



Journal of Internet Banking and Commerce

An open access Internet journal (<http://www.arraydev.com/commerce/jibc/>)

Journal of Internet Banking and Commerce, August 2011, vol. 16, no.2
(<http://www.arraydev.com/commerce/jibc/>)

The Impact of E- Banking on The Performance of Jordanian Banks

Mohammad O. Al-Smadi

Assistant Professor, Department of Banking, College of Economics and Administrative Sciences, Al-Imam Muhammad Ibn Saud Islamic University, Riyadh, Saudi Arabia.

Postal Address: Mohammad Oqlah Al-Smadi, Department of Banking, College of Economics and Administrative Sciences, Al-Imam Muhammad Ibn Saud Islamic University, P.O. Box 5701, Riyadh, Saudi Arabia.

Organizational Website: www.imamu.edu.sa

Email: msmadi82@hotmail.com

Dr. Mohammad Al-Smadi is an Assistant Professor of Banking at the College of Economics and Administrative Sciences, Al-Imam Muhammad Ibn Saud Islamic University-Riyadh, Saudi Arabia. His areas of interest are: Banking, Risk Management, Financial Economics, Financial management and Investment.

Saad A. Al-Wabel

Assistant Professor, Department of Banking, College of Economics and Administrative Sciences, Al-Imam Muhammad Ibn Saud Islamic University, Riyadh, Saudi Arabia.

Postal Address: Saad Ali Al-Wabel, Department of Banking, College of Economics and Administrative Sciences, Al-Imam Muhammad Ibn Saud Islamic University, P.O. Box 5701, Riyadh, Saudi Arabia.

Organizational Website: www.imamu.edu.sa

Email: sadalwabel@yahoo.co.uk

Dr. Saad Alwabel is an Assistant Professor of Banking at the College of Economics and Administrative Sciences, Al-Imam Muhammad Ibn Saud Islamic University-Riyadh, Saudi Arabia. His research and teaching interests lie in the areas of Financial Institutions, Financial management, Empirical Finance and Banking, and Credit Risk. His interests also include Benchmarking and Performance Measurement.

Abstract

Electronic banking has become one of the most important and modern applications that has witnessed a substantial expansion during the last years. This study examines the impact of electronic banking on the Jordanian banks' performance. Empirical analysis has been conducted on a panel data of 15 Jordanian banks for the period 2000-2010. Accounting data were used to measure the banks' performance and regressed on relevant variables using OLS regression. The results show that electronic banking has a significant negative impact on banks' performance. Electronic banking has not improved the performance of these banks. Banks' customers in Jordan depend on traditional channels to carry out their banking operations. As a result, costs associated with adopting electronic banking are still higher than revenues from provision electronic services. Hence, banks should focus its work to promote the confidence of electronic banking services and encourage the customers to use this kind of services.

Keywords: electronic banking; internet banking; banks' performance; Jordanian banks.

© Mohammad Al-Smadi and Saad Al-Wabel, 2011

INTRODUCTION

Since the beginning of the last century, world of business has seen dramatically developments in the areas of use of information technology and communication. These developments have contributed to the transformation in the performance of various economic sectors, including banking. Financial services industry has been affected by such transformation, which led to the emergence of modern concepts such as: e-finance, e-money and e-banking.

A strong banking sector is important to every country to stimulate economic growth and to maintain financial stability for the whole financial system. Hence, information and technological revolution motivated banks to spend more on technology to maximize return and attracting more customers who will not accept less than above-average services. In addition, banks have changed to keep up with the information technology and communication developments. This change includes using the technology of computer and communications to replace manual and paper operations to electronic operations; electronic banking (e-banking) or internet banking is the commonly method adopted by banks (Salhi and Alipour, 2010). The definition of electronic banking varies among researchers partially because electronic banking refers to several types of services through which a bank's customers can request information and carry out banking services. At the Basel Committee banking supervision, electronic banking is defined to include the provision of retail and small value banking products and services through electronic channels as well as a large value electronic payment and other wholesale banking services delivered electronically (Basel Committee on banking supervision, 2003). E-banking offers significant benefits for both banks and customers. It provides banks additional channels to deliver products and services to customers at a lower cost (Lin, Hu, and Sung, 2005). These channels expand the geographical area for banks and can help attract and keep further customers (Dandapani, Karels, and Lawrence, 2006). E-banking not only provides customers with appropriate and faster

transactions but also benefits from higher interest rate resulting from cost saving by the banks (Sumra and Manzoor, 2011). On another hand, adopting of e-banking brings additional risks. E-banking operations increased and modified some of the traditional risks associated with banking operations, thereby influencing the overall risk of banking (Pennathur, 2001).

Despite the rapid growth of e-banking, this topic has not received sufficient research. At the same time, the impact of e-banking on the performance of adopting banks is not yet clear. Sullivan (2000) compared the financial performance and risk of a sample of banks that are located in Tenth Federal Reserve District states and observed that the profitability and risk of the non internet banks and internet banks in the sample are similar. Moreover, Sathye (2005) compared the performance of major credit unions in Australia, and found that transactional internet banking does not have a significant impact on performance and risk. Delgado, Hernando, and Nieto (2007) observed that primarily internet banking in European Union affects profitability negatively. In contrast, recent studies associate a significantly positive impact on internet banking on banks' performance. DeYoung, Lang, and Nolle (2007) compared 424 internet banks and 5175 non internet banks and concluded that internet banks are more profitable compared with non internet banks in the US. Acharya, Kagan, and Linam (2008) reported that empirical evidence indicates that the increasing use of the internet as an additional channel of banking services has significantly improved the financial performance of community banks in the US. Ciciretti, Hasan, and Zazzara (2009) found a significant positive relationship between offerings of internet banking products and Italian banks' performance and a significant negative relationship between the adoption of internet activities and banks' risks.

Clearly, there is mixed evidence about the impact of e-banking on banks' performance. It is therefore, important for bankers, bank regulators, supervisors and researchers to understand how e-banking affects the performance of banks. Hence, the researchers' main purpose in this paper is to fill this significant gap by providing systematic analysis of the impact of electronic banks on the performance of Jordanian banks. To achieve this goal, they analyzed the performance of the Jordanian banks. We chose Jordan because the size of the Jordanian banking sector and its contribution to Jordan's economy is relatively large. At the end of 2010, the ratio of banks total assets to GDP was equal 176 percent, and the relative importance of financial services including banking services to GDP was the highest compared to other service sectors (Annual Report of Central Bank of Jordan, 2010). In addition, the adoption of internet banking has increased during the last years, most of the banks in Jordan are actively involved in internet banking operations to achieve a competitive position and to respond to the changes of customers' needs toward low-cost and faster transaction (Migdadi, 2008).

The aim of the paper is to examine the impact of e-banking on the performance of Jordanian banks over the period 2000-2010. The paper is organized as follows: section one is the introduction and the literature review. Section two discusses the methodology used in the paper and describes data analysis method. Section three contains the discussion of the results and section four presents the conclusions.

DATA, VARIABLES AND METHODOLOGY

Data

To examine the impact of e-banking on the performance of Jordanian banks, we have collected panel data from 15 Jordanian banks between 2000 and 2010. We chose this period because it witnessed a major growth of e-banking. The financial reports of fifteen banks and annual reports of the Central Bank of Jordan are the main sources of data of this study. The financial items that were computed into the relevant ratio were extracted from the balance sheet and income statement of the banks. Macroeconomic data have obtained from the annual reports and related publications of the Central Bank of Jordan during 2000-2010. Pooled Ordinary Least Squares (OLS) regression technique was used in this study.

Variables

Dependent Variable

Since this study examines the impact of e-banking on the performance of Jordanian banks, the dependent variable is banks' performance. Performance refers to the degree of success in attaining stated objective (Sathye, 2005). The major objective of banks as other financial institutions is maximizing shareholders' wealth. Following the literature, Return on Equity (ROE) is the common measure of performance. Return on equity reflects how effectively a bank management is using shareholders' funds. A bank's return on equity is affected by its return on assets as well as by the bank's degree of financial leverage.

Independent Variables

The focus of this study is to examine the effect of e-banking on banks' performance. A dummy variable (EBANK) was created that takes a value of 1 if the bank has adopted e-banking; otherwise it takes a value of 0. The coefficient associated with the e-banking dummy will indicate the possible association between e-banking and banks' performance. A positive sign for this variable is expected, since e-banking has the potential to reduce costs.

Control Variables

To isolate the effect of e-banking on performance, it is necessary to control the other variables that have been used in the literature as possible determinants of banks' performance. Two sets of control variables are expected to influence banks' performance: the bank specific and the macroeconomic determinants.

The set of bank specific variables used comprises size (SZE), capital (CAP), credit risk (CRR), expenses management (EXPM) and liquidity (LIQ). The size of the bank is included as a control variable to account for size related economies and diseconomies of scale. Financial intermediation theory predicts the efficiency benefits related to bank's size, due to economic of scale. This could imply lower cost for larger banks that they may retain as higher profits if they do not operate in a very competitive environment (Flamini, McDonald, and Schumacher, 2009). Moreover, Guru, Staunton, and Balashanmugam (2000) suggest that large banks have grater loans and greater product diversification and accessibility to asset markets, which may not be available for smaller banks. We use the logarithm of total assets as a proxy for bank size (SZE). A positive sign for this variable is expected. Capital plays a vital role in supporting safety and

soundness of banks. Banks with high capital to the assets ratio could be considered relatively safer in the event of loss or liquidation. Guru et al. (2000) indicated that capital adequacy requirement would increase the capital assets ratio and thus reduce the risk. This may induce banks to absorb more risk in their investment in the hope of maximizing return. Moreover, Naceur and Goaid (2001) suggest that the higher capital to assets ratio, the lower the need for external financing and therefore, higher profitability. We use the ratio of equity capital to assets as a proxy of bank capital (CAP). A positive sign for this variable is expected.

Credit risk has the first rank among the many banking risks according to their importance; it is the major source of loss. An increasing of credit risk is normally associated with decreased bank profitability. Hence, banks improve profitability by minimizing the credit risk level through improving their appropriate lending policies (Al-Smadi, 2011). We measure credit risk (CRR) using the ratio of nonperforming loans to total loans. A negative sign for this variable is expected. Expenses management is one of the significant determinants of banks' performance. Naifer (2010) suggests that the higher the expenses management the less efficient the bank, which could affect bank profit negatively. We use the ratio of operating cost to total assets as a proxy for expenses management (EXPM). A negative sign of this variable is expected. Liquidity management is one of the important functions of bank's management. It is necessary to avoid the liquidity deficit, which can lead to the insolvency problem. Liquid assets, which can be easily converted to cash, are often associated with the lower rate of return. Hence, high liquidity would affect profitability negatively (Guru et al., 2000). We use the ratio of total loans to total deposits to measure liquidity (LIQ). A negative sign is expected to this variable.

Two macroeconomic variables are used: inflation (INF) and economic growth (GDPG). Flamini et al. (2009) suggest that the extent to which inflation affects banks profitability depends on whether future movements of inflation are anticipated or unanticipated. If the inflation anticipated and interest rates are adjusted accordingly resulting in revenue, which increase faster than costs, then it may have a positive impact on profitability, while an unanticipated change could raise costs due to imperfect interest rate adjustment. We measure inflation (INF) by rate of change of CPI. A positive sign is expected to this variable. Economic growth has affected the performance of banks. Athanasoglou, Brissimis, and Delis (2008) indicated that during economic slowdowns, lending could decrease and credit quality deteriorate, and thus reducing bank profit. While, during economic booms, demand for credit could increase and the interest margin may widen. Therefore, revenues could grow leading to increase profit. We use GDP growth to measure economic growth (GDPG). A positive sign is expected to this variable.

Based on the previous discussion, the regression model was developed. It is mathematically expressed as:

$$ROE_{it} = \beta_0 + \beta_1 EBAN_{it} + \beta_2 SZE_{it} + \beta_3 CAP_{it} + \beta_4 CRR_{it} + \beta_5 EXPM_{it} + \beta_6 LIQ_{it} + \beta_7 GDPG_{it} + \beta_8 INF_{it} + \varepsilon_{it}$$

The dependent variable is bank's performance measured by the ratio of net income to total equity at the end of the financial year of the bank *i* at the time *t* (ROE_{it}), β_0 the intercept and ε_{it} is a random error. Table 1 summaries measurement and expected signs of the variables used in the study.

Table 1: variables used in the study

Variable	Measures	Expected Sign
Performance	Net income/total equity	
E-banking	Dummy variable equal to one if the bank offer e-banking and zero otherwise.	+
Size	logarithm of total assets	+
Capital	Equity capital/ total assets	+
Credit Risk	Nonperforming loans/ total loans	-
Expenses Management	Operating cost / total assets	-
Liquidity	Total loans/total deposits	-
Inflation	Rate of change of CPI	+
Economic Growth	GDP growth	+

EMPERICAL RESULTS

In order to get valid results, the classical least square regression assumptions are met. Table 2 presents the results of the regression analysis.

Table 2: regression results

Variable	Coefficient	t-value	p-value
Constant	0.235	2.668	0.008
EBANK	-0.323*	-1.727	0.085
SZE	0.721***	12.215	0.009
CAP	0.017	0.821	0.412
CRR	0.013***	2.949	0.004
EXPM	-8.363	-0.492	0.624
LIQ	-0.573**	-2.323	0.022
GDPG	0.173***	7.004	0.000
INF	-0.040	-1.600	0.110
R. squared	0.431		
F- statistics	4.272		
Prob.(F-statistics)	0.000		

Note: (EBANK) a dummy variable for e-banking, (SZE) is the bank size, (CAP) is the capital ratio, (CRR) is the credit risk, (EXPM) is the expanses management, (LIQ) is the liquidity ratio, (GDPG) is the economic growth, and (INF) is the inflation. The results were corrected for heteroscedsticty using White matrix. ADF test confirmed that the variables are stationary. *p<.10. **p<.05. ***p<.01

Based on the value of the tolerance and variance inflation factors, there is very low multicollinearity among the variables. All series were tested using Augmented Dickey Fuller (ADF) unit root test. The results show that the variables in the regression model are stationary. Heteroscedasticity problem was addressed by using the White procedure. The R-squared value is 0.431, which indicates that the regression explains 43.1% of the variation of the performance of all banks in the sample. F-value indicates that at least one of the independent variables is significantly related to the performance. Further, the computed t-value for e-banking, size of bank, credit risk, liquidity of bank, and economic growth are significant at the 10%, 5%, and 1% level.

Against our expectation, e-banking variable (EBANK) has a significant negative impact on the banks' performance. This implies that e-banking affects banks' performance negatively. This result is similar to the findings of Delgado et al. (2007). The possible explanation for the observed relationship is that the costs associated with e-banking, which includes electronic infrastructure, continuing maintenance, and employees training are higher than the revenues from electronic services in the Jordanian banks. This could be due to the fact that banks' customers in Jordan depend on traditional channels to carry out their banking operations rather than electronic channels. However, in Jordan, people and institutions in both private and public sectors are gearing up their efforts toward the maximum use of the internet and information technology (Migdadi, 2008).

The bank specific variable, size (SZE) shows a positive and significant relation to performance measure. The possible explanation for the observed relationship is that large banks have more resources, more investment channels and even more benefit for managers in comparison to small banks. These features contribute to an increase in the profit of the banks from the economies of scale (Al-Smadi, 2011). These results are consistent with the findings of Flamini et al. (2009) who studied the determinants of banks' profitability in 389 banks in 41 Sub-Saharan Africa countries.

The coefficient of the capital variable (CAP) is positive but not significant. This indicates that Jordanian banks are well capitalized banks. As expected, credit risk (CRR) is negatively and significantly related to banking performance measure. This suggests that increased exposure to credit risk is normally associated with decreased bank profitability. However, credit risk is the most visible risk facing banks' managers, and the main cause of failure. Therefore, bank would improve profitability by improving the screening and monitoring of credit risk and thus adjusts provisions held for loan loss that is decided at the beginning of each year. Our result is similar to the finding of Athanasoglou et al. (2008), who examined the effect of bank specific, industry specific and macroeconomic determinants of bank profitability in Greek banks. We found that expenses management (EXPM) has a negative but not significant effect on bank performance. The final bank specific variable, the liquidity ratio (LIQ) has a negative and significant relation with the bank performance measures as expected. This suggests that an increase of liquidity results in a decrease in bank profit. Our result is similar to that of Guru et al. (2000).

As for the impact of macroeconomic variables in banks' performance, the results show that inflation (INF) affect bank performance negatively, but this effect is insignificant. Finally, economic growth (GDPG) positively and significantly affects bank's performance. This implies that the performance of banks is better during good economic conditions

compared with conditions during the economic recession. During the recession, the economic activities in general are decreasing. Credit quality deteriorates, provisions held by banks will be higher, and thus reducing bank's return.

CONCLUSION

The revolution of technology and communication has affected the world of business significantly. While the banks, are facing financial liberalization and the pressure of international competition, it is urgent for them to improve their performance and own competitiveness. Hence, banks have adopted e-banking as one of the modern applications in the provision of banking services. However, previous banking studies show mix results about the impact of e-banking on banks' performance. Thus, we cannot conclude that adopting e-banking decision is the key factor in improving bank performance and growth in all banking environments. In this paper, we focused on the e-banking experiences undertaken by Jordanian banks. We examined the impact of e-banking on the performance of Jordanian banks over the period 2000-2010.

Our major findings are the following: adopting of e-banking affects bank performance negatively. E-banking may eventually become a very important factor affecting bank performance for many banks. The degree and speed at which this may happen will depend on the growth in the use of e-banking and on the emphasis banks place in the future on e-banking. Therefore, banks should focus its work to promote the confidence of e-banking services, and develop marketing policies that encourage customers to use e-banking services. Big banks are more profitable compared to small banks. A big bank has advantages to improve its performance which is not available for a small bank. High level off credit risk affects bank's performance negatively; hence, bank's management should develop prudent credit policy to minimize credit risk to the minimum level. High liquidity ratio leads to low profit. Therefore, the bank should manage its liquidity carefully to avoid excess liquidity that affects profit negatively. Finally, good economic conditions affect bank performance positively. The bank should benefit from conditions associated with economic boom as possible to mitigate the negative effects that may be faced bank during the economic recession.

REFERENCES

- Acharya, R. N., Kagan, A., & Linam, S. R. (2008). Online banking applications and community bank performance. *The International Journal of Bank Marketing*, 26(6), 418-439.
- Al-Smadi, M. O. (2011). *Credit risk, macroeconomic and bank specific factors*. Germany: VDM Verlag Dr. Müller.
- Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank specific, industry specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, 18(2), 121-136.
- Basel Committee on Banking Supervision (2003). *Risk management principles for electronic banking*, Switzerland: Bank of International Settlements. Retrieved from <http://www.bis.org/publ/bcbs98.pdf>.
- Central Bank of Jordan (2010). *Annual report*. Amman: Central Bank of Jordan.
- Ciciretti, R., Hasan, I., & Zazzara, C. (2009). Do internet activities add value? Evidence from the traditional banks. *Journal of Financial Services Research*, 35(1), 81-98.
- Dandapani, K., Karels, G. V., & Lawrence, E. R. (2006). Internet banking services and credit union performance. *Managerial Finance*, 34(6), 437-446.
- Delgado, J., Hernando, I., & Nieto, M. J. (2007). Do European primarily internet banks show scale and experience efficiencies? *European Financial Management*, 13(4), 643-671.
- DeYoung, R., Lang, W. W., & Nolle, D. L. (2007). How the Internet affects output and performance at community banks. *Journal of Banking & Finance*, 31(4), 1033-1060.
- Flamini, V., McDonald, C. A., & Schumacher, L. (2009). *The determinants of commercial bank profitability in Sub-Saharan Africa* (Paper No. 09/15). Washington, DC: International Monetary Fund.
- Guru, B. K., Staunton, J., & Balashanmugam, B. (2000). Determinants of commercial bank profitability in Malaysia. *Asian Academy of Management Journal*, 5(2), 1-22.
- Lin, J. C., Hu, J. L., & Sung, K. L. (2005). The Effect of Electronic Banking on the cost efficiency of commercial banks: an empirical study. *International Journal of Management*, 22(4), 605-611.
- Migdadi, Y. K. (2008). The Quality of internet banking services encounter in Jordan. *Journal of Internet Banking and Commerce*, 13(3), 1-8.
- Naceur, S. B., & Goaid, M. (2001). The determinants of the Tunisian deposit banks' performance. *Applied Financial Economics*, 11(3), 317-319.
- Naifer, N. (2010). The determinants of bank performance: an analysis of theory and practice in the case of an emerging market. *International Journal of Business Environment*, 3(4), 460-470.
- Pennathur, A. K. (2001). "Clicks and bricks": e-risk management for banks in the age of the internet. *Journal of Banking and Finance*, 25(11), 2103-2123.
- Salhi, M., & Alipour, M. (2010). E-Banking in emerging economy: empirical evidence of Iran. *International Journal of Economics and Finance*, 2(1), 201-209.
- Sathye, M. (2005). The impact of internet banking on performance and risk profile: Evidence from Australian credit unions. *Journal of Banking Regulation*, 6(2), 163-174.
- Sullivan, R. J. (2000). How has the adoption of Internet banking affected performance and risk in banks?. *Financial Industry Perspectives*, 1-16.
- Sumra, S. H., & Manzoor, M. K. (2011). The impact of E-Banking on the profitability of

banks: a study of pakistani public sector banks. *Journal of Public Administration and Governance*, 1(1), 31-38.