Do Financial Inclusion Indicators Affect Banks' Profitability? Evidence from Selected Arab Countries

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Abstract

The study aims to investigate the effects of financial inclusion on the performance of the banking sector, measured by the return on assets, for a set of 11 Arab countries over the 2013-2019 period in the dynamic panel data framework. In addition to financial inclusion indicators, We include bank-specific factors and macroeconomic variables into the analysis.

The study reveals that the bank-specific factors are the most influential on banks' profitability, and to a lesser extent the macroeconomic variables. Specifically, there is evidence of positive and significant impacts of the size of banks, the capital adequacy ratio, the credit growth for the banking sector, the real GDP growth rate, and the inflation rate on banks' earnings for the set of Arab countries under study. However, the return on assets does not react to the movements in the non-performing loans and the interbank lending rate. Regarding financial inclusion, the study does not find any evidence of significant effects of the distribution of ATMs and the number of bank branches on the return on assets. The study provides relevant policy recommendations for the banking decision-makers in the considered Arab countries, which can help them enhance management efficiency of the banking sector to improve banks' performance.

Introduction

The banking sector in the Arab region, as the most important component of the financial system,[1] plays a crucial role in financing economic activities. Given its importance for the economy, there is a need to assess the financial strength indicators of the Arab banking sector, thus determining its risks. In this context, financial soundness indicators, considered as an early warning system for the banks' financial position, help the banking sector manage assets and liabilities effectively, and reflect the banks' ability to meet capital adequacy and liquidity requirements. In this regard, the return on assets (ROA) and the return on equity (ROE) are the main ratios to measure the banks' operational efficiency, performance and profitability.[2] The banks' returns increase the flow of investments to the banking sector and the confidence degree.

Prior empirical studies have examined the effects of several determinants, such as bank-specific variables, monetary policy factors, and macroeconomic variables, on banks' profitability. To the best of our knowledge, the literature has not paid much attention to

[1] The assets of the Arab banking sector constitute more than 85% of the total assets. In addition, its assets reached about $3.6 trillion in 2019, representing 142% of the GDP in the Arab region.

[2] Profitability is one of the most important elements of the CAMELS (Capital adequacy, Assets, Management capability, Earnings, Liquidity, Sensitivity) rating system.

the responses of banks' earnings to the changes in financial inclusion in the Arab region. For this purpose, the current study includes financial inclusion indicators into the analysis to explore the sensitivity of banks' profitability to these indicators for a panel of 11 Arab economies over the 2013-2019 period in the dynamic panel data framework.

In addition to financial inclusion proxies, the analysis includes bank-specific determinants and macroeconomic factors. By doing so, we shed more light on a number of channels that may affect banks' earnings for selected Arab countries, providing policy recommendations that could help Arab bank decision-makers make pertinent policies to enhance banks' profitability.

The study outcomes reveal significant and positive effects of the one-period lagged return on assets, the size of banks, the capital adequacy ratio, the credit growth for the banking sector, the real GDP growth rate, and the inflation rate on the return on assets. However, the non-performing loans ratio, the interbank lending rate, and the financial inclusion indicators, namely the distribution of ATMs and the number of bank branches do not have the power to influence the return on assets for the selected Arab countries over the study period. Relevant policy recommendations are suggested to help policymakers enhance management efficiency of the Arab banking sector to increase banks' profitability.

The remainder of the study is organized as follows. Section 1 briefly reviews empirical studies in the related literature. Section 2 presents data and variables. A preliminary analysis of data is introduced in Section 3. The model and estimation issues are presented in Section 4. Section 5 discusses the study outcomes. Concluding comments and policy recommendations are provided at the end of the study.

1. Literature review

Some empirical studies in the related literature have examined the effects of financial inclusion on banks' profitability. Within this context, Ahamed and Mallick (2019) show that the spread of bank branches in the regions where more unbanked individuals and firms are located allows understanding their needs, thus reducing default risk and the non-performing loans, which in turn enhance banks' earnings.

Shihadeh et al. (2018) investigate the effects of financial inclusion indicators, namely the number of ATMs, the number of ATM services, the number of credit cards, and new services on the return on assets for 13 Jordanian commercial banks over the 2009-2014 period. They find that the impact on banks' profitability depends on the used financial inclusion indicator. For instance, there is evidence of a positive significant effect of the number of ATMs on the return on assets, implying that this indicator contributes to improving banks' performance.

Akhisar et al. (2015) analyze the influence of electronic banking services on the return on assets and the return on equity for the banking sector of 23 countries over the 2005-2013 period. The study reveals positive effects of debit and credit cards, the distribution of ATMs and the number of branches on banks' performance. However, the Internet banking and POS exert a negative effect on banks' profitability.

Ikram (2015) conducts a survey to study the effects of the usage and accessibility of the affordable financial services and products on banks' earnings in Karachi. The study outcomes show evidence of a nonsignificant relationship between profitability and the considered determinants.

Eyadat and Kozak (2005) study the sensitivity of cost-effectiveness improvements and earnings of the banking sector to the role of information technology systems. The results reveal that investments in information technology systems exert a positive impact on banks' profitability, while reducing cost efficiency proportionally with earning effectiveness.

2. Data and variables

There is limited evidence in the literature on the effects of financial inclusion on banks' earnings in the Arab region. For this reason, the current study examines the relationship between the return on assets and a set of various explanatory variables for a panel of 11 Arab

countries (Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Sudan, and the United Arab Emirates (UAE)) based on annual data from 2013 to 2019. In our models, the dependent variable is the return on assets. As regards the explanatory variables, we consider three classes of determinants.

2.1. Bank-specific variables

These variables first include the size of banks (SIZE) measured by the assets (in natural logarithm), which is expected to positively affect banks' profitability (see Kosak and Cok, 2008; and Khrawish, 2011). Indeed, larger banks are more effective in credit analysis due to their ability to manage credit risk and provide an accurate evaluation of the customers. Additionally, large banks exploit their market power and brand image to achieve higher profits, and take advantage of their size by reducing expenses (see Obeid and Adeinat, 2017). Second, we consider the solvency proxied by the capital adequacy ratio (CAR), which is expected to positively impact the return on assets. Indeed, a bank with high capital adequacy levels would increase customer confidence and attract more deposits, thus improving its earnings. The well-capitalized banks have a strong solvency position (see Athanasoglou et al., 2006).

Third, we consider the credit growth for the banking sector (CREDIT) whose correlation with banks' profits depends on the management of its assets, given the core business of banks is financial intermediation. Indeed, the granting more credits without

any rational evaluation would negatively affect bank's earnings (see Abreu and Mendes, 2000). However, the relationship between the credit growth and the bank's profits might be positive, due to the efficient management of the loan portfolio (see Staikouras and Wood, 2004). Fourth, we consider the non-performing loans (NPLs) ratio, which is expected to negatively affect the return on assets. Indeed, the weak credit evaluation and the low quality of the credit portfolio assets increase the non-performing loans and let part of the liquidity slip away to cover expected credit losses, thus decreasing banks' earnings (see Iannotta et al., 2007).

2.2. Macroeconomic variables

We first consider the interbank lending rate (ILR), which is expected to negatively influence the return on assets. Indeed, high interest rates may increase the costs for borrowing from banks, thus decreasing banks' earnings. Subsequently, increasing the interest rate may decline the solvency of bank clients, leading eventually to high default loans, which, in turn, increase the financial burden on banks to cover credit losses (see Jouini and Obeid, 2020). Second, we include the real GDP growth rate (GR), which is likely to positively affect the return on assets. Indeed, attractive economic environment enhances the cash flows of companies and households' sectors, thus improving their solvency. Additionally, increasing confidence in the economy would increase the demand for investment loans, thus raising banks' profitability (see Obeid and Adeinat , 2017). Third, we

consider the inflation rate (INF), which is expected to exert a negative impact on the return on assets, as high prices may affect negatively the clients' ability to repay their bank loans (see Curak et al., 2013). The relationship between the return on assets and the inflation rate can also be positive. Indeed, price increases may affect negatively the households and companies revenues, which may incite them to borrow more from banks, thus rising banks' earnings (see Vong and Chan, 2007; and Tan and Floros, 2013).

2.3. Financial inclusion variables

Related studies have generally revealed a positive relationship between the distribution of ATMs[3] and banks' earnings. Indeed, diversity of electronic channels from the banking sector attracts more deposits and enhances access to finance, thus increasing banks' profitability (see Frame and White, 2012). In addition, the geographical distribution of ATMs may increase customers' loyalty, which might positively affect banks' earnings (see Monyoncho, 2015). It is also found that the number of bank branches[4] (BRCH) exerts a positive impact on banks' profitability (see Al-Tamimi, 2010).

Data are gathered from different sources. Indeed, data on the return on assets, the NPLs ratio, the total assets, the capital adequacy ratio,

[3] In this study, we consider the number of ATMs per 1,000 km.

[4] In this study, we consider the number of bank branches per 1,000 km.

and the credit growth are gathered from financial stability surveys; data on the interbank interest rate are compiled from central banks databases; data on real GDP are collected from World Development Indicators published by the World Bank; data on inflation rate are gathered from the United Nations Conference on Trade and Development (UNCTAD) database; and data on financial inclusion indicators (distribution of ATMs and number of bank branches) are gathered from World Data Atlas.

3. Preliminary analysis of data

The descriptive statistics displayed in Table 1 indicate that Sudan records the highest return on assets (3.59) followed by Saudi Arabia (1.96) and Qatar (1.83), suggesting that the banking sector in these economies would have the more efficient business compared to the other countries. By cons, Iraq records the lowest return on assets (0.59) followed by Lebanon (0.87) and Morocco (0.91), implying that the banking sector management in these countries is less efficient at using total assets to generate earnings compared to the other economies.[5] It is worth noting that the average return on assets for Sudan (Iraq), Saudi Arabia (Lebanon) and Qatar (Morocco) is greater (weaker) than the average return on assets over the whole set of economies (1.50). The volatility of the return on assets differs across

[5] See also Figure 1 that displays the evolution of the return on assets in the banking sector of the Arab countries under study over the 2013-2019 period.

economies, as evidenced by the values of standard deviation, where Sudan is the most volatile (0.99), and Jordan and Kuwait are the least volatile (0.10). Additionally, the findings provide evidence of discrepancy in the averages and volatility of the bank-specific, macroeconomic and financial inclusion determinants across countries under study.

The correlations between the return on assets and the explanatory variables reported in Table 2 are computed across countries and over the full panel. The values by country reveal mixed (positive and negative) correlations between the return on assets and the considered determinants across countries. For the whole set of economies, the return on assets is negatively correlated with the size of banks (-0.02), the capital adequacy ratio (-0.32), the NPLs ratio (-0.32), the distribution of ATMs (-0.26), and the number of bank branches (-0.32). However, the return on assets is positively connected to the credit growth for the banking sector (0.09), the interbank lending rate (0.47), the real GDP growth rate (0.07), and the inflation rate (0.01). These correlation values are not conclusive as regards the nature of the connection of the return on assets to the considered determinants, leading us to conduct an in-depth study of such connection in the Arab region by opting for relevant estimation and testing procedures to achieve the objectives of the analysis.

4. Econometric methodology

In order to assess the responses of the return on assets in the Arab banking sector to the fluctuations in the bank-specific, macroeconomic, and financial inclusion variables, the current study opts for the difference Generalized Method of Moments (GMM), developed by Arellano and Bond (1991), to estimate dynamic panel data models. Practically, the model takes the following form:

$$\begin{cases} Y_{it} = \alpha_i + \beta Y_{i,t-1} + \gamma B'_{it} + \delta M'_{it} + \varphi F'_{it} + v_{it} \\ \quad i = 1, 2, \dots, N, \ t = 1, 2, \dots, T \end{cases} \tag{1}$$

where i stands for cross-section dimension (country) and t for time series dimension (time period); Y_{it} is the return on assets; B_{it} is the vector of bank-specific variables, namely SIZE, CAR, CREDIT, and NPLs ratio; M_{it} is the vector of macroeconomic variables, namely ILR, GR and INF; and F_{it} is the vector of financial inclusion indicators, namely ATMs and BRCH; and v_{it} is the disturbance term. As regards the model coefficients, α_i measure the individual-specific effects; the coefficient β assesses the response of the return on assets to its past own values, the vector γ assesses the impacts of the bank-specific determinants on the return on assets, the vector δ reveals how the return on assets reacts to the movements in the macroeconomic variables, and the vector φ assesses the effects of the financial inclusion indicators on the return on assets.

In this context of dynamic panel data models, the GMM estimators remove the individual-specific effect by transforming the model into first difference form:

$$\Delta Y_{it} = \beta \Delta Y_{i,t-1} + \gamma \Delta B_{it} + \delta \Delta M_{it} + \varphi \Delta F_{it} + \Delta v_{it} \qquad (2)$$

To overcome the correlation issue between the transformed error term, Δv_{it}, and the variable, $\Delta Y_{i,t-1}$, Arellano and Bond (1991) develop the first-differenced GMM estimator that opts for two or more lagged values of the independent variables as instruments by assuming no autocorrelation in the error term v_{it} and weak exogenous explanatory variables. This estimator is based on the following moment conditions:

$$E\left[X_{i,t-j} \Delta v_{it}\right] = 0, \;\; j \geq 2, t = 3, 4, \ldots, T \qquad (3)$$

where $X_{i,t-j} = Y_{i,t-j}, B_{i,t-j}, M_{i,t-j}, F_{i,t-j}$.

Based on these conditions, Arellano and Bond (1991) suggest calculating one-step and two-step estimators, which are widely used in the economic literature. In this study, we make use of the two-step GMM estimator that is asymptotically more efficient than the one-step GMM estimator (see Arellano and Bond, 1991).

5. Discussion of the results

We present results from the estimation of three models. First, we assess the effects of bank-specific variables on the return on assets

by setting $\delta = 0$ and $\varphi = 0$ in the model given by Eq. (1). Second, we assess the responses of the return on assets to the changes in the bank-specific and macroeconomic variables by setting $\varphi = 0$ in the model given by Eq. (1). Third, the reactions of the return on assets to the fluctuations in the bank-specific, macroeconomic and financial inclusion determinants are assessed by estimating the model given by Eq. (1).

5.1. Effects of bank-specific variables on profitability

The GMM estimate results of the responses of the returns on assets to the changes in the bank-specific variables from the full panel of 11 Arab countries over the 2013-2019 period are reported in Table 3. It is clear that the return on assets responds positively and significantly to its past own values. Regarding the bank-specific variables, the capital adequacy ratio and the credit growth for the banking sector are relevant drivers of the return on assets for the considered Arab economies, as the related coefficients are positive and significant, albeit the effects are weak. Indeed, an increase by one unit in the capital adequacy ratio and the credit growth for the banking sector tends to increase the return on assets by 0.016 and 0.007 unit, respectively. However, the size of banks and the NPLs ratio do not exert any effect on the return on assets.

5.2. Effects of bank-specific and macroeconomic variables on profitability

The GMM estimate results of the responses of the return on assets to the fluctuations in the bank-specific and macroeconomic variables are presented in Table 4. They reveal that the return on assets still responds positively and significantly to its past own values, with a little bit greater impact. The size of banks and the credit growth for the banking sector have the power to influence significantly and similarly the return on assets, albeit the effects are low, as an increase by one unit in these determinants leads to an increase by 0.002 unit in the returns on assets. The return on assets responds significantly and positively to the changes in the real GDP growth and inflation rates. Indeed, an increase by one unit in the real GDP growth and inflation rates leads to increase the return on assets by 0.008 and 0.040 unit, respectively. The other variables, namely the capital adequacy ratio, the NPLs ratio, and the interbank lending rate do not affect the return on assets.

5.3. Effects of bank-specific, macroeconomic and financial inclusion variables on profitability

The GMM estimate results of the reactions of the return on assets to the changes in the bank-specific, macroeconomic and financial inclusion determinants are displayed in Table 5. It is found that only two out of four bank-specific variables have the power to affect the return on assets. Indeed, the size of banks and the capital adequacy

ratio exert a positive and significant impact on the return on assets. In fact, an increase by one unit in the size of banks and the capital adequacy ratio leads to increase the return on assets by 0.002 and 0.015 unit, respectively. However, the credit growth for the banking sector and the NPLs ratio are not relevant drivers, as they do not exert any effect on the return on assets. The real GDP growth and inflation rates affect positively and significantly the return on assets, as an increase by one unit in these rates lead to increase the returns on assets by 0.013 and 0.030 unit, respectively. However, the return on assets does not respond significantly to the changes in the interbank lending rate. As regards financial inclusion, the findings reveal that the distribution of ATMs and the number of bank branches do not exert any influence on the return on assets.

5.4. Economic explanations

The results of most bank-specific variables are roughly consistent with previous studies in the related literature (see Dietrich and Wanzenrid, 2011; Davydenko, 2011; Olweny and Shipho, 2011; Rahman et al., 2015, and Kohlscheen et al., 2018). Indeed, the positive connection of the size of banks to the return on assets is due to the fact that increases in the size of banks may reflect the banks' ability to influence the market, thus attracting more customers and savings, which in turn exerts a positive effect on banks' earnings (see Sufian, and Habibullah, 2009; and Naceur and Omran, 2011).

The positive and significant relationship between the return on assets and the capital adequacy ratio is due to the fact that high capital adequacy indicates efficient management of banks' assets, which is reflected positively on banks' earnings and financial soundness indicators. In addition, high capital adequacy may indicate low banks' risk appetite, suggesting that banks may employ their funds sources within acceptable risk levels, which reduces credit risk.

The positive and significant relationship between the return on assets and the credit growth can be explained by the fact that this latter in parallel with accurate evaluation of customers and efficient risk management lead to more profits, which is aligned with prior related studies (see Nguyen et al., 2012; and Dang, 2019).

The negative (albeit nonsignificant) relationship between the return on assets and the NPLs ratio complies with previous studies (see Sufian and Habibullah, 2009; and Naceur and Omran, 2011), and is due to the fact that increases in credit risk (higher NPLs) lead to additional costs and pressure on banks' earnings.

Regarding the macroeconomic variables, the positive and significant relationship between the return on assets and the real GDP growth rate is due to the fact that the attractive economic environment leads investors to expand their activities by borrowing more from banks. In addition, the improvement in economic conditions may enhance customers' solvency, thus decreasing NPLs and increasing banks'

profitability (see Pasiouras and Kosmidou, 2007; Demirgüc-Kunt and Huizinga, 1999; and Bikker and Hu, 2002).

The positive and significant relationship between banks' earnings and inflation can be explained by the fact that price rises reduce the households and companies revenues, thus increasing their needs to borrow more from banks, which may be reflected positively on banks' profitability (see Vong and Chan, 2007; and Tan and Floros, 2013).

The nonsignificant relationship between the return on assets and the financial inclusion indicators (distribution of ATMs and geographical spread of bank branches) can be explained by the fact that the Arab countries still need to make more efforts to enhance financial inclusion and conduct more awareness campaigns. It is worth noting that the desired objectives of financial inclusion strategies take longer to be successful, taking into account that the operating costs of spreading ATMs and bank branches may be high.

5.5. Diagnostic checks

There are slight and nonsignificant differences in the estimate results across all models as to the statistical significance and the coefficients sign. In addition, we check the validity of the estimated models by conducting three tests for the consistency of the difference GMM

estimators, namely the Wald test for overall significance,[6] the second-order serial correlation,[7] and the Sargan test for overall validity of the instruments.[8] The results presented in Tables 3-5 provide evidence of overall significance of the model, as the Wald test rejects the null hypothesis at the 1% level. They also reveal no serial correlation in the first-differenced disturbance term, as the second-order autocorrelation test does not reject the null hypothesis. There is also evidence of valid over-identifying restrictions, as the Sargan test fails to reject the null hypothesis. Overall, the difference GMM estimates are supported by the tests outcomes.

Conclusion and policy recommendations

The study examines the relationship between the return on assets and various variables, such as the bank-specific determinants, the macroeconomic factors, and the financial inclusion indicators in the Arab banking sector for a set of 11 Arab countries over the 2013-2019 period in the dynamic panel data framework.

[6] The Wald test for overall significance tests the null hypothesis that all model coefficients (except the intercept) are equal to zero.

[7] The second-order serial correlation test tests the null hypothesis of no autocorrelation in the first-differenced disturbance term.

[8] The Sargan test for overall validity of the instruments tests the null hypothesis of validity of the over-identifying restrictions.

The study findings outline the importance of the responses of the return on assets to the fluctuations in a number of factors. Indeed, there is evidence of significant and positive impacts of the one-period lagged return on assets, the size of banks, the capital adequacy ratio, the credit growth for the banking sector, the real GDP growth rate, and the inflation rate on banks' earnings. However, the return on assets does not react to the movements in the non-performing loans ratio, the interbank lending rate, and the financial inclusion proxies, namely the distribution of ATMs and the number of bank branches. The study provides relevant policy recommendations for the banking decision-makers in the Arab countries under study:

1. Central banks may continue to improve the banks' operational efficiency and to monitor the financial soundness indicators of banks (especially the Domestic Systemically Important Banks, DSIBs).

2. Maintaining the soundness of banks' financial positions when extending the granting of loans, and the buffers of capital adequacy and liquidity ratios higher than those required by Basel III.

3. Enhancing the risk management in banks and the role of the board of directors in supervising the extent of compliance with the banks' credit policy.

4. Adopting financial awareness programs to include excluded individuals into formal financial system, especially those of rural areas.

5. Achieving a balance between operational costs on the one hand, and expanding bank branches and electronic financial services in remote areas on the other hand.

References

Abreu, M. and Mendes, V. (2000). Commercial bank interest margins and profitability: Evidence for some EU Countries. The 50th International Atlantic Economic Conference.

Ahamed, M.M. and Mallick, S.K. (2019). Is financial inclusion good for bank stability? International evidence. Journal of Economic Behavior and Organization, 17, 1–54.

Akhisar, I., Tunay, B. and Tunay, N. (2015). The effects of innovations on bank performance: The case of electronic banking services. In World Conference on Technology, Innovation and Entrepreneurship, Procedia – Social and Behavioral Sciences, 195, pp. 369–375.

Al-Tamimi, H.A.H. (2010). Factors influencing performance of the UAE Islamic and conventional national banks. Global Journal of Business Research, 4, 1–9.

Arellano, M. and Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Review of Economic Studies, 58, 277–297.

Athanasoglou, P., Delis, M. and Staikouras, C. (2006). Determinants of banking profitability in the South Eastern European region. Bank of Greece Working Paper. 06/47.

Bikker, J. and Hu, H. (2002). Cyclical patterns in profits, provisioning and lending of banks and procyclicality of the New Basel Capital Requirements. BNL Quarterly Review, 22, 143–175.

Curak, M., Pepur, S. and Poposki, K. (2013). Determinants of non-performing loans – evidence from Southeastern European banking systems. Banks and Bank Systems, 8, 45–53.

Dang, V. (2019). The effects of loan growth on bank performance: Evidence from Vietnam. Management Science Letters, 9, 899–910.

Davydenko, A. (2011). Determinants of bank profitability in Ukraine. Undergraduate Economic Review, 7, 1–30.

Demirgüc-Kunt, A. and Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: Some international evidence. The World Bank Economic Review, 13, 379–408.

Dietrich, A. and Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. Journal of International Financial Markets, Institutions and Money, 21, 307–327.

Eyadat, M. and Kozak, S.J. (2005). The role of information technology in the profit and cost efficiency improvements of banking sector. Journal of academy of business and economics, 70–76.

Frame W.S. and White, L.J. (2012). Technological change, financial innovation, and diffusion in banking. In the Oxford handbook of banking, chapter 19, Oxford University Press.

Iannotta, G., Nocera, G. and Sironi, A. (2007). Ownership structure, risk and performance in the European banking industry. Journal of Banking and Finance, 31, 2127–2149.

Ikram, I. (2015). Impact of financial inclusion on banks profitability: An empirical study of banking sector of Karachi, Pakistan. International Journal of Management Sciences and Business Research, 4, 88–98.

Jouini, J. and Obeid, R. (2020). Determinants of the non-performing loans in the Arab banking sector: Evidence from dynamic panel data models. Working Paper, Arab Monetary Fund.

Khrawish, H.A. (2011). Determinants of commercial banks performance: Evidence from Jordan. International Research Journal of Finance and Economics Zarqa University, 5, 19–45.

Kohlscheen, E., Murcia, A. and Contreras, J. (2018). Determinants of bank profitability in emerging markets. Monetary and Economic Department, BIS Working Papers.

Kosak, M. and Cok, M. (2008), Ownership structure and profitability of the banking sector: The evidence from the SEE-6 Region.

Proceedings of Rijeka Faculty of Economics. Journal of Economics and Business, 26, 93–122.

Monyoncho, L.N. (2015). Relationship between banking technologies and financial performance of commercial banks in Kenya. International Journal of Economics, Commerce and Management, 3, 784–814.

Naceur, S.B. and Omran, M. (2011). The effects of bank regulations, competition, and financial reforms on banks' performance. Emerging Markets Review, 12, 1–20.

Nguyen, T.C., Vo, D.V. and Nguyen, V.C. (2012). Risk and income diversification in the Vietnamese banking system. Journal of Applied Finance and Banking, 5, 99–115.

Obeid, R. and Adeinat, M. (2017). Determinants of net interest margin: An analytical study on the commercial banks operating in Jordan (2005-2015). International Journal of Economics and Financial Issues, 7, 515–525.

Olweny, T. and Shipho, T.M. (2011). Effects of banking sectoral factors on the profitability of commercial banks in Kenya. Economics and Finance Review, 1, 1–30.

Pasiouras, F. and Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the

European Union. Research in International Business and Finance, 21, 222–237.

Rahman, M., Hamid, K. and Khan, M. (2015). Determinants of bank profitability: Empirical evidence from Bangladesh. International Journal of Business and Management, 10, 135–150.

Shihadeh, F.H., Hannon, A.M.T., Ihtisham ul Haq, J.G. and Wang, X. (2018). Does financial inclusion improve the banks' performance? Evidence from Jordan. Global Tensions in Financial Markets Research in Finance, 34, 117–138.

Staikouras, C.H. and Wood, G. (2004). The determinants of European bank profitability. International Business and Economics Research Journal, 3, 57–68.

Sufian, F. and Habibullah, M.S. (2009). Determinants of bank profitability in a developing economy: Empirical evidence from Bangladesh. Journal of Business Economics and Management, 10, 207–217.

Tan, Y. and Floros, C. (2013). Risk, capital and efficiency in Chinese banking. Journal of International Financial Markets, Institutions and Money, 26, 378–393.

Vong, P.I. and Chan, H.S. (2007). Determinants of bank profitability in Macao. Macau Monetary Research Bulletin, 12, 93–113.

Table 1. Summary statistics of the variables

Variable	Egypt	Iraq	Jordan	Kuwait	Lebanon	Morocco
ROA						
Mean	1.53	0.59	1.20	1.14	0.87	0.91
Std. Dev.	0.36	0.28	0.10	0.10	0.30	0.11
SIZE						
Mean	301.57	108.71	68.00	204.57	202.86	148.14
Std. Dev.	51.26	12.28	4.80	17.67	29.89	13.68
CAR						
Mean	15.06	140.43	18.00	17.99	15.83	14.09
Std. Dev.	1.69	26.45	0.80	0.70	1.00	0.80
CREDIT						
Mean	7.67	11.38	11.80	6.16	-2.29	6.58
Std. Dev.	28.15	18.62	14.30	7.59	17.06	19.58
NPLs						
Mean	6.27	9.66	5.10	2.29	6.84	7.17
Std. Dev.	2.11	2.61	0.90	0.76	4.19	0.56
ILR						
Mean	15.25	4.86	3.30	1.21	2.86	2.45
Std. Dev.	2.31	1.07	0.80	0.42	1.21	0.29
GR						
Mean	4.125	3.905	2.352	0.304	0.034	3.240
Std. Dev.	1.211	5.986	0.530	2.373	3.471	1.293
INF						
Mean	15.84	0.89	2.10	2.27	2.22	2.86
Std. Dev.	7.65	0.95	2.40	1.07	3.45	0.89
ATM						
Mean	9.38	1.19	18.30	109.05	175.99	15.18
Std. Dev.	2.11	0.50	2.60	19.69	20.32	1.36
BRCH						
Mean	2.92	2.20	10.20	25.63	107.85	14.03
Std. Dev.	0.15	0.26	0.50	1.24	3.79	0.80

Table 1 - bis. Summary statistics of the variables

Variable	Oman	Qatar	Saudi A.	Sudan	UAE	Whole panel
ROA						
Mean	1.63	1.83	1.96	3.59	1.50	1.50
Std. Dev.	0.15	0.30	0.11	0.99	0.13	0.84
SIZE						
Mean	78.43	338.57	601.71	17.71	706.90	252.50
Std. Dev.	11.52	63.91	60.03	4.75	89.47	216.98
CAR						
Mean	16.84	16.24	19.21	17.39	18.30	28.10
Std. Dev.	1.30	1.25	1.21	1.63	0.64	36.55
CREDIT						
Mean	10.36	12.77	11.35	2.87	4.80	7.60
Std. Dev.	11.78	11.46	10.82	34.85	5.07	17.66
NPLs						
Mean	2.20	1.70	1.51	5.21	5.60	4.90
Std. Dev.	0.62	0.21	0.37	1.91	0.53	3.03
ILR						
Mean	7.50	4.64	1.68	14.05	1.40	5.40
Std. Dev.	0.00	0.28	1.02	3.10	0.70	4.91
GR						
Mean	2.393	2.746	2.022	1.808	3.249	2.380
Std. Dev.	2.629	2.674	1.744	3.211	1.596	3.247
INF						
Mean	0.84	1.58	1.22	1.22	1.70	3.00
Std. Dev.	0.55	1.60	1.99	1.99	1.89	4.95
ATM						
Mean	4.00	113.45	8.23	0.50	62.20	47.00
Std. Dev.	0.46	9.62	1.15	0.09	4.36	58.22
BRCH						
Mean	1.77	20.60	0.96	0.32	11.60	18.00
Std. Dev.	0.03	2.04	0.08	0.03	0.52	29.76

Table 2. Correlations between the ROA and the other variables

Variable	Egypt	Iraq	Jordan	Kuwait	Lebanon	Morocco
SIZE	0.54	-0.64	-0.50	0.84	-0.23	0.39
CAR	-0.04	0.72	0.30	-0.21	-0.02	0.33
CREDIT	-0.45	-0.01	-0.20	0.39	0.94	0.46
NPLs	-0.56	0.46	0.30	-0.89	-0.84	-0.19
ILR	0.60	-0.41	0.30	0.75	-0.73	-0.04
GR	-0.59	0.30	0.50	0.55	0.76	0.58
INF	0.56	-0.44	0.10	-0.82	-0.04	0.36
ATM	0.44	0.36	-0.50	0.86	-0.56	0.20
BRCH	0.44	-0.29	-0.40	0.88	-0.57	0.17

Table 2 - bis. Correlations between the ROA and the other variables

Variable	Oman	Qatar	Saudi A.	Sudan	UAE	Whole panel
SIZE	-0.66	-0.89	-0.42	0.86	-0.19	-0.02
CAR	-0.60	-0.31	-0.18	0.17	-0.24	-0.32
CREDIT	-0.31	-0.04	0.52	0.58	0.12	0.09
NPLs	-0.38	0.18	-0.10	0.18	0.51	-0.32
ILR	-	-0.49	-0.60	-0.56	0.10	0.47
GR	-0.06	-0.23	0.34	0.67	-0.11	0.07
INF	-0.07	0.82	0.46	0.33	-0.25	0.01
ATM	-0.73	-0.85	-0.29	-0.41	-0.25	-0.26
BRCH	-0.31	0.70	-0.28	-0.47	0.22	-0.32

Table 3. Two-step GMM estimates of the effects of bank-specific variables on profitability

Variable	Estimate	Standard Error
ROA(-1)	0.307***	0.061
SIZE	2.885E-4	4.357E-4
CAR	0.016***	0.002
CREDIT	0.007***	0.001
NPL	-0.021	0.035
Wald Test	16468.830+++	
	(0.000)	
Second-Order Autocorrelation Test	-1.506	
	(0.132)	
Sargan Test	9.726	
	(0.782)	

Notes: Wald test for overall significance of the model, Second-order autocorrelation test for no serial correlation in first-differenced errors, and Sargan test for over-identifying restrictions. The values in parentheses are the *p*-values of the tests. *** stands for statistical significance at the 1% level. +++ stands for rejection of the null hypothesis at the 1% level.

Table 4. Two-step GMM estimates of the effects of bank-specific and macroeconomic variables on profitability

Variable	Estimate	Standard Error
ROA(-1)	0.398***	0.078
SIZE	0.002**	0.001
CAR	0.011	0.009
CREDIT	0.002**	0.001
NPL	-0.036	0.044
ILR	-0.008	0.027
GR	0.008***	0.002
INF	0.040***	0.005
Wald Test	2887.340+++	
	(0.000)	
Second-Order Autocorrelation Test	-1.487	
	(0.137)	
Sargan Test	3.280	
	(0.999)	

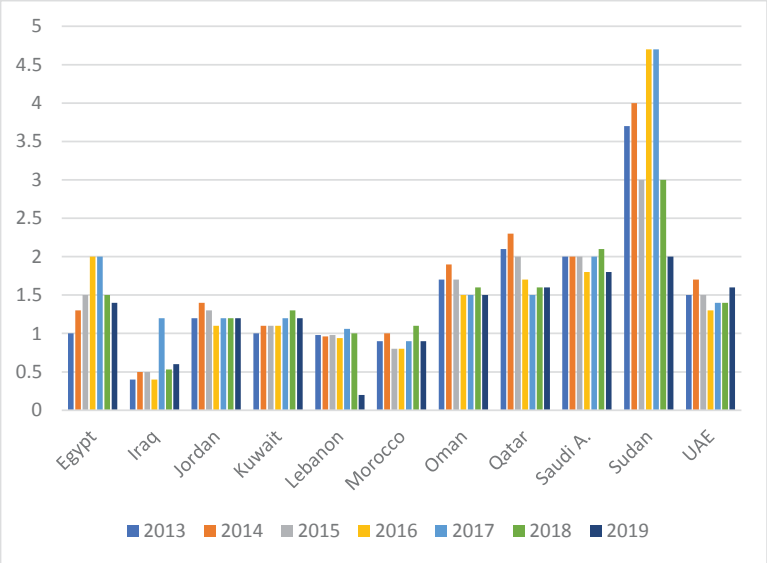
Notes: Wald test for overall significance of the model, Second-order autocorrelation test for no serial correlation in first-differenced errors, and Sargan test for over-identifying restrictions. The values in parentheses are the *p*-values of the tests. *** and ** stand for statistical significance at the 1% and 5% levels, respectively. +++ stands for rejection of the null hypothesis at the 1% level.

Table 5. Two-step GMM estimates of the effects of bank-specific, macroeconomic and financial inclusion variables on profitability

Variable	Estimate	Standard Error
ROA(-1)	0.963	0.979
SIZE	0.002***	4.987E-4
CAR	0.015*	0.009
CREDIT	2.926E-4	0.003
NPL	-0.006	0.056
ILR	-0.019	0.043
GR	0.013*	0.007
INF	0.030*	0.016
ATM	-0.013	0.009
BRCH	-0.013	0.030
Wald Test	197.700+++	
	(0.000)	
Second-Order Autocorrelation Test	0.598	
	(0.550)	
Sargan Test	1.764	
	(1.000)	

Notes: Wald test for overall significance of the model, Second-order autocorrelation test for no serial correlation in first-differenced errors, and Sargan test for over-identifying restrictions. The values in parentheses are the *p*-values of the tests. *** and * stands for statistical significance at the 1% and 10% levels, respectively. +++ stands for rejection of the null hypothesis at the 1% level.

Figure 1. Evolution of the return on assets (%) in the Arab banking sector over the 2013-2019 period



Source: Arab Financial Stability Report (2020), Arab Monetary Fund.

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ARAB MONETARY FUND

مجلس محافظي المصارف المركزية ومؤسسات النقد العربية
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