

# Determinants of Bank Capital Adequacy Ratio in Ghana

## Gana'da Banka Sermaye Yeterliliği Oranının Belirleyicileri

Yüksel Akay ÜNVAN, Ankara Yıldırım Beyazıt Üniversitesi, Türkiye, akay.unvan@gmail.com  
Orcid No: 0000-0002-0983-1455

*Abstract: This study explores the factors affecting capital adequacy ratio (CAR) of banks in Ghana relying on data for commercial banks spanning 2008-2017. More specifically, the study investigates the effect of bank-specific and macroeconomic factors on CAR. Evidence from the system generalized method of moments (GMM) reveals that banks' capital adequacy level is significantly driven by bank size, leverage, and broad money supply. The findings also posit that while bank profitability positively influences capital adequacy, the effect is insignificant. The study recommends the implementation of efficient policies geared towards enhancing bank size, leverage decisions, and money supply.*

*Keywords: Capital Adequacy Ratio, Commercial Banks, System GMM, Ghana*  
*JEL Classification: G21, G32, C33*

*Öz: Bu çalışma, 2008-2017 arasındaki ticari banka verilerine dayanarak Gana'daki bankaların sermaye yeterlilik oranını (CAR) etkileyen faktörleri araştırmaktadır. Daha spesifik olarak, çalışma bankaya özgü ve makroekonomik faktörlerin CAR üzerindeki etkisini incelemektedir. Sistem genelleştirilmiş momentler yönteminden (GMM) elde edilen kanıtlar, bankaların sermaye yeterliliği seviyesinin önemli ölçüde banka büyüklüğü, kaldıraç ve geniş para arzı tarafından yönlendirildiğini göstermektedir. Bulgular ayrıca, banka kârlılığının sermaye yeterliliğini olumlu yönde etkilerken, bu etkinin önemsiz olduğunu da göstermektedir. Çalışma, banka büyüklüğünü, kaldıraç kararlarını ve para arzını artırmaya yönelik etkin politikaların uygulanmasını önermektedir.*

*Anahtar Kelimeler: Sermaye Yeterliliği Oranı, Ticari Bankalar, Sistem GMM, Gana*  
*JEL Sınıflandırması: G21, G32, C33*

## 1. Introduction

A special interest has been acquired by international regulatory institutions for the capital adequacy ratio (CAR), a key regulatory instrument that is used to track and audit financial soundness of a bank (Milli et al. 2017). Capital adequacy is important for a number of reasons, according to Hewaidy and Alyousef (2018). Next, the rate of profitability of the bank is established and affected. Second, it is an instrument in minimizing operating losses and increasing the bank's investor trust, and it demonstrates banks' ability to finance its long-term capital expenditures and ventures. Due to its value, the regulator made enormous efforts towards setting a ratio to keep the assets of the banks at a certain rate. One of the most prominent of these is the Basel Group.

In 1988 the Basel Committee for Banking Supervision (BCBS) introduced the first Basel, the so-called Basel I scheme. The focus was on the identification of regulatory capital, measurement of risk-weighted assets and determination of minimum capital levels. The second Basle Agreement, named Basel II, was released as a new version of the Basel I, with three main priorities: minimum capital obligation, the audit and business regulatory names of the three foundations. Businesses must be able to maintain at least 8% of their assets under Basel I. In 2010 the Basel Banking Supervision Committee implemented, as a follow-up to three pillars in support of the banking regulation, supervision and risk management, the Third Basel Agreement, referred to as Basel III, following the economic crisis in 2008 and the collapse of financial institutions. The Basel III CAR threshold was raised from 8% to at least 10,5% of the bank's risk-weighted assets.

Banks and governments adopted over the years global banking rules, based on the Basel Committee's recommendations that the banking sector be more stable. Worldwide central banks force banks to build up clean capital and strengthen their accounts. In Ghana, for example, the Bank of Ghana as banking industry organizer raised GH to 400 million in 2017 from GH to 120 million minimum capital limit of all banks. In 2018, the number of banks operating in Ghana decreased to 23 from 34 in 2018, including domestic and foreign banks, in compliance with the list of approved banks in the Bank of Ghana 2019. The recapitalisation has been carried out in order to restore trust in Ghana and build a stable banking climate (Bank of Ghana 2018).

The Capital Adequacy Ratios of banks have increased substantially since the introduction of risk-based standards. Apart from legislation, there are other significant factors that clarify and assess the adequacy of banks' assets. Various studies of CAR banking determinants have been conducted in developed and developing countries (Ho and Hsu 2010; Abdioglu and Büyüksalvarci 2011; Al-Tamimi and Obeidat 2013; Polat and Al-Khalaf 2014; Dreca 2014; Alajmi and Alqasem 2015; Mili et al. 2017; Hewaidy and Alyousef 2018). But very little has been done to examine the factors that

### Makale Geçmişi / Article History

Başvuru Tarihi / Date of Application : 5 Aralık / December 2019  
Kabul Tarihi / Acceptance Date : 13 Ocak / January 2020

contribute to CAR banks in the case of Ghana. In contrast, debates on capital adequacy determinants are limited to bank conditions with very few studies taking macroeconomic factors into consideration.

This survey therefore seeks to bridge these literary gaps by critically evaluating CAR determinants in Ghana based on a panel of 2008-2017 results. It makes two significant literary contributions. Second, this article provides a comprehensive overview of the determinants of the adequacy of bank capital in Ghana through the extensive review of literature. Secondly, in a single formula the paper model uses recent data to identify both bank-specific and macroeconomic factors affecting CAR. Conclusion from the Generalized Moment Method (GMM) shows that the size of the account, the liquidity and big cash are essential to Ghana's bank CAR.

In the second section a summary of relevant literature is presented. The rest of the study was organized as follows: The empirical strategy is explained within Section 3. The fourth part evaluates the empirical results and the conclusion is placed in Section 5.

## 2. Literature Review

Some country-specific work is studying the determinants of the capital adequacy ratio of banks.

Moh'd al-Tamimi and Obeidat (2013) examined the key drivers of the capital adequacy rate of the listed commercial banks, for example, in Jordan, between 2000 and 2008. The analysis of ordinary lower squares led to a substantial positive impact on liquidity risk capital adequacy and equity returns. The study also found that the equity and interest rate returns greatly adversely affect the adequacy of assets.

Abusharba et al. (2013) assessed the successful capital adequacy factors for the period 2009-2011 in Islamic banks in Indonesia through a multiple regression analysis. The paper indicated a positive impact on capital adequacy on the profitability and funding of the deposit ratio. The findings also showed a significant adverse impact of non-performing lending on the capital adequacy ratio.

Wang and Ke (2013) studied the factors that affect U.S. banking assets with the GMM methodology from 1996 to 2012.

The Mekonnen (2015) used the CAR determinants in Ethiopian commercial banks by a board of eight banks with ten-year data from 2004-2013. Results from an empirical study have shown the significant positive impact on capital adequacy of bank profitability, bank deposit and account size (in terms of ROA). The ROE bank and the net interest margin had a negative impact on capital adequacy.

In 10 countries in south-eastern Europe, Aktas et al. (2015) evaluated the determinants of the capital ratio of 10 Banks using 70-bank board data for 2007 to 2012. The study found that bank size, asset return, leverage, liquidity, net interest margins, risk have an important role in the capital adequacy ratio by using General Least Squares ' technological approach in relation to a number of banking dimensional and environmental factors.

In Greece, Badalashvili (2016) investigated the factors affecting bank capital adequacy ratio over the period 2001-2015. Results from the random effects analysis showed a negative significant effect of asset structure, nonperforming loans, and unemployment on capital adequacy level.

Masood and Ansari (2016) have revealed that the equities ratio, the deposit asset ratio and the lending reserve for banks in Pakistan are positively and significantly inflationary. While credit rates and concentration of ownership have a significant negative impact on the level of capital adequacy, bank profitability, size and unperforming lending do not matter to bank capital.

Milli et al. (2017) analyzed both developed and emerging economies ' determinants of capital adequacy for 2000-2010. 310 subsidiary companies from 123 multinational banks were considered. Based on the GMM approach, economic growth had a positive impact on the rate of capital adequacy, with negative and substantial associations between real interests and capital adequacy.

Abba et al. (2018), in order to recognize significant drivers for bank capital adequacy in Nigéria, used banking information from 12 deposit-money banks listed on the Nigerian bursary (2005-2014). The analysis, which is based on models of OLS, Random and Fixed Effects, has demonstraered the positive effects on capital adequacy of Bank risk, productivity and deposits. The value of the wealth was nevertheless directly associated with capital adequacy.

In a study of 18 banks in Tunisia Ben Moussa (2018) evaluated banking capital determinant using the OLS methods. Analytical evidence has shown that the amount of Tunisian bank assets is significantly influenced by ROA, liquidity rates, international and private ownership, net interest and inflation.

During the period 2009–2016, Hewaidy and Alyousef (2018) investigated the effects on the capital adequacy of listed banks in Kuwait of the bank-related and macroeconomic factors. The results showed that bank size, liquidity and asset quality had a significant negative impact on capital adequacy rate with simple multiple regression analyzes. The study also found a major impact on capital adequacy from management efficiency.

Invoking the GMM system technique Kalifa and Bektaş (2018) analysed the impact on capital adequate ratios of Islamic banks operating in countries such as QISMUT, Kuwait and Bahrain from 2005 to 2014 from bank-specific and macroeconomic factors. We showed that bank considerations (profitability, leverage and credit risk) have a positive impact on the capital adequacy ratio. The study also showed that market capitalisation, unemployment and exchange rates have a significant influence on bank CAR as proxies of macroeconomic factors.

### 3. Data and Methodology

#### 3.1. Source of data

This study utilized a balanced panel data of 11 recapitalized banks spanning 2008 to 2017. These banks are chosen based on complete data available for this study. The data for the bank-specific variables and the macroeconomic factors are gleaned from the annual financial statements of the selected banks and the Central Bank of Ghana respectively.

#### 3.2. Selection of Variables

This research identified a number of bank and macroeconomic factors to determine their effect on the adequacy of assets, based on most empirical conclusions. Table 1 provides a complete description of each of the variables.

Table 1. Description of Variables

<i>Variables</i>	<i>Acronym</i>	<i>Explanation</i>
<i>Capital Adequacy</i>	<i>CAR</i>	<i>Bank capital expressed its risk-weighted commitments as a percentage.</i>
<i>Profitability</i>	<i>ROA</i>	<i>Net income to total assets</i>
<i>Bank Size</i>	<i>BSIZE</i>	<i>Total assets natural logarithm</i>
<i>Leverage</i>	<i>LVG</i>	<i>Total debt / Total equity</i>
<i>Broad Money Supply</i>	<i>BM</i>	<i>Broad supply of cash</i>
<i>Monetary Policy Rate</i>	<i>MPR</i>	<i>Central Bank's monetary policy rate</i>

#### 3.3. Model Specification

The character of the data allows the analysis to be carried out using the technique of panel data. The data methodology of the panel monitors human diversity due to hidden variables that can create skewed results if overlooked (Baltagi, 1995). The data model for the basic panel can be described as:

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \quad (1)$$

where  $\alpha$  is a constant,  $X_{it}$  is the dimensional vector of the explanatory factors and  $\varepsilon$  is the error term.

Following Yakubu et al. (2017) and Hewaidy and Alyousef (2018), the model for this study is listed below with some modifications:

$$CAR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 BSIZE_{it} + \beta_3 LVG_{it} + \beta_4 BM_{it} + \beta_5 MPR_{it} \varepsilon_{it} \quad (2)$$

where all variables in the model are previously defined.

A variety of panel methods are used in panel data analysis. Ordinary lower squares, fixed and random effect and GMM are common among these estimators. Nonetheless, the findings of the OLS may be non-consistent and biased given the possible presence of endogeneity. The study uses Arellano, Bover, Blundell and Bond GMM model (1998) to account for endogeneity. In this case, the lagged parameter depends on the time constant of the capital sufficiency requirement (CAR). This is supposed to affect the current CAR in the previous CAR value. This is why the research model will be reconstructed as follows:

$$CAR_{it} = \beta_0 + \beta_1 CAR_{i,t-1} + \beta_2 ROA_{it} + \beta_3 BSIZE_{it} + \beta_4 LVG_{it} + \beta_5 BM_{it} + \beta_6 MPR_{it} \varepsilon_{it} \quad (3)$$

### 4. Empirical Results

#### 4.1. Descriptive Statistics

Table 2 defines all variables, including capital adequacy, in Table 2. With peaks and minimum levels of 30.9% and 4.4%, the average ratio of the capital adequacy is 14.6 percent. This implies a capital adequacy ratio above the recommended Basel III of 10.5 percent in Ghana's commercial banks. Standard variables generally show a volatile level of monetary policy and leverage compared with capital adequacy, profitability, bank size, liquidity and large cash supply.

Table 2. Descriptive Statistics

<i>Variables</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min.</i>	<i>Max.</i>
<i>CAR</i>	<i>0.146</i>	<i>0.041</i>	<i>0.044</i>	<i>0.309</i>
<i>ROA</i>	<i>0.043</i>	<i>0.028</i>	<i>-0.047</i>	<i>0.093</i>
<i>BSIZE</i>	<i>14.283</i>	<i>0.885</i>	<i>12.070</i>	<i>16.080</i>
<i>LIQ</i>	<i>0.645</i>	<i>0.262</i>	<i>0.230</i>	<i>1.660</i>
<i>LVG</i>	<i>6.639</i>	<i>2.962</i>	<i>2.241</i>	<i>21.803</i>
<i>BM</i>	<i>9.842</i>	<i>0.680</i>	<i>8.750</i>	<i>10.810</i>
<i>MPR</i>	<i>18.450</i>	<i>4.444</i>	<i>12.500</i>	<i>26.000</i>

#### 4.2. Correlation and Multicollinearity Analysis

The correlation and regression multi-column of the sample is shown in Table 3. Kennedy (2003) explained that when the correlation coefficients exceed 0.80, the variables are very correlated. On that basis, the results show that the total correlation coefficient 0.773 does not pose a multicollinearity problem in the analysis. Therefore, VIF and sensitivity analyzes pose zero multicollinearities between the variables. According to Gujarati (2003), multicollinearity model-free variables with VIFs less than 10 and sensitivity rates above 0.10. The analyzes show 3,40 with a tolerance of 0,294 for the highest VIF value.

Table 3. Correlation Matrix and Variance Inflation Factor

<i>Variables</i>	<i>ROA</i>	<i>BSIZE</i>	<i>LIQ</i>	<i>LVG</i>	<i>BM</i>	<i>MPR</i>
<i>ROA</i>	<i>1.000</i>					
<i>BSIZE</i>	<i>0.297***</i>	<i>1.000</i>				
<i>LIQ</i>	<i>-0.123</i>	<i>-0.321***</i>	<i>1.000</i>			
<i>LVG</i>	<i>-0.400***</i>	<i>-0.207**</i>	<i>-0.104</i>	<i>1.000</i>		
<i>BM</i>	<i>0.209**</i>	<i>0.773***</i>	<i>-0.263***</i>	<i>-0.300***</i>	<i>1.000</i>	
<i>MPR</i>	<i>-0.013</i>	<i>0.520***</i>	<i>-0.039</i>	<i>-0.144</i>	<i>0.648***</i>	<i>1.000</i>
<i>VIF</i>	<i>1.35</i>	<i>2.76</i>	<i>1.22</i>	<i>1.36</i>	<i>3.40</i>	<i>1.88</i>
<i>Tolerance</i>	<i>0.742</i>	<i>0.362</i>	<i>0.820</i>	<i>0.738</i>	<i>0.294</i>	<i>0.533</i>

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

#### 4.3. Regression Analysis

The research employed a panel analytical approach to assess the factors influencing bank capital adequacy ratio. Table 4 estimates OLS, fixed and random effects and GMM process. The interpretation of the results is based on the GMM output model, so as to obtain objective results inherent in conventional panel approaches (OLS, fixed and random effects). The Sargan test was performed to check model validity. The value calculated of the Sargan test means that the instruments of analysis are accurate. There is also a serial correlation in AR (1) and AR (2). The test of Wald and the corresponding p-value show the importance and fitness of the model.

Table 4. Regression Results

<i>Variables</i>	<i>OLS</i>	<i>FE</i>	<i>RE</i>	<i>GMM</i>
<i>Lagged.(CAR)</i>				0.0400
				(0.0593)
<i>ROA</i>	0.232***	0.158*	0.203***	0.126
	(0.0726)	(0.0860)	(0.0767)	(0.0988)
<i>BSIZE</i>	-0.0191***	-0.0255***	-0.0198***	-0.0258**
	(0.00323)	(0.00763)	(0.00414)	(0.0111)
<i>LVG</i>	-0.0111***	-0.0115***	-0.0112***	-0.0116***
	(0.000669)	(0.000817)	(0.000714)	(0.00130)
<i>BM</i>	0.0173***	0.0241***	0.0183***	0.0236**
	(0.00468)	(0.00814)	(0.00523)	(0.0107)
<i>MPR</i>	-0.000334	-0.000388	-0.000368	-0.000363
	(0.000529)	(0.000516)	(0.000509)	(0.000522)
<i>C</i>	0.317***	0.349***	0.321***	0.355***
	(0.0340)	(0.0483)	(0.0357)	(0.0599)
<i>R<sup>2</sup></i>	0.811	0.758	0.810	
<i>F-Statistics (Prob.&gt; F-Stats.)</i>	89.50(0.000)	58.76(0.000)		
<i>Breusch-pagan test <math>\lambda^2</math> (Prob.&gt;<math>\lambda^2</math>)</i>			1.53(0.108)	
<i>Hausman test <math>\chi^2</math> (Prob.&gt;<math>\chi^2</math>)</i>		1.71(0.888)		
<i>Sargan test, <math>\chi^2</math> (Prob.&gt;<math>\chi^2</math>)</i>				30.97(0.663)
<i>AR(1) z (Prob.&gt; z)</i>				-0.91(0.364)
<i>AR(2) z (Prob.&gt; z)</i>				-0.47(0.637)
<i>Wald-test <math>\chi^2</math> (6) (Pro.&gt;<math>\chi^2</math>)</i>			382.38(0.000)	158.32(0.000)
<i>Observations</i>	110	110	110	88
<i>Number of Banks</i>	11	11	11	11

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Standard errors in parentheses

The lagged accurate parameter is positive from the GMM model calculation and indicates that the previous level of capital adequacy has a direct effect on the current CAR. It is noted that the impact of profitability (ROA) on CAR is positive and negligible. However, bank profitability spurs the level of capital sufficiency insignificantly implying that more profitable banks maintain a high degree of regulatory capital. The positive effect may indicate that Ghana's banks tend to hold income instead of investing it to increase their capital base and thus meet the capital requirements of the central bank. The findings are consistent with Kalifa and Bektaş (2018), which showed that the profitability (ROA) relationship with the CAR bank is a positive one.

The adequacy of capital has a significant negative impact as regards bank size (BSIZE). In other words, the growth of banks is related to a reduction of the bank capital adequacy ratio. When larger banks preserve overtime flexibility, lower capital adequacy may not necessarily affect their operations. One plausible explanation for the opposite relationship is that larger banks can access capital markets funds quickly and at lower transaction costs. Therefore, the sum of resources that larger banks hold can be overlooked. This result supports past studies (Batani et al. 2014; for example, Hewaidy and Alyousef 2018).

The leverage (LVG) of CAR is adverse and important. The capital adequacy rate falls as banks increase debt financing. This is because companies with more debt financing tend to resolve interests more by keeping less money in their vaults to meet the required demand. The analysis clashes with the data from the CAR tests of Kalifa and Bektaş (2018).

Concerning macroeconomic factors, large supplies of money (BM) have a positive and significant effect on the adequacy of bank assets. The implications are that the supply of money speeding up economic activity, resulting in more bank deposits for businesses and households. It provides "life support" to banks and allows them to retain enough money to comply with the regulatory requirement. Of note are the insignificant negative effects of the level of monetary policies of the Central Bank (MPR) on the CAR. This suggests that an increase in MPR would decrease banks' capital adequacy. As the level of the central banks is higher, MPR negatively impacts banks' ability to raise their profits.

## 5. Conclusion and Policy Implications

This research analyses the banking and macroeconomic factors affecting the rate of capital adequacy of Ghana banks using the GMM model with information covering 2008-2017. The evidence from the research shows that the effect is negligible although the profitability of the bank has a positive impact on the adequacy of bank capital. Bank size and leverage have a significant negative effect on bank capital level. As regards macroeconomic factors, the large amount of money has a positive effect on CAR, whereas the central bank's monetary policy rate is inversely connected to CAR. The results suggest banking factors (banking size, leverage), the supply of money and key factors affecting Ghana's banks' capital adequacy. The results of the study agree and contradict in some cases with previous studies. For example, while the result of profitability is in line with Kalifa and Bektaş (2018) and Mekonnen (2015) studies, it contradicts the findings of Masood and Ansari (2016) and Ben Moussa (2018). Regarding bank size the result is similar to the findings of Batani et al. (2014) and Hewaidy and Alyousef (2018). In agreement with the findings of Kalifa and Bektaş (2018), the finding evidenced a negative association between leverage and capital adequacy. The results have significant consequences in the macroeconomic sector for regulators, the management of banks and policymakers. Good policies should be enforced to increase banking volume, liquidity and money supply.

## REFERENCES

- Abba, Gabriel O., Okwa, Ene, Soje, Benedict, and Aikpitanyi, Lilian N. 2018. "Determinants of Capital Adequacy Ratio of Deposit Money Banks in Nigeria." *Journal of Accounting & Marketing* 7(2):1-7.
- Abusharba, Mohammed T., Triyuwono, Iwan., Ismail, Munawar, and Rahman, Aulia F. 2013. "Determinants of Capital Adequacy Ratio (CAR) in Indonesian Islamic Commercial Banks." *Global Review of Accounting and Finance* 4(1):159-170.
- Aktas, Rafet, Bakin, Bilge, and Celik, Gökhan. 2015. "The Determinants of Banks' Capital Adequacy Ratio: Some Evidence from South Eastern European Countries." *Journal of Economics and Behavioral Studies*, 7(1):79-88.
- Alajmi, Moeidh, and Alqasem, Khalid. 2015. "Determinants of Capital Adequacy Ratio in Kuwaiti Banks." *Journal of Governance and Regulation* 4(4):315-322.
- Al-Tamimi, Khaled Abdalla, and Obeidat, Samer Fakhri. 2013. "Determinants of Capital Adequacy in Commercial Banks of Jordan an Empirical Study." *International Journal of Academic research in Economics and Management Sciences* 2(4):44.
- Arellano, Manuel, and Bover, Olympia. 1995. "Another Look at The Instrumental Variable Estimation of Error-Components Models." *Journal of Econometrics* 68(1):29-51.
- Badalashvili, Iiona. 2017. "Determinants of Capital Adequacy Ratio in Banking Sector of Greece." Masters Thesis, International Hellenic University, Greece.
- Batani, Leila, Hamidreza Vakilifard, and Farshid Asghari. 2014. "The influential factors on capital adequacy ratio in Iranian banks." *International Journal of Economics and Finance* 6(11): 108-116.
- Baltagi, Badi H. 1995. *Econometric Analysis of Panel Data* (Vol. 2). New York: Wiley.
- Blundell, Richard, and Bond, Stephen. 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87(1):115-143.
- Büyüksalvarcı, Ahmet, and Abdioğlu, Hasan. 2011. "Determinants of Capital Adequacy Ratio in Turkish Banks: A panel Data Analysis." *African Journal of Business Management* 5(27):11199-11209.
- Dreca, Nada. (2014). "Determinants of Capital Adequacy Ratio in Selected Bosnian Banks." *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi EYİ* 2013 Özel:149-162.
- Hewaidy, Aly M., and Alyousef, Husain Y. 2018. "Bank-Specific and Macroeconomic Determinants of Capital Adequacy Ratio: Evidence from Kuwaiti Banks." *European Journal of Economics, Finance and Administrative Sciences* (99).
- Ho, Shirley J., and Hsu, Su-Chu. 2010. "Leverage, Performance and Capital Adequacy Ratio in Taiwan's Banking Industry." *Japan and the World Economy* 22(4):264-272.
- Kalifa, Wagdi., and Bektaş, Eralp. 2018. "The Impacts of Bank-Specific and Macroeconomic Variables on The Capital Adequacy Ratio: Evidence From Islamic Banks." *Applied Economics Letters* 25(7):477-481.
- Masood, Usman. and Ansari, Sanaullah. 2016. "Determinants of Capital Adequacy Ratio: A Prespective From Pakistani Banking Sector." *International Journal of Economics, Commerce and Management* IV (7):247-273.
- Mekonnen, Yonas. 2015. "Determinants of Capital Adequacy of Ethiopia Commercial Banks." *European Scientific Journal* 11(25).
- Mili, Mehdi, Sahut, Jean Michel, Trimeche, Hatem, and Teulon, Frederic. 2017. "Determinants of The Capital Adequacy Ratio of Foreign Banks' Subsidiaries: The Role of Interbank Market and Regulation." *Research in International Business and Finance* 42:442-453.
- Polat, Ali, and Al-khalaf, Hassan. 2014. "What Determines Capital Adequacy in The Banking System of Kingdom of Saudi Arabia? A Panel Data Analysis on Tadawul Banks." *Journal of Applied Finance and Banking* 4(5):27.
- Wang, Congcong, and Ke, Xinyu. 2013. "Determinants of Bank Capital: Evidence from the US." Unpublished Masters Thesis, Simon University, Canada.
- Yakubu, Ibrahim Nandom, Alhassan, Mohammed Mubarik, Mikhail, Abdul Azeez, and Alhassan, Abdul Nasiru Iddrisu. 2017. "Commercial Banks Performance in Ghana: Does Capital Structure Matter?" *International Journal of Accounting and Financial Reporting* 7(1):333-342.