



**RESEARCH PAPER**

**Derivative Usage and Bank Stability: A Comparison of Islamic and Conventional Banking from Pakistan**

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**PAPER INFO      ABSTRACT**

**Received:**  
February 21, 2020  
**Accepted:**  
March 15, 2020  
**Online:**  
March 30, 2020

**Keywords:**  
Bank Stability  
Derivative Usage  
Islamic and  
Conventional  
Banking

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Objective of this study includes influence of derivative usage on performance of Islamic and conventional banking sector working in Pakistan. Various studies have testified the concept of derivative usage in Islamic banks while various authors have testified it in conventional banks. This study opted 12 commercial banks and 5 Islamic banks. Data is used from 2015 to 2019. Four types of derivatives i.e. forward, options, swaps and future are used. CAMEL method is used to evaluate the performance of banks that was used by Mohamed Rochdi Keffala (2020). The CAMEL variable are related to bank features like managerial skills, earning capital, quality of an asset, liquidity and market risk adherence. Results revealed that forwards and Swaps effects positively the bank stability in conventional banks while option and future affects negatively the bank performance in conventional bank while in Islamic mode of banking the results are different. Swaps and options increase the performance while forward and future destabilize the banks.

**Introduction**

Any country's financial sector plays role in the stability and development of an economy (Zaidi, 2005). The financial sector has an important part which is banking sector, and for any country's best economic performance, this sector is important. Banks characteristics which can cause efficiency are helpful for banking system and economic development of country. The banks include Islamic Banking and conventional banking. Islamic banking follows the Shariya law and interest based is the conventional banking. As the commercial banks are old and stable, because they are operating in Pakistan since its independence, so there operations and stability is stronger compared to Islamic banks. The government is also supporting these commercial banks as this system reflects itself in government

policy and the monetary policies as well (Hartman, 2004). Another factor because of which the commercial banks increase the economic stability is the provision of loans to both government and public sectors. These banks act as a connection and then provide financing from the surplus to the deficit and in return claim interest for its services. As there are benefits of this financial system, due to over dependency it also caused harm and resulted in the Global Financial Crisis (M. Kabir and Kayed, 2011). But on the other hand, the Islamic banks are based on profit loss sharing; no interest crisis would have ever been existed. In various researches, Sarker, 1999, Bashir, 1999, Samad and Hassan, 1999, Hassan and Bashir, 2003, Yudistira, 2003, Hussein, 2004, have studied Islamic banking system and found it more stable.

After the freedom of Muslim world from foreign powers and intervention and spread of Islamic ideology in Muslim societies, the multitudes looked at the previous social systems with Islamic concepts and tried to incorporate the modifications and developments. The think tanks of Muslims confronted the already ruling economic and social systems and depicted their weakness. There existed capitalism “a system of economics where country trade is controlled privately for profits, rather than state owned. This system was analyzed and criticized. In this concept there were four factors of production and all risk is born by the owner alone, others factors reward is fixed. In this system the reward for using money is interest, so the conventional banking is based on interest through lending and accepting deposits. In the Islamic law this interest based driven product offered by the conventional banking is forbidden, so the Muslims established their own financial system by developing financial institutions under Islamic principles. The revolution in the development of the Islamic banking was caused by the establishment of Islamic Development bank in 1973-74, having total volume of US \$ 1,460/- Billion globally, in December 2012 (IFSL-2013). But in order to attain the market share, Islamic finance must meet the requirements of business world. But mainly it was designed for capturing the market share and providing the services to the large Muslim population scattered around the globe. Islamic Financial institutions are price taker not price setters as their volume is very less in the global financial market. But if we compare both the systems, we will find no such big difference between them. In the Islamic financing system, no fixed profit is charged and Shari’a fair play is required. The transactions process is different between these two. The lending in Islamic finance instruments used by the industry is based on trade, rental based and profit and loss sharing. Mudarba is trade based in which seller is required to reveal cost of goods and profit charged and Muajjal is a credit sales without disclosing amount of profit charged, then Murabaha that resembles to conventional loans, and is used extensively by IFIs, globally. Such agreement includes the supply of an asset to a customer by the bank and bank buys the asset and then sells to the customer and charge profit based on the time period of payment. So wherever the financial transaction is involved, risk is also involved, but the nature and risk attached with Islamic mode of financing is entirely different from conventional finance. The risk differentiates, the risk of default exists in conventional banking system while under the Islamic banking system certain other risks involve including price, security, foreign exchange, in addition to credit risk. Another mode of financing used by IFIs

is Ijarah which is based on the rent. In this the bank pays the amount to purchase an asset, i.e vehicle and made a contract with the customer to pay the rentals of the vehicle. The said vehicle is owned by the bank as the owner but deliver to the customer for using. After the completion of the any agreement, asset is handed over to the customer for some specific amount or free. Indirectly the total profit charge to the customer remains the same as conventional finance industry, but in the conventional finance, the risk of bank is only the default risk, but in the case of Islamic banking, it is totally different. The risk faced by the Islamic banking includes theft, accident, repair and maintenance, technology changes, foreign exchange risk and disposal of asset etc. in addition to credit risk.

In Pakistan five Islamic banks and 14 conventional banks are operating in Pakistan and some of the conventional banks have independent Islamic product services as well. In the last decade, Islamic financing industry is growing day by day.

As any activity if created by any financial institution, it involves some degree of risk. Risk taking in such cases are based on analysis and understanding of the risks, whereas gambling creates a risk that would otherwise be non-existent. Islam stops us from gambling, as Quran verses about games of chance or gambling are in (Surah Al-Baqarah, verse 219 and Surah Al-Maidah, verse 90), in Arabic called maysir. But in contrast conventional banks provides fixed interest on depositor's capital, according to a kibar plus a return of their capital. The Islamic banks are based on the risk sharing principal while conventional are fixed interest based.

Different risk factors are faced by the financial institutions which are involved in the transactions. Some are firm specific, some are industry specific, other are domestic and international. Not able to retain the competent employees is one of the firm risk, and having small number of suppliers and customers, and the legal risks. Additionally, the risk of technology, competitive market is the industry specific risk that an organization faces.

Due to these risks the firm faces loss and leads to bankruptcy. To mitigate these risks, managers try various ways. The big risk is the domestic risk for the banks, the increase in interest rates, the price hiking, the inflation and in order to reduce these risks using the financial derivatives is one of the major remedy. The financial concern from the last thirty years is this. These Financial derivatives are also traded on the stock exchanges of the countries in the form of futures, swaps, forward and option contracts. The process of derivative usage by financial sector increased in the late 1970s and 1980s, when the risk of market resulted in the shutdown of economy of many institutions. The most effected institutions were banks and other financial institutions. During that time period, nearly about 1000 banks failed in their operations. In order to fulfill the operational needs, the capital requirement of the banks increased and no solution was found other than the use of financial derivatives.

As the derivatives are highly liquid and less costly, its use in the world increased a lot. But some hurdles are there to stop the increased use of derivatives. These hurdles are lack of legal plans, less planned markets and absence of accounting & auditing standards. In order to increase the efficiency of derivatives and stop the hurdles, the SBP has made FDBR (Financial Derivatives Business Regulations) Foreign Exchange Regulations Act 1947 and Banking Companies Ordinance 1962 in Pakistan. FDBR assists institutes to regulate and administer financial sector which deals with derivative operations (Gishkori, M. A., & Ullah, N. (2013).

In this study, a sample from 14 commercial banks and 5 Islamic banks is used and the risk factor is identified and the use of derivative instruments to mitigate the risk is analyzed. Islamic banks are increasing day by day in order to enhance the operations and meet the needs of Islamic law. Past studies have found the performance of the banks after using the derivatives to mitigate risk factor but no one has compared the performance of conventional and Islamic banking sectors in Pakistan. In this study, comparison will be made in order to understand the usage and understand the effect of derivative usage on the performance of Islamic as well as conventional banks.

Many times the worldwide studies examined the performance of the banks using derivatives and banks not using derivatives. Researchers found positive relationship between performance of banks and derivatives. Shen and Hartarska (2013) involving US community banks in his study, finds out that the use of derivatives helped improve the profitability. Effenberger (2004) says that credit derivatives are popular. Mohamed Rochdi Keffala, (2020), conducted a study and evaluated the performance of using derivatives in the Islamic banks of different Islamic countries. Results revealed different results of using different forms of derivatives instrument on the performance of banks. Performance of the banks was increased by the usage of option but swaps has positive and weak impact on their performance. Forwards shrink bank performance, and futures have low and ambiguous effect on their performance. Comparison between Islamic and conventional banks is also made by Safiullah and Shamsuddin (2017), and Johnes, Izzeldin, Pappas, and Alexakis (2018) but no one has compared the use of derivatives in the Islamic and conventional banking specially in the context of Pakistan. So, this study will analyze this relationship in the context of Pakistani banking sector.

## **Literature Review**

The literature review includes the past studies that are based on conventional and Islamic mode of banking and their risk mitigation techniques in crisis period and other than crisis period most of the studies are in international context.

In fact, as it is said by Nilsen and Rovelli (2001), the financial markets are affected by the crisis starting with Chile in 1982 and Mexico in 1994–1995 and Russia in 1998 and Brazil in 1999. Different crisis gave different outputs and determinants.

And some common factors were also there, each demonstrated the potential for sharp changes in investor sentiment.

Fu et al. (2014) investigated the bank rivalry, awareness, directive and national institutional on single bank delicacy as measured by the chance of insolvency and the bank's z-score using information on 14 Asia Pacific economies from 2003 to 2010. Higher bank stability and less bank risk is the result of larger value the bank-level z-score. Cavallaro et al. (2011) study the Argentinian issue of financial instability which was affected by financial crisis. Akyuz and Boratav told that the less fiscal discipline resulted in financial fragility in Turkey. Banking system of Turkey was extremely fragile. Authors' states that financial novelties as derivatives can affect negatively firm stability. Indeed, Klemkosky (2013) explains financial crisis causes that are overconfidence, underestimating of risks, and financial innovations use. Financial innovation is good in his thinking, but in different financial crisis, there question arises whether all the financial innovations are good or not. Gatopoulos and Loubergé (2013) studied the currency crisis and found the determinants determinant of firms' use of foreign currency derivatives in Latin American countries. And they found the positive impact of derivative in these countries. According to Rossi(2009), different economies are suffered differently from derivatives market volatility.

In Deutsche Bank Research, Effenberger (2004) argued the credit derivatives efficiency in the stability of financial markets. Capelle-Blancard (2010) stated that derivative usage danger is more concerned by systematic risk. Li and Marinc (2014) found the relationship of derivatives and systematic risk exposure positive. Mayordomo et al. (2014) told that banks contribution to systematic risk is not impacted significantly by use of derivatives. On the other hand, banks having derivatives usage such as foreign exchange and credit derivatives enhances the banks assistances to systemic risk and on the other hand holdings of interest rate derivatives decrease it. According to Farhi and Borghi (2009), stated that in the countries like Brazil, China, India, which have more volatile currency rates, the adverse effects of derivatives use on bank stability may be strengthened.

In the literature, major studies have focused only on the comparison between Islamic and conventional banks i.e Safiullah and Shamsuddin (2017), Zins and Weill (2017), Ali and Yahyaee (2018). But no study is found having testifying the comparison between the usage of derivatives in Islamic and conventional banking in Pakistan. Rivas, Ozuna, and Policastro (2006) using DEA approach examined whether the use of derivatives affects the efficiency of Latin American banks. Resultantly, author stated that the use of derivatives increases the efficiency of Latin American banks. Shen and Hartarska (2013) also found positive relationship between derivative usage and performance of US community banks. In Kenya, the relationship between derivatives and profitability was studied by Gitogo (2012). The author used SPSS and conducted descriptive research. Positive relationship was found between profitability and derivatives use. Finally, in current research

conducted by Mohamed Rochdi Keffala, (2020), author evaluated the impact of using derivatives in the Islamic banks of different Islamic countries. Panel data econometrics with GMM is used and research is conducted on thirty two Islamic banks from 2007 to 2017. CAMELS approach is used. Results revealed that Islamic banks uses derivatives on large scale and these banks prefer using derivatives for trading purpose resultantly their performance is increased.

Literature includes the studies of international as well as national context. Internationally, various researchers showed the derivative usage enhances the performance of banks and when the same concept applied in Islamic mode of banking, it also helps increasing the performance but this paper will investigate the comparison of using derivatives and its performance on Islamic as well as conventional banks in Pakistan.

This study hypothesize that

H1: Using forwards affects positively the performance of conventional and Islamic banks.

H2. : Using options affects positively the performance of conventional and Islamic banks.

H3. : Using swaps affects positively the performance of conventional and Islamic banks.

H4. : Using futures affects positively the performance of conventional and Islamic banks.

### **Material and Methods**

Data will be obtained from the annual statements of conventional and Islamic banks from 2015 to 2019 and data will be secondary in nature. The sample will be selected from conventional as well as Islamic banks. 12 commercial banks and 5 Islamic banks working in Pakistan will be opted. The full sample of this paper is composed of 17 banks working in Pakistan.

#### **The Full Sample Banks which are used in our empirical study**

| <b>Sr. No</b> | <b>Banks</b>           | <b>Commercial / Islamic</b> |
|---------------|------------------------|-----------------------------|
| 1             | Allied Bank Limited    | Commercial Bank             |
| 2             | Askari Bank Limited    | Commercial Bank             |
| 3             | Bank Alfalah Limited   | Commercial Bank             |
| 4             | Bank Al-Habib Limited  | Commercial Bank             |
| 5             | Faysal Bank Limited    | Commercial Bank             |
| 6             | Habib Bank Limited     | Commercial Bank             |
| 7             | Muslim Commercial Bank | Commercial Bank             |
| 8             | Meezan Bank Limited    | Commercial Bank             |

|    |                                     |                 |
|----|-------------------------------------|-----------------|
| 9  | National Bank of Pakistan           | Commercial Bank |
| 10 | United Bank Limited                 | Commercial Bank |
| 11 | Bank of the Punjab                  | Commercial Bank |
| 12 | Habib Metropolitan Bank Limited     | Commercial Bank |
| 13 | Albaraka Bank (Pakistan) Limited    | Islamic Bank    |
| 14 | Bank Islami Pakistan Limited        | Islamic Bank    |
| 15 | Dubai Islamic Bank Pakistan Limited | Islamic Bank    |
| 16 | Meezan Bank Limited                 | Islamic Bank    |
| 17 | MCB Islamic Bank Limited            | Islamic Bank    |

### Description of Performance Measure

CAMELS is used in order to measure the performance of sample banks. This approach is significantly used in many researches to measure the banks performance soundness. Čihák and Schaeck (2010) stated the systematic banking problems can be reduced by effectiveness of CAMEL approach. In Romania, Roman and Sargu (2013) analyzed the financial soundness of commercial banks using CAMELS approach. Chiaramonte, Poli, and Oriani (2015) while investigating soundness of European banks made a comparison of z-score and the CAMELS approach reliability. And then Wanke, Azad, and Barros (2016) use CAMELS framework on the Malaysian banking system and assessed the financial distress. The indicators of CAMELS are given as follows: (Čihák & Schaeck, 2010; Rodica-Oana, 2014; Roman & Sargu, 2013) stated that "Capital adequacy" is CAMELS variable which is the ratio of total equity to total assets. Banks having more equity is a sound bank. So relationship is proportional. (Čihák & Schaeck, 2010) stated the "Asset quality" as the ratio of non-performing loans to gross loans. More ratio will result in low bank soundness. So, "Asset quality" is inversely proportional to bank's soundness. Chiaramonte et al., 2015 defined "Management quality" is found by the cost-to-income ratio. So, low value of cost-to-income ratio indicates better managerial quality resulting in better bank soundness. "Earnings ability" is measured by ROE which is also indicator of financial performance (Wanke et al., 2016). As ROE is higher, so the soundness of bank is higher. "Liquidity" is proxied by liquid assets divided by total assets (Roman & Sargu, 2013). This factor of CAMELS has a significant impact on its financial soundness and it is proportional to bank soundness. Last variable used in CAMELS is Sensitivity to market risk and is defined by Chiaromonte et al., 2015 as the ratio of non-interest income to net operating revenue.

Model of the study

Performance  $f$  = (Derivative tools, Control variables)

(CAMELS)  $f$  = (Forwards, Options, Swaps, Futures/Trading, Hedging, Control variables)

Dependent variables

Capital adequacy  $CAD_{i,t} = \gamma_0 + \gamma_1 TRD_{i,t} + \gamma_2 HDG + \gamma_3 SIZE_{i,t} + \gamma_4 CRI_{i,t} + \gamma_5 LOAN_{i,t} + \gamma_6 GDP_{i,t} + \gamma_7 INF_{i,t}$

Asset quality  $NPL_{i,t} = \gamma_0 + \gamma_1 TRD_{i,t} + \gamma_2 HDG + \gamma_3 SIZE_{i,t} + \gamma_4 CRI_{i,t} + \gamma_5 LOAN_{i,t} + \gamma_6 GDP_{i,t} + \gamma_7 INF_{i,t}$

Management quality  $CIR_{i,t} = \gamma_0 + \gamma_1 TRD_{i,t} + \gamma_2 HDG + \gamma_3 SIZE_{i,t} + \gamma_4 CRI_{i,t} + \gamma_5 LOAN_{i,t} + \gamma_6 GDP_{i,t} + \gamma_7 INF_{i,t}$

Earnings ability  $ROE_{i,t} = \gamma_0 + \gamma_1 TRD_{i,t} + \gamma_2 HDG + \gamma_3 SIZE_{i,t} + \gamma_4 CRI_{i,t} + \gamma_5 LOAN_{i,t} + \gamma_6 GDP_{i,t} + \gamma_7 INF_{i,t}$

Liquidity  $LIQ_{i,t} = \gamma_0 + \gamma_1 TRD_{i,t} + \gamma_2 HDG + \gamma_3 SIZE_{i,t} + \gamma_4 CRI_{i,t} + \gamma_5 LOAN_{i,t} + \gamma_6 GDP_{i,t} + \gamma_7 INF_{i,t}$

Sensitivity to market risk

$NONIM_{i,t} = \gamma_0 + \gamma_1 TRD_{i,t} + \gamma_2 HDG + \gamma_3 SIZE_{i,t} + \gamma_4 CRI_{i,t} + \gamma_5 LOAN_{i,t} + \gamma_6 GDP_{i,t} + \gamma_7 INF_{i,t}$

The CAMELS represents, Capital adequacy (CAD), Asset quality (NPL), Management quality (CIR), Earnings ability (ROE), Liquidity (LIQ), and Sensitivity to market risk (NONIM). The variable of interest is a derivative instrument. There are four derivative instruments i.e forwards, options, swaps and futures. The data on derivative is given in the annual reports of sample banks. Bank specific variables and country specific variables are control variables. Bank size, credit risk and lending behavior are bank specific variables while GDP and inflation are country specific variables.

**Estimation Method / Regression**

Generalized Methods of Moments (GMM) is used as estimator technique to estimate regressions. GMM is consistent if error term is not auto-correlated and an instrument used is valid. Test examines the hypothesis of no auto-correlation in the error term.

| <b>Regression GMM Estimator</b> | <b>Commercial Banks</b> | <b>Islamic Banks</b> |
|---------------------------------|-------------------------|----------------------|
| FWD (-1)                        | 0.0055912 (0.1213787)   | -0.6586 (0.2002)     |
| SWP (-1)                        | 0.0823231 (0.0155919)   | 0.89544 (0.2548)     |
| OPT (-1)                        | -0.05906 (0.0169346)    | 0.01254 (0.0154)     |
| FUT (-1)                        | -0.1134721 (0.011706)   | -0.1542 (0.0315)     |
| LOAN (-1)                       | 2.32798 (0.6403821)     | 1.528 (0.064)        |
| CAD (-1)                        | -0.0634313 (0.0065648)  | 0.05454 (0.0006)     |



|                |                       |                  |
|----------------|-----------------------|------------------|
| EFF (-1)       | -0.066497(0.0607356)  | 0.04448 (0.0545) |
| NIM (-1)       | 3.78114 (2.271669)    | 2.484 (2.2202)   |
| CRISK (-1)     | -4.334281(2.032353)   | -534 (20.2220)   |
| SIZE (-1)      | 0.044429 (0.0777436)  | 0.044 (0.2550)   |
| NOMIN (-1)     | 0.1910265 (3.689971)  | 0.13487 (5.566)  |
| GDP (-1)       | 0.025844 (0.0104642)  | 0.02584 (0.021)  |
| INFLATION (-1) | 0.0058791 (0.0148784) | 0.00441 (0.0221) |

## Results and Discussion

In conventional banking sector, forwards and swaps when used as a derivative are statistically significant and do not reduce the bank stability which is measured by asset quality from the period 2015-2019. While option and swaps are the destabilizing factors for the bank stability and it increases the sensitivity of banks to market risk from the period 2015-2019.

Using forwards resulted in reduction of the capital adequacy, the assets quality and the management ability of Islamic banks during 2015-2019 and increase of sensitivity of Islamic banks to market risk. If options are used it results in increase of capital adequacy, assets quality, management ability and the earnings of Islamic banks. On the other hand options decrease the sensitivity of Islamic banks to market risk. If swaps are used by the Islamic banks, it improves the assets quality of Islamic banks and shrinks their sensitivity to market risk. In the case of options, it has negative impact on management quality and liquidity while positive impact on capital adequacy, asset quality, earnings ability and sensitivity to market risk. Swaps have positive significant impact with asset quality and negative impact with the sensitivity to market risk. And when futures derivatives are used, earnings ability is reduced and sensitivity to market risk is increased. Thus, hypothesis 1 is accepted to the extent of conventional banks while rejected to the extent of Islamic banks. Hypothesis 2 is accepted for both the conventional and Islamic banks. Hypothesis 3 is rejected to the extent of conventional banks and accepted to the extent of Islamic banks. Hypothesis 4 of the study is rejected.

## Conclusion

This study is conducted on the Pakistan banking sector and by using CAMELS approach and GMM estimator the study analyzed the effect of types of derivatives on the conventional and Islamic banks in Pakistan. GMM regression was conducted. Results revealed that forwards and swaps affect positively the bank stability in conventional banks while options and future effects negatively the bank performance in conventional banking while in Islamic mode of banking the results are different. Swaps and options increase the performance while forwards and future destabilize the banks. Thus, these findings are helpful for the banks in choosing the derivative to be used.

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