provided by the IBs in terms of promoting the assets based activities thereby protecting the whole financial system. In other words, they are successfully playing their role in promoting economic activity besides financial intermediation.

This analysis also provides an idea about the working of IBs. The banks management in order to make their practices distinct should execute excessive control over their operations. They should strive to keep their deposits on the bases of PLS. They also need to utilize their expertise while applying PLS mechanism on assets side. IBs should strive to train their human resource regarding both financial and Shariah aspects of the transactions. In order to reap the maximum advantage of economies of scale they should increase their size. As their main role is to provide non-interest based services to the masses, they need to warrant that their practices are consistent with the Shariah. This study also provides insights about the behavior of IBs during changing outside environment and their competencies in protecting themselves during adverse circumstances. This thesis would also provide necessary insights to the regulators to formulate a well devised regulatory framework for IBs which will induce the growth of Islamic banking and increase competition. It also encourages the investors to evaluate the prospects and existing performance of IBs. Well-functioning banking sector ultimately uplifts the whole economy. Banking system is required to channelize the economic resources efficiently, otherwise it would lead to distressing situation for the

economy. Specifically, this study is concerned more about the role of IBs and how they are impacting the economy which is an interesting example of emerging sector.

1.7 Contributions of the Study

This dissertation contributes to the literature on comparison of IBs and CBs on several grounds. Existing literature on Islamic finance is mainly focused on comparison with respect to the impact of GFC or previous literature has taken into account the ratio analysis and data envelopment analysis while making such comparison. Further, these studies have largely investigated the difference directly ignoring the impact of the outside factor on difference in behavior of two types of banks. The specific contributions of the dissertation are as follows;

First, we examine how different are IBs from their conventional counterparts in their response to the changes in economic conditions. Specifically, we compared the behavior of IBs and CBs during different phases of the business cycle. Prior work on IBs and CBs is only focused on studying the impact of GDP growth or other macroeconomic variables such as interest rate and inflation on these two types of banks. None of the study examined the difference in behavior during different business cycle phases. Moreover, their behavior towards business cycle is studied from four different dimensions e.g. business orientation, cost efficiency, assets quality, and stability. What we know from the previous literature is that IBs performed better than CBs during GFC. This inherent resilience has paved the way for further research which requires comparing their resilience during the changing macroeconomic environment. In this sense, a study on the impact of the business cycle on IBs and CBs is expected to fill the gap in the literature and contributes by providing new

inferences and evidence for policymakers and regulators. It helps to capture the sensitivity of both types of banking in response to economic fluctuations.

Our second contribution is the comparison of stability of the countries having SBS with the countries having DBS to investigate the additional stability that could be achieved due to the presence of IBs in the DBS. However, when we examine the previous literature we find that studies are mainly focused on comparing the stability of IBs and CBs. However, none of the study has examined the stability of the system in which IBs are operating and compared it with the system in which Islamic banking has not been started yet. This analysis contributes to the literature by answering the question whether having Islamic banking in a system provides financial stability to the overall system. We attempt to ascertain the added advantage the DBS could have over the SBS due to presence of Islamic banks in the financial system using three measures of financial stability know as Z-score, ROA, and capital assets ratio (EAR).

This analysis also contributes to the financial development literature by investigating the impact of Islamic banking development on economic growth and domestic investment. It also examines the difference in the impact of Islamic and conventional banking development on growth and investment. Prior work on banking sector development is mainly focused on the impact of conventional banking development on economy. Literature on Islamic banking development is mainly focused on examining the impact of Islamic financing or Islamic deposits on economic growth and no study to date is done that examines the impact of Islamic banking development on domestic investment. The analysis in this chapter is different from the previous literature in two ways. Firstly, this analysis is conducted using a panel of 20 countries having DBS however; previous studies conducted

within Islamic framework examined this relationship in a single country. Moreover, the relationship is examined by computing four measures of Islamic banking development. Specifically, this study is different from the previous studies with respect to the measurement of banking sector development attributed to IBs and CBs separately. The contributions that this study is that it answers the questions that what is the nature of the relationship between Islamic banking development and economic growth and domestic investment? What is the difference between the impact of Islamic banking development and conventional banking development? This analysis fills the gap in literature by examining the relationships between Islamic financial development and economic activity to measure the extent to which abandoning interest based transactions led IBs to promote economic activity.

1.8 Structure of the Thesis

This dissertation is organized into seven chapters. Chapter 1 gives the background, motivation of the study. It also discusses the objectives, contribution, and research questions. Chapter 2 explains Islamic banking prospects and provides the theoretical basis and current practices of IBs. Chapter 3 provides the theoretical background of each essay. Chapter 4 reviews the existing literature related to each topic. Chapter 5 describes sample and data sources, variable construction, econometric framework, and estimation techniques used in each analysis. Chapter 6 reports the results and findings of each analysis. Chapter 7 concludes the dissertation. We then provide the summary and policy impactions of our findings. The limitations of our study and the future research ideas on Islamic banking are also discussed.

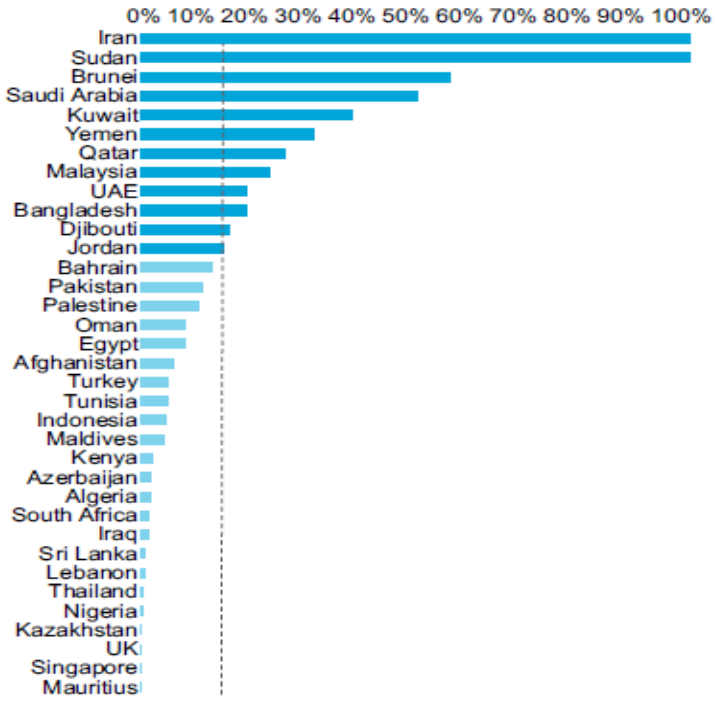
2 CHAPTER TWO

ISLAMIC BANKING THEORY

2.1 Islamic Banking Prospects

Even though Islamic banking history goes back to just half century, their assets are growing globally. According to IFSB, "the total Islamic banking assets increased from USD 1.4 trillion to USD 1.5 trillion in 2017". Currently, Islamic banking exists in 31 countries where they operate alongside their conventional counterparts. Out of these 31 tracked jurisdictions, Shariah-based banking is systemically important in 12 countries[1] holding about 88% of the global Islamic banking assets (IFSB, 2017) as shown in Figure 2.1

Figure 2. 1: Islamic Banking Share in Total Banking Assets by Jurisdiction (2017)

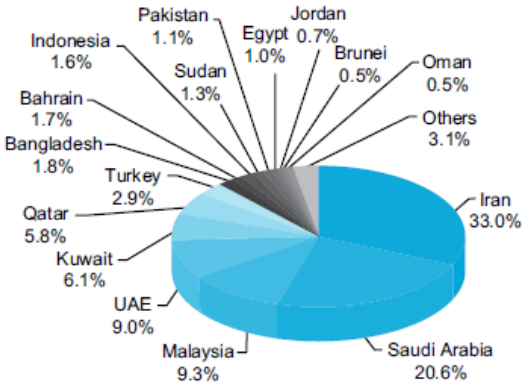


Source: Islamic Financial Services Industry Stability Report 2017

[1] These countries having a market share of more than 15% of total banking assets.

Country-wise share of Islamic finance assets in global Islamic banking assets shows that Iran remained the top jurisdiction having share of 33%, while Saudi Arabia and Malaysia remain the second and third largest jurisdiction with share of 20.6% and 9.3% respectively as shown by Figure 2.2. Gulf countries like UAE, Kuwait, and Qatar have a share of 9%, 6.1%, and 5.8%. Countries, like Turkey, Bangladesh, Bahrain, Indonesia, Pakistan and Sudan are also important Islamic finance markets. 3.1% of the global Islamic banking assets is in countries other than mentioned above which also includes Muslim minority counties like the UK and Luxemburg showing increasing acceptance of Islamic banking by western countries.

Figure 2. 2: Shares of Global Islamic Banking Assets (2017)



Source: Islamic Financial Services Industry Stability Report 2017

2.2 Shairah: The Islamic Jurisprudence

Shariah an Arabic word (شريعة) means "the path to be followed". It is the legal system of law based on divine revelations e.g. Qurah and Hadith. There are four sources of Shariah which includes Quran, Sunnah of Holy prophet, Qiyas (Analogical reasoning), and Ijma (Juridical consensus). Allah is only sovereign body deserves to be worshipped. He is

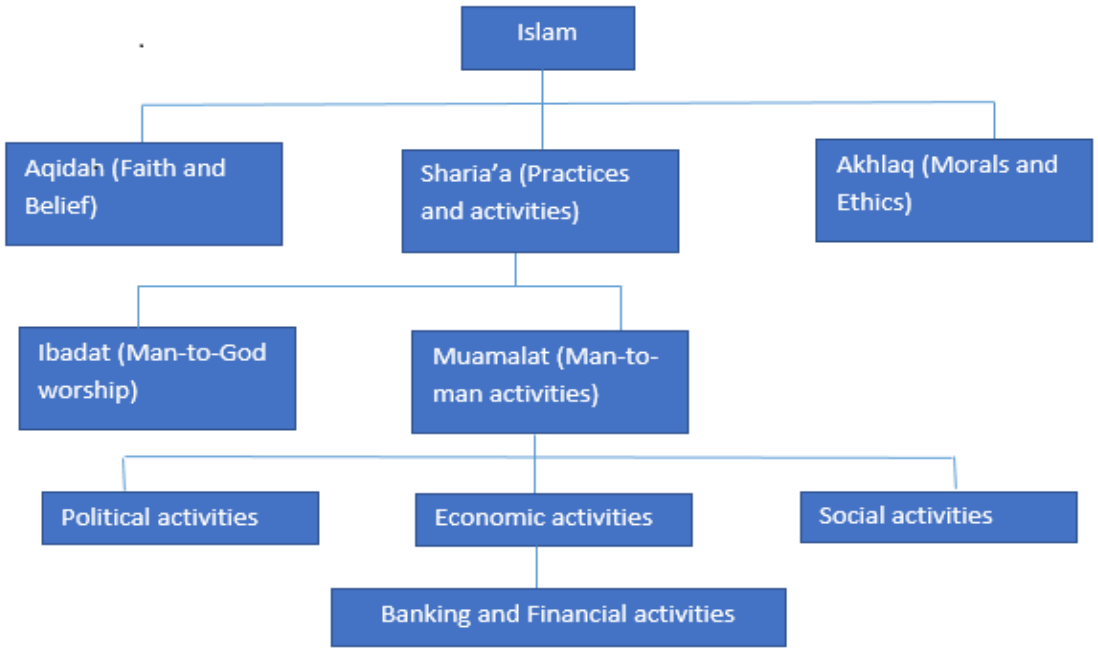
omnipotent, and omniscient, He alone has the right to ordain a way for the guidance of the mankind. Allah says in Holy Quran:

"It is not for a believing man or a believing woman, when Allah and His Messenger have decided a matter, that they should [thereafter] have any choice about their affair. And whoever disobeys Allah and His Messenger has certainly strayed into clear error" (33:36).

Islam is a comprehensive religion which guides three major aspects of life which includes Aqidah, Shariah, and Akhlaq as shown in Figure 2.3.

- The most important element Aqidah consists of belief of a Muslim in Allah and His decree, His attributes, destiny, angels, apostles, revealed books, and hereafter.
- The second important element is Shariah which concerns the practices of the Muslims regarding their connection with Allah and with other human beings.

Figure 2. 3: Shariah and Islamic Banking and Finance



Source: Brian Kettell (2011)

- Third element is Akhlaq, which provides the ethical and moral guidelines within which behavior, attitudes and conduct of the Muslims can be determined.

Shariah is an entire way of life that Muslims need to follow in fulfillment of their personal, religious, marital, social and moral, political and economic duties and obligation. Shariah includes two elements: Ibadat and Muamalat. Ibadat governs the relationship of Muslims with their creator, whereas Muamalat is linked with the man to man relationship which governs political, economic, and social activities of the human beings. Islamic law has very well addressed the financial need of the Muslims and provides complete guidelines regarding financial matters stating the lawful activities and the prohibitions.

2.2.1 The Framework of Islamic Banking

Shariah law forms basis of Islamic banking. "International Association of Islamic Banks (IAIB) defined Islamic banking as, The Islamic Bank basically implements a new banking concept in that it adheres strictly to the rules of Islamic Shariah in the fields of finance and other dealings. The Bank should work towards the establishment of an Islamic society. Hence, one of its primary goals is the deepening of religious spirit among the people". Every Islamic bank has a Shariah advisory committee which develops Islamic banking products and examines the compliance of activities with Shariah law.

2.2.2 Islamic Banking principles

Shariah-compliant finance is based on six distinct principles which include;

- Prohibition of Ribah
- Prohibition of Gharar

- Prohibition of Maysir
- Investment and financing of Shariah approved activities.
- Concept of risk and return sharing
- Linkage with the real economy.

2.2.2.1 Prohibition of Ribah

Prohibition of Ribah means that Islamic banking transactions should be interest free. According to the federal Shariah court of Pakistan, "prohibition of Ribah, includes both usury and interest, and applies to all forms of interest, whether large or small, simple or compound, doubled or redoubled". Shariah only allows Qard Hassan which is a form of loan in which a creditor does not demand any additional money over the principal amount. The prohibition of Ribah is evident from the following verse of the Nobel Quran:

"Those who consume interest cannot stand [on the Day of Resurrection] except as one stands who is being beaten by Satan into insanity. That is because they say, Trade is [just] like interest. But Allah has permitted trade and has forbidden interest. So whoever has received an admonition from his Lord and desists may have what is past, and his affair rests with Allah. But whoever returns to [dealing in interest or usury] - those are the companions of the Fire; they will abide eternally therein". (2:275)

2.2.2.2 Prohibition of Gharar

Shariah requires Islamic financial transactions to be free from uncertainty and speculation and based on accuracy and transparency. Parties involved must have prior knowledge about terms and conditions of the contract, the price of products, commodity to be delivered, the date and time of delivery, and the mode of payment. No contract in Islamic banking can be

made without keeping any of the party uninformed. Speculation is prohibited to protect the weak and to eliminate injustice, fraud and deception. Islam advocates disclosure of information as a sacred duty because asymmetrical information leads to adverse selection and moral hazard issues in IBs (Tatiana et al. 2015).

2.2.2.3 Prohibition of Maysir

Maysir literally means gambling or a game of chance and denotes acquiring wealth irrespective whether it deprives the other party of its right or not. In Maysir something of value has been acquired without earning it and depends upon the occurrence of an uncertain even in the future. It also includes a game of chance where risk is taken deliberately to obtain large returns e.g. lotteries, casinos etc. Islam has explicitly made Maysir prohibited as shown by the following verse.

"O you who have believed, indeed, intoxicants, gambling, [sacrificing on] stone alters [to other than Allah], and divining arrows are but defilement from the work of Satan, so avoid it that you may be successful" (5:90).

2.2.2.4 Investment and Financing of Shariah approved activities

Shariah requires Islamic banks to undertake activities consistent with the Islamic moral value system. Shariah prohibits them to undertake activities which are against the sanctity of Islam and are harmful for the society or masses in general. They cannot finance or invest in illegal activities such as weapons, drugs, wine, and selling pork etc (Tatiana et al. 2015).

2.2.2.5 Concept of Risk and Return Sharing

PLS feature requires risk and return sharing between bank and the customer. On the liabilities side, IBs are required to mobilise their deposits on the basis of PLS contrary to the fixed profit payments. Similarly on the assets side all financing and investment activities undertaken should be based on risk and return sharing. PLS arrangement if truly applied has the ability to provide pro-cyclical protection to banks during adverse conditions (Tatiana et al. 2015).

2.2.2.6 Linkage with the Real Economy

Shariah prohibits making money from money in the form of interest payment on loans or deposits. Money itself possess no value and only determines the value of a product and should be used as a medium of exchange only. Islamic banking transactions should be linked to the real economy and backed by physical assets (Mohieldin, 2012).

2.2.3 Assets and Liabilities of Islamic Banks

The assets and liabilities of IBs consist mostly of equity-based instruments. Islamic banking is asset-based and focuses on risk sharing. In contrast, conventional banking is debt-based and banks' assets are largely structured as debt instruments and the risk is transferred to the other party instead of sharing.

2.2.3.1 Liabilities

IBs maintain non-remunerating deposit accounts with guaranteed safekeeping (Qard Hasana or Amanah or Wadi'ah), resembling demand deposits in which a bank is responsible for the funds of depositors and no interest is paid thereon. The bank guarantees deposit money

which can be withdrawn at any time. Second, saving deposits are like the demand deposits as they do not carry fixed payments but the profit on these accounts is shared with the depositors. In current and saving accounts, capital is guaranteed. The third type of deposits is the profit sharing investment accounts (PSIA) (restricted and unrestricted) in which profit and loss is shared between IB and the depositors on the basis of PLS modes i.e. Mudarabah and Musharakah. In PSIA no guarantee regarding capital preservation and fixed income is given, as it runs under equity principle. The return itself is not decided until the productivity of the investment is ascertained. In Mudarabah, the funds are provided by the depositors and IB acts as the entrepreneur and uses its expertise to manage and invest those funds. The profit is shared in a predetermined ratio between banks and the depositors, while the losses are borne by the provider of the funds. Loss to the bank is to the extent that its efforts goes in vain. The true application of Mudarabah in deposit management in the form of PSIA. In Musharakah, a bank acts as the partner with the depositors and profits are shared in a predetermined ratio. However, losses are sustained by the partners in proportion to their capital contribution. CBs have obligations of debt holders towards their depositors and actively invest in liquidity market to meet their depositors' obligations. IBs, on other hand, keep reserves to meet their depositors need as they have limited access to Islamic money market. Investment deposits account have greater ability to impose discipline on IBs. Payoff to the IAH also depends upon the religiosity of the depositors which affect IB in term of imposing greater disciplines on deposits side or it may stimulate their performance. Two types of situation arises regarding the religiosity of the Islamic banking depositor. Either religious depositors are loyal to the bank and are ready to accept low returns. Here religiosity leads to lower withdrawal risk by the depositors which may affect the lending behavior of

IB. IBs' incentives to exercise monitoring and control may become weak since they can transfer credit risk on the assets side to IAH (Sundararajan and Errico, 2002). Or these religious depositors may be risk averse who demand higher returns and are more sensitive to the IBs' performance. Here the chances of withdrawal risk are much higher and these IAH have greater incentive to exercise discipline. Large payoffs to IAH increases deposits and also encourages shareholders to stabilize capital ratios. Paying lower payoffs leads to deposits withdrawal which give rise to liquidity and solvency issues.

2.2.3.2 Assets

The financing principles follow PLS mode and non-PLS modes (Tatiana et al. 2015).

2.2.3.2.1 PLS Financing

PLS financing is based on partnership modes such as Musharaka and Mudarbah whereby IB and the client acts as partners sharing resultant profit and loss as per agreed ratio.

2.2.3.2.2 Non-PLS Financing

It includes debt-based financing and lease-based financing;

- **Debt-based Financing**

In debt-based financing, IB purchases an underlying asset (Murabaha which is cost plus markup sale), or constructs or purchases an underlying assets (Salam is forward sale for agriculture products and Istisna for manufacturing or construction products) on behalf of its clients and sell to its customers on certain terms and conditions. The contract may be on the

basis of deferred payment or delivery or advances payment depending upon the type of the instrument.

- **Lease-based Financing**

It is known as Ijara in Islamic banking. The IB purchases an underlying assets or constructs or purchases an underlying assets on behalf of the client and rents it to client afterwards. At the end of the rental period ownership is wholly or partially transferred to the client.

3 CHAPTER THREE

THEORETICAL BACKGROUND

This dissertation intends to compare interest and non-interest based banks in terms of their behavior during business cycle phases, their ability to stabilize the overall financial system, and their contribution in economic activity.

3.1 Islamic and Conventional Banks during Business Cycle

The understanding of the link between business cycle fluctuations and banks behaviour is important in order to assess the characteristics and the resilience of the two types of banks. Considering the difference in underlying principles, their response to the business cycle fluctuations is assumed to be different. The two banks operate under different business models, have different cost structures due to different operational activities, and their ability to withstand shocks also differs due to their inherent characteristics.

The business cycle represents fluctuations in the long-term growth of an economy. Peak is the point at which economy reaches its highest level of output, trade, employment and income with respect to the long term growth trend line. Banks during peak stage expand their credit. Credit is available at cheap terms so people rush to the banks to get money from the banks. Banks are benefitted in a sense that they get more buyers of their money. While in expansion stage, the interest rate is reduced gradually in order to increase investment and banks starts expanding credit. In contraction stage, interest is increased in the economy as aftermath of rising inflation during peak stage. Increased interest rate decreases the investments and banks reduce the credit and the level of borrowing also decreases. During trough, the lowest point, economic activity is at its lowest. At this point the interest rates

have increased which leads to the decrease in the investment level. Due to this decreased investment, business decreases and credit crunch occurs due to increase in cost of borrowing and shortage of funds. Banks contract the level of credit as banks find no buyers of their money (Vosvrda, 2002; Claessens et al., 2011).

Economic fluctuations during business cycle are the result of the contraction and expansion of the credit by the banks. During trough phase the investments reached its lowest level but the trough turns into expansion when investment increases. Banks tend to start expanding the credit during the expansion stage and this increase in credit reaches its maximum at peak phase. Similarly, banks decrease their credit during the contraction stage with the lowest credit extended during the trough. Likewise lending, banks earnings also follow the same pattern. Strong demand for the banks credit and the banking services coupled with the supply of quality customers helped banks boost their earnings. Banks protect themselves during risky situations by tightening their lending standards either by increasing the interest rates on loans or they can demand more collateral (Lown & Morgan, 2006). Banks in response to these adverse conditions of the economy usually respond by adjusting the credit standards on new loans, but the slowing economy impacts the banks through the impaired quality of existing loans (Lown & Morgan, 2006; Yang & Tsatsaronis, 2012). The reason that banks are more adversely affected is the indirect impact on earnings of bank due to default by the firms, that are related to the banks, during the contraction or trough phase of the business cycle. However, nowadays banks are getting less effected by the economic fluctuations as banks are building capital base and perhaps their attention is now intensely towards implementing risk management strategies.

Banks adopts different strategies in response to the business cycle fluctuations. The forward looking banks extend their loan portfolio and maintain capital buffers during economic upturns in anticipation of increase in credit losses during economic downturn. In event of economic downturn, this capital buffer is then used to absorb the materialized capital losses. Consequently the capital buffer fluctuations for the forward looking banks are expected to have procyclical behavior. On the other hand, the shortsighted banks also enlarge their loan portfolio during economic upturn which is not accompanied by an increase in capital buffer. Insufficiency of capital buffer decrease their ability to absorb the materialized credit losses during economic downturns. Shortsighted banks then strive to increase their capital buffer from external sources when internal earnings are not sufficient enough to compensate those losses. These banks either opt for external capital sources which are expensive or they tend to increase their capital buffer through reduction in risk weighted assets which are also not marketable during economic slumps. For shortsighted banks, behavior of capital buffer is expected to be countercyclical (Stolz and Widow, 2005; Borio et al., 2001; Ayuso et al., 2004).

Now the question is what does the different theoretical background of these two types of banks indicate for their relative business orientation, efficiency, asset quality, and stability? Finance and economic theories do not provide a clear cut predication whether Islamic banks are more efficient or stable than their interest based equivalents as Beck et al. (2013) stated that, "the equity-like nature of savings and investment deposits might increase depositors' incentives to monitor and discipline the bank. At the same token, the equity-like nature of deposits might distort the bank's incentives to monitor and discipline borrowers as they do

not face a threat by depositors of immediate withdrawal, while it increases the overall riskiness of assets".

Consider first the business orientation. Islamic banking is governed by Shariah principles which require a different business model. We considered two aspects of the business model, i.e. the relative share of interest and non-interest revenues and the loan to deposits ratio. The relative share of non-interest revenues such as fee and commission might be higher in Islamic banks as they need to compensate for lack of interest revenues. However, the difference across bank types is unclear. Similarly, the loan to deposits ratio across both types of banks cannot be compared as Islamic banks neither take loans nor do they lend explicitly. The sales-based modes are not loans but a tailored form of loans as Islamic banks are limited by Shariah to invest in non-real assets. Due to this limitation, they are involved in a lending like business.

Regarding efficiency, the difference is also unclear. Due to lower agency problems, monitoring costs might be lower for IBs. On the other hand, the complexities involved in Islamic banking instruments contribute towards their higher costs. Moreover, short history and diseconomies of scale might lead to cost inefficiency. In terms of assets quality, it is a priori ambiguous whether IBs or CBs are more adequately able to assess and monitor risk and more able to discipline borrowers. The financing instruments such as Murabahah, Ijara, Salam, Istisna are structured in a way that they have in-built stability. Due to the nature of these instruments, a bank can monitor the flow of funds to the agreed sector and chances of diversion to unproductive sectors can be minimised. In these modes, IBs can monitor the usage of loans by the borrower which might reduce the chance of default. To avoid the withdrawal risk and deterioration of investment they tend to be more cautious. Similarly,

due to the limitation on excessive speculation, default risk is also minimised. In terms of stability, the difference is also vague. On the one hand, IBs are not allowed to invest in interest-based activities, which contribute towards their resilience (Miah & Uddin, 2017). The risk-sharing feature also mitigates credit risk as a shock on the assets side can be shared with the depositors. Due to the added advantage of monitoring by the depositors, agency problem, adverse selection and moral hazard might be minimised in IBs. The Shariah's limits in terms of investment in risky activities might also help increase the stability of Islamic banks. On the other hand, Islamic banks lack the necessary risk management techniques applied by conventional banks which might expose them to interest rate risk.

Further, applying the PLS mechanism on the assets side could expose them to agency problem and the need to exercise additional control over the borrowers. This might lead Islamic banks to operational risk. Lastly, the restriction on IBs in terms of using hedging instruments and lack of a Shariah-compliant money market exposes them to liquidity risk. They collect the majority of funds from demand deposits and are expected to be more stable as higher levels of mandatory reserves are to be maintained against these deposits (Khan, 1986). However, this stability could render them inefficient. As a result, they are left with fewer funds at their disposal for investment. The risk-sharing mechanism of Islamic banking also protects them as the borrowers share profit and losses with banks, which, in turn, share profits and losses with the depositors (Chong & Liu, 2009).

During growing economy, banks decrease their non-traditional banking business, extend more loans as compared to their deposits, and their cost also increases. NPLs are usually low; so the need to build up reserves, as a result of which LLP decreases. When GDP increases, new profitable investment avenues are generated, so liquid assets are used to fund

loans and make new investments. Banks adopt better risk management practices and are better equipped to sustain unexpected shocks which lead to the stability of banks and vice versa.

In a nutshell, theory does not provide clear evidence as to how IBs and CBs are different in terms of business orientation, efficiency, asset quality, and stability. This difference prevails possibly be due to the ambiguity regarding the practices of IBs, or due to the difference in size or governance. We can expect some differences in behaviour of IBs and CBs banks during peak, expansion, contraction, and trough phases of the business cycle. Specifically, focus is on studying the impact of the business cycle on business orientation, efficiency, credit quality, and stability of IBs and CBs.

3.2 Financial Soundness of Single *versus* Dual Banking System

Disturbances in financial markets after the GFC have increased the importance of financial stability in inducing economic growth[2]. No doubt, banking sector stability uplifts the economy and helps it to endure internal and external financial shocks. Further, it positively contributes to financial system stability and ultimately leads to achieve the global financial stability (Athanasoglou et al., 2005). Islamic banking is a worthwhile option to induce economic activity and possess ability to sustain external shocks due to the inherent structural advantages attached to it over the traditional banking practices.

[2] "Financial stability can be defined as a condition in which the financial system–comprising financial intermediaries, markets, and market infrastructure – is capable of withstanding shocks and the unraveling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities" (ECB, 2007)"

A financial system is considered to be stable if it is free from any excessive volatility, stress or crisis, or if any such calamity occurs, then the system is strong enough to counter or withstand such situation (Hussein, 2010). Similarly, bank soundness has been characterized as the capability of the bank to remain solvent under adverse economic conditions (Lindgren et al., 1996).

The whole discussion aims at examining the additional stability that the existence of IBs could provide to the financial system in which they are operating. Advocates of Islamic banking assert that their business model is clearly and substantially distinctive and consider them to be more stable, more profitable, and cost efficient. However, practices of IBs have raised many concerns regarding their similarity with CBs. Several researchers are of the view that in form, Islamic contracts are in accordance with the underlying Shariah principles, but in substance, their practices are similar to interest based banking practices (Baele et al. 2012; Chong and Liu, 2009; Dar and Presley, 2000; Greuning and Iqbal, 2008; Obaidullah, 2005; Kuran, 2010). Departing from the traditional comparison studies, this research therefore compares IBs and CBs in terms of their ability to provide stability to the overall financial system.

Role of type of banking in determination of the stability of financial system is very important in order to assess the characteristics and the resilience of the two types of banks. Due to the differences in their underlying principles, they assert different impact on the stability of the financial system. Secondly, IBs' ability to withstand shocks also differs due to their inherent characteristics. Moreover, IBs have the ability to provide stability to the overall financial system due to a unique nature of their transactions and the Shariah based principles (Cihak and Hesse, 2010). Examination of whether and how IBs contribute to the financial stability

of the system is of great interest, particularly for the countries that have not yet adopted Islamic banking. Further, evidence on the role that Islamic banking plays in stability of financial system helps policymakers and bank management to mitigate the likelihood of financial crisis.

One of the important question is that whether the different theoretical background of IBs and CBs significantly contributes to their relative stability? It is hard to clearly predict whether IBs are more stable than their conventional counterparts as their practices are similar in many aspects and both types of banks are operating under the same umbrella. The theoretical background of Islamic banks exposes them to different sort of risk. Specifically, on the one hand, a complex nature of instruments and restrictions imposed by Shariah regarding funding and investment activities, and, on the other hand, relations and obligations of Islamic banks towards their stakeholders, especially depositors and customers, expose them to risks which are different from the risks their conventional equivalents do face (Khan and Ahmad, 2001; Cihak and Hesse, 2010; Bourkhis et al., 2013). Firstly, Shariah principle of risk sharing requires IBs to apply PLS in both deposit management and financing activities. Sharing profit and loss with the depositors exposes them to the withdrawal risk (Khan and Ahmad, 2001). Similarly, PLS on assets side involves agency problem in which financer (IB here) is having no monitoring right upon finances. This forces IBs to have increased monitoring and administration costs and ultimately exposing them to additional operational risk in managing non-PLS modes (Bacha, 1997; Hasan and Dridi, 2010; Bourkhis et al, 2013). Secondly, IBs also suffer credit risk as they are not permissible to take collateral or guarantees to reduce credit risk.

Thirdly, Shariah also refrain them to undertake any hedging activities. Fourthly, they are also not allowed to invest in interest-based government securities in order to meet their liquidity needs. Due to absence of non-interest based interbank money market and lender of last resort facility, they are more exposed to liquidity risk. They are forced to undertake interest based liquidity management instrument such as Commodity Murabahah. Islamic banks also maintain high capital reserves to address this liquidity issue. Availability of the limited liquidity management tools (e.g. sovereign sukuks) make IBs far behind conventional banks in managing liquidity (Hasan and Dridi, 2010). Fifthly, Islamic banks possess additional risk because they lack necessary risk mitigation tools, which are frequently and effectively used by their conventional peers. Lastly, they are severely criticized due to the departure of their activities from purely profit sharing modes. Although they use PLS modes on liabilities side, they are not applied in true spirit. For instance, Islamic banks in order to avoid withdrawal risk do not share losses with the depositors and in case of low profit they still provide their investment account holders with competitive return (Siddiqi, 2006; Abedifar et al., 2011). However, on the assets side, the non-profit sharing modes known as the sale based or fixed income modes are used, which are similar to the conventional banks instruments as their returns are fixed.

It is also a fact that IBs do possess certain features that make them less vulnerable to the external shocks. Especially, during the subprime mortgage crisis, they were more resilient than CBs. This is because their investment and financing activities were more linked to the real sector of the domestic economy and less integrated with the global financial markets (Alaro and Hakeem, 2011). Assets-based financing and risk sharing arrangements protected them from the bad effects of the crisis (Hasan and Dridi, 2010). In nutshell, distinct features

that make them more stable are as follows. Firstly, Creator of this universe has ordained the curse of interest in Quran and Sunnah, and the prohibition of Riba provides Islamic banks with the stability, which in no way could be achieved by the conventional banking business based on interest. Shariah's limitations on interest-based transactions and investments in risky activities also positively contribute towards their resilience (Miah and Uddin, 2017). Secondly, the risk-sharing feature also protects Islamic banks and mitigates credit risk as it provides the advantage of passing a negative shock on the asset side to the investment depositors (Chong and Liu, 2009). The IBs, due to obligation of providing competitive return to investors, and facing higher operational risk and liquidity risk, are required to be more vigilant, which helps them in avoiding moral hazard and excessive risk. Monitoring by the depositors helps minimize agency problem, adverse selection, and moral hazard issues and makes Islamic banks more stable. Similarly, the financing instruments such as Murabahah, Ijara, Salam, and Istisna are structured in such a way that they have in-built stability. Thirdly, Shariah also protects IBs by restricting their investment in speculative activities and excessive leveraging, which was a main cause of the recent GFC. Finally, Islamic banks collect the majority of funds from demand deposits and maintain higher level of mandatory reserves against these deposits to avoid sudden massive withdrawals, which also positively contributes towards their stability (Khan, 1986). However, this stability could make Islamic banks inefficient as they are left with fewer funds at their disposal for investments (Cihak and Hesse, 2010; Bourkhis et al., 2013).

Considering the theoretically identified risk and stability factors of IBs, it remains an empirical question whether these factors promotes IBs stability. The expected effect of risk and stability factors of Islamic banks on financial stability is a priori ambiguous. As we

know that IBs were relatively protected from the crisis and their resilience during the crisis has induced increased attention towards studying IBs and their role in the financial stability. Yet, this also raises an important question. If IBs enjoyed more resilience during the crisis, do they have enough ability to enhance the stability of the financial system in which they operate? It is assumed in this study that if there is a difference in their theoretical backgrounds then it should be reflected in the relative stability of these two types of banks. This analysis compares the financial stability of the countries having both IBs and CBs operating side by side with the countries having CBs only. Considering their better performance during the GFC and their risk and stability factors it is hypothesized that Islamic banks are more stable compared to interest based banks.

3.3 Nexus between Economic Growth, Investment, and Islamic Banking Development

The purpose of establishment of IBs is to create welfare in the society apart from earning profit (Abduh and Chowdhury, 2012). Islamic banks play their part by providing financial services to the people according to the Shariah principles. Considering the inherent destructions of interest based system, removing interest element from the system should be benefiting the whole economy in addition to the bank based benefits of removing interest. Islamic banks are at the better position to contribute towards betterment of the economy by safeguarding it from the evil effects of interest (Furqani and Mulyany, 2012). According to Karich (2002), one of the prime reasons behind the establishment of interest free banking is to improve the economic and social well-being of the people, and ensuring increased access of fair banking services to majority of people. Islamic finance contributes to the economic welfare by encouraging ethical and moral values (Kassim, 2016; Imam & Kpodar, 2013;

Boukhatem & Moussa, 2018). According to Imam and Kpodar (2016), "Islamic banking can stimulate growth because it acts as a shock absorber for countries subject to large shocks and enhances financial stability as Islamic banks are less prone to crisis".

This basic idea behind this study is to study the role of Islamic banking development in stimulating economic activity in an economy as non-interest based banking is now getting more developed in terms of customers, investments and instruments. Linking financial development especially banking sector development with economic growth and investment is an important issue to be addressed as an efficient banking system is essential for channeling the surplus funds from savers to the profitable investment avenues. The financial markets emerge as a result of market frictions prevalent in the economy. Financial system, which consists of markets and intermediaries, mitigates these market frictions through the supply of financial services. Well-developed financial system reduces information asymmetry, and minimizes transaction and monitoring costs. It helps encourage investment opportunities by finding and financing profitable avenues, helps mobilizing the savings, monitoring managerial performance, managing risk, and assisting the exchange of goods and services. This ease in channeling of funds and required liquidity reduces the cost and the risk associated with investment leading to increased capital accumulation (Ndikumana, 2005). Capital accumulation further leads to economic growth due to efficient allocation of funds, formulation of physical and human capital, and advancement in technology (Creane, et al. 2003; Beck and Levine, 2004). Financial development stimulates domestic investment via by channelizing savings to capital intensive technologies, by minimizing liquidity risk, and by enabling the investors to hold a diversified investment portfolio to reap the advantage

of low risk and high returns. These functions trigger investment and help the economy achieve sustainable growth rate (Ucan & Ozturk, 2011; Muyambiri & Odhiambo, 2017).

Islamic banking development plays an important part in stimulating economic growth and domestic investment. Islamic banking development ensures the access of financial services in line with the Shariah principles. It discourages interest, gambling, uncertainty, speculation; loan trading all of these prohibitions encourage the business linked to the real economy and helps in creating a stable financial system that is capable of aiding economic activity in terms of increasing investment and sustainable economic growth. It is capable of protecting economy from the negative effects of the interest by linking the transactions with the tangible assets. Islamic banking mobilizes saving, promotes investment and financing activities, encourages ethical financial ventures, and contributes to overall financial stability (Imam and Kpodar, 2016).

The importance of financial sector development in inducing economic activity was first recognized by Bagehot (1873) who stated that financial system by easing the mobilization of capital encouraged industrialization in England. Later on, Schumpeter (1911) proposed that financial intermediaries contributes in inducing productivity growth and technological change. Following the initial study by Schumpeter (1911) and the later studies by Patrick (1966), Goldsmith (1969), McKinnon (1973) and Shaw (1973), focus of economic research shifted towards investigating the impact of financial development on economic activity.

Three schools of thoughts prevails regarding relationships between financial development and economic growth. First, the supply-leading hypothesis states that financial development has an important role in promoting economic growth and considered as a necessary

requirement for economic growth (Schumpeter, 1911; Patrick, 1966; Goldsmith, 1969). Financial development stimulates economic growth through the channel of capital formation (Schumpeter, 1934; Goldsmith, 1969; Quartey & Prah, 2008). On the other hand, McKinnon (1973), and Shaw (1973) support supply leading hypothesis and believe that the capital formulation is dependent on rate of return on real cash balances which is helpful in attaining a high rate of growth but low or negative real interest rate curtails saving and shrinks supply of funds for investment, which reduces economic growth. McKinnon-Shaw model asserts that financial development is hindered by government restrictions on the banking system mainly in the form of interest rate ceilings, high reserve requirements, and directed credit programs. Weak capital markets in developing countries are more vulnerable to these restrictions.

Financial development promotes economic activity as explained by Ahmed and Ansari (1998) in the following steps: "1) financial markets enable small savers to pool funds, 2) savers have access to a wider range of instruments which stimulate savings, 3) efficient allocation of capital is achieved as the proportion of financial saving in total wealth rises, 4) financial intermediaries redirect savings from individuals and the slow-growing sectors to the fast-growing sectors, 5) financial intermediaries partially overcome the problem of adverse selection in credit markets, and 6) financial markets encourage specialization in production, development of entrepreneurship and adoption of new technology".

Second, the demand following hypothesis states that financial development is the aftermath of economic growth. Financial services and institutions develop as a result of increasing demand for financial services in a growing economy (Robinson, 1952; Stern, 1989). Finance is only considered as the byproduct of the growth in real side of the economy. The third

hypothesis states bi-directional relationship where both considered to be complimenting each other (Lewis, 1955; Jung, 1986; Luintel & Khan, 1999).

Accelerator investment theory suggests that financial development affects domestic investment through the channel of real output growth (Jorgenson, 1971). According to Ndikumana (2000), "financial development has accelerator-enhancing impact on domestic investment i.e. overall level of financial development makes domestic investment more responsive to output growth." Financial development stimulates the flow of financial resources to investors in order to meet the increase in demand for output. Increase in GDP growth induces firms to increase their investment which increases the profit margins. The fixed investment and the capital stock of firms goes up leading to capital accumulation and hence the domestic investment.

The objective behind this analysis is to narrow the gap in the literature by examine to what extent abandoning interest based transactions led IBs' to contribute towards the betterment of the economy in terms of inducing economic growth and domestic investment in countries having DBS. The analysis used dynamic growth and investment model including the lagged variable of growth and investment, indicators of FD and macroeconomic determinants of growth and investment respectively.

4 CHAPTER FOUR

LITERATURE REVIEW

Here the relevant literature on each topic is discussed in Section 4.1, 4.2, and 4.3.

4.1 Islamic and Conventional Banks during Business Cycle

Attention has now been diverted towards investigating the features inherent in Islamic banking that contributed towards their relative resilience to the external shocks. A review of the literature reveals contradictory results regarding the difference that prevail between both in terms of their business orientation, efficiency, assets quality, and stability.

Regarding business orientation, Aggarwal and Yousef (2000), Chong and Liu (2009), Khan (2010), Ariff and Rously (2011) found that both IBs and CBs are similar in their activities. In the same way, Suzuki et al. (2017) found that financing activities of Shariah based banks are dominated by Murabah instead of PLS, which is similar to conventional banking products. Contrary to the above findings, Shahimi et al. (2006) demonstrated that IBs are involved more in nontraditional revenue earning businesses as compared to CBs. They postulated that banks that are more involved in fee-based business tend be less risky and more safe. It enables banks to have greater access to more diverse sources of revenues generation. Furthermore, Beck et al. (2013) compared IB and CB in terms of their business model, efficiency, assets quality and stability over the period 1995-2009 across 22 countries in a sample of 88 IBs and 422 CBs. They found higher asset quality, better capitalization and better post-crisis performance of IBs. Similarly, Hardianto and Wulandari (2016) found that IBs have higher share of fee income, have higher intermediation ratio, and higher cost inefficiency compared to their interest based equivalents. Additionally, Miah and Uddin

(2017) conducted comparison in terms of business orientation, stability, and efficiency over 2005-2014 period. Using data of 48 CB and 28 IB in GCC region they found that the Islamic banking model differs considerably from the conventional model.

With regards to cost efficiency, previous literature shows conflicting results. Hassan (2006) found lower cost efficient for IBs in 37 CBs and 43 IBs in OIC countries over 1995-2001 period. Likewise, Majid et al. (2010), Srairi (2010), Beck et al. (2013), Miah and Sharmeen (2015), Hardianto and Wulandari (2016) and Miah and Uddin (2017) also revealed higher cost inefficiency for IBs. Contrary to the above results, Asmild et al. (2018) compared IBs and non-IBs in Bangladesh in terms of difference in patterns of their inefficiency during GFC employing Multidirectional efficiency analysis (MEA) technique and found higher efficiency of IBs during the period 2007-2009. Additionally, Brown et al. (2007) and Pradiknas and Faturohman (2015) also found higher cost efficiency for IBs. However, Bader et al (2010) found no difference between IB and CB in terms of cost efficiency.

Regarding assets quality, unanimous interpretation that IBs exhibit better assets quality has been established by the previous literature. Baele et al. (2012) found less default risk for Islamic loans in Pakistan. Similarly, Rahim and Zakaria (2013), and Aman et al. (2016) found better assets quality for IBs than CBs. Erol et al. (2014) found that IBs showed better performance than CBs in terms of liquidity, asset quality, and earnings in Turkey.

There is an evident difference in stability between the two bank types. Rosly and Bakar (2003) found higher ROA and profit margins for IB in Malaysia. Samad (2004) found that IBs face less credit risk than CBs in Bahrain. Kassim et al. (2009) found that IBs greater ability to withstand monetary policy shocks than CBs in Malaysia. Ariss (2010) found that

IBs are less competitive and better capitalized in sample of 192 CBs and 58 IBs. Similarly, Boumediene and Caby (2009) showed highly volatility of CB's returns during the GFC in a sample of 14 IBs and 14 CBs. IB's return volatility was initially low but increases afterwards. They found that IBs remained protected during GFC but suffered mainly due to their links with the real economy. Cihak and Hesse (2010) found that IBs are more stable when they are small in size and CBs are more stable when the large in size. IBs lack the necessary capability to manage and monitor their credit risk as the scale of their operations widens. Problems like adverse selection and moral hazard becomes noticeable when IBs cannot monitor their growing operations especially those based on PLS arrangements. Hasan and Dridi (2010) found that crisis has different impact on both bank types due to difference in their business models. IBs' higher profitability during crisis period reduces the adverse impact of crisis on them. However, lack of risk mitigation tools expose IBs to financial shock to the greater extent. Furthermore, Beck et al. (2013) found that IBs are more able to sustain negative shocks due to higher capitalization. Rahim and Zakaria (2013) also found that IBs are more stable and have higher credit efficiency. They also stated that IBs perform better in economic boom period. Abedifar et al. (2013) found less credit risk and more stability for IBs. They found that due to the complications involved in Islamic banking instruments and Shariah restriction in their investment and risk management activities they are exposed to extra risk as compared to CBs. Olson and Zoubi (2016) and Abedifar et al. (2013) further stated that this extra risk helps them achieve higher profitability. Likewise, Mirza et al. (2015) established that IBs are better capitalized and are more stable.

Furthermore, Khediri et al. (2015) found that IBs have higher profitability, liquidity, capitalization and suffer less credit risk. Olson and Zoubi (2016) found that IBs were more profitable and more stable prior to GFC but noticeably underperformed when the crisis spreads to the real economy. Additionally, Zarrouk et al. (2016) established that IBs' performance is enhanced when they operate in an environment with high economic growth. Aman et al. (2016) showed less cost efficiency, better assets quality, and higher stability for IBs in Pakistan. Miah and Uddin (2017) found higher stability of IBs than CBs during crisis period. Contrary to these findings, Kabir and Worthington (2017) found higher stability of CBs in 16 developing countries over the period 2000-2012, while Bourkhis and Nabi (2013) found no significant difference in their stability during the crisis period. Recently, Ibrahim and Rizvi (2018), compared the financing growth of IBs with lending growth of CBs during stress period in a sample of 25 IBs and 114 CBs in 10 countries over 2000-2014 period. Their findings suggest that financing growth in IBs is higher than lending growth in CBs during the stress period. Mahdi and Abbes (2018) compared 88 CBs and 42 IBs in MENA region over the period 2005-2013 and found excessive risk taking in IBs. This riskiness is mainly caused by the adherence of contracts such as Mudaraba and Musharaka to the Shariah principles. Moreover, they found that GFC negatively influenced the capital of both bank types.

Numerous studies examined the impact of business cycle on bank's behavior. Albertazzi and Gambacorta (2009) found positive impact of GDP on the interest income and the profit after taxes of the banking industry. Similarly, Zhang and Daly (2013) established that economic prosperity is the stimulating factor behind growth in China's financial services.

Contrary to above mentioned studies, Ozili (2015) found that GDP growth asserts negative impact on banks profitability.

Bikker and Hu (2002) found a negative link between GDP growth and loan loss provisions (LLP). Similarly, Bikker and Metzemakers (2005) also found that LLP increases during slow economic growth. This negative relationship shows increased riskiness of credit portfolio and increased risk of credit crunch. Likewise, Cavallo and Majnoni (2002), Pain (2003), Arpa et al. (2001), Laeven and Majnoni (2003), and Glen and Velez (2011), Isa et al. (2015) also demonstrated negative relationship between LLP and GDP growth. Adzis et al. (2015) showed that banks in Malaysia set aside more LLP during the GFC to absorb unexpected loan losses. Caporale et al. (2015) suggested that LLP is determined mainly by non-discretionary components showing countercyclical behavior of LLP in Italian banks for the period 2001-2012. Contrary to these findings, Anandarajan et al. (2007) stated that during economic expansion, businesses expands and borrowing increases which also increases the risk of default. Banks as a result increase their LLP against the unexpected losses showing that LLP and GDP are positively related.

Khemraj and Pasha (2009) showed that GDP growth has negative association with NPLs in the Guyanese banks, decrease in NPL is associated with improvement in the real economy. Jordan and Tucker (2013) examined the level to which NPL are affected by economic output in The Bahamas and found negative relationship. Similarly, Messai and Jouini (2013) found that GDP growth has inverse relationship with NPL in Italy, Greece and Spain. Skarica (2014) showed that economic slowdown increases the NPLs in 7 CEE countries.

Vodova (2011) found that GDP growth and liquidity is positively related in case of Slovakian banks for the period 2001-2010. Borrowers demand less credit during growing economy and increase the demand for loans during economic slowdown. As a result, during the period of higher unemployment and lower profitability banks tend to lend more resulting in decreased liquidity. In contrast, Vodova (2010) found a negative link between GDP growth and bank liquidity in Czech Republic banks for the period 2001-2009.

Guidara et al. (2013) showed that Canadian banks hold more capital buffer in recessions than in expansion, they were high capitalized and this factor contributed towards there resilience during GFC. Almazari (2014) suggested that when the size of the bank increases diseconomies of scale prevails in Saudi and Jordanian banks. Small sized banks are at better position to get information advantage and as compared to large banks. Damankah et al. (2014) suggested that banks with small size, having low levels of deposits, higher liquidity, and higher expected loan losses mostly engage in non-interest earning activities as compared to large sized banks in Ghana. Conversely, Ruzickova and Teply (2015) showed that banks facing greater competition usually hold higher shares of fee income.

Several studies examined the link between GDP growth and IBs' behavior. For instance, Bashir (2003) documented that growing economy tends to stimulate higher profitability of IBs. Similarly, Zeitun (2012) showed that GDP and profitability of both IB and CBs is positively related in GCC countries during 2002-2009 period. Rahim and Zakaria (2013) showed positive relationship GDP and stability of both IBs and CBs. Almanaseer (2014) found no significant impact of GFC on profitability of 24 IBs operating in Bahrain, Kuwait, Qatar, Saudi Arabia and UAE over the period 2005-2012. They also found positive impact of GDP and size on IBs' profitability.

In contrast to the above-cited studies, Abdullah et al. (2015) found a negative link between business cycle and LLP in Malaysian banks. Recently, Rashid and Jabeen (2016) found a negative link between GDP and performance of both IBs and CBs. Masood and Ashraf (2012) showed that IBs of larger assets achieves higher profitability in 25 banks from 12 countries over 2006-2010 period. IBs have lower LLP than CBs. Taktak et al. (2010) suggested that IBs are well capitalized and are involved in less risky activities. Relationship of GDP with LLP indicates no effect of business cycle upon current LLP decisions of bank. Soedarmono et al. (2017) suggest that procyclical provisioning in IBs i.e. provisions are reduced when economy is growing. Moreover, it has been observed that LLPs are inflated by IBs as a part of discretionary managerial actions specifically when bank capitalization ratio decreases. They further suggest that for IBs with higher capitalization LLPs behave counter cyclically as they tend to maintain more reserves and provisions during period of high growth. Likewise, Bitar et al., (2017) investigated the financial characteristics that differentiate IBs from their conventional equivalents in a sample of 8615 banks, including 123 IBs during the period 2006 to 2012. They found that IBs are more capitalized, and have higher liquidity, profitability, and earnings volatility. Moreover, IBs had higher capitalization ratio and profitability during GFC. Furthermore, Alandejani et al., (2017) examined the survival time of IBs and CBs in GCC countries using discrete-time duration models during the period 1995-2011. The result of hazard function shows that IBs have a higher incidence rate of failure, and survivor functions indicate that they have shorter survival time than CBs. In context of Pakistan, Rashid et al. (2018) shows that IBs are less profitable, less cost efficient, better capitalized, more liquid and possess low credit risk over

the period 2005-2014. They found negative impact of GFC on the profitability of both IBs and CBs.

There is a considerable gap in the literature as previous studies investigated the effects of GDP and other macroeconomic indicators on IBs and CBs, but failed to study the behaviour of IBs with respect to different business cycle phases. This study differs from the literature mentioned earlier as it investigates the difference in the behaviour of IB and CBs business orientation, cost efficiency, assets quality, and stability during changes in the business cycle.

4.2 Financial Soundness of Single *versus* Dual Banking System

Shariah based banking principles are widely investigated these days to identify the areas in which they can be helpful for the economy as well as the global financial arena. There is a vast literature on stability of IBs and CBs and the majority of the research is focused on studying stability during the GFC.

Numerous papers examined the determinants of banks performance which includes; Samad and Hassan (2006) studied solvency and risk associated with Bank Islam Malaysia Berhad (BIMB) during 1984-1997 period. Inter-temporal analysis showed that BIMB becomes more solvent over time. In addition, comparison of BIMB with CBs showed that BIMB is more solvent and suffer relatively less credit risk due to large investments in Government securities and maintains more equity capital which increases shock absorbing capacity of IB and help them survive during loan losses compared to banks which has less capital. Furthermore, Masood and Ashraf (2012) showed that size, capital adequacy, loans to assets ratio, assets management are internal, whereas GDP and inflation are external determinants of IBs profitability. Similarly, Zhang and Daly (2013) examined performance of 124

Chinese banks over 2004-2010 period. Results showed that low credit risk and adequate capital increases profitability, and high expenses decrease banks performance. They also found that financial services increase with the economic prosperity. However, rising production costs tends to decrease bank's profitability. Bilal et al. (2013) found positive association between GDP growth and bank size. Results also showed that inflation asserts negative impact on profitability. On the same lines, Almazari (2014) found that Saudi banks have higher profitability than Jordanian banks. Cost income ratio and banks' size asserts negative influence on banks' profitability in both countries. Zarrouk et al. (2016) found that cost effectiveness, assets quality, capitalization, and GDP growth are positively, whereas, the inflation is inversely associated with Islamic banks' profitability in 51 IBs in MENA region over the period 1994-2012. Ashraf et al. (2016) showed positive relationship between size and Islamic banks' stability. Recently, Ibrahim and Rizvi (2017) examined weather IBs should increase size or should they stay small from the perspective of size and stability relationship using a panel data of 45 IBs across 13 countries and found that when IBs cross certain threshold in terms of size, their stability increases with increase in their size.

Many researchers highlight the risks associated with IBs and CBs which includes: Samad (2004) found that IBs in Bahrain suffer less credit risk and possess greater ability to sustain losses. Janice et al. (2005) found that IBs in Malaysia suffer less credit risk due to risk and return sharing principle and higher portion of Murabahah in overall financing activities over 1988-1996 period. Contrary to that, Abedifar et al. (2011) compared insolvency and credit risk of IBs and CBs in 22 OIC countries having 101 IBs, 72 CBs with Islamic windows and 283 CBs over the period 2001-2008. They found that no significant difference in terms of insolvency risk amongst them. IBs have significantly lower credit risk as measured by the

ratio of problem loans to gross loans and the ratio of loan-loss reserves to gross loans. Moreover, IBs more frequently write off loans and have lower recoverability of these loans. Credit and insolvency risk of CBs decreases which size but IBs are less able to mitigate these risks by increasing their size.

Literature reveals conflicting arguments results regarding the stability differences between IBs and CBs; Cihak and Hesse (2010) studied the stability of IBs using Z-score in 77 IBs and 397 CBS in 18 countries over 1993-2004 period. They found that IBs are more stable when they are smaller in size and CBs are more stable when they are larger in size. This suggests that when the scale of their operations increases, stability of IBs decreases and it becomes difficult for them to monitor their credit risk. Likewise, Turk-Asis (2010) found that CBs are more competitive, less sound, and more cost efficient. IBs better performance is attributed to their higher capitalization and higher liquid reserves kept by them. Baele et al. (2012) found that PLS modes such as Mudarabah and Musharakah have less than 2% share in Islamic banks financing in Pakistan. Islamic loans are having low default rates as the borrowers are reluctant to default on religious ground. On the same lines, Okumus and Artar (2012) compared the financial stability of 16 IBs and 54 CBs in Turkey and GCC countries over 2001-2010 period and found that CBs are more stable when they are larger in size and IBs are more stable when they are smaller in size. Moreover, Mirza et al. (2015) found greater stability for IBs in Pakistan. Ramlana and Adnan (2016) suggested greater profitability for IBs in Malaysia as compared to CBs over 2006-2011 period. Yanikkaya et al. (2018) suggested that financing structure based on risk sharing can enhance performance of IBs. Contrary to above findings, Gamaginta and Rokhim (2015) found lower stability for IBs in Indonesia as Islamic banking in Indonesia is still at its infancy phase with a relatively

low returns and higher equity level than CBs. Likewise, Doumpos et al. (2017) showed that CBs performed better in Asia and GCC, while IBs outperformed in MENA and Senegal region. Findings of univariate analysis suggested that IBs are more financially strong. However, regression analysis showed no significant difference in their financial strength. Additionally, Trada et al. (2017) found no significant difference between IBs and CBs in terms of profitability, credit risk and insolvency risk in a sample of 78 IBs in 12 countries over the period 2004-2013. IBs complements their conventional equivalents. Further, they found that bank size and capital are positively linked to profitability and stability, and negatively to the credit risk of IBs.

Researcher arguing higher stability of IBs state that they remained protected during GFC due to their limited exposure to the risky assets, assets based financing, and risk and return sharing arrangements. However, IBs also relied upon leverage and undertook significant risks that made them suffer when the crisis spread to the real economy. Nonetheless, larger equity capital increases shock absorbing capacity of Islamic banks and help them survive as compared to banks having less capital (Samad & Hassan, 2000). Boumediene and Caby (2009) found higher stability for IBs as their stock experiences relatively lower return volatility as compared to CB' stocks. They also adopt better risk management practices.

Hasan and Dridi (2010) revealed higher profitability for IBs during the crisis which significantly declined after the crisis period, but remained relatively similar to CBs' profitability. Assets growth and credit growth for IBs increases and were almost double than that of CBs during the crisis period which shows the growing market share. External rating remained stable for IBs which shows their high solvency and better ability to meet demand for the Islamic banking. Unique nature of the Islamic banks helped them saved during the

crisis but the decline in their profitability after crisis is evident of their weak risk management strategies. Large IBs perform better than small IBs. Additionally, Rahim and Zakaria (2013) suggested that IBs have low income diversification than CBs which shows that when different sources of banks income were adversely affected during the crisis, IBs remained resilient due to low income diversification. IBs were more stable and less risky than CBs in Malaysia over 2005-2010 period. Furthermore, Beck et al. (2013) concluded that IBs have higher costs, higher capitalization, better asset quality, and higher intermediation efficiency. Better asset quality and high capitalization of IBs protected them during GFC and also contributed towards their better stock performance. Ghassan and Taher (2013) found that IBs contribute towards the stability of the financial system through diversification of assets. Mobarek and Kalonov (2014) found that CBs were more cost-effective and financially stable than CBs during GFC in 18 OIC countries. Alqahtani et al. (2016) found that IBs performed better in terms of capitalization, profitability, and liquidity during the early stage of the crisis. However, their performance declined at later stage mainly in the areas of capitalization, profitability and efficiency. They also showed that IBs are superior to CBs in their capitalization ratios, assets quality and management efficiency.

In context of Pakistan, Rashid et al. (2017) found higher Z-score for IBs in Pakistan and found them effective in strengthening the overall financial system. IBs in Pakistan also showed higher profitability, higher income diversity, and higher investments to assets ratio in a sample of 10 CBs, and 4 full-fledge IBs and six standalone Islamic banking branches of CBs over the period 2006-2012. Likewise, Rashid and Khalid (2017) suggested that inflation uncertainty lays negative and interest rate uncertainty lays positive impact on solvency of IBs in Pakistan over 2008-2015 period. Contrary to above findings, Bourkhis

et al. (2013) found that impact of GFC on soundness is same across both types of banks. IBs practices are deviating from Shariah based theoretical model and mimicking conventional banking practices. Hassan et al. (2018) conducted an analysis of liquidity risk in IBs and CBs during GFC in 26 IBs and 26 CBs from selected OIC countries over 2007-2015 period. Their findings suggested that IBs are more able to manage credit and liquidity risk and CBs were more stable. Alexakis et al. (2018) found worse cost performance of IBs than CBs and found similar revenue performance for both types of banks during GFC in GCC countries. Lower cost performance can be attributed to costs associated with Shairah compliant product development and managing a high profile Shariah supervisory board.

There is a considerable gap in the literature as previous studies are confined to either the comparison of IBs' and CBs' individual stability or stability during GFC. They failed to examine their ability to provide stability to the financial system. This study differs from the literature mentioned earlier as it compares the financial stability of two financial systems to gauge the added benefit enjoyed by the system with non-interest based banking. In this sense, a study comparing the two system helps to compare their resilience in response to economic shocks.

4.3 Nexus between Economic Growth, Investment, and Islamic Banking Development

Previous literature on association between financial development and economic growth is focused on examining the correlation and causality. The literature committed to examine the correlation is explained as follows: Levine and Zervos (1998) found positive effect of banking sector development on economic growth and capital accumulation in 42 countries

over 1976-1993 period. Similarly, Levine et al. (2000) showed positive effect of financial development indicators such as liquid liabilities and private credit on economic growth. Beck and Levine (2004) found positive impact of stock market and banking sector developments on economic growth in 40 countries over 1976-1998 period. Similarly, Zhang et al. (2012) found positive association of financial development measures such as financial depth, size of financial intermediaries with economic growth in 286 Chinese cities during 2001-2006. Furthermore, Herwatz and Walle (2014) showed stronger impact of financial development on economic activity in high-income economies in 73 countries over the 1975-2011 period. Pradhan et al. (2014) found a positive connection between banking sector development and economic growth in ASEAN countries over 1961-2012 period. Moreover, Pradhan et al. (2017) showed a strong association among trade openness, banking sector depth and economic growth in ASEAN countries during 1961-2012. Ciftci et al. (2017) showed positive long run impact of both credit market and stock market development on economic growth in a panel of 40 countries during 1989-2011. Moreover, Agbetsiafia (2004), Atindehou et al. (2005), Hye (2011), Campos et al (2012), Jalil and Ma (2008) also found similar positive association between financial development and economic growth in seven African countries, West African countries, Indian context, and Argentina respectively. Contrary to the above findings, Narayan and Narayan (2013) found that banking sector development indicated by bank credit has negative impact on the economic growth in 65 countries over 1995 to 2011 period. Hye and Islam, (2012) also found negative impact in Bangladesh.

The literature investigating the causal relationship reported three types of relationships. Literature on supply leading hypothesis includes following studies; Goldsmith (1969)

conducted a first empirical study investigating the relationship in a sample of 35 countries and found the supply leading relationship. MacKinnon (1973) and Shaw (1973) postulated that the contributing role of financial development in economy is constrained by the government interventions on financial sector which includes high reserve requirements imposed by central bank, control over interest rate, and administrative allocation of bank credits, etc. which dampens prospects of the real sector of economy. Similarly, King and Levine (1993) found positive impact of financial development on growth in 80 countries over 1960-1989 period. On the same lines, Ahmed and Ansari (1998) support for the supply-leading hypothesis in India, Pakistan, and Sri Lanka. Christopoulos and Tsionas (2004) also found supply-leading hypothesis in ten developing countries over 1970-2000 period. Furthermore, Khan et al. (2005) found long-run link between economic growth and financial depth in Pakistan over 1971-2004 period. Adu et al., (2013) found that the relationship varies with the proxy used. They showed that the credit to the private sector ratio and total domestic credit ratio have positive, while broad money stock to GDP ratio has no impact on economic growth. Inoubli and Khallaouli (2011) studied the threshold effect to see whether there is any non-linearity in the relation in MENA region over the 1981-2008 period. The role of financial development is evident only when economy reaches certain level of financial development, below which the contribution is weak and above which the contribution is strong. Mehrara et al. (2012) found that in both the short run and the long run financial development has positive impact on economic growth for Iranian economy during 1975-2008. Uddin and Shahbaz (2013) also found positive impact of financial development in Kenya over the 1971-2011 period. Mahmood (2014) found supply leading relationship in Pakistan over 1979-2008 period using ARDL method. In addition to the

above studies, Spears (1992), Dehejia and Lleras-Muney (2003), Hasan et al. (2009), Biitencourt (2012), and Atif et al. (2010) also found that financial development cause economic growth.

The demand-following relationship is also established by numerous studies such as Liang and Tang (2006) found that economic growth caused financial development in China over the period 1952 to 2001 using Multivariate vector autoregressive (VAR) framework. Similarly, Adamopoulous (2009) found that economic growth leads to credit market development in Ireland for the period 1965-2007. In addition, similar relationship us reported by Robinson (1952), Lucas (1988), Kuznets (1955) and Chandavarkar (1992).

Bi-directional relationship is by Jung (1986) who found supply leading relationship in less developed while demand-following relationship in developed countries in a sample of 56 countries. Similarly, Demetriades and Hussein (1996) found bi-directional relationship. Luintel and Khan (1999) showed bi-directional relationship in ten less developed countries using multivariate VAR model. Rufael (2009) found bi-directional relationship in Kenya using VAR framework over the period 1966–2005. Similarly, Abu-Bader and Abu-Qarn (2008) found presence of bi-directional relationship in Egypt, Morocco and Tunisia.

The literature on the impact of banking sector development on domestic investment includes; Odedokun (1996) found a positive impact of financial development on domestic investment in 71 less developed countries. They found positive impact of per capita GDP growth and trade flows, while negative impact of external debt, public borrowing and inflation on domestic investment. Matsheka (1998) showed that credit extended to private sector has positive impact on domestic investment in Bostawana. Benhabib and Spiegel

(2000) found positive impact of share of banking assets in total banking assets on investment in Argentina, Chile, Indonesia and Korea over 1965-1985 period. Similarly, Ndikumana (2000) stated that well-developed financial system promotes economic growth in 30 sub-Saharan African countries by stimulating capital accumulation. Nasir and Khalid (2004) suggested that interest rates and domestic saving asserts positive impact on investment in Pakistan over the period 1971 -2003. Furthermore, Ndikumana (2005) found that the level of financial development is important in making domestic investment reactive to the increase in aggregate demand of output. On the same lines, Salahuddin et al. (2009) found that per capita GDP, trade openness, and domestic savings have positive while foreign debt servicing has negative impact on domestic investment in 21 developing Muslim countries over 1970-2002 period. Dutta and Roy (2009) found that existing state of investment in an economy decides the level of financial development. Countries having low investment climate need to have a well-established financial system and vice-versa.

Fowowe (2011) found accelerator effect in 14 Sub-Saharan African countries, and states that financial development stimulates investment through economic growth. Further negative relationship is also established between inflation and investment. Ucan and Ozturk (2011) investigated the role that financial development plays in stimulating domestic investment in Turkey over 1970-2009 period. The findings suggested positive relationship. Furthermore, domestic investment is affected negatively by inflation and real interest rate. Consistent with the literature, Mushtaq and Siddiqui (2016) suggested that interest rate and inflation have negative, while trade flows have positive impact on investment in 17 Islamic and 17 non-Islamic countries over 2005-201 period. Furthermore, credit provided to private sector has inverse relation with investment in non-Islamic countries. Muyambiri and

Odhiambo (2017) found that financial development associated with banking sector has positive impact on investment in Botswana over 1976- 2014 period. Furthermore, Pattanaik et al. (2013) found negative impaxct of real interest on domestic investment and economic growth. Similarly, Greene and Villanueva (1990), Larsen (2004), Aysan et al. (2005), Bader and Malawi (2010), Hyder and Ahmed (2003), Muhammad et al. (2013) also found a negative impact of real interest rates on investment. Contrary to the above findings, Athukorala (1998) found positive influence of interest rate on savings and investment India.

The association between Islamic banking development and economic growth is also investigated. For instance, Furqani and Mulyany (2012) found promoting role of economic growth in development of Islamic banking institutions in Malaysia for period 1997-2005. Abduh and Chowdhury (2012) found that economic growth has positive impact on Islamic bank financing and bi-directional relationship with Islamic bank deepening in Bangladesh over 2004-2011 period using quarterly data. Abdul et al. (2012) suggested that Islamic financial development has positive impact on economic growth in long run in Bahrain over 2000-2010 period. Manap et al. (2012) suggested that the Islamic banking development causes economic growth in Malaysia over the period 1998-2012 using quarterly data. Abduh and Omar (2013) found bi-directional relationship and suggested that Islamic banks' domestic financing promotes economic growth in Indonesia and vice-versa over the 2003-2012 period. Yusof and Bahlous (2013) suggested that Islamic banking development promotes economy activity in Malaysia, Indonesia, and GCC countries over the 2000-2009 period. Farahani and Dastan (2013) also found that Islamic financial development asserts positive impact on economic growth in Saudi Arabia, Bahrain, Kuwait, Malaysia, UAE,

Yemen, Egypt, Indonesia, and Qatar during 2000-2010. Similarly, Tabash and Dhankar (2014) found similar positive relationship in Qatar, Bahrain, and UAE.

On the same lines, Abedifar et al. (2016) found positive influence of the market share of IBs on economic welfare in 22 Muslim countries having DBS, over 1999-2011 period. Furthermore, Kassim (2016) found that Islamic deposits are promoting real economic activity in the long run in Malaysia over the period 1998-2013. Imam and Kapodar (2016) suggested that Islamic banking promotes economic growth via capital accumulation in 52 countries over 1990-2010 period. Smaouia and Nechib (2017) found that sukuk markets plays an important role in prompting long-run economic growth in 18 sukuk-issuing countries over 1995-2015 period. Likewise, Boukhatem and Moussa (2018) also similar supporting role of Islamic financial development in stimulating economic growth in 13 MENA countries over 2000-2014 period. They further suggested that institutional framework should be more developed for this impact to be more significant. Tabash and Anagreh (2017) suggested that Islamic banking development has supply-leading relationship with economic growth. It has also promoted investment and FDI in the economy.

Prior empirical literatures has provided rich evidence regarding the importance of banking sector development in inducing economic activity but these studies leave a gap in our knowledge about the role that Islamic banking development plays in economic prosperity. Being limited in number, the literature on Islamic banking development is largely focused on economic growth. Domestic investment, however, is the area that remained under researched with regards to the impact of Islamic banking development. In this study, we bridge the gap in Islamic banking literature how far Islamic banks are successful in inducing

growth and investments in the economy. We expect that Islamic banks due to their inherent features are at the better position to induce economic prosperity. This area should be widely investigated to reap the long run benefits of non-interest based banking apart from the financial benefits. What we have examined after the analysis of the existing literature is that all of these studies used just the crude measures of Islamic banking development. None of them have used different financial development indicators to measure Islamic banking development. This study is unique regarding the measurement of banking sector development attributed to IBs and CBs separately.

5 CHAPTER FIVE

DATA AND METHODOLOGY

This chapter first explains the sample selection and data sources, estimation technique applied and validity of instruments in section 5.1, 5.2, and 5.3 respectively. Then, discusses in detail the econometric framework of each aspect in Section 5.4, 5.5, and 5.6.

5.1 Sample Selection and Data Sources

Sample consist of two types of datasets, one comprising of countries having both conventional and Islamic banks operating side by side, and the other dataset includes group of countries having conventional banks only. Annual panel data for the period 1995 to 2014 is used. Specifically, first data set consists of data of 62 Islamic and 218 conventional banks across 20 countries[3]. The second dataset with SBS countries includes data of 136 conventional banks from 19 countries[4]. Banks included in the sample have at least two observations and countries included have a data of at least two banks. The data set consists of full-fledged Islamic and conventional banks. Further, the conventional banks are selected based on their assets size matched to IBs in the given country. Bank-level data has been obtained from Datastream and BankScope, and data on country-level variables is taken from the World Bank, IMF database (IFS), Datastream, and FRED.

3 Countries with dual banking system: (No. of Conventional Banks, No. of Islamic Banks)
Egypt (10,2), Indonesia (37,1), Palestine (3,2), Pakistan (19,2), Turkey (12,1), Bangladesh (22,7), Jordan (11,3), Kuwait (5,5),Oman (6,1), Qatar (7,3), Saudi Arabia (8,4), United Arab Emirates (17,7), Bahrain (12,6), Brunei Darussalam (1,1), Maldives (1,1), Gambia (8,1), Yemen (5,4), Iraq (12,7), Syria (13,2), Mauritania (9,2).

4 Countries with single banking system (Total numbers of Conventional banks)
Portugal (4), Poland (14), Norway (23), Mexico (2), Malta (3), Italy (13), Hungry (1), Finland (2), Greece (7), Hong Kong (8), Austria (7), Belgium (3), Colombia (7), Sweden (4), Spain (8), Zimbabwe (1), Argentina (6), Taiwan (12), Ukraine (11).

5.2 Estimation Technique

In this dissertation, econometric framework consists of dynamic panel models. The dependent variables in each analysis is predicted by their previous values. If we ignore this aspect and does not consider the past value of the dependent variable, we will get miss-specified equations and biased results. This situation entails an instrumental variable technique whereby the error term will no longer be correlated with the lagged dependent variable. In contrast, conventional estimation techniques such as OLS and fixed-effects estimator would give biased results and generate coefficient of the lagged dependent variable which is biased upward and biased downward respectively. Furthermore, these estimation techniques suffer omitted variable bias and fail to address dynamic panel modelling aspect.

In dynamic models instruments are generated internally to remove endogeneity. As a result, in the dynamic GMM estimation, not all variables in the equation are correlated with error term. Roodman (2009) states that, "In finance data due to shortage of appropriate instruments from outside, valid instruments could be generated from within the existing data by taking lag values and/ or differenced values of a variable". Therefore, in this dissertation we use "Two Step Robust System GMM" estimation technique developed by Arellano and Bover (1995) and Blundell and Bond (1998) to estimate the difference between IBs and CBs from three difference perspectives. It is noteworthy to discuss why system GMM is used instead of difference GMM. Difference GMM technique is developed by Arellano and Bond (1991) to estimate the model in first difference in order to remove unobserved individual effect. This technique employs instruments which are all lagged values of dependent variables and exogenous regressors. However, it fails to remove the endogeneity of the

explanatory variables. Furthermore, Blundell and Bond (1998) established that, "when the dependent variable and the explanatory variables are persistent over time, lagged levels of these variables are weak instruments for the regression equation in differences". System GMM yields more robust, efficient and precise estimation than difference GMM (Blundell & Bond, 1998; Baltagi, 2009, and Roodman, 2009). Secondly, two step system GMM techniques is applied instead of one step system GMM. According to Roodman (2009) and Windmeijer (2005), "The two-step estimation is more efficient than one-step; it will lead to results that are accurate". One step system GMM estimation reports Sargan statistic which is not robust to heteroscedasticity or autocorrelation. Two-step estimation reports the Hansen J statistic which is robust. Secondly, it also tests second order serial correlation in residuals using Arellano and Bond test for AR (2).

According to Bond et al. (2001), "System GMM estimation method uses lagged levels of variables as instruments for differenced equations and lags of the first-differences of variables for equations in level". There are added advantage that system GMM has over conventional estimation techniques i.e. ordinary least square, fixed effects and first-difference GMM estimators. Firstly, it controls for heterogeneity across individual banks as it estimates the model both in levels and first differences and allows use of different instruments with different lag structure for both equations. Secondly, it removes the time-invariant unobservable firm-specific fixed effects by taking first difference of each underlying variable. Thirdly, it uses appropriate lags of independent variables as instrumental variables to mitigate problem of endogeneity.

5.3 Validity of Instruments

To ensure that the system GMM process is correct specified, tests of overidentifying restriction and second-order serial correlation are applied. *J*-statistic of Hansen (1982), the test of overidentifying restrictions, is asymptotically distributed as chi square with degree of freedom equal to the number of overidentifying restrictions (number of instruments minus the number of parameters estimated). The null hypothesis of *J* Hansen test is that the instruments are valid i.e. they are uncorrelated with the error terms in the estimated equation. In addition, Arellano and Bond (1991) AR(2) test is applied to check the presence of second-order serial correlation in the residuals for each underlying model. The null hypothesis is that there is no serial correlation in the residuals. Since the model is dynamic in nature, there is a possibility that the model might exhibit first-order serial correlation, but second-order serial correlation should not be present in the residuals.

The estimates from the above diagnostic tests are reported in Panel B of each table presented in the results section. In results table, it is established that system GMM estimates are efficient and consistent as the *J*-statistic of Hansen test states that the instruments are valid. Secondly, the AR(2) states that there is no second order correlation in the residuals.

5.4 Islamic and Conventional Banks during Business Cycle

5.4.1 Data and Variable Construction

In this section, discussion is based on data used and how variables used are constructed.

5.4.1.1 Data and Sample

The dataset consists of countries having DBS. Annual data of 62 IBs and 218 CBs across 20 countries for the period 1995 to 2014 is taken.

5.4.1.2 Variables Construction

Here construction of dependent and independent variables is discussed.

5.4.1.2.1 Dependent Variables

For the purpose of analysis, a large set of variables is used selected in adherence to the previous literature. Both types of banks are compared regarding their business dynamics, cost efficiency, quality of credit, and stability.

5.4.1.2.1.1 Business Orientation

Business orientation shows the business model of the banks upon which their business activities and operations are based. The Shariah-compliant nature of the IBs implies a different business model than the CBs which can be assessed by studying their fee-based business and funding allocation. Two indicators suggested by Demirguc-Kunt and Huizinga (2010) and Beck et al. (2013) are used to represent business orientation.

5.4.1.2.1.1.1 Fee-Income Ratio (FIR)

The source of funds is measured using the fee-income ratio which is the ratio of fee-income to total operating income. It is used to measure the relative extent of interest and non-interest revenues and shows the extent to which banks are involved in non-interest-based sources of earnings revenues, e.g. fees and commission etc. There are three types of fee-based services

provide by IBs which includes financial, agent, and non-financial service. First, financial service includes Wakalah (financial representative), Kafalah (guarantee), Hiwalah (account receivable transfer), Rahn (pawn) and Sharf (foreign exchange). Second, agent service includes Mudharabah muqqayyadah (profit-sharing activity). Third, non-financial service group includes Wadi'ah yad dhamanah (product or money deposit) (Hardianto and Wulandari, 2016). In CBs it includes cash management underwriting activities, derivative arrangements, and custodial services.

5.4.1.2.1.1.2 Loans to deposit ratio (LDR)

To measure the funding allocation, loans to deposit ratio (also referred to intermediation ratio) is used which shows the extent of loans given by the banks as the percentage of the total deposits. It measures the deposit allocation towards advances. This measure has also been used by Beck et al. (2013), Mirza et al. (2015), and Miah and Uddin (2017). We expect IBs to have more loans to deposits ratio as they intermediate more of their deposits due to non-availability of non-interest based money market.

5.4.1.2.1.2 Efficiency

Cost efficiency is measured by using two variables suggested by Beck et al. (2013). Efficiency measures the cost structure of banks and shows the ability of the bank to keep its costs to a minimum. The proxies used to measure efficiency include:

5.4.1.2.1.2.1 Overhead cost (OHR)

Overhead costs is the ratio of total operating costs divided by total assets. Overhead costs of IBs are expected to be also higher as shown by Beck et al. (2013) due to high cost of

Shariah supervisory boards and committees which includes experts to monitor joint venture contracts and develop products.

5.4.1.2.1.2.2 Cost income ratio (CIR)

Cost income ratio given by overhead costs divided by gross revenues. IBs are expected to have higher CIR as they are relatively young, have limited tendency to achieve economies of scales.

5.4.1.2.1.3 Credit Quality

Credit quality shows the ability of the bank to manage its credit, adequately assess and monitor risk and discipline borrowers. IBs are expected to have better credit quality due to their non-aggressive strategies. Three measures suggested by Beck et al. (2013) are used to indicate credit quality:

5.4.1.2.1.3.1 Loan Loss Reserves Ratio (LLR)

It is indicated by the ratio of LLR to total gross loans. It measures the quality of loans of the banks whereby the higher the ratio the more problematic the loans are. LLR indicate a bank's sense of how stable its lending base is. An increase in the balance is called a LLP.

5.4.1.2.1.3.2 Loan Loss Provisions Ratio (LLP)

It is calculated by dividing LLP to total gross loans. LLP is an expense set aside as an allowance for bad loans. The amount of provisions needed depends on the likelihood of the loan not being repaid, the quality of the loan collateral or bank regulation.

5.4.1.2.1.3.3 Non-performing Loans Ratio (NPL)

It is indicated by the ratio of NPL to total gross loans. NPL is a loan either in default or close to being in default

5.4.1.2.1.4 Stability

Stability measures the ability of the banks to remain solvent under adverse circumstances.

5.4.1.2.1.4.1 Maturity mismatch (MM)

Maturity mismatch is given by the ratio of liquid assets to deposits and short term funding. It shows the ability of a bank to remain solvent in the short-term and assesses the banks' sensitivity to the bank runs. Higher the value of MM, greater is banks' liquidity and lesser vulnerable is the bank to the immediate bank runs. IBs due to Shariah limitation on liquidity management hold higher percentage of liquidity reserves to avoid any liquidity shortages. This measure is previously used by Beck et al. (2013) and Klomp and De Haan (2012).

5.4.1.2.1.4.2 Z-Score

Z-score represents the bank solvency and indicates the number of standard deviations by which the return on asset has to decrease in order to incur a loss.

5.4.1.2.1.4.3 ROA

Return on assets divides the net income of the bank by its total assets.

5.4.1.2.1.4.4 EAR

Equity assets ratio is the equity capital as percentage of total assets.

5.4.1.2.2 Independent Variables

The impact of business cycle phases is studied while controlling for certain bank-specific variables in order to account for bank-level differences. Two control variables suggested by the literature (Beck et al. 2013) are used;

5.4.1.2.2.1 Log of total assets (LTA)

Log of total assets is used in order to control for bank size.

5.4.1.2.2.2 Fixed assets to total assets (FAR)

Ratio of fixed assets to total assets is included in order to control for the opportunity costs that arise from having non-earnings assets on the balance sheet.

5.4.1.2.2.3 Construction of Business Cycle Phases

To identify the different phases of the business cycle, we first divide the GDP of each country included in the sample into three quartiles (Q1, Q2, and Q3) over the sample period. We then, for any given year and for the underlying country, define the peak phase of the business cycle if the GDP of the country lies above the third quartile (Q3), expansion phase of the business cycle if the GDP of the country lies between third quartile (Q3) and second quartile (Q2), contraction phase of the business cycle if the GDP of the country lies between second quartile (Q2) and first quartile (Q1), and trough phase of the business cycle if the GDP of the country lies below the first quartile (Q1). The dummy for peak phase takes a value of 1 for the country-year observations in which the peak phase occurs and otherwise 0. Similarly, the dummy for expansion phase takes a value of 1 for the country-year observations in which expansion phase occurs and otherwise 0. The dummy for contraction

phase takes a value of 1 for the country-year observations in which the contraction phase occurs and otherwise 0. Similarly, the dummy for trough phase takes a value of 1 for the country-year observations in which trough phase occurs and otherwise 0. It is worth noting that multiple phases of the business cycle can occur for a country over the sample period.

5.4.2 Econometric Framework

To examine the impact of business cycle phases on IBs and CBs, we extend the empirical framework proposed by Beck et al. (2013) by incorporating business cycle phases. Business cycle phases have been incorporated into our model following the procedure used by Akhtar (2012) in his capital structure study. The conceptual framework consists of eleven equations. First, the baseline model is formulated whereby we investigate the difference in both types of banks in terms of business orientation, efficiency, credit quality, and stability controlling for bank-specific variables. In the next step, we introduce phase dummies to examine the differential impact of business cycle phases on Islamic and conventional banks.

A. Specification of the Baseline Empirical Model: Comparing Islamic and Conventional Banks

To carry out our investigation, the baseline empirical model for IBs and CBs is estimated to explore the differences in business model, efficiency, asset quality, and stability across the two bank types. Specifically, we estimate the following regression:

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + C_j + B_i + Y_t + \varepsilon_{ijt} \qquad (1.1)$$

where $BANK_{ijt}$ is one of the measures of business orientation, efficiency, credit quality and stability of bank i in country j at time t. $D_{ij}^{Islamic}$ is the dummy variables equal to 1 if the

bank *i* in country *j* is an Islamic bank and 0 otherwise. $D_{ij}^{Conventional}$ is the dummy variables equal to 1 if the bank *i* in country *j* is a conventional bank and 0 otherwise.

Next, we examine the same relationship by controlling for a set of variables that include size, and share of fixed assets in total assets.

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1\, D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.2)$$

where $BANK_{ijt}$ is one of the measures of business orientation, efficiency, credit quality and stability of bank *i* in country *j* at time *t*. $D_{ij}^{Islamic}$ is the dummy variables equal to 1 if the bank *i* in country *j* is an Islamic bank and 0 otherwise. $D_{ij}^{Conventional}$ is the dummy variables equal to 1 if the bank *i* in country *j* is a conventional bank and 0 otherwise. X_{ijt} is the vector of bank-specific variables of bank *i* in country *j* at time *t*. It includes size and share of fixed assets in total assets.

B. Business Cycle Phases and their Differential Effect on Islamic and Conventional Banks

Next, a model with business cycle phases and interaction terms are introduced to test whether the impact of different business cycle phases on IBs is statistically different from that of CBs. As discussed earlier, it is assumed that the concept of Shariah-compliant products and the structure of Islamic banking enables them to behave differently as compared to conventional banks in response to changing macroeconomic conditions. We ascertain the impact of business cycle phases by introducing phase dummies. Then, we

interact phase dummies with Islamic and conventional bank dummy to investigate the differential impact of these phase.

We start by investigating the impact of peak phase of business cycle on different measure of business orientation, efficiency, credit quality and stability, which is given by the following equation.

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} \times D_{ij}^{Islamic} + \beta_4 \sum X_{ijt} \times D_{ij}^{Conventional} + \beta_5 Peak_{jt} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.3)$$

In equation (1.3), $Peak_{jt}$ is the peak phase in country *j* at time *t*, it is a dummy variable equal to 1 if the year corresponds to a peak phase and 0 otherwise. The estimator of key interest is β_5, which shows a change in business orientation, efficiency, credit quality and stability during peak phase.

Next, in equation (1.4) we interact the peak dummy with bank dummy to investigate differential impact of each phase on Islamic and conventional banks.

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} \times D_{ij}^{Islamic} + \beta_4 \sum X_{ijt} \times D_{ij}^{Conventional} + \beta_5 Peak_{jt} \times D_{ij}^{Islamic} + \beta_6 Peak_{jt} \times D_{ij}^{Conventional} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.4)$$

Here, $Peak_{jt} \times D_{ij}^{Islamic}$ and $Peak_{jt} \times D_{ij}^{Conventional}$ terms represent the interaction of the peak phase dummy with Islamic and conventional bank dummy respectively to ascertain the differential impact of peak phase between Islamic and conventional banks. β_5 and β_6 shows the impact of peak of the business cycle on business orientation, efficiency, credit quality and stability for Islamic and conventional banking respectively. The test of

differential effect is also performed whereby we test whether the impact of $Peak_{jt}$ on business orientation, efficiency, credit quality and stability is the same for Islamic and conventional banking ($\beta_5 = \beta_6$).

Equation (1.5 and 1.6), (1.7 and 1.8), and (1.9 and 1.10) formulate the model for expansion, contraction, and trough phase of the business cycle respectively with the similar interpretation of variables as that of peak phase.

In order to examine their behavior during expansion phase we run the following model;

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} \times D_{ij}^{Islamic} + \beta_4 \sum X_{ijt} \times D_{ij}^{Conventional} + \beta_5 Expansion_{jt} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.5)$$

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} \times D_{ij}^{Islamic} + \beta_4 \sum X_{ijt} \times D_{ij}^{Conventional} + \beta_5 Expansion_{jt} \times D_{ij}^{Islamic} + \beta_6 Expansion_{jt} \times D_{ij}^{Conventional} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.6)$$

$Expansion_{jt}$ is the phase in country *j* at time *t*, it is a dummy variable which assumes the value equal to 1 if the year corresponds to an expansion phase of the business cycle and 0 otherwise. Test of differential effect shows, if the impact of $Expansion_{jt}$ on business orientation, efficiency, credit quality and stability is same for Islamic and conventional banks ($\beta_5 = \beta_6$).

Banks' behavior during contraction phase is given by the following model;

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} \times D_{ij}^{Islamic} + \beta_4 \sum X_{ijt} \times D_{ij}^{Conventional} + \beta_5 Contraction_{jt} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.7)$$

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} \times D_{ij}^{Islamic} + \beta_4 \sum X_{ijt} \times D_{ij}^{Conventional} + \beta_5 Contraction_{jt} \times D_{ij}^{Islamic} + \beta_6 Contraction_{jt} \times D_{ij}^{Conventional} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.8)$$

$Contraction_{jt}$ is the phase in country *j* at time *t*, it is a dummy variable which assumes the value equal to 1 if the year corresponds to an contraction phase of the business cycle and 0 otherwise. Test of differential effect shows, if the impact of $Contraction_{jt}$ on business orientation, efficiency, credit quality and stability is same for Islamic and conventional banks ($\beta_5 = \beta_6$).

Impact of trough phase and the differential behavior of Islamic and conventional bank is given by following equations;

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} \times D_{ij}^{Islamic} + \beta_4 \sum X_{ijt} \times D_{ij}^{Conventional} + \beta_5 Trough_{jt} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.9)$$

$$BANK_{ijt} = \alpha\, BANK_{ijt-1} + \beta_1 D_{ij}^{Islamic} + \beta_2 D_{ij}^{Conventional} + \beta_3 \sum X_{ijt} \times D_{ij}^{Islamic} + \beta_4 \sum X_{ijt} \times D_{ij}^{Conventional} + \beta_5 Trough_{jt} \times D_{ij}^{Islamic} + \beta_6 Trough_{jt} \times D_{ij}^{Conventional} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (1.10)$$

$Trough_{jt}$ is the trough phase in country *j* at time *t*, it is a dummy variable which assumes the value equal to 1 if the year corresponds to a trough phase of the business cycle and 0 otherwise. Test of differential effect shows, if the impact of $Trough_{jt}$ on business orientation, efficiency, credit quality and stability is same for Islamic and conventional banks ($\beta_5 = \beta_6$).

5.5 Financial Soundness of Single *versus* Dual Banking System

5.5.1 Data and Variable Construction

We discuss data and construction of variables in this section.

5.5.1.1 Data and Sample

In this analysis, we used both datasets of countries having DBS and SBS. Annual data for the period 1995-2014 are taken. Industry specific variables were manually constructed the data of which has been taken from multiple sources.

5.5.1.2 Variables Construction

Here, we discuss dependent, and independent variables.

5.5.1.2.1 Dependent Variables

For examining the soundness of two financial systems, we used three measures of bank's stability i.e. Z-score, ROA and equity assets ratio. These three measure are used extensively by researchers for measuring stability of banks and are as follows;

5.5.1.2.1.1 Z-Score

Z-score represents the degree of standard deviations by which the return on asset has to decrease to achieve a negative return (loss). Z-score is inversely related to the probability of bank's solvency. It is a probability that the value of its assets might become lower than the value of debt (i.e. the losses exceed equity). It is denoted by the formula; $Z = (\mu + K)/\sigma$ where μ denotes the bank's average return as percentage of assets, K is the equity capital

and reserves as percentage of total assets, and σ is the standard deviation of return on assets as a proxy for return volatility. A higher z-score indicates lower probability of insolvency risk.

Z-Score is used empirically by Cihak and Hesse (2010), Beck et al. (2013), and Kabir et al. (2015). Hesse and Cihak (2007) stated that Z-score is an accounting measure of stability and it has edge over other measures as it can be used for institutions facing issues with the availability of sophisticated market data. Secondly, it can be used to compare default in different groups of institutions. Z-score is the best and improved measure of stability specifically for cross country comparison as each country vary in terms of reporting requirements.

5.5.1.2.1.2 Return on Assets (ROA)

ROA is indicated by the ratio of net income of the bank to its total assets and shows the ability of the banks' assets to generate profits. It is used by Beck et al. (2013) and Mirza et al. (2015) as stability measure.

5.5.1.2.1.3 Equity Assets Ratio (EAR)

Equity assets ratio is the equity capital as percentage of total assets. It represents measure of bank capitalization. Equity capital includes capital and reserves. This measure is also used by Beck et al. (2013) and Mirza et al. (2015). Berger (1995) shows the low value of EAR shows less stability and more risk.

5.5.1.2.2 Independent Variables

Independent variables includes bank-specific, industry-specific and macroeconomic variables. The proxies used to represent each are explained as follows;

5.5.1.2.2.1 Bank-Specific Variables

Following bank-specific variables have been used to control bank specific differences between the two groups of banks;

1. Natural log of total assets (NLTA) is used to control the differences banks' size. The stability increases with the increase in size of the bank.
2. Loan assets ratio (LAR) is given by net loans as a percentage of banks total assets and it is used to control differences in asset composition. High value shows that the bank is highly risky as it has high proportion of loan as compared to its assets and which decreases bank's liquidity and stability (Agusman et al., 2008).
3. Cost income ratio (CIR) is measured by the overhead costs as a percentage of gross revenues and used to control differences in cost efficiency between banks. Cost income ratio has negative impact on banks stability (Kwan and Eisenbeis, 1997).
4. Income diversity (ID) measure the extent to which banks are diversifying their businesses and involved in non-traditional lending businesses. It is used to control differences that prevails amongst banks regarding the structure of their income. High value shows high degree of diversification and lead to higher stability (DeYoung and Roland, 2001; Lepetit et al., 2008). This measure is given by;

$$1 - \left[\frac{Net\ interest\ income - other\ operating\ income}{Total\ operating\ income}\right]$$

5.5.1.2.2.2 Industry-Specific Variables

Following industry specific variables have been used in the study;

1. Herfindahl Hirschman Index (HHI) is indicated by summation of squared market shares (in terms of total assets) of all the banks in the country. It is used to control the difference across countries in terms of impact of market concentration on stability. The value of HHI ranges from 0 to 10,000. Zero indicates highly competitive and 10,000 indicates least competitive market (Ariss, 2010).
2. Market share of Islamic banks (MS_IB) is used to gauge the differences in the two banking systems. The interaction term of the market share of the IBs helps to examine the impact of presence of IBs on other banks stability. It identifies the role that the IBs play in the stability of DBS (Rahim and Zakaria, 2013). Higher market shares of IBs increased the stability of the system (Beck et al., 2013).
3. Governance (GOVR) is a measure to control differences across countries in terms of institutional development. Impact of governance is accounted for using the governance indicators compiled by Kaufmann et al. (2005). The single index per country is constructed by averaging the six governance measures of "voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption" based on the work of Cihak and Hesse (2010). Governance measures ranges from -2.5 to 2.5 which shows weak and strong governance performance respectively.

5.5.1.2.2.3 Macroeconomic Variables

Macroeconomic variables take the same value for all banks in a given country and used to control macroeconomic difference between the countries.

1. GDP growth. Higher GDP indicates leads to higher Z-score and higher stability for IBs (Shayegani and Arani, 2012; Demirguc-Kunt and Huizinga, 1999; Bikker and Hu, 2002).
2. Inflation (INFL)
3. Exchange depreciation (EX.DEP)

5.5.2 Econometric Framework

The empirical framework examines the difference in stability of set of countries with single banking system *versus* dual banking system. Specifically, we examine difference in the soundness of the two systems, which is likely to be owing to the presence of IBs in the banking system. We extend the empirical framework proposed by Cihak and Hesse (2010) to investigate the financial soundness in terms of Z-score, ROA, and EAR. Our empirical framework consists of nine equations using three measures of banks' stability for examining the soundness in three different situations. Firstly, we examine the difference in the soundness of single *versus* dual banking systems. Secondly, the soundness of DBS is investigated to examine whether IBs are more stable than the CBs. Finally, the soundness of DBS is investigated with the aim to examine the differential impact of controlled variables across IBs and CBs.

A. Soundness of Single Banking System and Dual Banking System: The Basic Research Question

The basic research question is empirically investigated by estimating the following model. Specifically, the indicators for single banking and dual banking system are introduced in the model.

$$STBL_{ijt} = D_{ij}^{DBS} + D_{ij}^{SBS} + \alpha\, STBL_{ijt-1} + \beta_1 B_{ijt-1} \times D_{ij}^{DBS} + \beta_2 B_{ijt-1} \times D_{ij}^{SBS} + \beta_3 M_{jt-1} \times D_{ij}^{DBS} + \beta_4 M_{jt-1} \times D_{ij}^{SBS} + \beta_5 I_{jt-1} \times D_{ij}^{DBS} + \beta_6 I_{jt-1} \times D_{ij}^{SBS} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (2.1)$$

where $STBL_{ijt}$ represents Z-score, ROA, and EAR for the bank *i* in country *j* at time *t*. B_{ijt-1} represents bank-specific variables, M_{jt-1} represents macroeconomic variables, I_{jt-1} contains time varying industry-specific variables, C_j, B_i and Y_t measures country-fixed effects, bank-fixed effects and time fixed effects, respectively. D_{ij}^{DBS} is the dummy taking value one for country having DBS, and zero otherwise. D_{ij}^{SBS} is the dummy taking value one for country having SBS, and zero otherwise. ε_{ijt} is the error term.

In Equation (2.1), the interaction terms are introduced where bank-specific, industry-specific and macroeconomic variables are interacted with SBS dummy and DBS dummy to examine their differential impact on the financial stability across dual and single banking system.

The interaction term shows:

i. The impact of B_{ijt-1} on Z_{ijt}, ROA_{ijt}, and EAR_{ijt} is same for single and dual banking system. ($\beta_1 = \beta_2$).

ii. The impact of M_{jt-1} on Z_{ijt}, ROA_{ijt}, and EAR_{ijt} is same for single and dual banking system. ($\beta_3 = \beta_4$).

iii. The impact of I_{jt-1} on Z_{ijt}, ROA_{ijt}, and EAR_{ijt} is same for single and dual banking system. ($\beta_5 = \beta_6$)

B. Soundness of Dual Banking System

The second model examines the soundness of only dual banking system using three measures of stability (Z-score, ROA, and EAR). The model is expressed as follows

$$STBL_{ijt} = D_{ij}^{Islamic} + D_{ij}^{Conventional} + \alpha\, STBL_{ijt-1} + \beta_1 B_{ijt-1} + \beta_2 M_{jt-1} + \beta_3 I_{jt-1} + C_j + B_i + Y_t + \varepsilon_{ijt} \quad (2.2)$$

where $STBL_{ijt}$ represents Z-score, ROA, and EAR for the bank *i* in country *j* at time *t*. $D_{ij}^{Islamic}$ is the dummy variable taking the value one for Islamic bank and zero otherwise. $D_{ij}^{Conventional}$ is the dummy variable taking the value one for conventional bank and zero otherwise.

C. Soundness of Dual Banking System: Differential Impact between Islamic Banks and Conventional Banks

The third model also examines the soundness of DBS by introducing interaction terms for IBs and CBs with bank-specific, industry-specific, and macroeconomic variables. Specifically, the model takes the following form.

$$\begin{aligned} STBL_{ijt} = {} & D_{ij}^{Islamic} + D_{ij}^{Conventional} + \alpha\, STBL_{ijt-1} + \beta_1 B_{ijt-1} \times D_{ij}^{Islamic} \\ & + \beta_2 B_{ijt-1} \times D_{ij}^{Conventional} + \beta_3 M_{jt-1} \times D_{ij}^{Islamic} + \beta_4 M_{jt-1} \times D_{ij}^{Conventional} \\ & + \beta_5 I_{jt-1} \times D_{ij}^{Islamic} + \beta_6 I_{jt-1} \times D_{ij}^{Conventional} + C_j + B_i + Y_t + \varepsilon_{ijt} \end{aligned} \quad (2.3)$$

The dependent variable $STBL_{ijt}$ being the Z-score, ROA, and EAR for the bank *i* in country *j* at time *t* for all the banks in countries having DBS. Model (2.3) investigates the difference in stability between IBs and CBs. Specifically the stability of CBs due to the presence of Islamic banks in the DBS. The interaction terms of IBs and CBs are included to examine the differential impact of bank specific variables, industry specific variables and macroeconomic variables upon the stability of two types of banks.

The interaction term shows:

i. The impact of B_{ijt-1} on Z_{ijt}, ROA_{ijt}, and EAR_{ijt} is same for IBs and CBs ($\beta_1 = \beta_2$).
ii. The impact of M_{jt-1} on Z_{ijt}, ROA_{ijt}, and EAR_{ijt} is same for IBs and CBs ($\beta_3 = \beta_4$).
iii. The impact of I_{jt-1} on Z_{ijt}, ROA_{ijt}, EAR_{ijt} is same for IBs and CBs ($\beta_5 = \beta_6$).

5.6 Nexus between Economic Growth, Investment, and Islamic Banking Development

5.6.1 Data and Variable Construction

In this section, discussion of data and variable construction is presented.

5.6.1.1 Data and Sample

This study uses data of 20 countries having DBS. Data of 62 IBs and 218 CBs has been taken in order to develop the financial development indicators separately for IBs and CBs over 1995-2014 period.

5.6.1.2 Variables Construction

Here construction of dependent and independent variables is discussed.

5.6.1.2.1 Dependent Variable

Dependent variables used are; First, economic growth which is given by "the growth rate of Real GDP". Second, domestic Investment is given by "the gross capital formation as a percentage of GDP". According to WDI, "GCF (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and work in progress."

5.6.1.2.2 Independent Variables

Independent variables includes banking development indicators and macroeconomic variables thee choice of which is strictly in conformity with the previous literature. The measures used to represent each variable are explained as follows;

5.6.1.2.2.1 Financial Development

Financial development has been measured using following four indicators of banking sector development attributed to IBs and CBs individually;

First, the depth of financial intermediation (DOI) is given by total loans in the financial system as a percentage of GDP (Zhang et al., 2012). Depth of Islamic financial intermediation is given by total loans of IBs as a percentage of GDP, and depth of conventional intermediation is measured by dividing total loans of CBs by GDP.

Second, the size of financial intermediation (SOI) is given by total deposits in the financial system to GDP (Zhang et al., 2012). Size of Islamic intermediation is indicated by total deposits of IBs as percentage of GDP. Similarly, size of conventional intermediation is given by dividing total deposits of CBs to GDP. According to Beck et al. (2008), "the ratio of deposits to GDP is the stock indicator of funds available in the forms of deposits for financing activities. It shows the extent of loanable funds for lending purpose".

Third measure is credit to private sector by banks as a percentage of GDP (CPS) (Federici and Caprioli, 2009). It measures domestic asset distribution and allocation of funds to the private sector. For Islamic banks it is measured by domestic credit to private sector by IBs to GDP and for conventional banks it is given by dividing the domestic credit to the private sector by CBs by GDP. According to King and Levine (1993), domestic credit is vital for attaining sustainable economic growth. Private credit ensures more productive allocation of resource in economy since private sector has ability to efficiently and productively utilize funds as compared to public sector.

Fourth measure is the ratio of assets of the banks to the total assets of the central banks, Islamic banks and conventional banks (ATA) (Federici and Caprioli, 2009). For IBs it is measured by the ratio of assets of IBs to the total banking assets. Similarly, for CBs it is indicated by the ratio of assets of CBs to total banking assets.

5.6.1.2.2.2 Controlled Variables

Controlled variables in economic growth and investment model includes macroeconomic determinates of economic growth and domestic investment respectively.

5.6.1.2.2.2.1 Determinants of Economic Growth

The potential determinants of economic growth other than financial development are; First inflation (INF), which is given by the percentage change of the CPI index. Theoretically, there are two schools of thoughts governing the link between inflation and growth. One school of thought stated as Mundell–Tobin effect considered money and capital substitutes. It states that when level of inflation rises, interest rate reduces which stimulates investment and economic growth (Mundell, 1965; and Tobin, 1965). The conflicting view states negative relationship whereby inflation is considered as a tax on investment. Inflation enhances the effective cost of investment, inefficiency of price mechanism, and uncertainty in macroeconomic environment (De Gregorio, 1993; Fischer, 1981).

Second, trade openness (T.OPEN) is given by summation of exports and imports divied by GDP. It impedes as well promotes economic growth. Trade openness promotes economic growth by increasing the overall production in the economy through expansion of imports of domestic goods and services (Grossman and Helpman, 1991). It may also leads to reduction in tariffs which ultimately hurts domestic manufacturing by reducing its price relative to foreign goods and making domestic goods less attractive which impedes economic growth (Batra, 1992; Batra and Slottje, 1993).

Third, gross fixed capital formation divided by GDP (GFCF). According to WDI, "GFCF includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings." Capital stock has a positive relationship with the economic growth.

Previous literature provided an evidence regarding the negative impact of inflation and positive impact of openness and GFCF on economic growth (Inoubli and Khallaouli 2011; Narayan and Narayan, 2013)

5.6.1.2.2.2.2 Determinants of Domestic Investment

The determinants of domestic investment are divided into three categories which includes factors related to; conventional investment theory (GDP growth, real interest rate, per capita GDP, and domestic savings); Govt. policy (Govt. consumption expenditure, and inflation); and open-economy (trade openness).

Factors based on conventional investment theory includes first the GDP growth, "measured by the growth rate of real GDP". According to neo-classical theory of investment, GDP growth has positive impact on domestic investment. It shows the increase in domestic investment to meet the aggregate demand for output. This relationship in governed by accelerator effect and well-established in the previous literature which includes Fielding (1997); Wai and Wong (1982); Greene and Villanueva (1991); and Ndikumana (2000).

Second, real interest rate (RIR), "the lending interest rate adjusted for inflation". According to WDI, "Lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector". Two types of relationship prevails between real interest rates and investment. McKinnon (1973) and Shaw (1973) hypothesized that investment has positive linkage with the accumulation of real money balances. Higher interest rates on deposits attract more real balances, which results in more investment. Contrary to it, the neo-classical view advocates that cost of capital increases with increase in interest which ultimately reduces investment. The interest rate affects investment through

the channel of savings. Low or negative real interest rates discourage saving, reducing the amount of funds available for investment.

Third, per capita GDP (P.C.GDP) (annual %) is, "gross domestic product divided by midyear population", and fourth is domestic savings (D.SAV) (percentage of GDP) given by "gross domestic savings calculated as GDP less final consumption expenditure (total consumption)". According to Ndikumana (2000), traditional view states that domestic savings are hypothesized to be positively linked to tdomestic investment. Neo-classical view states that real interest rate influences domestic investment through the channel of domestic savings. When interest rates are low or negative, savings reduces and so the investment.

Policy related factors include: first, Govt. consumption expenditure as a percentage of GDP (GOV.CON). According to WDI, "General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditure on national defense and security, but excludes government military expenditures that are part of government capital formation." Government consumption can influence domestic investment through crowding of private investment. Govt. consumption expenditure may crowd out domestic investment through various channels which includes; increasing interest rates, restricting the pool of funds in the market or by distortionary taxing investment activities. Govt. consumption may leads to budget deficit. This deficit if financed by borrowing from the financial system decrease the private investment. Govt. consumption may have the tendency to increases domestic investment through accelerator effect. Second, inflation (INF). High level of inflation reduces domestic investment. It creates the degree of uncertainty among the investors regarding the macroeconomic activity.

It discourages investors from undertaking long term projects which ultimately reduces investment.

Open economy factor includes trade-openness (T.OPEN). Harrison (1996); and Levine and Renelt (1992) found positive impact of trade-openness on domestic investment. The overall volume of trade positively impacts domestic investment. Trade-openness increase domestic investment when there is an increase in exports accompanied by increase in foreign exchange which can be used to import the capital good which ultimately expands the production of domestic goods. Similarly, increase in imports can only contribute positively to the domestic investment when it is accompanied by the import of investment goods as imports of consumer goods reduces the domestic production and it is also a burden on foreign exchange.

5.6.2 Econometric Framework

The empirical model consists of economic growth model and investment model whereby the impact of banking sector development on economic growth and domestic investment is investigated employing the framework proposed by Narayan and Narayan (2013) and Ndikumana (2000) respectively while controlling for macroeconomic variables. Each model consist of four indicators of banking sector development attributed to IBs and CBs.

The impact of banking sector development on economic growth is given by following model;

$$GDP_{jt} = \alpha + \beta_0 GDP_{j,t-1} + \beta_1 \sum X_{jt} + \beta_2 FD_{jt}^{Islamic} + \beta_3 FD_{jt}^{Convnetional} + C_j + Y_t + \varepsilon_{jt} \quad (3.1)$$

In model 3.1, GDP_{jt} stands for the GDP growth rate of country *j* at time *t*. $\sum X_{jt}$ is the vector of the country-specific variables which include inflation, gross fixed capital formation, and trade openness. $FD_{jt}^{Islamic}$ and $FD_{jt}^{Convnetional}$ is the financial development attributed to Islamic and conventional banks respectively in country *j* at time *t*. C_j is the country-fixed effects and Y_t measures time-fixed effects. Bank level data of financial development has been taken by calculating banking development separately for IBs and CBs. To ascertain the differential impact of banking sector development owing to Islamic and conventional banks upon economic growth, test of differential impact is also applied. In particular, we test if the impact of Islamic banking development $FD_{jt}^{Islamic}$ on GDP_{jt} is same as the impact of conventional banking development $FD_{jt}^{Convnetional}$ i.e. ($\beta_2 = \beta_3$).

Second, following model shows the impact of banking sector development on Investment;

$$GCF_{jt} = \alpha + \beta_0 GCF_{j,t-1} + \beta_1 \sum X_{jt} + \beta_2 FD_{jt}^{Islamic} + \beta_3 FD_{jt}^{Convnetional} + C_j + Y_t + \varepsilon_{jt} \quad (3.2)$$

In model 3.2, GCF_{jt} stands for the gross capital formation of country *j* at time *t*,. $\sum X_{jt}$ is the vector of country specific variables which include GDP growth, inflation, and trade openness, real interest rate, Govt. consumption, per capita GDP growth, and domestic savings. In order to ascertain the differential impact of Islamic banking development and conventional banking development on domestic investment, test of differential impact is applied. In particular, we test if the impact of Islamic banking development $FD_{jt}^{Islamic}$ on GCF_{jt} (investment) is same as the impact of conventional banking development $FD_{jt}^{Convnetional}$ i.e. ($\beta_2 = \beta_3$).

6 CHAPTER SIX

EMPIRICAL FINDINGS

Here, we conduct the detailed discussion of findings of each analysis.

6.1 Islamic and Conventional Banks during Business Cycle

6.1.1 Descriptive Analysis and Univariate Analysis

Table 6.1 presents descriptive statistics for IBs, CBs and for the entire sample. First, business orientation of IBs and CBs is measured using two indicators. FIR has an average of 17.75%; the mean value of FIR is higher for the CBs as compared to IBs and the difference is statistically insignificant. The LDR has a mean of 127.9%. The mean value is statistically different for IBs and CBs with the value of 220.471% and 107.09% respectively. Findings suggests that IBs intermediate most of the deposits they receive and invest more in advances with majority funds mobilized through deposits as confirmed by Beck et al. (2013). Second, efficiency measures indicate that the statistics on CIR shows no significant difference between the two groups. Mean value of OHR is significantly lower for IBs. Third, measures of credit quality shows that the mean value of LLR is lower for IBs but the difference is statistically insignificant. LLP is higher for IBs, while there is no significant difference in NPL. Fourth, comparing stability, it is observed that the mean value of MM, Z-score and EAR is significantly higher for IBs which is in line with the results presented in Beck et al. (2013) and Bourkhis et al. (2013). Maturity match has an average of 49.42%. IBs have significantly higher MM of 58.260% as compared to CBs whose MM is 46.373%. Z-score has an average of 16.75 with mean value of 21.71% for IBs and 15.6% for CBs. The difference is statistically significant. ROA has an average of 1.6% but there is no

Table 6.1: Descriptive Statistics Islamic Banks and Conventional Banks

	Business Orientation		Efficiency		Credit Quality			Stability				Control Variables	
	FIR	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**	**SIZE**	**FAR**
Observation	2,721	3,126	2,909	3,202	2,681	2,666	2,140	1,792	3,123	2,667	3,224	3,230	3,209
Mean	17.75	127.9	54.77	6.833	6.803	2.965	8.381	49.42	16.75	1.647	13.37	14.46	2.190
Standard Deviation	81.14	922.0	159.4	6.941	9.598	29.62	11.41	56.32	29.01	3.910	11.34	1.863	2.570
Type of banks													
Islamic	14.204	220.471	52.686	4.573	6.620	9.982	9.227	58.260	21.706	1.500	18.089	14.120	2.341
Conventional	18.563	107.093	55.277	7.385	6.840	1.486	8.224	46.373	15.604	1.683	12.237	14.548	2.154
Difference t-test (p-value)	0.2745	0.008***	0.7290	0.0000***	0.6542	0.000***	0.1392	0.001***	0.000***	0.339	0.00***	0.0000***	0.103

***Notes*:** Mean values of variables for full sample, Islamic and conventional Banks.
*** p<0.01, ** p<0.05, * p<0.1

significant difference between two bank types in terms of ROA. EAR has an average of 13.37% with significantly higher mean value for IBs. Results suggest that IBs are more able to avoid bank runs, are more stable and better capitalized as compared to CBs. Lastly, with regards to controlled variables, IBs are significantly smaller in size than CBs and have higher fixed assets ratio. However, there is no significant difference between both bank types in terms of fixed assets ratio.

Table 6.2 presents the correlation matrix which shows that SIZE is positively correlated with FIR, and negatively correlated with CIR, OHR, LLR, NPL, MM, Z-SCORE, and EAR. FAR is positively correlated with CIR, OHR, LLR, NPL, MM, Z-SCORE, and EAR, and negatively correlated with ROA, and SIZE.

Table 6.2: Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	**FIR**	1												
2	**LDR**	0.0331	1											
3	**CIR**	0.375***	-0.0221	1										
4	**OHR**	-0.0186	-0.108***	0.223***	1									
5	**LLR**	-0.114***	-0.0822**	0.0501	0.454***	1								
6	**LLP**	-0.0131	-0.0285	0.00114	0.00285	0.0280	1							
7	**NPL**	-0.143***	0.0326	0.101***	0.489***	0.860***	0.0316	1						
8	**MM**	-0.0245	0.496***	0.0811**	0.0786**	0.187***	0.255***	0.266***	1					
9	**Z-Score**	-0.0698*	0.0707*	0.0784**	-0.0491	-0.143***	-0.0164	-0.156***	0.0603*	1				
10	**ROA**	-0.0486	0.103***	-0.472***	-0.299***	-0.115***	-0.0594*	-0.188***	0.0311	0.0805**	1			
11	**EAR**	-0.0709*	0.270***	0.00860	-0.120***	-0.149***	-0.0328	-0.133***	0.182***	0.460***	0.354***	1		
12	**SIZE**	0.0878**	-0.0534	-0.262***	-0.460***	-0.377***	-0.0398	-0.423***	-0.340***	-0.0716*	0.0498	-0.159***	1	
13	**FAR**	0.00708	-0.0174	0.294***	0.374***	0.0836**	0.0168	0.150***	0.0893**	0.0882**	-0.130***	0.177***	-0.340***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.1.2 Regression Results and Discussion

In this section, findings of comparison of IBs and CBs in terms of business orientation, efficiency, credit quality and stability are reported.

A. Comparing Islamic and Conventional Banks

Table 6.3 compares IBs and CBs in terms of business orientation, efficiency, credit quality and stability while controlling for country-year specific effects. IBs have higher values of fee-income ratio, intermediation efficiency, credit quality, cost efficiency, and capitalization.

Examining business orientation, higher FIR and LDR for IBs is according to the findings of Beck et al. (2013), Faye et al. (2013), and Hardianto and Wulandari (2016). Higher FIR shows that they are more involved in fee based business and their operating income constitute greater share of non-interest based revenue in the form of fees and commission in order to compensate the absence of interest revenue. They are limited by Shariah to lend money directly due to which they tend to seek alternative revenue sources by increasing

service income in order to increase profitability. Such earnings diversification strategies enables them to emphasize on sources of income generation other than traditional revenue sources. As in Shahimi et al. (2006), these earnings enables IBs to have greater access to financial innovation, and financial markets, which ultimately reduces the risk and reduces over dependence on debt financing. IBs can develop, recognize and operationalize the underdeveloped instruments such as Kafalah, Amanah, Wakalah and Ju'alah to further enhance their capabilities to generate more income sources. Advancement in businesses and demands for new financial services led to reduction in profitability of traditional banking activities and enables banks to move to banking activities offering diverse services and generating revenue through fee and commission. Higher loan deposits ratio implies that IB lend more of the deposits they receive. The reason behind this increased intermediation is that they are not available with purely Islamic interbank money market. IBs' source of funding is largely centered on core deposits due to which they are unable to manage liquidity (Hasan and Dridi, 2010).

With regards to cost efficiency, CIR is higher for IB as they are relatively young and do not have enough customers to achieve economies of scales due to which they also face lack of skilled human resources. Secondly, the complexity of their contract also contributes towards their lower efficiency. Islamic contracts such as Tawarruq and Murabaha involves complex procedures, long duration, and higher transactions cost as compared to ordinary loans (Al-Suwailem, 2009). Most of the IB contracts are modified and based on the mechanism of conventional banking contracts and are plated to avoid interest factor with has also contributed towards their cost inefficiency. Overhead costs of IB are also higher due to high

Table 6. 3: Comparing Islamic and Conventional Banks

	Model 1										
	Business Orientation		Efficiency		Credit Quality			Stability			
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
					Panel A: Estimation Results						
$BANK_{ijt-1}$	0.00968**	0.261	0.0865	0.385***	0.741***	0.373***	0.358**	0.712***	0.589***	0.226***	0.573***
	(0.00470)	(0.165)	(0.0582)	(0.0522)	(0.0764)	(0.00611)	(0.143)	(0.0410)	(0.0692)	(0.0272)	(0.134)
$Islamic_{ij}$	27.82***	78.98**	49.08***	7.765***	1.813***	6.078	5.135***	19.81**	13.75**	0.0384	9.179**
	(5.594)	(30.54)	(4.509)	(1.042)	(0.536)	(5.150)	(1.391)	(8.545)	(6.479)	(3.031)	(3.846)
$Conventional_{ij}$	19.89***	60.21***	46.68***	4.297***	3.134***	4.507***	9.388***	9.478***	7.500***	1.356***	5.411***
	(1.305)	(12.92)	(3.267)	(0.459)	(0.995)	(1.673)	(2.341)	(2.857)	(1.031)	(0.125)	(1.692)
					Panel B: Diagnostic Tests						
Observations	1,921	1,369	2,069	2,345	1,954	1,447	1,254	1,302	2,316	2,351	2,375
Banks	209	244	219	262	209	209	172	141	247	237	262
AR(2)	0.48	0.89	0.82	-0.56	-0.96	0.85	1.22	-0.25	-0.15	-0.69	1.19
p-value	0.634	0.374	0.414	0.575	0.336	0.395	0.222	0.806	0.881	0.492	0.232
J-statistic	190.24	16.47	202.32	239.53	185.22	174.60	152.76	127.45	185.07	207.82	162.11
p-value	0.887	0.225	0.672	0.622	0.482	0.123	0.513	0.994	0.161	0.774	0.219

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

cost of Shariah supervisory boards and committees which includes experts to develop products and monitor contracts. This evidence of higher cost efficiency is consistent with the findings of Beck et al. (2013), Miah and Sharmeen (2015), Hardianto and Wulandari (2016), Aman et al. (2016), and Miah and Uddin (2017).

Examining credit quality, IB have less LLR and less NPL as found by Beck et al. (2013), Mirza et al. (2015), and Aman et al. (2016). Higher level of NPL forces banks to increase LLPs which reduces the banks' earnings and also the funds for new lending. IBs cater to the financial needs of religiously motivated clients and usually target low-risk investment projects. They adopt moderate lending patterns and have less probability of default. Another reason for of better credit quality as suggested by Kassim and Abdulle (2012), and Ahmed (2009) is that IBs are not allowed to undertake risk mitigating tools such as credit default swaps (CDS) or securitization in order to transfer the credit risk of their trade contacts to

the third party. It enables them to undertake vigilance approach in evaluation of their risk resulting in better asset quality.

IB are more stable than CB in terms of maturity mismatch, have higher Z-score, higher EAR and lower ROA as suggested by Abdulle and Kasim (2012), Bourkhis et al. (2013), Rahim and Zakaria (2013), Beck et al. (2013), and Mirza et al. (2015). The maturity mismatch ratio shows that IB are more liquid due to which they are more able to avoid bank runs. They are more stable as they are prohibited to invest in risky trading activities. Secondly, IBs face less moral hazard and adverse selection issues. Furthermore, risk sharing arrangements is also a risk reducing factor. According to Ruzickova and Teply (2015), "higher EAR is associated with higher shares of FIR since by expanding into non-traditional businesses the bank needs more capital to prevent the potential risks of the new activity". This has been confirmed in Table 6.2 in case of IBs. According to Zarrouk et al. (2016), IB cannot issue debt in order to finance their assets due to the prohibition of Ribah instead they depend on shareholders equity for essential sources of funds. This practice discourages IBs to create leverage, and thus, making them less risky. Moreover, return is Islamic deposits is linked to the ROA of the bank. This link reduces the assets liability mismatch normally practices by CB and in return enhances the stability and soundness. Thirdly, they also maintain large capital to compensate the lack of risk management tools (Ahmed, 2009).

Next, the difference between the two bank groups is investigated controlling for size and asset structure (Equation 1.2). The results in Table 6.4 support the findings of Table 6.3 of higher FIR, higher LDR, higher CIR, lower LLR and lower NPL, higher MM and higher EAR of IBs. In addition, lower OHR, lower LLP, lower Z-score, and lower ROA for IBs.

Table 6. 4: Comparing Islamic and Conventional Banks – Controlling for Bank Characteristics

	Model 2										
	Business Orientation		Efficiency		Credit Quality			Stability			
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.357***	0.0883***	0.263***	0.766***	0.764***	0.209	0.770***	0.669***	0.774***	0.619***	0.581***
	(0.121)	(0.0135)	(0.0810)	(0.0547)	(0.0703)	(0.141)	(0.0719)	(0.0694)	(0.0886)	(0.0530)	(0.0775)
$Islamic_{ij}$	29.55***	105.0***	63.35***	4.133**	10.06**	8.900**	12.94**	58.26***	36.81***	3.288***	11.03***
	(9.899)	(33.67)	(10.43)	(1.844)	(4.064)	(4.284)	(5.778)	(12.50)	(13.10)	(1.254)	(3.525)
$Conventional_{ij}$	27.78***	78.95**	61.22***	4.441**	13.04***	9.009**	13.21**	56.90***	38.25***	3.363***	10.19***
	(9.055)	(30.78)	(10.44)	(1.928)	(4.582)	(4.169)	(5.363)	(11.69)	(13.29)	(1.262)	(3.304)
$SIZE_{ijt}$	-1.049**	0.864	-2.089***	-0.224**	-0.736***	-0.508**	-0.734**	-2.972***	-2.264***	-0.161**	-0.356**
	(0.523)	(1.737)	(0.614)	(0.103)	(0.270)	(0.254)	(0.318)	(0.693)	(0.779)	(0.0733)	(0.173)
FA_{ijt}	-0.0423	-10.29***	3.686**	0.0764**	0.0746	0.00267	-0.0217	-0.556*	-0.432*	-0.0820	0.0705
	(0.274)	(3.493)	(1.495)	(0.0385)	(0.0680)	(0.0755)	(0.178)	(0.325)	(0.251)	(0.0513)	(0.133)
Panel B: Diagnostic Tests											
Observations	1,156	175	1,325	264	1,946	945	532	1,282	2,316	1,006	1,813
Banks	184	175	175	101	209	151	109	139	246	155	233
AR(2)	0.61	1.03	0.96	-0.29	-1.00	0.44	1.00	-0.25	-0.05	1.55	0.86
p-value	0.541	0.301	0.337	0.769	0.316	0.660	0.315	0.800	0.957	0.120	0.390
J-statistic	155.00	49.23	149.07	36.16	181.35	136.88	103.98	120.54	230.96	105.91	179.03
p-value	0.920	0.177	0.193	0.368	0.298	0.279	0.999	0.319	0.277	0.121	0.506

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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Examining the impact of size, larger banks have lower FIR in line with Damankah et al. (2014). As size of the bank increases, they also increase access to diversified financial markets and instruments that resultantly reduces their dependence on fee based income business and more on traditional banking business. This is contradictory to the traditional view which states that larger banks have more incentives to involve in non-traditional services as compared to smaller ones. Smaller banks usually engage in areas giving them guaranteed income. According to Rogers and Sinkey (1999), "involvement in nontraditional activities generally requires some degree of specialization. It requires recruitment of staff with special knowledge as well as the acquisition of modern technology by the bank which is only possible in case of large banks".

Increase in the size of banks decreases the cost to income ratio and overhead costs. This finding is consistent with the results of Beck et al. (2013), Alqahtani et al. (2016), and Mirza et al. (2015). Larger banks have economies of scale which enables them to get financial services in bulk at low cost. Amount of investment, level of operation and output received by large banks considerably compensate the expenditure incurred by these banks.

Coming to credit quality, large banks have lower LLR, lower LLP and lower NPL in line with Beck et al. (2013), and Alqahtani et al. (2016). The inverse relationship between credit quality and bank size means that large banks have superior loan portfolios due to better risk management strategies that enables them to exercise extensive monitoring and control over risk and borrowers.

Regarding the relationship between banks size and stability, larger banks have lower stability as shown by lower maturity mismatch, lower Z-score, lower ROA, and lower EAR. This finding is consistent with the evidence provided by Beck et al. (2013), Ghassan and Taher (2013), Mirza et al. (2015), and Alqahtani et al. (2016). According to Bourkhis and Nabi (2013), the profitability of bank is negatively related to their cost and provisions. Table 4 shows that the CIR is higher for IB, and LLP are lower. The gap in the CIR between IB and CB is greater than the gap in LLP between the two banks. This contributed to the higher profitability of CB as compared to IB.

Table 6.4 indicates then when the size of the bank increases, intermediation efficiency, cost efficiency, credit quality decreases. Further, banks with higher fixed assets ratios have lower LDR, higher CIR, higher OHR, lower MM and Z-score.

B. Business Cycle Phases and their Differential Effect on Islamic and Conventional Banks

Table 6.5 shows the impact of peak phase of business cycle on different measures of business orientation, cost efficiency, credit quality and stability. Results show that IB are more involved in the fee-based business; they have high CIR and high EAR

During peak phase, FIR decreases as banks move towards traditional banking businesses as they are available with more opportunities to invest money and make money instead of charging fee and commission to its customers. (Ruzickova & Teply, 2015; Hahm, 2008). Here positive relation is also found between size and FIR in case of CB consistent with the findings of DeYoung and Rice (2004), and Hahm (2008). Large banks enjoy the benefit of economies of scale and have low costs. Conversely, they tend to earn low interest margins due to high competition, exhibit less risk and possess relatively fewer core deposits. In order to remain profitable, they tend to engage in non-interest bearing services as they are less able to generate revenue from traditional activities. Furthermore, LDR also increases as stated by Alqahtani et al. (2016), and Park et al. (2013). In order to meet the increased loan demand in the economy, during period of economic expansion, banks increase loan deposit ratio and usually go for wholesale funding instead of deposit funding. LDR is used as a macro prudential policy, a limit on this measure by the authorities helps curb the supply of credit in the economy through wholesale funding which is a non-deposit liability. Controlling wholesale funding helps in curbing systematic risk among the financial institutions. If maintained in limits, LDR helps meet loan demand, prepare banks for liquidity shortages during crises, and limits the amount of loans with respect to the deposits.

Table 6. 5: Impact of the Peak Phase of the Business Cycle

	Model 4										
	Business Orientation		Efficiency		Credit Quality			Stability			
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.197***	0.501***	0.131***	0.585***	0.779***	0.151	0.656***	0.655***	0.745***	0.588***	0.709***
	(0.00638)	(0.00035)	(0.00031)	(0.0767)	(0.0665)	(0.0950)	(0.00234)	(0.00967)	(0.0357)	(0.00318)	(0.0171)
$Islamic_{ij}$	30.52***	49.11***	95.29***	18.39***	6.188	0.409	0.113	60.65***	10.81*	1.130***	23.10**
	(3.948)	(4.996)	(0.632)	(6.177)	(6.428)	(2.346)	(0.541)	(10.55)	(6.105)	(0.171)	(9.895)
$Conventional_{ij}$	6.074***	-0.290	64.75***	1.703	12.23***	7.318**	18.56***	78.99***	31.46**	-0.0712	1.557*
	(1.730)	(1.117)	(0.492)	(2.494)	(4.369)	(3.350)	(0.315)	(3.761)	(15.62)	(0.158)	(0.793)
$SIZE_{ijt} \times D_{ij}^{Islamic}$	-1.215***	-0.474	-3.443***	-1.014**	-0.322	0.0526	0.131***	-3.207***	-0.576	0.000366	-1.013*
	(0.267)	(0.364)	(0.0255)	(0.400)	(0.433)	(0.144)	(0.0345)	(0.679)	(0.357)	(0.0120)	(0.583)
$SIZE_{ijt} \times D_{ij}^{Conventional}$	0.536***	2.754***	-2.115***	0.0258	-0.692**	-0.407**	-1.023***	-4.298***	-1.524*	0.0445***	0.104***
	(0.107)	(0.0634)	(0.0310)	(0.158)	(0.268)	(0.200)	(0.0212)	(0.233)	(0.913)	(0.0101)	(0.0377)
$FA_{ijt} \times D_{ij}^{Islamic}$	1.405***	1.651***	1.418***	-0.0525	-0.0399	-0.156	-0.249***	0.00117	0.278*	-0.258***	-2.227**
	(0.0692)	(0.0663)	(0.0704)	(0.169)	(0.299)	(0.102)	(0.0487)	(0.591)	(0.149)	(0.00843)	(0.928)
$FA_{ijt} \times D_{ij}^{Conventional}$	-0.00776	-0.295***	5.443***	0.417*	0.0522	0.169	0.0730***	-1.126***	-1.262	0.0550***	0.0387***
	(0.0126)	(0.00750)	(0.0160)	(0.248)	(0.0709)	(0.194)	(0.0257)	(0.202)	(1.038)	(0.000627)	(0.0123)
$Peak_{jt}$	-0.964***	0.858***	-1.484***	-0.776***	-1.197***	-0.417***	-0.219***	-2.335***	1.034**	0.0923***	0.666***
	(0.0221)	(0.0430)	(0.0215)	(0.196)	(0.191)	(0.101)	(0.0329)	(0.507)	(0.470)	(0.00614)	(0.0559)
Panel B: Diagnostic Tests											
Observations	990	257	1,314	2,228	1,946	806	532	1,290	1,206	1,013	1,082
Banks	200	101	174	273	209	135	109	139	239	156	230
AR(2)	0.47	1.55	0.61	-0.59	-0.92	0.61	0.99	-0.28	0.00	1.53	0.84
p-value	0.639	0.121	0.544	0.556	0.358	0.543	0.324	0.778	0.996	0.125	0.403
J-statistic	175.37	110.39	147.83	170.35	201.42	104.92	89.46	90.05	47.55	101.27	88.32
p-value	0.114	0.766	0.957	0.986	0.998	0.997	0.977	0.147	0.532	0.966	0.140

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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Regarding the impact of cost efficiency, CIR and OHR decrease during the boom period accordance to the findings of Mirza et al. (2015).

With growing economy, there are less chances for the default, and the banks are more likely to make good quality loans. LLR, LLP, and NPL shows negative behavior in line with the findings of Bikker and Metzemakers (2005), Khemraj and Pasha (2009), Floro (2010), Craigwell and Elliott (2011), Messai and Jouini (2013), Jordan and Tucker (2013), Beck et al. (2013), Skarica (2014), Ozili (2015), Mirza et al. (2015), Abdullah et al., (2015), Isa et al. (2015) and Alqahtani et al. (2016). The probability to default is low during good time so the need to build up reserves so LLR decreases. According to Bikker and Metzemaker (2005), the level of reserves are influenced by external shocks. The negative relationship

between LLP has perspectives. Either LLP decreases as a result of period of high economic growth which is referred to as non-discretionary, or LLP are deliberately set low by banks during economic expansion. This depends upon the riskiness of the loan portfolio and overall strength of the economy. It provides a cushion against future expected and unexpected losses to safeguard banks against financial risk and bankruptcy. During periods of high economic growth, economy is expanding, new opportunities are generated, and new loans are created. Default on loans are usually low; as a result of which LLP decreases. Secondly, LLPs is used by banks to stabilize their income and they deliberately set lower provision to earn more profit during the good times as they expect that the borrowers have strong ability to pay which ultimately increases banks income and provide more funds for profitable investment opportunities. As money flow between depositors and lender increase, the economy grows as well. Lowering down NPLs also lower down LLP as both are positively related. NPL also decreases during growing economy as higher level of real GDP growth increases borrowers' income, improves the debt servicing capacity of borrower and reduces bad debts. During economic boom, bad loans are relatively less, as borrowers are available with sufficient funds to return their debts within stipulated period. Reduction in NPL contributes towards economic growth and financial stability. Banks with aggressive lending profile, charge relatively higher interest rates are usually expected to suffer higher NPLs. Macroeconomic conditions greatly influence the assessment of borrower's credentials by banks and their ability to repay loans. Growing economy increase revenues and decreases financial distress which also affects the loan portfolios of banks.

Overall, the stability of banks increases during the peak phase. When GDP increases, new profitable investment avenues are generated, so maturity mismatch decreases as liquid

assets are used to fund loans and make new investments consistent with the study of Vodova (2011). Banks reduce their liquid assets as there are less chances of liquidity shortages during boom periods. Lower values of maturity mismatch indicate bank's increased sensitivity related to deposit withdrawals.

Z-score increases during the peak phase consistent with the findings of Ashraf et al. (2016), and Rahim and Zakaria (2013). During the economic boom period, banks adopt better risk management practices and are better equipped to sustain unexpected shocks which lead to the stability of banks. Banks through diversification of their assets significantly enhance their financial stability. ROA also has a positive relation with the economic growth in line with the findings of Hassan and Bashir (2003), Kosmidou et al. (2006), Zang and Daly (2013), Zeitoon (2012), Mirza et al. (2015). According to Demirguc-Kunt and Maksimovic (1996), and Bikker and Hu (2002) when economy is flourishing, a well-managed bank is likely to make more profits. Similarly, according to Bashir (2003), performance measures are affected positively as a result of favorable macroeconomic conditions. Rashid and Jabeen (2016) stated that a well-managed banking sector is essential for economic collaboration of the different segments of the market. It helps accelerating economic growth. During favorable economic conditions the demand for credit increases, the interest widens and revenue increases at an increasing rate than costs which results in increased profits. Moreover, off-balance sheet activities of bank increases due to investment growth which also contribute towards increased profitability. EAR increases during the economic boom period which shows the level of protection held by banks to remain solvent. Banks build up capital during economic growth which helps them sustain negative shocks during economic downturn. Sufian (2009) suggested "that a strong capital structure is essential for financial

institutions as it provides additional strength to with-stand financial crises and provides increased security for depositors during unstable macroeconomic condition"

Examining the behaviour of IB and CB during the peak (Table 6.6) phase, it is observed that both IBs and CBs behave differently. For instance, peak has positive impact on FIR of IBs according to Alqahtani et al. (2016), and negative impact on the FIR of CBs as suggested by Ruzickova and Teply (2015). The differential impact of peak phase on FIR is statistically significant across IBs and CBs. Cost inefficient banks are more inclined to diversity their income by increasing their fees. LDR for both IB and CB increases. The size of coefficient is greater is case of IB which shows that they make more loans as compared to deposits than CB when the economy is expanding and this difference is also statistically significant. They intermediate more of their deposits as compared to CB as stated by Beck et al. (2013).

Behavior of cost efficiency of IB and CB shows that OHR cost of IB increases but that of CBs decreases because it is difficult for IBs to control their overhead costs during peak phase. CIR for both IBs and CBs decreases according to Mirza et al. (2016).

Turning to credit quality, during peak phase IB and CB both decrease their LLR, LLP and NPL consistent with the previous literature but the difference in terms of impact of peak on LLR and LLP is statistically significant.

While compare stability across two bank types, it is found that during peak phase the Maturity mismatch decreases for both IBs and CBs and the difference is statistically significant between both banks. As the profitable opportunities increases during peak and banks find it more profitable to invest idle funds. IBs better use their idle fund more in investments and financing activities as compared to CBs. According to Beck et al. (2013)

Table 6. 6: Differential Impact of the Peak Phase of the Business Cycle

	Model 5										
	Business Orientation		Efficiency		Credit Quality				Stability		
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.17***	0.509***	0.134***	0.571***	0.791***	0.107***	0.511***	0.697***	0.654***	0.595***	0.595***
	(0.0020)	(5.63e-05)	(0.00071)	(0.0007)	(0.00186)	(0.0123)	(0.00394)	(0.00844)	(0.0324)	(0.0091)	(0.0495)
$Islamic_{ij}$	35.7***	61.80***	89.33***	20.69***	4.849***	6.503***	7.479***	109.5***	14.65**	-0.231	25.76
	(1.884)	(0.714)	(3.682)	(0.158)	(0.166)	(0.634)	(1.719)	(5.960)	(6.600)	(0.577)	(20.23)
$Conventional_{ij}$	18.4***	27.55***	72.46***	0.282***	5.968***	11.37***	23.71***	42.79***	48.05**	-0.289	10.36***
	(0.0746)	(1.892)	(1.010)	(0.0590)	(0.404)	(0.712)	(1.519)	(0.391)	(19.61)	(0.286)	(2.295)
$SIZE_{ijt} \times D_{ij}^{Islamic}$	-1.52***	-1.28***	-2.970***	-1.149***	-0.139***	-0.289***	-0.29***	-4.905***	-0.722*	0.0483	-1.396
	(0.122)	(0.0508)	(0.239)	(0.0117)	(0.0135)	(0.0474)	(0.102)	(0.402)	(0.385)	(0.0314)	(1.237)
$SIZE_{ijt} \times D_{ij}^{Conventional}$	-0.22***	0.975***	-2.620***	0.117***	-0.322***	-0.630***	-1.29***	-2.106***	-2.446**	0.0582***	-0.328***
	(0.0048)	(0.120)	(0.0597)	(0.00352)	(0.0249)	(0.0432)	(0.0902)	(0.0353)	(1.152)	(0.0169)	(0.121)
$FA_{ijt} \times D_{ij}^{Islamic}$	1.36***	1.710***	1.482***	-0.106***	-0.363***	-0.291***	-0.09***	-11.31***	0.260*	-0.0251	0.137
	(0.0408)	(0.0353)	(0.0702)	(0.0106)	(0.0114)	(0.0181)	(0.0129)	(0.663)	(0.141)	(0.0406)	(1.136)
$FA_{ijt} \times D_{ij}^{Conventional}$	-0.48***	-0.39***	5.547***	0.447***	0.242***	-0.0916*	0.176***	-0.00817	-1.702	0.0789***	-0.258
	(0.0037)	(0.00312)	(0.0638)	(0.00192)	(0.0177)	(0.0517)	(0.0544)	(0.0575)	(1.290)	(0.0225)	(0.189)
$Peak_{jt} \times Islamic_{ij}$	0.35***	7.652***	-8.448***	0.140***	-0.381***	-0.918***	-0.49***	-4.381***	0.115	0.732***	1.006
	(0.116)	(0.388)	(0.183)	(0.0333)	(0.0106)	(0.0386)	(0.0920)	(0.819)	(1.357)	(0.0157)	(2.000)
$Peak_{jt} \times Conventional_{ij}$	-0.74***	3.543***	-2.506***	-0.383***	-1.561***	-0.422***	-0.71***	-2.583***	1.391**	-0.166***	0.404**
	(0.0028)	(0.0472)	(0.0858)	(0.00182)	(0.0425)	(0.0541)	(0.124)	(0.122)	(0.572)	(0.0295)	(0.174)
Panel B: Tests for differential effects of Peak Phase of Business Cycle											
$\beta_{Peak}^{Islamic} = \beta_{Peak}^{Conventional}$	87.98	93.48	953.90	234.56	755.56	57.72	1.66	5.14	0.69	568.24	0.09
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2008	0.0249	0.4057	0.0000	0.7645
Panel C: Diagnostic Tests											
Observations	990	235	1,314	2,228	1,592	806	493	1,290	1,206	1,013	1,082
Banks	200	100	174	273	208	135	109	139	239	156	230
AR(2)	0.38	1.21	0.62	-0.66	0.87	0.48	1.15	0.02	-0.50	1.61	0.89
p-value	0.708	0.228	0.533	0.509	0.384	0.633	0.248	0.986	0.619	0.107	0.374
J-statistic	187.95	79.74	140.39	177.79	179.19	78.65	63.81	110.58	53.63	72.68	30.88
p-value	0.991	0.981	0.546	0.958	0.263	0.177	0.999	0.311	0.267	0.999	0.193

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Islamic banks unique nature based on equity and risk-sharing helps improve financial stability. When there is peak phase in the economy the differential is statistically significant across IBs and CBs. ROA of conventional banks decreases as shows by Alqahtani et al. (2016), Ozili (2015), and Beck et al. (2013). Possible reason might be that during favorable macroeconomic environment, corporate firms, businesses and household may have substantial internally generated funds and may have less reliance on bank borrowing. Therefore, may find it difficult to lend at favorable terms and condition, which may affect

banks' performance negatively. However, in case of Islamic banks we observe increased profitability during peak phase in line with the findings of Zeitoon (2012), Mirza et al. (2015). Bashir (2003) suggested that favorable macroeconomic environment tends to stimulate higher profits of Islamic banks. During periods of strong economic progress, IB increases PLS during peak phase. Fewer PLS loans defaults during strong economic conditions and the bank's profit rises.

As regards the impact of expansion phase on different measures of business orientation, cost efficiency, credit quality and stability (Table 6.7), FIR decreases, LDR increases, CIR decreases and overheads ratio increases. LLR, LLP and NPL decreases, stability increases showing positive behavior of Z-score, ROA and EAR. The results are consistent with the previous literature and similar to the results of the peak phase the discussion of which has been made earlier in peak phase.

The differential impact of expansion phase is reported in Table 6.8 which shows that FIR of Islamic banks increases as stated by Alqahtani et al (2016), and fee income ratio of conventional banks decreases according to Ruzickova and Teply (2015). This difference is statistically significant. LDR of IB decreases and that of CB increases. The results of CB are in line with Alqahtani et al. (2016) and Olson and Zoubi (2016). The differential impact of expansion phase on LDR is also statistically significant.

Examining cost efficiency, cost income ratio of both bank type decreases during expansion phase as stated by Mirza et al. (2015). Size of coefficient is greater in case of IBs as compared to CBs and the difference is statistically insignificant. Overhead ratio for both

Table 6. 7: Impact of the Expansion Phase of the Business Cycle

	Model 6										
	Business Orientation		Efficiency		Credit Quality			Stability			
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.237***	0.567***	0.00811	0.619***	0.781***	0.125	0.566***	0.656***	0.787***	0.668***	0.535***
	(0.0536)	(0.000822)	(0.0194)	(0.0748)	(0.0668)	(0.0884)	(0.116)	(0.00990)	(0.00533)	(0.00293)	(0.00784)
$Islamic_{ij}$	15.09***	16.12**	29.24	11.69***	7.869	0.150	7.882	49.98***	9.762***	1.051***	27.88***
	(5.387)	(8.010)	(18.89)	(4.100)	(6.373)	(2.960)	(8.747)	(11.40)	(1.003)	(0.225)	(5.373)
$Conventional_{ij}$	-7.169	-63.88***	59.53***	0.0851	9.624**	9.079**	22.97**	76.99***	6.868***	0.128	6.099***
	(15.05)	(2.497)	(16.01)	(2.628)	(4.269)	(3.966)	(8.936)	(3.591)	(1.068)	(0.107)	(0.640)
$SIZE_{ijt} \times D_{ij}^{Islamic}$	-0.176	0.839*	1.104	-0.643**	-0.444	0.0764	-0.288	-2.619***	-0.534***	-0.00896	-1.456***
	(0.352)	(0.492)	(1.107)	(0.255)	(0.432)	(0.180)	(0.506)	(0.727)	(0.0625)	(0.0137)	(0.355)
$SIZE_{ijt} \times D_{ij}^{Conventional}$	1.266	6.297***	-0.212	0.0842	-0.533**	-0.525**	-1.261**	-4.264***	-0.398***	0.0256***	-0.0344
	(0.914)	(0.159)	(1.043)	(0.164)	(0.259)	(0.241)	(0.506)	(0.222)	(0.0684)	(0.00649)	(0.0329)
$FA_{ijt} \times D_{ij}^{Islamic}$	-0.879***	3.662***	7.516***	0.109	-0.0292	-0.172	-0.352	0.629	0.247***	-0.244***	-0.198
	(0.175)	(0.439)	(1.073)	(0.182)	(0.327)	(0.114)	(0.355)	(0.581)	(0.0722)	(0.0109)	(0.176)
$FA_{ijt} \times D_{ij}^{Conventional}$	0.188	-0.0670***	1.387**	0.490*	0.0910	0.290	0.219	-0.878***	0.731***	-0.00371	0.0294**
	(0.583)	(0.00764)	(0.644)	(0.279)	(0.0738)	(0.203)	(0.339)	(0.181)	(0.0692)	(0.00252)	(0.0133)
$Expansion_{jt}$	-0.768***	0.982***	-15.32***	0.531***	-0.781**	-0.362**	-0.665**	0.959***	0.847***	0.178***	0.180***
	(0.217)	(0.128)	(1.653)	(0.179)	(0.345)	(0.169)	(0.323)	(0.278)	(0.0442)	(0.00848)	(0.0401)
Panel B: Diagnostic Tests											
Observations	408	257	818	2,228	1,946	806	532	1,290	1,908	1,013	1,675
Banks	101	101	172	273	209	135	109	139	243	156	233
AR(2)	-0.50	1.35	-1.13	-0.54	-1.03	0.50	0.96	-0.36	0.39	1.61	0.77
p-value	0.621	0.176	0.260	0.589	0.304	0.614	0.335	0.719	0.700	0.107	0.443
J-statistic	34.76	71.54	75.82	169.98	205.35	104.43	86.32	89.23	132.56	111.08	102.86
p-value	0.177	0.493	0.215	0.986	0.975	0.998	0.999	0.181	0.170	0.896	0.149

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

bank types increases during expansion phase according to Mirza et al. (2016). The differential impact is also significant across two bank types.

Examining credit quality, we find that LLR, LLP, and NPL all decreases during expansion phase for both IBs and CBs and the difference is statistically significant. The findings are consistent with previous literature as stated in explanation of differential impact of peak phase of business cycle. LLR and NPL decreases to greater extent in case of IBs than CBs during expansion phase.

Concerning the impact of expansion on stability we find that stability increases in line with previous literature. Maturity mismatch decreases for both IBs and CBs during expansion

Table 6. 8: Differential Impact of the Expansion Phase of the Business Cycle

	Model 7										
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.209***	0.491***	0.00733	0.637***	0.750***	0.125***	0.636***	0.660***	0.696***	0.604***	0.654***
	(0.00053)	(0.00035)	(0.0202)	(0.00079)	(0.0007)	(0.0149)	(0.00486)	(0.00453)	(0.00269)	(0.0095)	(0.0170)
$Islamic_{ij}$	40.46***	66.21***	44.13	4.244***	5.178***	0.0866	3.182**	71.72***	11.95***	7.691***	27.13*
	(0.405)	(4.274)	(31.21)	(0.249)	(0.301)	(0.709)	(1.404)	(2.779)	(0.741)	(0.323)	(15.05)
$Conventional_{ij}$	4.630***	22.54	93.36***	1.385***	10.95***	13.78***	18.50***	69.03***	29.14***	-1.327	5.129***
	(0.175)	(14.31)	(15.42)	(0.0275)	(0.103)	(0.649)	(1.274)	(1.888)	(1.070)	(0.986)	(0.874)
$SIZE_{ijt} \times D_{ij}^{Islamic}$	-1.908***	-1.22***	0.225	-0.197***	-0.21***	0.0771*	-0.0316	-3.959***	-0.646***	-0.46***	-1.517*
	(0.0265)	(0.292)	(1.841)	(0.0190)	(0.0226)	(0.0415)	(0.0900)	(0.152)	(0.0507)	(0.0194)	(0.886)
$SIZE_{ijt} \times D_{ij}^{Conventional}$	0.638***	1.337	-2.409**	0.0547***	-0.61***	-0.794***	-1.006***	-3.652***	-1.299***	0.123**	-0.0511
	(0.00923)	(0.901)	(0.969)	(0.00140)	(0.0061)	(0.0398)	(0.0753)	(0.120)	(0.0626)	(0.0609)	(0.0501)
$FA_{ijt} \times D_{ij}^{Islamic}$	1.454***	0.368***	7.234***	0.0401***	-0.07***	-0.172***	-0.322***	-0.0788	0.221***	-0.07***	-0.455
	(0.00614)	(0.0962)	(1.156)	(0.00606)	(0.0055)	(0.0348)	(0.0905)	(0.184)	(0.0446)	(0.0094)	(1.171)
$FA_{ijt} \times D_{ij}^{Conventional}$	-0.426***	-0.29***	1.948***	0.0354***	-0.00119	0.0893*	0.0355	-1.326***	-1.451***	0.00781	-0.03***
	(0.00187)	(0.0180)	(0.579)	(0.00209)	(0.0007)	(0.0524)	(0.0851)	(0.164)	(0.0589)	(0.0129)	(0.00542)
$Expansion_{jt} \times Islamic_{ij}$	0.433***	-4.51***	-17.31***	0.0578**	-1.15***	-0.188***	-0.730***	-2.801***	4.776***	0.206***	1.679**
	(0.00910)	(0.0810)	(2.803)	(0.0256)	(0.0106)	(0.0649)	(0.0824)	(0.0937)	(0.123)	(0.0126)	(0.731)
$Expansion_{jt} \times Conventional_{ij}$	-1.045***	1.498***	-16.02***	0.427***	-0.19***	-0.778***	-0.429***	-1.462***	0.408***	0.235***	0.186***
	(0.00307)	(0.303)	(1.968)	(0.00197)	(0.0048)	(0.0779)	(0.0832)	(0.255)	(0.0401)	(0.0870)	(0.0446)
Panel B: Tests for differential effects of Expansion Phase of Business Cycle											
$\beta_{Expansion}^{Islamic} = \beta_{Expansion}^{Conventional}$	29333.68	365.71	0.16	202.01	8346.65	26.61	4.04	29.11	1336.27	0.11	3.95
p-value	0.0000	0.0000	0.6860	0.0000	0.0000	0.0000	0.0469	0.0000	0.0000	0.7440	0.0482
Panel C: Diagnostic Tests											
Observations	993	235	818	2,228	968	806	532	1,290	2,264	977	937
Banks	202	100	172	273	147	135	109	139	246	156	229
AR(2)	0.55	0.48	-1.13	0.19	1.15	0.48	0.98	-0.11	-1.38	1.53	-0.32
p-value	0.580	0.632	0.259	0.853	0.250	0.629	0.326	0.913	0.168	0.125	0.751
J-statistic	191.59	64.18	79.59	171.37	139.80	90.48	69.23	114.59	190.74	80.59	79.95
p-value	0.671	0.470	0.122	0.936	0.931	0.988	0.940	0.267	0.101	0.107	0.133

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

phase; maturity mismatch of IBs decreases to greater extent than CBs as IBs available with more liquid funds finds it more profitable to invest when economy is flourishing. Z-score of IBs increases by greater extent as compared to CBS and the difference is statistically significant. According to Shayegani and Arani (2012), during expansion, the financial stability of the banks generally increases. Higher economic growth increases Z-score of IBs which indicates that they have lower probability to defaults and are more stable which can be attributed to interest free system, and reluctance on part of IBs to invest in derivatives, Tawaruq and loans sale. ROA of both type of banks increases during expansion but the

difference is statistically insignificant. High economic growth increases Islamic banks' profitability which corresponds to an increase in real economic activity. EAR of both bank types increases during the expansion phase showing positive relationship. The difference is statistically significant. IBs are on average better capitalized as they tend to build up capital to a much greater extent than CBs in order to sustain the negative shock during the economic downturns. IBs due to the nature of PLS arrangements are provided with inherent protection.

Next we examine the changes that occur in the business orientation, cost structure, assets quality and stability during contraction phase in the economy. Findings of this analysis are presented in Table 6.9 which shows that fee income ratio of banks increases as shown by Ruzickova and Teply (2015). When economy is declining banks tend to adopt nontraditional banking activities in order to remain solvent and profitable. LDR decreases during contraction phase. Banks make less advances as compared to their deposits as stated by Alqahtani et al. (2016) and Olson and Zoubi (2016). During the period of contraction, the demand for loans decreases, so banks limit their advances. Banks also decrease their deposits in order to manage liquidity. This ratio if maintained in limits during declining economy, prepare banks for liquidity shortages during crises. Cost efficiency shows that during declining economy, cost income ratio increases as stated by Mirza et al. (2015).

LLR, LLP and NPL increase when the economy is more volatile than normal. LLR behaves like capital. Reserves maintained by banks when economic environment is favorable protects them during adverse circumstances and also against the losses resulting from aggressive risk-taking (Bikker and Metzemakers, 2005). LLP also increases during the contraction phase. The demand for credit and stock market transactions decreases noticeably, the interest margin narrows, costs grow faster than revenues leading to decreased

Table 6. 9: Impact of the Contraction Phase of the Business Cycle

	Model 8										
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.250***	0.552***	-0.112***	0.590***	0.788***	0.129***	0.804***	0.266***	0.685***	0.611***	0.504***
	(0.0438)	(0.00199)	(0.0123)	(0.0838)	(0.00454)	(0.00512)	(0.00659)	(0.00631)	(0.000312)	(0.0292)	(0.00681)
$Islamic_{ij}$	31.00***	38.02***	251.8***	19.10***	5.708***	-0.152	1.147	125.2***	13.71***	-2.789***	29.21***
	(10.87)	(11.96)	(48.93)	(6.755)	(0.445)	(0.423)	(2.677)	(14.69)	(0.119)	(1.018)	(6.367)
$Conventional_{ij}$	26.22**	-8.332***	136.0***	-0.682	14.76***	9.499***	8.189***	75.77***	31.49***	0.256	3.153***
	(12.31)	(2.726)	(35.20)	(2.585)	(0.657)	(0.280)	(1.067)	(5.379)	(0.0549)	(0.409)	(0.670)
$SIZE_{ijt} \times D_{ij}^{Islamic}$	-1.223**	0.135	-12.17***	-1.033**	-0.256***	0.0774***	-0.0611	-6.410***	-0.678***	0.205***	-1.554***
	(0.615)	(0.631)	(3.027)	(0.401)	(0.0291)	(0.0270)	(0.159)	(0.906)	(0.00801)	(0.0605)	(0.411)
$SIZE_{ijt} \times D_{ij}^{Conventional}$	-0.824	3.000***	-5.005**	0.171	-0.893***	-0.549***	-0.472***	-3.560***	-1.522***	0.0317	0.177***
	(0.745)	(0.174)	(2.061)	(0.167)	(0.0430)	(0.0177)	(0.0598)	(0.352)	(0.00421)	(0.0247)	(0.0337)
$FA_{ijt} \times D_{ij}^{Islamic}$	-0.619	-1.097	-1.702	-0.186	-0.290***	-0.128***	0.141	-0.00139	0.365***	0.0489	0.244
	(0.458)	(2.001)	(1.290)	(0.209)	(0.00625)	(0.0118)	(0.0953)	(0.105)	(0.00428)	(0.0568)	(0.277)
$FA_{ijt} \times D_{ij}^{Conventional}$	0.0884	-0.210***	-0.0638	0.483*	-0.0116	0.182***	0.275***	0.187	-0.771***	-0.0123	0.131***
	(0.448)	(0.0223)	(1.278)	(0.278)	(0.0103)	(0.00722)	(0.104)	(0.255)	(0.00318)	(0.0257)	(0.0228)
$Contraction_{jt}$	0.816**	-0.807***	1.940***	-0.651***	0.278***	0.108***	0.802***	1.784***	-0.761***	-0.0931**	-0.269***
	(0.345)	(0.0775)	(0.383)	(0.206)	(0.0376)	(0.0118)	(0.181)	(0.521)	(0.00357)	(0.0403)	(0.0167)
Panel B: Diagnostic Tests											
Observations	408	257	1,037	2,228	1,946	806	514	346	2,316	569	1,675
Banks	101	101	173	273	209	135	109	82	246	155	233
AR(2)	-0.20	1.44	-1.41	-0.51	-1.02	0.48	1.02	0.73	-0.56	1.07	0.78
p-value	0.838	0.149	0.157	0.607	0.306	0.634	0.307	0.464	0.574	0.284	0.433
J-statistic	40.01	58.10	44.21	178.05	165.24	108.66	39.10	58.49	233.15	44.73	76.26
p-value	0.338	0.362	0.298	0.961	0.120	0.991	0.376	0.102	0.728	0.607	0.205

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

profitability. Correspondingly, bank increases the LLP to avoid default risk (Athanasolou et al. 2005). Banks set low provision during good times when chances of default are low but forced to increase them during downturns as a cushion to absorb shocks, which is referred to as the pro-cyclicality. Capital crunch theory states that when a bank increases its LLP during slow economy, it has to suffer in terms of decreased earnings and weakening of capital which reduces banks' lending which may trigger a credit crunch that ultimately deteriorates economics recession.

LLP timeliness could reduce the effect of capital crunch theory in the economic downturn periods. Similarly, Cavallo and Majnoni (2002) suggested capital regulation should include provisioning practices in order to help protect the bank capital from procyclical effect.

According to Beaver et al. (1989), "a boost in LLP conveys a good news to customers as it represents the strength of a bank's future earnings. However, a rise can also be viewed as bad news as unexpected boost in LLP will be interpreted by investors as a decrease in a bank's financial strength and earning ability of that bank. A boost in loan loss provision is conveyed as good news only when indicators of loan default such as NPLs, LLR and loan charge-offs are within limits". NPL is also increase during contraction phase. Aggressive loan growth during economic expansion leads to reduction in banks' capital ratios and increases non-performing loans during economic downturn. NPLs increases during period of slower growth, when there is increase in unemployment, depreciation in exchange rate, and period of high inflation when borrowers find it difficult to repay their loans. Moreover, prudent lending reduces NPLs while moral hazard incentives and excessive risk may contribute to higher NPLs.

Liquidity of banks increases and stability of the banks decreases during contraction phase. When GDP decreases, maturity mismatch increases as banks hold higher share of liquid assets due to poor lending opportunities. Banks also keep higher level of liquid assets in order to avoid bank runs. Furthermore, banks capital ratios decreases which leads to higher leverage, risk and borrowing costs and ultimately decreases profitability of banks. As a result, environment of financial instability arises which deteriorates economic acivity.

Next, studying the difference in behavior of IBs and CBs during contraction phase (Table 6.10), fee income ratio of IBs and CBs both increases but the magnitude of FIR is greater in case of Islamic banks. The difference between IBs and CBs with regards to impact of FIR is statistically significant. LDR of IBs decreases and that of CBs increases and the difference is significant also. CIR also increases during contraction phase, the magnitude is greater in

Table 6. 10: Differential Impact of the Contraction Phase of the Business Cycle

	Model 9										
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.181***	0.556***	0.193***	0.588***	0.530***	0.297***	0.838***	0.324***	0.692***	0.649***	0.398***
	(0.0346)	(0.00144)	(0.000294)	(0.0835)	(0.00036)	(0.0245)	(0.0102)	(0.00480)	(0.000437)	(0.0290)	(0.00290)
$Islamic_{ij}$	34.65***	11.16	90.03***	18.09***	8.818***	-3.147*	6.899**	229.6***	13.25***	-4.420***	25.57***
	(13.07)	(9.286)	(2.031)	(6.821)	(0.0809)	(1.790)	(3.331)	(5.225)	(0.210)	(0.820)	(0.369)
$Conventional_{ij}$	-29.16	-3.549	263.2***	-0.556	8.737***	9.436***	7.754***	63.57***	33.51***	0.182	8.211***
	(17.58)	(2.779)	(0.466)	(2.799)	(0.323)	(1.216)	(2.293)	(5.325)	(0.122)	(0.272)	(0.331)
$SIZE_{ijt} \times D_{ij}^{Islamic}$	-1.310	1.826***	-3.883***	-0.936**	-0.398***	0.244**	-0.446**	-12.12***	-0.587***	0.299***	-1.24***
	(0.808)	(0.659)	(0.135)	(0.407)	(0.00562)	(0.108)	(0.220)	(0.323)	(0.0142)	(0.0513)	(0.0263)
$SIZE_{ijt} \times D_{ij}^{Conventional}$	2.491**	2.631***	-14.58***	0.161	-0.496***	-0.538***	-0.480***	-2.820***	-1.673***	0.0330*	-0.06***
	(1.066)	(0.175)	(0.0305)	(0.182)	(0.0207)	(0.0706)	(0.126)	(0.311)	(0.00693)	(0.0175)	(0.0195)
$FA_{ijt} \times D_{ij}^{Islamic}$	-1.075***	-0.0580	5.731***	-0.224	-0.00405	-0.0368	0.217	-6.480***	0.381***	0.0691*	0.406***
	(0.357)	(1.714)	(0.0961)	(0.217)	(0.00246)	(0.0634)	(0.368)	(0.239)	(0.00285)	(0.0353)	(0.0333)
$FA_{ijt} \times D_{ij}^{Conventional}$	1.074**	-0.204***	3.095***	0.481*	1.435***	-0.0621	-0.0539	-0.481	-0.725***	-0.00826	-0.01***
	(0.450)	(0.0234)	(0.0165)	(0.280)	(0.0106)	(0.0963)	(0.298)	(0.688)	(0.00534)	(0.00916)	(0.00404)
$Contraction_{jt} \times Islamic_{ij}$	1.307**	-8.492***	8.159***	-1.489**	0.140***	0.0324	0.950**	6.720***	-5.422***	-0.0819**	-1.10***
	(0.570)	(2.791)	(0.216)	(0.695)	(0.00829)	(0.122)	(0.441)	(0.832)	(0.0136)	(0.0406)	(0.0185)
$Contraction_{jt} \times Conventional_{ij}$	0.962**	0.943***	1.923***	-0.457**	1.653***	0.249**	2.948***	2.148***	-0.772***	-0.121**	-0.22***
	(0.472)	(0.0593)	(0.0106)	(0.219)	(0.0100)	(0.125)	(0.557)	(0.660)	(0.00551)	(0.0471)	(0.00738)
Panel B: Tests for differential effects of Contraction phase of Business Cycle											
$\beta_{Contraction}^{Islamic} = \beta_{Contraction}^{Conventional}$	0.29	11.13	829.77	1.90	31917.69	1.55	6.56	12.02	60100.89	0.40	2179.23
p-value	0.5945	0.0012	0.0000	0.1691	0.0000	0.2151	0.0118	0.0008	0.0000	0.5263	0.0000
Panel C: Diagnostic Tests											
Observations	408	257	1,037	2,228	1,699	806	532	427	2,292	569	1,866
Banks	101	101	173	273	208	135	109	84	246	155	234
AR(2)	-0.72	1.64	0.79	-0.56	0.03	0.80	1.02	0.97	-0.76	1.04	0.64
p-value	0.473	0.100	0.427	0.578	0.979	0.422	0.306	0.333	0.448	0.299	0.524
J-statistic	37.57	58.19	167.39	182.22	174.73	80.69	31.38	66.21	233.77	66.22	124.16
p-value	0.742	0.324	0.997	0.932	0.860	0.973	0.498	0.993	0.653	0.935	0.883

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

case of IBs and the differential impact is statistically significant. LLR, LLP and NPL all increases during contraction phase. However, the increase is more in case of CBs as compared to IBs. The difference is significant in case of LLR and LLP only. Maturity mismatch of IB and CB increases during contraction, the increase is greater in case of IBs and the difference is statistically significant. Stability of both type of banks decrease, it decreases to greater extent in case of IBs when measure by Z-score and EAR, and lesser in case or ROA where the difference is insignificant.

Table 6.11 shows the impact of trough phase of business cycle. During trough phase, FIR increases, LDR decreases, CIR increases, OHR decreases, credit quality in terms of all the measures increase, maturity mismatch increases and Z-score, ROA and EAR decreases. The explanation of which has been made in discussion of contraction phase.

Next the relative behavior of IBs and CBs during crisis period is investigated to examine whether one bank type is in better position to sustain shocks in the economy (Table 6.12). During crisis fee income ratio of IBs decreases and that of CBs increases and the differential impact of trough on fee income ratio across IBs and CBs is statistically insignificant. LDR decreases for both IBs and CBs consistent with previous literature. However, the differential impact is statistically insignificant. The LDR of IBs decreases to a greater extent as compared to CBs during the crisis. IBs cut back lending to a greater extent during crisis period as compared to CBs which is exactly opposite to their behavior during economic expansion.

When we study the cost efficiency, we find that cost income ratio increases for both IBs and CBs. Furthermore, size of coefficient is greater in case of Islamic banks which suggest that during crisis period cost income ratio of Islamic banks increases by greater extent and the difference is statistically significant. However, overhead cost decreases in case of Islamic banks only which is in line with the previous literature which includes Mirza et al. (2015). Overhead cost for conventional banks increases during crisis and the difference is statistically significant also. This negative relation shows lack of competence on part of IBs to manage their expense due to limited experience and the lack of qualified personnel. IBs are generally smaller in size as compared to CBs. Due to diseconomies of scale IBs experiences cost disadvantage and higher risk which decreases the profit margin.

Table 6. 11: Impact of the Trough Phase of the Business Cycle

	Model 10										
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.197***	0.558***	0.0811***	0.586***	0.756***	0.139	0.817***	0.229***	0.755***	0.643***	0.517***
	(0.0356)	(0.00442)	(0.000639)	(0.000699)	(0.0601)	(0.0882)	(0.00623)	(0.00514)	(0.0204)	(0.00657)	(0.00127)
$Islamic_{ij}$	38.07***	54.15***	58.22***	18.59***	10.14	-0.305	-4.746	126.4***	-10.75	-11.87***	27.68***
	(11.04)	(19.01)	(1.913)	(0.362)	(6.304)	(2.365)	(3.056)	(13.76)	(16.69)	(0.666)	(0.495)
$Conventional_{ij}$	11.93	-69.77***	58.24***	-0.598***	14.75***	8.913**	4.369***	133.3***	18.74**	-0.0660	9.156***
	(8.548)	(5.565)	(0.621)	(0.0709)	(4.848)	(3.421)	(1.187)	(7.483)	(7.857)	(0.232)	(0.0642)
$SIZE_{ijt} \times D_{ij}^{Islamic}$	-1.711***	-1.789	-0.869***	-1.030***	-0.468	0.0919	0.260	-6.605***	0.876	0.766***	-1.461***
	(0.644)	(1.098)	(0.116)	(0.0212)	(0.424)	(0.144)	(0.188)	(0.925)	(1.066)	(0.0404)	(0.0294)
$SIZE_{ijt} \times D_{ij}^{Conventional}$	0.00481	6.820***	-1.085***	0.158***	-0.876***	-0.516**	-0.257***	-7.014***	-1.011**	0.0409***	-0.211***
	(0.504)	(0.356)	(0.0359)	(0.00403)	(0.293)	(0.206)	(0.0681)	(0.459)	(0.473)	(0.0134)	(0.00408)
$FA_{ijt} \times D_{ij}^{Islamic}$	-0.408	6.365***	1.476***	-0.0454***	-0.484	-0.172*	0.177	2.454***	0.377*	0.124***	0.405***
	(0.462)	(1.213)	(0.0204)	(0.00378)	(0.385)	(0.101)	(0.135)	(0.714)	(0.224)	(0.0188)	(0.0246)
$FA_{ijt} \times D_{ij}^{Conventional}$	0.273	0.211***	2.125***	0.497***	-0.0118	0.182	0.138	-0.767	0.965**	0.0523***	0.0148***
	(0.382)	(0.0180)	(0.0186)	(0.00194)	(0.164)	(0.150)	(0.117)	(0.550)	(0.443)	(0.0102)	(0.000789)
$Trough_{jt}$	1.348***	-2.558***	8.224***	-0.167***	0.704***	0.278***	1.811***	1.450***	-1.164**	-0.0226**	-0.181***
	(0.414)	(0.231)	(0.0523)	(0.00116)	(0.234)	(0.106)	(0.127)	(0.536)	(0.537)	(0.00911)	(0.00425)
Panel D: Diagnostic Tests											
Observations	408	260	1,037	2,228	1,946	806	532	346	1,206	569	1,675
Banks	101	101	173	273	209	135	109	82	239	155	233
AR(2)	-0.59	1.65	-0.01	-0.68	-0.89	0.60	0.99	0.22	0.85	1.08	0.79
p-value	0.556	0.100	0.992	0.495	0.372	0.546	0.324	0.826	0.395	0.280	0.432
J-statistic	44.48	72.43	135.46	180.56	198.76	101.71	52.99	50.53	40.80	115.22	193.20
p-value	0.157	0.997	0.973	0.948	0.994	0.998	0.119	0.201	0.524	0.835	0.583

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Asset quality behavior during crisis shows that LLR, LLP, and NPL increases during trough as stated by previous literature. Moreover, the increase in Islamic banks as compared to CBs in line with the findings of Beck et al. (2013). The differential impact is significant in case of all measure except LLP. This shows the better credit quality of Islamic banks during the crisis. During trough phase, LLR increased due to the fact that banks expects more defaults to occur. Banks increases provisions to cover loan defaults helping to remain solvent and capitalized in periods of economic downturn. The chances of default are less in IBs and they undertake less aggressive lending. Secondly, majority customers keep their accounts in IBs mainly due to faith based reasons and on these grounds the chances of defaults are minimized.

Table 6. 12: Differential Impact of the Trough Phase of the Business Cycle

	Model 11										
REGRESSORS	**FIR**	**LDR**	**CIR**	**OHR**	**LLR**	**LLP**	**NPL**	**MM**	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results											
$BANK_{ijt-1}$	0.203***	0.460***	0.0557***	0.584***	0.600***	0.111***	0.833***	0.670***	0.552***	0.618***	0.553***
	(0.0358)	(0.00366)	(0.00356)	(0.0845)	(0.000205)	(0.0217)	(0.00542)	(0.0128)	(0.00960)	(0.0216)	(0.00396)
$Islamic_{ij}$	35.29**	163.2***	-8.630	21.60***	17.47***	-2.043**	-16.27***	-2.903	82.08***	-2.598	37.58***
	(14.24)	(18.62)	(7.283)	(7.965)	(0.0642)	(0.972)	(3.156)	(11.97)	(11.53)	(1.907)	(3.112)
$Conventional_{ij}$	8.425	-74.70***	26.78***	-0.141	18.25***	9.611***	1.313	33.32***	107.8***	0.0789	7.531***
	(9.030)	(7.035)	(10.26)	(2.451)	(0.116)	(1.449)	(1.382)	(8.483)	(8.098)	(0.696)	(0.270)
$SIZE_{ijt} \times D_{ij}^{Islamic}$	-1.497*	-7.457***	2.447***	-1.199**	-0.888***	0.201***	0.988***	0.0370	-4.874***	0.187	-2.055***
	(0.870)	(1.072)	(0.369)	(0.469)	(0.00371)	(0.0581)	(0.179)	(0.666)	(0.744)	(0.120)	(0.202)
$SIZE_{ijt} \times D_{ij}^{Conventional}$	0.226	7.693***	1.650**	0.127	-1.150***	-0.578***	-0.0902	-1.641***	-6.069***	0.0327	-0.165***
	(0.545)	(0.441)	(0.652)	(0.163)	(0.00708)	(0.0882)	(0.0751)	(0.475)	(0.509)	(0.0390)	(0.0158)
$FA_{ijt} \times D_{ij}^{Islamic}$	-0.405	2.581	5.696***	0.0301	-0.336***	-0.201***	0.228	3.739***	-0.174	0.0857***	-0.0292
	(0.503)	(1.852)	(0.622)	(0.196)	(0.00202)	(0.0395)	(0.242)	(0.414)	(0.211)	(0.0324)	(0.0942)
$FA_{ijt} \times D_{ij}^{Conventional}$	0.183	0.145	1.267***	0.416	0.688***	0.225**	-0.0386	-0.0759	-3.050***	-0.0496	0.163***
	(0.399)	(0.0896)	(0.137)	(0.264)	(0.00583)	(0.0973)	(0.137)	(0.607)	(0.381)	(0.0576)	(0.00590)
$Trough_{jt} \times Islamic_{ij}$	-0.170	-8.692***	21.31***	-2.208**	0.115***	0.881***	0.754***	4.962***	-4.817***	-0.221***	-2.492***
	(1.544)	(1.440)	(1.843)	(0.932)	(0.00281)	(0.103)	(0.239)	(0.641)	(0.656)	(0.0674)	(0.155)
$Trough_{jt} \times Conventional_{ij}$	1.562***	-6.199***	10.47***	0.684***	2.299***	1.071***	3.647***	3.001***	-2.293***	0.546***	-0.099***
	(0.434)	(0.200)	(0.282)	(0.259)	(0.00168)	(0.140)	(0.160)	(0.715)	(0.444)	(0.132)	(0.0228)
Panel B: Tests for differential effects of Trough phase of Business Cycle											
$\beta_{Trough}^{Islamic} = \beta_{Trough}^{Conventional}$	1.15	3.02	34.96	8.03	5.9	1.26	107.12	3.89	10.38	28.60	213.57
p-value	0.2860	0.0855	0.0000	0.0049	0.0000	0.2628	0.0000	0.0517	0.0015	0.0000	0.0000
Panel C: Diagnostic Tests											
Observations	408	260	1,037	2,228	1,699	806	532	376	1,206	569	1,675
Banks	101	101	173	273	208	135	109	84	239	155	233
AR(2)	-0.61	1.25	-0.26	-0.51	0.05	0.65	0.93	0.08	-1.37	0.93	0.79
p-value	0.540	0.210	0.797	0.608	0.964	0.519	0.351	0.933	0.170	0.351	0.427
J-statistic	45.29	60.72	82.11	175.65	175.96	49.60	46.50	70.08	93.65	44.28	162.31
p-value	0.114	0.937	0.996	0.967	0.857	0.984	0.996	0.441	0.159	0.965	0.117

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Turning to the stability we find that, Maturity match for both bank type's increases during crisis but the magnitude of increase is greater in case of IBs according to Beck et al. (2013). The differential impact of trough on Maturity mismatch is statistically insignificant across IBs and CBs. Z-score for both bank type's decreases during crisis and decrease is greater in case of IBs and the difference is statistically significant. ROA for Islamic banks decreases during crisis and that of conventional banks increases. The results are consistent with the findings of Zeitoon (2012) and Mirza et al. (2015) in case of Islamic banks, and with the findings of Alqahtani et al. (2016), Ozili (2015), and Beck et al. (2013) in case of

conventional banks. The differential impact is statistically significant across the two bank type. Capitalization of both banks decreases during crisis with Islamic banks more capitalized even during crisis period. The differential impact is statistically significant. Findings suggest that IB are better capitalized, have better credit quality and are more stable during crisis as suggested by Beck et al. (2013).

IBs do not suffer frequent bank run in case of demand deposits but they face withdrawal risk in case of PSIA deposits if the returns are not competitive. They also maintain reserves to meet unanticipated liquidity demand, due to absence of Shariah compliant interbank money market. IB are more stable and possess better assets quality as they are focused on profit sharing investment and financing based on mutual risk sharing. Secondly, they are forbidden to indulge in speculative practices and excessive leveraging. These features influence how Islamic banks behave during panics. Liquidity decreases with the decline in economic growth as some borrowers increase the demand for loans in recessions. When the bank uses short-term debt to finance illiquid assets, bank runs are likely to occur. The equity-like nature of IBs' liabilities provides them with an additional protection during economic downturns. Alaro and Hakeem (2011) advocated that due to risk management that Islamic banking is more stable. They are not available with specialized risk management tools still they are able to manage risk due to the inherent feature of risk sharing, due to prudent lending and due to prohibition of interest. According to Sundararajan and Errico (2002), limitations in use of interbank market, government securities, and risk management tools may make them more vulnerable to financial shocks.

6.2 Financial Soundness of Single *versus* Dual Banking System

6.2.1 Descriptive Analysis and Univariate Analysis

Table 6.13 presents the descriptive statistics for dependent and independent variables for full sample, Islamic, and conventional banks. When DBS is examined, the mean values of Z-score and EAR for IBs are significantly higher than CBs in accordance with the findings of Beck et al (2013) and Bourkhis et al. (2013). Similarly, mean value of Z-score, ROA and EAR are considerably higher for DBS as compared to SBS. This may be attributed to the presence of IBs in the system. This implies that IBs may positively contribute towards the stability of financial system due to their non-interest based nature.

Regarding bank-specific variables, CBs are significantly large in size as compared to IBs. The mean value of LAR is 55.042 for CBs and 50.358 for IBs. The mean of LAR is significantly higher for CBs, showing their risky behavior in terms of having more loans as compared to total assets which also corresponds to lower stability of the CBs. This is further confirmed by making comparison between SBS and DBS in terms of these variables. The mean value of bank size is higher for SBS. The mean value of LAR provides substantial evidence of the fact that, in general, CBs are less stable. The mean value of CIR for SBS is significantly higher than that for banks operating in DBS countries. The statistics on CIR and income diversity do not yield any significant difference between IBs and CBs. However, both these variables are higher for CBs. In general, large size and higher LAR of CBs in dual banking system and resultantly their lesser stability is further confirmed by making comparison between SBS and DBS in terms of these variables. Size is higher for SBS so is the LAR which shows that, in general, CBs are less stable as SBS consists of CBs only. CIR

Table 6. 13: Descriptive Statistics Islamic Banks, Conventional Banks, Single Banking System, and Dual Banking System

Variables	Observations	Mean	Standard Deviation	Dual Banking System		Difference t- test (p-value)	Single Banking System	Dual Banking System	Difference t- test (p-value)
				Islamic Banks	Conventional Banks				
Stability Measures									
Z-Score	5,004	16.16	27.09	21.707	15.605	0.000***	15.176	16.754	0.046**
ROA	4,148	1.447	3.705	1.500	1.683	0.340	1.087	1.647	0.000***
EAR	5,276	11.37	10.72	18.089	12.238	0.000***	8.221	13.370	0.000***
Bank Specific Variables									
SIZE	5,282	15.18	2.200	14.120	14.548	0.000***	16.314	14.465	0.000***
LAR	5,133	60.33	20.55	50.358	55.042	0.000***	69.930	54.183	0.000***
CIR	4,620	59.23	141.0	52.687	55.277	0.729	66.810	54.775	0.005***
ID	5,194	0.500	4.475	0.253	0.501	0.333	0.573	0.453	0.348
Macroeconomic Variables									
GDP	8,225	0.236	0.310				0.154	0.275	0.000***
INF	8,274	8.243	25.98				6.327	9.179	0.000***
EXRT	6,213	2,105	37,898				4.694	3577.596	0.000***
Industry Specific Variables									
GOVR	6,656	-0.0401	0.907				0.825	-0.461	0.000***
HHI	8,320	0.296	0.244				0.357	0.266	0.000***
MS_IB	7,639	8.584	17.12				0.000	12.893	0.000***

Notes: Mean values of variables for Islamic and conventional Banks, single and dual banking system are reported in Islamic Banks, Conventional Banks, Single Banking System, and Dual Banking System columns in the above table.
*** p<0.01, ** p<0.05, * p<0.1

for SBS is 66.81 which is significantly higher than banks in DBS countries which is found out to be 54.77. There is no significant difference between the two systems in terms of income diversity.

Comparing dual and single banking countries in terms of macroeconomic variables, it is observed that countries having DBS show significantly higher GDP growth as compared to countries having only convention banking. Similarly, inflation and exchange rate is reported to be significantly higher in DBS countries. Comparison in terms of industry-specific variables between SBS and DBS shows that the mean value of variable governance, which

captures cross-country differences in institutional development, is lower and negative for IBs. The mean value of governance for DBS is -0.461, indicating weak governance. The corresponding figure for SBS countries is 0.825, which is indicating strong governance performance as compared to DBS. In spite of weak governance performance, countries having DBS appear to be more stable. The mean value of HHI is significantly higher for single banking system. This higher value of HHI index can be attributed to the low level of stability of SBS. Such evidence is also observed by Cihak and Hesse (2010). The mean value of market share of Islamic banks applies to the countries having DBS only as the countries having SBS do not contain any Islamic bank.

Table 6.14 shows the correlation between all the variables in the analysis. Variables of stability such as Z-score, ROA, and EAR are significantly positively correlated with each other which shows that they are good alternate measures of stability. Size is negatively correlated with Z-score and EAR. LAR is negatively correlated with both ROA and EAR. CIR is negatively correlated with ROA but positively correlated with EAR. GDP is significant and positively correlated with all the measures of stability. INF is negatively correlated with Z-score and ROA. GOVR is negatively correlated with all the measures of stability. HHI is negatively correlated with Z-score, and EAR. Market share of Islamic banks is positively correlated with Z-score and EAR.

Table 6.14 : Correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	**Z-Score**	1												
2	**ROA**	0.0467*	1											
3	**EAR**	0.428***	0.441***	1										
4	**SIZE**	-0.212***	0.0034	-0.366***	1									
5	**LAR**	-0.0349	-0.078***	-0.267***	0.332***	1								
6	**CIR**	0.0372	-0.068***	0.0582**	-0.0357	-0.0260	1							
7	**ID**	0.0175	0.0314	0.0142	0.0109	-0.0304	0.863***	1						
8	**GDP**	0.0800***	0.204***	0.209***	-0.186***	-0.0973***	-0.0139	-0.0149	1					
9	**INF**	-0.084***	-0.0488*	0.0145	-0.225***	-0.254***	-0.0150	-0.00990	-0.0167	1				
10	**EXRT**	-0.00290	-0.00114	-0.00908	-0.0596**	-0.0733***	-0.00039	-0.000368	-0.293***	0.0950***	1			
11	**GOVR**	-0.0524**	-0.0614**	-0.325***	0.548***	0.544***	0.00470	0.0106	-0.153***	-0.421***	-0.0563**	1		
12	**HHI**	-0.0434*	-0.00363	-0.164***	0.150***	0.167***	-0.0189	0.0133	-0.181***	-0.203***	0.0378	0.572***	1	
13	**MS_IB**	0.113***	0.0381	0.231***	-0.288***	-0.430***	-0.0269	0.00139	0.0310	0.0449*	-0.0132	-0.333***	-0.122***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.2.2 Regression Results and Discussion

A. Soundness of Single Banking System and Dual Banking System: The Basic Research Question

To examine the difference in soundness of DBS and SBS, model (2.1) is estimated. The results are reported in Table 6.15. DBS is more stable than SBS which supports the findings of our univariate analysis. Z-score and ROA of DBS is greater than SBS. Islamic banking activities are linked to the real economy and this linkage reduces leveraging and prevents IB to adopt speculative behavior that leads to instability (Bourkhis et al., 2013). Thus, such link is lacking in SBS. Hence, they are deprived of inherent characteristics of stability.

Examining the impact of bank specific variables on soundness of SBS and DBS, the result shows that bank size is negatively related to the financial soundness of DBS. This negative impact of size is consistent with the previous studies (Beck et al., 2013; Bourkhis et al., 2013; Cihak and Hesse, 2010). Bank size is insignificantly related to the financial stability for the countries having SBS. Tests for the differential impact shows significant difference

in impact of bank size on banks' stability across DBS and SBS, particularly in case when the stability is measured by Z-score. Similarly, the impact of LAR on the stability is negative in case of DBS (when stability is measured by ROA) in accordance with literature including Cihak and Hesse (2010) and Bourkhis et al., (2013). However, the impact of LAR on the stability is insignificant in case of SBS. Overall our results specify that the impact of LAR on the stability differs across SBS and DBS when Z-score and ROA are used as stability measures.

CIR is negatively linked to the stability for both SBS and DBS and the coefficients of CIR differs across DBS and SBS consistent with the findings of Cihak and Hesse (2010) Bourkhis et al., (2013), and Alqahtani et al., (2016). The magnitude of this impact is significantly greater for DBS which asserts that IB operating in DBS countries are not cost effective and their stability decreases with CIR, to a greater extent as compared to SBS. Examining the behavior of ID, it is found that income diversity exerts a significantly positive impact on stability for both SBS and DBS in line with the results of Okumus and Artar (2012). The size of coefficient for DBS is higher than that for SBS in case of Z-score and EAR. However, in case of EAR, it is almost double than that of SBS. Yet, this difference is statistically insignificant.

Regarding the impact of macroeconomic variables, GDP growth is positively related to the stability for both SBS and DBS. This finding holds for all the stability measures in case of DBS, however, in case of SBS it holds only for ROA in accordance with the previous literature including Zhang and Daly (2013), Mollah and Zaman (2015), Alqahtani et al. (2016), Wasiuzzaman and Tarmizi (2010), Bashir (2003), and Bilal et al. (2013). The magnitude of this impact is greater for DBS as compared to SBS and there exists statistically

Table 6. 15: Soundness of Dual Banking System and Single Banking System Countries

Regressors	Model 1		
	Z-SCORE	**ROA**	**EAR**
Panel A: Estimation Results			
D_{ij}^{DBS}	19.58** (9.702)	6.296*** (2.188)	10.84** (4.196)
D_{ij}^{SBS}	5.301 (6.738)	4.768 (3.033)	12.44* (6.833)
$SIZE_{ijt-1}.D_{ij}^{DBS}$	-1.238** (0.526)	0.164 (0.138)	-0.492** (0.209)
$SIZE_{ijt-1}.D_{ij}^{SBS}$	-0.0686 (0.365)	-0.182 (0.173)	-0.365 (0.343)
$LAR_{ijt-1}.D_{ij}^{DBS}$	0.0859*** (0.0320)	-0.0931*** (0.0326)	0.0341 (0.0230)
$LAR_{ijt-1}.D_{ij}^{SBS}$	0.00372 (0.0202)	-0.0145 (0.0124)	-0.0130 (0.0243)
$CIR_{ijt-1}.D_{ij}^{DBS}$	-0.0249*** (0.00933)	0.00157 (0.00494)	-0.0278***(0.00829)
$CIR_{ijt-1}.D_{ij}^{SBS}$	-0.00263*** (0.000852)	-0.00747***(0.00151)	-0.000547 (0.000572)
$ID_{ijt-1}.D_{ij}^{DBS}$	0.629*** (0.218)	-0.00782(0.105)	0.811** (0.352)
$ID_{ijt-1}.D_{ij}^{SBS}$	0.501 (0.592)	0.325(0.678)	0.536** (0.272)
$GDP_{jt-1}.D_{ij}^{DBS}$	1.707** (0.844)	1.551**(0.721)	3.426*** (0.944)
$GDP_{jt-1}.D_{ij}^{SBS}$	-0.522 (1.057)	1.356**(0.597)	0.405 (0.790)
$INF_{jt-1}.D_{ij}^{DBS}$	-0.00254 (0.0263)	-0.0935*(0.0519)	0.0435* (0.0260)
$INF_{jt-1}.D_{ij}^{SBS}$	0.00614 (0.107)	0.0237(0.0435)	-0.0728 (0.0655)
$EXRT_{jt-1}.D_{ij}^{DBS}$	1.44e-05 (1.15e-05)	9.44e-06**(4.11e-06)	1.93e-05***(3.56e-06)
$EXRT_{jt-1}.D_{ij}^{SBS}$	-0.00785 (0.0220)	0.00915(0.00834)	0.00286 (0.00697)
$GOVR_{jt-1}.D_{ij}^{DBS}$	-0.327 (1.219)	1.316**(0.570)	-0.0233 (0.668)
$GOVR_{jt-1}.D_{ij}^{SBS}$	1.785** (0.812)	-0.590**(0.295)	-1.356*** (0.519)
$HHI_{jt-1}.D_{ij}^{DBS}$	-7.510 (4.653)	-3.919**(1.845)	0.246 (3.772)
$HHI_{jt-1}.D_{ij}^{SBS}$	-5.929** (2.907)	2.999***(0.929)	-1.810 (1.800)
$MS-IB_{jt-1}.D_{ij}^{DBS}$	0.0609*** (0.0210)	-0.0401***(0.0133)	0.0281**(0.0134)
$MS-IB_{jt-1}.D_{ij}^{SBS}$	0 (0)	0(0)	0(0)
$ZSCORE_{ijt-1}$	0.609*** (0.0901)		
ROA_{ijt-1}		0.0972(0.0719)	
EAR_{ijt-1}			0.504***(0.0550)
Panel B: Tests for differential effects of Variables			
$\beta_{SIZE}^{DBS} = \beta_{SIZE}^{SBS}$	3.91	2.76	0.13
p-value	0.0491	0.0976	0.7221
$\beta_{LAR}^{DBS} = \beta_{LAR}^{SBS}$	5.64	6.58	1.74
p-value	0.0182	0.0109	0.1884
$\beta_{CIR}^{DBS} = \beta_{CIR}^{SBS}$	5.58	2.57	10.72
p-value	0.0188	0.1101	0.0012
$\beta_{ID}^{DBS} = \beta_{ID}^{SBS}$	0.04	0.24	0.36
p-value	0.8375	0.6219	0.5506
$\beta_{GDP}^{DBS} = \beta_{GDP}^{SBS}$	2.62	0.05	5.58
p-value	0.1066	0.8295	0.0188
$\beta_{INF}^{DBS} = \beta_{INF}^{SBS}$	0.01	2.96	2.80
p-value	0.9358	0.0864	0.0956
$\beta_{EXRT}^{DBS} = \beta_{EXRT}^{SBS}$	0.13	1.20	0.17
p-value	0.7208	0.2744	0.6841
$\beta_{GOVR}^{DBS} = \beta_{GOVR}^{SBS}$	2.67	7.82	2.63
p-value	0.1037	0.0055	0.1061
$\beta_{HHI}^{DBS} = \beta_{HHI}^{SBS}$	0.10	9.19	0.30
p-value	0.7494	0.0027	0.5842
$\beta_{MS-IB}^{DBS} = \beta_{MS-IB}^{SBS}$	8.44	9.10	4.37
p-value	0.0040	0.0028	0.0374

Panel C: Diagnostic Tests			
Observations	1,823	1,985	2,115
Banks	279	264	280
AR(2)	-0.45	-0.50	0.79
p-value	0.652	0.620	0.427
J-statistic	257.21	242.23	252.63
p-value	0.254	0.342	0.205

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

significant difference between the two coefficients. Inflation has negative impact on the stability of DBS and the results are significant in case of ROA. Zhang and Daly (2013), and Bilal et al. (2013) also reported the similar findings.

Observing industry-specific variables, Governance has also different impacts on the stability across DBS and SBS. There exists a positive relationship between governance and the stability of DBS (in case of ROA) and the relation is positive with the stability of SBS (in case of Z-score). HHI is negatively linked to the financial stability of both DBS and SBS when financial stability is measured by ROA and Z-score respectively. The differential impact of HHI on the financial stability is statistically significant across DBS and SBS. Findings suggest that the presence of Islamic banks increases the stability of the entire financial system.

Overall, we find that IBs are more stable than CBs when both are operating together in a DBS. Similarly, comparing DBS with SBS, it is noticed that the financial system with IBs is more stable. Since it has been theoretically and empirically proved that Islamic banking practices are not truly in line with the Shariah principles, they are more stable because that they do not invest in derivatives, "Tawaruq" and loans sale (Chapra, 2000; Siddiqi, 2006; Hassan, 2006). Moreover, IBs due to the diversification of their assets contribute towards enhancing the financial stability of the system (Ghassan and Taher, 2013).

The impact of macroeconomic and bank-specific variables on the financial stability measures vary across both banking systems. For instance, GDP is positively related to the financial stability of DBS. This finding holds for all three measures of stability. On the other hand, for SBS, GDP is positively linked to only ROA. The differential impact of GDP on the financial stability across DBS and SBS is statistically significant. Similarly, the rate of inflation has a negative impact on ROA and a positive impact on EAR in case of DBS. However, inflation does not have significant impact on any of the measures of the financial stability in case of SBS. Apart from the different basic principles of two types of banking, difference in the management skills also contributes towards the differential response of both types of banks to changes in macroeconomic variables as well as bank-specific variables (Okumus and Artar, 2012). Moreover, IBs perform better in economies where the GDP growth is high (Zarrouk et al., 2016).

B. Soundness of Dual Banking System

Since it has been established that DBS is more stable than SBS, the next step is to investigate the soundness of DBS to see whether IBs are more stable than the CBs (Model 2.2). Table 6.16 shows the results using three stability measures (Z-score, ROA and EAR). The results confirm the findings given in Table 6.13 of significantly higher stability of IBs as compared to CBs when measured by all the three measures of stability. When measured by Z-score and ROA, IBs have 0.25% point and 0.344% point higher stability, respectively, as compared to their conventional counterparts. The magnitude of this difference is meaningful in case of EAR where IB have 8.62% point higher stability.

Table 6. 16: Soundness of Dual Banking System

	Model 2		
Regressors	**Z-SCORE**	**ROA**	**EAR**
Panel A: Estimation Results			
$D_{ij}^{Islamic}$	14.18*** (5.194)	5.620*** (2.017)	31.28** (13.74)
$D_{ij}^{Conventional}$	13.93*** (5.016)	5.276*** (1.856)	22.66** (10.23)
$SIZE_{ijt-1}$	-0.950*** (0.295)	-0.101 (0.111)	-1.226** (0.535)
LAR_{ijt-1}	0.0558** (0.0229)	-0.0288*** (0.0101)	0.00381 (0.0272)
CIR_{ijt-1}	-0.00664** (0.00337)	-0.00543** (0.00265)	-0.0185** (0.00770)
ID_{ijt-1}	0.161** (0.0732)	0.138** (0.0571)	0.422** (0.170)
GDP_{jt-1}	1.188* (0.654)	0.720 (0.461)	0.958 (0.868)
INF_{jt-1}	0.0100 (0.0200)	-0.0194 (0.0205)	0.0202 (0.0374)
$EXRT_{jt-1}$	2.07e-05*** (6.16e-06)	8.93e-06* (5.10e-06)	1.80e-05** (8.11e-06)
$GOVR_{jt-1}$	0.876 (0.692)	0.758*** (0.273)	2.603** (1.160)
HHI_{jt-1}	-4.383** (2.114)	-3.128** (1.531)	-11.53** (4.964)
$MS-IB_{jt-1}$	0.0486** (0.0205)	-0.0166** (0.00646)	-0.0772* (0.0428)
$ZSCORE_{ijt-1}$	0.797*** (0.110)		
ROA_{ijt-1}		0.473*** (0.0994)	
EAR_{ijt-1}			0.884*** (0.182)
Panel B: Diagnostic Tests			
Observations	2,156	2,054	2,474
Banks	280	286	328
AR(2)	-0.61	1.15	1.17
p-value	0.541	0.251	0.243
J-statistic	159.58	158.41	175.55
p-value	0.406	0.954	0.873

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results regarding bank-specific variables are somewhat in accordance with the underlying theory and the previous literature. Bank size appears to be negatively related with banks' stability consistent with the findings of Beck et al., (2013), Bourkhis et al. (2013), and Mirza et al, (2015). Significant results are shown when stability is measured by Z-score and EAR. Banks with higher concentration of loans as compared to total assets (LAR) are less sound when ROA is used as the stability measure. Previous studies including Cihak and Hesse (2010), Bourkhis et al., (2013), and Staikouras and Wood (2003) also reported negative relationship between LAR and banks' stability.

CIR also exhibits significant and negative effects on banks' stability. Higher expenses leads to decreased profitability and lesser stability (Kosmidou et al., 2006). The coefficient of the

CIR is significant for all the three dependent variables. Efficient banks have higher stability as compared to less efficient as confirmed by Cihak and Hesse (2010), Bourkhis et al., (2013), and Alqahtani et al. (2016). Income diversity is positively related to all the measures of stability which helps to infer that when banks becomes more stable when they move to sources of income generation other than traditional lending businesses. Cihak and Hesse (2010), and Okumus and Artar (2012) also found similar relationship.

Examining the macroeconomic variables, GDP growth is significantly and positively related to Z-score as found by Cihak and Hesse (2010), Bilal et al., (2013), and Mirza et al., (2015). The exchange rate shows a positive relation with stability which is contrary to the theory which states that "depreciation tends to lead to significantly higher banking risk because banks' balance sheet positions that are denominated in foreign currency will be eroded with a depreciating domestic currency" (Cihak and Hesse, 2010).

Concerning the industry-specific variables, the results specify that governance is positively related to banks' stability when it is measured by ROA and EAR showing that better governance leads to more stable financial system. HHI is negatively related to all the three measures of financial stability showing that higher banking sector concentration is linked with lower stability as stated by Schaeck et al. (2006), Cihak and Hesse (2010), and Ghassan and Taher (2013). The value of HHI close to zero indicates high level of competition in dual banking system. Further, presence of IBs in DBS countries is shown to have increased the stability of all the other banks in system. Higher presence of IBs is likely to increase other banks' Z-score.

C. Soundness of Dual Banking System: Differential Impact between Islamic Banks and Conventional Banks

To test whether the impact of bank-specific, macroeconomic, and industry-specific variables differs across Islamic and conventional banks, Equation (2.3) is estimated and the results are reported in Table 6.17. IBs are significantly more stable than the CBs as the values of stability measures of IBs are greater than CBs. However, this relation is pretty much evident in case of Z-score (Cihak and Hesse, 2010 and Bourkhis et al., 2013).

Regarding bank-specific variables, size has negative impact on the financial stability in case of both types of banks. When the size of a bank increases, bank becomes less stable regardless of whether the bank is doing business based on Islamic or conventional modes of banking. Moreover, the magnitude is larger in case of CBs but we find no statistical different between the two coefficients. This finding is consistent with the several empirical studies Beck et al., (2013), Bourkhis et al., (2013), and Ashraf et al., (2016). Moreover, this behavior is well supported in case of IBs in a study by Cihak and Hesse (2010), in which they stated that IBs are more stable when they are small in size. Contrary to this belief, Hakenes and Schnabel (2011) stated that due to sophisticated risk management practices and access to lender of last resort facility larger bank are considered to be more stable. LAR is positively related to Z-score of CBs as shown by Cihak and Hesse (2010), Bourkhis et al., (2013), Alqahtani et al. (2016), and Almazari (2014). CIR is negatively related to stability for IBs (Cihak and Hesse, 2010; Bourkhis et al., 2013; Alqahtani et al. 2016; Almazari, 2014), and positively related to stability for CBs. The difference in the impact of CIR upon financial stability across IB and CB is statistically significant in case of Z-score and ROA. The negative relationship in case of IBs is explained by the lack of competency

Table 6. 17: Soundness of Dual Banking System; Difference between Islamic and Conventional Banks

Regressors	Model 3 Z-SCORE		ROA		EAR	
Panel A: Estimation Results						
$D_{ij}^{Islamic}$	28.91***	(3.523)	6.536**	(2.667)	23.89**	(10.89)
$D_{ij}^{Conventional}$	27.67***	(2.837)	0.982	(1.274)	6.355	(11.20)
$SIZE_{ijt-1} . D_{ij}^{Islamic}$	-1.287***	(0.279)	-0.157	(0.125)	-1.108	(0.696)
$SIZE_{ijt-1} . D_{ij}^{Conventional}$	-1.698***	(0.163)	-0.0914	(0.0697)	0.174	(0.575)
$LAR_{ijt-1} . D_{ij}^{Islamic}$	-0.00223	(0.0219)	-0.000693	(0.0157)	-0.00319	(0.0254)
$LAR_{ijt-1} . D_{ij}^{Conventional}$	0.0881***	(0.0114)	-0.00307	(0.00652)	-0.0329	(0.0315)
$CIR_{ijt-1} . D_{ij}^{Islamic}$	-0.0137***	(0.00150)	-0.0168***	(0.000637)	-0.0330**	(0.0167)
$CIR_{ijt-1} . D_{ij}^{Conventional}$	0.0149***	(0.00498)	0.0183***	(0.00154)	-0.00493	(0.00832)
$ID_{ijt-1} . D_{ij}^{Islamic}$	0.305***	(0.0300)	0.344***	(0.0737)	0.714**	(0.352)
$ID_{ijt-1} . D_{ij}^{Conventional}$	0.0887	(0.251)	-0.422***	(0.114)	-0.228	(0.910)
$GDP_{jt-1} . D_{ij}^{Islamic}$	-0.359	(0.506)	0.233	(0.203)	1.500	(2.354)
$GDP_{jt-1} . D_{ij}^{Conventional}$	3.795***	(0.797)	1.468***	(0.270)	2.083	(2.914)
$INF_{jt-1} . D_{ij}^{Islamic}$	0.00314	(0.0347)	-0.154***	(0.0186)	0.0147	(0.167)
$INF_{jt-1} . D_{ij}^{Conventional}$	-0.119***	(0.0144)	-0.0566***	(0.00788)	0.0259	(0.0775)
$EXRT_{jt-1} . D_{ij}^{Islamic}$	0.0231	(0.0308)	-0.0205***	(0.00635)	-0.0365	(0.0469)
$EXRT_{jt-1} . D_{ij}^{Conventional}$	0.0128	(0.0106)	7.19e-05*	(3.94e-05)	2.43e-05**	(1.09e-05)
$GOVR_{jt-1} . D_{ij}^{Islamic}$	1.330	(0.870)	-0.723	(0.466)	0.660	(1.965)
$GOVR_{jt-1} . D_{ij}^{Conventional}$	1.866***	(0.590)	-0.504	(0.370)	3.044*	(1.658)
$HHI_{jt-1} . D_{ij}^{Islamic}$	-6.583**	(2.702)	-6.303**	(3.060)	-2.524	(8.639)
$HHI_{jt-1} . D_{ij}^{Conventional}$	-16.71***	(3.352)	1.543	(1.244)	-7.109	(9.251)
$MS-IB_{jt-1} . D_{ij}^{Islamic}$	-0.0112	(0.0183)	-0.00922	(0.0106)	-0.00777	(0.0347)
$MS-IB_{jt-1} . D_{ij}^{Conventional}$	0.214***	(0.0192)	0.0451***	(0.00891)	0.0477	(0.0457)
$ZSCORE_{ijt-1}$	0.493***	(0.00602)				
ROA_{ijt-1}			0.118***	(0.0189)		
EAR_{ijt-1}					0.558***	(0.163)
Panel B: Tests for differential effects of Variables						
$\beta_{SIZE}^{Islamic} = \beta_{SIZE}^{Conventional}$	1.83		0.18		1.89	
p-value	0.1775		0.6679		0.1701	
$\beta_{LAR}^{Islamic} = \beta_{LAR}^{Conventional}$	13.77		0.02		0.44	
p-value	0.0002		0.8905		0.5081	
$\beta_{CIR}^{Islamic} = \beta_{CIR}^{Conventional}$	28.63		593.73		1.55	
p-value	0.0000		0.0000		0.2135	
$\beta_{ID}^{Islamic} = \beta_{ID}^{Conventional}$	0.75		31.27		0.71	
p-value	0.3867		0.0000		0.3993	
$\beta_{GDP}^{Islamic} = \beta_{GDP}^{Conventional}$	19.28		15.33		0.02	
p-value	0.0000		0.0001		0.8952	
$\beta_{INF}^{Islamic} = \beta_{INF}^{Conventional}$	10.92		23.22		0.00	
p-value	0.0011		0.0000		0.9531	
$\beta_{EXRT}^{Islamic} = \beta_{EXRT}^{Conventional}$	0.10		10.55		0.61	
p-value	0.7498		0.0013		0.4371	
$\beta_{GOVR}^{Islamic} = \beta_{GOVR}^{Cnventional}$	0.26		0.15		1.28	
p-value	0.6125		0.7032		0.2595	
$\beta_{HHI}^{Islamic} = \beta_{HHI}^{Conventional}$	7.03		4.92		0.08	
p-value	0.0084		0.0274		0.7713	
$\beta_{MS-IB}^{Islamic} = \beta_{MS-IB}^{Conventional}$	69.18		12.25		0.83	
p-value	0.0000		0.0006		0.3640	

Panel C: Diagnostic Tests			
Observations	1,963	1,650	2,585
Banks	288	244	328
AR(2)	-0.46	0.34	0.88
p-value	0.645	0.737	0.378
J-statistic	99.79	83.38	121.64
p-value	0.988	0.956	0.992

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

on part of IBs in expense management, which is due to their short history, limited experience, and the shortage of qualified personnel (Zarrouk et al., 2016). Examining income diversity (ID), as banks get more diversified their stability increases in case of IBs in line with the results of Cihak and Hesse (2010). Income diversity is negatively related to stability of CBs as stated by Okumus and Artar (2012).

Turning to the impact of macroeconomic variables, GDP growth has positive impact on the stability (measured by Z-score and ROA) of CBs as stated by Zhang and Daly (2013), Alqahtani et al., (2016), Kosmidou et al., (2006), and Demirguc-Kunt and Maksimovic (1996). The differential impact of GDP on the financial stability across IB and CB is statistically significant. According to Sufian (2009), demands for the financial services and banks' stability increase when the economy grows.

The rate of inflation has a negative impact on the stability of IBs as measured by ROA and CBs as measured by Z-score and ROA. Zhang and Daly (2013) and Mollah and Zaman (2015) also reported similar findings. The magnitude of coefficient is greater in case of IB and the differential impact is statistically significant too. Inflation may have a direct effect on the banks' profitability in the form of increase in price of labor or indirect effect in the form of changes in the interest rate and assets prices. The negative relationship shows importance of economic and financial policy of the government plays in inducing financial stability in the system (Ghassan & Taher, 2013). In case of IB, when inflation is

unanticipated, it makes difficult for them to adjust the profit rates accordingly as they are exposed to real economic activity. This results in costs which increases at increasing rate compared to revenues exerting negative impact on profitability and stability. The results for exchange shows that as the domestic currency depreciates, the stability of IBs decreases. The relation of the exchange rate with Islamic banks' stability is negative and significant when it is measured by ROA.

As regards industry-specific variables, governance has a positive impact on the stability of CBs in case of Z-score and EAR. Cihak and Hesse (2010) also report the similar findings. The differential impact of governance on financial stability across IB and CB is statistically insignificant. The impact of banking sector concentration on stability is negative in case of both types of banks. The magnitude is larger in case of CBs and this difference is statistically significant. Higher share of IBs has a positive impact on Z-score and ROA of CBs. However, higher shares of IBs in the financial system have no significant impact on Z-score, ROA and EAR of IBs.

6.3 Nexus between Economic Growth, Investment, and Islamic Banking Development

6.3.1 Descriptive Statistics and Univariate Analysis

Table 6.18 shows descriptive statistics for dependent, financial development, and controlled variables. Dependent variables GDP and GCF have mean score of 0.288 and 22.98 respectively. When we examine country specific variables we find the mean score of 7.311, 84.90, 22.04, 5.520, 15.98, 1.376, 25.97 for inflation, trade openness, and GFCF, RIR, Govt. consumption, Per capita GDP growth and domestic savings respectively. For the financial

Table 6. 18: Descriptive Statistics Economic Growth, Domestic Investment, Islamic Banking Development

Variables	Observations	Mean	Standard deviation	Min	Max
GDP	396	0.288	0.359	-2.277	2.509
GCF	391	22.98	8.089	4.562	61.47
Inflation	396	7.311	12.21	-3.846	84.64
Trade Openness	387	84.90	36.51	26.33	191.8
GFCF	368	22.04	7.974	2.918	58.96
RIR	289	5.520	10.23	-20.13	41.25
Govt. Consumption	378	15.98	6.795	2.332	33.01
Per Capita GDP Growth	385	1.376	4.757	-14.79	17.50
Domestic Savings	378	25.97	22.25	-32.09	74.34
Islamic Banks					
DOI	227	7.623	9.950	0.000194	43.25
SOI	232	9.714	11.59	0.000453	59.57
CPS	94	3.618	2.842	0.0291	12.08
ATA	233	17.68	16.52	0.0187	80.77
Conventional Banks					
DOI	346	41.68	60.69	0.0852	271.6
SOI	346	49.24	67.07	0.315	303.8
CPS	184	26.00	36.18	0.0006	164.6
ATA	342	72.01	22.12	3.304	99.99

development proxies, we find considerable differences with the mean score of all the measures of financial development being higher for conventional banking development.

Table 6.19 displays the correlation matrix. Correlation matrix shows that both measures of economic activity GDP and GCF are positively and significantly correlated. GFCF is positively correlated with GDP. Trade openness and domestic savings are positively correlated with GCF.

Table 6.19: Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	**GDP**	1																
2	**GCF**	0.582***	1															
3	**INF**	0.155	0.0115	1														
4	**T.OPEN**	0.0328	0.382*	-0.324*	1													
5	**GFCF**	0.592***	0.927***	0.0399	0.317*	1												
6	**RIR**	-0.253	0.0567	-0.426**	-0.0710	0.101	1											
7	**GOV.CON**	-0.178	-0.0952	-0.282	0.313*	-0.0447	0.258	1										
8	**P.C.GDP**	0.679***	-0.0521	0.0684	-0.170	-0.0932	-0.285	-0.0512	1									
9	**D.SAV**	0.425**	0.489***	-0.177	0.0800	0.457**	-0.051	-0.365*	0.0127	1								
10	**DOI_ISL**	-0.274	0.133	-0.261	0.406**	0.00727	0.181	-0.124	-0.32*	0.223	1							
11	**SOI_ISL**	-0.326*	0.0443	-0.221	0.363*	-0.0378	0.174	-0.0025	-0.34*	0.0625	0.956***	1						
12	**CPS_ISL**	0.203	0.236	-0.203	0.0942	0.198	-0.037	0.0779	0.0896	0.127	0.348*	0.417**	1					
13	**ATA_ISL**	0.125	-0.135	-0.0329	-0.325*	-0.130	0.0698	-0.0862	0.185	0.468**	0.310*	0.288	0.230	1				
14	**DOI_CON**	-0.214	0.212	-0.236	0.789***	0.130	0.0531	0.303*	-0.244	-0.369*	0.495***	0.517***	0.178	-0.476**	1			
15	**SOI_CON**	-0.214	0.157	-0.240	0.786***	0.0764	0.0185	0.302*	-0.216	-0.409**	0.430**	0.458**	0.122	-0.53***	0.977***	1		
16	**CPS_CON**	-0.255	0.170	-0.203	0.661***	0.126	0.0620	0.260	-0.32*	-0.328*	0.544***	0.599***	0.241	-0.390**	0.926***	0.910***	1	
17	**ATA_CON**	0.0517	0.505***	-0.243	0.806***	0.467**	-0.023	0.264	-0.282	-0.0403	0.175	0.166	0.107	-0.70***	0.721***	0.738***	0.63***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.3.2 Regression Results and Discussion

6.3.2.1 Economic Growth and Banking Sector Development

Table 6.20 reports the results of the impact of banking development on economic growth as estimated by Model (3.1).

In the Column 2, the impact of depth of Islamic and conventional financial intermediation is reported which shows that an increase in depth of Islamic intermediation has a positive effect on economic growth in line with the findings of Kassim (2016) and Imam and Kapodar (2016). On the contrary, depth of conventional intermediation does not have any significant impact on economic growth. Test of differential impact implies statistically significant difference between the impact of depth of Islamic and conventional intermediation on economic growth. Regarding the impact of country-specific variables, inflation and GFCF both have positive impact on economic growth. Column 3 show that an

Table 6. 20: Economic Growth and Financial Development

REGRESSORS	Model 1 DOI	Model 2 SOI	Model 3 CPS	Model 4 ATA
Panel A: Estimation Results				
$GDP_{j,t-1}$	0.0919***	0.554***	0.222	0.0451***
	(0.0240)	(0.0482)	(0.224)	(0.0142)
INF_jt	0.00588***	-0.00139	0.0832***	0.0126***
	(0.000245)	(0.00169)	(0.0146)	(0.00105)
$T.OPEN_{jt}$	-0.000888	0.000595*	-0.00275	-0.000022
	(0.000695)	(0.000312)	(0.00251)	(0.000460)
$GFCF_{jt}$	0.00853***	0.00396**	0.0413***	0.00969***
	(0.000994)	(0.00156)	(0.0124)	(0.00286)
$DOI_{jt}^{Islamic}$	0.00432*			
	(0.00224)			
$DOI_{jt}^{Convnetional}$	-0.00117			
	(0.000750)			
$SOI_{jt}^{Islamic}$		-0.00141***		
		(0.000327)		
$SOI_{jt}^{Convnetional}$		-0.000396***		
		(8.08e-05)		
$CPS_{jt}^{Islamic}$			0.0572**	
			(0.0186)	
$CPS_{jt}^{Convnetional}$			-0.00130	
			(0.00189)	
$ATA_{jt}^{Islamic}$				0.00521***
				(0.000941)
$ATA_{jt}^{Convnetional}$				0.00407***
				(0.000631)
Constant	0.163***	0.0107	-1.005	-0.400***
	(0.0464)	(0.0289)	(0.640)	(0.0637)
Panel B: Tests for differential effects of Variables				
$\beta_{DOI}^{Islamic} = \beta_{DOI}^{Conventional}$	3.79			
p-value	0.0673			
$\beta_{SOI}^{Islamic} = \beta_{SOI}^{Conventional}$		9.69		
p-value		0.0060		
$\beta_{CPS}^{Islamic} = \beta_{CPS}^{Conventional}$			8.49	
p-value			0.0172	
$\beta_{ATA}^{Islamic} = \beta_{ATA}^{Conventional}$				1.50
p-value				0.2362
Panel C: Diagnostic Tests				
Observations	203	208	76	208
Countries	19	19	10	19
AR(2)	1.24	1.59	-0.28	1.01
p-value	0.214	0.111	0.782	0.314
J-statistic	15.18	14.17	3.75	11.90
p-value	0.999	0.997	0.710	0.987

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

increase both in size of Islamic and conventional intermediation has a negative effect on economic growth and the difference is statistically significant. Furthermore, GFCF and

trade openness have positive impact on economic growth. Column 4 shows that domestic credit provided by Islamic banking sector has positive impact on economic growth which supports the findings of Imam and Kapodar (2016). On the other hand, domestic credit by conventional banking sector has insignificant impact on economic growth. Inflation and GFCF have significantly positive impact. The results are in line with the previous literature including Levine et al. (2000), Beck and Levine (2004). Column 5 shows that the impact of Islamic banking assets as percentage of total banking assets and conventional banking assets as percentage of total banking assets both have positive impact on economic growth. The impact is slightly higher in case of Islamic banking development in line with the findings of Imam and Kapodar (2016). As regard country-specific variables, inflation and GFCF have positive impact on economic growth.

As mentioned earlier, pervious literature is unanimous that impact of banking sector development cannot be apprehended solely by a single measure (Beck and Levine, 2004; Rousseau and Wachtel, 1998; Levine and Zervos, 1998). Decision whether financial development is favorable for economic growth varies with the type of proxy (Adu et al., 2013).

Results shows that Islamic banking development has positive impact on economic growth consistent with the findings of Tabash and Dhankar, (2014), Gheeraert (2014), Imam and Kapodar (2016), Kassim (2016), Abedifar et al. (2016), and Boukhatem and Moussa (2018). Islamic banks have the ability to influence economic growth by altering DOI, CPS, and ATA ratio. Whereas, conventional banks can stimulate economic growth only by adjusting ATA ratio. Moreover, results show that banking sector development also impedes economic growth. Islamic banking development hinders economic growth when banking sector

development is indicated by SOI. Similarly, conventional banking development hampers economic growth when SOI and CPS are used to measure banking sector development in accordance with the findings of Hye and Islam (2012), and Narayan and Narayan (2013). The inverse relationship between economic growth and banking sector development can be explained by McKinnon–Shaw model, which states that the government restrictions on banking sector retards financial development and ultimately reduces economic growth. Furthermore, inefficient allocation of capital also impedes economic growth (Zhang et al., 2012). Creane et al. (2003) found that this negative relationship is more evident where banking sector is dominated by public sector banks which are more influenced by government interventions. Finance helps eradicate poverty by helping poor to have increased access to financial services (Baltagi et al., 2009).

These findings further suggest that IBs are at better position to boost economic growth as compared to CBs. Islamic banking Shariah based principles stimulates economic growth due to unique nature of their activities which are linked to the real economy and are based on physical transactions. Moreover, Shariah promotes social justice and equity, and prohibits IBs from undertaking harmful products and activities. According to Leon and Waille (2017), IBs promotes economic growth by increasing the size of their intermediation. Islamic banking enhances the macroeconomic efficiency which contributes towards economic growth in overall economy (Gheeraert and Weill, 2016).

Islamic banks are not permitted to indulge in interest based transactions in any form. Risk and risk sharing arrangements enables them to share profit and losses with the depositors and the borrowers. Islamic banks with the profit sharing mechanism are well-equipped to sustain external shocks. Islamic banking development helps minimizing uncertainty in the

financial system as they are prohibited by Shariah to invest in speculative activities. IBs are more risk averse than CBs as they attempt to choose low risk projects. Similarly, requirement of having large portion of their deposits with central banks in order to meets the current depositors need also minimizes the chances of bank runs. IBs aid access to credit, Islamic banking instruments, and interest free transactions which enhance financial development, and economic growth (Furqani & Mulyany, 2012).

Establishment of Islamic banking influences the financial sector development through many channels. First, IBs create opportunities for the individuals who want to invest their funds according to Shariah principles and undertake to share the risks and returns accordingly. This results in increased access of banking facilities to the group of people who previously were not able to access Islamic banking services. Second, IBs then strive to introduce financial modes to satisfy the needs of the investors willing for interest fee returns. It includes bringing financial innovation and product development which may encourage CBs to offer products in order to compete with the Islamic financial products. Thirdly, establishment of IBs or opening of Islamic branches or windows by CBs results in more competition and higher incentives for IBs to develop more specialized products (Gheeraert, 2014; Kalim et al., 2016).

6.3.2.2 Investment and Banking Sector Development

Next the relationship between banking development and domestic investment is analyzed and the results are presented in Table 6.21. Column 2 shows that increase in depth of Islamic intermediation has a positive impact on investment. It shows the ability of the IBs to finance real economic activities. On the contrary, depth of conventional intermediation has a

significantly negative impact and the difference is statistically significant. Regarding country-specific variables, trade openness has positive impact on domestic investment in line with Ndikumana (2000), and Salahuddin et al. (2009). According to Ndikumana (2000), trade openness influences domestic investment through two channels. First, the increase in trade openness caused by imports of capital goods facilitates investment. Secondly, the increase in trade openness due to increase exports results in increased foreign exchange which is used to buy investment goods from abroad. Increase in exports can also be a means to extend the market for local good. Both these channels ultimately increase domestic investment. Column 3 shows that size of Islamic intermediation has positive and size of conventional intermediation has negative impact on domestic investment. However, the differential impact is statistically insignificant. Islamic intermediation shows the ability of IB to mobilize savings from the surplus units of the economy. Regarding the impact of the country-specific variables, GDP growth has positive impact on domestic investment which shows that financial development increases domestic investment through increase in output growth. This evidence of accelerator enhancing effect is consistent with previous literature including Ndikumana (2000), Ndikumana (2005), and Dutta and Roy (2009). Furthermore, Inflation and Govt. consumption both are negatively related to the domestic investment. Negative impact of inflation is in line with the findings of Ndikumana (2000), Ucan and Ozturk (2011), and Fowowe (2011). Negative relationship between Govt. consumption is governed by crowding out effect. Government consumption has the ability to crowd out investment. Public borrowing Govt. for consumption expenditure ultimately decreases the funds available for investment. Column 4 reports that domestic credit by Islamic banking

Table 6. 21: Investment and Financial Development

REGRESSORS	Model 1 DOI	Model 2 SOI	Model 3 CPS	Model 4 ATA
Panel A: Estimation Results				
$GCF_{j,t-1}$	0.187	0.838***	0.571	0.462
	(0.360)	(0.193)	(0.490)	(0.311)
GDP_{jt}	13.98	10.52**	-84.65	-6.918
	(14.60)	(3.770)	(55.26)	(21.46)
INF_jt	0.232	-0.485***	0.823	0.413***
	(0.391)	(0.155)	(0.766)	(0.0565)
$T.OPEN_{jt}$	0.424**	0.103	1.034*	-0.0535
	(0.148)	(0.0618)	(0.546)	(0.113)
RIR_{jt}	0.00242	-0.000348		-0.158***
	(0.161)	(0.0554)		(0.0217)
$GOV.CON_{jt}$	0.425	-0.566***	7.270*	1.625***
	(0.714)	(0.164)	(3.762)	(0.465)
$PC.GDP_{jt}$	-0.420	0.263	3.885	-0.555
	(0.906)	(0.515)	(2.839)	(1.030)
$D.SAV_{jt}$	-0.259**	-0.305	-1.162	0.0713
	(0.110)	(0.213)	(0.664)	(0.121)
$DOI_{jt}^{Islamic}$	0.819*			
	(0.427)			
$DOI_{jt}^{Convnetional}$	-0.231**			
	(0.0853)			
$SOI_{jt}^{Islamic}$		0.303**		
		(0.122)		
$SOI_{jt}^{Convnetional}$		-0.0368**		
		(0.0140)		
$CPS_{jt}^{Islamic}$			2.917*	
			(1.553)	
$CPS_{jt}^{Convnetional}$			-0.899*	
			(0.457)	
$ATA_{jt}^{Islamic}$				0.0559
				(0.0663)
$ATA_{jt}^{Convnetional}$				0.339**
				(0.133)
Constant	-16.08	10.88	-105.6	-34.83**
	(22.10)	(8.448)	(63.46)	(15.39)
Panel B: Tests for differential effects of Variables				
$\beta_{DOI}^{Islamic} = \beta_{DOI}^{Conventional}$	4.93			
p value	0.0413			
$\beta_{SOI}^{Islamic} = \beta_{SOI}^{Conventional}$		6.81		
p value		0.0197		
$\beta_{CPS}^{Islamic} = \beta_{CPS}^{Conventional}$			3.61	
p value			0.0899	
$\beta_{ATA}^{Islamic} = \beta_{ATA}^{Conventional}$				13.57
p value				0.0020
Panel C: Diagnostic Tests				
Observations	155	142	80	159
Countries	17	16	10	17
AR(2)	-0.43	-0.91	-1.10	0.15

p value	0.664	0.365	0.273	0.879
J-statistic	12.04	7.28	0.00	6.49
p value	0.991	0.996	1.000	0.994

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

sector has positive impact on domestic investment in line with the findings of Matsheka (1998), and Muyambiri and Odhiambo (2017). The impact of domestic credit by conventional banking sector is negative. The results of country-specific variables shows that trade openness has positive impact on domestic investment as reported by Ndikumana (2000), and Salahuddin et al. (2009). Column 5 reports that the impact of Islamic banking assets as a percentage of total banking assets on domestic investment is statistically insignificant. On the other hand, the impact of conventional banking assets as percentage of total banking assets is significantly positive consistent with the findings of Benhabib and Spiegel (2000). Regarding country-specific variables, real interest rate has negative impact on domestic investment supporting the findings of Bader and Malawi (2010), Ucan and Ozturk (2011), Pattanaik et al. (2013), and Muhammad et al. (2013) consistent with the view that an increase in the interest rate raises the cost of capital, resulting in a reduction in investment.

Results support the hypothesis that improvement in banking sector development stimulates domestic investment which is more evident in case of Islamic banking development in line with the findings of Tabash and Anagreh (2017). On the other hand, conventional banking development stimulates economic growth when ATA is used. No evidence regarding the negative impact of Islamic banking development on domestic investment is found. While, conventional banking development impedes domestic investment in case of depth and size of financial intermediation.

Islamic banking development plays vital role in increasing economic activity. IBs pools surplus funds of the savers in the form of risk and return sharing. With this mechanism of risk and return sharing, spirit of Shariah principles is maintained and the practice of paying fixed return is discouraged as it is liability on the bank and the burden on the economy. Risk and return sharing encourages depositors to fully participate in their investment. The cost of collecting savings is also minimized as they serve the purpose of fulfilling the financial needs of the people desirous of Shariah based returns who themselves approach IBs for this need. Secondly, Islamic banks financing is entirely in real sector in the forms of modes such as Murabahah, Salam, Ijara, Istisna, IBs do not lend money on interest but they finance the venture instead. IBs are bound to allocate financial resources in the real economy accompanied by physical transactions and tangible assets. For instance, Murabahah is a contract of sale in which IBs purchase a commodity on behalf of the client and sell this product to the client at a cost which includes the price plus an agreed profit margin for the bank. Murabahah is used to finance consumers as well as real sectors of the economy. It a source of financing in consumer finance for the purchase of consumers durable good e.g. cars etc., in real estate sector to finance the housing etc., in the production and agriculture sector to finance the purchase of machinery, equipment etc. Salam is a forward contract in which the buyer pays the price in advance and the delivery of the subject matter is deferred to an agreed time in future. Salam is usually used to meet the needs of the small farmers who need money to grow their crops and the needs of the traders for imports and exports. Similarly, Istisna is a type of sale contract in which the buyer places an order with the seller to manufacture certain assets. It is a contract of manufacturing used by IBs to finance different kinds of projects such as construction of building, houses, plants, roads, machines,

equipment and the manufacturing of aircrafts etc. Majority of the Islamic modes of finance are linked to the agriculture sector, and industrial sector which contributes to the domestic investment and hence the economic growth. Third, financing of the private sector bring private sector in inducing prosperity in the economy. The Islamic banking development ensures the efficient allocation of resources and balances investment among different sectors of the economy. IBs offers customized financial products that are designed considering the requirements of specific sectors of the economy. IBs through micro financing are becoming important source of finance for investors with little or no access to financial markets.

7 CHAPTER SEVEN

CONCLUSIONS AND POLICY IMPLICATIONS

7.1 Introduction

Islamic banking has emerged as a widely researched area in finance over the past few decades. The existing literature is mainly focused on comparison of Islamic and conventional banking by taking into account the ratio analysis, and data envelopment analysis. A major chunk of these studies probes the impact of GFC on two types of banks. However, this literature has largely investigated the difference directly and fails to examine the impact of the outside factor on difference in behavior of IBs and CBs. Keeping these gaps in mind, we investigate the difference with respect to their ability to respond to business cycle phases, their contribution in stability of the overall financial system, and their contribution in economic growth and the domestic investment in a dataset of 20 countries having DBS and 19 countries having SBS over the period 1995-2014.

This chapter concludes the findings of each analysis in Section 7.2. Section 7.3 highlights the policy implications from these findings. Section 7.4 provides the limitations, and Section 7.5 identifies the potential areas for future research in Islamic banking out of our analysis.

7.2 Summary of Findings

7.2.1 Islamic and Conventional Banks during Business Cycle

The first essay investigates the difference between Islamic and conventional banks in terms of business dynamics, cost structure, credit quality, and stability. Furthermore it also examines the difference in response of two types of banks during peak, expansion,

contraction, and trough phases of the business cycle. This analysis is conducted in a sample of 20 countries having DBS.

While comparing IBs and CBs with respect to business dynamics, cost structure, credit quality, and stability, results reveal that IBs have a diversified business model as they are more involved in fee-based business and have higher LDR. Second, IBs are less cost-efficient. Third, they have better assets quality. Fourth, they are more stable than CBs.

The examination of difference in behaviour of IBs and CBs during peak and expansion phases yield the result that IBs increase their fee-based revenues, and LDR. They decrease LLP to a greater extent compared to CBs. Moreover, during the contraction and trough phase, IBs tend to move to traditional banking business and their LDR decreases to a greater extent than CBs. The costs of IBs increase more than CBs. Asset quality of IBs deteriorates, but they are still able to maintain better assets quality than CBs during a declining economy.

As mentioned earlier, the practices of IBs are similar to conventional banking. However, we can expect some differences in their behavior based on the difference in their basic business dynamics. These findings lead us to conclude that IBs tend to maintain their assets quality and stability even during economic fluctuations and performed better than conventional banks with regard to their credit quality and stability indicators during economic downturns. Shariah refrains IBs from investing in speculative activities which provides them an edge over their conventional counterparts. Their better performance seems to be due to the difference in their provisioning strategies, the non-aggressive lending, and investment in real assets.

7.2.2 Financial Soundness of Single *versus* Dual Banking System

In this analysis, financial stability of the countries having both Islamic and conventional banks *versus* the countries having conventional banks only is compared. Specifically, difference in the soundness of the two systems, which is likely to be owing to the presence of Islamic banking in the banking system is examined. The analysis is conducted using a sample of 416 banks drawn from 39 countries.

Islamic banks due to Shariah based principles do have some unique characteristics. Islamic banking practices are found to be similar to conventional banking as discussed earlier. Still Islamic banks are on the way towards improvement. Due to short history, shortage of skilled manpower, and lack of products designed on the basis of non-interest based principles; they are facing such criticism. When comparing set of countries having DBS with the countries having conventional banks only it is evident that dual banking system is more sound and stable. This might be due to the inherent resilience that IBs have provided to the system in which they are operating. Furthermore, when dual banking system alone is investigated, the results confirm greater stability of IBs and that they tends to increase the stability of conventional banks too. IBs are mimicking conventional banking practices, but due to their increased interaction to the real economy and limited exposures to the speculative activities are proved to be more resilient and protected. Islamic banks still need lots of improvements in terms of ensuring development of non-interest based and profit and loss based products. While using PLS on assets side, i.e. when bank acts as financer, the management of Islamic banks need to enhance their expertise in selection of projects to minimize agency problem.

7.2.3 Nexus between Economic Growth, Investment, and Islamic Banking Development

This analysis examines the impact of Islamic banking development on economic growth and domestic investment for a panel of 20 countries having DBS. We also examine the differential impact of Islamic and conventional banking development on economic growth and domestic investment using four measures of banking development attributed to IBs and CBs individually namely, depth of financial intermediation, size of financial intermediation, credit to private sector, and ratio of assets of banks to the total banking assets.

Islamic banking development promotes economic growth by increasing depth of Islamic intermediation, domestic credit provided by Islamic banking sector, and Islamic banking assets as a percentage of total banking assets whereas the increase in size of Islamic intermediation impedes economic growth. Regarding impact of conventional banking development, size of conventional intermediation lays negative impact and conventional banks assets as a percentage of total banking assets asserts positive impact on economic growth but the impact is less than the impact of Islamic banking development. Inflation, GFCF, and trade openness have positive impact on economic growth.

The impact of Islamic and conventional banking development on domestic investment is also different. The impact of Islamic banking development as measured by the depth of Islamic intermediation, size of Islamic intermediation, and domestic credit provided by Islamic banking sector has positive impact on investment. Conventional banking development shows that the depth of conventional intermediation and size of conventional intermediation has a significantly negative impact and assets of conventional banks as

percentage of total banking assets has positive impact on domestic investment. Furthermore, GDP growth, trade openness, domestic savings have positive, and Inflation, Govt. consumption, real interest rate have negative impact on domestic investment consistent with the previous literature. The impact is more meaningful in case of Islamic banking development. Islamic banking stimulates growth and investment in the economy due to unique nature of their activities which are linked to the real economy and are based on physical transactions. Moreover, Shariah promotes social justice and equity, and prohibits Islamic banks from undertaking harmful products and activities.

This analysis finds that Islamic financial system is efficient enough to induce growth and domestic investment in the economy. Results suggest that the Islamic banking development stimulates economic growth by increasing the depth of their intermediation, domestic credit to private sector, and by increasing their assets as percentage of total banking assets. Islamic banking contributes towards inducing domestic investment by increasing the depth and size of their intermediation, and by extending more credit to the private sector. Risk and return sharing forms the basis of contribution of Islamic banks in the real economy which helps in better utilization of financial resources, enhances productivity and investment and leads to sustainable economic growth. Improvement of Islamic banking infrastructure and regulatory framework may stimulate economic activity.

7.3 Policy Implications

The findings of this dissertation suggests certain policy implications for the regulators, policy maker, bankers. The findings attempt to provide meaningful insights into the policy making of IBs and will be of great interest to the investors and the depositors too.

7.3.1 Implications for investors

This study provides insights for the depositors and investors regarding the performance and practices of IBs. Regardless of similar practices, they are found to be a most viable alternate to the investors looking for faith based investments.

7.3.2 Implications for Banks Management

Banks management should consider the situation of the economy while investing or extending loans. This study has insights for both types of banks in effectively managing their costs and capital losses during the downturn of the economy.

IBs should improve and properly execute fee-based instruments in order to enhance non-interest-based revenues. Islamic banks, while applying PLS arrangements in financing activities, should ensure that expertise has been utilised in selecting, evaluating, managing and monitoring projects to reduce moral hazard and adverse selection. Islamic banks need trained manpower to manage Islamic financial products. Shariah personnel and advisors having expertise in both banking and Shariah laws is necessary for smooth functioning of Islamic banks. Secondly, IBs relatively small size is also one of the reasons of their cost inefficiency. They should emphasize on increasing their size to reap the benefits of economies of scale, which ultimately leads to lower costs and better performance. They should ensure that their practices are in line with the Maqasid al-Shariah to boost the effectiveness of the Islamic financial system.

7.3.3 Implications for Regulators

This study has important policy implications for the regulators. It helps regulators to devise strategies considering the difference in the business model of these two types of banks. It is noteworthy that both these banks should be treated differently while devising and implementing bank regulations due to differences in their underlying principles.

7.3.4 Implications for Islamic Banking Regulators

From the perspective of Islamic banking regulators, these findings provide a thorough understanding of the various aspects of Islamic banking that need to be addressed. Countries faced with the increased entry of IBs are exposed to certain regulatory and supervisory challenges. Regulations pertaining to IBs should be more focused towards operational risk and information disclosure.

Islamic banking sector could be a helpful policy tool to promote economic activity. To increase the impact of Islamic banking development target ratio of Islamic banking assets to total banking assets can be fixed. In addition, caution should be exercised in choice of banking sector development proxy while formulating growth enhancing policies.

7.3.5 Implications for Policy makers

The study reveals that Islamic banking sector has great potential and requires proper regulatory and supervisory framework to prosper. The difference in response of the two banking systems towards business cycle fluctuations can be considered while policy formulation. This study provides insight to the countries not having Islamic banking regarding the adoption of IBs. Governments should develop sound policies to improve

Islamic banking sector by allowing establishment of more IBs, Islamic windows, and increasing branches of existing IBs in urban and rural areas. Furthermore, license should be issued to more foreign IBs.

7.4 Limitations and Areas for Future Research

Certain issues remained unaddressed in this study, addressing these issues may open more areas for future research. IBs can be studied more extensively by examining their behaviour by incorporating more dimensions during different phases of business cycle. The impact of the GFC can also be incorporated for a more accurate picture of the stability and resilience of IBs. In the DBS, dataset comprises those countries only in which Islamic banking is a significant proportion of the total banking industry. However, Islamic banking is now emerging in European and African countries. Future studies may consider these countries as well to get more robust results and see the picture in a broader sense. Thirdly, the analysis can be conducted by considering the threshold impact beyond which the relationship between financial development and economic activity is no longer linear.

The results can be generalized to a limited extent as there exists a difference across countries in terms of Shariah compliance of products, and also in structure of Shariah compliant products. Moreover, the sample size and the time frame can be increased to get more generalizable findings. The lack of data with respect to the calculation of banking sector development attributed to IBs and CBs was a very big limitation of this study e.g. aggregate data on credit to private sector by whole economy is easily accessible but the data of credit to private sector by individual bank is not reported by all banks in their accounts.

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