International Journal of Financial Management (IJFM)
ISSN(P): 2319-491X; ISSN(E): 2319-4928
Vol. 6, Issue 6, Oct– Nov 2017, 1-10

International Academy of Science, Engineering and Technology
Connecting Researchers; Nurturing Innovations

CRUDE OIL PRICES AND BANKS PERFORMANCE IN THE ARAB MAGHREB COUNTRIES (ALGERIA - LIBYA - TUNISIA - MOROCCO): CROSS SECTION ANALYSIS

FATMA BENNACEUR[1] & ALI BENDOB[2]

[1]Lecturer in Finance at Institute of Economics, Commerce and Management Sciences,
LMELSMC Laboratory, University of Ain Temouchent, Ain Temouchent, Algeria

[2]Ph.D. In Finance and lecturer at Institute of Economics, Commerce and Management Sciences,
LMELSMC Laboratory, University of Ain Temouchent BP 284, Ain Temouchent, Algeria

ABSTRACT

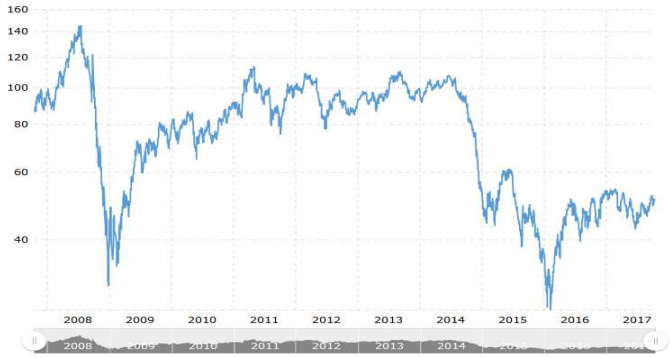
In the theoretical background, the profitability and performance of the banking sector will decrease in oil exporter countries; if crude prices fall; because these countries will suffer from falling revenues, unemployment rates rise and economic growth slow. This paper examines the relationship between oil prices and the performance of banks. Using the regression model, with unbalanced panel data analysis at the level of four Arab Maghreb countries (Algeria - Libya - Tunisia - Morocco), over the period of 1997-2013. Our results indicate that, there is a negative relationship, significant between oil prices and profitability (NIM, ROAA); and a significant negative relationship between inflation and profitability (NIM, ROAA) of the banking sectors, in the Arab Maghreb countries in the study. The relationship between oil prices and loans is positive and not significant. There is a relationship between GDP and profitability (NIM, ROAA) of the banking sectors, in the Arab Maghreb countries is positive and not significant. This results not change under the three methods POLS, fixed effects and random effects. The acceptance of random effects models shows that, the relationship varies from one country to another, due to the different characteristics of each economy and varied under time.

KEYWORDS: Oil Prices; Performance of Banks; Arab Maghreb Countries; Oil Exporting Countries; Unbalanced Panel Data

JEL Classification : G21, C23, L2

1. INTRODUCTION

Crude oil plays an important role in the economy, where all the sectors are correlated to this important product directly or indirectly, especially the transport sector, industries and other sectors. Oil prices have volatile significantly, over the last ten years, especially after the subprime crisis. We present the following figure to highlight the West Texas Intermediate (WTI or NYMEX) crude oil prices, per barrel fluctuations.



Source: http://www.macrotrends.net/1369/crude-oil-price-history-chart (10/10/2017)

Figure 1: Crude Oil Prices of 10 Year Daily Historical Charts

Figure 1 shows that, the biggest shocks were after the subprime crisis and after the middle of 2014. Oil prices fell sharply below 50 USA $, after it exceeded 140 USA $, year 2008.This volatility is due to several factors: wars and political instability in the Middle East, increased the supply of oil in the global market, declining demand for many developing countries, etc.(Chengcheng and Bingqing 2015). Oil price volatilities have implications, for the country's economy, depending on the nature of its activity, that was an importer or exporter of crude oil (see Said (2016)). The oil exporter countries suffer from falling revenues, if crude prices fall, unemployment rates rise and economic growth slows down, as a result, the profitability and performance of the banking sector will be decreased. The importing and non-oil producing countries, pay a lower cost and thus lower production cost. This decline in costs will have a positive impact on the economy, as unemployment rates decline and economic growth increases. As a result, the banking sector will increase profitability and performance (see Hesse & Poghosyan (2016)). Ferrouhi's (2014), work to analyze the performance of major Moroccan banks during the period 2001-2011, using CAMEL approach. This study aims to evaluate Moroccan banks capital adequacy, asset quality, management, earnings and liquidity and then determine financial performance, operating soundness and regulatory compliance of Moroccan banks. Without the use of standard techniques, the author applied CAMEL approach only. Sarra and Naoufel (2014), analyzes the determinants of profitability if sample of 10 Tunisian banks' over the period 1999-2010, and use the generalized method of moments (GMM) was used to generate the results of the econometric estimation of the dynamic panel. The empirical results indicate that many institutional and structural factors significantly influence the Tunisian banks profitability. Bendob's (2015) study examine the relationship between profitability of commercial banks and two types of factors internal and external, for a sample of 10 public and private Algerian banks over 1997-2012. We use the regression model with unbalanced panel data analysis and CAMEL approach. He concludes the management efficiency and liquidity indicators are positively related with profitability, and the capital indicator is negatively related with profitability. The assets quality, GDP and inflation have not any significant effect on profitability of commercial banks in Algeria in the period of study;

In this research paper, we work to verify whether oil prices effect on the profitability and performance of banking sector and whether this effect is a positive or negative? Is the nature of the impact of oil prices different between exporting and importing countries? In order to test this hypothesis, we use the linear regression model for four countries in the Maghreb (Algeria - Libya - Tunisia - Morocco) over the period 1997-2013.

Section 2 outlines the Literature review of the oil prices effect on the profitability and performance of banks. In section 3, we present the method and variables of the study. In section 4, we present the results of the linear regression model and analysis of results; we compare the impact of oil prices different between exporting and importing countries, and in section 5, we give some conclusions.

2. LITERATURE REVIEW

The profitability of banks depends on factors specific to the banking sector and the overall economy, which have confirmed that credit risk is negatively related to profitability (Bendob (2015), (Miller and Noulas, 1997) because risk management suffers of a defect in asset quality which led to a greater increase in loan amounts in difficulty and which negatively affected profitability. It has given rise to a mixed relationship between liquidity and profitability (Molyneux and Thornton, 1992 and Bourke, 1989). The most efficient banks can achieve higher profits (Bourke, 1989; Molyneux and Thornton, 1992), while the bank's profitability may also be stable (Athanasoglu et al., 2008), whereas they imply a certain level Concentration and market power in the banking sector, both in the entry and exit markets (Short, 1979, Bourke, 1989, Molyneux and Thornton, 1992 and Flamini et al., 2009).

On the one hand, macroeconomic researchers have found a link between inflation and interest rates and profitability (Bourke, 1989; Molyneux and Thornton, 1992) and the business cycle and performance of the bank (Demirguc-Kunt and Huizinga, 2000, Bikker and Hu, 2002, and Flamini and others, 2009). Banks are generally able to adjust interest rates if expected inflation is increased in order to boost profits. Researchers disagree on this point on the basis of the difference between commercial and Islamic banks. According to (Čihák and Hesse, 2008), Islamic banks often tend to be financed by vouchers and deposits compatible with Islamic law. The rise in oil prices is associated with high cash flows, so there is a positive correlation between oil prices and the performance of Islamic banks. But, with the fall in oil prices and oil yield, they notice the stoppage of investments in real estate for traditional banks. They assume that Islamic banks that rely on stable deposits may experience less risk than Islamic banks, which rely mainly on wholesale financing. We have reported two previous empirical studies of oil price fluctuations with performance. Domenico's (2009) article explored the relationship between oil price shocks and the profitability of banks using data on 145 Banks in the 11 countries of the oil exporting region for the period 1994 to 2008. The results indicated that oil price shocks have an indirect effect on the profitability of banks, where it passes through the variables of the ' Global economy and other institutional variables in each country, while the direct impact is minimal. It seems that investment banks are the most affected compared to Islamic and commercial banks. The researchers also highlighted the systemic effects of oil price shocks on the bank's performance, which confirms its importance for the purpose of macro prudential management in the countries of the region. Chengcheng and Bingqing's (2014) paper examined the analysis of the impact of oil prices on the profitability of banks in Canada. Based on data from 10 public banks in the period 1995-2015, researchers used bank profitability indicators and included special indicators of private banks as well as macroeconomic factors.

Researchers have identified a positive relationship between oil price and bank profitability in the first period, but there is no evidence to show that they have a relationship in recent years. The government has taken measures of interest to banks to protect them from the risks of oil price fluctuations.

3. METHOD

For testing the effect of oil prices on the bank's performance in the Arab Maghreb countries (Algeria, Libya, Morocco and Tunisia) during the period 1997 to 2013, we use cross section analysis and the application on a regression model as follows:

$$\text{Prof}_{it} = \alpha_i + \beta_1 \log(\text{Brent}_{t,t}) + \beta_2 Inf_{i,t} + \beta_3 \text{GDP}_{i,t} + \varepsilon_{i,t}$$

Where:

Profit: the profitability of banks for country i at year t, it is represented by three variables as follows: NIM: is a net interest margin, ROA: is a return on the assets, LOANS: is a credit offered to the economy (See Benahmed-Daho, et al. (2015)).

Log (Brenti, t): is a natural logarithm of Brent oil prices for year t.

Inf i, t: is a inflation rate for country i at year t;

Log (GDPi, t) is a natural logarithm of gross domestic product for country me at year t.

Our study includes four countries of the Arab Maghreb, classified according to the English alphabet: Algeria - Libya - Morocco - Tunisia. For the period of 17 years from 1997 until 2013, we downloaded the statistics from a site of the International Monetary Fund and the World Bank also from the Federal Bank of America. In this study, we proposed two hypotheses:

H^1_1: There is a negative and significant relationship between volatilities of oil prices and bank profitability.

H^2_1: There is a positive and significant relationship between volatilities of oil prices and bank profitability.

This study used several different models among the models of fixed and random effects on the level of three models according to (NIM - ROA - LOANS).

RESULTS

Table 1 below shows that most estimators of the Pooled least squares model are statistically also significantly different from zero, Fisher's statistic indicates acceptance of this model, at the significance level of 1%, notes that the oil price has a negative and significant relationship between the oil prices and NIM. The inflation rate has a negative and significant relationship between the oil prices and NIM at the level 1%. On the other hand, the return ratio of the ROA assets has a statistically significant relationship with the price of oil and the gross domestic product at the 1% level. Thus, a positive relation between ROA and GDP has been indicted and an inverse relationship between the price of oil and the return on assets knowing that the inflation rate INF is not meant with ROA. Finally, the ratio of credits offered to the LOANS economy shows a positive and statistically significant relationship with BRENT, GDP, INF. From this, it can be concluded that the BRENT oil price indicator has a relationship with the profitability of the banks, which is presented by the three ratios: NIM, ROAA, and LOANS. But we cannot stop our study at this level. In order to do so, we continued our study, which this time emphasized the impact of fluctuations in oil prices, taking into account the characteristic of each country in the sample, given that the latter contains four countries, two of them are oil exporters while the other two do not rely on this product in their economies. The results are as follows:

Table 1: Result of Estimation of Pooling Least Squared Method

Included observations: 17			
Cross-sections included: 4			
Total pool (unbalanced) observations: 68			
Dependent Variable			
	Model 1 (NIM)	**Model 2 (ROAA)**	**Model 3 (LOANS)**
Variable	**Coefficient**	**Coefficient**	**Coefficient**
C	6,0846*	1,6886*	12,6388**
	(0,0000)	(0,0000)	(0,0289)
LBRENT	-0,5874*	-0,2531*	0,0127 ns
	(0,0047)	(0,0082)	(0,9936)
INF	-0,1653**	-0,0614 ns	1,8982*
	(0,0585)	(0,1275)	(0,0064)
GDP	0,0000 ns	0,0000*	0,0000*
	(0,6000)	(0,0017)	(0,0000)
Adjusted R-squared	0,1593	0,1511	0,3059
S,E, of regression	1,0683	0,4946	8,3904
Sum squared resid	73,03	15,65	4505,49
Log likelihood	-98,9180	-46,5544	-239,0683
F-statistic	5,2306*	4,9740*	10,8409*
Prob(F-statistic)	0,0027	0,0036	0,0000

Source: Authors. () Prob.; * Significant at1% level; ** Significant at 5% level; *** Significant at10% level; ns: Not Significant.

Table 2 shows the estimation results of the fixed effects model, we are seen that the Fisher's statistic is significant at the level 1%, for the three indicators (NIM, ROA, LOANS).The fixed effects model is statistically accepted, the parameters of this method is characterized by a high elasticity price of the oil price in the first model NIM, it reached -0.858, also we noticed an inverse relationship statistically signified between the BRENT and NIM at the level 1%, thus a statically unrelated inverse relationship between the inflation rate and the profitability presented by the NIM indicator, on the other hand, the GDP ratio is significant at the level 5%, and a relationship indicated with the margin of net interest. The elasticity was low and not significant in the third model as small but significant in the second model. The principal independent variables are non-significant in the third model; one can refuse this model in this case. Concerning the indicator of the return on average assets ROAA it is noted that it is not significant statistically, with the rate of inflation, but on the side of the variables BRENT, GDP is significant at the level 1%. We notice there is a positive relationship between GDP and profitability, therefore, the third model represented by the LOANS indicator is not signed with any variables so one can distinguish a negative relation with the price variable of Oil and inflation. Summarizes that the price of oil has an impact on the asset return ratio and the net interest margin only in this case will affect the performance of banks, which we confirmed in the previous results of the bank performance with an inverse way or it decreases the net interest margin and asset returns this confirms the existence of a surplus of liquidity so the banks will thus lower interest rates to encourage investment credits for Improve the economy of the country especially the oil exporters. Concerning the countries that this base in its economy on the stock market as the countries of the GCC evaluation of the performance of these banks in 2008 (global financial crisis) shows a deterioration in bank profits and a loss of confidence that is installed on transaction banking in general. We can also talk about exchange rates because it has

been observed that sample countries frequently use the Dollars against their currencies, whereas the rise in oil prices in the countries exporting this product leads to an increase in the foreign exchange reserves of one country despite its performance and profitability of banks declines due to excessive investment without the precaution against the risks caused. In Algeria can be attributed to the applied policy from the government or to the nature of the banking sector. But for both countries, Libya and Tunisia can be attributed to external factors such as political instability and the Arab Spring, which have reversed the situation of the national economy and make the internal market weak also the emergence of the black market with mismanagement of the economy in general. The Oil can be considered as a wealth for Tunisia and Morocco by the countries consuming this product, so the rise in prices will have a negative impact on the national economies and on the performance of these banking systems, due to the rise in prices of commercial transactions with international countries then this impact will infect neighbouring countries.

But the results of differing estimates in the effects model are presented in the next step.

Table 2: Result of Estimation by Cross Section Fixed Effects Method

Included observations: 17			
Cross-sections included: 4			
Total pool (unbalanced) observations: 68			
Dependent Variable			
	Model 1 (NIM)	**Model 2 (ROAA)**	**Model 3 (LOANS)**
Variable	**Coefficient**	**Coefficient**	**Coefficient**
C	6,206*	1,964*	20,718*
	(0,000)	(0,000)	(0,000)
LBRENT	-0,858*	-0,449*	-1,408ns
	(0,000)	(0,000)	(0,246)
INF	-0,011 ns	-0,034 ns	-0,661 ns
	(0,910)	(0,408)	(0,250)
GDP	0,000**	0,000*	0,000 ns
	(0,044)	(0,000)	(0,235)
Adjusted R-squared	0,306	0,393	0,669
S,E, of regression	0,970	0,418	5,795
Sum squared resid	57,438	10,672	2048,668
Log likelihood	-90,749	-33,524	-212,273
F-statistic	5,931*	8,226*	23,554*
Prob(F-statistic)	0,000	0,000	0,000

Source: Authors () Prob.; * Significant at1% level; ** Significant at 5% level; *** Significant at10% level; ns: Not Significant.

According to Table 3 below, the first NIM model has a negative relationship between it and the inflation rate, the oil price, also a positive relationship between NIM and GDP. There is a statistical significance between NIM and INF, BRENT. There is an absence of significance for GDP. The second model presents the ROA has significance with all independent variables, except that it proves a positive relationship with the GDP and negative with the BRENT and INF. On the other hand, the third model indicates a positive and significant relationship between inflation rate, and the non-significance for oil prices, concerning the variables GDP and LOANS are statistically significant and shows a negative relationship between them. The estimated parameters of the random individual effects model with the generalized least

squares method are flexible and take a value less than the fixed effects model. With the Within method and is accepted only by the fixed effects method in the first two models, so we can confirm the hypothesis that indicate a negative effect of oil prices on the performance of the banking sector in the Maghreb countries.

Table 3: Result of Estimation by Cross Section Random Effects Method

Included observations: 17			
Cross-sections included: 04			
Total pool (unbalanced) observations: 68			
Dependent Variable			
	Model 1 (NIM)	**Model 2 (ROAA)**	**Model 3 (LOANS)**
Variable	**Coefficient**	**Coefficient**	**Coefficient**
C	6,085*	1,689*	12,639*
	(0,000)	(0,000)	(0,002)
LBRENT	-0,587*	-0,253*	0,013 ns
	(0,002)	(0,002)	(0,991)
INF	-0,165**	-0,061**	1,898*
	(0,038)	(0,073)	(0,000)
GDP	0,000 ns	0,000*	0,000*
	(0,564)	(0,000)	(0,000)
Adjusted R-squared	0,159	0,151	0,306
S,E, of regression	1,068	0,495	8,390
F-statistic	5,231*	4,974*	10,841*
Prob(F-statistic)	0,003	0,004	0,000

Source: Authors. () Prob.; * Significant at1% level; ** Significant at 5% level; *** Significant at10% level; ns: Not Significant.

The results of the Hausman's test below to confirm the dependence on the random effect model and the acceptance of the first hypothesis H0 which consists of the existence of a negative impact between the fluctuation of oil prices and the performance of the banks (profitability Banking) for the long term on the ROA, NIM models but there is a positive relationship between the oil price and the LOANS model especially in the oil exporting countries over the term.

Table 4: Result of Hausman Test

Test Cross-Section Random Effects				
Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**	**Chi-Sq. Statistic**
Cross-section random	0.000	3	0.999	0.000

Source: Authors

5. CONCLUSIONS

Based on the importance of oil and the effects of its volatilities on bank profits, we test the relationship between oil prices and bank's performance, using the data of the banking sector of the Arab Maghreb countries (Algeria - Libya - Morocco - Tunisia) over the period 1997 2013. In the first place, several important empirical studies

have been highlighted in the field of banking performance. Then, we study its relationship with oil prices. We support the theoretical side by a practical study of the banking sector concerning four countries of the Maghreb for the period 1997-2013. We found a negative relationship between these two variables represented by the following three models (return on ROA assets - net interest margin NIM - loans to the total assets) for the period 1997-2013. The most important results that have been drawn from this study are:

- There is a negative relationship significant at1% level between oil prices and profitability (NIM, ROAA) of the banking sectors in the Arab Maghreb countries (Algeria - Libya - Morocco - Tunisia).
- There is a positive relationship not significant between oil prices and loans of the banking sectors in the Arab Maghreb countries (Algeria - Libya - Morocco - Tunisia).
- These results not change under the three methods POLS, fixed effects and random effects.
- There is a negative relationship significant between inflation and profitability (NIM, ROAA) of the banking sectors in the Arab Maghreb countries (Algeria - Libya - Morocco - Tunisia).
- There is a relationship no significant between GDP and profitability (NIM, ROAA) of the banking sectors in the Arab Maghreb countries (Algeria - Libya - Morocco - Tunisia).
- We accept the random effects model; it shows that the relationship varies from one country to another, due to the different characteristics of each economy.

Based on previous results, it can be said:

- Accept the H^1_1 hypothesis that recognizes there is a negative and significant relationship between volatilities of oil prices and bank profitability.
- Reject the H^2_1 hypothesis that recognizes there is a positive and significant relationship between volatilities of oil prices and bank profitability.

For future research of this subject, we can propose to include the regional dimension MENA for example, and can be applied other econometric techniques in order to test the relationship between crude oil and profitability of banks.

REFERENCES

1. Benahmed-Daho, R., Bouteldja, A., & Bendob, A. (2015). Liberalization of Financial Services and Performance of Commercial Banks in Algeria: An Empirical Study (1998-2012). International Journal of Economics and Finance Issues, 5 (4).
2. Bendi A.,Benbouziane M., Benamar A.; Oil and economic activity in Africa: an econometric analysis; available: www.fseg.unv-tlemcen.dz
3. Bendob, A. (2015). Profitability of public and private commercial banks in Algeria: Panel data analysis during 1997-2012. European Journal of Business and Management, 7 (20), 117-128.
4. Berger, A. N. (1995). The profit-structure relationship in banking--tests of market-power and efficiency-structure hypotheses. Journal of Money, Credit and Banking, 27 (2), 404-431.

5. Bikker, J. A., & Hu, H. (2001). Cyclical patterns in profits, provisioning and lending of banks and procyclicality of the new Basel capital requirements. Research Series Supervision, 39.
6. Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. Journal of Banking & Finance, 13 (1), 65-79.
7. Burlet.M. et Crusson. L (2007), What impact of oil price changes on French growth?, Working Paper No. 4, www.inse.fr
8. Chengcheng Xu and Bingqing Xie (2015) the impact of oil price on bank profitability in canada, simon fraser university. p1-38.
9. Cihák, M. M., & Hesse, H. (2008). Islamic banks and financial stability: An empirical analysis (No. 8-16). International Monetary Fund.
10. Demirgüç-Kunt, A., & Huizinga, H. (2000). Financial structure and bank profitability. http://siteresources.worldbank.org/INTFR/Resources/475459-1108132178926/Kunt_Huizinga.pdf
11. Hesse, H., & Poghosyan, T. (2016). Oil prices and bank profitability: evidence from major oil-exporting countries in the Middle East and North Africa. In Financial Deepening and Post-Crisis Development in Emerging Markets (pp. 247-270). Palgrave Macmillan US.
12. Hesse, H., & Poghosyan, T. (2016). Oil prices and bank profitability: evidence from major oil-exporting countries in the Middle East and North Africa. In Financial Deepening and Post-Crisis Development in Emerging Markets (pp. 247-270). Palgrave Macmillan US.
13. Siagh Ahmed Ramzi & Hachemane Mouloud, Predict Crude Oil Prices in the International Market an Alternative Forecasting Technique, International Journal of Financial Management (IJFM), Volume 5, Issue 4, June-July 2016, pp. 23-36
14. Lescaroux, F., & Mignon, V. (2008). On the influence of oil prices on economic activity and other macroeconomic and financial variables. OPEC Energy Review, 32 (4), 343-380.
15. Maurice D., 1999 «The oil market», Ellips Edition.
16. Miller, S. M., & Noulas, A. G. (1997). Portfolio mix and large-bank profitability in the USA. Applied Economics, 29 (4), 505-512.
17. Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: A note. Journal of banking & Finance, 16 (6), 1173-1178.
18. Said, A. (2016). The Influence of Oil Prices on Islamic Banking Efficiency Scores during the Financial Crisis: Evidence from the MENA Area. International Journal of Finance & Banking Studies (2147-4486), 4 (3), 35-43. http://www.ssbfnet.com/ojs/index.php/ijfbs/article/download/223/192
19. Short, B. K. (1979). The relation between commercial bank profit rates and banking concentration in Canada, Western Europe, and Japan. Journal of Banking & Finance, 3 (3), 209-219.

20. Yahia, A., & Metwally, M. M. (2007). Impact of fluctuations in oil prices on Libyan economic growth. The Middle East Business and Economic Review, 19 (1), 39.

21. Yahia, A., & Metwally, M. M. (2007). Impact of fluctuations in oil prices on Libyan economic growth. The Middle East Business and Economic Review, 19 (1), 39.

22. Sarra TROUDI, Naoufel LIOUANE (2014) Profitability determinants in the Tunisian Banks, International journal of business and social research, ISSN 2164-2540.

23. Ferrouhi E. (2014), Moroccan Banks Analysis Using CAMEL Model, International Journal of Economics and Financial Issues Vol. 4, No. 3, 2014, pp. 622-627.