Bank profitability, financial stability, and economic growth: Evidence from North Africa

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Abstract

This study aims at investigating the relationship between bank profitability, financial stability, and economic growth in North Africa. This region has a lot of investments and a continuous increase in economic growth rates. This will be done by applying panel data to estimate the time series and cross-sectional data from 2007 till 2019 on a sample of four countries. The researcher chose Egypt, Algeria, Morocco, and Tunisia and exclude Libya because of a lack of data. This was investigated GMM test through depending on some variables such as the order of law, corruption index, and GDP per capita growth rate besides other financial indicators such as bank costs to total assets, and deposits to GDP. Therefore this paper resulted in the positive relationship between financial stability and economic growth. In other words, the increase in bank profitability resulted in more stability in banks and thus an increase in growth rates only in the short run not in long run.

Keywords: bank profitability, financial stability, North Africa, growth rates

ملخص البحث:

تهدف الدراسه الى دراسه العلاقه بين الاستقرار المالى، ربحيه البنوك ، والنمو الاقتصادى فى دول منطقه شمال افريقيا. وقد تم اختيار تلك المنطقه حيث تتشابه فى كثير من الاحوال الاقتصاديه والسياسيه والاجتماعيه مع بعضها البعض ولكن تم الاعتماد على 4 دول فقط من اصل خمسه واستبعاد ليبيا وذلك بسبب قله المعلومات المتوفره حول ليبيا والتى ترجع الى سوء الاحوال الاقتصاديه والسياسيه بها فى الفتره من 2007 حتى 2019. وقد تم الاعتماد على الطريقه العامه للحظات الاحصائيه من خلال االعتماد على بعض المتغيرات مثل معدل نمو الناتج المحلى الاجمالى، قوه تنفيذ القانون ومعدل الفساد الى جانب بعض المؤشرات الماليه مثل نسبه الودائع الى الناتج، نسبه تكاليف البنوك اى الاصول ، . خلصت الدراسه الى ايجابيه العلاقه بين الثلاثه متغيرات فى دول شمال افريقيا على المدى القصير وليس الطويل مما يؤدى الى ضروره توفير الكثير من السياسات الاصلاحيه فى تلك الدول.

1. Introduction

One of the main aims of economists as well as accountants is to maximize profits. The maximizing profits principle is achieved financially through banks and their financial situation. Therefore مthe study will extend from the micro-level on one bank or many banks to the whole sector indicators in countries of North Africa. The recent political and economic circumstances became effective for maximizing the banks` profits in the international banking sector. That sector is affected by the internal and external factors in the environment which it operates in (Mokni & Rachdi, 2014). The relationship between finance and growth is regulated by structural factors as debt, legal environment, and economic development.

Therefore the study will tackle the relationship between financial stability - in the respect of bank profitability - and economic growth in North Africa.

2. literature review

The literature review will deal with two paths as the first one is the relationship between finance and economic growth, the second path is the relationship between financial stability and economic growth.

2.1 finance and economic growth

Finance plays an important role in reallocation of resources in an efficient way beside enhancing savings in reducing risks and maximizing profits (Ang, 2008). The relationship between finance and economic growth was studied in the respect between economic growth and stock market, central bank, and banks. Through enhancing investment in the financial sector, economic growth can be achieved in developed countries (Bumann, et al, 2013).

Much literature supports the positive relationship between finance and economic growth as (King & Levine, 1993) found that financial development should be associated by capital accumulation, and growth rates. Also in stock markets, liquidity was used to show the positive link between economic growth and financial development in 30 countries (Demirgüç-Kunt & Maksimovic, 2002). Also that link was

studied depending on volatility in the stock market as conducted by (Arestis & Demetriades, 1999) on 12 countries. That study resulted in a positive relationship between financial developments and economic growth. In linking the economic growth to finance, many other factors that were key determinants as stock market value to GDP (Levine & Zervos, 1996),

In studying the relationship between finance and economic growth, banks were the main actor that used to measure the financial development. This was done through some indicators as bank deposits to GDP, foreign investments in stock market to GDP.

2.2 financial stability and economic growth

Any crisis that economy faces affect the financial stability that is affected by economic growth and financial stability. Therefore more profits, more stable environment- whether political or social- may affect the economic growth (Flannery & Ranhan, 2008) . Thus many literatures (Claeys & Schoors, 2007) link the financial stability in banks with the economic growth that help in predicting with any distortions that may affect the bank's profitability (Klein & Weill, 2018). This supports the theory by Schumpeter that found that any firm needs funds in order to finance the innovations and its developments. Banks can act as firms in that aspect and funds are the profitability of the banks (Creel et al, 2015).

But others criticized the positive link between both – economic growth and bank profitability, as in case of crises as financial crises (Rancière, Tornell, & Westermann, 2008) or pandemics as COVID-19, the financial stability and economic growth are very high and stable. Therefore we can`t accept the positive relationship between economic growth and financial stability in all cases and all counties.

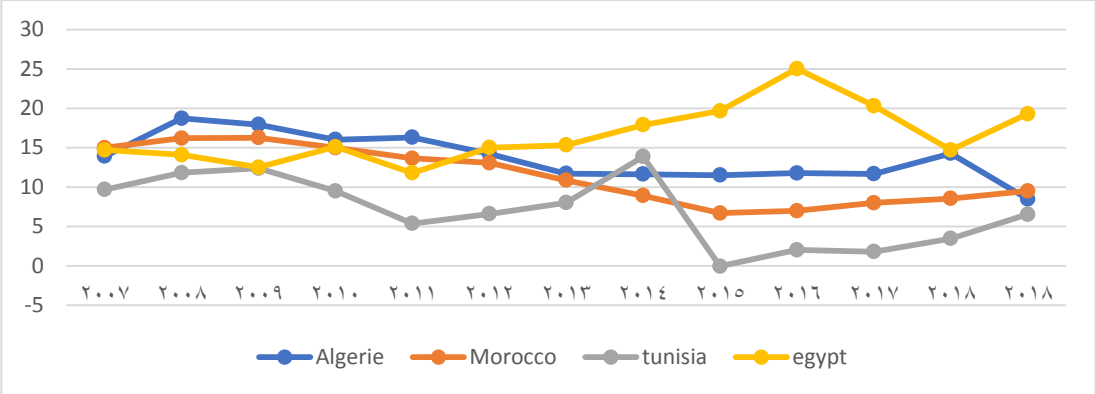
Regarding the financial indicators, (Goddard, et al, 2004) linked the financial stability to competition and collusion between European banks and that can be achieved by some indicators as return on equity (ROE), and capital adequency ration (CAR). Also high leverage and

the lending growth can affect bank profitability and financial stability in the short-run (Reinhart & Rogoff, 2014).

3. Data trends

Through depending on world bank financial indicators, that data extracted for the four countries from 2007 to 2019 where the data for all variables were availabe. Figure 1 shows the raw statistics for ROE for the 4 countries as the highest was in Egypt and the lowest in Tunisia.

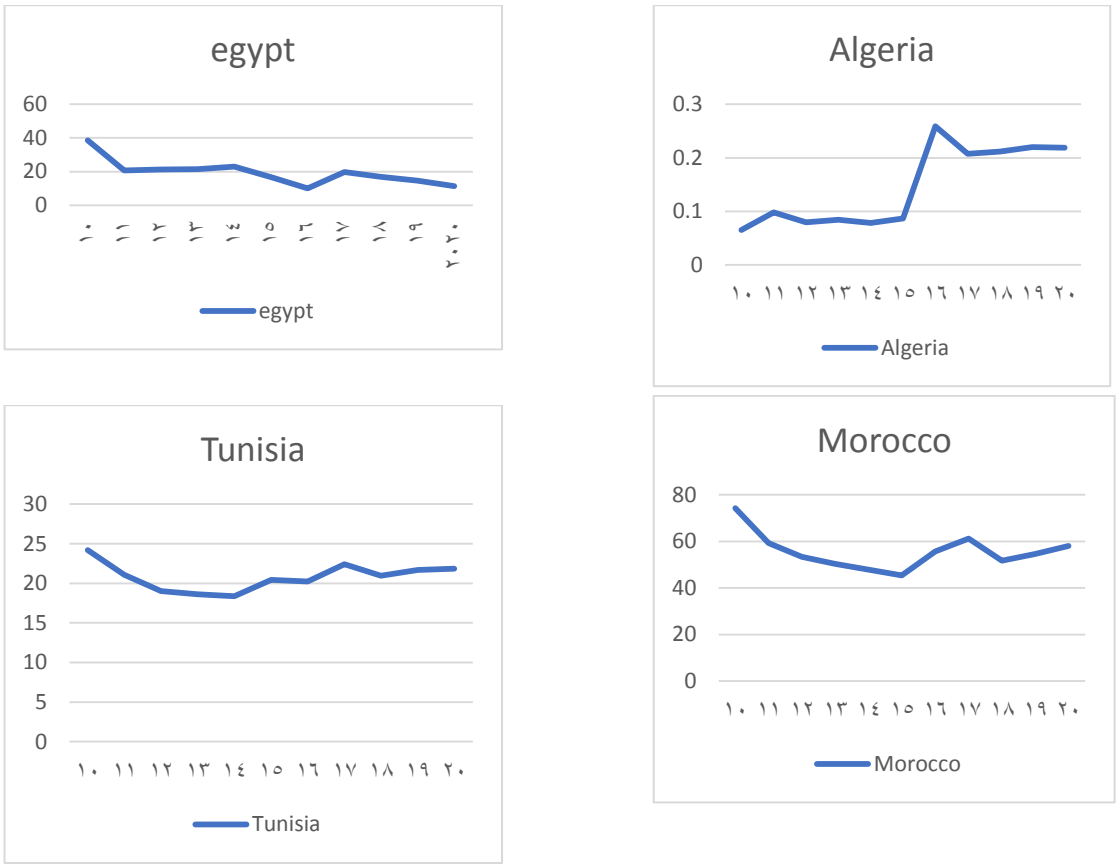
Figure 1 ROE in North Africa



Source: authors 'estimation

Regarding stock capitalization to GDP, figure 2 shows the development of stock market capitalization from 2010 to 2020 in the 4 countries. Morocco recorded the highest stock capitalization to GDP as it reaches its maximum in 2010 with 74% then it fluctuates with the period 2010-2020. Then comes Egypt in the second position then which decreases over time to reach 11.3% in 2020. Tunisia comes in third place then Algeria in the last one.

Figure 2: stock capitalization to GDP (2010-2020)



Source: authors` calculations

4. Methodology

As this paper will study the casual relationship between economic growth and bank profitability, the research will be based on two types of data: profitability and economic growth, as well as how bank profitability would contribute to economic growth in Egypt in light of financial inclusion adaptation.

4.1. Data

The data for this study are taken from the World Development Indicators (WDI), the World Bank financial development indicators, and the International Monetary Fund (IMF) yearly reports. This study

covers the North Africa as it has many similar economic, cultural and financial circumstances between its countries. The researcher depends on only 4 countries that are Egypt, Algeria, Morocco, and Tunisia and exclude Libya because of lack of data. The analysis covers the years 2007 to 2019. Panel data of eight observations were utilized that resulted on 412 observations for all variables.

4.2. Variables

The variables are depending on GDP per capita (growth rate) and some profitability variables as bank concentration, percentage of costs to assets, deposits to GDP, return to equity (ROE) and stock capitalization to GDP. Also other variables were used as control variable that were used in some literatures in understanding the relationship between bank profitability and economic growth as corruption index and rule of law

The literature review supported the use of some variables that may affect profitability that affects the bank profitability in many studies. (Naceur & Ghazouani, 2007) studied the relationship between financial development and economic growth and depended on net credit and liquid liabilities in measuring the profitability of bank. Also (Herwartz & Walle, 2014) found that one of the most variables to measure bank profitability is broad money (M2) as percentage of GDP as it was applied on a study of 73 developing countries. Moreover Net domestic credit was reliable in studying the financial development and economic growth in the EU countries (Deltuvaitė & Sinevičienėb, 2014).

The authors used ROE in studying the profitability of banks because many studies as (Nacceur & Ghazouani, 2007; Kim et al, 2017; Khan, 2011; Shihadeh & Liu, 2019; Mirzaei et al., 2013; Unnikrishnan et al, 2014) used it but none of them tried to link it to economic growth. So the authors used some measures as bank concentration, percentage of

costs to assets, deposits to GDP, return to equity (ROE), and stock capitalization to GDP as shown in table 1

Table 1: List of variables

Variable	Notion	Source
GDP per capita growth rate	GDP	World bank development indicators
Bank concentration	BCON	World bank financial development indicators
Order of law	LAW	World Bank
Corruption index	COR	World Bank
Stock capitalization percentage of GDP	STKGDP	World bank financial development indicators
Deposits to GDP	DGDP	World bank financial development indicators
Bank Costs to total assets	Cassets	World bank financial development indicators

Regarding GDP per capita growth rate, that study depended on the data available from the World Bank financial development (WFD) and World development indicators (WDI) from 2007 to 2019. These variables will be provided on an annual basis as the dependent variable.

4.3 econometric analysis

4.3.1 Johnsen cointegration test

In order to investigate the stationary of the data in each country, the paper began with an assumption that all data are stationary at the first level and translated in the following equation

$GDP= \beta_0+ \beta_1 ROE + \beta_2 DGDP+ \beta_3 BCONC + \beta_4 CASSET + \beta_5 STKGDP+ \beta_6 CORR+ \beta_7 LAW+ \mu$ ----------Equation 1

4.3.2 Linear Regression test

Although the results of the regression is easy to compute and very clear, its results are biased. In order to avoid the bias of results and autocorrelation, the authors conducted a fixed effect GMM test.

4.3.3 Generalized method of moments (GMM)

This study will depend on dynamic panel estimation for the North Africa countries in order to investigate the profitability of banks and to address the endogeneity issue. This issue was developed by using the GMM method (Arellano & Bover, 1995). The author depends on one-step GMM rather than differentiated GMM in order to decrease bias and consistency in the first difference estimator, especially in a short period with a small number of countries (Sinha & Sharma, 2015). Also, this method proved its efficiency in avoiding heteroscedasticity second-order autocorrelation in eviews 12.

5. Results and discussion

5.1 Descriptive statistics:

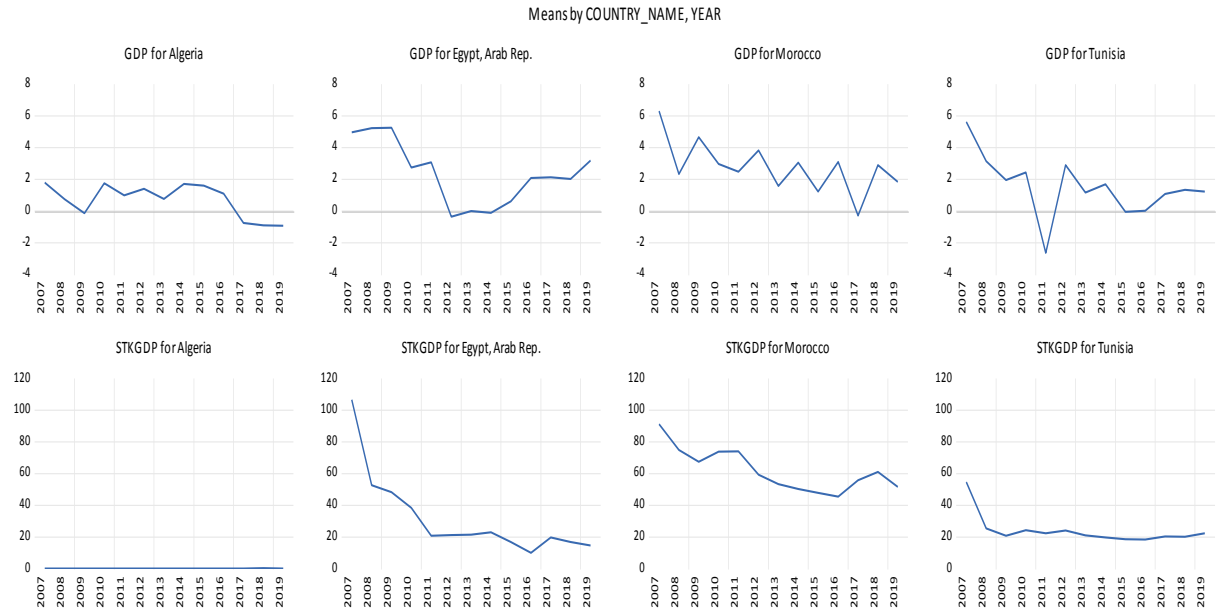
table 2 shows the 4 countries' descriptive statistics as mean, median, max, and min. as these countries are characterized by fluctuations in growth rate with increasing growth rate till 2014 (Algeria) or morocco at 2015) or decreasing in Tunisia since 2012 till now or Egypt with highly and continuous increasing growth rates since 2015. This was reflected in the mean for these variables reaching its maximum of 6.3% in Morocco and a minimum of -2.6% in Tunisia.

Table 2 Descriptive statistics

	Mean	Median	Maximum	Minimum	N
GDP	1.844573	1.728623	6.321998	-2.6403	52
BCONC	69.04219	69.43528	99.20553	40.21897	52
CORR	40.97577	39.57345	57.34597	23.78641	52
CASSETS	1.94998	1.854091	4.069375	0.970259	52
DGDP	63.88352	58.16933	90.1588	41.27208	52
ROE	12.16845	12.43489	25.00861	-0.0588	52
LAW	41.85996	48.3333	59.24171	18.75	52
STKCAP	29.44372	21.14721	106.7741	0.0534	52

Source: authors` calculations

Figure 1 Means of GDP and STKGDP by country



Source: authors` calculations depending on table 2

Also, the maximum for branches happens in Egypt. Morocco recorded the maximum DGDP, and BCON only. Finally, Tunisia has the highest corruption which is 57.3 percentile rank. Also in figure 1 shows that the highest GDP per capita is in Morocco in 2007 and the lowest in Tunisia in 2011

5.2 unit root test

A unit root test is conducted in order to test the stationary of data. Augmented Dickey-Fuller test ADF was as considered as the most appropriate method in measuring the cross-sectional at level and first differences (pesaran, 2007; Paparoditis & Politis, 2018). The unit root test resulted in the stationary of data at the first level I(1) as shown in table 3.

Table 3 Unit root results

	Level		1st difference	
	Intercept	Intercept and trend	Intercept	Intercept and trend
GDP	ADF:10.0.17 PP:24.3953***	ADF:7.50250 PP:26.3654***	ADF: 21.4661*** PP:53.3749***	ADF:21.3340*** PP:55.0847***
BCONC	ADF:4.23082 PP:7.08650	ADF:5.88401 PP:8.31287	ADF:14.2931* PP:22.2592***	ADF:8.33798 PP:21.2318***
CORR	ADF: 24.8638*** PP: 15.9620**	ADF: 21.8239*** PP: 10.4111	ADF:29.1062*** PP:36.8527***	ADF:19.7013** PP: 43.5674***
ROE	ADF:7.46624 PP:5.87295	ADF:6.70361 PP:12.0666	ADF:15.8380** PP:36.7520***	ADF:9.87308 PP:28.0481***
CASSET	ADF: 7.68805 PP:15.8161**	ADF:10.1276 PP:20.2272***	ADF: 13.0367 PP:46.1946***	ADF:6.16720 PP:40.2128***
DGDP	ADF:10.5459 PP:10.4381	ADF:3.51977 PP:2.78015	ADF:10.7052 PP: 28.2142***	ADF: 14.9522* PP:45.4751***
LAW	ADF:11.4889 PP:9.92120	ADF:5.56594 PP:3.94975	ADF:16.6077** PP:27.4321***	ADF:13.5221* PP:25.6677***
STKCAP	ADF:9.32324 PP:58.9969***	ADF:4.55756 PP:41.9120***	ADF:23.4959*** PP:61.9044***	ADF:20.0921** PP:48.9830***

* Significant at 10%, ** significant at 5%, ***significant at 1%

Source: authors` calculations

5.3 Correlation cointegration:

In conducting the correlation between GDP economic growth rate and bank profitability most of the correlation are positive. There is positive correlation between growth rate and DGDP, BCONC, STKCAP, LAW, and ROE. It is clear that there is low negative correlation between CORR and COST/ASSET as shown in table 4.

Table 4: Correlation results

Correlation								
t-Statistic	GDP	BCONC	ROE	STKCAP	DGDP	CASSET	CORR	LAW
GDP	1							
BCONC	0.076492	1						
ROE	0.186773	-0.088084	1					
STKCAP	0.628431	0.157615	-0.042382	1				
DGDP	0.388184	0.330246	0.090863	0.765890	1			
CASSET	-0.014851	0.214338	-0.733951	0.289189	0.125510	1		
CORR	-0.018850	0.078465	-0.662134	0.242493	0.157381	0.689545	1	
LAW	0.396050	-0.010096	-0.502906	0.612023	0.413287	0.700590	0.715738	1

Source: authors` calculations

5.4 generalized methods of moments (GMM)

GMM is one of the tests that was used in many other studies on bank profitability. The results show that the relationship between GDP and ROE is significant only using GMM at none level. In OLS panel at fixed effect test, a lower value for GDP was estimated at 0.23% as shown in table 5. The only significant for value that expresses the relationship between ROE and GDP at 0.89% that support the assumption – in most literatures (Bond, et al, 2001; (Campbell, et al, 2006) - of reliability of GMM system. In other words, an increase in GDP by 1% will increase ROE by 0.89% over the period of 12 years.

Also it is clear that the past level of GDP (-1) - which is insignificant- won`t contribute to that relationship over the run.

Finally the results prove that there is insignificant relationship between bank profitability and GDP per capita growth as there are statistically insignificance between GDP, and profitability variable as bank concentration, stock capitalization to GDP and, deposits to GDP. The only significance in the short run is between GDP and bank profitability is expressed through the capital to assets and corruption index in the North Africa region.

Table 5: OLS & GMM results

Variable	OLS	Panel (FE)	GMM system	GMM (FE)
GDP	0.405917 (1.048)	0.230926 (0.498)	0.893870* (1.69)	0.318099 (0.788)
GDP(-1)	-	-	-	0.541645 (1.4)
DGDP	0.063708 (1.262)	0.185477** (2.09)	0.231918*** (3.85)	-0.163704 (1.22)
CORR	-0.136933* (-186)	-0.146645* (-1.741)	-0.027709 (-0.278)	-096960 (-0.64)
CASSET	-3.190410*** (-2.856)	-1.146550 (-0.71)	-3.5744579** (-2.31)	-2.361822 (-1.34)
BCONC	-0.012087 (0.364)	-0.009810 (-0.223)	0.063926 (1.40)	0.121899* (1.8)
LAW	-0.035909 (0.405)	0.106732 (-0.976)	0.069202 (0.57)	-0.539185*** (-4.023)
STKGDP	-0.004460 (0.122)	0.075752 (1.26)	-0.312426*** (-3.12)	-0.074904 (0.894)
C	21.65097 (6.52)***	15.51371*** (3.09)	0.893870* (1.696)	24.79144** (2.268)
N	412	412	412	384
Adjusted R^2	0.582165	0.520601	0.196473	0.707216
F	11.15109***	3.614908***		-------

Conclusion:

As this paper was examining the relationship between economic growth – in terms of GDP per capita- and bank profitability depending on different measures examined in different literatures, it was considered the first study that tackles the North Africa region away from the MENA region as a whole. The paper was recognized as the first to study North Africa using GMM method and its fixed effects. The empirical results show statistical insignificant between GDP per capita and profitability on the short run but they are positively significant in long run.

This paper includes many variables that most studies in different areas whether in MENA, or through the country level as USA (Abbas, et al, 2019; Abbas, et al, 2021), Ghana (Gyamerah & Amoah, 2015). The gap of that study lies in the lack of data in some countries as libya or some data in certain variables as net performining loans as an important factor for bank profitability. For further study, it will be very beneficial to link the bank profitability with economic growth in the light of financial inclusion in North Africa region.

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