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# The Worldwide Financial Crisis: An Analysis of Financial Performance from the Banking Sector of Pakistan

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**Abstract:** The global financial crisis (GFC) of 2007-2008, which started in the USA and quickly spread worldwide, caused major disruptions in many countries' economies. This study focuses on evaluating the financial performance of Pakistan's banking sector before and after the crisis, spanning from 2004 to 2013. Both Islamic banks (IBs) and conventional banks (CBs) were analyzed, looking at variables like return on assets, investments, solvency, liquidity, deposits, asset quality, advances, and total asset size. A stepwise panel regression model was used for the analysis. The results show that asset quality and advances had a positive effect on return on assets, while solvency, liquidity, investments, deposits, and total asset size had a negative impact. Comparisons between the pre-crisis (2004-2008) and post-crisis (2009-2013) periods suggest that the global financial crisis had an insignificant effect on the financial operations of Pakistan's banking sector.

## 1. Introduction:

The global financial crisis (GFC) began in the U.S. in late 2007, negatively impacting the financial and operational performance of banks worldwide. However, public interest in Islamic banks grew during this period because these institutions were less affected by the crisis. Over the past forty years, Islamic banks have expanded globally, including in both Muslim and non-Muslim countries. Bahrain played a key role in the growth of Islamic banking, launching its industry in 1979 (Hidayat & Abduh, 2012). The GFC, originating in the United States, had long-term effects on the global banking sector, reducing credit availability and increasing uncertainty about future economic gains (Mirzaei, 2013). Australia, in contrast, performed better than many other countries during the 2007-2009 crisis, implementing policies to support the economy and minimize the crisis's impact (Bollena et. al., 2014).

The global financial crisis also impacted Pakistan's financial institutions, particularly commercial banks, affecting their operational programs, financial structures, and market strategies. Similarly, Pakistan's overall economy felt the effects of the crisis. While the efficiency and effectiveness of conventional banks were significantly influenced, Islamic banks in Pakistan were less affected. This study aims to analyze the impact of the financial crisis on banking performance in Pakistan from 2004 to 2013, with the period from 2004-2008 considered as pre-crisis years and 2009-2013 as post-crisis years.

The global financial crisis (GFC), which began in the USA and spread worldwide, hurt the economies of many countries. Economists consider the 2007-2008 GFC one of the worst financial crises in history, severely affecting European and Western economies, as well as those in Asia and the Arab world. Throughout history, several financial crises have similarly shaken global economies. The stock market crash on 24 October 1929, known as Black Tuesday, devastated Western economies. Other significant crises include the 1994 Mexican peso crisis, the 1997 Asian financial crisis that started in Thailand, the 1998 Russian financial crisis (Russia Flu), the 2001 Turkish economic crisis, and the 2007-2008 GFC, all of which severely impacted the economies of numerous countries.

The global financial crisis occurred because banks created too much money too quickly and used it to speculate on assets, driving up housing prices. Banks generated money by issuing loans, and between 2000 and 2007, they doubled the amount of money and debt in the economy. A large portion of this money was directed outside the productive financial sector: 31% went into housing, around 20% into commercial real estate, 32% into the

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business sector, 8% into areas outside the business sector, and another 8% into personal loans and credit cards. Banks borrowed vast amounts to inflate housing prices through personal loans. As debt grew faster than incomes, many people became unable to repay their loans, pushing banks toward bankruptcy. This triggered the global financial crisis. In response, banks reduced borrowing, causing the economy to shrink.

The global financial crisis significantly impacted the economies of many countries and affected the performance of the banking sector. This study examines the financial performance of Pakistan's banking sector before and after the crisis, using variables such as return on assets (ROA), investment, liquidity, deposits, advances, size, and solvency. ROA, the dependent variable, is typically defined as total profit after tax divided by total assets, indicating a company's profitability relative to its assets. The independent variables (investment, liquidity, deposits, advances, size, and solvency) are used to assess banking performance. According to a study by Nazir & Safdar et. al. (2012), the capital ratio, cash and cash equivalents to total assets, advances to total assets, total assets, and investments to total assets positively affect ROA, while the deposit to total assets ratio and provisions against non-performing loans (NPL) negatively affect it. The results showed that poor asset quality and deposits negatively impact financial performance, whereas investment, liquidity, size, solvency, and advances have a positive effect. Additionally, the comparison of pre- and post-crisis periods suggests that the global financial crisis had a significant impact on the financial performance of Pakistan's banking sector.

## 2. Literature Review

Nazir et. al. (2012) examined the financial performance of commercial banks in Pakistan during the global financial crisis. Their findings revealed that poor asset quality had a negative effect on financial performance, while solvency, size, liquidity, and investment positively influenced the performance of these banks. Similarly, Hidayat and Abduh (2012) assessed the financial performance of Islamic banks in Bahrain during the global financial crisis by analyzing both internal and external factors. The study showed that Islamic banks outperformed during the crisis. However, there were two limitations: the sample was limited to Bahrain, and conventional banks were not included. The authors recommended that future research should explore Islamic banking in other countries and include conventional banks for comparison.

Mirzaei (2013) examined bank performance during the 2007-2010 financial crisis and found that the crisis had a negative impact on bank performance. However, efficient banks performed better during this period. The study also revealed that market concentration negatively affected profitability and stability, while market efficiency had a positive impact on both profitability and stability during the crisis. In a study by Dalaien (2016), which analyzed seven banks in India and seven in Jordan from 2002 to 2014 using descriptive and analytical techniques, the results showed that the global financial crisis had a negative impact on Jordanian banks, with an increased deposit-lending ratio, higher interest rates, and a drop in stock prices. Conversely, Indian banks saw a positive effect, as share prices increased after the crisis. For future research, the study suggests applying different independent variables to analyze their impact on bank performance and comparing the performance of Indian and Jordanian banks with those in other countries.

Claessens and Horen (2014) evaluated the impact of the global financial crisis on banking globalization using a cross-sectional regression model and bank ownership data. This data included information from current and past commercial, cooperative, and savings banks that reported financial statements to BankScope. The findings indicated that banking performance was severely affected by the global financial crisis. Similarly, Ashamu and Abiola (2012) analyzed the crisis's impact on Nigeria's banking sector, showing that the crisis reduced the quality of credit extended by banks and negatively affected the broader Nigerian economy. Sufian and Habibullah (2010) studied the effects of the financial crisis on bank profitability in Indonesia from 1990 to 2005, using a linear regression model. Their results indicated that the crisis negatively impacted bank profitability in Indonesia, although Indonesian banks were more profitable during the pre-crisis and crisis periods.

Gerrath and Leenders (2013) highlighted that branding and entry strategies can help banks survive challenging situations. Using descriptive statistical techniques, the study found that international brand strategies play a crucial role in strengthening the relationship between a bank and its country-of-origin image. To minimize the crisis's impact, restructuring programs were implemented in the banking sector to reduce costs, lower risks, and address weaknesses. Similarly, Gunay (2012) used Data Envelopment Analysis (DEA) to measure bank efficiency, and the results indicated that bank efficiency improved following the financial crisis.

Maredza and Ikhide (2013) examined the impact of the global financial crisis on the efficiency and productivity of South Africa's banking system from 2000 to 2010. The study employed a two-stage methodology, using total factor productivity in the first stage and the Tobit model in the second. The findings revealed that the financial crisis negatively impacted South Africa's banking system, leading to reduced efficiency and productivity.

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Similarly, Anichshenko (2009) analyzed the effects of the 2007 financial crisis on Kazakhstan's banking system. The results showed that the crisis had a negative impact on Kazakhstan's economy, which in turn affected the country's banking sector.

Almanaseer (2014) studied 24 Islamic banks operating in Saudi Arabia, Qatar, Bahrain, and the UAE from 2005 to 2010, using a linear regression technique for data analysis. The empirical results showed that the financial crisis did not impact the profitability of Islamic banks. In fact, the study found that the profitability of these banks increased due to growth in total assets and liquidity. Similarly, Abdulle and Kassim (2012) analyzed the performance of six Islamic banks and nine conventional banks from 2006 to 2010, using ratio analysis. Their findings revealed that Islamic banks performed better than conventional banks during the global financial crisis.

Cernohorskaa (2010) compared the banking sectors of the Czech Republic and Great Britain, using correlation analysis to assess their stability. The study examined financial indicators such as profit after tax, return on assets, net interest margin, the ratio of bank capital to assets, and return on equity, all of which impacted banking sector stability. The findings indicated that the Czech banking sector outperformed Great Britain's during the financial crisis.

Ahid and Augustine (2012) assessed the impact of the financial crisis on the Jordanian economy using a nonparametric approach to evaluate banking efficiency. Their study revealed that the banking and tourism sectors were not significantly affected during the 2008-2011 period. Similarly, Popovici (2014) analyzed the effect of the financial crisis on banking efficiency in Romania from 2003 to 2012. The study found that Romanian banks performed better before the crisis (2003-2008), but their efficiency declined during the crisis period (2009-2012).

Grove et. al. (2011) explored how corporate governance factors influenced the performance of commercial banks after the financial crisis, focusing on the 2006-2008 period. The study showed that financial performance was stronger than loan quality and found a negative relationship between leverage and both loan quality and financial performance.

## 3. Methodology

The data is collected from financial statement analysis provided on bank websites, and Pakistan Stock Exchange. The economic data is collected from the Statistical Bureau of Pakistan and the Pakistan economic survey for the period of 2003-2013. The population consists of the banking sector, including 34 scheduled banks in Pakistan. The sample consists of 14 scheduled banks. In which 7 are Islamic banks and 7 are conventional banks. The sample period consists of 2004-2013.

Based on the panel regression model to analyze the impact of the global financial crisis on bank performance as follows:

$$ROA=\alpha+\beta_1\ Dpst+\beta_2\ Adv+\beta_3\ Liq+\beta_4\ Inv+\beta_5\ AQ+\beta_6\ S+\beta_7\ Sol+\epsilon \ldots\ldots\ldots\ldots \text{Equ. 1}$$

In this equation, Return on Assets (ROA) serves as the dependent variable, calculated by dividing total profit after tax by total assets, reflecting how efficiently the bank generates profit from its assets. The independent variables include Dpst, which is the deposit to total assets ratio, highlighting the bank's reliance on deposits for its asset base, and Adv, representing the advances or loans portion of the bank's assets. Liquidity (Liq), measured as cash and cash equivalents to total assets, indicates the bank's ability to meet short-term financial obligations.

The investment to total assets ratio (Inv) reflects the extent to which a bank's assets are invested, while asset quality (AQ), calculated by the ratio of provisions against non-performing loans (NPLs) to gross advances, measures the quality of the bank's loans. An increase in NPLs suggests inefficiency, leading to a decline in productivity and performance, and thus, the sign of AQ is expected to be negative. Size (S), defined by total assets, evaluates how the bank's scale impacts its efficiency. A bank can be either too large or too small relative to its optimal size, meaning the sign of the size coefficient could be either positive or negative. Solvency (Sol), calculated by the capital ratio (total equity to total assets), assesses the bank's ability to meet long-term financial obligations. Overall, highly profitable banks are generally more efficient, so the sign of the net profit (NETP) coefficient is expected to be positive (Maredza & Ikhide, 2013).

## 4. Results

The panel regression model is used for the analysis of the data and highlights the financial performance of the banking sector in post and pre-crisis years over the period 2004-2013.

### 4.1 Correlation

Correlation shows the association or strength of the relationship between two or more variables. Correlation shows that the relationship between the variables is strong, weak, or moderate.

**Table 1:** Correlation Matrix of selected varaibles

| Variables | Roa | Size | Sol | Liq | Inv | Dpst | Aq | Adv |
|---|---|---|---|---|---|---|---|---|
| **Size** | 0.148 | 1 | | | | | | |
| **Sol** | -0.325 | -0.332 | 1 | | | | | |
| **Liq** | -0.298 | -0.326 | -0.021 | 1 | | | | |
| **Inv** | -0.227 | -0.054 | 0.016 | 0.301 | 1 | | | |
| **Dpst** | -0.583 | -0.192 | 0.090 | 0.667 | 0.728 | 1 | | |
| **Aq** | -0.466 | -0.193 | 0.088 | 0.086 | 0.078 | 0.251 | 1 | |
| **Adv** | -0.637 | -0.218 | 0.130 | 0.632 | 0.510 | 0.937 | 0.318 | 1 |
| **Mean** | 0.114 | 10.227 | 0.887 | 1.624 | 4.062 | 11.363 | 0.006 | 6.959 |
| **Median** | 0.167 | 10.000 | 0.893 | 1.377 | 3.696 | 10.138 | 0.007 | 6.137 |
| **Maximum** | 0.580 | 11.000 | 1.351 | 4.728 | 15.375 | 56.748 | 0.143 | 35.193 |
| **Minimum** | -2.687 | 9.000 | 0.477 | 0.552 | 0.246 | 0.888 | -0.118 | 0.479 |
| **Std. Dev.** | 0.317 | 0.526 | 0.115 | 0.850 | 2.554 | 6.802 | 0.027 | 4.449 |

The correlation matrix shows there is no issue of multi-collinearity between the dependent variable return on assets and independent variable investment, liquidity, solvency, size, deposit, and advances as shown in Table 1.

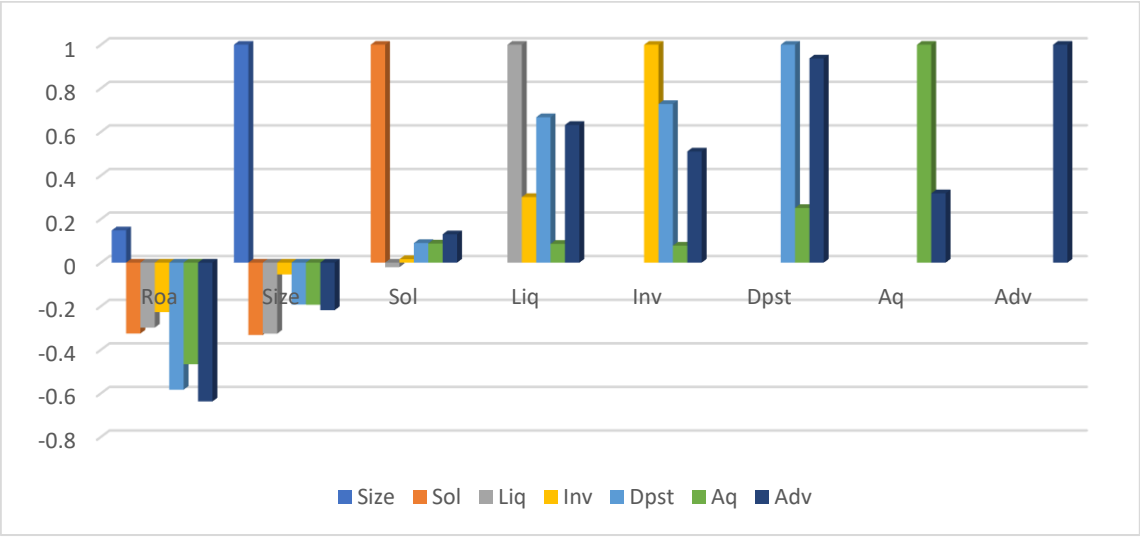


**Figure 1**: Correlation analysis of the selected variables

### 4.2 Descriptive Statistics

Statistics is defined as the collection, organization, and interpretation of data. There are two types of statistics. The first one is descriptive statistics. The second one is inferential statistics. Descriptive statistics is defined as the value that describes the characteristics of a sample or population. Inferential statistic describes those values that infer results of a sample to the population from which the sample is drawn.

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**Table 2:** Descriptive Statistics of the selected variables for the study

| | ROA | SIZE | SOL | LIQ | INV | DPST | AQ | ADV |
|---|---|---|---|---|---|---|---|---|
| **Mean** | 0.11 | 10.23 | 0.89 | 1.62 | 4.06 | 11.36 | 0.01 | 6.96 |
| **Median** | 0.17 | 10.00 | 0.89 | 1.38 | 3.70 | 10.14 | 0.01 | 6.14 |
| **Maximum** | 0.58 | 11.00 | 1.35 | 4.73 | 15.38 | 56.75 | 0.14 | 35.19 |
| **Minimum** | -2.69 | 9.00 | 0.48 | 0.55 | 0.25 | 0.89 | -0.12 | 0.48 |
| **Std. Dev.** | 0.32 | 0.53 | 0.12 | 0.85 | 2.55 | 6.80 | 0.03 | 4.45 |

The table presents the summary statistics of the variables used in the panel regression analysis. The descriptive statistic includes mean, median, maximum, minimum, and standard deviation. In return over assets, the mean value is .114, the median value is .167, the maximum value is .579, and the standard deviation value is .316. In size, mean value is 10.22, the median value is 10.00, the maximum value is 11.000, and the standard deviation value is .526. In solvency, the mean value is .886, the median value is .893, the maximum value is 1.350, and the standard deviation value is .115. In liquidity, the mean value is 1.624, the median value is 1.37, the maximum value is 4.72, and the standard deviation value is 0.849. In investment, the mean value is 4.06, the median value is 3.69, the maximum value is 15.3, and the standard deviation value is 2.55. In deposit, the mean value is 11.3, the median value is 10.1, the maximum value is 56.7, and the standard deviation value is 6.80. In advance, the mean value is 6.95, the median value is 6.13, the maximum value is 35.1, and the standard deviation value is 4.44.

### 4.3 Base Line Model

The stepwise panel regression model is used to determine the influence of independent variables on the dependent variables to analyze the performance of the banking sector before and after the global financial crisis over the period 2004-2013. The stepwise technique of the panel regression model used in this study provided us with three-panel regression methods with a number of independent variables. The following tables show the result of pre and post-crisis periods using three-panel regression methods such as the common effect method, the fixed effects method, and the random effect model.

### 4.4 Result of Pre-Crisis Period

**Table 3:** Results of the selected variables Pre-Crisis Period

| Regressors | CEM | | FEM | | REM | |
|---|---|---|---|---|---|---|
| | Coefficients | P Value | Coefficients | P Value | Coefficients | P Value |
| **Coefficients** | 0.739 | 0.266 | 1.372 | 0.047 | 0.830 | 0.148 |
| **Size** | -0.022 | 0.683 | -0.051 | 0.426 | -0.012 | 0.815 |
| **Solvency** | -0.300 | 0.165 | -0.331 | 0.210 | -0.411 | 0.037 |
| **Liquidity** | 0.054 | 0.276 | 0.024 | 0.697 | 0.038 | 0.418 |
| **Investment** | 0.133 | 0.000 | 0.031 | 0.479 | 0.106 | 0.003 |
| **Deposit** | -0.043 | 0.114 | -0.007 | 0.807 | -0.036 | 0.128 |
| **Asset quality** | -7.290 | 0.000 | -4.672 | 0.002 | -6.172 | 0.000 |
| **Advances** | -0.008 | 0.760 | -0.059 | 0.038 | -0.022 | 0.348 |
| **Model Sig** | | | | | 0.000 | |
| **Adjusted $R^2$** | | | | | 0.1748 | |
| **Hausman Test** | 0.01624 | | | | | |
| **Wald Stat** | | | 0.0005 | | | |
| ***m2*** | | | | | 0.6421 | |
| **Sargan Test** | | | | | 0.2142 | |

*p < 0.05; **p < 0.01; ***p < 0.001

Table 3 and Figure 2 shows the results using three models: Common Effects Model (CEM), Fixed Effects Model (FEM), and Random Effects Model (REM). For each model, coefficients and p-values are provided for various independent variables such as Size, Solvency, Liquidity, Investment, Deposit, Asset Quality, and Advances. In CEM, the coefficient for Asset Quality is highly significant (-7.290, p = 0.000), indicating a strong negative relationship with the dependent variable. The Investment variable also shows significance (0.133, p = 0.000), positively impacting the outcome. However, other variables like Size and Solvency are not statistically significant in CEM.

In FEM, Asset Quality remains significantly negative (-4.672, p = 0.002), while Advances also show a statistically significant negative effect (-0.059, p = 0.038). Investment, while positive (0.031), is not significant in this model (p = 0.479). REM results are similar to CEM, with Asset Quality (-6.172, p = 0.000) and Investment (0.106, p = 0.003) remaining significant. Solvency also becomes significant in REM (-0.411, p = 0.037), showing a negative impact.

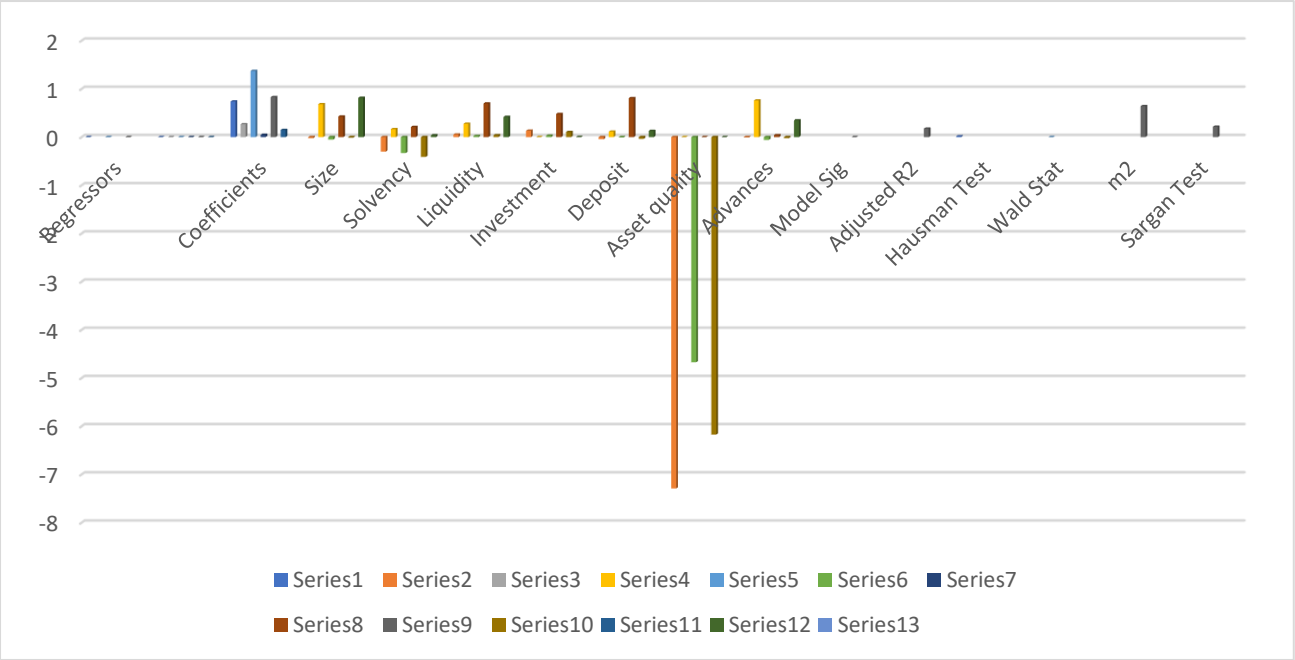


**Fig. 2:** Pre-Crisis Period

The Hausman Test result (p = 0.01624) suggests that the Fixed Effects Model (FEM) is more appropriate than the Random Effects Model (REM) for this data. The overall model significance is high (p = 0.000), and the Adjusted $R^2$ value of 0.1748 indicates that around 17% of the variation in the dependent variable is explained by the independent variables. Other diagnostics like the Wald Stat (p = 0.0005) and the Sargan Test (p = 0.2142) provide further insights into model validity and the absence of over-identifying restrictions, respectively.

**Table 4:** Results of Post-Crisis Period

| **Regressors** | **CEM** | | **FEM** | | **REM** | |
|---|---|---|---|---|---|---|
| | **Coefficients** | **P Value** | **Coefficients** | **P Value** | **Coefficients** | **P Value** |
| **Coefficients** | 1.783 | 0.137 | 1.507 | 0.198 | 2.319 | 0.022 |
| **Size** | -0.061 | 0.426 | -0.039 | 0.696 | -0.111 | 0.102 |
| **Solvency** | -0.920 | 0.055 | -0.666 | 0.242 | -0.873 | 0.042 |
| **Liquidity** | 0.038 | 0.038 | -0.009 | 0.698 | 0.022 | 0.193 |
| **Investment** | 0.023 | 0.630 | -0.003 | 0.953 | 0.020 | 0.664 |
| **Deposit** | -0.011 | 0.644 | -0.009 | 0.718 | -0.009 | 0.661 |
| **Asset quality** | -1.733 | 0.031 | -9.270 | 0.000 | -4.041 | 0.000 |
| **Advances** | -0.052 | 0.086 | -0.036 | 0.267 | -0.049 | 0.067 |

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|---|---|---|---|
| **Model Sig** | | | 0 |
| **Adjusted R2** | | | 0.5142 |
| **Hausman Test** | 0.01571 | | |
| **Wald Stat** | | 0.0001 | |
| **m2** | | | 0.6482 |
| **Sargan Test** | | | 0.2417 |

*p < 0.05; **p < 0.01; ***p < 0.001

The global financial crisis, which originated in the USA and spread worldwide, had a negative impact on the economies of many countries. Western and European developed economies were severely affected during this period. The crisis also hit the economies of developing regions, including Asia and Arab countries. This study aims to analyze the financial performance of Pakistan's banking sector, covering both Islamic and conventional banks over the period from 2004 to 2013, using panel regression analysis.

The stepwise panel regression analysis revealed that provisions against non-performing loans to total assets and advances to total assets had a positive effect on return on assets (ROA), whereas capital ratio, investment to total assets, cash and cash equivalents to total assets, deposits to total assets, and size to total assets negatively impacted ROA. This indicates that while non-performing loans and deposits positively influenced financial performance, size, solvency, investment, liquidity, and advances had a negative impact.

A comparative regression analysis of the independent variables between the pre-crisis years (2004-2008) and post-crisis years (2009-2013) shows that the global financial crisis had an insignificant impact on the financial performance of Pakistan's banking sector. The results highlight that non-performing loans improved financial performance more during the post-crisis years compared to the pre-crisis period. In contrast, the size of total assets had an insignificant effect on financial performance. Additionally, deposits to total assets enhanced financial performance in the pre-crisis years but had a declining effect in the post-crisis period, negatively contributing during the latter years. Investment positively contributed to financial performance before the crisis but had a negative impact afterward. Similarly, liquidity was a positive contributor pre-crisis but turned negative post-crisis.

## 5. Conclusions

This study analyzed the financial performance of Pakistan's banking sector, comparing Islamic and conventional banks before and after the global financial crisis (2004–2013). The findings reveal that the crisis had an overall insignificant impact on the financial operations of the sector. Asset quality and advances positively influenced return on assets (ROA), while solvency, liquidity, investments, deposits, and size exhibited a negative effect. Notably, Islamic banks demonstrated greater resilience during the crisis, underscoring their stability in adverse economic conditions. The results suggest that while Pakistan's banking sector weathered the global financial crisis relatively well, its financial performance was influenced more by intrinsic operational factors than external economic shocks. Future studies could further investigate specific strategies employed by Islamic banks that contributed to their resilience, offering insights for enhancing the stability of conventional banking institutions under similar circumstances.

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