



Global Financial Crisis and its Impact on Efficiency and Performance of Commercial Banks in Pakistan

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Abstract

This study is aimed at investigating the effect of global financial crisis on efficiency and financial performance of banks in Pakistan. The comparative efficiency analysis of pre-crisis, crisis, and after-crisis period is made by applying data envelopment analysis technique. The data for this purpose were extracted from annual audited reports of commercial banks. The results of analysis depicts that banking efficiency in Pakistan was not substantially affected by the crisis. The affirmation of findings is made by examining the phenomenon in context of financial performance. The panel data methodology is deployed for this purpose and crisis dummy is inserted to capture the effect of crisis. The results again supports the findings of efficiency analysis. The significant effect of crisis on profitability of banking sector in Pakistan is not found. It is concluded that lesser integration of domestic banks with global banks helped Pakistan to survive from sever harmful effects of crisis.

Key Words: *Global Financial Crisis, Banking Sector, Data Envelopment Analysis, Panel Regression, Dummy Variable*

1. Introduction

The word financial crisis is used to state a situation in which major stream of assets and institutions lose its value. The term was elaborated by Allen and Gale (2004) as an extreme event of decline in value of assets that deteriorates the ability of many financial institutions to meet their obligations and commitments with depositors timely. The crisis refers to the periods during which normal functioning of financial markets and institutions disturb severely (Terrones, Scott, & Kannan, 2009). It, indeed, create a disturbance for entire financial system. The financial crises have historical background and global economies passed though many crises episodes. The great depression and global financial crisis are attributed as the most terrible events of economic history. The global financial crisis originated form United States with enormous default of borrowers and collapse of some major financial institutions in 2007. The problem was rapidly transmitted to other developed and then developing economies of world. The situation of credit crunch emerged

that affected almost every country of the world regardless of its integration level with rest of economies (Bahiti, Shkurti, & Babasuli, 2011).

The crisis spread sharply to financial markets of Europe and other countries of the world. The transmission of crisis was through both indirect and direct channels. The crisis passed on so speedily because the financial systems of many world countries were integrated and interconnected through United States which was playing the role of a hub (Frenkel & Rapetti, 2009). The integration of financial systems across globe expedited the spread of crisis among economies and globally (Chava & Purnanandam, 2011; Raz, Indra, Artikasih, & Citra, 2012). This integration affected the economies during global financial crisis through decline of domestic liquidity, reduction of overseas financing for companies, and falling stock prices (Siddiqui, 2009). The effect of crisis varied across countries and it remained more pronounced in advanced than emerging economies of the world (Fraga & Rocha, 2014; Bhattarai, 2015). The countries with higher dependence of financial sector and greater economic freedom remained more vulnerable to the crisis (Shostya, 2014).

The unique feature of global financial crisis is its economic costs for almost all world countries. There was not a complete escape of any country from its harmful effects. The effect, however, differed across regions and countries while in advanced economies it was transmitted and appeared immediately (Claessens, Kose, & Terrones, 2010). The effect of crisis was also felt in Pakistan and this study is aimed at observing the phenomenon empirically. It is examined from the aspects of efficiency and financial performance. The efficiency analysis is made through data envelopment analysis while panel regression model is applied for observing the impact of crisis on financial performance of commercial banks in Pakistan. The results indicate that global financial crisis neither affected efficiency nor performance of banking sector in Pakistan. There are two major areas in which the study can contribute to existing literature. The first one is related to its contextual contribution as prior studies in this domain were not much broader. The study covers a broader spectrum by addressing the efficiency and profitability perspectives in parallel. The second one is related to its practical importance for banking officials, investors, depositors, government, and general public. The findings of study can also facilitate the bank management to identify weak areas and then device policies for improvement.

The rest of paper is structured into four sections. Section 2 summarizes the findings of existing studies while methodological framework alongwith description of sample and data is in section 3. The results are presented in section 4 whereas brief summary and conclusion of study are given in section 5.

2. Literature Review

The financial intermediaries are playing a pivotal in economic growth of many countries. It assists saving surplus and deficit units through transfer and proper allocation of resources (Allen & Santomero, 2001). The intermediation activities enable the economies to minimize the proportion of idle savings and unproductive assets (Bencivenga & Smith, 1991). The financial intermediation theory described the role of intermediaries and reasons of their existence in economies (Andrieş, 2009). The intermediaries can have a competitive edge because of their ability of acquiring low cost information, minimizing transaction costs, and securing benefits of scale economies (Benston & Smith, 1976). Their existence and proper functioning is beneficial for overall economy in addition to that of individual borrowers and lenders. The informational advantages of financial intermediaries

were described by Leland and Pyle (1977). The information asymmetry models were developed by assuming that one party of transaction can dominate the decision because of having better information level. Diamond (1984) proposes that financial intermediaries can help to overcome informational asymmetry issues by acting as delegated monitors

The financial intermediaries have a long history and banks actually existed since the recognition of money as medium of exchange (Siddiqui, 2003). The intermediaries ever provided valuable and wide-ranging services for their customers and overall economy. With the passage of time, the financial intermediaries reconsidered their traditional role of attracting deposits and making loans only. They are now engaged in wide-ranging services and became a key component of financial system. According to Beck, Degryse, and Kneer (2014), economic stability can be strengthened with the help of intermediation activities, especially in low income countries. The financial institutions and markets strengthened themselves and turned-out to be a major contributor of economic growth in majority of world countries. The problematic situation in financial system, however, create trouble for entire economy. This was also noted in the era of global financial crisis which started with failure of some prominent financial institutions in United States. The initial banking sector disturbance induced the fearful investors to suddenly withdraw their funds. These substantial and immediate bank runs lead to failure of banks and origination of crisis in United States (Goedde-Menke, Langer, & Pflingsten, 2014).

The banking performance was affected negatively in many countries due to emergence of credit crunch and liquidity problems. This situation adversely affected the confidence of investors and raised serious concerns about the stability of financial and economic system in world (Spence, 2009). The bank run theory can effectively explain the phenomenon. The theory addressed pessimistic expectations of depositors regarding future economic stability, in economic downturn period. This can induce them in immediate cash withdrawals and create liquidity problems for entire banking system. In order of meeting liquidity requirements, the banks may have to trade their assets, even at loss (Diamond & Dybvig, 1983). The bank run, therefore, is amongst the fundamental characteristics of severe economic crises and a base of real economic problems. The economic issues during great depression were also mainly developed through bank runs (Diamond & Dybvig, 1983; Gorton, 1988). Additionally, the banks cannot fulfil the financing requirements of borrowers due to shortage of funds available with them. This can also lead to a situation of bankruptcy, insolvency, and economic recession. Fisher (1933) also highlighted the dominant role of availability of debt in economic expansion and depression.

The efficiency and performance of banking sector generally declined in financial crises periods. The phenomenon has been empirically addressed by researchers previously in context of global financial crisis. In one such study, Anayiotos, Toroyan, and Vamvakidis (2010) documented the efficiency decline of banking sector in emerging European economies during crisis years. By applying ratio analysis, Kumbirai and Webb (2010) noted a decline in liquidity, profitability, and credit quality of banks in South Africa, during global financial crisis. The significant difference of crisis to pre-crisis trend was, however, found only for profitability related indicators. Dietrich and Wanzenried (2011) also found a negative and significant impact of global financial crisis on profitability of banking sector in Switzerland. The performance of state-owned banks remained comparatively better than those owned and operated by private investors. The substantial negative effect of crisis on efficiency and financial performance of banks in Jordan was

also documented by Zeitun and Benjelloun (2012), Al Qudah and Malkawi (2014). In India, Singh and Makkar (2014) observed a significant impact of global financial crisis on stocks volatility of banking sector. Matousek, Rughoo, Sarantis, and Assaf (2015) also reported an overall efficiency decline of European banks in after-crisis period. Similar negative effect of crisis on performance of financial firms in United States was found by Hippler and Hassan (2015). In another study, Moradi-Motlagh and Babacan (2015) found a negative effect of crisis on scale and pure technical efficiency of Australian banks.

There are, however, certain researchers who reported either positive or insignificant effect of global financial crisis on performance of banking sector across different countries. In one such study, Luo, Yao, Chen, and Wang (2011) observed a significant increase in banking efficiency of China during crisis period. A similar lesser impact of crisis on performance of Turkish banking sector was found by Dincer, Gencer, Orhan, and Sahinbas (2011). They attributed it as the outcome of restructuring activities. Önder and Özyildirim (2013), however, credited state-owned banks for their positive contribution in minimizing harmful effects of crisis and enhancing local economic growth in Turkey. The insignificant effect of crisis on profitability of banking sector in Oman was noted by Sangeetha (2012). The domestic commercial banks revealed relatively higher level resilience there. The differential effect of crisis across banking sector of different countries and that of conventional and Islamic banks was also examined by some researchers. Bourkhis and Nabi (2013) compared the performance and soundness of conventional and Islamic banks during global financial crisis in 16 countries. The significant difference across two categories was not found by researchers. The Islamic banks, however, performed relatively better in and after crisis duration. Mobarek and Kalonov (2014), on the other side, noted a better performance of conventional banks selected from OIC countries. The variation in behavior of banking sector during global financial crisis period was also observed by Dias and Ramos (2014), Xiang, Shamsuddin, and Worthington (2015).

There are some studies in Pakistan but are not much broader in scope. In one such study, Haque and Tariq (2012) relatively examined the efficiency of conventional and Islamic banks in Pakistan. They noted an overall decline in efficiency of banking sector during the period of 2006-2009. The Islamic banks were found to be comparatively more efficient. The overall general trend of banking efficiency in Pakistan was analyzed by the researchers without integrating the impact of global financial crisis. The nearly similar findings were reported by Phulpoto, Shah, and Shaikh (2012). They found a relatively better performance of Islamic banks during crisis period. The researchers, however, extracted a small sample of four banks from each side. Nazir, Safdar, and Akram (2012) also found a significant impact of global financial crisis on relative ability of different financial performance determinants to explain its variations. The main focus of their research was financial performance determinants and a minor touch was given to the effect of crisis. It is felt that a broader study to determine the effect of crisis on banking sector of Pakistan can significantly contribute in existing body of knowledge. This is addressed in current study by examining the impact of global financial crisis on efficiency and financial performance of banks in Pakistan.

3. Methodology

3.1 Efficiency Analysis of Banks

Data Envelopment Analysis (DEA) technique is applied for efficiency analysis of commercial banks in Pakistan. This approach of efficiency computation is very famous among researchers. It is used for checking the efficiency of a decision making unit relative to other units of similar pattern. The technique applies observed input-output combination to identify the firms establishing envelopment surface. The fully efficient firms lie on surface and receive a unity value. On the other side, firms failing to lie on surface are treated as inefficient with lesser than unity value. The researchers in past have widely used this technique for efficiency analysis of enterprises (Sufian & Majid, 2007; Sufian, 2010; Haque & Tariq, 2012; Zeitun & Benjelloun, 2012; Mobarek & Kalonov, 2014).

The basic model for measuring productive efficiency of enterprises at micro level was originated by Farrell (1957). Its extension for multiple output-input combination was later proposed by Charnes, Cooper, and Rhodes (1978). This model has been termed as CCR model and is input oriented with assumption of constant return to scale. The model was further extended by Banker, Charnes, and Cooper (1984) to fit for variable returns to scale (VRS) condition. The mathematical expression of model applied in study is:

$$\text{Max } e_0 = \frac{\sum_{i=1}^m u_i y_{i0}}{\sum_{j=1}^p v_j x_{j0}} \text{-----(i)}$$

$$\text{Subject to; } \sum_{i=1}^m u_i y_{is} / \sum_{j=1}^p v_j x_{js} \leq 1$$

Where $s=1,2,\dots, n$; $u_i, v_j \geq 0$; $i=1,2,\dots,m$; $j=1,2,\dots,p$, x_{js} and y_{is} symbolizes positive known inputs and outputs of s^{th} DMU whereas variable weights are denoted by u_i and v_j . The base DMU is being measured by index 0. For efficiency score of $e_0 = 1$; the DMU₀ satisfies condition of efficient DEA, otherwise it is inefficient.

The first step in application of DEA is the choice of appropriate combination of inputs and outputs. This choice depends upon the kind of functions performed by unit of analysis. Considering this aspect alongwith broader application and extensive coverage, intermediation approach is applied in study for selection of inputs-outputs combination. The similar approach has been applied previously by Isik and Hassan (2002), Sufian and Habibullah (2009), Burki and Niazi (2010), Sufian (2010), Sufian, Kamarudin, and Annuar md. Nassir (2016). This approach identifies labour, physical capital, financial capital, and operating costs as inputs while loans & advances and investments as outputs of banking sector. The input prices are also computed for cost efficiency determination. The efficiency scores of individual banks are analyzed with the help of Win4DEAP software.

3.2 Performance Analysis of Banks

The effect of global financial crisis on performance of banks in Pakistan is determined with the help of panel regression and following model is being applied:

$$\text{ROA}_{it} = \beta_0 + \beta_1 \text{CA}_{it} + \beta_2 \text{LNTA}_{it} + \beta_3 \text{NPLGL}_{it} + \beta_4 \text{CIR}_{it} + \beta_5 \text{LATA}_{it} + \beta_6 \text{LTD}_{it} + \beta_7 \text{AGE}_{it} + \beta_8 \text{BN}_{it} + \beta_9 \text{GFC} + \varepsilon_{it} \text{-----(ii)}$$

Return on assets (ROA) is the dependent variable of panel regression and is used for determining the financial performance of sample banks. Different factors, having direct or indirect impact on banking profitability are used as regressors. These are extracted by following studies of Sufian (2010), Kumbirai and Webb (2010), Sufian and Habibullah (2010), Dietrich and Wanzenried (2011), Sufian and Noor (2012). The monetary

authorities also applies these indicators to examine banking sector soundness. In order of capturing the effect of crisis on banking performance, the dummy of “GFC” is added in regression model. It is assigned with value of ‘1’ for crisis period, and ‘0’ otherwise.

3.3 Population, Sample, and Data

The population of study comprises of scheduled commercial banks in Pakistan while a sample of 18 banks is selected. The banks established after 2005 are not included in sample to ensure fair comparison. This is to ensure that sample banks were holding an established and competitive position in market. The banks closed before 2012 are also excluded from sample. Similar is the case for foreign and specialized banks. The years of 2005-2007 and 2010-2012 are considered as pre-crisis and post-crisis years, respectively. The crisis period cover the years of 2008-2009. The annual audited reports of sample commercial banks are utilized for the extraction of data related to variables of study.

4. Empirical Results and Discussions

4.1 Efficiency Analysis of Banking Sector

The year-wise efficiency scores of sample banks are initially computed by applying data envelopment analysis technique and then trend for pre-crisis, crisis, and post-crisis period is analyzed. The results of efficiency analysis are presented in Table 1.

Table 1: Efficiency Scores of Commercial Banks in Pakistan

DMU	Symbol	Technical Efficiency (TE)									Cost Efficiency (CE)						
		Pre-Crisis Period			Crisis Period			Post-Crisis Period			Pre-Crisis Period		Crisis Period		Post-Crisis Period		
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011	2012
1	ABL	1.000	0.846	0.862	0.925	1.000	1.000	1.000	0.974	0.810	0.663	0.724	0.788	0.911	0.957	0.830	0.895
2	AKBL	0.850	0.812	0.828	0.908	0.940	0.919	0.915	0.908	0.619	0.746	0.719	0.783	0.853	0.850	0.809	0.856
3	BAFL	0.724	0.812	0.857	0.830	0.862	0.900	0.827	0.900	0.483	0.748	0.755	0.743	0.822	0.856	0.762	0.857
4	BAHL	0.761	0.831	0.881	0.928	0.959	1.000	1.000	0.967	0.478	0.765	0.792	0.809	0.879	1.000	1.000	0.941
5	FABL	0.491	1.000	1.000	1.000	1.000	0.988	1.000	1.000	0.252	1.000	1.000	1.000	1.000	0.960	0.898	1.000
6	FWBL	1.000	1.000	1.000	1.000	0.851	1.000	1.000	0.909	1.000	0.782	0.557	0.609	0.573	0.754	0.703	0.694
7	HBL	0.945	0.895	0.918	0.913	1.000	0.965	0.908	1.000	0.727	0.703	0.760	0.835	0.940	0.914	0.827	0.935
8	HMB	0.302	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.253	1.000	1.000	1.000	1.000	1.000	1.000	1.000
9	KASBB	0.893	0.768	0.925	1.000	0.880	0.865	0.709	0.821	0.679	0.687	0.846	0.922	0.844	0.823	0.613	0.752
10	MCB	0.930	0.869	0.973	0.985	1.000	1.000	0.972	0.983	0.765	0.690	0.874	0.880	0.956	0.886	0.870	0.910
11	NBP	0.851	0.929	0.906	0.924	1.000	0.981	1.000	1.000	0.586	0.713	0.739	0.736	0.884	0.870	0.797	0.928
12	NIB	0.616	1.000	0.910	0.879	0.964	0.915	0.859	0.919	0.434	0.909	0.798	0.723	0.872	0.844	0.751	0.884
13	SBL	1.000	0.930	0.746	1.000	0.991	1.000	1.000	1.000	1.000	0.687	0.515	0.683	0.801	0.889	1.000	0.945
14	SILK	1.000	0.933	0.887	0.840	0.811	1.000	0.994	0.977	0.467	0.881	0.829	0.757	0.774	1.000	0.874	0.900
15	SNBL	0.954	0.890	0.867	0.875	0.947	0.955	0.944	0.983	0.473	0.837	0.816	0.824	0.926	0.921	0.841	0.925
16	BOK	0.624	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.509	1.000	0.906	0.953	0.978	0.919	0.969	0.990
17	BOP	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.705	0.815	0.943	0.940	0.924	0.871	0.753	0.902
18	UBL	0.819	0.871	0.853	0.907	1.000	0.966	0.918	0.937	0.583	0.725	0.780	0.890	1.000	0.924	0.866	0.913
Mean		0.820	0.910	0.912	0.940	0.956	0.970	0.947	0.960	0.601	0.797	0.797	0.826	0.885	0.902	0.842	0.901

DMU	Symbol	Allocative Efficiency (AE)									Scale Efficiency (SE)								
		Pre-Crisis Period			Crisis Period			Post-Crisis Period			Pre-Crisis Period			Crisis Period			Post-Crisis Period		
		2005	2006	2007	2008	2009	2010	2011	2012	2005	2006	2007	2008	2009	2010	2011	2012		
1	ABL	0.810	0.783	0.840	0.852	0.911	0.957	0.830	0.919	1.000	0.930	0.954	0.933	1.000	1.000	1.000	0.980		
2	AKBL	0.728	0.919	0.869	0.861	0.907	0.925	0.884	0.942	0.874	0.934	0.988	0.979	0.994	0.999	0.984	0.985		
3	BAFL	0.667	0.922	0.881	0.895	0.954	0.951	0.922	0.952	0.724	0.929	0.970	0.984	0.999	0.994	0.928	0.983		
4	BAHL	0.628	0.920	0.899	0.873	0.917	1.000	1.000	0.973	0.860	0.998	0.999	1.000	1.000	1.000	1.000	0.976		
5	FABL	0.513	1.000	1.000	1.000	1.000	0.972	0.898	1.000	0.966	1.000	1.000	1.000	1.000	0.993	1.000	1.000		
6	FWBL	1.000	0.782	0.557	0.609	0.673	0.754	0.703	0.763	1.000	1.000	1.000	1.000	0.851	1.000	1.000	0.909		
7	HBL	0.770	0.786	0.829	0.914	0.940	0.947	0.912	0.935	0.945	0.895	0.918	0.913	1.000	0.965	0.908	1.000		
8	HMB	0.838	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.981	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
9	KASBB	0.761	0.896	0.915	0.922	0.959	0.952	0.864	0.917	0.938	0.839	0.925	1.000	0.985	0.993	0.993	0.960		
10	MCB	0.823	0.793	0.898	0.893	0.956	0.886	0.895	0.926	0.930	0.877	0.973	0.985	1.000	1.000	0.972	0.983		
11	NBP	0.689	0.767	0.816	0.796	0.884	0.887	0.797	0.928	0.851	0.929	0.906	0.924	1.000	0.981	1.000	1.000		
12	NIB	0.704	0.909	0.877	0.822	0.904	0.922	0.874	0.962	0.788	1.000	0.996	0.999	0.998	0.998	0.971	0.994		
13	SBL	1.000	0.738	0.690	0.683	0.809	0.889	1.000	0.945	1.000	0.930	0.746	1.000	0.991	1.000	1.000	1.000		
14	SILK	0.467	0.944	0.934	0.901	0.955	1.000	0.879	0.921	1.000	0.997	0.939	0.993	0.972	1.000	0.994	0.995		
15	SNBL	0.495	0.940	0.942	0.942	0.978	0.965	0.891	0.941	0.977	0.993	0.989	0.988	0.976	0.999	0.962	1.000		
16	BOK	0.816	1.000	0.906	0.953	0.978	0.919	0.969	0.990	0.862	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
17	BOP	0.705	0.815	0.943	0.940	0.924	0.871	0.753	0.902	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
18	UBL	0.712	0.832	0.914	0.981	1.000	0.956	0.943	0.974	0.900	0.871	0.853	0.907	1.000	0.966	0.918	0.937		
Mean		0.729	0.875	0.873	0.880	0.925	0.931	0.890	0.938	0.922	0.951	0.953	0.978	0.987	0.994	0.979	0.983		

The results of analysis show that banking sector efficiency in Pakistan was not affected in crisis period or afterwards. The efficiency, instead, gradually increased for sample banks. The similar trend for banking sector of China was earlier noted by Luo, Yao, Chen, and Wang (2011). The mean efficiency scores for sample banks increased gradually throughout the period with exception of few banks for which it declined slightly. For confirmation of results and further clarity, the phenomenon is examined from perspective of financial performance. The effect of global financial crisis on profitability of commercial banks is observed in this approach. The descriptive statistics of variable are analyzed to observe the distribution of data and its results are summarized in Table 2.

Table 2. Summary Statistics of Variables Applied in Panel Regression Model

	ROA	CA	LNTA	NPLGL	CIR	LATA	LTD	AGE	BN
Mean	0.005	0.151	18.864	0.019	0.816	0.105	0.648	3.107	0.048
Median	0.012	0.127	19.031	0.012	0.766	0.095	0.662	2.944	0.020
Maximum	0.041	0.654	21.141	0.178	2.257	0.276	1.016	4.277	0.203
Minimum	-0.092	-0.036	15.804	-0.052	0.355	0.030	0.283	1.099	0.002
Std. Dev.	0.023	0.102	1.268	0.029	0.258	0.044	0.134	0.724	0.057
Observations	144	144	144	144	144	144	144	144	144

The descriptive statistics endorses the normal distribution of data without having any serious concern of outliers. The analysis is further proceeded though panel regression and choice of suitable model is based on likelihood ratio test. The results of test applied for selection of model are presented in Table 3.

Table 3. Results of Redundant Fixed Effects Tests

Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.77	(17,118)	0.721
Cross-section Chi-square	15.19	17	0.582

The insignificant value supports for suitability of common effect model for this data set. In order to examine the effect of crisis on profitability of banks, a dummy variable “GFC” is added in regression model. The dummy variable is assigned a value of ‘1’ for crisis period and ‘0’, otherwise. As described in earlier section, 2008-2009 is considered as the crisis period. The results of panel regression are in Table 4.

Table 4. Effect of Global Financial Crisis on Banking Profitability in Pakistan

Dependent Variable: ROA			
Intercept	0.014 (0.015)	CA	0.021*** (0.005)
LNTA	0.0020*** (0.0006)	NPLGL	-0.370*** (0.017)
CIR	-0.062*** (0.002)	LATA	0.023** (0.011)
LTD	0.005 (0.004)	AGE	0.002 (0.002)
BN	-0.050** (0.020)	GFC	-0.001 (0.001)
Adjusted R-squared	0.95	Durbin-Watson stat	1.95
*, **, *** indicates significance at 10%, 5% and 1% levels, respectively and the values in parenthesis			

The significant and positive effect of capital adequacy and size on banking profitability portrays the usefulness of capital and assets for banks. These are consistent with findings of Sufian and Habibullah (2010), Dietrich and Wanzenried (2011), Sufian and Noor (2012). The larger banks with prominent capital base are treated as safer ones by the depositors who are much concerned with safety of funds. It can also safeguard the banks from external shocks. The greater number of depositors in such banks can strengthen their survival by virtue of law of large numbers. The negative effect of non-performing loans and cost to income ratio on profitability of banks is consistent with the results reported by Dietrich and Wanzenried (2011), Nazir, Safdar, and Akram (2012), Petria, Capraru, and Ilnatov (2015). This indicates that higher bad debts and increased banking costs hinder their profitability. The liquidity is found to be positively affecting the profitability of banks which is in line with the findings of Ćurak, Poposki, and Pepur (2012), Nazir, Safdar, and Akram (2012).

The effect of loans to deposits ratio and age remained insignificant. The reason of former can be the switching options available with banks from lending to investment. Regarding age, the older banks can have an advantage of customers' confidence while of innovated features and products for younger banks. The negative effect of branch network can be attributed to higher operating costs of establishing and preserving branches in remote areas. The similar negative effect was earlier reported by Matthews, Murinde, and Zhao (2007). The main variable of interest in study is the crisis dummy "GFC", intended to capture the effect of global financial crisis on performance of commercial banks in Pakistan. The coefficient of this variable is found to be negative but insignificant. This indicates that banking sector of Pakistan survived from severe harmful effects of global financial crisis. The results are not much surprising as banking sector of many other developing countries also escaped from severe damages of the crisis. The nearly similar evidence for Turkey was found by Dincer, Gencer, Orhan, and Sahinbas (2011) who reported a minor impact of crisis on banking performance there. Similarly, Sangeetha (2012) reported an insignificant effect of crisis on performance of banking sector in Oman.

5. Summary and Conclusion

The global financial crisis originated from United States with failure of some renowned banks. It spread rapidly to global level due to integration and interlinkages of economies. As documented by Doovern and Roye (2014), almost all emerging and advanced world economies were affected by the harmful effects of crisis. In the words of Ioan and Maria (2009), this was similar to tsunami which affected almost every country of the world. The growth pace of many countries declined significantly in crisis period and afterwards. The stock markets became more volatile that has shaken the confidence of investors. The situation was so severe that it created doubts regarding economic stability of entire world (Spence, 2009). No world country has completely escaped from harmful effects of the crisis. The effect, however, differed across countries; depending upon their level of integration with global economies and internal mechanism. The harmful effects of crisis were also transmitted to Pakistan, though these external shocks were absorbed partially. The crisis affected both financial and real sectors. It is attempted in the study to examine the effect of crisis on financial sector of Pakistan. For this purpose, the efficiency and performance of banking sector around global financial crisis period is examined empirically.

The efficiency of individual banks over the study period is computed by applying data envelopment analysis. The comparison of efficiency scores indicates that efficiency of banking sector is not affected much by the crisis. A persistent increase in mean efficiency scores over the study period is found, though it declined slightly for few individual banks during crisis years. The results are further affirmed through performance analysis of sample banks in backdrop of crisis. The panel regression model is used for this purpose and effect of crisis is captured through insertion of dummy variable. The coefficient of this variable is found to be negative but insignificant indicating that crisis has not significantly affected banking performance in Pakistan. On the basis of overall results, it is concluded that banks in Pakistan have been largely survived from severe harmful effects of crisis because of their low level of integration with global banks and sound monetary policies. The study can be extended in future by including other non-bank financial institutions of the country to examine and document the overall effect of crisis on financial system of Pakistan.

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