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BANK RESILIENCE OVER THE BUSINESS CYCLE IN A DUAL BANKING SYSTEM

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Abstract

The study aims to analyze the stability and resilience of conventional and Islamic banks¹ over a complete business cycle in a dual banking system, Pakistan, with the objective to investigate whether Islamic and conventional banks maintain high level of performance in terms of profit and cost efficiency, in times of economic distress. It gathers bank level and macroeconomic quarterly unbalanced panel data for the period 2006 to 2016. The study is based on a dynamic panel data model and applies dynamic System GMM estimators as suggested by Arellano and Bover (1995) and Blundell and Bond (1998) for analysis purpose. Further, in order to add credence to the outcomes, a robustness check in the form of a two-stage least squares (2SLS) is performed. Findings of the study affirm the procyclical behavior of the dual banking system in Pakistan. However, Islamic banks are found to be more procyclical as compared to the conventional ones, which implies the former to be relatively less resilient to economic disruptions, and would suffer from intense decline in performance as the economy tends to shrink.

Keywords: Business Cycle, Islamic Banks, Conventional Banks, Bank Resilience.

1. Introduction

Since the inception of Islamic banking industry, its comparison from various aspects with conventional counterpart has been an interesting subject for researchers. Further, the vulnerable behavior of conventional banks during the 2007-2009 financial crisis and the relatively stable performance of Islamic banks in the same period has put Islamic banks under the microscopic lenses (Rosman, Abd Wahab, & Zainol, 2014; Ibrahim, 2016; Farooq & Zaheer, 2015). Some scholars found Islamic banks to be more stable and resilient (Berger, Boubakri, Guedhami, & Li, 2019; Farooq & Zaheer, 2015)

¹ Mentioning Islamic banks throughout the research work would signify Islamic banks and Islamic banking branches of conventional banks.

while others argued opposite results by ascertaining better performance of conventional banks (Beck, Demirguc-Kunt, & Merrouche, 2013; Alqahtani, Mayes, & Brown, 2017; Miah & Uddin, 2017). The current study attempts to re-evaluate the stability view of Islamic banks from two major performance specific dimensions after the subject has obtained mixed results. It evaluates the dual banking system in Pakistan over a business cycle in terms of profit efficiency and cost efficiency. Ascertaining the actual financial impact of Islamic banks on the economy is imperative to gain logical support for the highly increasing intermediational role of the industry.

The study contributes to the existing body of literature in many ways. Firstly, it adds to the thread of literature that discusses different fundamental characteristics of banks, which may cause them to respond heterogeneously in times of economic and financial disruptions (Bertay, Demirguc-Kunt, & Huizinga, 2015; Merilainen, 2016). The current study is contributing by presenting the *Shari'ah* compliance feature of Islamic banks that distinguishes them from conventional financial institutions.

Second, existing literature like Ibrahim and Rizvi (2017) is concentrating on analysis of cross-country panel data. Such researches usually include country specific effects to take into account different country specific dissimilarities. However, countries with diverse nature of economic and financial structure, socio-cultural norms and level of economic development may pose problems in obtaining holistically reliable and conclusive results (Huang, Fang, Miller, & Yeh, 2015). Thus, this research is assembling bank-specific panel data from a developing country i.e. Pakistan for the purpose of analysis. The structure of the financial system in Pakistan is bank-centric, where both conventional and Islamic banks coexist. Further, banks in Pakistan hold reserves (as a proportion of total deposits) very less in amount as compared to other countries. This affects their stability, performance and efficiency (Farooq & Zaheer, 2015). The current market share of Islamic banking industry is recorded at 11.9% with an impressive annual growth rate of more than 20% over the last five years (see SBP published Islamic banking bulletin, 2017). Thus, selecting Pakistan for analyzing the stability of its dual banking system seems a natural choice.

Third, existing studies like Rosman *et al.*, (2014) have examined the procyclicality of Islamic banking efficiency only in times of crisis. Other researchers did not take a complete business cycle. Thus, the argued relative stability of Islamic banks may not be sustaining in the long term. Their claimed relative stability may be due to its much smaller size, local orientation and less exposure to cross border international transactions. Thus, there is a need to study the subject at different stages of real activities. Therefore, in line with Ibrahim (2016); Bertay *et al.*, (2015); Merilainen (2016) and Micco and Panizza (2006), the current study intends to check the profit and cost efficiency of the dual banking system in Pakistan over a complete business cycle. It captures a period of 11 years starting with the evolving of economic down turn in 2006,

covering the global financial crisis period, reaching the floor in 2009 and then again heading to the boom till 2016. These 11 years were crucial for the economists in Pakistan as critical decisions were needed to bring Pakistan's economy back on track. The next section reviews relevant literature on the subject. This is then followed by a description of the research method in section 3. Section 4 provides a detailed discussion of the study results. Lastly, section 5 concludes the study and highlights its limitations, policy implications and possible directions for future research.

2. Literature Review and Development of Hypotheses

2.1 Bank efficiency

Stability and resilience of the banking sector in economic and financial panics has been examined in different ways in existing literature. Among others, profit and cost efficiency have been most crowded measures (Bouheni & Hasnaoui, 2017; Belke *et al.*, 2016). Abbas, Azid and Besar (2016) define efficiency as attaining targets with best possible utilization of resources. Others like Belke *et al.*, (2016) describe bank efficiency as the capacity of a bank to transform its inputs into outputs by maximizing profit and minimizing cost. Cost and profit efficiencies are the two major types of efficiency. Mohamad, Hassan and Bader (2008) define profit efficiency as the extent a bank is forecasted to perform better than other banks in terms of profit to produce a similar bundle of output in a given period of time. Toit and Cuba (2017) declare return on average assets (ROAA) ratio to be one of the key measures of profit efficiency. On the other hand, cost efficiency tells the degree to which a bank's cost is similar to that of a best-practice bank for generating a similar combination of outputs in similar circumstances. Akhtar (2013) defines cost efficiency as the provision of bank services with the avoidance of wastage in resources that occur due to allocative and technical inefficiency. The current study would use ROAA as a measure for profit efficiency and cost to income ratio (COI) as a proxy for measuring cost efficiency. COI is obtained with bank operating cost divided by total income of the bank.

$$\text{Total income} = \text{Net spread income} + \text{Other income}$$

2.2 Efficiency over the business cycle

The conventional banking debt generation mechanisms, speculation, high leverage, interest based risk selling and lack of profit and loss sharing mechanisms are the main causes of its collapse in different financial crises. These factors work as financial sector weapons of mass destruction. Islamic banks are fundamentally commercial banks. However, based on their peculiar characteristics, they are expected

to behave in a way different from the mainstream commercial conventional banking institutions.

Islamic banks while avoiding such destructive factors and many others similar like excessive uncertainty, risk transfer and sale of debt, have proved to be more stable and efficient in times of economic and financial panics (Chapra, 2007, 2008).

Disciplining banking institutions is imperative for the stability of the financial sector. Customers can demand their banks to ensure better banking practices, governance and risk management. If banks do not comply, customers can punish them by withdrawing their deposits. However, customers would never do that as long as they are offered risk free guaranteed return on their savings. This restricts their concern to interest payments and not to the required best banking practices (Chapra, 2008). Such a situation leads to poor quality debt generation, unnecessary leverage expansion, excessive volatility in the financial markets and ultimately chaos and adverse inefficiency in the financial cycle (Chapra, 2008). In contrast to this scenario, Islamic banks' customers deposit their money on the basis of profit and loss sharing (Belanes, Ftiti, & Regaieg, 2015). Thus, the scope of their interest with respect to their banks and deposits is much wider. They would require their banks to adopt all possible best banking and governance practices to ensure maximum profits and minimum losses on their deposits. Such customer attitude towards banking institutions would discipline them and push them to think beyond their interests.

Alqahtani *et al.*, (2017) confirms that unlike conventional banking industry, which is more closely linked to the international financial sector, Islamic banks are more closely linked to the real sector of the economy. Therefore, Islamic banks were dominating conventional banks in terms of efficiency and stability during the global financial crisis until the devastations were limited to the financial circle. According to the study, Islamic banks were already avoiding investments in most of those financial assets, which later on considered to have actually triggered the worldwide financial crisis, being disallowed in *shari'ah*. According to a similar study of 30 Islamic banks in GCC countries conducted by Belanes *et al.*, (2015), at times when the impact of crisis has been devastating conventional financial institutions, Islamic banks remained to be efficient. Islamic banks were even able to generate extra deposits from their customers and maintain a proper and safe level of liquidity. However, this efficiency was attributed to the unique religious inclination of the depositors who gathered huge deposits for their banks in quest for *Shari'ah* compliant financial services.

Chapra (2007, 2008) while examining the stability view of Islamic banking system and its conventional peer in different financial panics passed in the last three decades have confirmed the superior position of the former. Rosman *et al.*, (2014) found that Islamic banks from both Middle Eastern and Asian countries were able to sustain their operations and maintain a positive average efficiency during the period of

2007-2010. This performance was ensured by the selection of efficient mix of input resources by concerned bank managers, which allowed them to obtain the productive output despite the unfavorable scale effects. Masood and Ashraf (2012) while examining the bank-specific and macroeconomic profitability determinants of Islamic banks in a cross country analysis found their provision of loan losses to be less than conventional banks. It is due to the fact that Islamic banks face lower non-performing loans, which favorably affects their profitability. Similarly, Islamic banks in the MENA region from 1994 to 2012 were reported of having earned higher profits from non-financing activities. Since Islamic banks' investment activities are based on profit and loss sharing principle, it was observed that Islamic banks can further boost profitability by enhancing project management related skills and boosting specializing in Islamic financing (Zarrouk, Jedidia, & Moualhi, 2016). Investigating the stability of participation banks (Islamic banks) as compared to their conventional counterparts in Turkey, Batir, Volkman and Gungor (2017) have also witnessed the comparatively more efficient behaviour of the former

Despite the above arguments in favor of the stability view of Islamic banking system. There are some studies that present opposite results. They argue that banks highly rely on sources of funding for their financings. Therefore, the non-availability of a well developed Islamic financial money market and the lack of lender of last resort facility for Islamic banks in few countries could be pillarious for the industry in times of financial pressure. Further, the *mudaraba* based profit and loss sharing mechanism of deposits could put Islamic banks in a more vulnerable situation in financial downturns, being exposed to a relatively higher deposit withdrawal risk as compared to the fixed profit paying conventional banks (Farooq & Zaheer, 2015). Abdul-Majid, Falahaty and Jusoh (2017) find Islamic banks to be less efficient due to their distinguished processes and organizational structure. Similarly, their relatively less advanced technological standards do not match the mainstream banking industry, which is also a cause of inefficient operations. Moreover, the complex Islamic financial products add to the normal operational cost of the bank; products like *salam*, *murabaha* and *musharaka* need extra operational measures to ensure their *Shari'ah* compliance status (Alqahtani *et al.*, 2017). Miah and Uddin (2017); Beck *et al.*, (2013) and Alqahtani *et al.*, (2017) reported that Islamic banks beside their relative inefficiency are no more stable than conventional banks once the financial crisis effects transfer to the real sector of the economy. Thus, the discussion adds to the significance of examining the below given hypotheses:

Profit efficiency:

H1A: Profit efficiency of conventional banks is procyclical over the business cycle.

H1B: Profit efficiency of Islamic banks is procyclical over the business cycle.

H1C: Profit efficiency of Islamic banks is less procyclical as compared to conventional banks over the business cycle.

Cost efficiency:

H2A: Cost efficiency of conventional banks is procyclical over the business cycle.

H2B: Cost efficiency of Islamic banks is procyclical over the business cycle.

H2C: Cost efficiency of Islamic banks is less procyclical as compared to conventional banks over the business cycle.

3. Research method

3.1. Sample and data description

In this study, bank level and macroeconomic quarterly unbalanced panel data is gathered for the period 2006 to 2016. The banking data is collected separately for Islamic and conventional banks operating in Pakistan. Sources of banking data include periodic banking reports of the State Bank of Pakistan and quarterly financial statements of selected commercial banks whose data is easily accessible and available for at least four consecutive years of this study period. Moreover, banks selected should have been in existence in the crisis period 2009-2010 where Pakistan's GDP had touched its lowest growth rates. Further, only those conventional banks with Islamic banking branches are included that state detailed separate financial statements for their Islamic banking operations. Keeping in view these criteria, 4 full fledged Islamic banks and 4 conventional banks with their Islamic banking branches have been selected for the study. Quarterly GDP data at market price of Pakistan with constant prices (1999-2000) is obtained from the extended version of the study conducted by Hanif, Iqbal and Malik (2013). Further, quarterly discount rates and inflation data was gathered from the websites of International Monetary Fund and State Bank of Pakistan respectively.

3.2. Measurement of efficiency through accounting ratios

A review of literature on bank efficiency reveals that the subject has been measured by three different ways, namely, stochastic frontier analysis (SFA), data envelopment analysis (DEA) and accounting ratios. The current study is using accounting ratios due to its various superior attributes over other parametric (SFA) and non-parametric (DEA) methods. Accounting ratios are universally applied due to their general accessibility and simplicity of application. They provide results in absolute form that can be easily used for rankings, assessments and evaluations. There are few limitations to this approach. However, no evidence is in place regarding any inbuilt flaws in its results or failure in its analysis (Toit & Cuba, 2017; Wozniowska, 2008). Olson and Zoubi (2008) in their study carried out on the banking industry of the GCC region confirm accounting ratios as the best measure when it comes to comparing between conventional and Islamic banks. It is helpful in classifying firms that belong to a single industry into two or more categories on the basis of financial characteristics.

Moreover, they suggest that measurement through accounting numbers and financial information can be used for both developed and developing economies.

SFA and DEA both are frontier analysis methods with different characteristics and efficiency measuring tools. SFA is an econometric and parametric frontier approach, while DEA is a mathematical linear programming technique based non-parametric approach, both approaches are mainly used to evaluate bank efficiency. Many studies have used SFA (Mohamad *et al.*, 2008; Abdul-Majid *et al.*, 2017; Alqahtani *et al.*, 2017; Belke *et al.*, 2016) to analyze bank efficiency while others relied on DEA (Akhtar, 2013; Alqahtani *et al.*, 2017; Abbas *et al.*, 2016) as an efficient and effective approach to perform the same analysis. Both SFA and DEA have several advantages and disadvantages. SFA gives a definite way of measuring efficiency by decomposing the error term into a noise and random error factors. The noise calculates for bank inefficiencies while the random error part shows other random disturbances that may arise from factors not in control of the bank management. However, the disadvantage with SFA is the restriction into a particular production, profit or cost functional form for estimation and the imposition of some strict constraints. On the other hand, DEA does not restrict the measurement into a particular functional form nor imposes strict constraints. However, it does not take into account any noise factor of error term to measure for inefficiencies, rather, by neglecting the presence of any random error, it declares any deviation from the frontier as inefficiency, because of being not resulted from the predetermined inputs (Alqahtani *et al.*, 2017; Batir *et al.*, 2017; Belanes *et al.*, 2015). Therefore, the current study uses financial analysis ratios method to work with bank efficiency.

3.3. Estimation strategy and empirical models

Taking leads from existing literature, a statistical specification is designed to investigate the resilience of Islamic and conventional banking systems by assessing their procyclicality in terms of profit and cost efficiency in different economic conditions. The appended model has been used by different studies like Bertay *et al.*, (2015) and Micco and Panizza (2006) to investigate the performance of banking institutions based on the nature of bank ownership. The current study incorporates two stability crucial variables in the model i.e. profit efficiency and cost efficiency. For this purpose, the below given econometric equations are developed.

Model for cost efficiency of conventional banks

$$CE_{ci,t} = \beta_0 + \beta_1 E_{ci,t-1} + \beta_2 Y_t + \beta_3 X_{i,t-1} + \beta_4 inf_t + \mu_{i,t} \quad (1)$$

Model for profit efficiency of conventional banks

$$CE_{pi,t} = \beta_0 + \beta_1 E_{pi,t-1} + \beta_2 Y_t + \beta_3 X_{i,t-1} + \beta_4 inf_t + \mu_{i,t} \quad (2)$$

Model for cost efficiency of Islamic banks

$$IE_{ci,t} = \beta_0 + \beta_1 E_{ci,t-1} + \beta_2 Y_t + \beta_3 X_{i,t-1} + \beta_4 inf_t + \mu_{i,t} \quad (3)$$

Model for profit efficiency of Islamic banks

$$IE_{pi,t} = \beta_0 + \beta_1 E_{pi,t-1} + \beta_2 Y_t + \beta_3 X_{i,t-1} + \beta_4 inf_t + \mu_{i,t} \quad (4)$$

In eq. 1, 2, 3 and 4, "C" and "I" are used for conventional banks and Islamic banks respectively. E_c and E_p symbolizes the cost efficiency and profit efficiency respectively. Y represents the real GDP growth rate. X signifies bank specific control variables including banks size, capitalization ratio and funding ratio. inf is the inflation rate and μ is the population error term. Further, the subscripts i and t represent the number of banks and time interval.

In order to capture possible dynamics in the dependent variables, for example, due to performance targets by the commercial banks in terms of cost cuttings or profit orientations, the study takes lag values of the dependent variables and include them as independent variables in the model. Inflation rate is included as a control variable to capture for macroeconomic variations. Variables like equity to assets ratio, deposits to total liability ratio (funding ratio) and natural log of the total assets are included as bank level control variables. Equity to total assets ratio and total assets are common variables used to control for bank capitalization and size of the bank. Bank funding ratio is used to capture for variations caused by changes in banking deposits and their dependence on it. There are many bank specific control variables in the banking literature, however, only the most relevant three are being included with lag values to get aside any possibility of multicollinearity and endogeneity in the study data. To tackle further with the issue of endogeneity, lag of four instrumental variables including discount rate, inflation, total banking deposits and total bank lending growth rate are added as determinants of our endogenous (independent) variable GDP growth rate (equation 5).

$$\Delta Y = \beta_0 + \beta_1 r + \beta_2 inf + \beta_3 tdep + \beta_4 \Delta L + e \quad (5)$$

The above equation suggests that ΔY is an endogenous variable signifying real GDP growth rate, r denotes discount rate, inf is the inflation rate, $tdep$ is the total banking sector deposits and ΔL is the consolidated lending growth rate of both conventional and Islamic banks while e represents the error term. The equation will be used for both conventional and Islamic banks.

Furthermore, the study checks for autocorrelation of order 1 and order 2 in the residuals of all the equations. It also uses the Sargan test statistic to check for the over-identifying restrictions in the model.

This study is based on a dynamic panel data model. The traditional OLS estimators like fixed effects and random effects are inconsistent while dealing with equations containing endogeneity and unobservable individual specific heterogeneity. The generalized method of moments (GMM) method is considered the most efficient technique to cope with these and many other issues particularly in dynamic panel data modeling (Bun & Kleibergen, 2010). Therefore, in this study system GMM is used as suggested by Arellano and Bover (1995) and Blundell and Bond (1998).

4. Results and Discussion

4.1. Regression analysis

Table 4 represents the autocorrelation test and Sargan test results. The significant p-values for AR (1) and insignificant p-values of AR (2) signify the absence of order 1 and order 2 autocorrelation in the residuals for all the tested equations. Similarly, the non-rejection of null hypothesis in Sargan test for overidentifying restrictions states validity of the instrumental variables (see table 4). Having checked for autocorrelation and instruments validity, working with the equations would produce reliable results, as given in table 3.

Table 1
Descriptive statistics.

Variables	Conventional banks				
	Mean	SD	Min	Max	Obs.
Return on average assets	0.0029	0.0066	-0.0297	0.0148	152
Cost-income ratio	0.4823	0.3309	-0.7920	3.2103	136
GDP Growth rate	0.02287	0.1670	-0.2120	0.2650	152
Size	19.29	1.488	15.80	21.16	157
Equity-asset ratio	0.09372	0.0396	0.0006	0.1879	156
Deposit-liability ratio	0.88172	0.0462	0.7233	0.9620	156
Inflation rate	0.0075	0.0060	-0.0044	0.026	176

4.1.1 Profit efficiency

Unlike our suggested hypotheses, data analysis reflects opposite tendencies exhibited by conventional and Islamic banks over the business cycle in terms of profit efficiency. Results are not accepting the hypothesis of positive relationship between conventional banks' profit efficiency and real GDP growth rate. Profit efficiency of conventional banks is found to have a negative relationship with economic growth (see table 3). Thus, hypothesis H1A is not accepted. In contrast, Islamic banks' profit efficiency is found to be having a positive relationship with real GDP growth rate.

This leads to the acceptance of hypothesis H1B. However, the beta values are showing minimal impact of ROAA on real GDP growth rate for both Islamic and conventional banks. The coefficient value of ROAA for conventional banks and Islamic banks is -0.71 percent and 0.23 percent respectively (see table 3). These results are also inconsistent with the third hypothesis H1C, which states less procyclical behavior by Islamic banks in terms of profit efficiency as compared to the conventional ones. It concludes that a decrease in real GDP growth rate would cause profit efficiency of conventional banks to rise, but the performance of Islamic banks in terms of profit efficiency to decline (see table 3).

Table 2
Descriptive statistics.

Variables	Islamic banks and Islamic banking branches				
	Mean	SD	Min	Max	Obs.
Return on average assets	0.0013	0.0057	-0.0160	0.0415	206
Cost-income ratio	0.9751	0.9103	-0.0344	11.4709	214
GDP Growth rate	0.0229	0.1667	-0.2120	0.2650	266
Size	17.17	1.532	10.84	20.30	215
Equity-asset ratio	0.1275	0.1266	0.0236	0.9803	211
Deposit-liability ratio	0.8557	0.1646	0.1540	1.1087	212
Inflation rate	0.0075	0.0060	-0.0044	0.0260	308

4.1.1.1 Cost efficiency

The cost efficiency measure used in this study is cost to income ratio (COI). Positive COI coefficient means lower the growth rate, lower the COI, and thus, higher the cost efficiency. Similarly, a negative COI coefficient value indicates that higher the growth rate, lower the COI, and thus, higher the cost efficiency. This is because COI is a ratio of operating cost to total income. Therefore, bigger the operating cost, higher would be the COI ratio and thus, lower the efficiency and vice versa for a smaller operating cost to total income ratio.

Empirical results found conventional and Islamic banks to be having significant and positive relationships with real GDP growth rate. This is in favor of hypotheses H2A and H2B. However, as indicated in table 3, results are against the H2C hypothesis. Conventional banks are found to be less procyclical as compared to Islamic banks.

The COI coefficient for conventional banks is found to be at -8.9 percent while that of Islamic banks at -62.7 percent (see table 3). It means a decrease in real GDP growth rate would cause cost efficiency of Islamic banks to decline many fold more than that of the conventional banks.

Table 3
One-step system GMM

Variables	Conventional banks		Islamic banks and Islamic banking branches	
	ROAA	COI	ROAA	COI
L.ROAA	0.3533*** (0.0012)	- -	0.3137** (0.0350)	- -
L.COI	- -	0.2925*** (0.0050)	- -	-0.6234*** (0.0010)
ΔGDP	-0.0071** (0.0250)	-0.0895*** (0.0020)	0.0023** (0.0270)	-0.6275*** (0.0010)
L.SIZE	0.0007* (0.0540)	-0.0551*** (0.0010)	0.0001 (0.8730)	-0.1354* (0.0660)
L.E-ASST	0.0535*** (0.0010)	-0.4559 (0.7500)	-0.0095** (0.0030)	0.7551 (0.4710)
L.D-LIB	-0.0276** (0.0220)	-0.5923 (0.5330)	-0.0066*** (0.001)	0.6999 (0.2060)
INF	-0.0001 (0.8940)	-0.0327* (0.0960)	0.0000 (0.948)	-0.5444*** (0.0020)
CONST	0.0080 (0.5790)	1.99*** (0.0040)	0.0069 (0.1830)	3.4288*** (0.0030)

Significance level at 1 percent ***

Significance level at 5 percent**

Significance level at 10 percent*

Table 4
Sargan and autocorrelation test

Statistic	Conventional banks		Islamic banks and Islamic banking branches	
	ROAA	COI	ROAA	COI
AR(1)	0.000	0.015	0.049	0.027
AR(2)	0.903	0.260	0.364	0.135
Sargan	0.552	0.762	0.818	0.171

4.2 Robustness Check

To further support our results indicating resilient behavior of conventional banks and a more procyclical behavior of Islamic banks over the business cycle in terms of profit and cost efficiency, the study undertakes a robustness check. Though, steps were taken in this study to avoid any problem of endogeneity, a robustness check in the form of a two-stage least squares (2SLS) estimation would add credence to our outcomes. Table 5 presents results obtained by 2SLS technique.

Unlike Islamic banks, the profit efficiency of conventional banks found to be moving in a direction opposite to the GDP growth rate. However, the impact of economic growth is minimal over the profit efficiency of both of the banking systems with beta values of -1.4 percent and 1.8 percent for conventional and Islamic banks respectively (see table 5). As long as the cost efficiency is concerned, the negative coefficient of GDP growth rate indicates positive relationship between cost efficiency of the dual banking system and GDP growth rate. However, Islamic banks are approximately four times more procyclical with a coefficient value of -64.5 percent in terms of cost efficiency as compared to the -16 percent coefficient value of its conventional peers (see table 5). Results obtained through this exercise add credence to our aforementioned findings and hint to the volatile behavior of Islamic banks in times of economic crisis. No evidence could be found regarding the ability of Islamic banks to perform counter cyclically when economic conditions get worse. Instead, all the analyzed measures of stability have proved conventional banks to be more safe and stable in times of economic disruptions.

Table 5

Variables	Conventional banks		Islamic banks and Islamic banking branches	
	ROAA	COI	ROAA	COI
	Two-stage least squares (2SLS)		Two-stage least squares (2SLS)	
L.ROAA	0.3471*** (0.0000)	-	0.3040*** (0.0000)	-
L.COI	-	0.6125*** (0.0000)	-	0.3875*** (0.0000)
ΔGDP	-0.0141** (0.0390)	-0.1633* (0.0770)	0.0189** (0.0430)	-0.6450* (0.0980)
SIZE	0.0008** (0.0210)	-0.0276*** (0.0070)	0.0005 (0.3300)	-0.0666*** (0.0060)
E-ASST	0.0659*** (0.0000)	-0.7425* (0.0660)	-0.0209* (0.0830)	0.8246* (0.0530)
D-LIB	-0.0041 (0.7310)	0.1948 (0.4330)	-0.0136*** (0.0005)	0.4511*** (0.0070)
INF	-0.0007 (0.5020)	-0.0348* (0.0920)	0.0022 (0.1360)	-0.1372** (0.0290)
CONST	0.0160 (0.2480)	0.6506** (0.0410)	0.0042 (0.6200)	1.3265*** (0.0020)

Significance level at 1 percent ***

Significance level at 5 percent**

Significance level at 10 percent*

5. Discussion

Applying dynamic system GMM technique, the study finds both conventional and Islamic banks to be procyclical in nature. It finds that with increasing GDP growth rate, the performance of both conventional and Islamic banks amplifies. They start performing better in terms of cost efficiency in line with the expanding economy.

As long as profit efficiency is concerned, Islamic banks will remain procyclical, but conventional banks will behave in a way against the external economic conditions. However, the flourishing performance of the dual banking system will start fading as soon as the economy begins to shrink. These results are in line with the procyclical behavior of the overall banking sector reported in existing literature. Interestingly, this study finds Islamic banks to be relatively more procyclical with respect to the used measures of resilience and stability, namely profit efficiency and cost efficiency. On the other hand, conventional banks are found to be less procyclical and thus, more resilient to economic and financial downturns.

Moreover, except for the hypothesis of procyclical profit efficiency of conventional banks, cost efficiency of both conventional and Islamic banks and profit efficiency of Islamic banks are found to be procyclical, which is as per the suggested hypotheses. However, unlike the study expectations, performance by Islamic banks is found to be more procyclical over the business cycle in terms of both profit and cost efficiency. It means that in times of economic down turns, Islamic banks' profit and cost efficiency would decline more rapidly and would be less resilient to severing economic conditions. The results are in line with many other studies including Abdul-Majid, David and Battisti (2010) Alqahtani *et al.*, (2017) Abdul-Majid *et al.*, (2017), Miah and Uddin (2017) and Beck *et al.*, (2013). Abdul-Majid *et al.*, (2017) find Islamic banks to be less cost efficient than conventional banks due to their difference in processes, difference in organizational structure and lower standard of technology as compared to conventional banks. Moreover, the complex structure of their products adds to the usual cost of banking operations. Doumpos, Hasan and Pasiouras (2017) argue that Islamic banks suffer from shortage of high quality liquid instruments. They unlike conventional banks, cannot invest in bonds, and have to solely rely on *Sukuk* in order to park their cash in highly liquid financial securities. Since *Sukuk* are rarely issued by governments and central banks, Islamic banks have to hold some of their funds in cash, which adversely affects their earnings.

Several studies in banking literature including Ayub (2016), Azmat *et al.*, (2015) Khan (2010) Mirza *et al.*, (2015) and Hassan and Aliyu (2018) have reported deviations in Islamic banks' practices from the idealized *Shari'ah* based Islamic banking model. They claim of Islamic banks being merely a complex replica of the conventional banking practices, and thus, may not bear any distinct financial and economic impacts. Therefore, Islamic banks are not superior and may bear outcomes and financial behavior similar to conventional banks. A question arises here that why according to our results Islamic banks are even more procyclical or less resilient than conventional banks if not equivalent? Farooq and Zaheer (2015) argues that since banks highly rely on the sources of funding for their financings, thus, the non-availability of a well developed Islamic money market and the facility of lending of last resort in many countries, except Malaysia, for Islamic banks may hurt credit supply and prove to be

perilous for it. Further, Alqahtani *et al.*, (2017) finds Islamic banking industry to be more closely linked with the real sector of the economy. Therefore, they observed that Islamic banks were dominating the conventional ones in terms of stability during the global financial crisis until the devastations were restricted to the financial circles. However, in the long term, once the crisis were diffused to the real sector of the economy, Islamic banks were witnessed to be suffering more as compared to conventional banks. Since our study is covering a business cycle of 11 years instead of a short crisis period, it witnessed similar results of lesser stability by Islamic banks in the long term.

6. Conclusion

The stability view of Islamic banks has obtained varying results in existing literature. The current study is adding to this thread by attempting to provide a clear and comprehensive picture through utilization of different dimensions of stability and resilience. For this purpose, it gathers unbalanced panel data of 11 banks, including conventional banks, full fledged Islamic banks and Islamic banking divisions of conventional banks from the dual banking system of Pakistan for the period 2006 to 2016. Applying dynamic System GMM estimators, the study affirms the procyclicality of conventional and Islamic banks over the business cycle. However, Islamic banks are found to be more procyclical as compared to conventional banks. It indicates that Islamic banks are more exposed and less resilient to economic disruptions, and would suffer from intense decline in performance as the economy keeps on shrinking. This behavior may lead to severe financial inefficiencies in the economy and fall down to the banking sector, which may further intensify the crisis.

Keeping our results in view, the present study suggests for central banks to closely monitor the procyclical performance of the banking sector with changing economic conditions. Further, it recommends caution in promoting Islamic banking industry as a viable alternative to the conventional one. Countries where conventional and Islamic banks coexist need to regularly monitor the performance of Islamic banks. This will help in immediate identification of any crisis intensifying tendency. A higher share of Islamic banking in the overall dual banking system would indicate a more procyclical general banking behavior. The functioning of Islamic banks as per *Shari'ah* principles in letter and spirit and adoption of its actual distinctive modes of financing should be ensured. It will help in attainment of the superior stability view of Islamic banks, a claim repeatedly proclaimed in its theoretical literature. (Masood & Ashraf, 2012)

The findings and practical implications of the study should be dealt with vigilance due to some limitations. The study was based on a small sample size of 4 conventional banks, three Islamic banking divisions of conventional banks and 4 full-fledged Islamic

banks. The limited number of banks in our study was due to the less number of Islamic banks in Pakistan, non-availability of some banks' financial statements and non-categorization of financial data by some banks into Islamic and conventional banking. Further, few banks were screened due to their inability to qualify the previously discussed sample criteria. Therefore, generalizability may be considered with caution. Future studies may use larger sample of banks from different jurisdictions and incorporate other measures of stability to examine the subject from different dimensions.

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