

Bank Specific, Industry Concentration, and Macroeconomic Determinants of Egyptian Banks' Profitability

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Abstract

This paper aims to explain the elements that affect banks' profitability in the Egyptian banking sector during the period from 2006 to 2015. The researcher uses unbalanced panel annual data for 26 working banks in the Egyptian market. Generalized methods of moments (GMM) estimators are applied to define the most affected factors. Return on assets (ROE) and the return on equity (ROA) have been used as measurements of bank profitability. The findings of the study reveal that high profitability are associated with large bank size, large capital ratio and large operating income, while lower profitability is associated with higher non-interest income. As macroeconomic variables do affect profitability significantly, the researcher suggests that macroeconomic strategies that encourage low inflation and sustain growth rate, enhances loans expansion, boost banks' profitability.

Keywords: Profitability Determinants, Banks, GMM estimator, Egypt

1. Introduction

The financial system plays a substantial role in greasing and facilitating the economic operations. Banks as a main player of any financial system play a major role in collecting funds and transfer it into investments. Banks as a financial intermediation support economic growth by transforming saving and deposits into productive investments (Levine et al., 2000). Accordingly, banking sector contributes strongly to the stability of the financial system. As banks are influenced by variety of factors including both the internal and external factors that have an immediate impact on its performance. The more the bank is profitable, the more it contributes positively to the economy of a nation. Therefore, this paper investigates the bank

specific, industry specific and macroeconomic determinants of Egyptian banks' profitability.

In order to achieve the research goal, the paper is organized as follows: Section 2 reviews the existence literature concerning the determinants of bank profitability, Section 3 depicts the research design and methodology, Section 4 presents the data analysis and results of the empirical analysis. Section 5 includes the conclusion of the research and implication. Section 6 presents research limitation.

2. Literature Review

Reviewing the literature asserts that considerable number of studies are concentrated on exploring the variables influencing bank profitability. However, the previous studies take two approaches. The first one focused on a single country to explore bank profitability determinants such as (Alper & Anbar 2011; Kanwal & Nadeem 2013; Owoputi et al., 2014; Samad, A., 2015; Abel & Le Roux 2016; Mehta & Bhavani 2017). The second approach examines bank profitability determinants of a panel of countries such as (Bashir 2003; Pasiouras & Kosmidou 2007; Mirzaei & Mirzaei 2011; Olson & Zoubi 2011; Capraru & Ilnatov 2015; Petria et al., 2015; Menicucci & Paolucci 2016). As this study aims to investigate the determinants of Egyptian banks' profitability, therefore the literature survey will focus on similar studies of a single country to facilitate the comparison between the findings.

Alper & Anbar (2011) analyze the determinants of the banks' profitability in Turkey between years 2002 and 2010 using fixed effect panel regression model to find that bank total assets and non-interest income has a positive effect on bank profitability, while loans to assets has an inverse relation with profitability. Concerning macroeconomic variables, the real interest rate has a positive effect on profitability, while GDP growth rate and inflation rate didn't have significant effect on profitability.

Olweny & Shipho (2011) evaluate the influence of bank-specific factors on profitability in Kenya. A total of 38 Kenyan commercial banks are financially analyzed between 2002 and 2008. The findings show that capital adequacy, income diversification and liquidity are positively significant with bank profitability, whilst operational costs efficiency, asset quality, and market concentration are negatively significant. On the contrary the impact of foreign ownership has no effect on Kenyan banks.

Kanwal & Nadeem (2013) examine the effect of macroeconomic factors on commercial banks' profitability in Pakistan covering a time horizon from 2001 to 2011. They employ Ordinary Least Square (OLS) technique. They use return on assets (ROA), return on equity (ROE) and equity multiplier (EM) as dependent variables. The findings demonstrate that real interest rate is positively significant with all measures of profitability. GDP has inverse relation with ROE and EM only, while it is insignificant with ROA. Concerning inflation rate it was found negatively correlated to the three measures of profitability. Therefore, they suggest that macroeconomic factors have a strong effect on banks profitability.

Adeusi et al., (2014) investigate the factor affect the profitability of Nigerian banks with a sample of 14 banks covering the period from 2000 to 2013. They employ ROA as a proxy for profitability and selected bank-specific, industry-specific and macroeconomic indicators.

Their findings show that total loans to the total assets, interest income to interest expenses, and GDP growth have the most significant effect on banks' profitability. They also find that capital adequacy, liquidity risk and inflation have no significant effect.

Almazari (2014) Analyses the factors affecting banks' profitability in two countries Saudi Arabia and Jordan. They aim to explain the differences and similarities between banks profitability in order to make a comparison between banks in the two countries. He uses twenty three banks, nine of them are Saudi banks and fourteen are Jordanians for the period of 2005-2011. The result of the study shows that all selected factors such as, liquidity risk, credit risk, total investment to total assets ratio, adequacy ratio, net loans to total deposits ratio, cost income ratio and the bank total assets have statically significant impact profitability in both countries.

Chinoda (2014) investigates the determinants of banks' profitability in Zimbabwe during the period from 2009-2014. They use a sample of five commercial banks, using return on assets and return on equity as dependent variables. The results indicate that liquidity, size, inflation, GDP growth rate are positively related to ROA, while expenses management is inversely related to ROA. Liquidity and expense management are negatively related to ROE, while size and inflation have a strong positive relationship with profitability.

Owoputi et al., (2014) assess the determinants of the Nigerian banks' profitability from 1998 to 2012. They use three dependent variables (ROA, ROE, and NIM) as proxies for bank profitability. The results of the study show that capital adequacy, assets size, productivity growth and deposits ratio are positively related to profitability, while credit risk and liquidity ratio are inversely related to profitability.

Tariq, et al., (2014) explore the effect of banks determinants on banks' profitability in Pakistan covering the period from 2004 through 2010. They use a sample of seventeen commercial banks employing fixed effect technique. The results declare that well-capitalized banks achieving higher profitability. Loans to assets ratio also have a significant positive correlation with both returns on equity and net-interest margin. The study also indicates that bank total assets are positively related to profitability, while bank free services and banks debt to equity are negatively affect profitability.

Rahman et al., (2015) evaluate both internal and external factors affect banks' profitability in Bangladesh on a sample of 25 commercial banks from 2006 to 2013. The research result demonstrates that capital adequacy and loan intensity are positively related to profitability. The findings also show that cost to income has an inverse impact on profitability. Non-interest income, credit risk and real GDP growth are positively correlated to NIM. Bank size positively affects ROA, while inflation has an inverse relation with ROA and ROE.

Samad (2015) investigates the determinants of banks' profitability in Bangladesh. He employs random effect regression model to investigate this relationship. The results implies that only loan-loss provision to total assets is negatively related to profit, while other variables such as liquidity risk, loan to deposit ratio, credit risk, capital risk, and bank efficiency are positively related to profitability of Bangladesh banks.

Abel & Le Roux (2016) examine the factors that affect the banks' profitability in Zimbabwe

covering the period from 2009 to 2014 using the fixed effects model. They use the rate of return on assets (ROA) and the rate of return on equity (ROE) as measures for profitability. The results of the empirical analysis show that bank size, credit risk, capital adequacy, total expenses to total assets and inflation rate are negatively related to both ROE and ROA. Furthermore, liquidity risk has been found positively correlated to profitability. Accordingly, they suggest that bank's profitability can be improved by increasing assets quality, decreasing expense management and improving liquidity.

El Ansary & Megahed (2016) seek to explain the determinants of banks' profitability in Egypt before and after the global financial crisis that started by the end of 2008. Their sample covers the period from 2004 to 2013. They divided the sample into two groups five years before the crisis and five years after the crisis. They employ ROA and ROE as proxies for bank profitability. The results reveal that the determinants of Egyptian bank profitability is almost the same in the period of pre-crisis and post-crisis, as there is no significant difference in the banks' profitability between both periods. Furthermore they declare that credit quality, loan to assets ratio, deposit to total assets ratio have an inverse relation with profitability, while operating income to total asset, asset share ratio have a positive relation. However, capital assets and banks assets to GDP are not significant related to bank profitability.

Islam et al., (2017) examine the factors that affect commercial banks' profitability in Bangladesh using financial data of eleven banks for two years from 2014 to 2015. The research result shows that credit risk is the most important factor that affect bank profitability, as it has an inverse relation with return on equity, whilst loan to total assets has a positive relationship. They also find that bank total assets, and net interest margin ratios have insignificant effect on return on equity (ROE).

Mehta & Bhavani (2017) study the factors that affect banks' profitability in UAE by applying balanced panel data for the period from 2006 to 2013, using a sample of 19 UAE banks. The results of the study declare that the cost efficiency, noninterest income, and asset quality are the most significant bank-specific variables for the three measures of profitability (ROA, ROE and HIM). GDP is positively related to ROA and ROE, while inflation rate has no effect on profitability.

It is obviously that the findings of the previous studies are mixed and differ significantly from a country to another, as a reason for the variation of the environment, the measurements of the variables, the way the data are analyzed, and many other reasons. However, the majority of studies have agreed upon common factors that significantly influencing banks' profitability.

3. Research Design and Methodology

3.1 Sample and Data Source

The study examines a number of 26 listed and unlisted banks operating in Egypt covering a period of 10 years (2006-2015). The bank specific variables and industry specific data were obtained from the unconsolidated financial and annual reports of the banks; Herfindahl-Hirschman index (HHI) is calculated by the researcher, and macroeconomic were obtained

from the international monetary fund (IMF) database. Some data for some banks in sample are not available for all years; therefore the researcher uses unbalanced panel data for not losing degrees of freedom. However, any bank selected in the sample should have full data for at least four successive years during 2006–2015.

3.2 Variables Definition

Reviewing the literature declare that a numerous number of variables affecting bank profitability. For the sake of examining the determinants of bank profitability in Egypt the researcher use two ratios as measurements for bank profitability: the return on assets (ROA), and the return on equity (ROE).

The researcher considers three categories of explanatory variables, bank-specific (internal) variables (loans to asset ratio, liquidity, deposits to assets ratio, capital adequacy, operating income to asset ratio, non-interest income to asset ratio, and bank size), and external variables are industry specific (HHI market concentration), and macroeconomic (growth and inflation rate). The variables symbol and measurement are summarized in Table 1.

Table 1. Variables Symbols and Measurement

Variables	Symbols	Measurement
<i>Dependent Variables</i>		
Return on Assets	ROA	Net Profit/Total Assets
Return on Equity	ROE	Net Profit /Total Equity
<i>Independent Variables</i>		
Bank Specific Variables (Internal)		
Loans to asset ratio	LA	Total Net loans/Total Assets
Liquidity	LQ	Ratio of Liquid Assets / Total Assets
Deposits to total assets ratio	DA	Total Deposits/Total Assets
Capital Adequacy	CAP	Total Equity/Total Assets
Operating income to asset ratio	OIA	Operating Income/Total Assets
Non-interest income to asset ratio	NIIA	Non-Interest Income/ Total Assets
Bank size	LOGA	Log of Total Assets
Industry specific variable (External)		
Market Concentration	HHI	The sum of the squares of the market share of banks.
Macroeconomic variables (External)		
Economic Activity (Real Growth Domestic Products)	GDB	Annual Real GDP Growth Rate
Inflation Rate	INF	Annual Inflation Rate (Consumer Price Index, CPI)

3.2.1 Dependent Variables

In this study the researcher uses two ratios as measurements for bank profitability: the return on assets (ROA), and the return on equity (ROE).

ROA is one of the most used indicators of bank's financial performance and managerial efficiency, which demonstrates how efficient the bank uses its assets to generate profit (Alper and Anbar, 2011; Chinoda Tough 2014; Rahman et al., 2015; El Ansary, & Megahed 2016; Islam et al., 2017). It is calculated by dividing net profit on total bank assets.

ROE measures the banks efficiency in using the money provided by the shareholders in generating profit (Alper and Anbar, 2011; Kanwal & Nadeem (2013; Chinoda Tough 2014; Abel & Le Roux 2016) and it is computed by dividing net profit on the total equity.

3.2.2 Independent Variables

The researcher considers three groups of independent variables: bank-specific variables, industry specific (market concentration) and macroeconomic variables.

Bank-Specific Independent Variables

Bank specific determinants are the internal factors that determined by internal efficiency and banks managerial decisions, such as capital adequacy, asset quality, level of liquidity, deposit and income-expenditure structure, and bank size. Therefore, in this study the researcher use the following eight bank-specific characteristics as internal determinants of bank profitability:

Loans to assets ratio (LA): is considered one of the assets qualities indicators as loans are one of the main risky assets, the more the loans, the more the bank expose to risks. Therefore, higher level of loans means a possible deterioration of the bank assets' quality with an inverse effect on profitability (Alper and Anbar 2011). On the other side, as loans are the main income source for a bank, accordingly, bank's profitability is expected to increase as its portfolio of loans grows specially if this increase is relative to other more secure assets (such as government securities) which is the exact situation in the Egyptian banking sector, therefore higher level of loans is expected to positively impact profitability.

Liquidity (LQ): A bank holds a certain level of liquid assets to be able to face the risk of default in financing its daily operations. The quick liquid assets measures as cash and due from banks. As liquid assets generate lower return; therefore, an inverse relationship is expected with bank profitability.

Deposits ratio (DA): measures the amount of deposits held by a bank to total assets. This measure reflects the amount of deposits gathered by the bank to finance its assets. It is furthermore, considered as a liquidity measure. Deposits are one of the cheap and stable financial resources compared with other financing alternatives. Therefore, more deposit can be transformed to more loans and higher interest margin, and accordingly higher profit unless the bank fails to do such transformation efficiently. However in general high level of deposit associated with high profit, therefore, the researcher expects a positive correlation between the deposit rates and bank profitability.

Capital adequacy (CAP): measures the ability of banks to realize any losses generated by risk occurrence or to overcome any crucial macroeconomic imbalances. Many studies use the ratio of equity to asset as a measurement for capital adequacy, which declares how much the assets of the bank is financed by equity. However, the relationship of capital with profitability, in the literature is varied. A higher equity to assets ratio may decrease the leverage effect, increase the financing costs, and decrease the profitability (Akbas, 2012). On the other hand, higher capital ratio may have a positive influence on profitability as it decreases the associated risk of the bank (Athanasoglou et al, 2006). Therefore, the researcher expects a positive correlation between bank capital and profitability.

Non-interest income to total assets (NIIA): represents the income diversification of a bank and is computed as total non-interest income divided by total assets. It is argued that high proportion of non-interest income to total revenues, declaring the bank's diversification activities, and may have a positive influence on bank profitability (Alper and Anbar 2011).

Operating income to total assets (OIA): This ratio measures the asset management efficiency, as profit earned on interest activities is the main source of profit in any bank. Therefore, the researcher expects to have a positive relationship with banks profitability (Alper and Anbar, 2011).

Bank size (BS): measures the complexity of the bank. Larger size gives the bank the opportunity to obtain economies of scale. In this study the researcher computed bank size as the natural logarithm of the total assets of bank. However, in the literature, the relationship between the bank size and profitability is varied. Some studies declare a positive correlation with probability, due to the economies of scale approach and to the increased degree of diversification of the banking products such as Alper and Anbar (2011). Others, such as Yong & Christos (2012) find that huge banks size can have a negative effect on profitability because of the increase of agency costs, and the administrative cost associated with operating big banks. However, it is expected to have a positive relationship with profitability.

Industry Specific Variables

The Herfindahl-Hirschman Index (HHI): is used mainly to measure the level of competition in the marketplace. It can also be used to calculate portfolio concentration risk. The HHI is computed by summing the squared market share of each bank. It can be ranged from zero to 10,000. However, the relation to bank profitability is mixed therefore; we expect a positive relationship with bank performance.

Macroeconomic Independent Variables

Banks' profitability can be also influenced by macroeconomic external factors; those are the factors which are not under the supervision of bank management. However the efficient management of a bank has the capability to take proper procedures to explore and expect the changes in external environment and adjust the organization to benefit from advantages of economic progress.

Real Growth Domestic Products (GDP): is used as a proxy variable for the economic activity; in periods of bad economic conditions the quality of the loan portfolio become worse, as a result this increase credit risk, the provisions, generating credit losses, subsequently reducing bank profitability. On the contrary, an improvement in economic conditions will improve the solvency of borrowers, increases loan request, with positive effects on the profitability of banks. Accordingly, the researcher expects a positive relationship between GDP and bank profitability.

Inflation Rate (INF): The majority of studies demonstrate that the effect of inflation rate on profitability depends on whether the inflation is expected or not. If the inflation is expected by management, the banks can instantly adjust the interest rates, to be higher than the increase of the costs and thus, bank profitability is positively affected. If the inflation is unexpected, the banks will adjust their interest rate lately which may cause bank costs to increase faster than the income. Thus, the profitability will be inversely affected. Therefore, the researcher expects a negative relationship with bank profitability.

3.3 Model Specification

The econometric model developed for this study consists of two equations. The first equation employs ROA as performance indicator and the second equation employs ROE as another performance indicator. Therefore, the equations used are as follows:

$$\text{ROA}_{i,t} = \beta_0 + \beta_1 (\text{LA})_{i,t} + \beta_2 (\text{LQ})_{i,t} + \beta_3 (\text{DA})_{i,t} + \beta_4 (\text{CAP})_{i,t} + \beta_5 (\text{OIA})_{i,t} + \beta_6 (\text{NIIA})_{i,t} + \beta_7 \text{Ln} (\text{BS})_{i,t} + \beta_8 (\text{HHI})_{i,t} + \beta_9 (\text{GDP})_{i,t} + \beta_{10} (\text{INF})_{i,t} + e \quad (1)$$

$$\text{ROE}_{i,t} = \beta_0 + \beta_1 (\text{LA})_{i,t} + \beta_2 (\text{LQ})_{i,t} + \beta_3 (\text{DA})_{i,t} + \beta_4 (\text{CAP})_{i,t} + \beta_5 (\text{OIA})_{i,t} + \beta_6 (\text{NIIA})_{i,t} + \beta_7 \text{Ln} (\text{BS})_{i,t} + \beta_8 (\text{HHI})_{i,t} + \beta_9 (\text{GDP})_{i,t} + \beta_{10} (\text{INF})_{i,t} + e \quad (2)$$

3.4 Estimation Method

A main assumption of regression analysis is that independent variables are uncorrelated with the disturbance term. If this assumption is not fulfilled, both OLS and weighted LS are biased and inconsistent. One reason of this is the presence of endogeneity between independent and dependent variables. To overcome the endogeneity problem, Generalized Method of Moments (GMM) estimator is used. The researcher follows Rachdi (2013), Glenn et al. (2015), and El- Ansary, & Megahed, (2016) in using the generalized method of moments (GMM), in using lagged values of dependent variables to solve the problem of endogeneity.

4. Data Analysis and Results

The following section presents the empirical evidence on the determinants of bank profitability in the Egyptian Banks. A description of the banks characteristics is given in table (2). Next, the researcher reports the results of correlation matrix between explanatory variables in table (3), then the researcher reports the results of regression of the banks return on asset variables and banks return on equity, in table (4 and 5) respectively. The tables include several specifications, with the basic specification including a set of bank specific variables. Subsequently, the researcher adds the industry concentration then macroeconomic variables.

4.1 Results of Descriptive Statistics

Table 2. Descriptive Statistics of Research Variables

Obs	Mean	Std. Deviation	Minimum	Maximum
Dependent Variables: Bank Profitability				
ROA	1.2918	.98398	-2.57	4.00
ROE	14.0699	11.14865	-35.86	44.39
Independent Variables				
Bank Specific Factors (Internal)				
LA	37.9897	11.22273	7.06	74.50
LQ	25.8892	13.53463	6.09	76.00
CAP	9.6975	3.53956	3.28	22.58
DA	79.9800	8.82552	45.18	91.96
LOGA	16.9580	1.12084	12.86	20.07
OIA	4.0769	1.42401	.15	11.12
NIA	1.4480	1.17958	-2.10	10.69
Industry Specific Factors (External)				
HHI	1294.42	87.824	1126	1403
Macroeconomics Factors (External)				
GDP	4.5055	2.00041	1.81	7.16
INF	10.5970	2.98076	7.12	18.31

Source: Computed by the author using E-Views 9

The descriptive statistics of all the data series is presented the in Table 2, which shows mean, standard deviation, minimum and maximum value.

In general it is obviously clear that all variables mean are greater than zero. It is also noticed that standard deviations is very high in the case of ROE and much smaller in the case of ROA. Regarding the independent variables, the dispersal is high in the case of market concentration (HHI), loans to asset ratio, liquidity risk, and the deposit to asset ratio. The high volatility variables are reflected by large difference between the extreme values of variables for example ROE minimum is -35.86% and the maximum is 44.39%.

Concerning banks' profitability, ROA mean is 1.29 % with a standard deviation of 0.98% ranging from -2.57 % to 4%. This high standard deviation declares the existence of cross-sectional variation in the level of bank profitability. ROE mean is 14.07% ranging from -35.86% to 44.39% with a standard deviation of 11.15 %. Concerning banks 'specific

variables, loans to assets ratio average is 37.99% with a standard deviation 11.22% ranging from 7.06% to 74.50%. Liquidity ratio is 25.89% on average, while it varies between 6.09% and 76%. Capital adequacy ratio (CAP) is 9.70 % minimum is 3.28% and maximum is 22.58 %. Averages deposits/assets (DA) are approximately 79.98% with a minimum of 45.18% and maximum of 91.96%. The bank LOGA average is 16.95% with a minimum of 12.86% to 20.07%. The operating income to assets (OIA) and Non-interest income to asset ratio (NIIA) average amounts to 4.08% and 1.44% respectively. Concerning bank concentration (HHI) average is 1294 ranging from 1126 to 1403 indicating the presence of fair competition between banks. Concerning the macroeconomics variables GDP and inflation rate average is 4.50% and 10.59% ranging from 1.81% to 18.31% and 7.12% to 18.31% respectively.

4.2 Result of Correlation Matrix between Explanatory Variables

Table 3. Correlations between independent variables

	LA	LQ	CAP	DA	LOGA	OIA	NIIA	HHI	GDP	INF
LA	1									
LQ	-.298**	1								
CAP	.106	.050	1							
DA	-.046	-.317**	-.298**	1						
LOGA	-.154*	-.214**	-.580**	.302**	1					
OIA	.116	-.045	.289**	-.075	.006	1				
NIIA	.047	.167*	.089	-.135*	-.006	.106	1			
HHI	-.077	-.312**	.017	.145*	.098	.080	-.246**	1		
GDP	.059	.438**	-.058	-.199**	-.186**	-.060	.287**	-.491**	1	
INF	.127	.108	.029	-.034	-.022	.003	.140*	-.413**	.410**	1
Obs	238	238	238	238	238	238	238	238	238	238

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

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

Table 3 represents the correlation matrix between independent variables. It shows fairly low correlations among the independent variables. Kennedy (2008) argues that if correlations not exceed .80 there is no Multicollinearity problem. However the researcher has run the tolerance and VIF tests to find that tolerance is between .463 and .793 and VIF is between 1.261 and 2.161 indicating the absence of Multicollinearity problem.

4.3 Result of the Panel Data Model

Table 4 shows the regression analysis of equation 1 of ROA and Table 5 shows the regression analysis of equation 2 of ROE. To see the stability and the significant of the coefficients, in model 1 the researcher includes only the bank-specific variables, while in model 2 the bank-specific variables and industry specific, and in model 3 the researcher includes all of the determinants.

The Wald χ^2 statistics for ROA (3) is 438.33 with a probability value of (0.000) and the Wald χ^2 statistics for ROE (3) is 356.58 with a probability value of (0.000) suggests that the null-hypothesis of the slope of all coefficient, $\beta_{jt} = 0$ is rejected, and the slopes are significantly different than zero. The Wald-test declares the fine goodness of fit of our panel data set and the Sargan-test confirms the absence of over-identifying restrictions.

Table 4. Regression results for ROA

Dependent variable	ROA (1)	ROA (2)	ROA (3)
C	-2.926504 (0.0137) **	-0.900439 (0.4873)	-2.910777 (0.0345)
LAG ROA	0.637579 (0.0000) ***	0.629122 (0.0000) ***	0.604609 (0.0000) ***
LA	-0.000164 (0.9685)	-0.002856 (0.4895)	-0.003734 (0.3478)
LQ	0.006607 (0.0721) *	0.002901 (0.4373)	-0.002570 (0.4957)
CAP	0.039258 (0.0303) **	0.045627 (0.0104) **	0.052873 (0.0021) ***
DA	-0.001465 (0.8009)	-6.89E-05 (0.9903)	2.67E-05 (0.9961)
LOGA	0.140623 (0.0077) ***	0.159684 (0.0021) ***	0.167874 (0.0008) ***
OIA	0.190894 (0.0000) ***	0.226296 (0.0000) ***	0.256410 (0.0000) ***
NIA	-0.091709 (0.0875) *	-0.148674 (0.0072) ***	-0.175936 (0.0012) ***
HHI		-0.001853 (0.0008) ***	-0.000462 (0.4605)
GDP			0.167114 (0.0000) ***
INF			-0.053738 (0.0024) ***
No. of Obs	212	212	212
R Squared	0.632	0.652	0.686
Durbin-Watson Stat.	1.812	1.896	1.839
Wald Chi2	349.9189 ***	379.5419 ***	438.3399 ***
Sargan- Test	203***	202***	200***

*** Correlation is significant at the 0.01 level.

** Correlation is significant at the 0.05 level.

* Correlation is significant at the 0.10 level

Table 5. Regression results for ROE

Dependent variable	ROE (1)	ROE (2)	ROE (3)
C	-13.78662 (0.2437)	-1.318246 (0.9206)	-18.23790 (0.1849)
LAG ROE	0.637836 (0.0000) ***	0.634582 (0.0000) ***	0.634952 (0.0000) ***
LA	-0.033252 (0.4297)	-0.049557 (0.2445)	-0.054433 (0.1770)
LQ	0.061511 (0.0944) *	0.039081 (0.3045)	-0.016451 (0.6627)
CAP	-0.113191 (0.5167)	-0.079096 (0.6494)	-0.024666 (0.8805)
DA	0.033811 (0.5602)	0.042687 (0.4600)	0.048362 (0.3743)
LOGA	0.705842 (0.1804)	0.817653 (0.1202)	0.829180 (0.0950) *
OIA	1.816209 (0.0000) ***	2.029175 (0.0000) ***	2.255456 (0.0000) ***
NIIA	-0.997785 (0.0659) *	-1.346854 (0.0175) **	-1.501798 (0.0064) ***
HHI		-0.011324 (0.0431) **	0.002110 (0.7369)
GDP			1.794027 (0.0000) ***
INF			-0.756500 (0.0000) ***
No. of Obs	212	212	212
R Squared	.581	.590	.640
Durbin-Watson Stat.	2.035	2.073	2.063
Wald Chi2	282.4128 ***	290.9341 ***	356.5810 ***
Sargan- Test	203***	202***	200***

*** Correlation is significant at the 0.01 level.

** Correlation is significant at the 0.05 level.

* Correlation is significant at the 0.10 level

Note:

(1) Bank specific determinants of bank profitability

(2) Bank specific and industry-specific determinants of bank profitability.

(3) Bank specific, industry-specific and macroeconomic determinants of bank profitability.

Table 4 shows that the model explains 68.60 % of the variation of profits (ROA) of Egyptian banking industry by the ten explanatory variables.

Table 5 shows that the model explains 64% of the variation of profits (ROE) of Egyptian banking industry by the ten explanatory variables.

The lag ROA and ROE is found positively correlated with all models of ROA, and ROE, indicating that profit is persistence in the Egyptian banking industry within the period of study. This positive relationship is consistent with the finding of Hoffmann (2011) in Spain, Tan & Floros (2012) in China and El- Ansary& Megahed (2016) in Egypt.

Loans to asset ratio (LA) have been found negatively insignificant with all ROA and ROE models, indicating that loans ratio has a negative effect on bank profitability but insignificantly, may be because it is not the absolute amount of loans that matter, but the quality of loans portfolio is more crucial. The result is consistent with Tan & Floros (2012) who find a negative insignificant relation with ROA in China banks, and contrast with the result of with Alper& Anbar (2011) in Turkey, El- Ansary& Megahed (2016) in Egypt, who find that loans to assets ratio has a significant negative correlation with bank profitability urging that that weak credit portfolio with bad asset quality decrease the return on asset, and the result is also contrast to Rahman et al (2015) in Bangladesh who find a significant positive relationship with ROA.

Concerning bank liquidity ratio (LQ), it has been found positively significant at 10% with ROA and ROE models 1 only, while it is negatively insignificant with all other models which indicates that bank liquidity doesn't affect bank profitability significantly. Chinoda (2014) in Zimbabwe find statically positive correlation between liquidity ratio and profitability measured by ROA, while on contrast Owoputi, et al (2014), Tariq, et al (2014) in Nigeria, find a significant negative relation with profitability arguing that the more the bank invest in current assets, the more the bank would lose profit.

Concerning the capital adequacy (CAP), the result indicates that CAP has a significant positive relation with all model of ROA, while it is negatively insignificant with all models of ROE. This may indicate that well-capitalized banks reduce the expected bankruptcy costs, which decrease cost of capital, and accordingly increase return on assets. This result is in line with Athanasoglou et al (2006) in Greece, Alexiou & Sofoklis (2009), Owoputi, et al (2014) in Nigeria, Tariq, et al (2014) in Pakistan, Rahman et al (2015), Samad Abdus (2015) in Bangladesh and Abobakr (2017) in Egypt, in which they declare that well – capitalized banks have higher profitability. The insignificant negative relation with ROE indicates that increasing the amount of equity lead to decrease the ROE.

Deposit to total assets ratio (DA) is positively insignificantly correlated with both ROA and ROE in all models, which indicates that profitability will be increased if the deposit to assets ratio increase, but the relationship is statistically insignificant. It seems that Egyptian banks fail to transfer deposits into loans therefore; the profitability is not strongly affected. The result is in the line of Islam et al (2017) in Bangladesh and on contrast with Hoffmann (2011)

in Spain and El- Ansary & Megahed (2016) in Egypt, who find a statically negative effect on Egyptian bank profitability.

Log of total assets (LOGA) has been found positively significant with ROA in all models with level of 1%, while it is positively correlated with ROE in model (3) with level of 10%, which indicates that banks with higher assets can achieve more profit due to the loan diversification opportunities and economics of scale, which reduces bank cost and accordingly increase bank performance. The results are consistent with Alexiou & Sofoklis (2009) in Greece, Alper& Anbar (2011) in Turkey, Owoputi, et al (2014) in Nigeria, Capraru & Ihnatov (2015) in Greece, and Rahman et al (2015) in Bangladesh, who find a positive significant relation with performance arguing that the bigger the bank, the higher the return on assets due to the benefit from economies of scale or and other size-related advantages. On the contrary Abel & Le Roux Tan (2016) in Zimbabwe find a negative significant relation, which means bigger banks achieve less profitability as compared to smaller banks.

Operating income to assets ratio (OIA) is positively correlated with ROA and ROE at level of 1% with all models. This indicates that the high the operating income the high the profitability of bank. The result is similar to the result of Alper& Anbar (2011) in Turkey and El- Ansary, & Megahed, (2016) in Egypt.

Non-interest income to asset ratio (NIIA) is negatively correlated to all models of ROA at level of 10%, 5%, and 1% respectively, which indicates that non-interest income may be more volatile but not necessarily more profitable than interest-generating activities as the marginal increases in non-interest revenue are not associated with better performance as it can be offset by the costs of increased exposure to volatile activities, and accordingly affect negatively the performance (Sun et al 2017). The result is on line with Bashir (2003), and Sun et al (2017) who reported a negative relationship. This is contrast with the result of Alper& Anbar (2011) in Turkey, Rahman et al (2015) in Bangladesh who find that non-interest income has a significant positive correlation with bank.

Concerning the industry specific determinants (HHI), is found negatively significant with ROA (2) and ROE (2) at the level of 1%, 5% respectively, while it is insignificant with all other models, which indicate that market concentration affect negatively the bank profitability but insignificantly. On the contrary Capraru & Ihnatov (2015) in Greece, Nouaili et al (2015) in Tunisia and Petria et al (2015) in Greece find a negative significant relation as decreasing the completion would increase bank performance.

Concerning the macroeconomics determinants, the GDP is positively significant with all ROA, and ROE models at the level of 1%, which indicates that when GDP increase it affects the bank performance positively as high economy rate of growth increase the demand for loans that is financed through banks. When more loans are provided by banks, accordingly the profitability of banks increases. The result is on line with Chinoda (2014) in Zimbabwe, Petria et al (2015) and Nouaili (2015) in Tunisia.

Inflation rate (INF) is found to be negatively significant correlated with all ROA, and ROE models at the level of 1%, which indicates that inflation rate affect negatively bank

performance as Egyptian bank may not forecast the inflation rate, therefore they can't adjust the debit interest charged from their customers, so that their cost increase faster than their return and accordingly, decrease their profit. The finding is in the line of Owoputi, et al (2014) in Nigeria, Rahman et al (2015) in Bangladesh Abel & Le Roux Tan (2016) in Zimbabwe who report a statistical negative relationship between inflation rate and profitability. This result is inconsistent with the findings by Athanasoglou et al (2006) in Greece, Tan & Floros (2012) in China, as they find inflation has a significant positive effect on profitability as, with inflation, bank revenue increases more than bank costs, which may attributed to the bank clients failure to anticipate future inflation.

5. Conclusion and Implications

This paper examines the factors that influencing profitability of Egyptian banks. A sample of 26 banks out of 43 banks is analyzed, by using unbalanced panel data set covering the period from 2006 to 2015. In line with previous literature, the determinants of bank profitability categorized into two sections, internal (bank specific) determinants and external (industry specific and macroeconomic) determinants. The researcher finds results that support and contradict previous researches. The findings show that internal variables, which consist of capital adequacy ratio, banks size, operating income ratio, and non-interest income ratio, are the internal variables that have the strong effect on determining banks profitability in Egypt, which imply that banks can improve their profitability through enhancing their capital, increasing their size and maximizing their operating income ratio with giving a proper attention to the non-interest ratio. In connection with macroeconomic determinants, the findings demonstrate that inflation and rate of growth significantly affect bank's profitability, Inflation reduces credit expansion and accordingly reduces bank profitability, while growth are good for banks and contribute positively to the bank profitability. This result lends some support from the findings of Chinoda (2014), Petria et al (2015), Nouaili (2015) and Abel & Le Roux Tan (2016). The study findings may be of interest to banks' managements and policy makers in highlighting the factors that help banks to maximize their profits. Therefore, the researcher suggests that policy makers should initiate fiscal and monetary policies that are designed to control inflation and promote output stability and sustainable growth, which are good for banks.

Furthermore, the researcher suggests banks to take appropriate actions regarding loans ratio to have the appropriate reflect in banking returns as the researcher find no significant positive effect on banks profit on contrary to the expectation.

Finally, the banks management should give proper care to the level of its non-interest income and they should not strive for non-interest income as it seems that non-interest is more risky and more volatile in comparison with generating interest income, therefore they should control this ratio, and otherwise, it will not affect positively the profitability.

6. Limitation of the Study

- The study depends on secondary data that is restricted to information obtained from the annually financial reports.

- The study ignore some other various that affect bank performance like client care, bank image, market strategies, and others.

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