



UvA-DARE (Digital Academic Repository)

Financial intermediation and monetary transmission through conventional and Islamic channels

Zaheer, S.

Publication date
2013

[Link to publication](#)

Citation for published version (APA):

Zaheer, S. (2013). *Financial intermediation and monetary transmission through conventional and Islamic channels*. [Thesis, externally prepared, Universiteit van Amsterdam].

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

3 On the Co-existence of Conventional and Islamic Banks: Do They Differ in Business Structure²⁶

3.1 Introduction

Islamic and conventional banking institutions co-exist in many Muslim countries as well as in few western states. In some jurisdictions the share of Islamic banking and finance (IBF) is substantial while in other it is still nascent. However, the growth of IBF suggest bright future prospects of the industry, especially due to its relatively better performance in the recent financial crisis (Hasan and Dridi (2010)). The superior growth of IBF raises important questions about the business structure of the Islamic banks and how it is different from that of conventional commercial banks. Renewed interest has been emerged about the principles of IBF itself. Various empirical studies have been conducted at individual and institutional level, especially at World Bank, IMF and ECB, on Islamic banking with respect to its diffusion, efficiency, performance and stability. We hope to contribute in this emerging body of literature through this empirical study by applying bank-time fixed effects which compares the Islamic and conventional banking within same bank and a specific year-quarter.

IBF mainly emerged because Islamic jurisprudence (*shariah*) does not allow the transactions that involve usury or interest. Moreover, gambling, discounted sale of debt and excessive uncertainty in contracts are banned in Islam. *Shariah* also prohibits investments in certain industries which are illegal based on its social values. Therefore, financial intermediation in IBF expected to have starkly different structure of conventional banking. Since financing based on profit and loss, and thus risk sharing contract comply with IBF principles, the same has been used in banking system for raising funds and extending finances. Therefore, the popular notion is that IBF is equity-based rather than debt-based. However, asset-backed financing that generate fixed streams of returns is also consistent with *shariah* injunctions as according to these rules every financial transaction should involve a

²⁶ The chapter is based on joint work with Moazzam Farooq. The authors acknowledge the data support from State Bank of Pakistan. All views expressed here are those of authors and do not necessarily represent the views of State Bank of Pakistan or its subsidiaries.

real economic activity. Consequently, a priori, the business structure and related efficiencies are presumably different in Islamic banking from that of conventional banking.

There has been a long debate that practice of Islamic banks is different from what is proposed in theory of IBF. Accordingly, some academic studies argue that Islamic banks are operating just like conventional banks (El Gamal (2006), Zaman, (2002)). Some other support this argument by showing that non-participatory debt-based modes used by Islamic banks are much higher than equity-based modes of financing mainly proposed in IBF. They conclude that practice of Islamic banking is indistinguishable from conventional banking (Khan (2010) , Chong and Liu (2009)). That is, Islamic banks use asset-backed debt instruments such as *murabahah* (sale of merchandise on credit) and *ijarah* (operating lease) instead of joint venture financing modes as *musharakah* and *mudarabah*.²⁷ These studies conclude that IBF is different from conventional banking in its *form* but not in *substance*. On the other hand, some scholars advocate that it is inevitable to use debt financing (backed by real assets) in transitional phase of IBF to avoid moral hazard problem that exists in equity financing (Ahmad (1993), Yousef (2004)). Still the debt contracts used in IBF differ from the interest based contracts as every product is backed by some real activity. Conversely, on the liability side, Islamic banks invariably issue saving and investment deposits on the basis of equity-like profit and loss contracts. Regardless of this debate, we instead test if the business structure of IBF is different from conventional banking using income, funding and financing indicators of Islamic and conventional banking.

Islamic banking products are also criticized because of their complex structures due to techniques adopted by the bank to make the *shariah* compliant (El-Gamal (2007)). El-Gamal (2006) notes a trade of between efficiency and the legitimacy (*shariah*-compliance) of Islamic banking products. Extended contracts used to execute the transactions in IBF may result in higher costs in Islamic banking. Accordingly, Islamic banks may turn out to be cost inefficient. On the other hand, because of lower moral hazard problem, screening and monitoring cost in IBF may be lower due to lower agency problem as there are more chances of a bank run from PLS depositors (Beck, Demirgüç-Kunt and Merrouche (2013)). This is

²⁷ Musharakah is a partnership in which both parties invest and profits and losses are shared proportional to the investments. Whereas in Mudarabah, on party invests in some venture and other party manages the business by exerting efforts and skills. The profit is shared according to pre-agreed ratio, while financial loss is borne by the investors.

because depositors of the Islamic banks face more uncertainty about the return and principle amount of their deposits due to profit and loss sharing contract. Hence, whether or not Islamic banks are efficient than conventional banks is an empirical question.

Using banking sector data in Pakistan, we therefore investigate how Islamic banking in practice is different from conventional banking in terms of business structure and related cost efficiencies. Pakistan is among those few countries which has been hosting both conventional and Islamic banks for more than a decade. Currently, both the systems are well developed and co-exist in a competitive atmosphere. Since the regulatory framework of the country has the provision for conventional banks to open stand-alone Islamic branches, several conventional banks have availed this opportunity and started Islamic banking operations.

For this paper, we generally follow the methodology in Beck, Demirgüç-Kunt and Merrouche (2013). Our main contribution to the continuing research on this subject is that, we apply bank-time fixed effects to decipher how Islamic and conventional operations within the *same* bank differ in terms of their business structure and efficiency. To distinguish these banks from others, we call them *mixed banks*. Thus, for this purpose we employ a subset of the main data which we use in preliminary specification without any fixed effects. Further distinctions of our paper from Beck, Demirgüç-Kunt and Merrouche (2013) are in terms of time coverage, data frequency, and bifurcation of Islamic banks and Islamic banking branches of conventional banks.²⁸ We employ quarterly dataset starting from 2002:II to 2010:I for full-fledged Islamic banks and Islamic banking branches of mixed banks.²⁹ Our dataset is more precise, standardized and comprehensive than used in previous studies as it is extracted from quarterly reports of all banks submitted to the State Bank of Pakistan (SBP), the central bank, for regulatory purposes.

After controlling for an array of bank level characteristics, our findings suggest that there is a significant difference in business orientation of Islamic and conventional banking institutions, measured by non-deposit funding to total funding,³⁰ and gross loans to total

²⁸ The aggregate data of Islamic banking branches of a *mixed bank* represent the accounts of Islamic segment of the total banking operations of that bank. Similar is the case for conventional banking branches. Thus we use 'segment', 'banking branches' and 'windows' interchangeably.

²⁹ We start with time period when full-fledged Islamic bank was established in Pakistan in 2002.

³⁰ Non-deposit funding includes borrowing from financial institutions including central bank and bills payable. Mainly borrowings are categories secure and unsecure borrowings. Secured borrowing also includes

assets ratios. The results demonstrate that Islamic Banking Institutions (IBIs) rely less on non-deposit funding which implies that they are more engaged in core banking business. However, their asset portfolio reveals that they have lower loans to total asset ratio than that of Conventional Banking Institutions (CBIs). This outcome indicates that IBIs are less involved in financial intermediation than their conventional counterparts. On the other hand, IBIs are less efficient than CBIs. However, with increase in their size the differences between IBIs and CBIs in terms of cost efficiency and business structure decline. The results are robust to changing the data and estimation technique. To analyze the data further, we segregate Islamic Banks (IBs) and Islamic Banking Branches (IBBs) of *mixed* banks and check how these are different from CBIs in aforementioned aspects. The estimates show that both IBs and IBBs rely less on non-deposit funding, have less loans to assets ratio, and are less efficient. However, as IBIs become larger their cost efficiency level also improves and the difference between IBIs, which comprise IBs and IBBs, and CBIs fades away. Similarly, with the increase in size IBs rely more on non-deposit funding and are engaged less financing activities. But IBBs rely more on non-deposit funding and financing activities as they grow bigger.

The model with bank-time fixed effects demonstrates that Islamic windows of both large and small mixed banks rely less on fee based income. Further, contrary to Islamic windows of large mixed banks, Islamic windows of small mixed banks are more involved in financial intermediation shown by their higher loans to assets ratio. However, Islamic windows both small and large of mixed banks are less efficient than CBBs as their cost indicators are higher than those of CBBs.³¹

The rest of the chapter is organized as follows. Section 3.2 reviews the literature on the subject, section 3.3 discusses contemporary Islamic banking and its structure in Pakistan, section 3.6 describes the data and main indicators used in the paper and section 3.7 explains the econometric techniques employed for estimation. Finally, section 3.8 presents the results and section 3.9 concludes the study.

repos that are zero in case of Islamic banking institutes due to its inhibition of interest in Islamic law. A priori, therefore, funding from the money and capital market is expected to be lower in IBF.

³¹ Since bank-quarter fixed effects account for all time varying observed and unobserved bank heterogeneity, the specification does not need bank characteristics to be added in the specification.

3.2 Review of Empirical Literature

In a broader study spanning 141 countries and covering period of 1995-2007, Beck, Demirgüç-Kunt and Merrouche (2013) find few significant differences in business orientation while comparing conventional and Islamic banks and controlling for time-variant country-fixed effects. However, they do not find significant differences in the efficiency between Islamic and conventional banks. In a recent study employing data from 10 countries over the period 1996-2002, Abdul-Majid, Saal and Battisti (2010), find that Islamic banks are technically inefficient as compared to their conventional counterparts. Furthermore, the efficiency of Islamic banks varies significantly across countries. They find that the Islamic banks in Sudan and Yemen to be least efficient and those in Bahrain and Bangladesh to be the most efficient in 10 countries that they analyze. Contrary to the study of Abdul-Majid, Saal and Battisti (2010), using data from 2001-2006 encompassing 21 countries, Bader, Khaled, Mohamad, Ariff, and Hassan (2008) do not find any significant difference between the overall efficiency of conventional and Islamic banks. They find Islamic banks to be more efficient in the larger sample comprising all countries, but less efficient than conventional banks in countries where Islamic and conventional banks co-exist.

The literature on efficiency does not provide any conclusive evidence of the absolute superiority of Islamic or conventional banks in terms of their efficiency. The results are overall mixed, with Islamic banks more efficient in some forms or countries and less in others. This suggests that, banks both Islamic and conventional have the potential to gain efficiency in different regions or employing certain structure.

3.3 Contemporary Islamic Banking and its Structure

The idea of Islamic banking presented by Uzair (1955) works under two-tier *mudarabah* (agency/trustee) contract. In classical *mudarabah* agreement, the owner of the capital (*Rabb-ul-mal*) transfers the capital to user of the capital (*mudarib*), to employ the funds in some profitable venture. Both the parties to *mudarabah* share the profit and loss of the business. The *mudarib* manages the funds and the capital owner acts as a sleeping partner. Financial loss is exclusively borne by the capital owner, while loss of the *mudarib* is sacrifice of his time and services. That is, the *mudarib* is not compensated for his management services. When applying *mudarabah* to Islamic banking, the contract implies that depositors invest

their money in profit and loss sharing (PLS) based saving and investment (S&I) deposits. The Islamic Bank acts as a *mudarib* (fund manager) for the depositors. On their asset side, Islamic banks act as an investor and their clients act as *mudarib*. Islamic banks are also allowed to employ some asset-backed financing products. In practice, Islamic banks employ *mudarah* mostly for collection of deposits, but not for financing (Baele, Farooq and Ongena (2012); Chong and Liu (2009); Zaheer, Ongena and Van Wijnbergen). These banks use asset-backed instruments for financing to avoid moral hazard problem (Aggarwal and Yousef (2000); Usmani (1998)). Main financing products of Islamic banks are *murabahah* and *ijarah*, whereas former has some resemblance with financial lease and latter is equivalent to operating lease in conventional banking (Beck, Demirgüç-Kunt and Merrouche (2013)).³²

In Pakistan, the need for Islamic banking emerged more as a result of constitutional and legal obligations than an economic and financial phenomenon. Early efforts were made to Islamize the entire financial system during early 1980s. However, after going through lengthy courts' proceedings regarding *Shariah* compliance of banking products,³³ in 1999 Shariat Appellate Bench (SAB) of the Supreme Court of Pakistan declared the banking system as *unIslamic* due to some contracts which were against Islamic jurisprudence. Subsequently, to reintroduce Islamic banking, SBP issued detailed criteria for the establishment of Islamic banks in the private sector in 2001. This time, a three-pronged strategy was introduced. This approach permitted financial industry to establish either full-fledged Islamic banks in the private sector; or Islamic banking subsidiaries or standalone Islamic banking branches of the existing commercial banks. The new strategy was considerably different from initial one in which the banks were directed to Islamize their *all* operations invariably within certain timeframe.³⁴ The approach to allow the co-existence of both banking systems has been proved successful, and Islamic banking so far has been growing in double digits. Currently, there are 5 full-fledged Islamic banks and 13 conventional banks having Islamic branches with a market share of about 7 percent.

³² In *murabahah*, the bank purchases an asset, a machinery for instance, and sells it to its client on credit by charging a higher price than the purchase price. The difference is called markup. The price is paid in periodic installments. The ownership of the asset is transferred to the client, as in financial lease. For details of Islamic financing products see El-Hawary, Dahlia, Wafik Grais, and Zamir Iqbal, 2004.

³³ *Shariah*, also known as Islamic law, is a set of certain laws based on Quran and the traditions of Prophet Muhammad, *peace be upon him*, called *sunnah*.

³⁴ State Bank of Pakistan, BCD Circular No. 13 dated October 12, 1984.

Figure 1. Simplified Balance Sheet of a hypothetical Islamic bank

Assets	Liabilities
<u>Cash and Balances</u>	<u>Current accounts (Qard)</u>
<u>Investment</u>	<u>Mudarahah S&I Accounts</u>
<i>Sukuk</i>	a. Saving
	b. Investment
<u>Financing</u>	<u>Borrowing from Capital Market</u>
<u>Debt instruments</u>	<i>Sukuk</i>
<i>Murabahah</i>	
<i>Ijarah</i>	<u>Equity</u>
<i>Salam</i>	
<i>Istisna</i>	
<i>Qard(interest free loans)</i>	
<u>Profit-and-loss-sharing instruments</u>	
<i>Musharakah</i>	
<i>Mudarahah</i>	

The structure of the Islamic banking institutions is presented in Figure 1. First item on the liability side of IBIs is current accounts (deposits) based on loan contract called *qard* (loan). Contractually, IBIs are not bound to pay any return on these accounts. The principal amount of these accounts, however, remains intact. These accounts are similar to current accounts in conventional banks. Second funding item is *mudarahah* S&I deposits based on the PLS principle. It has two components *mudarahah* saving accounts and *mudarahah* investment accounts. Saving accounts can be withdrawn anytime while investment accounts are time specific investments. Accordingly, for calculating the return on both types of accounts, lower weights are applied to saving accounts in comparison to investment accounts. In total profit, therefore, saving account holders of Islamic banks get lower proportional return than what investment accounts holders receive. The asset portfolio of the Islamic banking institutions shows their reliance on trade and leasing based instruments so-called *murabahah*, and *ijarah*. In March 2010, 83 percent of financing by the IBIs in Pakistan was concentrated in these fixed income modes of financing, while financing under PLS modes was only 1.9 percent of total financing, of which *mudarahah* was 0.2 percent only (Islamic Banking Bulletin, SBP, March 2010). The asset portfolio of IBIs may lead to reputational risk, the risk that “there is little difference between the two banking systems” or at extreme that Islamic banking is ‘*unIslamic*’.

3.4 Data and Descriptive Statistics

We employ individual quarterly financial accounts of all commercial banks. The data comprise very detailed information of the balance sheet and income statement items of all commercial banks (both Islamic and conventional). We compute the indicators for business model and cost efficiency to compare Islamic and conventional banking institutions. The data covers 32 quarters starting from June 2002 to March 2010. There are 21 conventional banks (CBs), 6 full-fledged Islamic banks (IBs) and 13 mixed banks with both Islamic as well as conventional operations. Following the convention in Pakistan, we name the Islamic branches of mixed banks as Islamic banking branches (IBBs) and their conventional branches as conventional banking branches (CBBs). Both IBBs and full-fledged Islamic banks (IBs) form the Islamic banking institutions (IBIs).

Table 1 shows descriptive statistics of main indicators for IBIs and CBIs. For business model we compare funding and income structure and asset portfolio of Islamic and conventional banking institutions using non-interest/markup income to total income,³⁵ non-deposit funding to total funding and gross loans to total assets ratio.

For IBIs the word ‘loan’ refers to financing by IBIs using Islamic financing modes and markup refers to the profit earned from this financing. Average of non-interest/markup income to total income for IBIs is 9.84 percent against industry’s average of 17.73. The outcome is possibly because of fewer avenues for fee and commission based activities owing to lower clientele base and business network of Islamic banks. In our sample, gross loans to assets on average is 52.61 percent with a standard deviation of 22.23, while IBIs have a bit lower level of this ratio. Non-deposit funding scaled by total funding has an average of 22.46 percent in this panel setting.

As expected, IBIs rely less on non-deposit funding due to limited market based funding options as the Islamic money and capital markets are not developed. Conventional repurchase agreements (repos) are absent in Islamic finance due to prohibition of zero coupon bond, discounting and ban on two-in-one contracts (Usmani (2007)). The indicators of efficiency show that on average cost-income ratio of IBIs is higher than that of the CBIs,

³⁵ This comprise fees, commission & brokerage income, dividend income, income from dealing in foreign currencies etc.

Table 1. Descriptive Statistics

The table shows the descriptive statistics of all the indicators used for estimation in all specifications. We also report p-values for the test of difference in means between Islamic banking Institutions and conventional banking institutions. All the bank balance sheet data from State Bank of Pakistan is quarterly and cover the period from 2002-Q2 to 2010-Q1. There are 6 full-fledged Islamic banks (IBs) 21 conventional banks (CBs) and 13 conventional banks which have conventional banking branches (CBBs) and Islamic Banking Branches (IBBs). We call these banks as *mixed banks*. For estimation purpose we treat these IBBs as separate entities. So there are 53 banks with 32 quarters for whole sample (Sample A). Sample B contains only mixed banks with comparison of their conventional banking and Islamic business. Higher number of the z-score suggests greater stability. All ratios are in percentages. All variables are winsorized at the 1% and 99% level to remove outliers.

Sample A All Banks

Variable	Normalized by	Obs.	Mean	Median	Std. Dev.	Max.	Min.	IBIs	CBIs	p-value
Islamic Banking Institutions		1696	0.36		0.48	1	0			
Islamic Banks		1696	0.11		0.32	1	0			
Islamic Banking Branches		1696	0.25		0.43	1	0			
Non interest / Markup Income	Total Income	1417	17.73	15.31	13.30	66.70	0.00	9.84	20.23	0.00
Non-Deposit Funding	Total Funding	1423	22.46	13.15	24.87	96.88	0.00	16.03	24.51	0.00
Gross Loans	Total Assets	1423	52.61	53.35	22.23	128.40	0.00	49.68	51.23	0.23
Cost Income Ratio		1417	87.73	75.65	52.92	393.40	9.17	90.67	85.38	0.11
Operating Cost	Total Cost	1389	47.14	45.51	20.08	99.94	11.58	48.73	46.62	0.00

Bank Level Controls

Size		1423	10.00	10.01	1.91	13.49	4.53	7.99	10.61	0.00
Non-Loan Earning Assets	Total Earning Assets	1423	52.19	48.43	18.99	99.55	9.19	44.16	54.42	0.00
Fixed Assets	Total Assets	1423	2.98	1.70	3.93	22.90	0.00	3.43	2.75	0.00

Sample B Mixed Banks Only

Variable	Normalized by	Obs.	Mean	Median	Std. Dev.	Max.	Min.	IBIs	CBIs	p-value
Islamic Banking Branches		832	0.50	0.50	0.50	1	0			
Non interest / Markup Income	Total Income	247	7.13	5.07	10.34	83.94	0.00	7.01	20.14	0.00
Non-Deposit Funding	Total Funding	666	15.52	10.26	18.27	87.44	0.00	20.03	12.81	0.00
Gross Loans	Total Assets	665	53.69	54.96	17.16	128.4	0.00	52.28	54.63	0.09
Cost Income Ratio		661	74.07	70.32	41.53	320.80	0.20	251.00	415.00	0.00
Operating Cost	Total Cost	632	43.93	40.26	20.33	100.00	9.33	40.42	42.66	0.22

Variable	Normalized by	Obs.	Mean	Median	Std. Dev.	Max.	Min.	IBIs	CBIIs	p-value
<i>Bank Level Controls</i>										
Size		665	10.26	10.98	2.42	13.62	4.05	7.56	11.88	0.00
Non-Loan Earning Assets	Total Earning Assets	661	36.36	36.92	19.53	100.00	0.00	43.78	48.31	0.00
Fixed Assets	Total Assets	665	2.69	1.78	3.58	21.95	0.00	3.23	2.40	0.01

Table 2 Correlation Matrix Among Selected Variables

In this panel we report Pearson correlation coefficients. The asterisks, i.e., ***, **, * and ** show that statistically there is a significant correlation between underlying variables at 1%, 5% and 10% level respectively. For example, the correlation between gross loans (normalized by total loans) and Islamic Banking Institutions (IBIs), which comprise Islamic banks and Islamic Banking Branches, is negative 0.18 and statistically significant. This shows that gross loans to total loans ratio of IBIs is 18 percent lower than the similar ratio of Conventional Banking Institutions.

Non-Interest Income		1									
Non-Deposit Funding		-0.07***	1								
Gross Loans		-0.18***	0.43***	1							
Cost-income Ratio		-0.16***	0.13***	0.05***	1						
Operating Cost		0.25***	0.07**	-0.16***	0.07***	1					
Fixed Assets		-0.11***	0.02	-0.06**	0.25***	0.19***	1				
Size		0.1***	-0.28***	0.09***	-0.29***	-0.19***	-0.01	1			
Islamic Banking Institutions		-0.29***	-0.1***	0.06**	0.06**	0.02	0.07**	-0.45***	1		
Islamic Banks		-0.01	-0.17***	-0.05*	0.07***	0.09***	0.11***	-0.08***	0.59***	1	
Islamic Banking Branches		-0.35***	0.02	0.11***	0.02	-0.05*	-0.01***	-0.48***	0.73***	-0.12***	1

and their overheads, measured by operating cost to total cost, are lower than the same ratio of CBIs

In sample B, we present the descriptive statistics of mixed banks used in our fixed effects specifications. While comparing the IBBs with CBBs the results are mostly similar to those of sample A. However, contrary to sample A, for sample B, IBBs rely more on non-deposit funding and are more efficient than CBBs.

Table 2 presents the correlation between all indicators. Simple correlations support most of the previous results of Table 1. These correlations suggest that IBIs have lower non-interest/markup income to total income and non-deposit funding.

3.5 Econometric Specification

To evaluate difference in various banking indicators of business model and efficiency across both bank types in our data, we estimate the following specification:

$$M_{ijt} = \alpha_t + \beta ISL_j + \gamma_1 B_{ijt} + \varepsilon_{ijt} \quad (1)$$

where M_{ijt} is one of the measures corresponding to business model and efficiency of bank i , branches type j , in quarter t . α_t is coefficient for time fixed effects. ISL_j is the dummy for Islamic banking institutions, which includes both IBs, and IBBs of mixed banks. The dummy is one when the IBIs are Islamic and zero otherwise. B_{ijt} are the time-variant banking characteristics as control variables. Specifically, we include log of assets, non-lending operations and fixed assets of the banks to control size and asset structure of banks. We first estimate (1) with only an intercept and a dummy for IBIs (in order to compare CBIs and IBIs) without any covariates. Then we control the results for an array of bank/ segment level time-changing features which might affect the differences across bank types.

We thus include log of assets as a proxy for size as larger banks may be more efficient due economies of scale, could have more access to wholesale funding and might generate more fee based income. Most of the Islamic banks in Pakistan are in small to medium size bank categories, whereas to tap into the market few big conventional banks also introduced Islamic banking operations through IBBs. We also include fixed assets to total assets ratio and non-

loan earning assets to total assets ratio to control for the opportunity cost of having unproductive assets and non-lending business respectively.³⁶ Both the variables influence the cost efficiency of the banks as shown by some previous studies (Aggarwal and Yousef (2000); Beck, Demirgüç-Kunt and Merrouche (2013); Demirgüç-Kunt, Laeven and Levine (2004); Demirgüç-Kunt and Huizinga (2010)). To remove the outliers, the data is winsorized for all variables at the 1st and 99th percentiles. That is we set all the observations greater/lower than 99th percentile/1st percentile value of a given series to 99th percentile/1st percentile value.

Further, to see the corresponding difference from CBIs, we also split the dummy for IBIs into dummy for Islamic banks (IBs) and Islamic banking branches (IBBs). We, therefore, estimate specification (2)

$$M_{ijt} = \alpha_t + \beta_1 ISLb_j + \beta_2 ISLbb_j + \gamma_1 B_{ijt} + \varepsilon_{ijt} \quad (2)$$

where $ISLb_j$ and $ISLbb_j$ are dummies for full-fledged Islamic banks and Islamic banking branches of mixed banks respectively.

Our main contribution to the emerging research on the topic is that we apply bank-time fixed effects to specification (1). That is, we measure how conventional banking branches of a mixed bank are different from Islamic banking branches of the same bank across different financial indicators of business structure and cost efficiency. Thus we estimate following specification

$$M_{ijt} = \alpha_{it} + \beta ISL_i + \varepsilon_{ijt} \quad (3)$$

where M_{ijt} is one of the measures conforming to business structure and efficiency of bank i , branches/operations type (Islamic or conventional) j , in quarter t . Crucially for our purposes we introduce α_{it} for bank-quarter fixed effects, to account for all observed and unobserved time variant bank heterogeneity. So effectively we compare Islamic and conventional operations within the *same* bank and in a specific quarter. Bank-quarter fixed effects take out all the banks which have either only Islamic operation or only conventional operations. So we are left only with mixed banks having both types of banking, Islamic and

³⁶ Fixed assets include operating fixed assets of the bank and non-loan earning assets comprise balances with other banks, lending to financial institutions and investment in securities and bonds.

conventional.³⁷ Therefore, the estimates of bank-year-quarter fixed effects show the difference is due to Islamic banking *per se*.

3.6 Results:

3.6.1 Conventional vs. Islamic Banking Institutions

Table 3, shows the main results of specification (1) for various indicators of business model and cost efficiency of Islamic and conventional banking operations *with* and *without* any control variables. In this specification ‘*Islamic*’ is a dummy for IBIs which includes both IBs plus IBBs of mixed banks. Across all the specifications, standard errors are clustered at bank segment level to allow for correlation within clusters across year quarters. The models without control variables (1, 4, 7, 10 and 13) show that non-interest/markup income to total income of IBIs is significantly lower than that of CBIs. This demonstrates a considerable difference in business model of IBIs and CBIs. However, in this set of specifications there is no significant difference between both type of banking institutions in terms of efficiency and other indicators of business model namely non-deposit funding to total funding and gross loans to total loans.

Once we control for the bank level characteristics of size, fixed assets and non-loan earning assets, business model indicators namely non-deposit funding and gross loans to total assets of the IBIs also indicate significant difference from similar indicators of CBIs (model 2, 5, 8, 11 and 14). Specifically, we find a 24 percentage point’s difference in non-deposit funding to total funding between IBIs and CBIs. The results are in line with the findings of Beck, Demirgüç-Kunt and Merrouche (2013) who use cross country sample. Similarly, loan portfolio of IBIs shows that they have lower loans to total asset ratio than conventional banks. There is 11 percentage points difference in gross loans to total assets of IBIs and CBIs. This is an expected result as at the initial stage of their growth IBIs operate at sub-optimum level due to lack of opportunities for IBIs and limitations on the applicability of the products they offer to the various sectors of the economy.

³⁷It is apparent that for IBBs (i.e. Islamic segment of mixed banks) the size and asset structure of the parent company would matter. Thus, for example, IBBs of a big (mixed) bank probably have more access to capital market than IBBs of a small (mixed) bank.

Further details of Islamic banking finances suggest that Islamic banks are relying mainly on two lending instruments *murabahah* (sale of merchandise items on credit with fixed markup) and *ijarah* (operating lease) which have applications limited to only some sectors of the economy. Both differences are large given the averages of 22 percent and 53 percent for non-deposit funding and gross loans to total loans respectively. Still there is no difference in efficiency of the Islamic and conventional banking institutions.

Some of the bank level control variables, which are also statistically significant, show interesting results. Specifically, large banks demonstrate less dependence on non-deposit funding. In an emerging economy where capital markets are less developed, large banks may seek funding from core deposits. On the other hand, as the size of the banks increases they become more cost efficient due to economies of scale. Coefficients of the banks with higher fixed assets show standard signs as they have lower loans to total assets ratio, higher cost-income ratio and operating cost to total cost ratio. The banks which have more non-loans earning assets have, as anticipated, rely on higher non-interest (or non-markup) income to total income and lower gross loans. These banks are also less efficient than other banks as non-loan earning assets to total earning assets have positive sign for cost-income ratio and operating cost to total cost ratio.

Since size of an Islamic bank may affect the business structure and efficiency of IBIs we also interact dummy for IBIs with size (model 3, 6, 9, 12 and 15)). The coefficients show that in comparison to the CBIs, small Islamic banks rely less on non-interest/markup income and non-deposit funding and have lower gross loans to total assets ratio. Moreover, they are less efficient than CBIs. However, as the size of IBIs increases they become more efficient and the difference in between IBIs and CBIs in efficiency measures starts decreasing. Similar is the case for indicators of non-deposit funding and loans to assets ratio.

3.6.2 Conventional Banking Institutions vs. Full-Fledged Islamic Banks and Islamic Banking Branches of Mixed Banks

As mentioned earlier, Islamic banking operations in Pakistan are carried out by two different kinds of entities, full-fledged Islamic banks and Islamic banking branches of mixed banks. We, therefore, split IBIs into IBs and IBBs of mixed banks. We thus use a dummy for each category separately. Table 4, presents the regression results for specification (2) with

and without covariates. The results show that IBs rely less on non-deposit funding. The non-deposit funding to total funding ratio of IBs is 14 percentage points less than that of CBIs. Whereas IBBs of mixed banks depend less on non-interest/markup income. The non-markup income, scaled by total income of IBBs is 12 percentage points less than counterpart measure of CBIs.

After controlling for size, fixed assets and non-loan earning assets, the results suggest that the difference in aforesaid indicators of IBs and CBIs is not due to the size, fixed assets and non-loan earning assets. Specifically, we find that non-deposit funding scaled by total funding of IBs and IBBs is 22 percentage points and 27 percentage points lower than the same ratio of CBIs respectively. The difference is significant considering the industry average of 23 percent. Also, gross loans to total assets ratio of both IBs and IBBs are lower than the conventional banking institutions showing relatively lower level of financial intermediation through IBIs. Precisely, gross loans scaled by total loans of IBs and IBBs are 9 percentage points and 13 percentage points smaller than the same indicator of CBIs. Moreover, IBBs depend less on non-interest/markup income than CBIs do.

To check how size affects the coefficients of IBs and IBBs for different variables, we yet again interact dummies for these institutions with size separately. The results, shown in Table 4 (model 3, 6, 9, 12 and 15) indicate that in comparison to CBIs, small IBs depend less on non-deposit funding, have lower loan to asset ratio and are less efficient.

Specifically, the coefficient of small IBs for non-deposit funding and loan asset ratio is 74 and 26 percentage points lower than the matching indicators of CBIs. Operating cost of small IBs is 68 percentage points higher than that of their conventional counterparts. With increase in size, however, IBs and IBBs become more efficient. This is obvious from the fact that if we compute coefficients of size of IBs and IBBs by adding (4) and (7), and (4) and (8). The resultant coefficients are negative 6 and negative 8 for IBs and IBBs respectively. Also, due to increase in the size differences between Islamic and their conventional counterparts decreases as shown by the negative coefficients of the interaction term. Thus business model of both banking systems represented by income, funding and financing structure, converges.

Table 4 In this table we show the results of specification (2). The table reports the estimated coefficients with various stability (Panel A) and asset quality (Panel B) measures as dependent variables of bank *i* in year *t*. The independent variables *Islamic Banks* and *Islamic Branches* are dummies which takes value of 1 if the institution is full-fledged Islamic bank or Islamic branches of the mixed banks respectively and zero otherwise. Size is natural log of the assets. Fixed assets are normalized by the total assets and non-loan earning assets are normalized by the total earning assets of the each banking institution. The estimations use various banking institution-year quarter observations. Standard errors (in parentheses) are clustered at the bank (segment) level. *** Significant at 1%, ** significant at 5%, * significant at 10%.

Coefficients	Non-interest/markup	Non-deposit Funding	Loans-Asset Ratio	Cost Income Ratio	Operating Cost								
Islamic Banks	-1.074 (2.807)	-13.799*** (4.090)	-22.43*** (5.334)	-74.396*** (34.101)	-3.186 (5.328)	-8.556** (3.978)	-25.671* (14.664)	11.098 (14.062)	-0.039 (11.320)	39.142 (123.962)	8.960 (8.404)	7.410 (6.141)	68.373*** (31.060)
Islamic Banking Branches	-11.53*** (1.801)	-10.76*** (3.622)	-12.796 (8.001)	-3.447 (10.128)	-26.732*** (27.795)	-94.169*** (5.486)	1.170 (6.579)	-12.749* (20.886)	3.061 (10.090)	-24.234 (15.698)	-11.034 (4.898)	2.438 (5.435)	68.47*** (23.894)
(4) Size	0.065 (0.705)	0.054 (0.854)	-6.345*** (1.457)	-7.97*** (1.481)	-1.904 (1.297)	-2.517 (1.634)	-9.702*** (2.794)	-9.333*** (3.397)	-0.961 (1.221)	0.259 (1.203)			
Fixed Assets	-0.150 (0.189)	-0.169 (0.191)	0.195 (0.810)	0.239 (0.776)	-0.611** (0.260)	-0.596** (0.255)	2.735*** (0.745)	2.697*** (0.720)	1.486*** (0.291)	1.345*** (0.280)			
Non-Loan Earning Assets	0.059 (0.043)	0.058 (0.043)	-0.308 (0.191)	-0.34* (0.187)	-0.838*** (0.113)	-0.85*** (0.107)	0.365* (0.198)	0.373* (0.202)	0.212*** (0.076)	0.251*** (0.068)			
(7) Islamic Banks*Size	-1.954 (2.276)	5.182 (3.294)	1.701 (1.103)	-3.991 (11.705)									-6.141** (2.817)
(8) Islamic Banking Branches*Size	0.257 (1.048)	8.182** (3.649)	3.12* (1.775)	-1.578 (6.575)									-7.999*** (2.879)
Constant	19.83*** (1.430)	16.379* (9.003)	108.065*** (21.938)	126.914*** (3.224)	52.673*** (12.787)	120.211*** (16.653)	86.247*** (6.146)	161.971*** (34.913)	157.764*** (2.090)	45.969*** (15.245)	40.412*** (15.586)	25.78* (15.245)	
(4) + (7)=0	-1.900	0.311***	-2.788***	0.212***	-0.816*	-13.324							-5.882***
(4) + (8)=0	0.257	0.265	0.159	0.194	0.029	0.448	0.454	0.017	0.18	0.18	0.178	0.313	0.351
R-squared	1417	1417	1423	1423	1424	1424	1424	1417	1417	1417	1389	1389	1389

3.6.3 Bank-Time Fixed Effects: Conventional vs. Islamic Windows of Mixed banks

The data also provide us with the opportunity to use bank-time fixed effects, since we have some banks that have been hosting both Islamic and conventional banking separately through Islamic and conventional banking branches. Bank fixed effects permits us to control for any time variant observed and unobserved heterogeneity. This specification thus shows how Islamic banking operations of mixed banks are different from their conventional operations within the *same* bank and in a particular year quarter. Since specification with fixed effects takes into account only those banks which have both types of banking windows, the sample observations decrease by about half.

Table 5, reports the results of the specification (3) that incorporates bank-time fixed effects. The coefficients of dummy for IBBs suggest that there is a significant difference between IBBs and CBBs in various indicators of business orientation and cost efficiency. Specifically, Islamic operations of mixed banks demonstrate less reliance on fee based income. Furthermore, IBBs are less efficient potentially due to the complex structure of transaction in IBF which increase the transaction and monitoring cost. More precisely, non-interest/markup income of IBBs is 11 percentage points less in comparison to CBBs, which shows that IBBs rely more on markup income. Cost to income ratio and operating cost normalized by total cost of IBBs are 22 and 8 percentage points larger than the same indicators of CBBs.

In model 2, 4, 6 and 8 of both panels, we use separate dummy variables for IBBs of small and large mixed banks to see if these behave differently from CBBs.

The results show that IBBs of both small and large mixed banks rely less on fee based income. However, though IBBs of small mixed banks are more involved in financial intermediation (high loans to assets ratio), loans to assets ratio of IBBs of large banks is significantly lower than that of IBBs of small mixed banks. IBBs of both small and large mixed banks are less efficient than CBBs as their cost indicators are significantly higher than those of CBBs. Specifically, non-deposit funding, scaled by total funding and loans to assets ratio of IBBs of small mixed banks are 11 percentage points and 8 percentage points higher than those of CBBs respectively.

Table 5 In this table we report the results of specification (3) for Sample B (only dual banks) using bank-time fixed effects. The table reports the estimated coefficients for specifications with the various business structure and efficiency measures as dependent variable of bank i in year: quarter t . The independent variable *Islamic* is a dummy variable which takes the value of 1 if the branches of a mixed bank are Islamic and zero otherwise. For model 2, 4, 6, 8 and 10, *Islamic* take a value of 1 for small Islamic windows of mixed banks and zero otherwise. *Large Islamic* is a dummy used for Islamic windows of big banks with assets more than around USD2 billion. The estimations use various numbers of banking institution– year: quarter observations. Standard errors (in parentheses) are clustered at the bank-segment level. *** Significant at 1%, ** significant at 5%, * significant at 10%.

Coefficients	Non-interest/ markup		Non-Deposit Funding		Loans-Assets Ratio		Cost-income Ratio		Operating cost	
	1	2	3	4	5	6	7	8	9	10
(1) <i>Islamic</i> @	-10.801*** (0.833)	-10.921*** (1.152)	7.644 (5.380)	4.212 (4.238)	0.925 (3.653)	8.358** (3.385)	21.542*** (4.774)	10.424* (5.564)	7.893** (3.742)	9.065*** (3.447)
(2) <i>Large Islamic</i>		-10.625*** (1.171)		12.741 (11.327)		-9.730 (6.210)		37.886*** (3.586)		5.761 (8.281)
C	12.904*** (1.309)	12.815*** (1.429)	0.682 (6.468)	12.741*** (0.000)	27.917*** (0.510)	31.506*** (2.134)	63.4*** (2.843)	55.228*** (4.598)	46.262*** (4.277)	47.328*** (6.188)
<i>P value</i> (1)-(2)=0		0.857		0.000		0.011		0.000		0.713
R-squared	0.814	0.814	0.507	0.481	0.516	0.560	0.557	0.577	0.709	0.710
Observations	661	661	666	666	666	666	661	612	632	661

@ For model 2, 4, 6, 8 and 10, *Islamic* represent '*Islamic*' is a dummy for small IBBs, which otherwise represent Islamic windows of mixed banks.

Cost-income ratio and operating cost, scaled by total cost, are 10 percentage points and 9 percentage points higher for IBBs of small mixed banks than the same ratios of conventional windows of mixed banks respectively. For Islamic windows of large mixed banks, non-markup income is 11 percentage points lower than that of conventional window of mixed banks. Likewise, IBBs of large mixed banks have cost-income ratio 38 percentage points higher than that of CBIs. All these coefficients are statistically significant and economically important in comparison to industry averages.

Through applying coefficient restriction (Wald) test, we also check if the behavior of the small and large IBBs is different from each other in terms of business and cost efficiencies. The outcome show that, as expected, Islamic windows of large banks depend more on non-deposit funding and are less involved in financial intermediation than Islamic windows of small mixed banks. However, the results show a stylized fact that Islamic windows of large mixed banks are less efficient than that of small mixed banks. Particularly, cost-income ratio for IBBs of large mixed banks is 38 percentage points higher than the same ratio of IBBs of

small mixed banks. This is perhaps because Islamic windows of large IBBs are involved in more complex and costly transaction structures.³⁸

Robustness

We check the robustness of our estimations by using the original un-winsorized data for all specifications. The unreported results are not different from the baseline results which indicate insignificance of outliers in the estimation process.

Moreover, for specifications (1) and (2), using contemporaneous control variables of size and asset structure, i.e. fixed assets and non-lending, of the bank may create endogeneity problem in the estimation due to reverse causality. We, therefore, replace contemporaneous control variables with lag values of the control variables in a robust estimation. The results of the robust specification support our results of baseline estimation.

Age and experience of a bank may influence the differences between Islamic and conventional banking across all indicators of business structure, financial stability, asset quality and efficiency. Thus it may be the case that efficiency of the CBIs turns out to be better than that of IBIs because IBIs are newly established. Therefore, the difference in behavior of IBIs from CBIs may not be because of Islamic characteristics *per se*, but may be merely an outcome of the recency of their operations. In robust estimation we therefore control for this fact and add number of years a bank has been doing the business as a proxy for age and experience of a bank. To disentangle this effect, we re-estimate the specifications with additional control for age and experience of a bank that we proxy by the number of years a bank has been in the business. The results confirm that the differences between Islamic and conventional banking for baseline specifications are not due to age and experience. Thus, our baseline results still stay valid. Finally, we also use number of bank branches (outlets) as a proxy for a bank's experience as it is generally expected that older banks will have larger numbers of branches. Our results are also robust to this alternative treatment.

³⁸ Another theoretical reason might be that monitoring of sharing-modes by IBBs become more costly as the mixed bank grow larger. Moreover, anticipating larger operations in future they might have setup larger (and more expensive) structures since infancy.

3.7 Conclusion

In this paper, using Pakistan as a case in point, we investigate how Islamic banking institutions are different from conventional banking institutions in terms of business structure and cost efficiency. The results suggest that, once we control for bank level characteristics, there is significant difference in business model of Islamic and conventional banking institutions. The coefficients show that small IBIs depend less on non-interest/markup income and non-deposit funding and have lower gross loans to total assets ratio in comparison to the CBIs. Moreover, they are less efficient than CBIs. However, as the size of IBIs increases they become more efficient and the difference in between IBIs and CBIs in efficiency measures starts decreasing. Similarly, as the size of IBIs increases, the differences between IBIs and CBIs also decrease in terms of non-deposit funding and loans to assets ratio.

Further analysis of the data suggest that in comparison to CBIs, small IBs depend less on non-deposit funding, have lower loan to asset ratio and are less efficient. With increase in size, however, IBs and IBBs become more efficient. Also, due to increase in the size differences between Islamic and their conventional counterparts decreases. Thus business model of both banking systems represented by income, funding and financing structure, converges.

Results for applying bank-quarter fixed effects suggest that Islamic operations of mixed banks have less reliance on fee based income. Further, contrary to large mixed banks' Islamic windows, Islamic windows of small mixed banks are more involved in financial intermediation as their loans to assets ratio is higher than that of CBBs. However, both Islamic operations of small and large mixed banks are less efficient than CBBs as their cost indicators are higher than those of CBBs. The fact that IBBs are less efficient may be because of complex contracts and higher monitoring costs and transaction costs in IBF (El-Gamal (2007)).

The results have important implications for the co-existence of conventional and Islamic banking systems. These results imply that there is an inherent difference in the business orientation of IBIs and CBIs. Moreover, within mixed banks there are additional differences in efficiency indicators as well.