The Impact of Macroeconomic Factors on Profitability of Commercial Bank in the UK

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Abstract

Due to the vast contribution of commercial banks to the economic development in the UK, this study examined the effect of macroeconomic variables on profitability of Commercial Banks listed at the London Stock Exchange (LSE) for years 2015 to 2019. The objective was to determine the effect of macroeconomic factors on profitability. Panel data for the 23 listed banks in the LSE was utilized. Panel data regression analysis with random effects was utilized on the data to examine the effects of these five macroeconomic variables which included: Gross Domestic Product (GDP), Real interest rate, Inflation rate, unemployment rate, and Exchange rate on Return on Asset (ROA) and Return on Equity (ROE) which proxies' profitability. The study findings indicated that real GDP growth rate had a negative significant effect on profitability of commercial banks as measured through Return on Assets (ROA) and Return on Equity (ROE). While the rest of the macro-indicators do not have a significant impact on profitability measured by ROA and ROE. It is therefore indicating that internal factors are impacting the profitability of banks in the UK rather than external factors.

Keywords: Macroeconomic Indicators, Return on Asset, Return on Equity, Profitability

Introduction

The banking industry in the UK has made a huge contribution to the economy by providing 1.6% of employment opportunities for the banking industry and more than 40% of the employment opportunities for the entire financial industry (Burgess, 2011). In addition, the banking industry's contribution to GDP is close to 3.7%, which exceeds 50% of the entire financial market (Burgess, 2011). Therefore, it is inherent to investigate factors that directly and/or indirectly affect the profitability of British banks. In this regard, this research aims to study the possible determinants of the profitability of British banks, with a particular focus on the period before, during and after the referendum of leaving the EU.

Due to Brexit, It is reasonable to assume that it poses a huge challenge to British banks because their business environment changes rapidly, which affects their performance. Therefore, The purpose of this study is to investigate the impact of macroeconomic indicators on profitability of commercial banks in the UK during 2015-2019 as commercial banks in the UK witnessed significant growth and changes after the referendum for leaving the EU of the UK banking industry. In the following literature, the study has found many researches on the determinants of the profitability of banks in other countries, while previous studies on British banks have focused on other aspects of bank performance. For example, Drake (2001) and Webb

(2003) studied the efficiency of the UK banking industry. Holden and El-Bannany (2004) studied the importance of information technology development to the profits of major UK banks. Kosmidou et al. (2006) Analyze performance factors to identify salient features of British foreign and domestic bank profits. Other research on bank profitability also considers British banks as part of a larger sample aggregated in multiple countries (e.g. Molyneux and Thorton, 1992; Pasiouras and Kosmidou, 2006).

However, this research differs from the above research in three main aspects. First, this study only focuses on the profitability of UK banks. Secondly, we considered representative samples of large and small banks in the near term, thus providing more appropriate and up-to-date empirical evidence. Third, this study's empirical analysis separates the specific influence of internal factors from external factors (macro indicators), so that this study can investigate the impact of the macro indicators on the profitability of commercial banks.

Literature Review

The financial performance (Profitability) can be affected by internal and external factors. However, this study will only focus on external factors which are macroeconomic factors such as GDP, inflation, interest rate, unemployment rate, and exchange rate that affect the bank's profitability. In theory, real GDP growth has a positive impact on banking performance through three main channels: net interest income, loan loss improvement and operating costs (Jiménez et al., 2009; Bolt et al., 2012; Calza et al., 2006). During the period of economic expansion, the company's profitability will increase, and during the period of economic recession it will decline. Therefore, higher GDP growth will lead to an increase in corporate loans and deposits and improve banks' net interest income and loan losses. In addition, higher GDP growth means higher disposable income, lower unemployment rates and fewer consumer loan defaults. Therefore, net interest income and loan losses are cyclical with GDP growth. However, the relationship between bank operating costs and GDP growth is unclear. Bolt et al. (2012) indicates that unfavorable economic conditions, such as lower GDP growth rates, may reduce deposits and loans and their management costs. These conditions may also increase the cost of collecting loan repayments. Revell (1979) introduced the relationship between inflation and bank performance in the theory. He showed that inflation will affect the profitability of banks by affecting indirect expenses (especially wages and operating costs). If the inflation rate rises, it may increase wages and operating costs, thereby reducing the profitability of banks. However, if the bank's management fully anticipates the inflation rate, then the bank can adjust interest rates appropriately so that revenue growth is faster than cost growth, which will have a positive impact on profitability (Trujillo-Ponce, 2012). Samuelson (1945) studied the impact of interest rates on bank profits. The results show that, in general, bank profits increase with the rise of internal interest rates. "Rising interest rates is an invaluable help to the banking system as a whole, rather than hindering it. Commercial banks will make more profits than savings banks" (Samuelson, 1945). Further, Samuelson (1945) pointed out that raising interest rates actually has an impact on borrowers, but it has no impact on bank performance. Borrowers will tolerate the impact of high interest rates, and the performance of banks will not be affected by high interest rates. Gelos (2006) used bank and country-level data to study the determinants of profitability of Latin American banks. They found that relatively high interest rates (which can replace macroeconomic risks) have a great impact on bank efficiency. As pointed out by Adler and Dumas (1980),

the activities of banks are affected by exchange rates because asset values fluctuate with exchange rates. Chamberlain et al. (1997) showed that the most direct impact of exchange rate is those banks that conduct foreign exchange transactions and conduct foreign business. Even if there is no such activity, the exchange rate will be affected. Banks can be indirectly affected by affecting foreign competition, loan demand, and other aspects of bank conditions. The lower exchange rate improves the competitiveness of the company, because domestic ex-factory prices of goods fall and foreign demand rises (Luehrman, 1991). As a result, loans and deposits and bank profits have increased. However, a lower exchange rate may also reduce the purchasing power of domestic consumers as imported goods become more expensive. This situation may increase loan losses and may have a negative impact on the bank's profitability. Economic factors such as financial crises could affect the unemployment rate. Tanveer et al., (2012) proved that the financial crises in 2007-2008 has impacted on the unemployment rate in different groups of countries. Increasing unemployment has an impact on the decrease of income per capita which results in bank profitability.

Extensive research in many countries and regions around the globe has been conducted for examining the factors that influence a bank's profitability. Prior studies of a bank's profitability can be classified into three categories. First, studies related to a bank's profitability determinants that are empirically examined in different countries around the world (e.g. Perera and Wickramanayake (2016) who studied 122 countries, Dietrich and Wanzenried (2014) who studied 118 countries and Masood and Ashraf (2012) who studied 14 countries). Second, studies that compare a bank's profitability determinants among different banks in the same region (e.g. Chowdhury and Rasid (2017) who studied GCC countries, Petria, Capraru, and Ihnatov (2015) who studied EU 27 countries, Roman and Camelia (2015) and Dietrich and Wanzenried (2011) who studied CEE countries, Menicucci and Paolucci (2016) who studied Europe, Jara-Bertin, Moya, and Perales (2014) who studied, Lemma and Negash (2013) who studied Nine African countries). Finally, studies that have investigated a bank's profitability determinants and focused only on a single country. For example, Zouari-Ghorbel (2014) and Bougatef (2017) who studied Tunisia, Marijana, Poposki, and Pepur (2012) who studied Macedonia, Tan and Floros (2012) and Tan (2016) who studied China, Bouzgarrou, Jouida, and Louhichi (2017) who studied France, Bose, Saha, Zaman, and Islam (2017) and Robin, Salim, and Bloch (2018) who studied Bangladesh, Athanasoglou, Brissimis, and Delis (2008) who studied Greece, Ramlan and Adnan (2016) Malaysia, de Mendonça and da Silva (2018) Brazil, Kapaya and Raphael (2016) who studied Tanzania, Growe, DeBruine, Lee, and Maldonad (2014) who studied the United States, AL-Omar and AL-Mutairi (2008) who studied Kuwait and Almaqtari, Al- Homaidi, Tabash, and Farhan (2018) and Singh and Sharma (2016) who studied India

Majority of the prior studies have measured profitability by ROA and ROE. For example, Chowdhury and Rasid (2017); Naeem, Baloch, and Khan (2017); Zampara, Giannopoulos, and Koufopoulos (2017); Tiberiu (2015); Singh and Sharma (2016). However, the bank's profitability was investigated by prior research as a function of both bank-specific (internal) and macroeconomic (external) determinants. Bank specific determinants are related to the direct result of managerial decisions of a bank (Louzis, Vouldis, & Metaxas, 2012; Rjoub, Civcir, & Resatoglu, 2017; Saona, 2016; Singh & Sharma, 2016). Several studies such as Petria et al. (2015); Salike and Ao (2018); Tiberiu (2015); Pathneja (2016); Rashid and Jabeen (2016); Garcia and Guerreiro (2016); Singh and Sharma (2016); Rani and Zergaw (2017); Rjoub et al. (2017);

Zampara et al. (2017); Bougatef (2017) assessed bank-specific determinants including variables such as capital adequacy ratio, asset quality ratio, liquidity ratio, operating efficiency ratio, deposits ratio and bank size.

On the other hand, macroeconomic factors are determinants that are related to economic, industrial and legal environments that are out of a bank's control (Ongore & Kusa, 2013). Macroeconomic determinants comprise variables such as GDP, inflation rate, interest rate and exchange rate (Acaravci & Calim, 2013; Chowdhury & Rasid, 2017; Jara-Bertin et al., 2014; Marijana et al., 2012; Masood & Ashraf, 2012; Menicucci & Paolucci, 2016; Saona, 2016; Pasiouras & Kosmidou, 2007). Although extensive research has been conducted on banks' profitability determinants in different countries, comprehensive empirical evidence from emerging and developing countries have either yielded ambiguous evidence or mixed results (Almaqtari et al., 2018). With regard to banks' profitability determinants studies in the UK context, there are not too many studies that investigate this issue. Kosmidou, Tanna, and Pasiouras (2005) have examined bank-specific and macroeconomic factors that determined the profitability of UK banks. The results revealed that macroeconomic factors such as GDP, and inflation rate have positive relation with ROA. Accordingly, the current research aims to investigate the impact of Macroeconomic factors on UK commercial banks' profitability. More specifically, it empirically evaluates only macroeconomic determinants that may have an impact on UK commercial banks' profitability as measured by ROA and ROE. The present study bridges a serious gap in UK banks' profitability literature. Furthermore, the current study extends, contributes and builds on the work of Kosmidou et al. (2005) who ignored a major proxy of banks' profitability namely; Return on equity (ROE). The current study also uses different econometric techniques for analysis of data, which give more sound results.

Research Methodology

The main research question will be answered by using deductive research approach, descriptive research design, and secondary data collection which will be supported by panel data regression analysis. The full dataset will contain strong balanced panel data on 23 banks for the period 2015-2019. The main research question will be estimated by a mostly used panel data regression model such as Pooled OLS, Fixed effects, and Random effects model for appropriate statistical decision. In terms of getting appropriate results, the whole data will be analyzed by different kinds of diagnostic tests such as normality test, multicollinearity test, and Heteroscedasticity Test. Furthermore, the Hausman test will be run to choose between fixed effect and random effects if pooled OLS is not used.

In regression analysis ROA and ROE profitability measures will be used as dependent variables and GDP, inflation, interest rate, exchange rate, unemployment rate as independent variables to evaluate their impact on each measure of profitability. Most importantly, this research ignored the net interest margin due to data absence of sampled banks.

In this study, ROA and ROE are defined as the dependent variable and it has been chosen based on previous studies. In the literature review most of the studies employed ROA and ROE as dependent variables such as Kanwal and Nadeem (2013), Osamwonyi and Michael (2014), Rao and Lakew(2012), Kiganda (2014), Zeitun (2012), Wong et al. (2006), Anwar and Herwony (2006), Suffian and Habibullah (2010), Suffian and

Chong (2008), Rasiah(2010), Vong and Chan (2008), Ramadan et al. (2011), Saksonova and Solovjora (2011), Ghazali (2008), Naceur (2003), Alpha and Anber (2011), Zang and Dong (2011), Obillo (2015), Simiyu and Ngile (2015), Atindehow and Gueyie (2001), Abebe (2006), Babazadeh and Fanokhnejad (2012), Getachew (2016), Casey et al. (2014), Maigua and Mouni (2016), Manyo et al. (2016),Glogowski (2008), Messai and Jouini (2013), Ab. Bari (2018), Gordijenkaite (2015), and Dewi et al. (2019).

GDP, Inflation, Interest rate, Exchange Rate, and unemployment rate are defined as independent variables in this study. The macroeconomic indicators have been chosen based on previous studies. In the literature review, most of the studies have conducted those macro- indicators as independent variables. For example, Kanwal and Nadeem (2013), Osamwonyi and Michael (2014), Rao and Lakew (2012), Kiganda (2014), Zeitun (2012), Wong et al. (2006), Anwar and Herwony (2006), Suffian and Habibullah (2010), Suffian and Chong (2008), Suffian (2011), Rasiah (2010), Vong and Chan (2009), Ramadan et al. (2011), Solovjora (2011), Ghazali (2008), Naceur (2003), Constantions and Sofoklis (2009), Dovydenko (2011), Kosmidou et al. (2005) employed GDP and Inflation as macro- indicators. Further, there are many studies have been employed Interest rate as macro-indicators such as Alper and Anber (2011), Zang and Dong (2011), Kanwal and Nadeem (2013), Obilo (2015), Osamwonyi and Michael (2014), Simiyu and Ngile (2015). There are very few studies that employed Exchange rate and Unemployment rate such as Atindehow and Gueyie(2001), Abebe (2006), Babazadeh and Fanokhnejad (2012), Getachew (2016), Casey et al. (2014), Maigua and Mouni (2016), Manyo et al. (2016), Kiganda (2014), Glogowski (2008), Messai and Jouini (2013), Ab. Bari (2018), Gordijenkaite (2015), and Dewi et al. (2019). Furthermore, this study employs ROA and ROE as dependent variables and chooses based on literature review.

The sample period is from 2015 to 2019. This study implemented an analysis of the year 2015- 2019 as there are a number of studies that have been done up to the year 2015. Since 2015, there have been lots of changes such as Brexit, technological innovation, and economic downfall which directly and indirectly impacted the UK banking sector.

Analysis and Discussion

This chapter introduces the data analysis, interpretation and discussion of the research results. After analysis and interpretation of the data collected from secondary sources, it is in line with the purpose of the research, that is, to determine, examine, evaluate and determine the impact of macroeconomic variables on the 23 listed commercial banks on the LSE. This chapter will cover descriptive statistics, Correlation analysis, normality tests, diagnostic tests and panel regression analysis.

Summary Statistics:The descriptive statistics for the dependent and independent variable for the chosen studies. Descriptive statistics can provide initial indications of variables, can be used for regression analysis, and provide multiple summary statistics about variables, such as mean, standard deviation, and lowest and highest observed values.

Table 1:Descriptive Statistics

```
. sum ROE ROA GDP Inflation InterestRate UnemploymentRate ExchangeRate

    Variable |       Obs        Mean    Std. Dev.        Min        Max

         ROE |       115    10.61713    15.41271     -26.06      72.91
         ROA |       115    1.276638    1.795855     -2.626   7.222922
         GDP |       115      1.8012    .3810649      1.341      2.356
   Inflation |       115       1.593    .8141151       .368      2.558
InterestRate |       115         .55    .1879016        .25        .75

  Unemployme~e |     115      4.4592    .5378225      3.851      5.301
ExchangeRate |       115    .7498957    .0964843       .655      1.655
```

The descriptive statistics in Table 1 show that the total number of data analyzed (n) is 115, representing 5 years of data from 2015 to 2019 for 23 listed banks on the LSE in the UK. According to Gujarat (2003), the standard deviation represents a measure of the dispersion from the mean, which indicates that the smaller the standard deviation, the less variability, the more accurate the future prediction may be. In Table 1, the results show that the bank's profitability, return on assets (ROA), and Return on Equity (ROE) fluctuations do not differ much from the mean; however, both variables have much more standard deviation than mean. Therefore, the future prediction will not be accurate.

GDP growth rate, interest rate, inflation rate, exchange rate, and Unemployment rate fluctuations are not much different from the mean, and the standard deviation of the variables is small, so the future forecast is more accurate. The average ROA is 1.277 and the standard deviation is 1.796, and the average ROE is 10.617 and the standard deviation is 15.412 which means that the data are not clustered around the means. The average GDP is 1.801, the standard deviation is 0.381, the average interest rate is 0.559, the standard deviation is 0.218, the average inflation rate is 1.593, and the standard deviation is 0.814, the average exchange rate is 1.332, and the standard deviation is 0.081, and the average unemployment rate is 4.459, and the standard deviation is 0.538. Moreover, the table shows that the mean of each variable is between the minimum and maximum values, which enhances the accuracy of the data considered.

Correlation Analysis: According to the statistical data in Table 2, most variables are weakly correlated or negatively correlated with correlation coefficients less than 0.55, but among the dependent variables, ROE and ROA are highly correlated with the value 0.796. And the correlation between macroeconomic factors; GDP growth rate and Unemployment rate, and Inflation rate and Unemployment rate are highly positive and negative correlated respectively, with a value higher than 0.80 which could possibly create a problem of multicollinearity in the regression analysis, as Kennedy (2008) pointed out that when the correlation value is higher than 0.80 or 0.90, the correlation is high. Bryman and Cramer (2001) believe that multicollinearity is obviously possible when the correlation exceeds 0.80, while Anderson, Sweeney and Williams (1990) use 0.70 as the standard point. By considering all the views, there is multicollinearity between two of the dependent and independent variables, which may change the results. In order to obtain accurate output, one of the variables could be removed from the model if needed.

Table 2:Correlation Analysis

```
. pwcorr ROE ROA GDP Inflation InterestRate UnemploymentRate ExchangeRate

                 ROE       ROA       GDP  Inflat~n  Intere~e  Unempl~e  Exchan~e

       ROE    1.0000
       ROA    0.7964    1.0000
       GDP   -0.1304   -0.1492    1.0000
  Inflation    0.1075    0.1460   -0.6194    1.0000
InterestRate    0.0131    0.0440   -0.6827    0.4715    1.0000
Unemployme~e   -0.1133   -0.1463    0.9230   -0.8158   -0.7113    1.0000
ExchangeRate   -0.0024    0.0095   -0.2069    0.2548    0.1171   -0.2721    1.0000
```

Normality Test: According to Gujarati (2003), if skewness lies between -3 and +3 and kurtosis for all the variables are positive then it is implied that the variables have normal curves with lighter tails. The below skewness/kurtosis analysis shows that skewness of all variables is between -3 and +3, and all the variable values of kurtosis are positive which indicates that data are normally distributed.

Table 3:Skewness/Kurtosis Test

```
. sktest ROE ROA GDP Inflation ExchangeRate InterestRate UnemploymentRate

Skewness and kurtosis tests for normality
                                                      ——— Joint test ———
      Variable |    Obs   Pr(skewness)   Pr(kurtosis)   Adj chi2(2)   Prob>chi2

           ROE |    115      0.0000         0.0003         22.94        0.0000
           ROA |    115      0.0000         0.0016         23.90        0.0000
           GDP |    115      0.7288         0.0000         99.00        0.0000
     Inflation |    115      0.1754         0.0000         85.54        0.0000
  ExchangeRate |    115      0.0000         0.0000        137.06        0.0000
  InterestRate |    115      0.1203         0.0000         26.97        0.0000
UnemploymentRate |  115      0.0665         0.0000         50.98        0.0000
```

Multicollinearity Test: Gujarati (2003) mentioned that the VIF will be 1 if there is no collinearity between two independent variables. And if the VIF >10 then the chances of multicollinearity are very high. In the below table, the VIF is 8.49 which is less than 10 and it indicates that there is no risk of multicollinearity for these sample variables.

Table 4:Multicollinearity Test

```
. vif

     Variable |      VIF       1/VIF

 Unemployme~e |     23.33     0.042870
          GDP |     10.77     0.092859
    Inflation |      5.03     0.198793
 InterestRate |      2.22     0.449890
 ExchangeRate |      1.11     0.901315

     Mean VIF |      8.49
```

Heteroskedasticity Test: Gujarati (2003) stated that heteroscedasticity is present if the p value is less than a significance level of 0.05. However, according to the below table result in this study heteroscedasticity is absent as p value is 0.2165 which is greater than significance level of 0.05.

Table 5:Breusch-Pagan test

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ROE

         chi2(1)      =       1.53
         Prob > chi2  =     0.2165
```

Panel Data Regression Analysis:There are several estimation methods in panel data. The most general and frequently used panel data methods are Pooled OLS, Fixed effects, and Random effects model. All the three models are being estimated for comparison reasons. In terms of determining the appropriate model all three model results will be examined to make statistical decisions. First of all, the P value will be considered for all the models then Adj. R-squared followed by F statistics and P value of F statistics.

Results of Model Estimation:The below table illustrates the estimation for all the three models. The three models are Pooled, Fixed, and Random models and the model provides the result differently while considering the dependent variable such as ROA and ROE. However, the results reveal that the Adj. R-squared for ROA is -0.009 for Pooled OLS model while 0.03 is for both fixed and random model. This indicates that the macroeconomic indicators contribute about 0.9% by considering pooled OLS while 3% and 3% contribute by considering fixed effects and random effects model respectively to the profitability as measured by ROA. In terms of p value of F-statistics, the random model and fixed model show the significance which indicate that these models are appropriate for this data as ROA dependent variable, on the other hand, pooled OLS shows insignificance value that suggest inappropriate models for this data. Moving to coefficient's significance, the result of all three models show that in pooled OLS models none of them macroeconomic variables are significant while in random and fixed effects models have at least one variable significant. This also indicates that random and fixed effects models are more appropriate compared to pooled OLS models.

In terms of ROE result as dependent variable, the adj. R-squared of ROE is -0.01 for pooled model, 0.03 for fixed effects model, and 0.03 for random effects model. This signifies that the macroeconomic indicators explain approximately 1% , 3%, and 3% in pooled OLS, fixed effects, and random effects models respectively of the variation of the bank's profitability as measured by ROE. In terms of P value of coefficient for all the models, both fixed effects model and random effects model have at least one variable significance at 10% level, while in pooled OLS model does not have significance variable. This result indicates either fixed effects model or random effects model is appropriate for ROE. In terms of p value of F-statistics, the result shows all the models are insignificant however, random effect model and fixed effects model result are much better than pooled OLS model. Therefore, the result suggests choosing between fixed

effects and random effects models. To compare and evaluate between fixed effects model and random effects model, the Hausman test will be conducted.

Table 6:Model Estimation Results Summary

Variable	ROA Pooled Coef.	T-Stat	Prob.	ROA Fixed Coef.	T-Stat	Prob.	ROA Random Coef.	T-Stat	Prob.	ROE Pooled Coef.	T-Stat	Prob.	ROE Fixed Coef.	T-Stat	Prob.	ROE Random Coef.	T-Stat	Prob.
Cons	-10.41	-0.5	0.62	-16.47	-1.32	0.19	-15.9	-1.29	0.2	-124.5	-0.7	0.49	-98.32	-0.8	0.43	-101.97	-0.84	0.4
GDP Growth Rate	-1.75	-0.98	0.33	-2.07	-2.03	0.04**	-2.03	-2.01	0.04**	-19.5	-1.27	0.21	-18.13	-1.79	0.08*	-18.32	-1.82	0.07*
Inflation Rate	0.37	0.8	0.42	0.4	1.57	0.12	0.4	1.56	0.12	3.08	0.77	0.44	2.95	1.16	0.25	2.96	1.17	0.24
Interest Rate	0.29	0.16	0.87	0.91	0.8	0.42	0.85	0.76	0.46	4.12	0.26	0.8	1.45	0.13	0.9	1.82	0.16	0.87
Unemployment Rate	1.79	0.68	0.5	2.49	1.59	0.12	2.42	1.57	0.12	21.13	0.93	0.36	18.12	1.17	0.25	18.54	1.21	0.23
Exchange Rate	8.23	0.54	0.59	12.49	1.38	0.17	12.05	1.35	0.18	92.85	0.71	0.48	74.61	0.83	0.41	77.16	0.87	0.38
Adj. R-Squared			-0.009			0.14			0.14			-0.01			0.09			0.09
F-Statistic			0.79			2.73			13.7			0.72			1.75			8.83
Prob. (F-statistic)			0.56			0.02			0.01			0.61			0.13			0.12

Note: significance ***1%, ** 5%, and * 10%

Hausman Test:The Hausman test was developed by Hausman (1978) and it has a null hypothesis that random- effect specification procedures have a consistent coefficient. The results of the test are outlined below.

Table 7:Results summary of Hausman Test

	ROA	ROE
chi2(5)	0.1	0.03
Prob>chi2	0.99	1

The results show that the value of the Prob>chi2 is 0.99 and 1.000 for ROA and ROE respectively which is greater than the significance level of 0.05. Therefore, the result indicates that the null hypothesis would be more appropriate. The null hypothesis of the Hausman test means that the random-effects model is more appropriate. Thus, the panel data regression with random-effects model is preferred in this study.

Random Effects Model Results:As per Hausman test, the random effects model results displayed below which were analyzed by the econometric software STATA.

Table 8:Results of Random effects Model

Variable	ROA Random Coef.	T-Stat	Prob.	ROE Random Coef.	T-Stat	Prob.
Cons	-15.89	-1.29	0.2	-101.97	-0.84	0.4
GDPGrowth Rate	-2.03	-2.01	0.04**	-18.32	-1.82	0.07*
Inflation Rate	0.4	1.56	0.12	2.96	1.17	0.24
Interest Rate	0.85	0.76	0.46	1.82	0.16	0.87
Unemployment Rate	2.42	1.57	0.12	18.54	1.21	0.23
Exchange Rate	12.05	1.35	0.18	77.16	0.87	0.38
Adj. R-Squared			0.03			0.03
F-Statistic			13.7			8.83
Prob. (F-statistic)			0.01			0.12

Empirical Result

From the result table, the adj. r-squared is 0.03 and 0.03 for ROA and ROE as dependent variables respectively which indicates that 3% variation in ROA and ROE were explained by independent variables. Further, the F-statistics were included to see whether all the coefficients in the model are different from zero. If the prob. F statistic <0.05 which indicates the model is appropriate. As a result, from the result table, it is shown that the prob. (F) is 0.01 with ROA which is less than 0.05 and suggest that the model is appropriate while with ROE the prob. (F) is 0.12 which is greater than the significance level of 0.05 and suggests that the model is not appropriate with ROE. However, by comparing all the models, a random model is more appropriate compared to other models. Moreover, the result discovered that 1 unit increase of GDP decrease ROA by 2.03, 1 unit increase in Inflation increase the ROA by 0.40, 1 unit increase in interest rate increases ROA by 0.85, 1 unit increase in unemployment rate increases ROA by 2.42, and 1 unit increase in exchange rate increases ROA by 12.05. if all the factors are held constant ROA will decrease by 15.89. While, 1 unit increase of GDP decrease ROE by 18.32, 1 unit increase in Inflation increase ROE by 2.96, 1 unit increase in Interest rate increase ROE by 1.82, 1 unit increase in unemployment rate increase ROE by 18.54, and 1 unit increase in Exchange rate increase ROE by 77.16. if all the factors are held constant ROE will decrease by 101.97.

In terms of GDP with ROA, the result table shows that the GDP growth rate has a significant negative effect on ROA, which revealed the inverse contribution to the profitability of UK banks as measured by ROA. This outcome is consistent with Staikouras and Wood (2004), Combey and Togbenou (2017), and Jaber and Al-khawaldeh (2014) who have reported that GDP has significant negative impacts on ROA. In addition, there are many studies who have found to have significant effect on ROA but positively such as Bourke (1989), Molyneux and Thornton (1992), Athanasoglou et al. (2008), Bashir (2003), Zang and Dong (2011), Ghazali (2008), Anwar and Herwony (2006), Wong et al. (2006), Suffian and Habibullah (2010), Suffian and Chong (2008), Flamini et al (2009), Ali et al (2011), Saksonova and Solovjova (2011), Alper and Anbar (2011), Davydenko (2011), Zeitun (2012), Desaro (2012), Dietrich and Wanzenried (2009), Scott and Aria (2011) and Kosmidou, Tanna, and Pasiouras (2005). However, the findings contradict with Khrawish (2011), Sharma and Mani (2012), and Suffian (2011) who found GDP insignificant negative effect on ROA. In addition, there are several studies who found insignificant positive effect of GDP on ROA such as Naceur (2003), Vong and Chan (2008), Kanwal and Nadeem (2013), Raw and Lakew (2012), Kiganda (2014), Simiyu and Ngile (2015).

 GDP with ROE, the table shows that GDP has a significant negative impact on ROE. The result is consistent with Anwar and Herwony (2006), Alper and Anbar (2011), Masood and Ashraf (2012), Grow et al. (2014), and Zeitun (2012). However, the finding is inconsistent with Kanwal and Nadeem (2013), Khrawish (2011).

 Turning to inflation, the findings show that the inflation has insignificant positive effect on profitability measured by both ROA and ROE. This indicates that inflation did not have a significant influence on the UK bank's profitability. This outcome is supported by Naceur (2003), Raw and Lakew (2012) Jasmine et al. (2011), Alper and Anbar (2011), Demirguc-Kunt and Huizinga (1999), Havrylchyk and Jurzyk (2006),

Mamatzakis and Remoundos (2003), and Sharma and Mani (2012) who also found positive relation of inflation with profitability but insignificant.. However, the finding is inconsistent with Zeitun (2012), Otuori (2013), Suffian and Chong (2008), and Saksonova and Solovjova (2011) as they have found to have negative effect on profitability. In addition, there are several studies who have found to have significant effect of inflation on profitability such as Haron and Azmi (2004), Ghazali (2008), Wong et al. (2006), Anwar and Herwony (2006) Vong and Chan (2008), and Suffian and Habibullah (2010).

In terms of interest rate, the results found insignificant positive relation with ROA and ROE. This suggests that the interest rate did not impact the UK bank's profitability. This outcome is consistent with Vong and Chan (2008), and Mamatzakis and Remoundos (2003). On the other hand, Anwar and Herwony (2006), Suffian and Habibullah (2010), Alper and Anbar (2011), Zhang and Dong (2011), Kanwal and Nadeem (2013), and Obillo (2015) found significant relation with profitability.

Moving to the unemployment rate, the result indicates insignificant impact on profitability measured by ROA and ROE but positive relationship with profitability. This finding is supported by Singh and Sharma (2016), Gordijenkaite (2015), and Dewi et al. (2019). On the opposite, Ab. Bari (2018) and Messai and Jouini (2013) found significant impact of unemployment on profitability on their studies.

In terms of exchange rate, the finding of this study indicates an insignificant positive effect on both profitability measurement ratios of ROA and ROE. This indicates that exchange rate fluctuations did not influence the bank profitability in the UK. This result is supported by Manyo et al. (2016), and Kiganda (2014). On the other hand, the study by Abebe (2006), Babazadeh and Farrokhnejad (2012), Getachew (2016), Casey et al. (2014), and Maigua and Mouni (2016) found significant impact on profitability.

The study investigated the effect of macroeconomic factors on profitability of the 23 listed commercial banks in the London Stock Exchange for a 5-year period from 2015-2019. The study specifically sought to determine, examine, evaluate and establish the effect of real GDP, interest rate, inflation, exchange rate, and unemployment rate on bank profitability. The effect of macroeconomic factors on bank profitability was examined using panel regression analysis. The regression results show that macroeconomic factors have an insignificant effect on bank profitability in the UK except GDP which show the negative significant impact on profitability.

Conclusion

The present study aimed at investigating the impact of macro-economic indicators on profitability of commercial banks in the UK. The macroeconomic variables that were considered in this study included real GDP, real interest rates, inflation, exchange rate (US dollar/ GBP), and unemployment rate. As per the first objectives of the study to determine the concept of the macroeconomic indicators and profitability. This research has fulfilled the first objectives by determining the concept of macro-indicators and profitability. The study discussed leading and lagging indicators. Jeang (2010) enunciated that lagging indicators only start showing some change through them when the economy has predominantly started following a certain pattern of change or direction; the lagging indicators are more precise than the leading indicators, they portray the change of the macro-economy in a better way. Lagging indicators are included such as GDP, inflation, exchange rate, and unemployment rate. On the other hand, Lee (2010) articulated that a leading

indicator is any type of macro-economic factor that changes in a direction before the rest of the economy begins to go in a particular direction. Breeden (2013) enunciated that the leading indicators help the participants in the market to observe the future trend of the market and lets policymakers predict significant changes in the economy based on which the policymakers can decide on their policies. Leading indicators included such as Interest rate. Further, this research discussed the importance of profitability, measurement of profitability. The profitability could be measured such as ROA, ROE, and NIM. However, this study has conducted ROA and ROE as profitability measurement.

In terms of second objectives, the study has reviewed the effect of macroeconomic indicators on profitability through previous research. However, the findings of the studies were mixed. In majority of researches GDP was found as a significant variable such as (Bourke (1989); Molyneux and Thornton (1992); Athanasoglou et al. (2008); Bashir (2003); Zang and Dong (2011)). Rest of the macro-indicators were found to have positive relation with profitability except a couple of studies such as Zeitun (2012), Otuori (2013), Suffian and Chong (2008), and Saksonova and Solovjova (2011) were found to have negative relation with profitability.

Moving to the third objective of developing the methodology by using appropriate models for the sampled data. This research has estimated all the panel data regression models to justify the goodness of fit the data. Also run a couple of diagnostic tests to check the data. Further this research has conducted a Hausman test to choose between random and fixed effects models. Finally, the random effects model was applied to data which was obtained from 23 banks financial statements from 2015-2019.Through the random effects model, the study explored the effects of macro-indicators on profitability of commercial banks in the UK.

Finally, the study concludes that GDP has a significant negative effect on profitability of commercial banks in the UK measured by ROA and ROE. Which indicates a negative contribution to profitability. However, rest of the sampled macro indicators do not have influence on bank profitability. This indicates that the macro-economic indicators do not impact on profitability of commercial banks in the UK.

The study was faced by a number of limitations. First, only 23 commercial banks are listed in the London Stock Exchange(LSE) against a total of 156 banks in the banking sector in the UK. Secondly, this study made use of ROA and ROE as measures of financial performance. There are other measures of financial performance including NIM (Net Income Margin) among others. Lastly, the study was specific to the UK and therefore suffers from the limitations of country specific studies thus cannot be generalized to banks in other countries other than the UK. For future research, this study can be extended to cover longer time periods. Unbalanced panel data can be used to incorporate the banks which are recently established. Quarterly data can be analyzed to reveal more precise results. Other econometric techniques can be applied to verify the relationship. More macroeconomic factors such as CPI, imports, exports, tax rates and income level can be focused on. In addition to domestic banks, foreign banks may be included in the sample. Furthermore, listed banks in different countries or a group of countries can be evaluated.

References

Ab. Bari, N. (2018). Bank Specific and Macroeconomics Determinants of Profitability in Barclays Bank PLC, United Kingdom. *School Of Economics, Finance & Banking (SEFB), Universiti Utara Malaysia, Sintok 06010, Kedah, Malaysia.*.

Abebe, D. (2006). Measuring Exchange Market Pressure and the Degree of NBE's Intervention in the Foreign Exchange Market.

Acaravci, S., & Çalim, A. (2013). Turkish banking sector' s profitability factors. *International Journal Of Economics And Financial Issues*, *3*(1), 27-41.

Adalet McGowan, M., Andrews, D., & Millot, V. (2018). The walking dead? Zombie firms and productivity performance in OECD countries. *Economic Policy*, *33*(96), 685-736. doi: 10.1093/epolic/eiy012

Adler, M., & Dumas, B. (1980). The Exposure of Long-Term Foreign Currency Bonds. *The Journal Of Financial And Quantitative Analysis*, *15*(4), 973. doi: 10.2307/2330573

Almaqtari, F., Al-Homaidi, E., Tabash, M., & Farhan, N. (2018). The determinants of profitability of Indian commercial banks: A panel data approach. *International Journal Of Finance & Economics*, *24*(1), 168-185. doi: 10.1002/ijfe.1655

AL- Omar, H., & AL- Mutairi, A. (2008). Bank- Specific Determinants of Profitability: The case of Kuwait. *Journal Of Economic And Administrative Sciences*, *24*(2), 20-34. doi: 10.1108/10264116200800006

Alper, D., & Anbar, A. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: empirical evidence from Turkey. *Business And Economics Research Journal*, *2*(2), 139-152.

Altavilla, C., Canova, F., & Ciccarelli, M. (2019). Mending the broken link: Heterogeneous bank lending rates and monetary policy pass-through. *Journal Of Monetary Economics*, *110*, 81-98. doi: 10.1016/j.jmoneco.2019.01.001

Anderson, R., Sweeney, D., & Williams, T. (1990). *Statistics for business and economics*. West Publishing Company.

Andrews, D., & Petroulakis, F. (2019). Breaking the shackles: Zombie firms, weak banks and depressed restructuring in Europe.

Anwar, M., & Herwany, A. (2006). The determinants of successful bank profitability in Indonesia: empirical study for provincial government's banks and private non-foreign banks.

Athanasoglou, P., Brissimis, S., & Delis, M. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal Of International Financial Markets, Institutions And Money*, *18*(2), 121-136. doi: 10.1016/j.intfin.2006.07.001

Atindéhou, R., & Gueyie, J. (2001). Canadian chartered banks' stock returns and exchange rate risk. *Management Decision*, *39*(4), 285-295. doi: 10.1108/eum0000000005463

Babazadeh, M., & Farrokhnejad, F. (2012). Effects of Short-run and Long-run Changes in Foreign Exchange Rates on Banks' Profit. *International Journal Of Business And Management*, *7*(17). doi: 10.5539/ijbm.v7n17p70

Babihuga, R., & Spaltro, M. (2014). Bank Funding Costs for International Banks. *IMF Working Papers*, *14*(71), 1. doi: 10.5089/9781475517910.001

Bashir, A. (2003). Determinants of Profitability in Islamic Banks: Some Evidnece From The Middle East. *Islamic Economic Studies*, *11*(1), 32-57.

Bolt, W., de Haan, L., Hoeberichts, M., van Oordt, M., & Swank, J. (2012). Bank profitability during recessions. *Journal Of Banking & Finance*, *36*(9), 2552-2564. doi: 10.1016/j.jbankfin.2012.05.011

Bose, S., Saha, A., Khan, H., & Islam, S. (2017). Non-financial disclosure and market-based firm performance: The initiation of financial inclusion. *Journal Of Contemporary Accounting & Economics*, *13*(3), 263-281. doi: 10.1016/j.jcae.2017.09.006

Bougatef, K. (2017). Determinants of bank profitability in Tunisia: does corruption matter?. *Journal Of Money Laundering Control*, *20*(1), 70-78. doi: 10.1108/jmlc-10- 2015-0044

Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal Of Banking & Finance*, *13*(1), 65-79. doi: 10.1016/0378- 4266(89)90020-4

Bouzgarrou, H., Jouida, S., & Louhichi, W. (2018). Bank profitability during and before the financial crisis: Domestic versus foreign banks. *Research In International Business And Finance*, *44*, 26-39. doi: 10.1016/j.ribaf.2017.05.011

Breeden, D. (2013). Consumption as a Leading Indicator. *SSRN Electronic Journal*. doi: 10.2139/ssrn.2642367

Calza, A., Manrique, M., & Sousa, J. (2006). Credit in the euro area: An empirical investigation using aggregate data. *The Quarterly Review Of Economics And Finance*, *46*(2), 211-226. doi: 10.1016/j.qref.2005.02.001

Casey, M., Fayman, A., & Ling, T. (2014). Bank Profitability: The Impact of Foreign Currency Fluctuations. *Journal Of Applied Business And Economics*, *16*(2).

Chamberlain, S., Howe, J., & Popper, H. (1997). The exchange rate exposure of U.S. and Japanese banking institutions. *Journal Of Banking & Finance*, *21*(6), 871-892. doi: 10.1016/s0378-4266(97)00002-2

Chowdhury, M., & Rasid, M. (2016). Determinants of Performance of Islamic Banks in GCC Countries: Dynamic GMM Approach. *Advances In Islamic Finance, Marketing, And Management*, 49-80. doi: 10.1108/978-1-78635-899-820161005

de Mendonça, H., & Silva, R. (2018). Effect of banking and macroeconomic variables on systemic risk: An application of ΔCOVAR for an emerging economy. *The North American Journal Of Economics And Finance*, *43*, 141-157. doi: 10.1016/j.najef.2017.10.011

Dewi, V., Tan Lian Soei, C., & Surjoko, F. (2019). The Impact of Macroeconomic Factors on Firms Profitability (Evidence From Fast Moving Consumer Good Firms Listed on Indonesian Stock Exchange). *ACADEMY OF ACCOUNTING AND FINANCIAL STUDIES JOURNAL*, *23*(1), 1-6.

Dietrich, A., & Wanzenried, G. (2010). Determinants of Bank Profitability Before and During the Crisis: Evidence from Switzerland. *SSRN Electronic Journal*. doi: 10.2139/ssrn.1370245

Drake, L. (2001). Efficiency and productivity change in UK banking. *Applied Financial Economics*, *11*(5), 557-571. doi: 10.1080/096031001752236825

Flamini, V., Schumacher, L., & McDonald, C. (2009). The Determinants of Commercial Bank Profitability in Sub-Saharan Africa. *IMF Working Papers*, *09*(15), 1. doi: 10.5089/9781451871623.001

Garcia, M., & Guerreiro, J. (2016). Internal and external determinants of banks' profitability. *Journal Of Economic Studies*, *43*(1), 90-107. doi: 10.1108/jes-09-2014-0166

Getachew, T. (2016). The Impact of Exchange Rate on the Profitability of Commercial Banks in Ethiopia. *A Thesis Submitted To Department Of Accounting And Finance, College Of Business And Economics, In Partial Fulfilment Of The Requirements For The Degree Of Masters Of Science In Accounting And Finance. Addis Ababa Universit*.

Ghazali, M. (2008). *The bank-specific and macroeconomic determinants of Islamic bank profitability: some international evidence*. Dissertation (M.B.A.), University of Malaya, Faculty of Business and Accountancy.

Głogowski, A. (2008). Macroeconomic determinants of Polish banks' loan losses – results of a panel data study. *NATIONAL BANK OF POLAND WORKING PAPER*.

Gordijenkaitė, A. (2015). Nordic commercial banks profitability drivers' analysis before and after financial crisis in 2007-2009.

Greene, W. (2008). *Econometric analysis* (6th ed.). Upper Saddle River, NJ: Pearson.

Growe, G., DeBruine, M., Lee, J., & Tudón Maldonado, J. (2014). The Profitability and Performance Measurement of U.S. Regional Banks Using the Predictive Focus of the "Fundamental Analysis Research". *Advances In Management Accounting*, 189-237. doi: 10.1108/s1474-787120140000024006

Gujarati, D. (2003). *Basic econometrics*. New York,: The McGraw-Hili Companies, Inc.

Hausman, J. (1978). Specification Tests in Econometrics. *Econometrica*, *46*(6), 1251. doi: 10.2307/1913827

Holden, K., & El-Bannany, M. (2004). Investment in information technology systems and other determinants of bank profitability in the UK. *Applied Financial Economics*, *14*(5), 361-

365. doi: 10.1080/0960310042000211623

n4p22

Jara- Bertin, M., Arias Moya, J., & Rodríguez Perales, A. (2014). Determinants of bank performance: evidence for Latin America. *Academia Revista Latinoamericana De Administración*, *27*(2), 164-182. doi: 10.1108/arla-04-2013-0030

Jasmine, E., Yen, Y., Yun, X., Mohanen, S., & Ding, T. (2011). An Empirical Analysis of Commercial Banks' Profitability Determinants in Malaysia. *Universiti Tunku Abdul Rahman*.

Jiménez, G., Ongena, S., Peydro, J., & Saurina Salas, J. (2010). Credit Supply: Identifying Balance-Sheet Channels with Loan Applications and Granted Loans. *SSRN Electronic Journal*. doi: 10.2139/ssrn.1685370

Kanwal, S., & Nadeem, M. (2013). THE IMPACT OF MACROECONOMIC VARIABLES ON THE PROFITABILITY OF LISTED COMMERCIAL BANKS IN
PAKISTAN. *European Journal Of Business And Social Sciences*, *2*(9), 186-201.

Kapaya, S., & Raphael, G. (2016). Bank-specific, industry-specific and macroeconomic determinants of banks profitability: Empirical evidence from Tanzania. *International Finance And Banking*, *3*(2). doi: 10.5296/ifb.v3i2

Khrawish, H. (2011). Determinants of commercial banks performance: evidence from Jordan. *International Research Journal Of Finance And Economics*, (81), 148-159.

Kiganda, E. (2014). Effects of Macroeconomic factors on Commercial Banks Profitability in Kenya: Case of Equity Bank Limited. *Nternational Journal Of Economics And Sustainable Development*, *5*(2).

Kosmidou, K., Pasiouras, F., Zopounidis, C., & Doumpos, M. (2006). A multivariate analysis of the financial characteristics of foreign and domestic banks in the UK. *Omega*, *34*(2), 189-195. doi: 10.1016/j.omega.2004.10.002

Kosmidou, K., Tanna, S., & Pasiouras, F. (2005). Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002. *Economics, Finance And Accounting Applied Research Working Paper*.

Lee, C., & Hsieh, M. (2013). The impact of bank capital on profitability and risk in Asian banking. *Journal Of International Money And Finance*, *32*, 251-281. doi: 10.1016/j.jimonfin.2012.04.013

Louzis, D., Vouldis, A., & Metaxas, V. (2012). Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. *Journal Of Banking & Finance*, *36*(4), 1012-1027. doi: 10.1016/j.jbankfin.2011.10.012

Luehrman, T. (1991). Exchange Rate Changes and the Distribution of Industry Value. *Journal Of International Business Studies*, *22*(4), 619-649. doi: 10.1057/palgrave.jibs.8490317

MAIGUA, C., & MOUNI, G. (2016). Influence of Interest Rates Determinants on the Performance of Commercial Banks in Kenya. *International Journal Of Academic Research In Accounting, Finance And Management Sciences*, *6*(2). doi: 10.6007/ijarafms/v6-i2/2078

Mamatzakis, E., & Remoundos, P. (2003). Determinants of Greek Commercial Banks Profitability, *53*(1), 85-94.

Manyo, T., Sabina, N., & Ugochukwu, U. (2016). The Effect of Foreign Exchange Transaction on the Performance of Nigerian Banks. *IJRDO-Journal Of Business Management*, *2*(11).

Marijana, C., Poposki, K., & Pepur, S. (2012). Profitability Determinants of the Macedonian Banking Sector in Changing Environment. *Procedia - Social And Behavioral Sciences*, *44*, 406-416. doi: 10.1016/j.sbspro.2012.05.045

Masood, O., & Ashraf, M. (2012). Bank- specific and macroeconomic profitability determinants of Islamic banks. *Qualitative Research In Financial Markets*, *4*(2/3), 255-268. doi: 10.1108/17554171211252565

Menicucci, E., & Paolucci, G. (2016). The determinants of bank profitability: empirical evidence from European banking sector. *Journal Of Financial Reporting And Accounting*, *14*(1), 86-115. doi: 10.1108/jfra-05-2015-0060

Messai, A., & Jouini, F. (2013). Micro and Macro Determinants of Non-performing Loans. *International Journal Of Economics And Financial Issues*, *3*(4), 852-860.

Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: A note. *Journal Of Banking & Finance*, *16*(6), 1173-1178. doi: 10.1016/0378- 4266(92)90065-8

Naceur, S. (2003). The Determinants of the Tunisian Banking Industry Profitability: Panel Evidence. *Universite Libre De Tunis Working Papers.*.

Naeem, M., Baloch, Q., & Khan, A. (2017). Factors affecting banks' profitability in Pakistan. *International Journal Of Business Studies Review*, *2*(2), 33-49.

Obillo, M. (2015). The Relationship between Lending Interest Rate and Profitability of Commercial Banks in Kenya. *Department Of Finance & Accounting, School Of Business, University Of Nairobi.*.

Ongore, V., & Kusa, G. (2013). Determinants of financial performance of commercial banks in Kenya. *International Journal Of Economics And Financial Issues*, *3*(1), 237-252.

Osamwonyi, P., & Michael, C. (2014). The Impact of Macroeconomic Variables on Profitability of Listed Commercial Banks in Nigeria. *European Journal Of Accounting Auditing And Finance Research.*, *2*(10), 85-95.

Otuori, O. (2013). Influence of Exchange rate Determinants on the Performance of Commercial Banks in Kenya. *European Journal Of Management Sciences And Economics*, *1*(2), 86- 98.

Pasiouras, F., & Kosmidou, K. (2006). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research In International Business And Finance*, *21*(2), 222-237. doi: 10.1016/j.ribaf.2006.03.007

Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research In International Business And Finance*, *21*(2), 222-237. doi: 10.1016/j.ribaf.2006.03.007

Perera, A., & Wickramanayake, J. (2016). Determinants of commercial bank retail interest rate adjustments: Evidence from a panel data model. *Journal Of International Financial Markets, Institutions And Money*, *45*, 1-20. doi: 10.1016/j.intfin.2016.05.006

Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of Banks' Profitability: Evidence from EU 27 Banking Systems. *Procedia Economics And Finance*, *20*, 518-524. doi: 10.1016/s2212-5671(15)00104-5

Ramadan, I., Kilani, Q., & Kaddumi, T. (2011). Determinants of Bank Profitability: Evidence from Jordan. *International Journal Of Academic Research*, *3*(4), 76-89.

Ramlan, H., & Adnan, M. (2016). The Profitability of Islamic and Conventional Bank: Case Study in Malaysia. *Procedia Economics And Finance*, *35*, 359-367. doi: 10.1016/s2212- 5671(16)00044-7

Rani, D., & Zergaw, L. (2017). Bank specific, industry specific and macroeconomic determinants of bank profitability in Ethiopia. *International Journal Of Advanced Research In Management And Social Sciences*, *6*(3), 74-96.

RAO, K., & LAKEW, T. (2012). DETERMINANTS OF PROFITABILITY OF COMMERCIAL BANKS IN A DEVELOPING COUNTRY: EVIDENCE FROM ETHIOPIA. *International Journal Of Accounting And Financial Management Research (IJAFMR)*, *2*(3).

Rashid, A., & Jabeen, S. (2016). Analyzing performance determinants: Conventional versus Islamic Banks in Pakistan. *Borsa Istanbul Review*, *16*(2), 92-107. doi: 10.1016/j.bir.2016.03.002

Rasiah, D. (2010). Theoretical framework of profitability as applied to commercial banks in Malaysia. *European Journal Of Economics, Finance And Administrative Sciences*, (19), 74-97.

Revell, J. (1979). Inflation & Financial Institutions. *Financial Times Limited*.

Rjoub, H., Civcir, I., & Resatoglu, N. (2017). Micro and macroeconomic determinants of stock prices: The case of Turkish banking sector. *Romanian Journal Of Economic Forecasting*, *20*(1), 150-166.

Robin, I., Salim, R., & Bloch, H. (2018). Financial performance of commercial banks in the post-reform era: Further evidence from Bangladesh. *Economic Analysis And Policy*, *58*, 43-54. doi: 10.1016/j.eap.2018.01.001

Saksonova, S., & Solovjova, I. (2011). Analysis Of The Quality And Profitability Of Assets In The Banking System And The Impact Of Macroeconomic Factors On Its Stability-Case Of Latvia. *International Conference On Applied Economics*, 537-548.

Salike, N., & Ao, B. (2018). Determinants of bank's profitability: role of poor asset quality in Asia. *China Finance Review International*, *8*(2), 216-231. doi: 10.1108/cfri-10-2016- 0118

Saona, P. (2016). Intra- and extra-bank determinants of Latin American Banks' profitability. *International Review Of Economics & Finance*, *45*, 197-214. doi: 10.1016/j.iref.2016.06.004

Scott, J., & Arias, J. (2020). Banking profitability determinants. *Business Intelligence Journal*, *4*(2), 209-230.

Sharma, E., & Mani, M. (2012). Impact of Macroeconomic and Financial Market Indicators on The Banking Sector: Some Evidence From India. *International Journal Of Research In Finance & Marketing*, *2*(2), 171-185.

Simuyu, C., & Ngile, L. (2015). Effect of Macroeconomic Variables on Profitability of Commercial Banks Listed in The Nairobi Securities Exchange. *International Journal Of Economics, Commerce And Management United Kingdom*, *3*(4).

Singh, A., & Sharma, A. (2016). An empirical analysis of macroeconomic and bank-specific factors affecting liquidity of Indian banks. *Future Business Journal*, *2*(1), 40-53. doi: 10.1016/j.fbj.2016.01.001

Staikouras, C., & Wood, G. (2004). The Determinants Of European Bank Profitability. *International Business & Economics Research Journal (IBER)*, *3*(6), 57-68. doi: 10.19030/iber.v3i6.3699

Sufian, F. (2011). Financial depression and the profitability of the banking sector of the Republic of Korea: panel evidence on bank-specific and macroeconomic determinants. *Asia-Pacific Development Journal*, *17*(2), 65-92. doi: 10.18356/1025290d- en

Sufian, F., & Chong, R. (2008). Determinants of bank profitability in a developing economy: empirical evidence from the Philipines. *Asian Acdamey Of Management Journal Of Accounting And Finance*, *4*(2), 91-112.

Sufian, F., & Shah Habibullah, M. (2010). Assessing the Impact of Financial Crisis on Bank Performance:Empirical Evidence from Indonesia. *ASEAN Economic Bulletin*, *27*(3), 245-262. doi: 10.1355/ae27-3a

Tan, Y. (2016). The impacts of risk and competition on bank profitability in China. *Journal Of International Financial Markets, Institutions And Money*, *40*, 85-110. doi: 10.1016/j.intfin.2015.09.003

Tan, Y., & Floros, C. (2012). Bank profitability and inflation: the case of China. *Journal Of Economic Studies*, *39*(6), 675-696. doi: 10.1108/01443581211274610

Tanveer Choudhry, M., Marelli, E., & Signorelli, M. (2012). Youth unemployment rate and impact of financial crises. *International Journal Of Manpower*, *33*(1), 76-95. doi: 10.1108/01437721211212538

Tiberiu, A. (2015). Banks' Profitability and Financial Soundness Indicators: A Macro-level Investigation in Emerging Countries. *Procedia Economics And Finance*, *23*, 203-209. doi: 10.1016/s2212-5671(15)00551-1

Trujillo-Ponce, A. (2012). What determines the profitability of banks? Evidence from Spain. *Accounting & Finance*, *53*(2), 561-586. doi: 10.1111/j.1467-629x.2011.00466.x

Vong, A., & Chan, H. (2009). Determinants of bank profitability in Macao, 93-113.

Webb, R. (2003). Levels of efficiency in UK retail banks: a DEA window analysis. *International Journal Of The Economics Of Business*, *10*(3), 305-322. doi: 10.1080/1357151032000126256

Wong, J., Wong, T., Fong, T., & Choi, K. (2006). Competition in Hong Kong's Banking Sector: A Panzar-Rosse Assessment. *SSRN Electronic Journal*. doi: 10.2139/ssrn.1032034

Zampara, K., Giannopoulos, M., & Koufopoulos, D. (2017). Macroeconomic and industry- specific determinants of Greek bank profitability. *International Journal Of Business And Economic Sciences Applied Research*, *10*(1), 13-22.

Zeitun, R. (2011). Macro and Micro Determinants of Islamic and Conventional Banks Performance and Financial Crises in GCC Countries. *SSRN Electronic Journal*. doi: 10.2139/ssrn.1933102

Zhang, C., & Dong, L. (2011). Determinants of Bank Profitability: Evidence from the U.S Banking Sector. *Simon Fraser University*.

Zouari-Ghorbel, S. (2014). Macroeconomic and Bank-specific Determinants of Household's Non-performing Loans in Tunisia: A Dynamic Panel Data. *Procedia Economics And Finance*, *13*, 58-68. doi: 10.1016/s2212-5671(14)00430-4