



A Study on Financial Performance of the Jordanian Commercial Banks using the CAMEL Model and Panel Data Approach

Jamil Salem Al Zaidanin

Senior Business Advisor at Arkan Investment Co., Abu Dhabi – UAE

Abstract

The purpose of this research paper is to extensively investigate and examine the effect of the CAMEL model variables on the profitability and financial soundness of the thirteen Jordanian commercial banks for the period of 2013 to 2019, the primary data were collected from the published audited financial reports of the Jordanian commercial banks. The study uses CAMEL model variables of Capital adequacy, Asset Quality, Management efficiency, Earnings ability, and Liquidity management to rank banks as per their overall performance and measuring their effect on banks' profitability measures of Return on Assets and Return on Equity separately through applying the fixed effect regression model. It is concluded that the ranking approach shows that Bank of Jordan was in the top position followed by the Capital Bank of Jordan. Jordan Ahli Bank was in the lowest rank in most positions. Furthermore, the empirical results indicates that Non-Interest Income to Total Assets and Net Interest Income to Total Loans and Advances have significant positive relationships with both profitability measures whereas cost to Total Income and Non-Interest Income to Total Assets have strong negative relationships with the profitability measures. In addition, Equity to Total Assets has strong negative relationship with ROE. The study suggests that Jordanian commercial banks can improve their profitability through the concentration on main activities, efficiently managing their capital adequacy, maintaining high quality level of lending policy, and utilization of full assets. Additionally, the current study recommends conducting more studies on banks' performance determinants with an expanded scope and using more financial models besides the CAMEL model.

Keywords: CAMEL Model; Determinants; Jordanian Banks; Performance

JEL Classifications: C12; C31; C33; G21; G29; F65

Introduction

The financial institutions are main pillars of the growth and development of their countries' economy. Furthermore, banks influence liquidity structure in any economy through accumulating the surplus from individuals and entities in a form of saving and current accounts, providing finance, capital, and financial services to individuals and entities in all economic sectors. In addition, banks support their country's economy in the times of recession and economic crisis. However, it is important to watch banks' performance and their compliance with the regulations and the central bank requirements to develop banks sector and prevent some banks' behaviors that might lead to more recessions and economic crises where banks are major influencer in the welfare and economic development. The economic situation of any country reflects how strong is the financial sector, where a healthy banking sector affects positively all sectors in facing any negative shocks to the economic development (Athanasoglou , Brissimis, & Delis, 2005) through financing productive investments from internal funds (Tobash, 2016), where banking sector sets its goals to mainly have highlighted profit, to keep an adequate capital, full asset utilization, manages liquidity and sources of income and maintaining low percentage of bad loans.

The banks' performance is the main goal of any bank to consistently increase the equity value and provide good quality of services to customers where "a good economic environment for financial institutions fosters an increase in profitability" (Al Zaidanin, 2020, p. 674). Furthermore, Banks' performance could be affected by many factors; hence, the variables that affect profitability might be changed as the macroeconomic and legal environment changes. Therefore, investigating the factors affecting profitability is the main task of banks themselves, the central banks, and all related individuals and firms who would be influenced by the banks' performance. However, examining the profitability level of a bank in a developed economy is of an important interest to many parties like banks, investors, borrowers and scholars, and economic entities. It is safe to say that in an emerging economy, research is not that much developed and banking industry used to struggle for survival in time of economic turn down and crises. Jordan is not apart from the world developments and economic challenges where banking industry has variety of financial institutions including commercial banks who was affected strongly by the economic crises and the regional challenges. From this point, conducting a comprehensive and consistent research on banks financial healthiness and improvements became an important and core task to banks' management and researchers. Therefore, monitoring the banks activities that would be reflected on the bank's performance and achievements of goals became a major task to banks' management and central bank authorities.

Banks in Jordan are a dynamic engine of the Jordan economic growth through mobilizing the financial resources in meeting the needs of individuals for financing and providing funds to support all other economic sectors; "this is evident when looking at the main indicators related to these banks, where statistics indicate that the assets of licensed banks reached USD 71.82 billion at the end of 2018, while the credit facilities reached USD 36.82 billion in the same period" (Ahmad Ali Bawaneh & Ahmad Dahiyat, 2019, p. 1). Currently, Jordan financial sector have 24 banks in which 13 are commercial banks listed in Amman stock exchange and 3 local Islamic Banks.

The studies that use modeling approaches to measure banks performance in Jordan are limited. Accordingly, the current study attempts to define the factors that significantly affect profitability of Commercial Banks listed in Amman stock exchange through the application of CAMEL model and panel data approach for the years 2013-2019. This would be of beneficial and important to the Central Bank of Jordan, banking industry, investors, banks' managers, analysts, and researchers. "The approach that is most commonly used by bank regulators to monitor performance is the CAMEL approach. This is a composite of various bank performance components that management is expected to act upon so as to improve performances" (Abdurezak Mohammed Kuhil, 2018, p. 2). In addition, CAMEL approach was used worldwide since 1970s for monitoring bank's performance through ranking the bank as per the five elements of this model, which is used worldwide to monitor the banks performance.

This study attempt to quantify the best performance among Jordan Commercial Banks who are currently listed in Amman stock exchange using CAMEL which is an abbreviation for the terms: Capital adequacy, Asset Quality, Management efficiency, Earnings ability, and Liquidity management, and define the factors that affect banks' performance through analyzing panel data for the years 2013 to 2019. Banks are working in a changing environment with many external and internal factors that would greatly affect their performance and development. The economic crises in the USA and downturn of 2008 caused bank failures which was widely spread worldwide and increasingly created a need for frequent banking examinations. These crises

showed big sign to the need of a continuous monitoring and investigating banks' performance to take their place in development and protection from a big crisis and downturn.

Banks compete to reach a considerable profitability level and positive results during a normal economic life. However, banks in a changing and risky environment are trying to keep hold on an acceptable performance and to be in the right track and are sometimes struggling to survive. Furthermore, it is vital to know how commercial banks perform. Therefore, the current study aims to quantify the performance Commercial Banks in Jordanian and explore the factors that affect this performance where CAMEL approach and panel data analysis are used.

This current study brings the attention of bank managers, policy makers, risk managers, and researchers to the need for analyzing CAMEL model components and panel data to rank the overall bank's performance and find out the factors that have significant relationship with profitability. That would help decision makers in setting up an action plan to improve banks' performance. However, this study is of importance to regulators of banks who are interested in developing an early warning system to protect banks during economic crises where financial and statistical analysis would provide regulators a clear view of factors that have impact on commercial banks' performance and their behavior, and it attempts to provide important information to shareholders and investors. Hence, many savers, investors, and depositors need to know about the relationships between profitability and the selected variables which would affect banks' deposits and investment decisions. It also works as a steppingstone for more research in banks' profitability and remarkable performance and help researchers through paving the way for more investigations on commercial banks' performance and behavior.

Literature Review

Numerous research papers were recently made to determine the internal variables that affect banks' profitability which are called internal determinants of profitability (Gungor, 2007). These variables include the financial ratios that represent banks' ability to hold an adequate capital for financing good quality of assets and to have good earnings and liquidity management.

A study prepared by (Mamatzakis & Ramoundo, 2003) in Greece concluded that banks' strategic planning were giving high attention to the variables that highly affect profitability such as expenses and percentages of loan and equity to assets. Another study on Indian banks profitability determinants for the period 2001-2004 made by (Badola & Verma, 2006) concluded that non-interest income, operating expenses, provision contingencies and bank spread have significant impacts profitability. Another research conducted by (Guru, Staaunton, & Balahanmugam, 2002) about the determinants of banks' performance in Malaysia which found that the way of managing expenses is important factor that affect profitability.

In Switzerland, a study about the determinants of profitability of commercial banks prepared by (Dietrich & Wanzenrid, 2009) concluded that banks with better capital adequacy and a loan volume increase compared to market both will be reflected positively on the banks' performance. In another study on the factors that affect banks' profitability prepared by (Athanasoglou, Delis, & Staikouras, 2008) found that the equity to total assets has positive relationship with profitability. This supports the argument that well-capitalized bank usually achieves higher profitability.

In a study made by (Javaid, Anwar, Zaman, & Gafoor, 2011) for examining the factors that have significant effect on banks' profitability in Pakistan found that bank's equity and customers' deposits have significant relationships with profitability, they also concluded that a higher asset do not lead to higher profitability and higher loans do not significantly affect profitability although they have statistical relationship.

A research paper on the variables that affect the profitability of commercil banks in Malaysia for the years 2003-2009 by (Ong & Teh, 2013) concluded that all internal factors affect significantly the banks' performance. In addition, in an investigation study by (Saeed, 2014) on banks' internal variables and external indusrteal and microeconomic factors effect on the banks'cperformance in the United Kingdon for the years 2006 to 2012 found that the size of bank, loans volum, avaiability of adequate capital, customers deposits, inrest rate and liquidity are all have positive relationships with bank profitability measured by ROA.

The effect of bank-internal varaibles, industry-specific and macroeconomic variables in Tanzanian banks' performance during years 1998-2010 were examined by (Kapaya & Gwahula, 2016), they concluded that

capital adequacy, credit facilities, bank risk and financial market development, and diversification ratio significantly affected ROA.

A study on the commercial banks' performance of South African for the years 2005 to 2009, (Kumari, 2017) found that the banks' performance has deteriorated during years 2008 and 2009 due to the worldwide financial crisis. However, the liquidity, credit quality and profitability have been improving from years 2005 to 2009. Furthermore, (Nagarkar, 2015) concluded in a research paper about the banks' financial Performance in India that commercial banks strongly rely on deposits.

There were many studies used different financial measurements to measure the elements that significantly affect profitability of banks. However, due to continuous changes and challenges to the determinates of banks performance, researchers are trying to be focusing with modeling approaches applications that would give viable findings. For these reasons, various studies used CAMEL model to analyze banking activities measured by the model's five elements by ranking each bank as per the overall performance, this model is a monitoring system that banks would use to continuously examine their performance against standards and ratios imposed by central banks and industry. Accordingly, The CAMEL approach is widely used to investigate a bank's performance and impact on profitability.

CAMEL Model consists of five performance parameters which give an indication of how much a bank was able to improve its performance and achieve an acceptable profit and healthy financial position. These parameters are defined as Capital (C), Asset (A), Management (M), Earnings (E), and Liquidity (L). However, Capital as a measurement is weighted by adequacy and refers to total capital and different securities that bank holds to support the financial situations and protect the bank against a financial disaster (Ezike & MO, 2013). Asset refers to assets quality which is one of the main supporters of banks operations (Gulia, 2014) and main factor that researchers investigate whenever a study about a bank's performance is done (Chisti, 2012). This ratio shows the effectiveness of the bank's management in monitoring and dealing with all types and levels of credit. Management refers to the bank management efficiency in taking difficult decisions in time of circumstances and shows the bank's efficiency in achieving good financial performance (Reddy & Prasad, 2011). Management efficiency was measured by non-interest expense divided by the sum of net interest income and non-interest income (Poghosyan Cihak, M. & Cihak, 2011). However, Earnings refers to the ability of the bank in making profit out of lending activities. Liquidity refers to the ratios that banks use to measure the overall management performance in managing the bank resources (Han, Kim, & Kim, 2012). Liquid resources are those resources that can be converted easily into cash money (Farooq, Maqbool, Humanyun, Nawaz, & Abbas, 2015).

The CAMEL approach is widely used to investigate a bank's performance and impact on profitability. However, (Mustafa & Taqi, 2017) in an investigation on the performance of Punjab National Bank by applying CAMEL model concluded that Punjab National Bank had good financial efficiency and growth.

A study used CAMEL approach for analyzing the banks' profitability in Kosovo for the years 2006- 2012 prepared by (Ahmeti & Bekteshi, 2014) concluded that global financial crisis in 2008 and 2009 had some effects on the banks' performance in Kosovo and Kosovo's bank has strong capital adequacy, good level of earnings, and liquidity.

In an investigation study of Indian banks' performance by (Siva & Natarajan, 2011), it was concluded that CAMEL approach is an appropriate method for testing banks' performance and explore the preventive measures to be taken in the time of crises.

A study about banks' performance made by (Nag & Khatik, 2014) found that CAMEL model is used to measure banks' capital adequacy, efficiency of bank's management, ability to make profit and keep good liquidity and quality of assets. In addition, (Mohammady, 2019) used CAMEL model to measure the factors that affect the banks' performance in Afghanistan.

In another study by (Mohiuddin, 2014) on the performance of NCB and PCB banks' operating in Bangladesh using the CAMEL model, it was concluded that the financial situation of these are of a satisfactory level when it comes to holding adequate capital, good quality of assets, management efficiency, earning ability, and keeping good liquidity level.

An analysis study prepared by (Muhmad & Hashim, 2015) on the Malaysian banks' performance for the period 2008-2012 using CAMEL model, concluded that an adequate capital, high assets and liquidity levels affect significantly on the banks' performance.

A study conducted by (Bastan, Mazrae, & Ahmadvand, 2016) about the Iranian banks' performance found that the major indicators of these banks are capital adequacy, quality of assets and management. Another study on banks performance in Indonesia and Malaysia prepared by (Munir, Salwa, & Bustamam, 2017) during years 2010 to 2015 found that the CAMEL five elements have significant relationship with profitability.

Another study carried out by (Ebrahimi, Bahraminasab, & Seyedi, 2017) about banks' profitability in Tehran using the CAMEL approach; found that that capital adequacy, management quality and earnings affect negatively on the bank's profitability, while liquidity affect positively on profitability. Moreover, quality of assets does not significantly affect profitability.

Many research papers have been made in a developed and underdeveloped economies on the determinants of banks' profitability and came out with different and mixed conclusions (Almaqтари, Al-Homaidi, & Tabash, 2018). In Jordan, some studies were conducted to quantify the factors that have impact on banks' profitability in Jordan through applying modeling approaches. A study made by (Ahmad Ali Bawaneh & Ahmad Dahiyat, 2019)

used CAMELS approach to investigate the banks' performance in Jordan. They concluded that all CAMELS elements have significantly affected commercial banks performance excluding capital adequacy and quality of assets. Furthermore, a research paper about the use of CAMEL model to measure the financial healthiness of banks in Jordan, found that "all Jordanian banks performance is within the acceptable norms, despite of difference in the indicator values of CAMEL model, as the statistical analysis shows that there is no significant difference in the performance of Jordanian banks" (Kaddumi, 2017).

Looking into the objectives of present study, theoretical background and previous studies, the researcher addresses the following question: What are the main factors that have significant impact on Jordan banks' profitability? Accordingly, the study determined the following hypotheses:

- H1: Banks' profitability is affected positively by Capital to Asset Ratio.
- H2: Banks' profitability is affected positively by Equity to Asset Ratio.
- H3: Banks' profitability is affected negatively by Loans Loss Provision to Loans Ratio.
- H4: Banks' profitability has negative relationship with Loans to Assets Ratio.
- H5: Banks' profitability is affected negatively by Loans and Advances to Deposits Ratio.
- H6: Banks' profitability is affected negatively by Equity and Non-Interest Expenses to the Total Net Interest Income and Non-Interest Income.
- H7: Banks' profitability is affected positively by Operating Income to Total Income.
- H8: Banks' profitability is negatively affected by Cost to Total Income.
- H9: Banks' profitability is affected negatively by Net Interest Income to Total Loans and Advances Ratio
- H10: Banks' profitability is affected positively by Non-Interest Income to Total Income Ratio.
- H11: Banks' profitability is affected positively by Non-Interest Income to Total Assets Ratio.
- H12: Banks' profitability is affected negatively by Loans to Customers Deposits Ratio.
- H13: Banks' profitability is affected negatively by Customers Deposits to Total Assets Ratio.

The remaining parts of the current study are structured as follows: the second part is the literature review and previous studies which will handle the theoretical background and previous studies on the factors that impact banks' performance. The third part is the research methodology consisting the data and the models' specifications, while the fourth part is the discussion and conclusions, and the last part is recommendations.

Research Methodology

Conceptual framework (figure1) of this study is developed from the above discussed literature review and previous studies. This conceptual framework shows the relationships between the profitability ratios as dependent variables including ROA and ROE and the five CAMEL approach variables.

CAMEL approach		Expected relations	Bank performance
Measurements	Ratios (Independent Variables)		Dependent Variables
Capital Adequacy	<ul style="list-style-type: none"> • Capital / Assets (CA1) • Equity / Total Assets (CA2) 	+/- +/-	
Assets Quality	<ul style="list-style-type: none"> • Loans Loss Provision / Total Loan (AQ1) • Loans / Total Assets (AQ2) • Loans & Advances / Deposits AQ3) 	- + +	
Management Quality	<ul style="list-style-type: none"> • Non-Interest Expense / Net Interest and Non-Interest Income (MQ1) • Operating Income / Total Income (MQ2) • Cost / Total Income (MQ3) 	- + -	ROA ROE
Earnings Ability	<ul style="list-style-type: none"> • Net Interest Income / Loans & Advances (EA1) • Non-Interest Income / Total Income (EA2) • Non-Interest Income / Total Assets (EA3) 	+ + +	
Liquidity Management	<ul style="list-style-type: none"> • Loans / Customers Deposits (L1) • Customers Deposits / Total Assets (L2) 	+/- +/-	

Figure 1: The Conceptual Framework of the study

The primary data was collected from Jordan commercial banks published audited financial reports for the period 2013 to 2019, while secondary data was collected from Central Bank of Jordan, previous studies, and internet. The researcher uses the five elements of the CAMEL model and the Panel Data approach to evaluate bank's general security, financial healthiness, and solidness and examine the determinants of bank profitability. CAMEL model is a systematic approach that has been "adopted in November 1979 by the Federal Financial Institutions Examination Council (FFIEC), USA for The Uniform Financial Institutions Rating System (UFIRS). The initial rating system evaluated the overall condition and performance of banks by assessing "Capital adequacy, Assets Quality, Management Administration, Earnings Quality and Liquidity Measurement" (Bushra & Subhadra , 2017, p. 35) , while Panel data approach is a set of data called longitudinal data consisting of time series (t= 1 to T periods) and cross-sectional data (n cross-sectional units, denoted i= 1 to N) and total observation of n*T were also used to calculate the statistical regression for examining the impact of CAMEL's five on the profitability of Jordan commercial banks measured by ROA and ROE as dependent variables. These variables and statistical method are described as follows: -

Banks' profitability is typically measured by ROA and ROE where most previous studies such as (Zampara, Giannopoulos , & Koufopoulos, 2017; Salike & Ao, 2017; Bougatef, 2017) used them as proxy for profitability measurement. Essentially, return on assets is a measures of overall bank profitability and indicates how much net income the management can make as percentage out of utilizing its assets (Rose, 2002). In other words, it indicates the ability of bank's management in generating income out of utilizing its assets. However, ROE measures the banks' management efficiency in making income out of employing its own resources (Afolabi & Adawale, 2013) this ratio is described as the net profit divided by owners' equity. Therefore, this study uses ROA and ROE as proxies for measuring the profitability where ROA is the main measurement that measures banks' ability in generating income from their own sources. Furthermore, ROE measures the bank ability in making income out of utilizing its shareholders' (Olalere & Wan, 2016).

These variables are limited in this study within the CAMEL model variables defined as adequacy of capital, quality of assets, management efficiency, earnings ability and liquidity management. The adequacy of bank's capital an internal bank measure of strength in maintaining capital balance with risk weighted credit exposures. According to Basel norms, capital adequacy is set as a ratio of 8% of risk weighted assets and as a prudential requirement. Furthermore, Banking Regulation and Supervision Agency (BRSA) imposed 4% additional capital requirement. However, the study will measure capital adequacy (CA) by using capital to assets ratio which is basic ratio for measuring capital adequacy or strength and not adjusted by risk factors to quantify the actual adequacy of bank's capital adequacy ratio where data are confidential and not available

to the public. In addition, equity to total asset is used. These ratios give an indication on whether the bank needs an external funding or not, where the bank would need external funds in case of low capital adequacy ratio and vice versa. However, equity to total assets ratio indicate the ability of banks in dealing with losses and meeting risk exposure. This ratio is expected to be a positive determinant of bank performance where higher ratio means lower costs of external funding and lower risks and cost of bankruptcy (Staikouras CH & Wood, 2003). Therefore, the current study expects that equity to total assets ratio has positive relationship with banks' profitability.

Asset quality uses three ratios: loans to assets ratio which measures the main income source of a commercial bank and expected to affect positively on banks performance unless bank faces an unexpected levels of risk (Alper & Anbar, 2011). Second ratio is net loans under follow-up to total loans (LFA). This ratio is an important measurement of quality of asset and indicates the quality and healthiness of the loan portfolio which expected to be negatively affecting bank's performance (Aydogan, 1990); however, when this ratio is high, that means the bank have weak quality and high risk that this loan portfolio created. The third ratio is the loans and advances to deposits ratio. This ratio is an important parameter of the bank's ability to manage the loans portfolio and the available customer deposits. Furthermore, it shows how efficient is the bank in managing and controlling the lending policy, and it reflects the level of assets quality. However, the higher the ratio compared to the central bank requirements means higher risk and lower level of loans quality.

Management efficiency is used to measure management's ability in controlling the overall bank's activity and achieve high performance and profitability, it also measures the management efficiency in dealing with circumstances and risk factors. This measurement uses non-interest expense to the sum of net interest income and non-interest income (Poghosyan Cihak, M. & Cihak, 2011), operating income to total income (Rahman, Mansor, & Meera, 2009), total cost to total assets (Nasreddine, Fatma, & Anis, 2013), and total cost to income ratio (Altunbas, Gardener, Molyneux, & Moore, 2001). However, in terms of cost to income ratio, essentially, high ratio means low bank efficiency (Burger & Moormann, 2008).

Earnings Ability shows the banks' ability to earn income regularly from their activities. This measurement is an important component of the CAMEL model. The Earnings ability indicator usually uses ROA and ROE (Abdurezak Mohammed Kuhil, 2018). However, this study will use net interest income to the total loans and advances, non-interest income to total income. Furthermore, the non-interest income to total assets will be also used to measure banks' ability in making profit from the non-lending activities through utilizing their assets. The Earnings quality measurement defines the progress and sustainability of future earnings (Khatik & Amit, 2014). Nevertheless, the earnings ability is particularly important measurement that indicate the bank future trend in generating profit continuously. This ratio is basically defined as the banks' profitability (Chisti, 2012).

Liquidity Management (LQD) uses various ratios among the different empirical studies. Some researchers such as (Ihomovich, 2009) used cash divided by deposits to measure the bank's liquidity, others used customers deposits to total assets ratio (Iqbal, Loksha, K., Parakash, & Sheila, 2017). In addition, total loan divided by total deposit, liquid asset divided by asset were used to measure liquidity of banks. However, this study uses the total loans divided by total deposits and customer deposits divided by total assets. Low liquidity ratio is an indicator of bank's management efficiency level in controlling liquidity where a continuous low liquidity level would cause financial obstacles and bank failures. However, in case of keeping big volume of liquid assets in the bank would also create financial obstacles and have an opportunity cost of extra returns. (Bourke, 1989) finds positive significant link between bank liquidity and profitability.

Many researchers like (Chowdhury & Rasid, 2017; Brooks, 2014) have used the structure of panel analysis where followed the same structure and context of other studies. The researcher uses the same structure and context as well using the following panel data regression model:

$$Pit = \alpha + \beta X_{it} + U_{it} \dots (1)$$

Where Pit is the profitability dependent variable, α , is the intercept term on the independent variables, β is a $k \times 1$ vector of parameters (coefficient) to be estimated, and X_{it} , is a $1 \times k$ vector of observations on the independent variables, $t = 1, \dots, T$; $i = 1, \dots, N$. Equation (1), are defined as follows:

Profitability measured by ROA and ROE is the f (bank internal independent variables), bank internal independent variables are the Adequacy of Capital, Quality of Asset, Management Efficiency, Earnings ability, and Liquidity. Equation (1) can be restructured as follows:

$$ROA_{it} = \alpha_i + \beta_1 CA1_{it} + \beta_2 CA2_{it} + \beta_3 AQ1_{it} + \beta_4 AQ2_{it} + \beta_5 AQ3_{it} + \beta_6 MQ1_{it} + \beta_7 MQ2_{it} + \beta_8 MQ3_{it} + \beta_9 EA1_{it} + \beta_{10} EA2_{it} + \beta_{11} EA3_{it} + \beta_{12} L1_{it} + \beta_{13} L2_{it} + \epsilon_{it} \text{ ----- (1-a)}$$

$$ROE_{it} = \alpha_i + \beta_1 CA1_{it} + \beta_2 CA2_{it} + \beta_3 AQ1_{it} + \beta_4 AQ2_{it} + \beta_5 AQ3_{it} + \beta_6 MQ1_{it} + \beta_7 MQ2_{it} + \beta_8 MQ3_{it} + \beta_9 EA1_{it} + \beta_{10} EA2_{it} + \beta_{11} EA3_{it} + \beta_{12} L1_{it} + \beta_{13} L2_{it} + \epsilon_{it} \text{ ----- (1-b)}$$

Where *i* is the individual bank, *t* is the year, β_1 : β_{13} are the coefficients of independent variables, ϵ is the error term, and other variables are as stated in Figure 1. These equations are used by this study to define the determinants of profitability of Jordanian commercial banks. The above regression models are estimated using fixed effects model where dependent and independent variables can be correlated to each other's, taking into consideration that the research papers uses either fixed effects or random effects models to estimate panel data models. However, fixed effects model is an appropriate model that studies use at the time of concentrating on a specific set of *N* entities and the results are restricted to the behavior of these entities (Baltagi, 2005). Other studies are using Random effects model when the dependent variable is uncorrelated with the independent variables. However, this study uses the fixed effects model which is applied on all the thirteen Jordanian commercial banks who are listed in Amman Stock Exchange (Table 1) with a total observation of 91 for the period 2013-2019.

Table 1: The listed Commercial Banks in Amman Stock Exchange

Banks		Banks	
1.	Arab Bank (AB)	8.	Arab Jordan Investment Bank (AJIB)
2.	Jordan Ahli Bank (JAB)	9.	Arab Banking Corporation (Jordan) (ABC)
3.	Bank of Jordan (BJ)	10.	Invest Bank (IB)
4.	Cairo Amman Bank (CAB)	11.	Bank Al Etihad (BE)
5.	The Housing Bank (HB)	12.	Société General De Banque-Jordanie (SGDB)
6.	Jordan Kuwait Bank (JKB)	13.	Capital Bank of Jordan (CBJ)
7.	Jordan Commercial Bank (JCB)		

Source: Central Bank of Jordan, Sept 6, 2020

Analysis and Results

Each Jordanian commercial bank is ranked according to the sub-parameters of each CAMEL model's parameter, the group average of each parameter for every bank is calculated. After that, the average of these group averages is calculated to reach the composite rankings of all banks. The banks are ranked in ascending or descending order as per the individual sub-parameter. Accordingly, descriptive analysis and discussion are presented as follow:

Central Bank of Jordan required a minimum of 12% Capital Adequacy Ratio. However, the main variable that bank uses to decide the capital adequacy is the statutory minimum capital requirement. Capital to Assets Ratio and Equity to Total Assets Ratio are used to evaluate capital adequacy of Jordan commercial banks.

Table 2 shows that Société General De Banque-Jordanie Bank is with the highest average of capital adequacy ratio of 23.43 compared with other commercial banks in Jordan, the next is Arab Banking Corporation (Jordan) with an average of 20.50 and the Bank of Jordan with an average of 18.00. Bank Al Etihad stood at the lowest position with average ratio of 12.59. Equity to total assets ratio is another sub-parameter of capital adequacy, where Invest Bank has the highest average ratio of 17.04 followed by Capital Bank of Jordan with equity to total assets ratio of 16.56. Bank Al Etihad was at the bottom with an average of 10.74. By group average, the results indicate that Bank of Jordan and Jordan Kuwait Bank were at the top with a group rank average of 3.5. These two banks were followed by Arab Banking Corporation and Capital Bank of Jordan with a group rank average of 4. Bank Al Etihad stood at the lowest level with group rank average of 13.0 due to the bank's weak performance in in terms of average of capital adequacy and equity to total assets ratios compared to the other Jordanian Commercial Banks although the bank was able to keep Capital adequacy ratio above the minimum required ratio by the Central Bank of Jordan.

Table 2: Capital Adequacy Ratio during the period 2013-2019

Name of Bank	CA1		CA2		Group Rank	
	Avr.	Rank	Avr.	Rank	Avr.	Rank
Arab Bank	13.77	11	14.73	5	8	6
Jordan Ahli Bank	14.33	10	11.47	9	9.5	9
Bank of Jordan	18.00	3	16.04	4	3.5	1
Cairo Amman Bank	15.90	9	12.24	8	8.5	7
The Housing Bank	17.45	5	13.57	7	6	5
Jordan Kuwait Bank	17.83	4	16.34	3	3.5	1
Jordan Commercial Bank	13.05	12	10.85	12	12.0	10
Arab Jordan Investment Bank	16.65	7	11.15	11	9	8
Arab Banking Corporation (Jordan)	20.59	2	14.04	6	4	2
Invest Bank	16.43	8	17.04	1	4.5	3
Bank Al Etihad	12.52	13	10.74	13	13.0	11
Société General De Banque-Jordanie	23.43	1	11.08	10	5.5	4
Capital Bank of Jordan	17.07	6	16.56	2	4	2

Asset Quality is an indicator that determine the level of financial strength for all banks. Banks usually back up the probability of having bad loans through setting aside an adequate provision for loan loss. Accordingly, quality of asset is assessed by measuring the ratio of loan loss provision to total loan where lower ratio indicates that quality of bank's assets is relatively better than other banks who have higher ratio of loans-loss provision to total loans ratio. In addition, banks measure their assets quality through the weight of loans to total assets ratio and loans and advances to customers deposits ratio. This study uses the same ratios to measure assets' quality.

Regarding Loans Loss Provision to Total Loans ratio, table 3 shows that Arab Jordan Investment Bank is at the highest level with ratio average of 2.04, Jordan Commercial Bank and Cairo Amman Bank are at the next level with ratios of 2.93 and 4.16, respectively. The Housing Bank is on the lowest level with average ratio of 9.23. For Loans to Total Assets ratio, Société General De Banque-Jordanie Bank was at on the top level with ratio average of 21.36 followed by Capital Bank of Jordan with average of 30.03 and Cairo Amman Bank with an average of 31.38. Jordan Ahli Bank is on the lowest level with a ratio average of 46.62. In terms of loans and Advances to Deposits ratio, Arab Jordan Investment Bank is on the highest level with ratio average of 29.51 followed by Bank of Jordan with average of 33.38 and The Housing Bank of Jordan with average of 33.98. Invest Bank is at the lowest level with a ratio average of 68.71.

As for the group averages of the three indicators of the quality of assets, the overall quality measurements indicate that Société General De Banque-Jordanie Bank is on the top level with group average of 3.33 followed by Arab Jordan Investment Bank with ranking average of 3.67 and Cairo Amman Bank with group average of 4.0. Invest Bank is on the lowest level with average rank of 11.0 due to the weak performance in all sub-parameter ratios of assets quality.

Table 3: Assets Quality Ratios during the period 2013-2019

Name of Bank	AQ1		AQ2		AQ3		Group Rank	
	Avr.	Rank	Avr.	Rank	Avr.	Rank	Avr.	Rank
Arab Bank	6.51	08	43.89	11	43.50	05	08.00	9
Jordan Ahli Bank	8.45	11	46.62	13	54.15	07	10.33	12
Bank of Jordan	6.17	07	35.18	05	33.38	02	04.67	4
Cairo Amman Bank	4.16	03	31.38	03	44.77	06	04.00	3
The Housing Bank	9.23	13	46.03	12	33.98	03	09.33	11
Jordan Kuwait Bank	7.99	10	34.19	04	57.01	11	08.33	10
Jordan Commercial Bank	2.93	02	40.07	10	54.93	09	07.00	6
Arab Jordan Investment Bank	2.04	01	38.63	09	29.51	01	03.67	2
Arab Banking Corporation (Jordan)	5.56	04	35.38	06	59.71	12	07.33	7
Invest Bank	8.49	12	37.51	08	68.71	13	11.00	13
Bank Al Etihad	6.11	06	37.48	07	55.58	10	07.66	8
Société General De Banque-Jordanie	5.6	05	21.36	01	35.98	04	03.33	1
Capital Bank of Jordan	7.64	09	30.03	02	54.91	08	06.33	5

The present study uses Non-Interest Expense to Net Interest Income & Non-Interest Income (MQ1), The Operating Income to Total Income (MQ2) and Cost to Total Income (MQ3) ratios to evaluate Jordanian

commercial banks management efficiency which measures the management ability to use the available resources to maximize income and have an efficient use of bank's facilities to reduce costs.

Table 4 indicates that on the Non-Interest Expense to Net Interest Income & Non-Interest Income ratio, The Housing Bank is on the top position with ratio of 40.12 followed by Société General De Banque-Jordanie Bank with ratio of 42.96 and Bank of Jordan with ratio of 43.47. Jordan Ahli Bank is on the last position with 65.01. According to Operating Income to Total Income ratio, Bank Al Etihad is on the top level with average of 94.78 followed by Jordan Ahli Bank with average of 90.34 and Cairo Amman Bank with average of 90.10. However, Société General De Banque-Jordanie Bank is on the last level with average of 80.48. In terms of Cost to Total Income ratio, Capital Bank of Jordan is on the top level with average of 6.01 followed by Société General De Banque-Jordanie Bank with average of 47.77 and Arab Jordan Investment Bank with average of 52.77. Jordan Ahli bank is on the last level with an average of 78.61.

By group average of management efficiency indicators, Bank of Jordan is on the top level with group average of 4.9, followed by The Housing Bank with average of 4.33 and Capital Bank of Jordan with average of 4.67. Jordan Ahli Bank is scored on the lowest level with group average of 9.33.

Table 4: Management Quality Ratios of Banks during the period 2013-2019

Name of Bank	MQ1		MQ2		MQ3		Group Rank	
	Avr.	Rank	Avr.	Rank	Avr.	Rank	Avr.	Rank
Arab Bank	44.70	5	83.74	10	57.43	8	7.67	8
Jordan Ahli Bank	65.01	13	90.34	2	78.61	13	9.33	12
Bank of Jordan	43.47	3	90.01	4	54.39	5	4.00	1
Cairo Amman Bank	55.52	11	90.10	3	61.00	10	8.00	9
The Housing Bank	40.12	1	85.90	8	54.02	4	4.33	2
Jordan Kuwait Bank	43.76	4	83.34	11	56.87	7	7.33	7
Jordan Commercial Bank	57.59	12	81.75	12	76.98	12	12.00	13
Arab Jordan Investment Bank	49.00	7	88.66	5	52.77	3	5.00	4
Arab Banking Corporation (Jordan)	51.59	9	87.86	6	61.61	11	8.67	11
Invest Bank	53.44	10	84.79	9	55.04	6	8.33	10
Bank Al Etihad	49.09	8	94.78	1	58.27	9	6.00	6
Société General De Banque-Jordanie	42.96	2	80.48	13	47.77	2	5.67	5
Capital Bank of Jordan	45.44	6	87.10	7	6.01	1	4.67	3

Earnings Ability is a conventional parameter of a bank's financial performance which reflects the sustainability and growth of future earnings and competency to maintain earnings ability consistently. Net Interest Income to Total Loans & Advances (EA1), Non-Interest Income to Total Income (EA2) and Non-Interest Income to Total Assets (EA3) ratios are used to explain the quality of income generated out of utilizing banks assets and grant loans to customers.

In table 5, it is noticeably clear that Net Interest Income divided by Total Loans & Advances (EA1) ratio is on the highest level in The Housing Bank with average of 13.3 followed by Cairo Bank (11.83) and Arab Jordan Investment Bank (10.80). Société General De Banque-Jordanie Bank is on the lowest level (5.99). According to Non-Interest Income to Total Income (EA2) ratio, Capital Bank of Jordan is on the top position (42.23) followed by Arab Bank (33.36) and Invest Bank (32.27). Arab Banking Corporation with the average of 19.73 is on the last position. In case of Non-Interest Income to Total Assets (EA3), Jordan Commercial Bank is on the top level (49.52) followed by Invest Bank (48.34) and Capital Bank of Jordan (46.46).

The group average of the three ratios indicates that Capital Bank of Jordan is at the highest level followed by Invest Bank (5.33) and Jordan Commercial Bank (5,67). However, Société General De Banque-Jordanie Bank is on the lowest position (9.33).

Table 5: Earning Ability Ratios of Banks during the period 2013-2019

Name of Bank	EA1		EA2		EA3		Group Rank	
	Avr.	Rank	Avr.	Rank	Avr.	Rank	Avr.	Rank
Arab Bank	08.12	6	33.36	2	33.36	10	6.00	4
Jordan Ahli Bank	08.27	5	27.00	5	26.68	11	7.00	7
Bank of Jordan	10.63	4	23.79	10	23.79	13	9.00	11
Cairo Amman Bank	11.83	2	25.09	8	25.10	12	7.33	8
The Housing Bank	13.13	1	22.15	11	42.19	7	6.33	5
Jordan Kuwait Bank	07.83	7	25.99	6	44.14	6	6.67	6
Jordan Commercial Bank	06.08	12	29.34	4	49.52	1	5.67	3
Arab Jordan Investment Bank	10.80	3	23.95	9	41.93	8	6.67	6
Arab Banking Corporation (Jordan)	07.33	8	19.73	13	46.16	5	8.67	10
Invest Bank	06.42	11	32.27	3	48.34	2	5.33	2
Bank Al Etihad	07.06	9	20.64	12	46.18	4	8.33	9
Société General De Banque-Jordanie	05.99	13	26.94	6	37.40	9	9.33	12
Capital Bank of Jordan	06.56	10	42.23	1	46.56	3	4.67	1

Liquidity Management is crucial and important function of bank which represents management ability to meet its obligations. Furthermore, if liquidity is not properly utilized, the bank cannot meet its obligations, the demand on withdrawals of depositors, suffer a loss or there will be a decline in earnings. In the other hand, adequate liquidity level means that bank can get enough funds by borrowing or sell some of liquid assets. This study uses Loans to Customers Deposits (L1) and Customers Deposits to Total Assets (L2) ratios as an indicator of bank's ability in manage liquidity.

Table 6 clearly indicates that Société General De Banque-Jordanie Bank is on the top position in terms of Loans to Customers Deposits (L1) with a ratio of 27.72 followed by Jordan Kuwait Bank (45.12) and Bank of Jordan (45.36). However, Arab Banking Corporation is on the lowest level with average of 80.14. In terms of Customers Deposits to Total Assets (L2), Capital Bank of Jordan is on the highest level with average of 66.21 followed by Invest Bank (68.01) and Jordan Ahli Bank (70.86) while Arab Jordan Investment Bank is on the lowest level with average of 80.06. As for group averages of sub-parameters, Invest Bank stood on the top level with a group average of 3.5, followed by Jordan Kuwait Bank (5.33) and Société General De Banque-Jordanie Bank (4.5). Arab Jordan Invest Bank is on the lowest level with group average of 11.0 due to its weak performance in managing liquidity.

Table 6: Liquidity Ratios of Banks during the period 2013-2019

Name of Bank	L1		L2		Group Rank	
	Avr.	Rank	Avr.	Rank	Avr.	Rank
Arab Bank	61.46	7	73.89	5	06.00	6
Jordan Ahli Bank	74.40	11	70.86	3	07.00	8
Bank of Jordan	45.36	3	77.86	10	06.50	7
Cairo Amman Bank	77.79	12	77.12	9	10.50	12
The Housing Bank	59.86	6	73.50	4	05.00	4
Jordan Kuwait Bank	45.12	2	75.49	6	04.00	2
Jordan Commercial Bank	70.49	8	77.93	11	09.50	10
Arab Jordan Investment Bank	70.87	9	80.06	13	11.00	13
Arab Banking Corporation (Jordan)	80.14	13	75.65	7	10.00	11
Invest Bank	55.18	5	68.01	2	03.50	1
Bank Al Etihad	47.80	4	79.61	12	08.00	9
Société General De Banque-Jordanie	27.71	1	77.00	8	04.50	3
Capital Bank of Jordan	74.00	10	66.21	1	05.50	5

The individual ranking of banks for the years 2013-2019 is used to measure the composite rating to assess the overall ranking of Jordan commercial banks, these calculations are presented in table 7. According to CAMEL model analysis, Capital Bank of Jordan is on the top level followed by Bank of Jordan, and the Société General De Banque-Jordanie is on the third level, while Jordan Ahli Bank is on the lowest level.

Table 7: Composite Ratios Ranking of Banks during the period 2013-2019

Institution	C	A	M	E	L	Average	Rank
Arab Bank	6	9	8	4	6	6.6	7
Jordan Ahli Bank	9	12	12	7	8	9.6	12
Bank of Jordan	1	4	1	11	7	4.8	2
Cairo Amman Bank	7	3	9	8	12	7.8	8
The Housing Bank	5	11	2	5	4	5.4	5
Jordan Kuwait Bank	1	10	7	6	2	5.2	4
Jordan Commercial Bank	10	6	13	3	10	8.4	10
Arab Jordan Investment Bank	8	2	4	6	13	6.6	7
Arab Banking Corporation (Jordan)	2	7	11	10	11	8.2	9
Invest Bank	3	13	10	2	1	5.8	6
Bank Al Etihad	11	8	6	9	9	8.6	11
Société General De Banque-Jordanie	4	1	5	12	3	5.0	3
Capital Bank of Jordan	2	5	3	1	5	3.2	1

Table 8 shows that Bank of Jordan ranked as number 1 in terms of ROA with average of 1.84 followed by Invest Bank (1.54) and The Housing Bank (1.5). Furthermore, Jordan Commercial Bank is on the lowest level with ROA ratio average of 0.63. In terms of ROE, Cairo Amman Bank is on the top position with average of 11.9 followed by Bank of Jordan (11.62) and The Housing Bank (10.6). On the other side, Jordan Kuwait Bank scored on the lowest position with average ROE ratio of 5.6. The overall performance ranking of CAMEL model variables, ROA, and ROE indicates that Bank of Jordan is on the top performance level followed by Capital Bank of Jordan and then the Housing Bank. Additionally, Jordan Ahli Bank was on the last level due to the weak performance of profitability and all other CAMEL model variables.

Table 8: Overall Performance Ranking of Banks during the period 2013-2019

Name of Bank	ROA		ROE		C	A	M	E	L	Avr.	Rank
	Avr.	Rank	Avr.	Rank							
Arab Bank	01.20	7	08.10	7	6	9	8	4	6	06.71	7
Jordan Ahli Bank	00.75	11	06.34	11	9	12	12	7	8	10.00	12
Bank of Jordan	01.84	1	11.62	2	1	4	1	11	7	03.86	1
Cairo Amman Bank	01.44	4	11.90	1	7	3	9	8	12	06.29	5
The Housing Bank	01.50	3	10.60	3	5	11	2	5	4	04.71	3
Jordan Kuwait Bank	01.40	5	05.60	13	1	10	7	6	2	06.29	5
Jordan Commercial Bank	00.63	12	06.00	12	10	6	13	3	10	09.43	11
Arab Jordan Investment Bank	01.20	7	09.61	5	8	2	4	6	13	06.43	6
Arab Banking Corporation (Jordan)	01.10	9	07.64	9	2	7	11	10	11	08.43	8
Invest Bank	01.54	2	09.05	6	3	13	10	2	1	05.29	4
Bank Al Etihad	01.17	8	09.76	4	11	8	6	9	9	07.86	8
Société General De Banque-Jordanie	00.78	10	07.09	10	4	1	5	12	3	09.00	9
Capital Bank of Jordan	01.30	6	07.80	8	2	5	3	1	5	04.29	2

The dependent and independent variables in Table 9 indicates that main values for ROA and ROE over the entire period of 2013 to 2019 were at an average of 1.1777 and 8.5633, respectively. This indicates that ROE has higher mean value compared to ROA which implies that net profit before tax was at an average of 8.6% of shareholders' equity in Jordanian commercial banks. Furthermore, ROA had a mean value of 1.18 which means that banks are earning JOD 0.0118 per JOD1.00 on average as net profit before tax of total assets. However, the lowest value of ROA during the period of 2013 to 2019 is 0.5% and the highest value is 2.05%. Among independent variables, Operating Income to Total Income Ratio (MQ2) as management quality variable of CAMEL model has the highest mean value of 86.835 which implies that banks can make an average of 86.84% of their total income as operating income. Loans to Customers Deposits Ratio (L1) which is liquidity management ratio has the highest standard deviation among all explanatory variables, this is due to the big gap between the maximum and minimum values of this ratio for Jordanian commercial banks during the years 2013 to 2019 and implies greater variability in loans compared to total customers deposits among Jordanian commercial banks. Non-Interest Income to Total Assets Ratio (EA3), as an earnings ability ratio shows the lowest mean value of 1.122 which indicates that average of Non-interest income is 1.12% of total assets among banks. Cost to Total Income Ratio (MQ3) as management quality variable implies the second

highest mean value of 59.65%. In terms of Capital Adequacy, Capital to Total Assets Ratio has the highest mean of 16.80% among all capital adequacy ratios. Furthermore, Loans and advances to Deposits Ratio (AQ3) as part of the assets' quality variable has the highest mean of 49.70% compared to the other Assets Quality Ratios. However, the standard deviation of 12.156 of these ratios is the second highest standard deviation of all independent variables due to the big difference between the highest and lowest values of the same ratio of all Jordanian Commercial Banks during years 2013 to 2020.

Table 9: Descriptive Statistics - Dependent and independent variables (2013-2019)

Dependent Variables	Mean	Maximum	Minimum	Std. Deviation
ROA	1.1777	2.05	.05	.45935
ROE	8.5633	15.44	.33	2.83147
Independent Variables	Mean	Maximum	Minimum	Std. Deviation
CA1	16.7986	34.17	11.10	03.62419
CA2	13.6174	18.29	07.50	02.57495
AQ1	07.4102	15.88	02.72	02.76639
AQ2	32.8001	48.06	12.53	08.27336
AQ3	49.6836	75.48	21.81	12.15630
MQ1	49.3550	71.81	22.24	09.41656
MQ2	86.8345	96.48	66.63	05.34571
MQ3	59.6450	92.95	38.31	11.68253
EA1	08.5255	18.04	03.89	02.75353
EA2	27.1080	59.20	10.82	07.59821
EA3	01.1224	02.78	00.31	00.40175
L1	44.0532	71.60	16.94	12.22470
L2	75.1891	88.32	58.53	05.54003

Source: SPSS data analysis result

The correlation coefficients shown in table 10 are below 0.8 which indicates that research data is free from multicollinearity problems. According to (Cooper & Schindler , 2014), only variables with correlation coefficients of 0.8 and above are sign of a multicollinearity problem which must be eliminated in the regression model.

The correlation between variables shows that ROA has positive significant relation with Equity to Total Assets (CA2), Net Interest Income to Total Loans & Advances (EA1) and Non-Interest Income to Total Assets (EA3) (table 10).

Banks' profitability has positive relationship with Loans Loss Provision to Total Loan (AQ1) where quality of loans portfolio determines bank's profitability, this indicate that internal bank's resources are more important than external resources for maximizing bank's profitability. In addition, high level of assets utilizations and good quality of loans are the main drivers of profitability, this is supported by (Dang , 2011; Lui & Wilson, 2010) who argued that losses coming from bad loans are main risk that banks would bear which would highly affect Bank's performance, unlike the argument of (Rani. & Zergaw, 2017) that loans under follow-up to total loans affect negatively on bank's profitability except when bank is at unbearable risk and it has the highest strength of correlation with Equity to Total Assets (CA2). This is supported by (Masood & Ashraf, 2012) who argued that there is positive relationship between banks' profitability and higher assets management ratio. In addition, ROA has negative relationship with Non-Interest Expense to Net Interest Income & Non-Interest Income (MQ1) ratio and Cost to Total Income (MQ3) ratio. This shows that non-operational expenses should be continuously monitored where it has significant effect on bank's profitability, in the other hand, it gives an indication that banks' must give high attention to the main activities; this is supported by (Davydenko, 2010) who concluded that if non-interest expenses of bank are efficiently managed, the interest margin and income will be positively affected, he also argued that banks are incapable to pass their expenses to customers because of the competition. A study about the banks' performance by (Lipunga, 2014) concluded that management efficiency has strong effect on banks' performance as measured by ROA.

ROE has significant positive relationship with Net Interest Income to Total Loans & Advances (EA1) ratio which indicates that net-interests income generated from loans and advancements affects strongly and positively on the banks' profitability while the non-interest income to total assts (EA3) has weak effect on profitability. However, ROE has significant negative relationships with Loans to Total Assets (AQ2) ratio, Loans & Advances to Deposits (AQ3) ratio, Non-Interest Expense to Net Interest Income & Non-Interest Income (MQ1) ratio, Cost to Total Income (MQ3) ratio, Net Interest Income to Total Loans & Advances (EA1)

ratio, and Loans to Customers Deposits (L1). This shows that assets' quality is a main player in the bank's performance and survival which is supported by (Swamy, 2013) who found that incredibly low level of assets quality is statistically important indicator of bankruptcy and a high level of non-performing advances comes prior to bank's failure.

Table 10: Correlations Matrix between variables

	ROA	ROE	CA1	CA2	AQ1	AQ2	AQ3	MQ1	MQ2	MQ3	EA1	EA2	EA3	L1	L3
ROA	1														
ROE	.885**	1													
CA1	.176	.085	1												
CA2	.582**	.161	0.28**	1											
AQ1	.216*	.073	-.144	.269**	1										
AQ2	-.152	-.325**	-.487	.190	.059	1									
AQ3	-.052	-.329**	-.194	.417**	.148	.697**	1								
MQ1	-.517**	-.481**	-.38**	-.320**	-.069	.428**	.389**	1							
MQ2	-.030	-.017*	-.024*	-.014	.094	.208**	.164	.347**	1						
MQ3	-.698**	-.706**	-.423**	-.270**	.133	.505**	.369**	.688**	.216*	1					
EA1	.514**	.617**	.104	.078	.284**	-.426**	-.578**	-.316**	.171	-.268**	1				
EA2	.068	-.059	-.089	.268*	-.022	.083	.110	-.167	-.495**	-.025	-.248	1			
EA3	.402**	.207*	-.166	.523**	.229*	.230*	.275**	-.159	-.262**	.004	.069	.734**	1		
L1	-.123	-.335**	-.434**	.274**	.096	.792**	.754**	.432**	.174	.477**	-.439**	.198	.317**	1	
L2	-.085	.165	-.166	-.471**	-.156	-.229*	-.481**	-.140	.039	-.060	.202	-.446**	-.416**	-.482**	1

Source: SPSS data analysis result

** Correlation is significant at the 0.01 level (2-tailed) and * Correlation is significant at the 0.05 level (2-tailed).

Two regression analysis are undertaken to examine the relationship between ROA and ROE profitability measures and the explanatory variables. The statistical results of ANOVA test in table 11 show that ROA has F-value of 57.948 compared to the ROE F-value of 42.623 and both models have significant value of F as 0.000 which is lesser than 0.05, this show that the two models (ROA and ROE) are good measurements of banks' profitability.

Table 11: ANOVA

Model		Sum of squares	Df.	Mean square	F.	Significant
ROA	Regression	17.229	13	1.325	57.948	.000
	Residual	1.761	77	0.023		
	Total	18.99	90			
ROE	Regression	633.515	13	48.623	42.623	.000
	Residual	88.035	77	1.143		
	Total	721.55	90			

Source: SPSS statistical data analysis result

The model summary of regression results for the two profitability measurements of ROA and ROE as reflected in figure 2 exhibits that the ROA model has higher R square of 0.907 compared to the ROE R square value of 0.878 which means that 90.7% of the variance of ROA is explained by the thirteen CAMEL model independent variables which are used in this paper and still leaves 9.03% unexplained variables that have not been considered. However, the ROE model generates the lower R square among the two models, wherein the sample describes only 87.80% where the remaining 12.20% is unexplained.

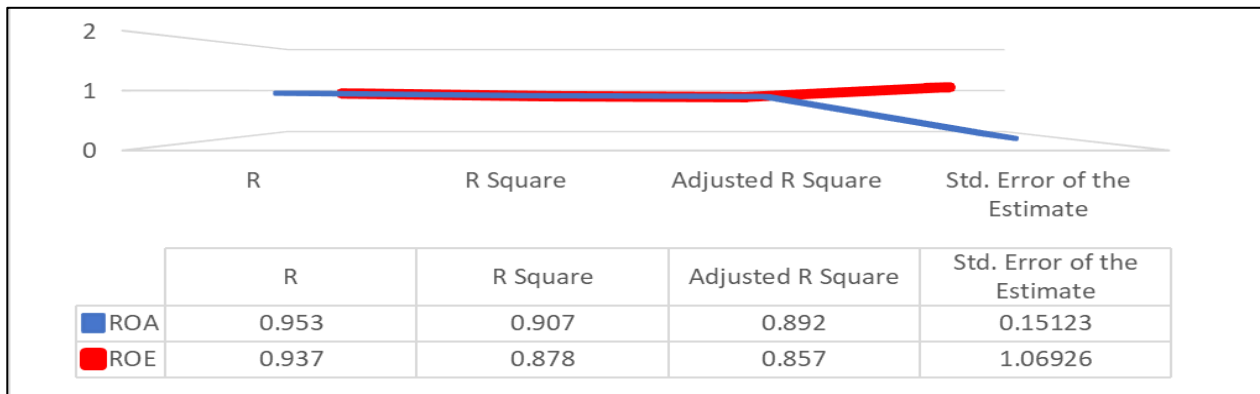


Figure 2: Regression Summary of the Dependent Variables

Source: SPSS statistical data analysis result

Statistical analysis shows that the ROA model has higher R square compared to ROE which means that ROA is more reliable measurement of profitability and is better explained by bank-specific determinants that the current study used. This implies the importance of using the ROA as a profitability measurement compared to ROE. This finding is supported by (Golin J, 2001) who demonstrate that ROA is the best measurement of bank’s profitability compared to ROE.

As per Table 12, there are five independent factors that have significant relationship with bank’s ROA and ROE, namely Equity to Total Assets (CA2), Cost to Total Income (MQ3), Net Interest Income to Total Loans & Advances (EA1), Non-Interest Income to Total Income (EA2), and Non-Interest Income to Total Assets (EA3). The current study concluded that EA3 is the most critical determinant factor in ROA and ROE models with positive impact at a 5% level of significance on Jordanian commercial banks’ profitability. This result indicates that utilizing the bank assets in making non-operational income is of an important factor that strongly affect ROA and ROE which means that banks have to monitor the non-operational profit as main driver of their performance, this supports hypothesis H11 and supported by the findings of a research paper about the bank’s performance of Mellat Bank by with applying CAMEL model conducted by (Azizi & Sarkani, 2014) who concluded that there is strong positive relationships between the indicators of earnings quality with financial execution. EA1 has significant positive relationship at 5% level of significance with the profitability of Jordanian commercial banks which supports hypothesis H9 and matches with the findings of (Saeed, 2014). Regression analysis indicates that EA2 is significantly affecting profitability measured by ROA and ROE in the negative direction. This finding supports hypothesis H10 and matches with the findings of (Anupam Mehta & Ganga Bhavani, 2017) in their study about the determinants of UAE banks’ profitability that Income from non-traditional sources has a significant impact on the banks’ performance. MQ3 has negative impact on profitability of Jordanian commercial banks with 5% level, this result indicates that banks’ profitability is highly affected by total cost of all activities, furthermore, banks must be quality oriented in their lending policy, assets management, and uses of external financial sources to control the cost of activities. This result supports hypothesis H8 and supported by (Nuhiu , Hoti , & Bektashi , 2017) who studied the profitability determinants of commercial banks in Kosovo and concluded that management efficiency is vital determinant of commercial banks’ performance in Kosovo with great effect on profitability.

Equity to total assets ratio (CA2) Significantly affect the ROE of commercial banks in Jordan with negative effect at a 5% level, this shows that the more equity the bank has compared to assets, the less profitability the bank has, this result refers to the importance of equity structure which is influenced by bank’s dividend policy and capital structure that Jordanian banks must watch closely. This result does not support hypothesis H2 which stated that bank’s profitability has positive relationship with equity to total assets ratio and supported by (Ebenezer, Bin Omar, & Syahida, 2017) who examined the effect of a set of variables on banks’ profitability in Nigeria for years 2010 to 2015 and concluded that capital adequacy is significantly affecting banks’ profitability.

Regression analysis indicates that there are no significant relationships between capital to total assets ratio (CA1) which does not support hypothesis H1 and disagree with the findings of (Idowu & Olausi, 2014) who concluded in his study about Nigerian banks’ profitability that capital adequacy has significant effects on banks’ profitability in Nigeria. This result gives an indication that Jordan commercial banks should give good attention to the capital adequacy and make balance between the use of their own resources and applying

the central bank's regulations. Statistical results also indicates that non-interest expenses to net interest income and non-interest income ratio (MQ1), operating income to total income ratio (MQ2) do not have significant relationships at a 5% level with banks' profitability, this result does not support hypotheses H6 and H7 which is unlike the findings of (Hawaladar , Lokesha, Kumar, Pinto , & Sison, 2017) who studied the commercial bank performance analysis in the Kingdom of Bahrain (2001-2015) and found a correlation between profitability and commercial banks' efficiency in the Kingdom of Bahrain. In addition, loans, and advances to deposits ratio (AQ3), and loans to customers deposits ratio (L1) have no significant relationships at a 5% level with the profitability of Jordanian commercial banks which does not hypotheses H5 and H12, respectively. However, there is no significant relationship between banks' profitability at a 5% significance level with loans provision to total loans ratio which does not support hypotheses H3 and does not match with the findings of (Heffernan & Fu, 2008) who found that loan loss provisions improved performance if the asset quality is good.

The regression test indicates that loans to total assets ratio (AQ2) does not significantly impact ROA and ROA at 5% level which indicates that loans to total assets is not a determinant of profitability and does not support hypothesis H4 although it was expected to have significant negative effect on bank's profitability except when bank is at unbearable risk levels (Rani & Zergaw , 2017). Furthermore, customers deposits to total assets ratios have no significant relationships with a banks' profitability at a 5% level. This result does not support hypothesis H13 and does not conform with the theoretical expectations of (Obamuyi, 2013).

Table 12: Summary of banks' profitability Regression results

Independent variables	Dependent Variables					
	ROA			ROE		
	Coefficient	t. value	Significant	Coefficient	t. value	Significant
CA1	-.006	-.815	.418	-.039	-.756	.452
CA2	.018	1.516	.134	-.447	-5.187	.000
AQ1	.005	.710	.480	-.035	-.682	.498
AQ2	-.001	-.046	.963	-.030	-.163	.871
AQ3	.005	1.208	.231	.039	1.234	.221
MQ1	.003	1.097	.276	.007	.357	.722
MQ2	-.005	-1.129	.263	-.016	-.564	.574
MQ3	-.030	-13.543	.000	-.208	-13.264	.000
EA1	.047	2.488	.015	.382	2.861	.005
EA2	-.028	-2.770	.007	-.212	-2.921	.005
EA3	.739	3.994	.000	5.669	4.334	.000
L1	.005	.230	.819	.040	.285	.777
L2	.004	.307	.760	.034	.330	.742

Source: SPSS data analysis result

Conclusions

This study uses the CAMEL model for ranking the average rate of the model variable values for the years 2013 to 2019 in all the listed commercial banks in Amman Stock Exchange. This analysis approach provides a simplistic analysis presentation of multi complex data regarding banks' performance as per capital adequacy, assets quality, management quality, earnings ability, and liquidity management. It is quite clear that applying an individual performance measurement would not give the right indication of bank performance. Hence, each performance criterion gives certain rank among all banks. Therefore, using CAMEL model to measure bank's performance would help in determining the performance changes of bank when occur and easily understand the reason behind deficiencies through quantifying CAMEL's ratio components.

The current study concluded that ROA is more reliable measurement of profitability than ROE, and it is better explained by the bank-specific determinants that the current study use. In addition, Non-operational profit is one of the main drivers of banks' performance in Jordan and banks' profitability is highly affected by the total cost of all bank activities. It is also concluded that Capital bank of Jordan is at the top position followed by Bank of Jordan in terms of the composite ratios ranking and Jordan Ahli Bank is at the lowest position. In addition, both banks are still at the top position level in the overall performance ranking, where Bank of Jordan is at the top level followed by Capital Bank of Jordan. Hence, the change in the ranking between the first and the second banks from the composite ranking to the overall ranking is because of profitability which is the

major player in the ranking approach. This indicates that the highly ranked banks in terms of overall performance are the best and on the top position of the list of banks in terms of financial healthiness and performance.

The results of indicate that loans and advances are the main players in banks' performance through the interest generated out of these lending activities. Furthermore, banks who utilizes their assets on all activities will result in high interest and non-interest income which is positively and significantly reflected on banks' profitability. Banks' performance will be in a higher position when they are able to plan and control their activities' cost. In addition, banks must seriously consider the cost of equity and borrowing to finance their assets. However, the findings of the present study indicates that bank-specific factors described as assets quality ratios, liquidity management ratios, non-interest expense to net interest income and non-interest income, and operating income to total income do not have significant effects on banks' profitability.

As per the findings of the current study, the researcher recommend that the Jordanian commercial banks ensure that they maintain a high-quality level of lending policy and keep good asset utilization to minimize the risk of non-performing loans and maximize the income generated from interest and non-interest returns. In addition, banks can improve their profitability through more concentration on the main activities as a main source of income and efficiently manage their capital adequacy through continuous monitoring of the cost of capital and borrowing. Additionally, the researcher recommends a continuity of using CAMEL approach and other financial models to analyze and understand what precautions should be taken before any deficiencies in the banks' performances occur and to improve the competitiveness of banks. Furthermore, the current study recommends conducting more studies on the banks' performance determinants with an expanded scope and using more financial models and arguments.

References

- Abdurezak Mohammed Kuhil. (2018). Empirical Evidence of the Impact of Bank-Specific Factors on the Commercial Banks' Performance: The CAMEL Model and the Case of Ethiopian Banks. *International Journal of Financial Management*, 8(3), 1-14. Retrieved from <http://publishingindia.com/ijfm/>
- Afolabi , B., & Adawale, A. A. (2013). Measuring Bank Performance Using The C.A.M.E.L. Analytical Technique In A Liberalized Economy; A Case Study Of The Nigerian Economy (1971-2005). *SSRN Electronic Journal*, 10.2139/ssrn.2316694,.
- Ahmad Ali Bawaneh , & Ahmad Dahiyat. (2019). Performance measurment of commercial banks in Jordan using the CAMEL rating system. *Academy of Accounting and Financial Studies Journal*, 23(6), 1-7. Retrieved from <https://www.abacademies.org/articles/Performance-Measurement-of-Commercial-Banks-in-Jordan-Using-the-Camels-Rating-System-1528-2635-23-6-497>
- Ahmeti, H., & Bekteshi. (2014). Analysis of Financial Performance in the Banking System in Kosovo - the Period 2006-2012. *Journal of Knowledge Management, Economics and Information Technology*, 4(2).
- Al Zaidanin, J. S. (2020). Bank Speccific and Macro-economic Determinants of the United Arab Emirates Commercial Banks Profitability: A Panel Data Analysis. *International journal of advanced research*, 8(11).
- Almaqtari , F. A., Al-Homaidi , E. A., & Tabash, M. I. (2018). The determinants of profitability of Indian commercial banks : A panel data approach. *International Journal of Finance & Economics*, 1–18. doi:10.1002/ijfe.1655
- Alper, D., & Anbar, A. (2011). Bank-specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey. *Business and Economics Research Journal*, 140-152.
- Altunbas , Y., Gardener , E., Molyneux, P., & Moore. (2001). Efficiency in European banking. *European Economic Review*, 45, 1931-1955.
- Anupam Mehta , & Ganga Bhavani. (2017). What Determines Banks' Profitability? Evidence from Emerging Markets-the Case of the UAE Banking Sector. *Accounting and Finance Research*, 6(1), 77-88.
- Athanasoglou , P. P., Brissimis, S. N., & Delis, M. (2005). Bank- specific, industry- specific and macroeconomic determinants of bank profitability. *MPRA Paper*, 153.
- Athanasoglou, P. P., Delis, M. D., & Staikouras, C. K. (2008). Determinants of Bank Profitability in the South Eastern European Region. *Munich Personal RePEc Archive*.

- Aydogan, K. (1990). An Investigation of Performance and Operational Efficiency in Turkish Banking Industry. *Discussion Paper*(No: 9022.).
- Azizi , M., & Sarkani, Y. A. (2014). Review financial performance of MELLAT Bank According to CAMEL Model. *A journal of multidisciplinary research*, 3(1), 32-42.
- Badola, B. S., & Verma, R. (2006). Determinants of Profitability of Banks in India: A Multivariate Ananlysis. *Delhi Business Review*, 7(2), 79-88.
- Baltagi, B. H. (2005). *Econometric analysis of panel data*. New York, NY:: Wiley.
- Bastan, M., Mazrae, M. B., & Ahmadvand, A. (2016). Dynamics of banking soundness based on CAMELS rating system. *The 34th International Conference of the System Dynamics Society*. Delft, Netherlands. Retrieved from <https://www.researchgate.net/publication/308400698>
- Bougatef, K. (2017). Determinants of bank profitability in Tunisia : Does corruption matter? *Journal of Money Laundering Control*, 20(1), 70-78. doi:10.1108/JMLC10-2015-0044
- Bourke, P. (1989). Concentration and Other Determinants of Bank Profitability in Europe, North America and Australia. *Journal of Banking and Finance*, 79, 65-79.
- Brooks, C. (2014). *Introductory econometrics for finance*. Cambridge: Cambridge University Press.
- Burger, A., & Moormann, J. (2008). Productivity in banks: myths & truths of the cost income ratio. *Banks and bank systems*, 3(4), pp. 92-101.
- Bushra , A. A., & Subhadra , G. (2017). The Impact of Mergers and Acquisitions on Financial Performance of Banks in the Kingdom of Bahrain during 2004-15. *Information Management and Business Review*, 9(4), 34-45. doi:DOI: 10.22610/imbr.v9i4.1897
- Chisti, K. A. (2012). The impact of Asset Quality on Profitability of Private Banks in India. *Journal of African Macroeconomic Review*, 2(1).
- Chowdhury , M. A., & Rasid, M. E. (2017). Determinants of performance of Islamic banks in GCC countries: Dynamic GMM approach. *Advances in Islamic Finance, Marketing, and Management*, 49-80.
- Cooper, D. R., & Schindler , P. S. (2014). *Business Research Methods* (12 ed.). McGraw-Hill Publishing Company Limited.
- Dang , U. (2011). The CAMEL rating system in banking supervision: a case study of Arcada University of applied Sceiences . *International business*.
- Davydenko, A. (2010). Determinants of bank profitability in Ukraine. *Undergraduate Economiv Review*, 7(1).
- Dietrich, A., & Wanzenrid, G. (2009). What Determines the Profitability of Commercial Banks? New Evidence from Switzerland. *12th Conference of the Swiss Society for Financial Market Researches* . Geneva.
- Ebenezer, O. O., Bin Omar, W. A., & Syahida, K. (2017). Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Emporical Evidence from Nigeria. *Journal of Finance and Banking Studies*, 6(1), 25-38.
- Ebrahimi , S. K., Bahraminasab , A., & Seyedi, F. S. (2017). The impact of CAMEL indexes on profit management in banks listed on Tehran Stock Exchange. *International Review of Management and Marketing*, 7(2), 421-429. Retrieved from <https://www.econjournals.com/index.php/irmm/article/view/4694>
- Ezike, J. E., & MO, O. (2013). Capital Adequacy Standards, Basle Accord and Bank Performance: The Nigerian Experience (A Case Study of Selected Banks in Nigeria). *Asian Economic and Financial Review*, 3(2), 146-159.
- Farooq, U., Maqbool, M. Q., Humanyun, A. A., Nawaz, M. S., & Abbas, M. (2015). An Empirical Study on Impact Liquidity Risk Management on Firm Performance in the Conventional Banking of Pakistan. *IOSR Journal of Business and Management (IOSR-JBM)*, 17(2), 110-118.
- Golin J, J. (2001). *The bank credit analysis handbook: a guide for analysts, bankers and investors* . John Wiley & Sons (Asia) Pre Ltd.
- Gulia, Y. (2014). Financial Performance Of Private Banks In India. *Global Journal for Research Analysis*, 3(9).
- Gungor, B. (2007). Türkiye'de Faaliyet Gösteren Yerel ve Yabancı Bankaların Karlılık: Panel Veri Analizi. *İktisat İşletme ve Finans*, 22(258), 40-63.
- Guru, B. K., Staaunton, J., & Balahanmugam, B. (2002). Determinants of Commercial Bank Profitability in Malaysia. *12th. Annual Finance and Banking Conferense*. Sidney.

- Han, Y. V., Kim, M. H., & Kim, W. J. (2012). Determinants of profit efficiency: evidence from Korean savings banks. *Applied Financial Economics*, 22(12), 1003-1-16.
- Hawaladar, Loksha, Kumar, Pinto, & Sison. (2017). Performance Analysis of Commercial Banks in the Kingdom of Bahrain (2001-2015). *International Journal of Economics and Financial*, 7(3), 729-737.
- Heffernan, S., & Fu, M. (2008). The determinants of Bank Performance in China. *Working Paper*.
- Idowu, A., & Olausi, A. S. (2014). The Impact of Credit Risk Management on the Commercial Banks Performance in Nigeria. *International Journal of Management and Sustainability*, 3(5), 295-306.
- Iqbal, T. H., Loksha, K., A. K., Parakash, P., & Sheila, M. S. (2017). Performance analysis of commercial banks in the Kingdom of Bahrain (2001-2015). *International Journal of Economic and Financial Issues*, 7(3), 729-737.
- Javaid, S., Anwar, J., Zaman, K., & Gafoor, A. (2011). Determinants of Bank Profitability in Pakistan: Internal Factor Analysis. *Mediterranean Journal of Social Sciences*, 2(1), 59-78.
- Kaddumi, T. A. (2017). Soundness of Jordanian Banks – Camel Approach. *International Journal of Economic Research*, 14, 119-127. Retrieved from https://www.asu.edu.jo/en/Economics/thair_lion/Documents
- Kapaya, S. M., & Gwahula, R. (2016). Bank-specific, Industry-specific and Macroeconomic Determinants of Banks Profitability: Empirical Evidence from Tanzania. *International Finance*, 3(2), 100-119.
- Khatik, S. K., & Amit, K. N. (2014). Analyzing soundness of Nationalized Banks. *Applied Studies in Agribusiness and Commerce*, 8(1), 73-78.
- Kumari. (2017). A study on the financial performance of foreign commercial banks in Sri Lanka: An application of CAMEL rating system. *Economics, Commerce and Trade Management: An International Journal (ECTIJ)*, 1(1), 59-70.
- Ihomovich, S. E. (2009). Factors Affecting the Performance of Foreign Banks in Malaysia Master of Science (Banking) College of Business (Finance and Banking), University Utara Malaysia.
- Lipunga, A. M. (2014). Determinants of profitability of listed Commercial Banks in Developing Countries: Evidence from Malawi. *Research Journal of Finance and Accounting*, 5(6), 41-49.
- Lui, H., & Wilson, J. (2010). The Profitability of Banks in Japan. *Journal of Applied Financial Economics*, 20(24), 1851-1866.
- Mamatzakis, E. C., & Ramoundo, P. C. (2003). Determinants of Greek Commercial Banks Profitability, 1989-2000. *SPOUDAI*, 53(1), pp. 94-94.
- Masood, O., & Ashraf, M. (2012). Bank-specific and macroeconomic profitability determinants of Islamic. *Qualitative Research in Financial Markets*, 4(2/3), 255-268.
- Mohammady, E. (2019). A Study on Financial Performance of Private and Public Banks in Afghanistan (2014-2017). *Asian Journal of Research in Banking and Finance*, 9(4), 8-30.
- Mohiuddin, G. (2014). Use of CAMEL Model: A Study on Financial Performance of Selected Commercial Banks in Bangladesh. *Universal Journal of Accounting and Finance*, 2(5), 151-160.
- Muhammad, S. N., & Hashim, H. B. (2015). CAMEL Framework and Bank Performance: Evidence in Malaysia. *International Journal of Economics, Management and Accounting*, 23(1), 109-127. Retrieved from <https://journals.iium.edu.my/enmjjournal/index.php/enmj/article/view/292>
- Munir, B., Salwa, U., & Bustamam, A. (2017). Camel ratio on profitability banking performance (Malaysia Versus Indonesia). *International Journal of Management, Innovation & Entrepreneurial Research*, 3(1), 30-39. doi:10.18510/ijmier.2017.314
- Mustafa, & Taqi. (2017). A Study on the Financial Performance Evaluation of Punjab National Bank. *International Journal of Business and Management Invention*, 6(1), 05-15.
- Nag, A. K., & Khatik, S. K. (2014). Analyzing soundness of nationalized Banks in India: A camel Approach. *Applied Studies in Agribusiness and Commerce*, 8(1), Nag, A. K., & Khatik, S. K.
- Nagarkar. (2015). Analysis of Financial Performance of Banks in India. *Annual Research Journal of Symbiosis Centre for Management Studies*, 3, 26-37.
- Nassreddine, G., Fatma, S., & Anis, J. (2013). Determinants of bank performance: Viewing test by cognitive mapping technique a case of Biat. 2(1), 20-35.
- Nuhiu, Hoti, & Bektashi. (2017). Business: Theory and Practice. *Determinants of commercial banks profitability through analysis of financial performance indicators: Evidence from KOSOVO*, 160-170.
- Obamuyi, M. T. (2013). Determinants of Banks' profitability in a developing economy: Evidence from Nigeria. *Organizations and Markets in emerging economies*, 4(2), 102-109.

- Olalere, O. E., & Wan, A. B. (2016). The empirical effect of Credit Risk on Profitability of Commercial Banks: Evidence fro Nigeria. *International Journal of Science and Research*, 5(8), 1645-1650.
- Ong, S. T., & Teh, B. H. (2013). Factors affecting the profitability of Malaysian commercial banks. *African Journal of Business Management*, 7(8), 649-660.
- Poghosyan Cihak, M. , T., & Cihak , M. (2011). Determinants of bank distress in Europe: Evidence from a new data set. *Journal of Financial Services Research*, 40(3), 63-184.
- Rahman , A. A., Mansor , I., & Meera , A. M. (2009). Lending structure and bank insolvency risk: A comparative study between Islamic and conventional banks. 4(2), 189-211.
- Rani, D. M., & Zergaw , L. N. (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.
- Reddy , D., & Prasad, K. N. (2011). Evaluating performance of Regional Rural banks: an application of CAMEL Model. *Journal of Arts, Science & Commerce*, 2(4), 61-67.
- Rose, P. (2002). *Commercial bank management* (International ed.). U.S.A: McGraw-Hill.
- Saeed, M. S. (2014). Bank - related, Industry - realted and Macroeconomic Factors Affecting Bank Profitability: A case of the United Kingdom. *Research Journal of Finance and Accounting*, 5(2), pp. 42-50.
- Salike, N., & Ao, B. (2017). Determinants of bank ' s profitability : Role of poor asset quality in Asia. *China Finance Review International*. doi:10.1108/ CFRI-10-2016-0118
- Siva , S., & Natarajan, P. (2011). CAMEL Rating Scanning (CRS) of SBI Groups. *Journal of Banking Financial Services and Insurance Research*, 1(7), 1-17.
- Staikouras CH, C., & Wood, G. (2003). The determinants of bank profitability in Europe. *European Applied Business Research Conference*. Venice.
- Swamy, V. (2013). Determinants of Bank Asset Quality and Profitability-An Empirical Assessment. *Munich Personal RePEc Archive - 47513*.
- Tobash, M. I. (2016). An empirical investigation between liquidity and key financial ratios of Islamic banks of United Arab Emirates (UAE). *Business and Economic Horizons*, 143, 713-724.
- Zampara, K., Giannopoulos , M., & Koufopoulos, D. N. (2017). Macroeconomic and industry-specific determinants of Greek bank profitability. *International Journal of Business and Economic Sciences Applied Research*, 10(1), 13-22. doi:10.25103/ijbesar