DETERMINANTS OF COMMERCIAL BANKS' PROFITABILITY IN VOLATILE ENVIRONMENTS: EVIDENCE FROM GENERALIZED METHOD OF MOMENTS

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ABSTRACT

The paper is a study that assesses the prime factors that determine the profitability in the banking industry, focusing on banks in volatile environments in the MENA countries for the timeframe 2010-2019. These factors will be categorized into internal and industry external factors i.e. macroeconomics, country risk and bank related factors. As the bank's proxy for profitability, we consider the return on average equity, return on average assets and net interest margin. The empirical findings are consistent with the expected results. Political risk, credit ratings, corruption, concentration ratio and efficiency, and the economic growth have influence on bank profitability, on return on average equity, return on average assets and net interest margin.

Keywords: Volatile Environment, GMM, Bank Profitability, Banking System, Volatile Environments, GMM

INTRODUCTION

In the decade that just elapsed, Financial markets experienced volatile environments in the Middle East and North Africa countries (MENA) due to revolutions and Arab Spring. The alterations were proposed to liberalize service provisions, reduce corruption levels, strengthen the economy, increase financial markets and enhance the degree of economic stability. According to Al-Gasaymeh (2018); Levine (1997); banks are considered the most important financial institutions. They play an intermediary role and positively impact their role in capital formation and financial stability. Banks are the prime owners of financial assets (Oladejo & Oladipupo, 2011). Thus, these financial institutions are obliged to conduct proper management of liabilities and assets to sustain the growth of the economy and ensure stability through fostering the profitability of the system. To fulfill all these obligations, banks act as intermediaries between borrowers (deficit) and lenders (surplus). Masood, et al., (2015) state financial institutions such as banks play an intermediary role in the relationship between surplus (lenders) and deficit (borrowers) units. According to Banga (2013); Athanasoglou, et al., (2008); a profitable, sound, and stable banking system significantly improve the financial system and economy, which becomes a defense against adverse shocks. In addition, states that possess profit-making banking systems, which are stable, have a faster rate of improvement than countries that have weaker banking systems Levine (1997); Chen & Liao (2011) provide that profitability is considered among the most vital factors contributing to an efficient and productive banking system. The primary objective of any business is to make profits as they simultaneously provide products and services.

Similarly, banks and other financial institutions are established with the sole purpose of earning the owners profit (Aduda & Gitonga, 2011). Also, they aim towards enhancing stability in the financial system, growing the economy, and expanding. Aduda & Gitonga (2011), state that because of the operations and nature of banks, they are susceptible to risks that may potentially have adverse effects on banks' profitability. Miller (1992), explains that these risks have the capability to have adverse effects and usually end up in bank liquidation, especially if the employed strategies are not effective enough for risk prevention or reduction of potential adverse effects in case the risks cannot be controlled.

Smith (2002), states that risks are part of the bank's activities. Risk can be referred to as the recurrence of unpredictable events that are not desirable that lead to results that are uncertain (Chicken, 1996). Likewise, Aduda & Gitonga (2011) provide the description of risks as uncertainties that have the capability to result in losses or determine profitability. According to Al-Gasaymeh (2016), some of the rampant risks that banks experience include country risk, credit risk, and competition. Research shows that country risk, credit risk, and competition are among the most critical international levels. Gup et al., (2007); Drehmann et al., (2006) state that these factors are crucial since they significantly influence banks' profitability, investments, and capital.

Economies that are volatile are more susceptible to country risk, credit risk, and corruption factors. Political risk, credit risk, and corruption are important external factors that may have a critical effect on banks' profitability in volatile areas in the North Africa and the Middle East countries during Arab Spring, *i.e.,* Egypt, Libya, Syria, Iraq, Tunisia, and Yemen. A severe country risk might encourage the shareholders of banks to decrease their shares and their investments in banks which might have a critical influence on banks' profitability (Saad, 2014). This study examines whether the political risk, credit ratings, credit risk, corruption, and concentration ratios influence banks' profitability. The relevance of the study is based on the stability brought about by profitability in the banks system which in turn promotes national economic stability. Reports from World Bank (2017) with the time frame 2011-2017 portrayed the importance of profitability in volatile MENA countries. Since the last decade, it has been influential to the economy and the banking industry. The country risk refers to the political situation of instability that might affect the financial system and economic growth and is considered to be a solid indicator for the business environment (Tsai & Su, 2005).

However, banks are the most significant financial institutions in the MENA countries since governments and their citizens are highly dependent on the services offered. Middle East countries, in particular, are volatile environment countries as its effects on banks profitability. The findings of this paper may provide an important vision to the policymakers as well as bank managers in volatile environments.

LITERATURE REVIEW

The field's literature uses approaches that focus on the performance of banks, including complex composite indexes and probability ratios. Some of the prevalent performance proxies in usage include ROE (Return On Equity, which is calculated as the net profit to equity, and ROA (Return On Assets), computed as a ratio of the total assets to a net profit of the bank. The former shows the net return of the shareholder's capital investments. At the same time, the latter portrays the relative net profit that has been earned from the total bank assets and is used as an element that shows how efficiency levels of the bank's management. According to Athanasoglou et al., (2005), in comparison to ROE, the utilization of ROA includes the risks that come with leverage, which is the most significant ratio of bank profitability. The presence of the off-balance-sheet assets is a potential ROA drawback that represent as a profitable source for European banks. However, it is not considered in computing this measure. Therefore, ROE utilization is considered to be more appropriate. The determine performance levels more

accurately the utilization of average annual assets and equity values than the end year values. Therefore, we make use of Return On Average Equity (ROAE) and the return on average equity (ROAE) and the ROAA (Return On Average Assets) as parameters to measure performance. The paper breaks down the factors that have the capability to determine the profitability of banks, which include: macroeconomic and industry-related external factors and internal factors that are specifically focused on banks. Profitability is dependent on internal factors such as credit risk, business mix, bank size, financial structure, business mix, capital adequacy, credit risk is taken, liquidity risk, business mix, and income-expenditure structure. The study revealed that among the factors specifically relating to the industry include market concentration. Research on macroeconomic factors provided examples of influential factors that included inflation and economic growth. Another dependent variable is taken into account in this study is net interest margin. The net interest margin designates the differences between the bank paid interests and interest income earned or financial interest-earning assets such as cash relative to a financial institution or bank. The lenders' profitability increases with a higher NIM.

There is a significant volume of literature that pays attention to the elements that impact a bank's profitability. Some of the early studies have also focused on banks' profitability. Some of the investigations on bank profitability were done by Abbas, et al., 2019; Almekhlafi, et al., 2016. Some of the studies included several countries, while others focused on a specific state. Some of the country-specific studies focus on counties such as Greece (Mamatzakis, 2003; Alexiou & Sofoklis, 2009); India (Badola & Verma, 2006); China (Heffernan & Fu, 2010); America (Berger, 1995); Japan (Lui & Wilson, 2010); Switzerland (Dietrich & Wanzenried, 2009); Brazil (Afanasieff et al., 2002); Taiwan (Ramlall, 2009); Croatia (Kundid et al., 2011); Czech Republic (Horvath, 2009);Tunisia (Naceur, 2003); Philippines (Sufian & Chong, 2008); Pakistan (Javaid et al., 2011); Korea (Sufian, 2011);Turkey (Sayilgan & Yildirim, 2009).

Since factors such as credit risk, country risk, corruption had been introduced and analyzed briefly. It is necessary to discuss the relationship between country risk, credit risk and profitability. Several studies from Khan & Satta (2014); Bourke (1989) indicate that profitability is particularly a matter dependent on both external and internal determinants. According to Masood, et al., (2015); Dietrich & Wanzenried (2011); Sufian (2011); Athanasoglou et al., (2008) internal factors are unique to each bank, but some include credit risk, cost efficiency, working expenditure, efficiency in management, capital adequacy and the size of the bank. Furthermore, the country risk, credit risk, corruption and competition have an influence on the financial sector. This also includes a significant level of Non-Performing Loans (NPL), increasing inflation and low Gross Domestic Product (GDP). Risk that portrayed a significant effect on a performance and profitability in the bank sector was credit risk and political risk. The strength of the financial system is profitability. The financial system can be considered the backbone of the economic structure of a country. Thus, this study aims at analyzing the effects of competition, credit risk, corruption, and political risk on a state's banking sector, especially in volatile environments – the backbone of every country's economic structure. Therefore, this study seeks to analyze the impact of country risk, credit risk, and competition on profitability in the volatile environments country banking sector.

Furthermore, political risk, credit risk, corruption, and competition influence the financial sector and this includes a high volume of Non-Performing Loans (NPL), low Gross Domestic Product (GDP), and increasing inflation. Political and credit risk are the two types of risks that significantly affected banks' profitability and performance. The cornerstone of the entire financial system is profitability which is an integral part of the financial system country's economic structure. Therefore, this study seeks to analyze the impact of political risk, corruption, credit risk, and competition on profitability in the volatile environments country banking sector.

The debate question in this study is: Does political risk, credit ratings, corruption, credit risk, and competition in volatile environments region affect the profitability of banks? Thus, the

paper aims to fill the literature gap in determining the impact of political risks, credit risks, corruption, and competition to which commercial banks are exposed to and their impact on the financial profitability of the commercial banks in volatile environments.

METHODOLOGY

The methodology used in the research is based on the works of Goldberg & Rai (1996); Berger (1995); Claeys & Vander (2008) to examine the determinants of bank profitability in volatile environments in the MENA countries. It pays attention to political risk, credit ratings, corruptions, and concentration rations, and GMM procedure utilizes the dynamic panel data approach. The GMM model offers several advantages. For example, the dynamic panel has the capability to recognize cross-sectional variations and time in the model. The model also helps to prevent bias in cross country regression. The method can use instrumental variables to generate estimators that are more accurate and precise. The final advantage is that this method is beneficial, especially for a panel with a more significant number of cross-sections annually with a low number of years. GMM approach was coined by Arellano & Bond (1991) and then was further developed by Bover & Arellano (1995); Bond & Blundell (1998).

Banks that generate loans through incorporating term deposits ought to be well-established financial institutions that employ long term strategies. Their historical performance and decisions should be reflected on their ongoing performance. According to Matthews (2010), this should be considered in any study focusing on the determinants of profitability. Therefore, the following represents the dynamic behavior of the determinants of banks profitability after considering ROA, ROE and NIM lag off as written as follows:

$$\mathcal{D}_{it} = \alpha\mathcal{D}_{i,t-j} + \beta_1 X_{1it} + \beta_2 X_{2it} + \delta_1 SX_{1it} + \delta_2 + \sum_{t=2010}^{2019} \tau_t Time_t + \eta_i + v_{it} \qquad (1)$$

where $\mathcal{D}_{it}$ represents the dependent variables namely, ROA, ROE and NIM respectively and the $\alpha ROA_{i,t-j}$, $\alpha ROE_{i,t,-j}$ and $\alpha NIM_{i,t,-}$ are lagged dependent variables and assumed to be predetermined and X_{1it} and X_{2it} are not strongly exogenous (endogenous) or predetermined bank and country-specific variables respectively. It is believed that SX_{1it} (Political risk, Credit ratings, corruption, and Concentration) and X_{2it} ((Inflation, GDP per capita, Efficiency, and Credit risk) are strictly exogenous bank and country-specific variables, respectively. In addition, *i=1....88, t* is time as *t*=2010…2019, and *k* reflects six states as *k* =1…6. Including time in the equation, which indicates, the vector of time dummy variables? The explanatory variables and their expected is as explained earlier. The assumption is that the error term ($\varepsilon_{it} = \eta_i + v_{it}$) follows a one-way component model. η_i is an unobserved firm-specific time-invariant effect which allows for heterogeneity in the main of the $ROA_{it}, ROE_{it}, and EPS_{it}$ series across individuals where $\eta_i = IID(\sigma_v^2)$.

Including the lagged dependent variables in Eq. (1, 2 and 3) shows a correlation between the error term and the regressors because of the lag of firm $ROA_{it-1}, ROE_{it-1}, and NIM_{it-1}$, depends on $\varepsilon_{it} - 1$. Evidence of lagged dependent variables implies that random effects, fixed effects and OLS are inconsistent and biased for a fixed time period (T) with the enlargement of the number of firms (*N*). According to Blundell & Bond (1998), the OLS estimator would show an upward estimate of the coefficient. On the other hand, the within-group estimator would be downward biased. To deal with variables that are correlated with the error term, it is recommendable to instrument them. Therefore, due to this correlation, the estimation of the dynamic panel data in Eq. (1) is a subject to Nickell (1981) bias, which will only be removed if *T* approaches infinity of it becomes larger.

To manage the issue of endogeneity, the Generalized Method of Moments (GMM) coined by Arellano & Bond (1991) and later extended by Blundell & Bond (1998) was used in the study. This estimator is made for data that is set with a large number of individual

observations (N) over a limited number of time periods (T). Arellano & Bond (1991) coined a General Method of Moments estimator that makes use of instruments whose is dependent on orthogonality between the erros and the lagged values of the dependent variable. This method eradicates the unaccounted bank heterogeneity by conducting an estimation of the equation in the initial-differences and control for potential problematic issues of endogeneity by utilizing the model's variables which are lagged by at least one period as instruments. The paper provides a study that utilizes the GMM estimator as Bond & Arellano (1991) proposed to make sure the estimations are consistent and efficient.

Baltagi (2009) argues that the parameters are kind of the same in an asymptotical manner if the ε_{it} is iid. However, Bond (2002) proposes that the two-step results are more preferable to the one-step result because his simulation studies discovered the inefficiency of the two-step estimator when the asymptotic standard error is less efficient is the minute or the asymptotic t-ratio is vaster. Thus, there exists a bias correction for the standard errors in the two-step estimators (Windmeijer, 2005). Windmeijer (2005) states that the one-step GMM is not as good as the two-step GMM performance in providing an estimation of the coefficients, with standard errors and lower bias. The two-step standard errors with the correction work well and are superior to the cluster strong one-step estimation. Hence, this study would use the one-step, two-step difference and system GMM in the multifactor model at a baseline level.

Definitions and Explanations of the Variables

This study focuses on volatile environments in the MENA regions. We provide an examination of environmental conditions influence on bank profitability in the banking industry. Some of the considered environmental variables that are taken into consideration include; corruption, credit risk, political risk, macroeconomic conditions, credit rating, concentration ratio and efficiency. This paper incorporates an annual bank-level data that is not balanced of conventional and Islamic operation in the volatile environments in MENA states namely, Egypt, Libya, Syria, Iraq, Tunisia and Yemen, in a time frame between 2010 to 2019. Bank financial statements were collected from the Bureau van Dijk's company Bankscope database. Euromoney database was used as the source of the country risk index. The study utilized the World Development Indicator (WDI) databases, the World Bank and the IMF Financial Statistics (IFS) databases to derive the macroeconomic variables.

Table 1 reports the dependents and independents variables that were utilized in the study. The profitability of the bank's financial system always depends on stable environment countries with low political risk. Moreover, Political risks arise between nations in terms of politics, social policy, geography, economic structure, and currency. In other words, changes in government and conditions of economic instability or other non-economic factors can render the banking sector ineffective (Meldrum, 2000; Aseel & Al-Gasaymeh, 2018). The level of freedom from corruption is used as a measure of Economic freedom and this measure is selected as it influences bank profitability and its relevance in providing an explanation of the discrepancies in bank's profitability in the selected MENA states. According to Holmes, et al., (2008); Chortareas, et al., (2012); the higher the level of profitability and per capita GDP, the higher the level of economic freedom.

Among the most significant variables that have an impact on banks' profitability is credit risk. This element portrays the likelihood of loss due to the debtor's failure to address its responsibilities to the bank. Texts usually express this by the ratio of gross or net loans to loan loss reserves that banks grant. Based on research from Al-Gasaymeh (2016); we anticipate for an adverse impact on profit of the possible losses from bad quality loans. This study uses the proxy of income to cost ratio for management efficiency since the higher the operating costs the lower the profitability of banks. Therefore, based on provisions of Gasaymeh, et al., (2014); a negative relationship is a potential outcome. The bank profitability is not only dependent on

assets in the balance sheets. Significant off-balance-sheet assets are evident in banks in the MENA regions that bring in operating income, which has a positive influence on the net gains, therefore accumulating the profitability. Based on findings Alexiou & Sofoklis (2009); the study uses is the ratio of the average bank assets to the other operating income (Table 1).

Table 1 DEPENDENT AND INDEPENDENTS VARIABLES			
Symbol	**Variables**	**Proxy**	**Expected Sign(+/-)**
Dependent variables			
ROAA	Return on average assets	Net profit/average assets	
ROAE	Return on average equity	Net profit/average common stock equity	
NIM	Net Interest Margin	Net Interest Income/Total Assets	
Independent variables			
Political risk	Country risk	0-15	+/-
Credit ratings	Country risk	0-15	+/-
Corruption	Economic freedom		+/-
Concentration ratio HHI	Market concentration	Herfindhal-Hirschman Index	+/-
Efficiency	Management Efficiency	Cost to Income ratio	-
Credit risk	Non-Performing loan		
Inflation	Inflation	Inflation, GDP deflator (annual %)	+/-
GDP Growth	Economic Growth	GDP per capita Growth (annual %)	+

Source: Author calculation

According to Sufian & Chong (2008) market concentration is proxied by the Herfindahl-Hirschman Index (HHI). Herfindahl-Hirschman Index is computed as the total market share squares of banks. HHI accounts for each bank's share in the market and   is the most appropriate concentration index as it provides an account for the market share of each bank and attaches importance to the firms of more considerable share sizes. There lies an uncertainty in relation to the bank. Several studies by Berger (1995); Pilloff & Rhoades (2002) test hypotheses regarding the effects of the structure of the local market on bank performance measures particularly on ROE and ROA. However, most of the works do not consistently support the approach that there exists a direct relation between profitability and concentration. Herfindahl index increases suggest market power increase and a decline in competition and an increase of market power, whereas a decrease in HHI suggests an inverse result. In contrast, Al-Gasaymeh (2018); an Al-Gasasymeh (2016) investigate the country risk effect, competition and economic freedom on the efficiency of banks in the Gulf Corporation Countries and found that states with country risk which is low and low concentration have efficient performance.

Macroeconomic conditions are an external influence to profitability of banks. The economy's growth represented through the GDP (per capita) growth carries several consequences such as a significant increase in business activity. The increase of granted loans and interest margins as well as customer deposits has an affects banks' profitability positively. Sufian & Chong (2008) state that a decrease in economic activity leads to a decline in loan demands and deposits which results in an adverse effect on the profit margins. The rate of inflation is a macroeconomic factor that relates positively to the profitability of banks. High inflation rates dictate the increase of loan interest rates which leads to increased levels of bank profitability. However, Al-Gasaymeh (2016) states that we ought to note that rates of inflation are not predictable it might cause an increase in costs of finance and impact the profitability of banks.

Table 2 demonstrates the empirical variables in the descriptive statistics utilized in this study. From the data, it is evident that banks in South Asia earned approximately 1% ROA, net interest margin was around 15% and ROE was at least 14%. Other significant indicators included, the cost of fund average was slightly more than 6.6%, and the non-performing loan to total loan ratio was significantly high recoding at least 8%. Also, the off-balance sheet income appeared to be good meaning there was proper diversification of bank operations in the area. Herfindahl-Hirschman Index that is over 13% provides the evidence that the banking industry in the area was fairly competitive.

Table 2 DESCRIPTIVE STATISTICS			
Variables	Mean	Median	Standard Deviation
Dependents Variables Return on assets (ROAA) Return on Equity (ROAE) Net Interest Margin (NIM)	0.965 13.045 10.233	1.154 14.432 15.654	4.324 12.453 5.343
Political Risk	12.987	18.876	8.934
Credit Ratings	7.238	11.324	7.978
Non-Performing Loan	8.787	12.876	24.876
Corruption	2.876	8.1654	11.365
Concentration ratio	0.145	0.898	0.153
Efficiency	0.884	0.700	1.464
GDP per Capita	5.889	5.254	3.643
Inflation	7.076	7.876	4.763

Source: Author calculations

Within the specified timeframe inflation was in single-digit (7%) which appears to be satisfactory. The average growth rate of the Gross Domestic Product in this region was at least approximately 5%.

Table 3 below provides a description of the sample banks' distribution by type for every state. All these countries have conventional and Islamic banks; suggest the selected states practice diverse banking operations that serve as an advantage to the states. This may suggest that these banks operate in an environment will monopolistic competition since there has not been no increase or decrease in the number of banks.

Table 3 ISLAMIC AND CONVENTIONAL BANKS, 2010–2019											
Country	Bank Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total Banks
Egypt	Conventional	14	14	14	14	14	14	14	14	14	14	14
	Islamic	5	5	5	5	5	5	5	5	5	5	5
Libya	Conventional	8	8	8	8	8	8	8	8	8	8	8
	Islamic	3	3	3	3	3	3	3	3	3	3	3
Syria	Conventional	12	12	12	12	12	12	12	12	12	12	12
	Islamic	4	4	4	4	4	4	4	4	4	4	4
Iraq	Conventional	15	15	15	15	15	15	15	15	15	15	15
	Islamic	5	5	5	5	5	5	5	5	5	5	5
Tunis	Conventional	8	8	8	8	8	8	8	8	8	8	8
	Islamic	2	2	2	2	2	2	2	2	2	2	2
Yemen	Conventional	9	9	9	9	9	9	9	9	9	9	9
	Islamic	3	3	3	3	3	3	3	3	3	3	3
All countries	Conventional	66	66	66	66	66	66	66	66	66	66	66
	Islamic	22	22	22	22	22	22	22	22	22	22	22

(Source: Bankscope)

From Table 4 shows the country risk variable represented by risk in politics range between zero and twenty-five with less risk being represented by the higher value. The political risk in selected countries is similar except for Syria is the lowest while Egypt compared to the selected countries has the highest. The level of competition level in all countries is almost similar. Where, Table 3 shows that corruption is low in most of the countries. However, Iraq has a considerably high level with an average value score of 39. Credit ratings in Egypt and Tunis averaged 8.10 and 8.89, respectively, which are significantly high. Yemen inflation level is the highest recording 12.98.

Table 4 ENVIRONMENTAL CHARACTERISTICS BY COUNTRY, 2010–2019								
Country	Bank Specific Variables		Country Risk				Macroeconomic Variables	
	Efficiency	Concentration Ratio	Political Risk	Credit ratings	Credit Ratings	Corruption	GDP	Inflation
Egypt	4.783	0.87	13.33	7.55	8.10	55.45	0.66	6.45
Libya	4.320	0.79	10.22	6.56	5.50	52.22	1.22	7.33
Syria	3.432	0.83	8.23	4.56	4.23	45.76	2.88	8.34
Iraq	4.323	0.90	10.18	5.45	4.88	39.65	3.23	4.87
Tunis	2.343	0.68	14.76	8.86	8.89	68.65	0.88	7.98
Yemen	1.223	0.45	9.87	4.89	4.65	42.45	0.34	12.98

(Source: Bankscope, Heritage foundation, Euromoeny Database, and Worldbank database.)
Political Risk ranges between 0 and 25 with the higher value representing less risk.
Credit Rating Range between 0 and 10 with the higher value representing less risk. Corruption Indices range between 0 and 100 with the higher value representing the higher freedom. Hence, less corruption,

RESULTS AND DISCUSSION

This part of the study provides a deeper look into the determining factors of resulted bank profitability from results from Equation 1,2 and 3 estimations emphasizing on the role of political risk, corruption, credit ratings, credit risk and competition level utilizing the Generalized Method of Moments technique.

We have done tests of specifications of AR (2) to find out the serial correlations and Hansen test to validate the tool that has been incorporated. As shown, the Hansen tests show that it is statistically 10% insignificant which shows the empirical model is specified appropriately since there is no evidence of autocorrelation in the instruments and transformed residuals utilized in the models are valid, respectively. Conditions that are additional such as the difference in Hansen tests are considered to be insignificant from a statistical approach.

The significant lagged dependents co-efficient variables $\alpha ROA_{i,t-j}$, $\alpha ROE_{i,t-j}$ and $\alpha NIM_{i,t-j}$ assert the character of dynamism of the model specification, therefore becoming a justification for the utilization of the dynamic panel data model estimation. More so, the two-step system GMM is strongly against autocorrelation and heteroskedasticity. Also, it utilizes more instrumental variables compared to two-step difference GMM resulting to estimators that are more efficient. In addition, the significantly high coefficient of lagged dependent variable ROA_{t-1} (0.5467), ROE_{t-1} (0.4653) and NIM_{t-1} (0.2326) are a confirmation of a dynamic model that imply that inefficiencies experienced in the past have a significant influence on the current inefficiencies.

After estimation, all models with dependent variables namely ROA, ROE and NIM, the results remain the same for all models as shown in Table 5 and 6. The challenges in autocorrelation and heteroscedasticity and autocorrelation are dealt with using the two-step system GMM that is strong and incorporates less of the two-step difference GMM and more instrumental variables. This means that the two-step GMM estimator is more efficient and robust estimators. Moreover, the lagged dependent variable with a highly significant coefficient

is an affirmation of the use of the dynamic model, which indicates that the inefficiencies that have been experienced in previous times have an impact even on the future and current times. The two system GMM results is interpreted and show political risk, as expected, has a negative value (-0.0034, -0.0022, and -0.0033) on ROA, ROE and NIM respectively and is significant at 1 %. According to Saini & Bates (1984); this implies that lower risks in volatile environments establishes a conducive environment in which banks perform better based on sustained growth of the GDP, stability and currency equilibrium. The credit rating has a value that is positive and significant at 1% level (-0.0013, -0.0007 and -0.0065) respectively, which suggest that the credit risks have a major influence on banks' profitability in volatile countries. Moreover, Credit ratings led to alterations in bond prices and asset demands that influence bank profitability, since banks incur more interest charges due to low ratings (Cantor & Packer, 1996; Reisen & Von Maltzan, 1999). In addition, due to government debt in the financial system, credit ratings have a negative effect on the performance of banks.

Further, after measurement of credit risk by non-performing loan it is evident that ROA and credit risk have a negative relationship. The relationship with ROA suggests that the bank profitability is lower when credit risk is higher. The plausible reason for the negative relationship between credit risk and profitability is because of increase in non-performing loans of the banks will reduce the bank profitability. The credit risk presented by non-performing loans negatively correlates with the NIM and ROE which indicates that credit risk is an effective risk indicator. Management of credit risk becomes simpler when following proper guidelines, meaning there is no need to develop a system which will help lower the expected costs. Previous studies from Ruziqa (2013); Beck, et al., (2013); are consistent with the result from this study as it found and adverse relationship between performance and credit risk.

The negative coefficient of corruption is (-0.0045, -0.0078 and -0.0087) respectively and statistically significant at 1%. Economically, this is evidence which indicates that free from corruption countries improved transparency and governance quality to protect shareholder interests; this would help the banking sector profitability and lower the costs. Miles, et al., (2006) provides that states with low level corruption have more equitable treatment and better efficiency in regulation. A country with corruption incurs additional costs *via* distortions. Hence, as seconded by Sufian & Majid (2012) it is anticipated that a negative coefficient for corruption freedom because corruption negatively affects profit since it brings uncertainty and insecurity into established economic relationships.

	ROA$_{t-1}$		ROE$_{t-1}$		NIM$_{t-1}$	
Variables	**Coefficient**	**Robust Std. Err.**	**Coefficient**	**Robust Std. Err.**	**Coefficient**	**Robust Std. Err.**
Dependent Variables	0.6345***	0.0546	0.0459***	0.0653	0.4342***	0.004
Political Risk	-0.0056***	0.002	-0.0045**	0.001	-0.0045***	0.004
Credit ratings	-0.0033***	0.006	-0.0064***	0.000	-0.0044***	0.003
Non-Performing loan	-0.0065***	0.071	-0.0034***	0.022	-0.0024***	0.052
Corruption	-.0045***	0.001	-0.0033***	0.000	-0.0233***	0.004
Concentration ratio	0.3124***	0.052	0.2212***	0.054	0.2412***	0.024
Efficiency	-0.0003***	0.003	-0.0002***	0.067	-0.0012***	0.057
GDP per capita	-0.008***	0.0005	-0.0007***	0.000	-0.0012***	0.001
Inflation	0.0021**	0.002	0.0012	0000	0.0014	0005
AR (1)	-4.34***		-3.67***		-3.34***	
AR (2)	0.65		0.76		0.65	
Hansen test	14.76		6.54		8.76	
Difference (null H=exogenous)	9.56		10.55		11.35	

Table 5
ONE STEP SYSTEM PANEL GMM REGRESSION OF BANK PROFITABILITY DETERMINANTS

Wald chi2	312.05***		287.98***		287.98***	
No. of observations	735		735		735	
No. of instruments	32		32		34	
No. of Group	88		88		88	

ROA_{t-1}, ROE_{t-1}, and NIM_{t-1} are independents variables respectively.
***, **, * Significant at 1%, 5%, and 10%, respectively;
Sargan is the *p*-value for the Sargan test for the validity of the over-identifying restrictions for the GMM estimates
AR(2) is the *p*-value for the test for 2nd order autocorrelation for the GMM first-difference estimate residuals

Focusing on concentration ratio as predicted, concentration ratio co-efficient value is positive (0.2212) and is significant statistically which implies that completion has a positive impact on profitability levels (Matthews et al., 2007; Gasaymeh et al., 2014; Yildirim & Philippatos, 2007; Al-Muharrami et al., 2006). Competition plays a pivotal role in decreasing concentration, which would consequently increase profitability (Chortareas et al., 2012). According to Yildirim & Philippatos (2007) moreover, reduced bank margins and improvement of profitability was seen to be related to the degree of competition (Yildirim & Philippatos, 2007). Akbas (2012) states that the negative significant coefficient of efficiency (-0.0002) implies that a country improves bank efficiencies as cost to income decreases if operation costs are higher to bank incomes, the level of bank profitability lowers.

Table 6
TWO-STEP SYSTEM PANEL GMM REGRESSION OF BANK PROFITABILITY DETERMINANTS

Variables	ROA_{t-1}		ROE_{t-1}		NIM_{t-1}	
	Coefficient	Robust Std. Err.	Coefficient	Robust Std. Err.	Coefficient	Robust Std. Err.
Dependent variables	0.5467***	0.0354	0.4653***	0.0243	0.2326***	0.0135
Political Risk	-0.0034***	0.006	-0.0022***	0.007	-0.0033***	0.000
Credit ratings	-0.0013***	0.009	-0.0007***	0.001	-0.0065***	0.005
Non-Performing loan	-0.0043***	0.034	-0.0067***	0.009	-0.0078***	0.098
Corruption	-.0012***	0.000	-0.0078***	0.007	-0.0087***	0.005
Concentration ratio	0.4531***	0.044	0.2786***	0.044	0.2667***	0.009
Efficiency	-0.0001***	0.000	-0.0039***	0.043	-0.0009***	0.071
GDP per capita	-0.003***	0.0035	-0.0067***	0.008	-0.0027***	0.004
Inflation	0.0099**	0.0009	0.0033	0003	0.0052	0008
AR (1)	-5.44***		-2.97***		-5.87***	
AR (2)	0.95		0.34		0.32	
Hansen test	13.75		4.87		5.34	
Difference (null H=exogenous)	8.66		12.65		11.54	
Wald chi2	213.05***		357.91***		324.58***	
No. of observations	735		735		735	
No. of instruments	32		32		33	
No. of Group	88		88		88	

ROA_{t-1}, ROE_{t-1}, and NIM_{t-1} are independents variables respectively.
***, **, * Significant at 1%, 5%, and 10%, respectively;
Sargan is the *p*-value for the Sargan test for the validity of the over-identifying restrictions for the GMM estimates
AR(2) is the *p*-value for the test for 2nd order autocorrelation for the GMM first-difference estimate residuals

The study discovered that the rate of inflation and gross domestic product growth and inflation rates have an effect on the profitability of banks. As it was predicted, inflation has a positive influence on bank profitability which also means that although bank clients did not anticipate inflation, bank managers, on the other hand, effectively predicted the future rise of inflation rates. This earned profit in MENA banking due to the presence of asymmetric data. We provide proof to the hypothesis that banks in expansionary economies operate their business in less risk environments and therefore charging their customers less. Therefore, we came to the

conclusion that the negative coefficient of Gross domestic growth rate is a factor that can affect a bank's profitability.

CONCLUSION

Using GMM methodology to study the determinants of profitability in the banking industry in a volatile environment in the MENA countries, the study considers as proxy for banks profitability ROAA and ROAE and (NIM) for 88 banks operating in this region as from 2010 to 2019. After analyzing the effect of the most important variable in the MENA region: the political risk on banks' profitability was considered a major risk, after controlling for different banking factors. The results show a negative impact of political risk on banks' profitability especially in selected volatile MENA region. It is therefore to true to conclude that empirical findings are almost and the expected results maintain consistency in the volatile MENA region. Thus, the Political risk has an adverse effect on a bank's capability to make earn profits whereas, the controlling of the seven most important variables (credit ratings, credit risk, corruption, concentration ratio, efficiency, GDP and inflation) are significant and influence bank profitability in volatile MENA countries. Therefore, as a policy recommendation for decision-makers and authorities in volatile areas such as selected countries in this study, we suggest better supervision for the banking industry and unstable macroeconomic factors in the MENA region. This supervision may increase profitability levels in banks to give banks the capability to survive in unstable institutions. Supervision will also allow banks to fulfill their role in fostering the growth and development of the economy through funding individuals, governments and economic sectors, in the volatile MENA region.

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