

The Impact of Bank's Asset and Liability Structure on their Profitability Regardless of Monetary Policy and Size: A Panel Analysis

Osama Wagdi (Corresponding author)

Financial Institutions Department, Faculty of Management
Modern University for Technology and Information, Cairo, Egypt
E-mails: osamawagdi_ta@yahoo.com

Amira Hasaneen

Accounting Department, Faculty of Management,
Modern University for Technology and Information, Cairo, Egypt

Walid Abouzeid

Business Administration Department
International Academy for Engineering and Media Science - IAEMS
6th of October City, Egypt

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Abstract

The study examines the impact of bank's asset and liability structure on their profitability without monetary policy and size; the study utilizes panel data with cross section analysis on data of 10 unit banks according to the annual balance sheet & performance. The populations of the study are bank units listed on Egyptian Exchange (EGX), the study's data collection covered the duration from 2008 till 2016. Eventually, the study ascertained that there is an impact of the bank's asset and liability structure on their profitability according to "Return on Asset" and "Return on Equity"; however, the interprets of bank's asset and liability structure

for "Return on Equity" more than to "Return on Asset". Therefore, the banking units should work to maintain the optimal rate of the structure of the bank's assets and liabilities; this may be a potential research scope in banks.

Keywords: Banking structure; Banking profitability; Egypt, Panel analysis

JEL Codes: G2; M2; M4

Introduction

Two traditional roles that banks perform in the economy are to create liquidity and transform risk (Bhattacharya & Thakor, 1993; Berger & Bouwman, 2009). Financial innovation over the last few decades has spurred value creation in the forms of risk sharing and risk management in the banking sector. Allen and Santomero (1997) and Scholtens and van Wensveen (2003) argue that these changes have increasingly shifted banks away from their traditional activities. Instead, they suggest that banks are making increasing use of the financial markets to transfer, transform, and redistribute risk.

Liquidity plays an enormous role in financial crises. In the classic model of Diamond and Dybvig (1983), the illiquidity of bank assets coupled with the liquidity promised through bank liabilities leaves banks vulnerable to runs and financial crises. During the 2007 to 2009 financial crisis, the U.S. government provided several trillion dollars of reserves to the financial sector to forestall and ameliorate a liquidity crisis.

The study finds that the bank's characteristics of the structure has been affected by these developments in the business environment, through the introduction of non-conventional financial instruments, which leads banks to become vulnerable to more risks in the light of targeting to maximize the return on assets. so; The performance of banking units is influenced by both liquidity levels as well as the ability to provide loans in addition to taking advantage of investment opportunities; all that is the bank's characteristics of the structure.

Literature review

The unit banks play an important role in allocating countries' economic resources by channeling depositors' funds continuously to investors' funds (Ongore and Kusa, 2013). The banks are able to provide all essential facilities for personal and corporate deposit and loan customers and provide credit, liquidity under the nation's payments systems (Handley-Schachler et al., 2007). Furthermore, the banks are also the player to convey the Central Bank's active monetary policy, sharing their obligation to stabilize the economy and finance system. (Siddiqui and Shoaib, 2011). on the other side; the impact of the interest rate structure on net interest income dominates for bank unit. Also its effect is stronger on bank's profit (Borio et al 2017) according to monetary policy; There are several studies that have addressed the

relationship between bank profitability and monetary policy (Demertzis and Wolff, 2016; Borio et al. 2017; Altavilla et al., 2018). Kashyap and Stein (2000) found a relationship between monetary policy changes and loan growth; according to the standard monetary transmission mechanisms prediction (see Mishkin, 1995). Den Haan et al. (2007) showed that commercial lending increases while real estate loans decrease sharply after monetary policy tightening.

Many studies were conducted to determine the profitability in general and, in particular, the determinants of banks' profitability. Nevertheless, many of the studies in developed markets are carried out, emerging markets. (Ayanda et al., 2013)

According to Ayanda et al. (2013) the term profitability refers to the ability of the business organization to maintain its profit year after year. Profitability of a bank according to Podder (2012) is the efficiency of a bank at generating earnings. Profitability apart from ensuring the sustainability of the companies it has also wider implications of the economy as a whole. According to Ayanda et al. (2013) generally profitability of organizations contributes to the economic development of the nation by way of providing additional employment and tax revenue to government. Ayanda et al. (2013) further state that profitability contribute the income of the investors by having a higher dividend and thereby improve the standard of living of the people. On the other hand, however in relation to the banks poor profitability can lead to banking failure and crisis which have dire negative repercussions on the economic growth (Ongore and Kusa, 2013) and the wellbeing of the people.

The soundness of the banking sector is highly important to the whole economy. (Sufian and Chong, 2008). In agreement Katrodia (2012) posited that they are closely related. In contrast, the soundness of a bank depends largely on its financial performance, which shows a bank's strength and weakness (Makkar and Singh, 2013). One of the groups for bank's KPIs are evaluated by the profitability. Banks ultimately rely on their survival on their profitability. This is because the banks have to generate the revenue needed to offset the operating costs incurred (Ongore and Kusa, 2013). In fact, investors profit from their savings, which also encourages additional investment in units of bank (Ongore and Kusa, 2013). Ultimately, banks continue to operate because they expect profit; therefore, the most rational decision to leave once that expectation is proven unattainable (Ayanda et al., 2013). Ongore and Kusa (2013) asserted that gain is the commercial banks' ultimate goal and that therefore, all the policies and activities planned and executed aim to achieve this essential purpose. However, Ongore and Kusa (2013) explained that this does not mean that commercial banks have no other aims. In reality it also has social and economic additional priorities.

Profitability determinants in the units of bank; Kumbirai and Webb (2010) at South African; a significant change in trend is noticed at the onset of the global financial crisis in 2007, reaching

its peak during 2008-2009. This resulted in falling profitability, low liquidity and deteriorating credit quality in the Banking sector. Still within Africa, Ayanda et al. (2013) Results revealed in Nigeria that contrary to views of some authors, Bank Size and Cost Efficiency did not significantly determine bank profitability. However, Credit Risk and Capital Adequacy have significant drivers which affected bank profitability both in the long run and short run respectively. But, while Liquidity affected bank profitability in the short run, labor efficiency only affected bank profitability in the long run. In Kenya, according to Ongore and Kusa (2013). The results highlighted that bank specific factors significantly affect the performance of commercial banks; except for liquidity variable. On the other hand, the overall impact of macroeconomic variables was not definitive;

As for the Islamic bank; Bashir (2003) found high capital-to asset and loan-to-asset ratios lead to higher profitability. In addition, there is evidence that indicate that foreign-owned banks are likely to be profitable. On the other hand; Haron (2004) found that internal factors like liquidity, gross investment, Islamic securities fund and profit-sharing ratio ratios between the lender and the borrower are highly related to the rate of total income earned. External factors such as interest rates, market share and bank size are similarly affected. Certain determinants like the funds invested in the current accounts, the share of income between banks and depositors and the supply of liquidity also play an important role in affecting the profitability of Islamic banks. In India; Makkar and Singh (2013) the results revealed significant difference in the capital adequacy, asset quality and earning capacity of public and private sector banks. In contrast, they found no significant difference in the management, liquidity position and sensitivity to market risk of the two different banking groups.

In addition to several studies that used the method of case study analysis of the profitability of banks: Almazari (2012); Alkhatib and Harsheh (2012); Alalaya and Al Khattab (2015); Dehghan and Shamsi (2015); Ramlan and Adnan (2016); Dewi et. al. (2016); Abbas et. al. (2019); Setiawan et. al., (2019).

Generally, financial performance is measured by properly establishing the association between the items of the balance sheet and profit and loss account (Makkar and Singh, 2013). The process of establishing relevant association is referred as financial analysis which involves calculating of financial ratios, thus it also called ratio analysis. There are several ratios that can be computed in assessing profitability. According to Ongore and Kusa (2013) return on assets (ROA) is one of the major ratios that indicates the profitability of a bank. It measures the ability of the bank management to generate income by utilizing company assets at their disposal (Davydenko, 2011; Ongore and Kusa, 2013). In other words, the ratio indicates how much net income is generated on each unit of assets thus the higher the ROA, the more the profitable the bank (Kumbirai and Webb, 2010; Davydenko, 2011). The ratio shows how

efficiently the resources of the company are used to generate the income (Ongore and Kusa, 2013). The problem of ROA is that it excludes off-balance sheet items of the bank creating a positive bias in evaluating bank performance (Davydenko, 2011). Another related ratio is called return on equity (ROE) which measures how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet. It is the rate of return to shareholders or the percentage return on each unit of equity invested in the bank (Kumbirai and Webb, 2010). A business that has a high return on equity is more likely to be one that is capable of generating cash internally (Ongore and Kusa, 2013).

Kalluci (2011) it is better to look at both ROA and ROE, citing that even though they differ from each other and express different aspects, they both remain two main indicators of management efficiency towards generating income from the money invested by the shareholders and the total investments made in assets, as well. However, of the two, extant literature favors of ROA to ROE (Davydenko, 2011). One of the stated reasons is that ROE does not provide an indication for the bank's financing through borrowing, whereas ROA does (Kalluci, 2011), thus ROE gives limited insight about the bank profitability and performance (Alkhatib and Harsheh, 2012). The study therefore employs ROA as the proxy of internal profitability.

Both ROA and ROE uses the accounting book values however they can be adjusted to take into account the market values through the calculation of earnings yield found by earnings per share divided by the share price. According to Sangoi (2011) earnings yield is an important indicator of future profitability of the company per the assessment of the market. A high earnings yield indicates that the market is assuming a lower future growth in profits and a low EY indicates expectation by the market for high profit growth for an extended period of time. The study employs earnings yield as the proxy for external profitability. In relation to the determinants of profitability Ayanda et al. (2013) categorized them into two namely; endogenous (internal) and exogenous (external) factors.

According to Ayanda et al. (2013) the key drivers of profitability that may be affected by the management decisions of the bank relate to internal factors. External factors, on the other hand, are beyond the control of a bank management which represents phenomena outside the bank's power. Nevertheless, it is understood that the management must predict changes in the outside world and seek to position the organization to use the planned developments. The internal factors are the subject of this analysis Ongore and Kusa (2013) The internal factors include equity, deposit liability, loan portfolio size and composition, interest rate policy, efficiency of work and information technology system, risk level, quality management, bank size, ownership and so on. Alkhatib and Harsheh (2012) recognized also that some principal factors to improve

financial performance for financial institutions include the bank's size, its assets management, leverage ratio, operational efficiency ratio, its portfolio composition, and credit risk.

The main motivation behind this study is to examine the relationship between banks profitability and bank's characteristics of structure. An additional and interconnected motivation is to test whether shifting bank loan portfolios, as suggested by Den Haan, Sumner, and Yamashiro (2007), may help to explain some of the relationship between loan growth and changes in characteristics of structure without economic policy and effect of bank size.

The analysis contributes to and extends the broad monetary literature by examining banks grouped by different types of profitability measurements to see if they behave differently under the same monetary policy in regard to their loan growth and the loan portfolio mix between real estate and commercial loans. To the best of my knowledge, such an analysis of a bank's loan portfolio mix; These estimations help to extend and fill in the gaps in the related literature conducted by Den Haan et al. (2007) and Black and Rosen (2007), which raised questions regarding how changes in monetary policy can cause banks to shift their loan portfolios. In contrast, the traditional monetary literature focuses on bank capital, deposits, and interest rates as important determinates of loan growth, with little attention given to the role of bank profitability. Examples of such traditional studies include those by Kashyap and Stein (2000) and Kishan and Opiela (2000, 2006).

Hence; this study analyzes the impact of changes in bank's characteristics of the structure and the levels of deposit employment on the profitability of banks, which assists these institutions to achieve the highest profitability possible through risk-return trade off without monetary policy and effect of bank size.

Study Problem

There are many studies to indicate the impact of monetary policies on the profitability of banks, this fact now and not tested, now we are observing the impact of the characteristics of the structure of the bank on its profitability without the impact of monetary policy (interest rate / legal reserve rate); therefore the study addresses the following question:

How does the bank's characteristics of its structure impacts on their profitability regardless of monetary policy and size?

Study layout

The general framework of the study can be viewed in the following figure; According to the this figure, economic policies affect the structure of bank assets and liabilities through monetary and fiscal policies. Monetary policy is more influential in the banking sector compared to fiscal policy, which is reflected in five sets of indicators of the bank's asset and liability structure: "Liquid assets to deposits ratio", "Investments to deposits ratio", "Loans to total assets ratio", "Liquid assets to total assets ratio" and "financial investments to total assets ratio"-. This is reflected in the profitability indicators of banks such as "Return on Assets" and "Return on Equity"

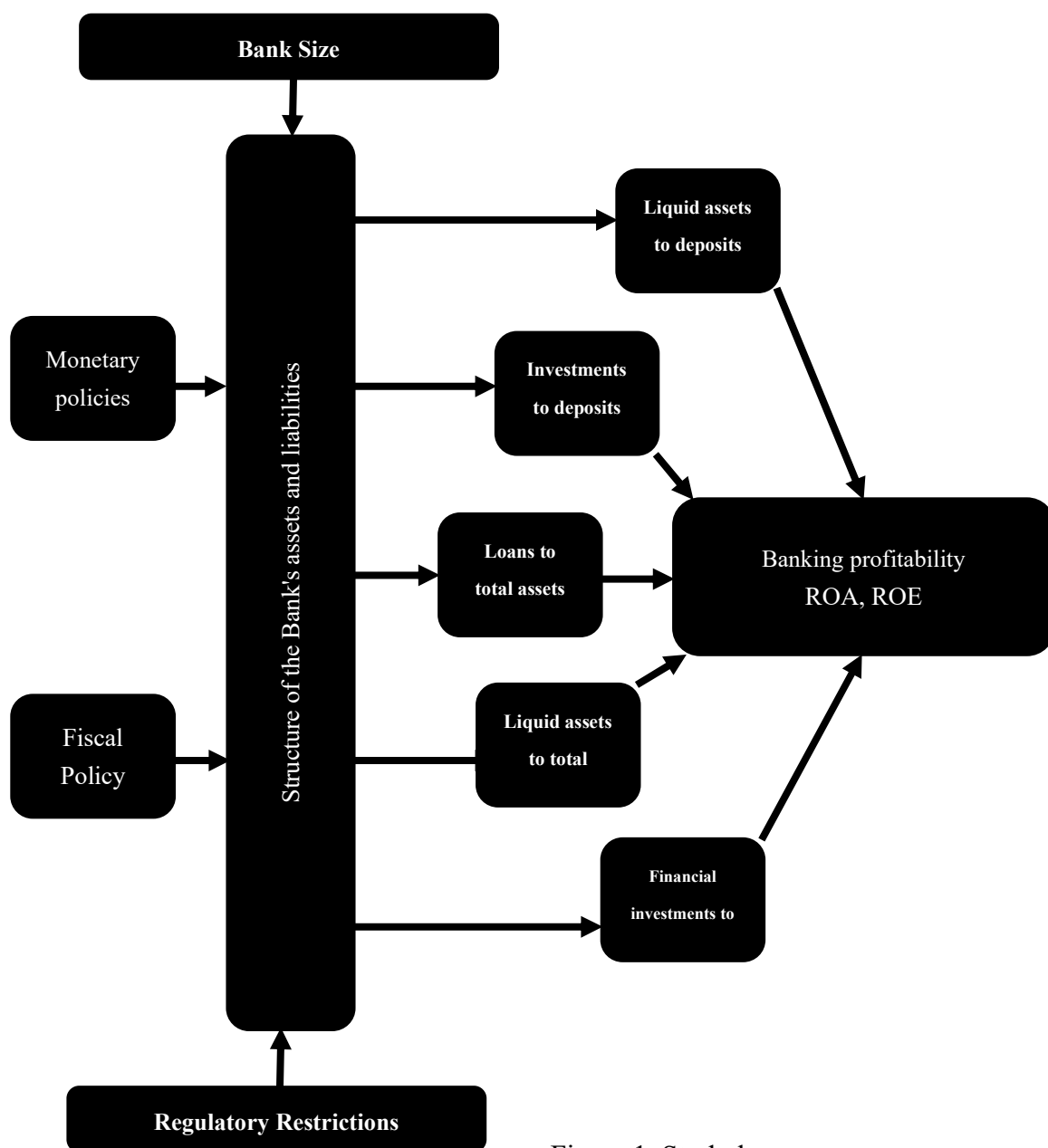


Figure 1. Study layout

Study Hypotheses

According to study problem and their layout; the researcher can formulate the study hypothesis as follows:

There is an impact of the bank's asset and liability structure on their profitability

Therefore, sub-hypotheses can be examined as follows

(H₁) There is an impact of the bank's asset and liability structure on their profitability according to "Return on Assets".

(H₂) There is an impact of the bank's asset and liability structure on their profitability according to "Return on Equity".

Study Methodology

The study utilizes panel data with cross section analysis on data of 10 unit bank according to annual balance sheet and performance; the data covered the time period 2008-2016

Society and sample

The study sampled banks that are listed on Egyptian Exchange (EGX) as they were palpable to the measurement profitability. There were eleven banks operating in EGYPT; Table 1 listed The Egyptian Banks in the Sample of the Applied Study.

Table 1. The Egyptian Banks in the Sample of the Applied Study

No.	Listed Securities	REUTERS	LISTING DATE
1	Societe Arabe Internationale De Banque (SAIB)	SAIB.CA	29/11/1980
2	Housing & Development Bank	HDBK.CA	13/09/1983
3	Egyptian Gulf Bank	EGBE.CA	17/11/1983
4	National Bank of Kuwait- Egypt- NBK	NBKE.CA	12/09/1994
5	Commercial International Bank (Egypt)	COMI.CA	02/02/1995
6	Union National Bank - Egypt " UNB-E	UNBE.CA	05/11/1995
7	Export Development Bank of Egypt (EDBE)	EXPA.CA	14/12/1995
8	Abu Dhabi Islamic Bank- Egypt	ADIB.CA	19/06/1996
9	Qatar National Bank Alahly	QNBA.CA	03/07/1996
10	Credit Agricole Egypt	CIEB.CA	03/07/1996

Source: The Egyptian Exchange

Variables of Study

Data extracted from financial reporting in the study for dependent and independent variables. The following table illustrates different variables that will be used in the analysis.

Table 2. Variables of Study

No.	Variables	Description
1	Y1	Return on Assets
2	Y2	Return on Equity
3	X1	Liquid assets to deposits ratio
4	X2	Investments to deposits ratio
5	X3	Loans to total assets ratio
6	X4	Liquid assets to total assets ratio
7	X5	financial investments to total assets ratio

Data Description at Individual Bank Units

The participation of bank units in Egyptian Exchange is relatively a modest one, The following bank's characteristics of the structure and the profit of bank for 10 units in the study sample.

a. Societe Arabe Internationale De Banque (SAIB)

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

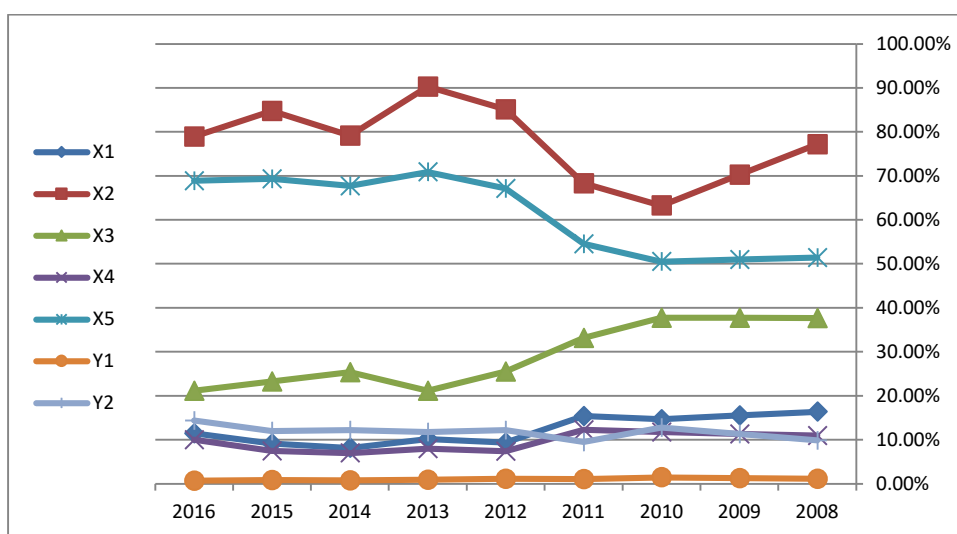


Figure 2. the Bank's structure and profitability indicators for

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study finds that the highest rate of return on assets is (1.45%) in 2010, but the highest rate of return on equity is (14.39%) in 2016.

b. Housing & Development Bank

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

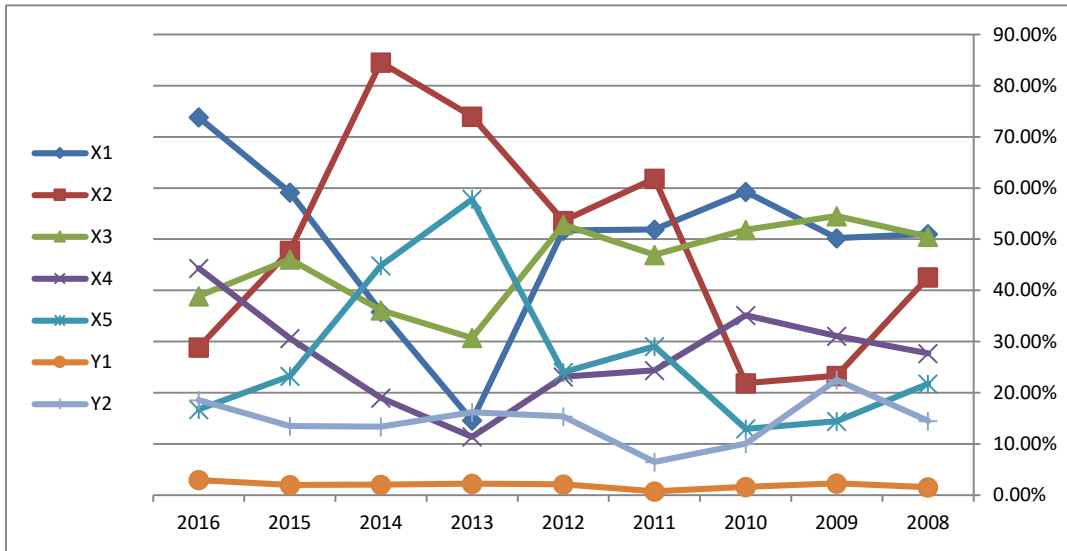


Figure 3. The Bank's structure and profitability indicators for Housing & Development Bank

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study observes that the highest rate of return on assets is (2.30%) in 2009, but the highest rate of return on equity is (22.53%) in 2009.

c. Egyptian Gulf Bank

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

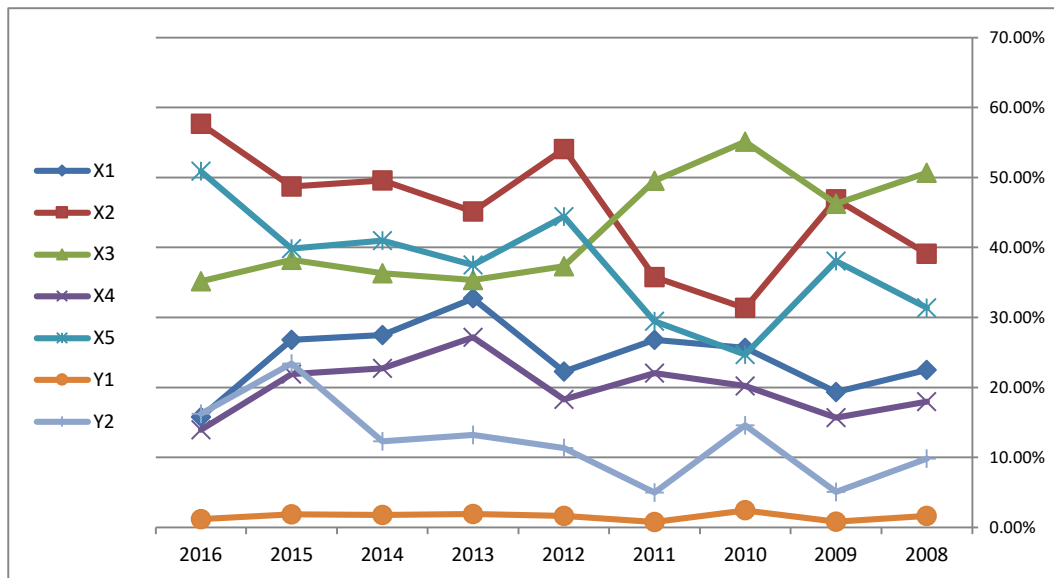


Figure 4. the Bank's structure and profitability indicators for Egyptian Gulf Bank

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study observes that the highest rate of return on assets is (2.44) in 2011, but the highest rate of return on equity is (23.42) in 2015.

d. National Bank of Kuwait- Egypt- NBK

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

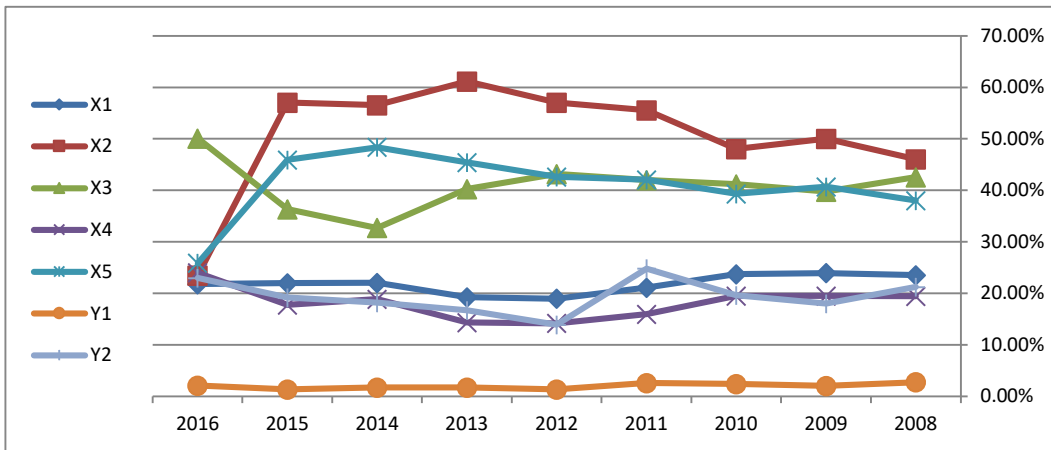


Figure 5. the Bank's structure and profitability indicators for National Bank of Kuwait

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study observes that the highest rate of return on assets is (2.76%) in 2008, but the highest rate of return on equity is (24.83%) in 2011.

e. Commercial International Bank (Egypt)

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

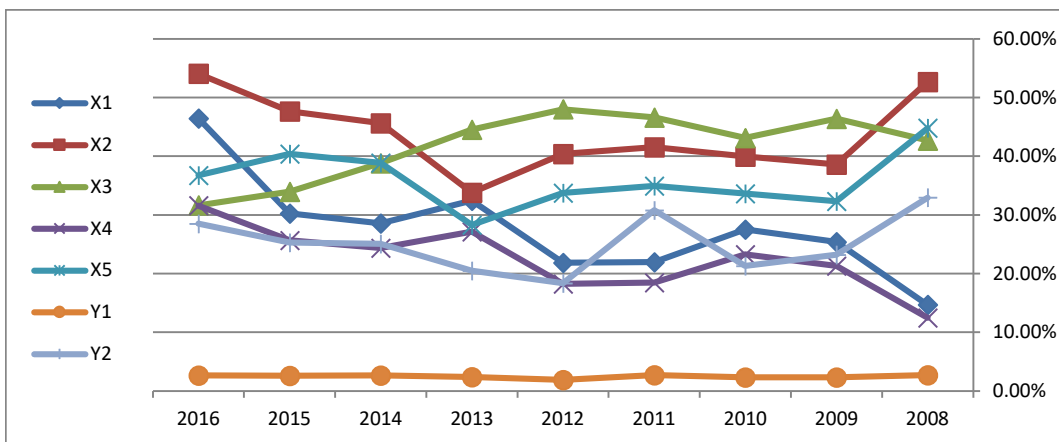


Figure 6. the Bank's structure and profitability indicators for Commercial International Bank (Egypt)

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study finds that the highest rate of return on assets is (2.68%) in 2011, but the highest rate of return on equity is (32.97%) in 2008

f. Union National Bank - Egypt " UNB-E

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

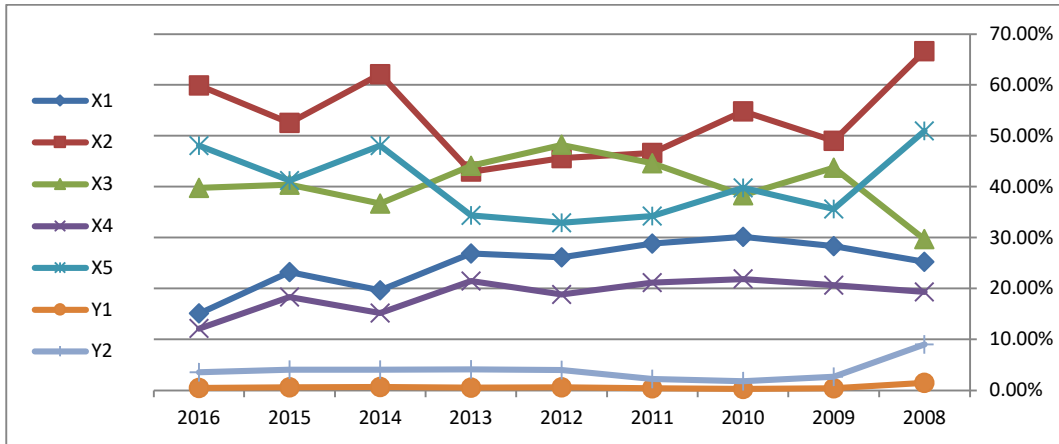


Figure 7. the Bank's structure and profitability indicators for

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study finds that the highest rate of return on assets is (1.5) in 2008, but the highest rate of return on equity is (9.04) in 2008.

g. Export Development Bank of Egypt (EDBE)

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

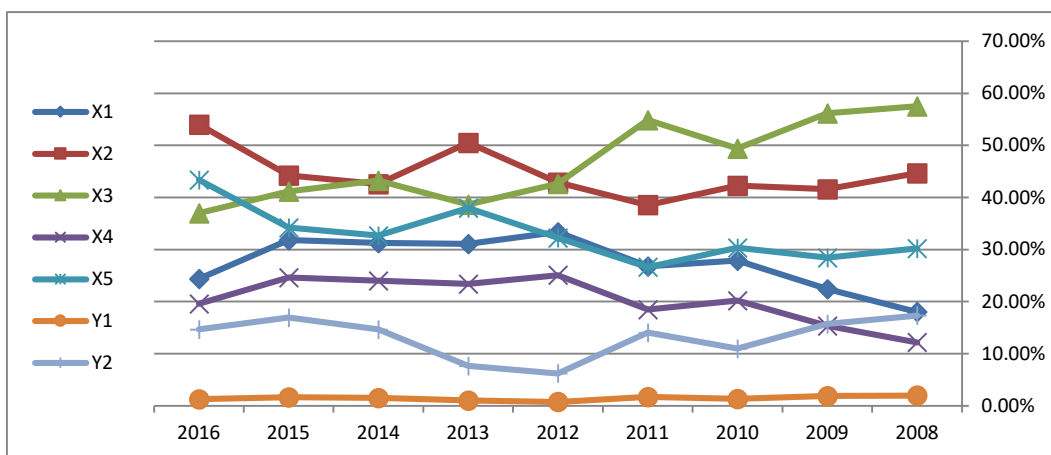


Figure 8. the Bank's structure and profitability indicators for Export Development Bank of Egypt

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study finds that the highest rate of return on assets is (2%) in 2008, but the highest rate of return on equity is (17.37%) in 2008.

h. Abu Dhabi Islamic Bank- Egypt

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

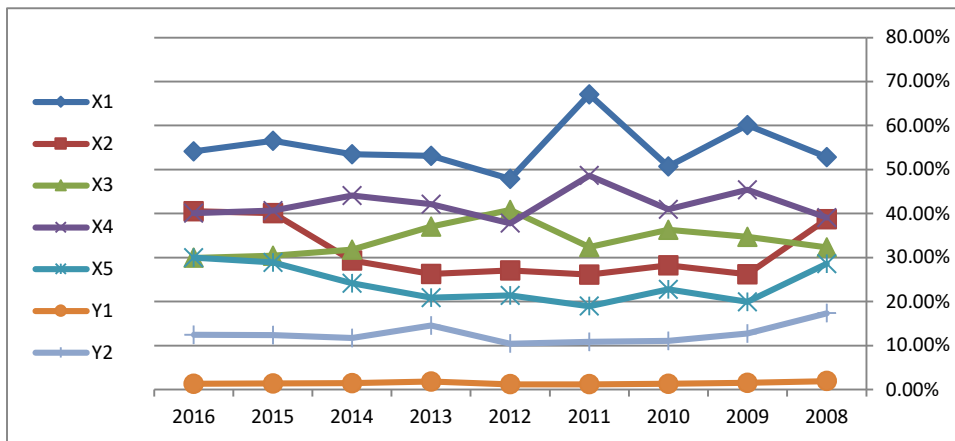


Figure 9. the Bank's structure and profitability indicators for

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study finds that the highest rate of return on assets is (1.93) in 2008, but the highest rate of return on equity is (17.35% 2008) in

i. Qatar National Bank Alahly

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

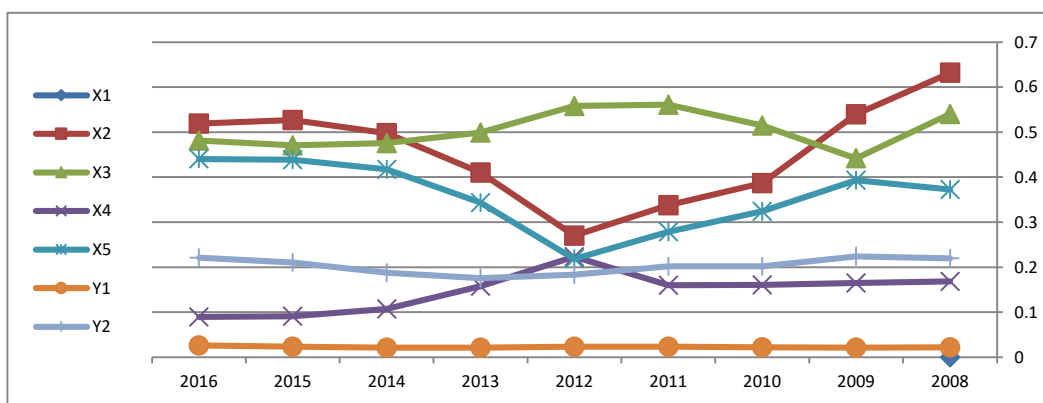


Figure 10. The Bank's structure and profitability indicators for

Source: Authors calculations based on data extracted from financial reports of banking units

According to the previous figure, the study finds that the highest rate of return on assets is (2.65%) in 2016, but the highest rate of return on equity is (22.45%) in 2009

j. Credit Agricole Egypt

The following figure illustrates the historical evolution of the Bank's structure and profitability indicators during the period from 2008 to 2016

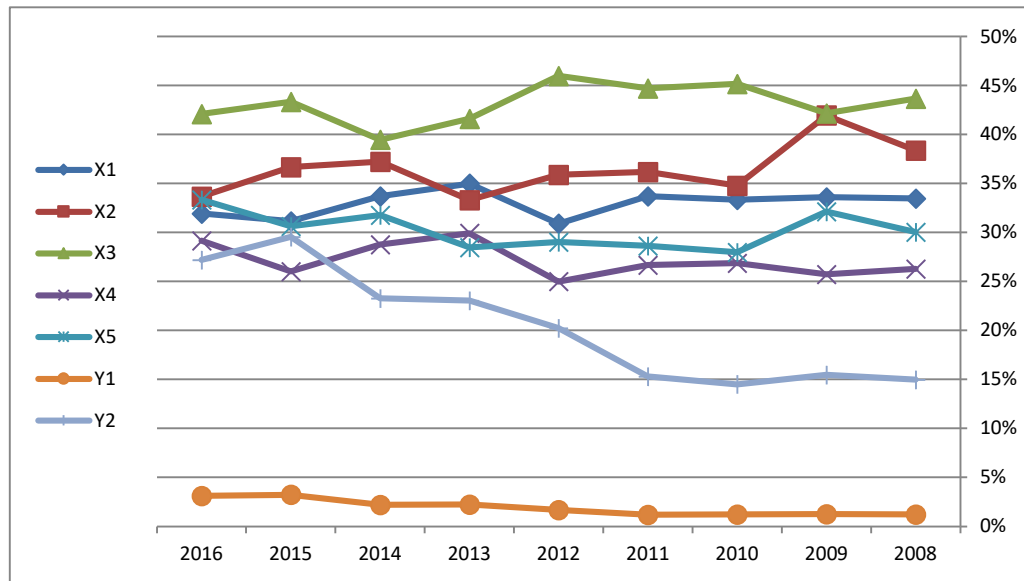


Figure 11. the Bank's structure and profitability indicators for

Source: Authors calculations based on data extracted from financial reports of banking units.

According to the previous figure, the study finds that the highest rate of return on assets is (3.24%) in 2015, but the highest rate of return on equity is (29.55%) in 2015.

Examining the impact of the bank's asset and liability structure on banking profitability

a. ROA

Table 3. Examining H₁

Model 2: WLS, using 90 observations

Included 10 cross-sectional units

Dependent variable: Y1

Weights based on per-unit error variances

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
constant	-0.117071	0.0719871	-1.626	0.1076	
X1	0.0327687	0.0268574	1.220	0.2258	
X2	-0.0350306	0.0208117	-1.683	0.0960	*
X3	0.144622	0.0716657	2.018	0.0468	**
X4	0.0882186	0.0683934	1.290	0.2006	
X5	0.167670	0.0861432	1.946	0.0549	*

Statistics based on the weighted data:

Sum squared residual	89.62471	S.E. of regression	1.032938
R-squared	0.116962	Adjusted R-squared	0.064400
F(5, 84)	2.225225	P-value(F)	0.059188
Log-likelihood	-127.5164	Akaike criterion	267.0329
Schwarz criterion	282.0317	Hannan-Quinn	273.0813

Statistics based on the original data:

Mean dependent variable	0.016667	S.D. dependent variable	0.007495
Sum squared residual	0.004399	S.E. of regression	0.007237

Source: Gnu Regression, Econometrics and Time-series Library output.

The previous statistical results show that there impact of the bank's asset and liability structure on banking profitability according to ROA, and Loans to total assets ratio; Liquid assets to total assets ratio and financial investments to total assets ratio is significant at 0.1; 0.05 and 0.06 levels. According to adjusted R-squared; it interprets (6.44%) of a banking profitability according to ROA. Therefore, the study ascertained that there is an impact of the bank's asset and liability structure on their profitability according to "Return on Assets".

b. ROE

 Table 3. Examining H₂

Model 4: WLS, using 90 observations

Included 10 cross-sectional units

Dependent variable: Y2

Weights based on per-unit error variances

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
constant	-1.49291	0.585038	-2.552	0.0125	**
X1	0.0745095	0.231523	0.3218	0.7484	
X2	-0.360735	0.179255	-2.012	0.0474	**
X3	1.71765	0.581691	2.953	0.0041	***
X4	1.52448	0.540484	2.821	0.0060	***
X5	2.03829	0.722426	2.821	0.0060	***

Statistics based on the weighted data:

Sum squared residual	89.64545	S.E. of regression	1.033057
R-squared	0.183525	Adjusted R-squared	0.134925
F(5, 84)	3.776259	P-value(F)	0.003917
Log-likelihood	-127.5268	Akaike criterion	267.0537
Schwarz criterion	282.0525	Hannan-Quinn	273.1021

Statistics based on the original data:

Mean dependent variable	0.153222	S.D. dependent variable	0.068200
Sum squared residual	0.352671	S.E. of regression	0.064796

Source: Gnu Regression, Econometrics and Time-series Library output.

The previous statistical results indicate that the impact of the bank's asset and liability structure on banking profitability according to ROE, and Investments to deposits ratio; Loans to total assets ratio; Liquid assets to total assets ratio and financial investments to total assets ratio is significant at 0.05; 0.01; 0.01 and 0.01 levels. According to adjusted R-squared; it interprets (13.49%) of a banking profitability according to ROE. Hence, the study found that there is an impact of the bank's asset and liability structure on their profitability according to "Return on Equity".

Discussion and conclusions

The study confirmed that there is an impact of the bank's asset and liability structure on their profitability according to "Return on Asset" and "Return on Equity"; but the interprets of bank's asset and liability structure for "Return on Equity" are more that to "Return on Asset".

Through inferential analysis, the study substantiated that both Investments to deposits ratio; Loans to total assets ratio; Liquid assets to total assets ratio and financial investments to total assets ratio has impact on bank's profitability according to "Return on Equity", these are significant at 0.05; 0.01; 0.01 and 0.01 levels. In addition to Loans to total assets ratio; Liquid

assets to total assets ratio and financial investments to total assets ratio has an impact on bank's profitability according to "Return on Asset"; these are significant at 0.1; 0.05 and 0.06 levels.

Through the above, the study reveals that the characteristics of the structure of assets and liabilities of the bank act as intermediate variables to convey the impact of economic policies; especially monetary policies (see: Hancock, 1985; Aharony et al., 1986; UDEH, 2015; Alalaya and Al Khattab, 2015; Alessandri and Nelson, 2015; Djalilov and Piesse, 2016; Borio et al., 2017; Altavilla et. al., 2018) ; and the impact of the size of the bank on profitability at different levels (Aladwan, 2015; Menicucci and Paolucci, 2015), in addition to the impact of Development of Regulatory Restrictions from the central bank (Tran et al., 2016; Helmy and Wagdi, 2019).

Recommendations

The study concluded that there is an impact of the bank's asset and liability structure on their profitability according to "Return on Asset" and "Return on Equity". Therefore, the banking units should work to reach the optimal rate of the structure of the bank's assets and liabilities; as this may be a new/potential research scope in banks.

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