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Bank-related, Industry-related and Macroeconomic Factors Affecting Bank Profitability: A Case of the United Kingdom

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Abstract
This paper investigates the impact of bank-specific, industry-specific, and macroeconomic variables on bank profitability before, during, and after the financial crisis of 2008. For this purpose, 73 UK commercial banks are selected on the basis of availability of required information. The empirical data for these banks are collected for the period from 2006 to 2012 from Bankscope and Data-stream databases. The regression and correlation analyses are performed on the data and concluded that bank size, capital ratio, loan, deposits, liquidity, and interest rate have positive impact on ROA and ROE while GDP and inflation rate have negative impact. The findings of this study can help UK banks, government, investors, policymakers, and shareholders for decision making and improving the performance of financial institutions in the future.
Keywords: Profitability indicators, bank profitability, UK banking sector

1. Introduction

The banking system of the United Kingdom (UK) has grown extensively since 1990 and expanded quickly till the emergence of financial crisis 2008. The banking industry in the UK is composed of both national and multinational banks. The combined total assets of the industry in 1990 were accounted for nearly £1,266 billion which expanded three times and reached £4234 billion in 2003 (Kosmidou, 2007). Currently, the UK banking assets stand nearly £8 trillion (Persson and Ruparel, 2012).

The researcher is convinced that new changes in the UK banking industry and emergence of new players increased the profitability of the sector (Tanna *et al.* 2005). But on the contrary, these additions and alterations in the existing system also brought several challenges for the banking industry and consequently its performance is affected. Several studies have been conducted in other regions which explore the performance indicators of banks and determinants of bank's profitability. Others conducted in the European region where profitability and performance determinants of the European banking industry are addressed. The work of Hassan and Bashir (2003) is prominent in terms of investigating the determinants of Islamic banking industries of 21 countries. Some comparative studies contribute significantly to the literature. In this regard, Bourke (1989) from Europe, America, and Australian perspective and by Lee *et al.* (2013) from Asian perspective are prominent. Most of the above stated studies reached the conclusion that internal factors (e.g. bank and industry related) can largely affect the profitability of the banks and external factors (e.g. macroeconomic related) can greatly influence the performance of the entire banking sector.

The banking sector in the United Kingdom contributes greatly to the economy by providing 1.6 per cent jobs in the banking sector and over 40 per cent jobs in the entire financial sector (Burgess, 2011). Also, the banking industry contributes nearly 3.7 per cent in the Gross Domestic Product (GDP) which is in excess of 50 percent of that produced by the financial market as a whole (Burgess, 2011). Therefore, it is inherent to investigate the factors that directly and/or indirectly affect the profitability of the UK banks. In this regard, this research intends to examine the possible determinants of bank profitability in the United Kingdom with a particular focus on the period before, during, and after the financial crisis of 2008.

2. Literature review

ROA and ROE are most commonly used ratios for measuring profitability in any organisation including banks and other financial institutions. ROA indicates the profit generated per pound of assets and decides how bank used investment resources over the year to generate profit (Sheeba, 2011). In addition, it also shows how a bank effectively utilises its managerial efficiency to transform assets into earnings. The higher ROA ratio points out higher performance whereas the lower ROA figure indicates inadequate managerial efficiency of the banks. Different banks in the banking industry are also compared with each other on the basis of ROA. ROE is measured as dividing the net income over shareholder's equity. Like ROA, ROE also indicates how well a bank uses its managerial efficiency and investment funds to achieve higher profitability level. ROE figure between 15 and 20 percent is a good indication for the banks (Sheeba, 2011).

The study of Bourke (1989) shows a positive and statistically significant correlation between bank size and profitability. Taking this into consideration, many other researchers (e.g. Pasiouras and Kosmidou, 2007; Athanasoglou *et al* 2008) consider both the impact of bank size and capital ratio of profitability, and confirm

their positive relationship with each other. The summary of their findings reveals that an increase in size often causes to amplify the profitability level. However, some researchers believe that banks can save costs by increasing their size but on the other hand they may face scale inefficiencies (Berger and Humphrey, 1991). Some researchers like Dietrich and Wanzenried (2011) found a negative correlation between profitability and bank size. They found that the core reason of negative relationship is that large banks faced considerable losses due to several irrecoverable loans.

Sufian and Chong (2008) believe that the capital structures of banks operating in developing countries must be very strong because the economy expects a considerable support of the banking sector during crises and macroeconomic disturbance. The point of view of Berger and Humphrey (1991) about maintaining capital structure is also similar. They assert that banks with low capital structures put themselves into a dangerous situation and this also affects their profitability level. On the other hand, Molyneux and Thornton (1992) argue that a particular amount of equity allows banks to minimise their cost of capital which may have a positive effect on bank's profitability. Several past studies indicate the fact that many banks become insolvent due to the credit loss and this is why it is essential for the banks to maintain a higher level of capital structure to bear losses during difficult times.

The empirical facts of Sufian and Chong (2008) demonstrate a statistically significant relationship between total loans and an amount of loan loss provision which signifies a credit risk level. The results also confirm that a high credit risk shows a sign of the low profitability level. Similarly, the study of Sastrosuwito and Suzuki (2012) also reveals a negative relationship between bank's profitability and loan loss provisions. They further explain that a high Loan-to-Total Assets ratio tends to decrease the profitability of a bank. In addition, a tight rivalry in the financial markets generates additional problems for banks to lend loans at higher interest rates. Some parallel studies (e.g. Hassan and Bashir, 2003) on the determinants of profitability also support above findings. The measurement of loan quality of the bank is a contradictory issue. Rasiah (2010) believes that the quality of loans in any bank can be measured through non-performing loans. However, Sastrosuwito and Suzuki (2012) recommend the use of loan-loss provision to total loans ratio to measure loan quality.

Banks rely greatly on customer deposits to give away credits to other customers. It is well-known that money gathered through public deposits is the cheapest source of funding for the banks and therefore, customer deposits are positively correlated with bank profitability. Thus, more deposit a bank will get, it will be able to provide more loan opportunities to customers and generate further profits (Lee and Hsieh, 2013). But on the other hand, bank's inability of not releasing money through loans may decrease its profitability level because then bank has to pay interest to depositors on their fixed, time, or term deposits. The researchers also found a strong association among deposits, total assets, total liabilities, and ROA.

The liquidity in banks serves as an imperative internal determinant of bank's profitability. Today, banks are required to maintain a certain level of liquidity to build up an adequate level of cash. Furthermore, the banks only consider high liquidity if they have enough cash or other liquid assets in possession. It does not mean that banks need to uphold huge cash and idle funds in order to become profitable. Rather it means that banks need to create a balance between cash reserves and lending credits to borrowers because lending loan helps them to become profitable (Berríos, 2013). According to Vieira (2010), the relationship between ROA and liquidity is positive but weak in the short run.

In a study, Tanna *et al.* (2008) found an association between ROA and macroeconomic variables. They found a significant and positive relationship between bank profitability and GDP. The study of Sufian and Chong (2008) also states similar results. Other studies that found a strong and positive relationship between GDP and profitability include: Hassan and Bashir (2003), Tanna *et al.* (2005), Kosmidou *et al.* (2006) and Pasiouras and Kosmidou (2007). All these studies are conducted on internal and external determinants of profitability and provide consistent results in terms of economic growth and its impact on profitability in the banking sector. On the contrary, the study of Khrawish (2011) on Jordanian banking sector does not support the results of previous studies. According to the researcher, ROA and GDP have negative correlation with each other. Similarly, the study conducted by Sastrosuwito and Suzuki (2012) on the Indonesian banking industry also points out an insignificant correlation between the profitability of banks and annual growth rate.

The results of empirical studies reveal a positive and statistically significant correlation between interest rate and bank profitability. For example, the investigation of Aburime (2009) on the influence of macroeconomic variables in the banking sector in Nigeria reveals a significant impact of interest rate on bank profitability. The results of correlation coefficient also demonstrate a positive correlation between the two factors. Some other parallel studies showing a positive relationship include Pasiouras and Kosmidou (2007) and Sufian *et al.* (2008).

The study of Molyneux and Thornton (1992) demonstrates a positive and statistically significant correlation among interest rate, inflation rate, and bank profitability. However, Bourke's (1989) study indicates a negative relationship between inflation and bank profitability. According to Bourke (1989), the inverse relationship between inflation and profitability largely based on the capability of bank to predict inflation occurrence. If the

banks are successful in anticipating the rate of inflation and its occurrence, this means that they can devise proper strategies of dealing with this situation.

3. Research Methodology

3.1 Research Design

The nature of this research is discrete and flexible in addressing the research aim which is to examine the possible bank-related, industry-related and macroeconomic variables affecting bank profitability in the United Kingdom with a particular focus on the period before, during, and after the financial crisis of 2008. The researcher has chosen a descriptive research design to more openly achieve the research objectives which are difficult to address in exploratory research design (Creswell, 2003). In addition, this study is mainly based quantitative or empirical data and therefore detailed analyses are required which are easily achievable in descriptive design.

3.2 Population

The population of this study is the UK commercial banks. Currently 137 commercial banks are running their operations in the UK. However, 73 banks are selected on the basis of full availability of required variables. The data of other banks is not considered to avoid its possible impact on research findings and conclusions. The commercial banks are only considered to avoid the dissimilarity of the banking operations of the other banks, focusing on bank-specific, industry-specific, and macroeconomic- related variables.

3.3 Data Collection

The public opinion is essential in most of the researches but it is not relevant in this study due to the nature of the research aim. This is the reason that primary data using a survey or questionnaire is not considered in this study. Also it is not possible to collect primary data about bank, industry, and macroeconomic related variables of all the commercial banks for seven consecutive years. Additionally, the care is taken not to use old or obsolete literature sources, and for this purpose latest research articles, books, and other information sources are considered to extract meaningful data by following a digital 'snowballing' approach (Bryman, 2008). During digital snowballing, the researcher extended the search throughout different databases and libraries such as Science Direct, Emerald, and Taylor and Francis. The research articles and data are selected using the criteria of the latest research articles with related citation features.

3.4 Variables

The readily available empirical data about specific profitability determinants are acquired from Bankscope and Datastream databases. The data are collected for the period from 2006 to 2012 to cover the period before, during, and after the financial crises. This quantitative information is based on various independent and dependent factors which indicate bank, industry, and macroeconomic determinants of profitability in the UK banking sector. The bank-related variables include Return on Assets (ROA) and Return on Equity (ROE) whereas capital ratio, bank size, loan size, deposits, and liquidity are considered as industry-based variables. GDP, inflation rate, and interest rate are taken as macro-economic variables. The definitions, formulas, and sources of these variables are described below while their theoretical reasons and relationships are explained in the literature review section.

ROA	ROA is a profitability measure which is often calculated by dividing net income over total assets.
ROE	ROE is also a profitability measure which is calculated by dividing net income over shareholder's equity.
Bank size	Bank size is usually measured either through total assets or total deposits. In this paper, bank size is determined on the basis of total assets of the UK banks. It usually has a positive impact on profitability.
Capital	The capital shows the money invested in the bank. It is calculated as a ratio of total equity in the bank divided by total assets. The expected impact of capital is positive.
Loan	Loan is one of the sources of income generated by the banks. Loan can have either positive or negative impact depending upon the interest rate and liquidity. It can be expressed as dividing total loans over total assets.
Deposits	Deposit represents customer deposits and can be computed as dividing total customer deposits by total assets of the banks. It is another source of income and thus has a positive impact on bank profitability.
Liquidity	Liquidity represents the degree to which bank assets or securities can be purchased or sold in the market without influencing the price of the asset. Liquidity can affect the profitability in both ways. It has a positive impact if the bank is successful in holding liquidity or otherwise it has a negative impact on profitability.
GDP	GDP is the Gross Domestic Product which represents the economic growth of any

country. The upward or downward impact of national GDP has a positive or negative impact on bank profitability.

Interest rate — The Interest rate represents the percentage charged by the banks from customers for providing services or products. This is another source of income of banks and therefore it has a positive relationship with bank profitability.

Inflation rate — The inflation rate means the rate of changes in the price of any commodity. Inflation has an inverse relationship to profitability because an increase in inflation means lowering the profitability of banks due to higher prices.

Table 1: Extracted variables and measures

Extracted variables: net income, total assets, total deposits, total equity, shareholder's equity					
Dependent variables		**Measure**	**Formula**	**Expected impact**	**Source**
		ROA	= Net income / Total assets		Bank scope
		ROE	= Net income / shareholder equity		Bank scope
Independent variables	Bank & industry	Capital ratio	= Total equity / Total assets	+	Bank scope
		Bank size	= Total assets	+	Bank scope
		Loan size	= Total loans / Total assets	+/-	Bank scope
		Deposits	= Total deposits / Total assets	+	Bank scope
		Liquidity	= Net loans / Total assets	+/-	Bank scope
	Macroeconomics	GDP	= GDP of United Kingdom	+/-	Data stream
		Inflation rate	= UK Inflation Rate	-	Data stream
		Interest rate	= UK Interest Rate	+	Data stream

3.5 Econometric Methodology

The fixed effect model is used in this study for econometric-based regression analyses. The reason of taking into account fixed effect model is its assumption of 'known and fixed' independent factors that are observed without error. It is contrasted to the random effect model which assumes that all variables may be known or unknown (Grafarend, 2006). According to Alison (2005), most of the researchers choose a fixed effect model while performing regression analysis and Analysis of Variance (ANOVA) where independent variables are fixed and ratios are used. Also, the former studies conducted by several researchers on profitability determinants considered a fixed effect model for regression analyses.

In order to confirm the choice of fixed effect model, the researcher performed the Hausman test on the model. The Hausman test is normally used to find the difference between fixed and random effect models in panel data. The formula for performing the Hausman test is as follows.

$$H = (b_1 - b_0)`\Big(Var(b_0) - Var(b_1)\Big)^{\dagger}(b_1 - b_0) \quad (1)$$

In equation 1, b_1 indicates random effect estimator which should be consistent and efficient in case if the null hypothesis is true. On the other hand, b_0 shows the consistency of fixed effect in case of alternative hypotheses. Moreover † symbol shows the inverse matrix. This statistic has asymptotically chi-squared distribution with the number of degrees of freedom equal to the rank of matrix Var (b_0) – Var(b_1). Grafarend (2006) states that if the outcome of dimension 'b' which is calculated through chi-square is large then fixed effect is recommended otherwise the random effect model is preferred. The results of the chi-square test show larger values in table 2 which indicates the suitability of fixed effect model in this research.

Table 2. Hausman's test through chi-square

Variables	**ROA**			**ROE**		
	Chi-square value	Asymptotic Significance	Likelihood ratio	Chi-square value	Asymptotic Significance	Likelihood ratio
Bank size	4672	.251	603.18	5256	.239	626.41
Capital	4672	.251	603.18	5256	.239	626.41
Loan	4672	.251	603.18	5256	.239	626.41
Deposit	4599	.280	600.41	5183	.240	623.63
Liquidity	4672	.251	603.18	5256	.239	626.41
GDP	386.9	.449	263.49	438	.411	283.94
Inflation	261.18	.399	200.34	292	.423	218.02
Interest	386.9	.449	263.49	438	.411	283.94

3.6 The model

The linear regression analysis is performed using a linear model involving two kinds of variables: dependent and independent. The regression model used in this study is as follows where 'Y' represents the dependent variable which is bank profitability and 'X' indicates independent variables which are internal and external factors affecting the profitability of UK commercial banks.

$$Y = c + f(X) \tag{2}$$

Based on the above equation, the following linear regression model can be expressed.

$$\prod it = c + \sum_{b=1}^{B} \beta_j X_{it}^{b} + \sum_{m=1}^{M} \beta_m X_{it}^{m} + \varepsilon_{it} \tag{3}$$

In equation 3, $\prod it$ shows bank profitability such as ROA and ROE with i=1,…N, and t=1,…,T; 'c' shows the constant value and X_{it} are different explanatory variables including bank size (BS), capital (CA), loan (LN), deposit (DP), liquidity (LQ), GDP, inflation (INF), and interest rate (INT). X_{it} demonstrates the independent variables which are categorised into two ways. For example, X_{it}^{b} shows bank and industry specific variables and X_{it}^{m} denotes macroeconomic variables. Finally, ε_{it} shows the disturbance level.

3.7 Correlation

The relationships between profitability indicators and internal and external profitability determinants found through correlation analysis. The correlation analysis is performed using Karl Pearson's correlation coefficient formula as follows.

$$r = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sqrt{\sum (x-\bar{x})^2 - \sum (y-\bar{y})^2}} \tag{4}$$

The result of 'r' should be between -1 and +1. The outcome of the formula shows the strength of the relationship between two variables. For example, the result near -1 points out a negative relationship and close to +1 shows strong relationship. The result equal to 0 demonstrates no relationship between factors or variables.

4. Results and discussion

4.1 Regression analysis

The regression model takes into account ROA and ROE as the two dependent profitability indicators which depend upon eight internal and external independent variables. By applying a regression model in equation 3, the following equations are derived and applied to this study.

$$\text{ROA} = c + f(\text{BS, CA, LN, DP, LQ, GDP, INF, INT}) \tag{3a}$$

$$\text{ROE} = c + f(\text{BS, CA, LN, DP, LQ, GDP, INF, INT}) \tag{3b}$$

Table 3 shows the independent predictors entered into both models to perform regression analysis.

Table 3 Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
3a & 3b	Inflation, Capital, GDP, Liquidity, Bank Size, Deposits, Interest, Loan [a]	.	Enter

a. All requested variables entered

Table 4 gives the summary of the regression models. It demonstrates the variability percentage among all predictor variables. The R square shows an association between dependent and independent variables (Archdeacon, 1994). The 'R' is the square root of R square and indicates how internal and external influencing factors are related to the bank profitability indicators. In addition, the adjusted R-square refers to the rigorousness of additional predicting variables with statistical shrinkage. In simple words, the adjusted R-square is the proportion of independent and dependent variables and may support the decision maker in choosing the appropriate model (Archdeacon, 1994).

Table 4 Summary of the models

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
3a	.524a	.275	.184	3.970
3b	.383a	.148	.042	16.711

a. Predictors: (Constant), Inflation, Capital, GDP, Liquidity, Bank Size, Deposits, Interest, Loan

In model 3a, the R square value .275 shows the fair relevancy between ROE and all independent predictors. The difference between R-square and adjusted R-square so-called shrinkage level (.091) is relatively low and acceptable in representing the relevancy of dependent and independent factors. Although, there is no clear standard of evaluating the shrinkage level (Osborne, 2000) but the level between 10 and 15% is acceptable (Slavkin, 2007). The standard error of the estimate is also quite low which shows a fair association between the profitability indicators and internal and external factors.

On the other hand, in model 3b, the R-square value .148 also indicates an acceptable level of association between dependent and independent variables. Although, the difference between R-square and adjusted R-square (0.106) is slightly higher than the shrinkage level in model 3a, But still it shows the fair relevancy between ROE and all independent predictors. Similarly, the standard error of the estimate 16.711 is also higher as compared to the model 3a.

The table 5 demonstrates the Analysis of Variance (ANOVA) showing the statistical significance of the randomness of independent factors over dependent variables through p-value and F-value. The significance level or p-value in the model 3a is 0.006 which is less than 0.01 and 0.05 benchmarks. This indicates the linear relationship between dependent and independent variables. Also, the low F-value 3.032 shows apt relationships between ROA and internal and external influencing factors which are taken as independent variables in this model. On the other hand, the significance level .218 in model 3b is more than 0.01 and 0.05 levels. This shows a non-linear association between ROE and independent factors. But on the other hand, the lower F-value represents the appropriate level of relationship between ROE and internal and external factors that affect bank profitability.

Table 5 ANOVA[b & c]

Model		Sum of Squares	d.f.	Mean Square	F	Sig.
3a	Regression	382.260	8	47.782	3.032	.006a
	Residual	1008.504	64	15.758		
	Total	1390.764	72			
3b	Regression	3107.174	8	388.397	1.391	.218a
	Residual	17871.561	64	279.243		
	Total	20978.734	72			

a. Predictors: (Constant), Inflation, Capital, GDP, Liquidity, Bank Size, Deposits, Interest, Loan

b. Dependent Variable: ROA

c. Dependent Variable: ROE

The table 6 gives an idea of standardised beta coefficients of both regression models. Also, based on the regression coefficients presented in table 6 and model-based sizes and signs, the regression equations can be formed as follows.

ROA = 76.494 + .061 (bank size) + .475 (capital) + .206 (loan) + .180 (deposits) + .072 (liquidity) – .365(GDP) + .346 (interest rate) – .094 (inflation rate)

ROE = 108.754 + .133 (bank size) + .313 (capital) – .711 (loan) + .295 (deposits) + .712 (liquidity) –.130 (GDP) +.130 (interest rate) –.162 (inflation rate)

Table 6 Coefficients

Variables	**ROA**			**ROE**		
	Coefficients	**t-value**	**Sig.**	**Coefficients**	**t-value**	**Sig.**
Constant	76.494	1.684	.097	108.754	.569	.571
Bank Size	.061	.519	.605	.133	1.044	.300
Capital	.475	3.605	.001	.313	2.192	.032
Loan	.206	.365	.717	-.711	-1.160	.250
Deposits	.180	1.387	.170	.295	2.095	.040
Liquidity	.072	1.30	.897	.712	1.177	.244
GDP	-.365	-1.72	.090	-.130	-.565	.574
Interest rate	.346	1.536	.130	.130	.531	.597
Inflation rate	-.094	-.647	.520	-.162	-1.029	.307

The model outcomes in case of both profitability measures (i.e. ROA and ROE) show relevance with expected outcome and potential impact on profitability defined in table 1. In both cases, bank size, capital ratio, loan, deposits, liquidity, and interest rate have the positive impact on ROA and ROE whereas GDP and inflation rate

have negative impacts. These results are matched with the findings of most of the researchers including Bourke (1989), Molyneux and Thornton (1992), Pasiouras and Kosmidou (2007), and Athanasoglou *et al.* (2008).

4.2 Validity of regression analysis

The multicollinearity statistics are calculated in SPSS to check the validity of the regression results. The tolerance level and Variance Inflation Factor (VIF) are computed and the results are loaded in table 7. According to Gujarati (2003), the standardised value of VIF for each variable must be less than 5 and tolerance level near to zero means no multicollinearity. VIF below 5 or 10 suggests no serious multicollinearity problem. Based on these criteria, the results in table 7 look reasonably good. The values of VIF for all independent variables are ranging from 1.218 to 8.247 which suggest the absence of multicollinearity among all internal and external factors that affect bank profitability.

Table 7 Collinearity Statistics

	Internal variables					**External variables**		
	Bank size	Capital	Loans	Deposits	Liquidity	GDP	Interest	Inflation
Tolerance level	.821	.653	.135	.670	.136	.252	.223	.534
VIF	1.218	1.532	8.247	1.493	7.488	3.964	4.476	1.873

4.3 Correlation Analysis

The correlation analyses are performed by individually correlating profitability indicators (ROA and ROE) with internal and external factors. Therefore the correlation matrices are constructed and interpreted in four ways: (1) correlating ROA with internal factors, (2) correlating ROA with external factors, (3) correlating ROE with internal factors, and (4) correlating ROE with external factors.

Table 8 demonstrates the associations between ROA and internal factors that affect bank profitability. The table shows that loans, capital, and liquidity are positively correlated with ROA but unexpectedly the deposit ratio and bank size have a negative correlation with ROA. This is because that the period considered in this study covers the financial crises of 2008. The reason of the minor negative relationship of deposits and bank size with ROA is the fear that developed in the minds of customers because of the financial crisis and they were unwilling to deposit additional money in banks. This point is also highlighted by Lee and Hsieh (2013) by concluding that more deposits can provide better prospects for generating more profits while low deposits may affect the profitability of the banks.

Table 8 Correlation analysis

Profitability Indicators	**Internal determinants**					**External determinants**		
	Bank size	Capital	Loans	Deposits	Liquidity	GDP	Interest	Inflation
ROA	-.014	.352	.211	-.092	.223	-.057	.082	-.172
ROE	.051	.146	-.041	.067	-.006	-.041	.071	-.223

The positive correlation between capital and ROA is also shown in table 8. This lined up with the results of other studies including Pasiouras and Kosmidou (2007) and Sufian and Chong (2008). This positive correlation shows that if a bank prefers capital for taking high risk of investments then it may increase the profitability level by avoiding liquidity or credit shocks. Similarly, a positive association between liquidity and ROA is evident. These results are parallel to the findings of Vieira (2010) who found a positive relationship between liquidity and ROA in the short-run. In fact, liquidity was the major problematic factor during the financial crisis of 2008 but the UK banking sector performed very well in holding the liquidity to avoid further problems (Berríos, 2013). This is another reason why liquidity is positively correlated with ROA. In contrast, the correlation results in this study are not matched with Rasiah (2010) and Lang and Maffett (2011) as they proved a negative correlation between ROA and liquidity.

ROE is positively correlated with bank size, capital, and deposits while it has a negative relationship with loans and liquidity. The reason for its positive relationship with bank size is that when a bank expands its operations then there are more chances of an increase in bank's profitability due to the increment of shareholder's equity. Similarly, the capital has a positive impact on ROE because an increase in the amount of equity which allows banks to reduce their cost of capital and consequently increases the profitability level (Molyneux and Thornton, 1992). But banks often do not like to hold a lot of capital as it reduces ROE.

The correlations between ROA and external influencing factors (GDP, interest rate, and inflation rate) are also available in table 8. It can be seen that the interest rate is positively correlated with ROA whereas GDP and inflation rate are negatively associated with it. An increase in GDP shows a better economic condition that has a positive impact on banks and their profitability level. The results of positive relationship between GDP and ROA are inconsistent with some previous studies that have been carried out in this domain. Many researchers in the past such as Pasiouras and Kosmidou (2007), Sufian and Chong (2008), Tanna *et al.* (2008, and Dietrich and Wanzenried (2011) demonstrated positive relationships. The foremost reason of inverse relationship in this study is the recent economic downturn in the UK.

However, results concerned with interest rate are similar with former studies. The positive correlations found in this study are parallel to the findings of the studies of Aburime (2009), Pasiouras and Kosmidou (2007), and Rasiah (2010). This shows that an increase in the interest rate will intensify the profitability level of the bank because banks often adjust their base rates and return on assets according to the interest rate fluctuations.
In this study, ROA is found negatively correlated with GDP and inflation rate. The reason of this inverse relationship is the effect of inflation on the value of bank assets. The results are consistent with many studies including Bourke (1989), Sufian and Chong (2008), Rasiah (2010) and Khrawish (2011). However, these results look contradictory when compared with Molyneux and Thornton (1992) because they believe the full anticipation of inflation rate indicates the proper adjustment of interest rate in order to amplify profitability quicker than the operating costs. Like ROA, ROE also has a positive relationship with interest rate while it is negatively correlated with inflation and GDP.

5. Conclusion

The investigation throughout the study regarding the impact of independent variables on bank profitability reveals interesting insights. Based on regression analyses, it is found that internal factors including capital, loan, bank size, deposits, and liquidity are positively correlated with both profitability indicators ROA and ROE. On the other hand, the interest rate has a positive impact on bank profitability whereas GDP and inflation have a negative impact. Based on these findings, it can be concluded that large banks with extensive assets, capital, deposits, loans, equity, and macro-economic factors such as interest rate, economic growth and low inflation rate can achieve safety and competitive advantage and thus can achieve higher profitability. Based on slightly negative correlations of bank size and deposits with bank profitability, it can be said that the UK banking sector experienced a considerable decline in deposits and hence reduced the banking operations during the financial crises of 2008. This situation consequently placed a negative effect on deposits and bank size influencing bank profitability. However, these generalisations cannot be considered in normal circumstances.

References

Aburime, U.T. (2009). Impact of political affiliation on bank profitability in Nigeria. *African Journal of Accounting, Economics, Finance and Banking Research*, 4(4), 61-75.
Alison, P.D. (2005). *Fixed Effects Regression Methods for Longitudinal Data: Using SAS*. SAS Institute
Archdeacon, T.J. (1994). *Correlation and Regression Analysis: A Historian's Guide*. University of Wisconsin Press
Athanasoglou, P.P., Brissimis, S.N. and Delis, M.D (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *International Financial Markets, Institutions, and Money,* 18, 121-136.
Berger, A.N. and Humphrey, D.B. (1991). The dominance of inefficiencies over scale and product mix economies in banking. *Journal of Monetary Economics*, 28(1), 117-148
Berríos, M.R. (2013). The Relationship between Bank Credit Risk and Profitability and Liquidity. *The International Journal of Business and Finance Research*, 7 (3), 105-118.
Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia, *Journal of Banking and Finance,* 13(1), 65-79.
Bryman, A. (2008): Social Research Methods. 12th ed. Oxford: Oxford University Press
Burgess, S. (2011). Measuring financial sector output and its contribution to UK GDP. *Quarterly Bulletin* Q3, Bank of England, 234-246.
Creswell, J.W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE
Dietrich, A. and Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money*, 21, 307-327.
Grafarend, E.W. (2006). *Linear and Nonlinear Models: Fixed Effects, Random Effects, and Mixed Models*. Germany: Walter de Gruyter
Gujarati, D. (2003). *Basic Econometrics*. 4th edition, New York: McGraw-Hill.
Hassan, M.K. and A.M. Bashir, (2003), Determinants of Islamic Banking Profitability, *Economic Research Forum (ERF) 10th Annual Conference*, Marrakesh-Morocco, 16-18 December.
Khrawish, H.A. (2011). Determinants of Commercial Banks Performance Evidence from Jordan. *International Research Journal of Finance and Economics*, 5(5), 19-45.
Kosmidou, K., Pasiouras, F., Zopounidis, C. and Doumpos, M. (2006). A multivariate analysis of the financial characteristics of foreign and domestic banks in the UK. *Omega*, 34, 189-195.
Lang, M. and Maffett, M. (2011). Transparency and liquidity uncertainty in crisis periods. *Journal of Accounting and Economics*, 52, 101-125.
Lee, C-C. and Hsieh, M-F. (2013). The impact of bank capital on profitability and risk in Asian banking. *Journal of International Money and Finance*. 32, 251-281.

Molyneux, P. and Thornton, J. (1992). Determinants of European bank profitability: A note. *Journal of Banking and Finance*, 16(6), 1173-1178.
Osborne, J.W. (2000). Prediction in multiple regression. *Practical Assessment, Research & Evaluation*, 7(2), ISSN 1531-7714
Pasiouras, F. and Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21, 222-237.
Persson, M. and Ruparel, R. (2012). *The Eurozone banking union: A game of two halves*. London: Open Europe
Rasiah, D. (2010). Theoretical Framework of Profitability as Applied to Commercial Banks in Malaysia. *European Journal of Economics, Finance and Administrative Services*, 19, 74-97.
Sastrosuwito, S. and Suzuki, Y. (2012). The determinants of post-crisis Indonesian banking system profitability. *Economics and Finance Review*, 11(1) 48-57.
Sheeba, K. (2011). *Financial Management.* Pearson Education India
Slavkin, M.L. (2000). *Juvenile Firesetting: An Exploratory Analysis*. Universal-Publishers
Sufian, F. and Chong, R.R. (2008). Determinants of bank profitability in a developing economy: empirical evidence from Philippines. *Asian Academy of Management Journal of Accounting and Finance*, 4(2), 91-112.
Vieira, R.S. (2010). The relationship between liquidity and profitability. PhD Thesis. UMEA University, Sweden
Tanna, S., Kosmidou, K. and Pasiouras, F. (2005). Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002. Money Macro and Finance (MMF) Research Group Conference 2005, 45, Money Macro and Finance Research Group