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DOES FINANCIAL INCLUSION IMPROVE THE BANKS' PERFORMANCE? EVIDENCE FROM JORDAN

Fadi Hassan Shihadeh, Azzam (M. T.) Hannon, Jian Guan, Ihtisham ul Haq and Xiuhua Wang

ABSTRACT

This study investigates the relationship between financial inclusion (FI) and banks' performance in the economy of Jordan using annual data of 13 commercial banks from 2009 to 2014. Performance is measured by gross income and return on assets (ROA) of these banks. To ensure the robustness of our results, we used six different measures of FI. These include credits for small and medium enterprises (SMEs), deposits for SMEs, number of ATMs, number of ATM services, number of credit cards, and new services. We found a significant impact of FI on ' performance when measured by gross income, and ROA, although our study displays different results when considering the effect of FI variables separately. Thus, FI contributes to enhance the banks' performance.

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Global Tensions in Financial Markets

Therefore, the banks should devote more resources to increase FI as it benefits their profitability.

Keywords: Financial inclusion; innovation; banks' performance; Jordan; financial institutions; services; economic

JEL classification: G2; O16; O530

INTRODUCTION

According to Levine et al. (2000), King and Levine (1993a), and Barth et al. (2001), banks as an important part of financial institutions are vital to the entire financial system. Banks provide and innovate essential services that enhance the living standards of individuals, the performance of small and medium enterprises (SMEs), and overall economic development (Beck et al., 2007, 2015; Bruhn and Love, 2014). These developments are the aims of financial inclusion (FI). The majority of people in developing countries have no access to formal institutions. In Jordan, 24.6% of adults 15+ years maintain an account in financial institutions, whereas that in the rest of the Middle East accounts for 14%. The saving percentage of adults of 15+ years in Jordan is 3.8%, whereas that in the rest of the Middle East is 4%. In 2014, 13.6% of adults 15+ years in Jordan borrowed money from financial institutions, whereas that in the rest of the Middle East accounts for 5.6% (World Bank, 2015).

To enhance FI, official financial institutions, such as central banks, encourage banks and other financial service companies to offer suitable services that cover the needs of individuals and SMEs through different policies and regulations. According to the Consultative Group to Assist the Poor (CGAP), "financial inclusion means that households and businesses have access and can effectively use appropriate financial services. Such services must be provided responsibly and sustainably, in a well regulated environment."

International institutions, such as the World Bank, CGAP, Alliance for Financial Inclusion (AFI), and Group 20 (G20), are seeking enhanced economic growth, reduced rate of unemployment, and economic stability for poor countries. These objectives can be achieved by facilitating the access of individuals (Honohan, 2008; Swamy, 2014) and SMEs to financial sources (Beck and Demirguc-Kunt, 2006), which is the primary target of FI. Laeven et al. (2015) and Valverde et al., (2007) found that innovation in delivering financial products and services will positively affect economic growth. Also, Beck et al. (2015) linked financial innovation with FI.

The Central Bank of Jordan (CBJ) joined the AFI in June 2009. Since then, financial institutions have worked to enhance FI in Jordan by following the instructions and regulations issued for banks and other financial service providers. Previous studies examined FI from the side of demand (individuals and SMEs) but overlooked the supply side (banks, as main drivers, and other financial institutions). This study is testing the effect of FI on the banks performance. The question of the study is stated as: Does FI affect the performance of Jordanian banks?

A number of FI indicators were included and tested empirically in this study. G20 identified three main indicators of FI: (i) access to finance, (ii) usage of financial services, and (iii) quality of products and service delivery (GPFI, 2012). This study used the following main indicators as predictors: SMEs credits and deposits, number of ATMs, number of ATM services, and number of credit cards, including the number of new services. The outcomes are gross income and return on assets (ROA), which are used as indicators of a bank's performance. The study tested the hypothesis through statistical tests and an empirical method to determine whether or not FI affects bank performance. We propose the following hypothesis to answer the research question.

H1: There is a significant impact of FI on banks' performance.

Our findings contribute to the literature on bank services and FI, especially on the supply side. This academic study enhances economic development by covering this important topic and by encouraging further research on the performance of banks and FI. Jordan, which is the focus of study, suffers from unemployment problems that reached 11.9% in 2014. Jordan is surrounded by several politically and economically unstable countries, such as Syria, Iraq, and Palestine; given this situation, enhancing the financial sector in Jordan will lead to economic development (CGAP, 2010). Also, this study aims to fill the gap in literature about FI in Jordan that gives this research an advantage and facilitate its application in other developing countries.

How FI Affects the Banks' Profit in the Short and Long Term

Banks invest their resources in service development and generate new services to address customer needs and achieve suitable return to enhance their performance. For instance, banks expand their networks through branches, ATMs, point of sales (POS), and other electronic terminals to increase customer reach, attract deposits, and offer services. Capital expenditure will increase as a result of this approach, and profit might decrease as a result of cost increment. Most banks cannot achieve earnings from this short-term development, but they aim to enhance them in the long term.

Bank ATMs and ATM services have related costs, such as machines, technology, rent, security, and maintenance costs. These services do not provide direct revenues for banks because basic services are usually offered without fees. Banks can earn from these services by attracting customers and their deposits. This approach enhances their ability to lend money to the demand side. ATMs also enhance the loyalty of bank customers (Monyoncho, 2015).

Frame and White (2012) linked service innovation with the improvement of access to accounts and payment tools such as ATMs, ATM card, debit cards, and prepaid cards. Enhancing these tools will improve access to finance and FI. Therefore, banks offer new services to cover customer needs. Such enhancements and the generation of new services incur costs for market research, risks, training, advertising, and service delivery. Banks incur costs in the short term. This type of cost has no direct effect on profit until the customers use new services. By contrast, banks can profit from new services in the long term. The new services of a bank may not be utilized by customers because they do not find them useful; hence, creating a new service is also a challenge for banks and the financial system as documented by William and Ramana (2015) and Beck et al. (2015).

Credit cards are used by a holder to buy goods and services locally and internationally. Banks issue credit cards as a credit line and require customers to guarantee that the credit line and interest will be covered. Banks addressed the issue of increased technological risks and possibility of fraud but reduced credit and liquidity risks (Monyoncho, 2015). Therefore, banks earned increased profit from credit cards, but they also suffered from additional risks (Sinkey and Nash, 1993).

SMEs in developing countries suffer from low credit rate. Credit rate in the Middle East, North Africa, Afghanistan, and Pakistan, (MENAP) is less than 10% of the total credits. One of the reasons for this low percentage is collateral issues and risks. Reforming the infrastructure and innovating services that can address the needs of SMEs will enable banks to lend more to SMEs with low risk, thereby earning increased profit in the long term (Ben Naceur, 2014). Thus, banks can attract SMEs deposits and improve liquidity by reinforcing laws and the lending environment.

This chapter is organized as follows. The next section conducts a review of previous literature on bank performance and bank services. The third section provides the data and methodology used in the study. Section four discusses the results. Section five presents the conclusions and recommendations.

LITERATURE REVIEW

Several studies from the past discussed and examined how banks can earn more profit if credits, branches, ATMs, credit cards, and innovation services are improved. FI is a recent and novel topic in financial literature, especially from the supply side. Studies also found that access to finance and use of financing resources could change the lives of disadvantaged people and could improve SMEs performance, thereby giving banks a chance to innovate services and gain more profits.

Humphrey (1994) used cross-sectional data from 161 banks from 1991 to 1992 to study the effect of increased use of ATMs on a bank's performance. The study concluded that ATMs offer easy and convenient services to customers, but the cost for this service is slightly higher. Increasing the number of ATMs reduced the cost of each depositor transaction. However, when depositors increased the number of transactions, the amount of total costs were relatively equal to or slightly higher than previous costs. The additional bank provision offered by ATMs raised revenues and bank profits, but such an increase is weak and consistently insignificant. Frame and White (2004) reviewed articles that discussed and tested financial innovation; they also addressed the definition of financial innovation and its economic importance. The main purpose of this study is to review the literature on financial innovation and discuss its rarity in empirical studies. One difficulty encountered in empirical tests is how to reach data sources. This study highlighted the major role of the financial sector in economic development and the scarcity of empirical research on financial literature.

Allen and Rai (1996) used bank data from 15 countries from 1988 to 1992 to examine the operational efficiency of banks. The study used labor, capital, and borrowed fund as input and traditional banking assets and investment assets as output to measure functions. They found negative profits for all banks when total loans are divided by total assets; this finding indicates that banks with high number of loans operate efficiently. However, the result was only significant for small banks when deposits were divided by total assets. Snellman (2006) studied data collected from 20 countries from 1988 to 2003 and 1990 to 2002. The study examined the effects of the market structure of the ATM network on the number of ATMs and cash usage. They found that competition in the market structure of the ATM increased the number of ATMs. They also found a negative effect of ATMs on cash holding.

Scholnick et al. (2008) examined the literature on credit cards, debit cards, and ATMs. They examined whether debit cards and ATMs can substitute each other in customer transaction and whether additional fees on ATM

services can affect the use of debit cards. They concluded that scarcity of data on credit cards, debit cards, and ATMs is the reason for the minimal and insignificant research on the topic, which continues to require additional research. The study concluded that debit card and ATM transactions are substitutes for each other, and ATM surcharges have significant effects on the volume of debit cards. Brevoort et al. (2010) surveyed the finances of small business in three years, namely, 1993, 1998, and 2003; their study considered these years to measure the entire decade to test whether the distance between small businesses and lender institutions changed. They found that distance initially increased for the first half of the decade and stopped in the second half. Firms with experienced ownership and high-quality credit achieve increased profit within this distance. Their study covered the demand side of financial services.

Alfonse and Florence (2012) used the descriptive approach to examine the effect of credit cards on the performance of Kenyan banks. The sample included 120 credit card holders from six banks, and they found that use of credit cards improved bank revenues. Jegede (2014) used primary data collected from Nigerian banks to examine whether ATMs have a positive effect on the banking sector. By analyzing the responses of employee respondents to 100 questionnaires, the study found that ATMs effectively influenced Nigerian banks and enhanced bank growth. Muiruri and Ngari (2014) used credit cards, Internet banking, mobile banking, and agent banking as the innovation factors of a bank and net profit margin and gross profit as performance indicators. The study covered 16 banks from 2008 to 2012. Primary and secondary data were used to test the relationship between bank performance and bank innovation. The study found that all financial innovation indicators have a significant effect on bank profit.

Akhisar et al. (2015) examined the effect of electronic banking services as innovation tools on bank performance in 23 countries from 2005 to 2013. The performance measurements used in their study were ROA and ROE. By using dynamic panel data models, the study found that cards (credit, debit, and other cards) and ATMs/branches have positive effects on bank performance, whereas POS and Internet banking have negative effects. Sansone and Formisano (2016) used the "Banca Popolare del Cassinate" as a case study to examine the relationship between marketing innovation and performance in the banking sector. The performance indicators used include change in net income, change in net banking income, change in operating income, and change of the ordinary income. The innovation variables contain several indicators, such as total number of services offered to customers and number of online services. They found that marketing innovation can enable banks to overcome economic obstacles, enhance performance indicators, and benefit from economic development. Burgress and Pande (2005) examined whether banking expansion in unbanked, poor, rural provinces in India can alleviate poverty through government instruction for commercial banks. The study used bank branches, rural credit, saving share, and poverty to determine the effect of bank expansion on poverty. The study concluded that government procedures and instructions for banks to branch out in unbanked rural areas contributed to poverty alleviation. The study also showed that poverty reduction led to increased credit and deposits.

FI aims to include the poor and SMEs in the financial system through lending and deposits. Identifying the link between supply and demand is important to achieving FI and bank profit. Beck and Demirguc-Kunt (2006) claimed that the main obstacle for SMEs' development is the access to financial sources. The study concluded that literature should focus on the policies and financial instruments needed to enhance the access of SMEs to finance. Ben Naceur (2014) addressed and discussed the factors and obstacles of low access to finance for SMEs in MENAP, Caucasus, and Central Asian countries. The study concluded that SMEs loans in these regions were less than 10% of the total loans in the entire financial market. This percentage is the lowest global percentage. The obstacles to increase loans in these regions is the lack of policies that encourage banks to lend to SMEs and the fact that banks require risk allowance and enforce strict collateral requirements.

Wang and Shihadeh (2015) highlighted FI policies, status, and challenges in Palestine. They compared the FI indicators (access, usage) in Palestine with that in other countries in the Middle East (Jordan and Lebanon). They also addressed the laws and instructions launched by the Palestine Monetary Authority to motivate banks to enhance FI through additional services, branches, and loans. The study concluded that these countries expended considerable effort in improving FI, but access to financial sources and borrowing remain at the lowest level, especially in Palestine. Ifeakachukwu and Olasunkanmi (2013) used neoclassical production functions to determine the effect of SMEs loans on productivity in Nigeria from 1992 to 2010. The study concluded that bank loan to SMEs had a significant effect on the manufacturing process both in the long and short terms. The study recommended to the government to increase efforts in ensuring that loans are given to ultimate users. Moderate collaterals and interest rates should be applied in bank loans to SMEs to promote such services to the SMEs sector.

The above studies covered several topics related to variables, such as ATMs, credit cards, financial innovation, SMEs credits, and the effect of bank services on SMEs and rural areas. These studies examined the effect of

bank services and innovation on bank performance, SMEs performance, and poverty in rural areas. In the present study, FI and bank service innovations are linked with bank performance as supply side. Several studies covered the demand side, but only few explored the topic from the supply side. The present study attempts to bridge this gap.

DATA AND METHODOLOGY

Data

Data for this study were collected manually from annual reports of listed Jordanian banks available through the CBJ, Jordan Securities Commission (JSC), and Association of Banks in Jordan (ABJ). The study population included all 16 national Jordanian banks. The sample for this study includes 13 commercial banks. We excluded three Islamic banks because they have different income and investment sources. The study covered the period from 2009 to 2014, which is the period after Jordan joined the AFI. Panel data of 78 observations were used. Given that all banks published their annual reports in the Jordanian Dinar currency, converting the currency is not applicable in our data. The main obstacles of this study were the difficulty of data collection and finding suitable data for analysis. Frame and White (2004) claimed that one of the reasons for the scarcity of research on financial innovation is the lack of data. Data were collected manually because of the lack of a database that can provide the data we needed.

Methodology

This study used an empirical method based on the financial data obtained from the annual reports of Jordanian banks. This study examined the effect of FI on bank performance as measured by gross income and ROA. The new services variable, which is used as indicator for innovation, was considered as part of FI. As a new service, bank can reduce costs and risks and add value to services to cover the needs of customers (Frame and White, 2012). We hypothesize the significant effect of FI on bank performance, which is based on the following findings of previous studies: (i) banks offer their services to attract customers and earn profit; (ii) banks should focus on SMEs credits and deposits to enhance performance and increase profit; and (iii) several studies examined the variables considered in our study but they were considered separately. Previous studies found a significant effect for the variables considered in our study on banks' performance. The present study explored the effect of a group of FI variables on banks' performance.

The G20 Summit held in Los Cabos in 2012 determined the following FI indicators: (1) access to financial services (number of branches, ATMs, and accounts); (2) usage of financial services (deposits, loans, and saving of adults and SMEs); and (3) quality of products and service delivery (financial knowledge, collateral, and accounts cost). Every category has several factors, which are used to measure FI levels for Individuals and SMEs as a demand side. The present study employed a new method by considering FI from the supply side. This approach involved two indicators, namely, access and usage of financial services indicators. The third indicator, namely, quality of products and services delivery, was excluded because it is difficult to measure using available data.

The study used gross income and ROA as outcomes to measure the performance of banks. We used as predictors the following factors of FI indicators: credits for SMEs (usage), deposits for SMEs (usage), number of ATMs (access), number of ATM services (access), number of credit cards (usage), and new service as a variable for bank innovation in every year. The study used these variables and adopted the following models to measure the effect of predictors' variables on the outcomes:

$$lnGincome_{it} = \beta_0 + \beta_1 lnATMs_{it} + \beta_2 lnATMsservices_{it} + \beta_3 lncreditcards_{it} + \beta_4 lnNewservicest_{it} + \beta_5 lnSMEscredits_{it} + \beta_6 lnSMEsdeposits_{it} + \varepsilon_i$$
(1)

 $\begin{aligned} lnGincome_{it} &= \beta_0 lnGincome_{it-1} + \beta_1 lnATMs_{it} + \beta_2 lnATMsservices_{it} \\ &+ \beta_3 lncreditcards_{it} + \beta_4 lnNewservices_{it} \\ &+ \beta_5 lnSMEscredits_{it} + \beta_6 lnSMEsdeposits_{it} + \varepsilon_i \end{aligned}$ (2)

$$ROA_{it} = \beta_0 + \beta_1 lnATMs_{it} + \beta_2 lnATMsservices_{it} + \beta_3 lncreditcards_{it} + \beta_4 lnNewservices_{it} + \beta_5 lnSMEscredits_{it} + \beta_6 lnSMEsdeposits_{it} + \varepsilon_i$$
(3)

$$ROA_{it} = \beta_0 ROA_{it-1} + \beta_1 lnATMs_{it} + \beta_2 lnATMsservices_{it} + \beta_3 lncreditcards_{it} + \beta_4 lnNewservices_{it} + \beta_5 lnSMEscredits_{it} + \beta_6 lnSMEsdeposits_{it} + \varepsilon_i$$
(4)

where *i* refers to the bank and *t* to the year, β_0 : constant intercept; *Gincome*: gross income; *ROA*: return on assets; *ATMs*: number of ATMs; *ATM services*: number of ATM services; *Creditcards*: number of credit cards issued every year in the study period; *Newservices*: number of new services; *SMEscredits*: amount of loans for SMEs; *SMEsdeposits*: amount of deposits from SMEs; and \dot{e}_i error term.

The variables are numeric and also logarithmic, except for ROA. Models 1 and 3 present our benchmark gross income and ROA regression models. Models 2 and 4 present the lagged value of gross income and ROA. The lagged value was used as an explanatory variable to examine whether the previous outcome has an effect on the present outcome. Ordinary leased square (OLS) regression was used to test the effect of the predictors on the outcome. STATA software ran the regression to test the research hypothesis.

RESULTS AND DISCUSSION

This section presents the descriptive statistics, correlation coefficients of all variables, and result of OLS regression. Table 1 shows the descriptive statistics, including the mean, standard deviation, minimum, and maximum observations for the predictors and outcome variables.

Table 1 shows that the minimum number of ATMs is 11 and the maximum is 208. This result shows a significant range when the number of ATMs of different banks is compared. We can also see that the minimum number of ATM services is 5 and the maximum is 21. This result indicates that a number of Jordanian banks offer basic services only on their ATMs, whereas others maximize their machines services. The minimum number of credit cards issued is only 217, but the maximum reached 2,917,882. This result suggests that some banks used a studied plan to market their cards, but others neglected this issue.

Some banks do not offer new services (minimum number of the new services offered is zero), whereas the maximum number of new services offered to customers is 14. This finding indicates that some banks did not innovate or offer new services in certain years.

The result of banks data analysis in Table 1 indicates that percent of SMEs credit is extremely low compared with the total credit. The average SMEs credits is 11%, maximum is 34%, and the minimum is 1%. This result suggests that Jordanian banks are not interested in providing credit to SMEs. This result resembles the finding of Ben Naceur (2014) who found that SMEs

Variables	Obs.	Mean	Standard Deviation	Min	Max
Gross income	78	147,155,894	214,574,828.8	13,354,183	926,625,000
ROA	78	0.0130929	0.0057331	-0.0009	0.0261
ATMs	78	76.01282	59.38899	11	208
ATM services	78	11.24359	3.419523	5	21
Credit cards	78	46,656.82	329,596.5	217	2,917,882
New services	78	3.320513	2.626012	0	14
SMEs credits	78	11 %*	170,345,953.3	1 %*	34 %*
SMEs deposits	78	12 %**	378,559,803.5	2 %**	44 %**

Table 1. Descriptive Statistics.

Notes: * Percentage from the total credits, ** percentage from the total deposits

loans in MENAP is less than 10% of the total loans. Beck and Demirguc-Kunt (2006) cited limited access to financial sources as one of the reasons for the underdevelopment of the SMEs sector. The average percent of deposits of SMEs is 12%, minimum deposits comprise 2%, and maximum is equivalent to 44%. These results indicate that SMEs are not encouraged to save in banks. For instance, banks encourage SMEs deposits because of their significance to lending and because of the role of government and financial institutions, such as the Jordan Deposit Insurance Corporation, in implementing rules that protect depositors, encourage savings, and deepen the confidence in the banking system (JODIC website).

We also tested the existence of multicollinearity problem in the study model using the variance inflation factor (VIF) test. Table A1 in the Appendix presents the VIF result, wherein the mean VIF was 2.21. The multicollinearity problem did not exist in the independent variables in the study model. No robust rule is applied on the process of determining the value of VIF that indicates multicollinearity; a number of existing studies suggest that the value should not exceed 10 (Field, 2000; Hassan, 2009).

Table 2 presents the matrix of correlation coefficients among the variables used in the gross income model. The matrix reflects the correlation of each variable with other variables.

The correlation matrix in Table 2 shows that all variables have a positive coefficient with gross income, and some of these coefficients, such as ATMs, ATMs services, SMEs credits, and SMEs deposits, are highly correlated. Credit cards and new services have low coefficient, but they remain positive. The correlation matrix initially suggests that the variables have a strong positive relationship with the bank's gross income as a performance indicator.

Variables	Gross Income	ATMs	ATM Services	Credit Cards	New Services	SMEs Credits	SMEs Deposits
Gross income	1.0000						
ATMs	0.5701	1.0000					
ATM services	0.6772	0.7331	1.0000				
Credit cards	0.0238	0.0168	0.1082	1.0000			
New services	0.0933	0.0081	-0.0536	-0.0525	1.0000		
SMEs credits	0.9453	0.5336	0.6189	-0.0301	0.1528	1.0000	
SMEs deposits	0.9667	0.4529	0.6314	0.1003	0.0623	0.9110	1.0000

Table 2. Correlation Matrix: Gross Income Model Variables.

Table 3 presents the matrix of correlation coefficients of the variables used in the ROA model.

Table 3 shows that the variables in general have low correlation coefficients when ROA is used as a performance indicator. ATMs, ATM services, credit cards, and new services have positive coefficients, whereas SMEs credits and SMEs deposits have low and negative coefficients. After OLS regression, we tested for the heteroskedasticity problem in our data. The Breusch-Pagan test was used for models 1 and 3. The results are given in Table A2 in the Appendix. It shows that Prob> chi2 is 0.4724 and 0.1306 for models 1 and 3, respectively. These values are higher than 5%. Ayadil and Ellouze (2015) indicated that a significant chi2 (Prob> chi2 is less than 5%) indicates heteroskedasticity; this problem was not found in our two basic models. These results show that OLS regression is suitable for examining the relationship of our data and variables.

Table 4 presents the OLS estimation results for models 1 and 3 to examine the effect of FI and bank innovation on bank performance as measured by log gross income and ROA.

Variables	ROA	ATMs	ATM Services	Credit Cards	New Services	SMEs Credits	SMEs Deposits
ROA	1.0000						
ATMs	0.3261	1.0000					
ATM services	0.0299	0.7331	1.0000				
Credit cards	0.0832	0.0168	0.1082	1.0000			
New services	0.0204	0.0081	-0.0536	-0.0525	1.0000		
SMEs credits	-0.1142	0.5336	0.6189	-0.0301	0.1528	1.0000	
SMEs deposits	-0.0786	0.4529	0.6314	0.1003	0.0623	0.9110	1.0000

Table 3. Correlation Matrix: ROA Model Variables.

Variables	Gro	ss Income			ROA	
	Coefficient	Std. Error	T-Test	Coefficient	Std. Error	T-Test
Intercept	(6.448377)	0.7207968	8.95	(0.0288928)	0.0108585	2.66
	0.000***			0.000***		
ATMs	(0.4804434)	0.0816883	5.88	(0.0044688)	0.0012306	3.63
	0.000***			0.001***		
ATM services	(0.5575039)	0.2168847	2.57	(-0.0075057)	0.0032673	-2.3
	0.000***			0.025**		
Credit cards	(-0.0024915)	0.0352647	-0.07	(0.0004775)	0.0005312	0.9
	0.944			0.372		
New services	(0.1424166)	0.0580895	2.45	(0.0004625)	0.0008751	0.53
	0.001***			0.599		
SMEs credit	(0.1866609)	0.0483956	3.86	(-0.0012294)	0.0007291	-1.69
	0.000***			0.096*		
SMEs deposit	(0.2698404)	0.0459308	5.87	(0.0000992)	0.0006919	0.14
	0.000***			0.886		
Adj R ²	88.80%			16.68%		
Sum of Squares	83			0.0025		
Df	77			77		
F-statistic	102.72			3.57		
Prob(F-statistic)	0.0000***			0.0038***		
Observations	78			78		

Table 4. OLS Estimation Results, Models 1 and 3.

Notes: Significant at 1%***, 5%**, 10*. Variables in logs except the ROA.

The regression results show that the number of ATMs have a significant effect on ROA and gross income, at the 1% level. ATMs are low-cost delivery channels for bank services and provides easy to use services to customers; this type of service satisfies the FI philosophy of encouraging costumers to use electronic methods, thereby decreasing branch visitors (PMA, 2014). The result of our study is consistent with Jegede (2014), who found an effective influence of ATMs on Nigerian banks. By contrast, our study contradicts the findings of Humphrey (1994), who found that ATMs did not lessen total banks costs but merely decreased individual deposit transactions; this study also found that customers gained more benefits from expanded ATM networks than banks.

The number of ATM services measured the number of services an ATM, thus, providing more services will encourage customers to use ATMs. Banks aim to decrease the number of branch visitors by encouraging clients to use electronic channels, such as POS, ATMs, card payments, and other methods; decreasing bank costs by lessening paper transactions in the branches reduces total bank costs (Scholnick et al., 2008). The present study found that ATM services were significant at 1% level when the coefficient of gross income is used. By contrast, when ROA is used as a variable for bank performance, ATM services were significant at the 5% level and the coefficient was negative. This finding means that ATM services have a negative effect on bank performance when measured by ROA. This finding means that ROA will decrease by 0.75% when ATM services increase by 1%.

The number of credit cards is insignificant with a P-value of 0.944 when gross income is used as outcome. This variable is insignificant with ROA with a P-value of 0.372. Akhisar et al. (2015) found that the number of electronic payment methods, such as credit and debit cards, have a positive effect on bank performance.

New bank services, as bank innovation indicator, are positive and significant at the 1% level when gross income is used as an indicator of bank performance. The variable of new bank services is insignificant when ROA is used as an indicator, but the coefficient is positive. Service innovation indicates that banks constantly innovate and offer new services, thereby addressing the needs of customers, especially individuals and SMEs which are FI targets. Service innovation benefits banks because new services attract customers as depositor and/or borrower. Frame and White (2004) suggested the need for increased empirical research in the innovation of the financial sector. The present study enhances literature in the financial field. Sansone and Formisano (2016) analyzed the marketing innovation of banks and its effect on bank performance; they found that marketing innovation enhanced performance on several indicators.

The effect of SMEs deposits and credits are both positively significant at the 1% level when gross income is used as an indicator. SMEs credits have a significant effect on ROA at 10% with negative coefficient. This finding means that the variable of SMEs credits has a negative effect on bank performance when measured by ROA. This finding means that ROA will decrease by 0.12% when SMEs credits increase by 1%. Thus, SMEs credits enhanced bank profits but not ROA. SMEs deposits were insignificant with ROA and the coefficient is positive. Our result is consistent with Allen and Rai (1996), who found that an increased number of loans can enhance bank profit, which is also applicable to deposits in small banks. Deposits are the main source of bank lending. While the percentage of SMEs credits extremely low compared with the total credit, out that the importance of SMEs comes from their contribution to economic growth. SMEs in Jordan hire around 60% of the country's labor force and contribute to around 50% of the GDP in 2011 (Jordanian Department of Statistics, 2011). Furthermore, Table 4 shows

that the independent variables are statistically significant in predicting gross income as bank performance as shown in model 1. The results presents a significant value of p = 0.0000, which indicates a statistically significant relationship at the 1% level. Also, the independent variables are statistically significant in predicting ROA as bank performance in model 3. The results presents a significant value of p = 0.0038, which indicates a statistically significant relationship at the 1% level. Table 5 presents the result of OLS regression after including the lagged gross income and lagged ROA as explanatory variables in the study models.

In Table 5, the regression result is presented for models 2 and 4, which include lagged gross income and ROA as explanatory variables. Some of the results for model 2 is consistent with model 1 as shown in Table 4. In both the results, credit cards have an insignificant effect on gross income as an indicator of bank performance but the coefficient became positive. The variable of lagged gross income has a significant effect at 1% level with positive coefficient. The

Gro	ne	ROA			
Coefficient	T-test	Std. Error	Coefficient	T-test-	Std. Error
(0.3825403) 0.000***	5.71	0.0670457	(0.0055673) 0.000***	6.84	0.0008143
(4.210913) 0.000***	5.63	0.7477252	(0.0499989) 0.000***	5.37	0.0093191
(0.3671712) 0.000***	5.27	0.0696242	(0.0030965) 0.000***	3.14	0.0009853
(0.2484968) 0.190	1.32	0.1878817	(-0.0034782) 0.000^{***}	-1.32	0.0026357
(0.0029876) 0.603	0.1	0.0289705	(0.0002389) 0.031**	0.57	0.0004173
(0.0731492) 0.140	1.49	0.0489803	(-0002893) 0.557	-0.41	0.0006978
(0.127313) 0.003***	3.12	0.0408703	(-0.0001916) 0.904	-0.32	0.0005929
(0.1373284) 0.002***	3.15	0.0435884	(-0.000777) 0.021*	-1.38	0.0005649
92.07%			49.89%		
77.72			0.0025		
76			75		
127.02			11.67		
0.0000***			0.0000***		
77			76		
	Gro Coefficient (0.3825403) 0.000*** (4.210913) 0.000*** (0.3671712) 0.000*** (0.2484968) 0.190 (0.0029876) 0.603 (0.0731492) 0.140 (0.127313) 0.003*** (0.1373284) 0.002*** 92.07% 77.72 76 127.02 0.0000*** 77	Gross Incon Coefficient T-test (0.3825403) 5.71 0.000*** (4.210913) (4.210913) 5.63 0.000*** (0.3671712) (0.3671712) 5.27 0.000*** (0.2484968) (0.2484968) 1.32 0.190 0.0029876) 0.1 0.603 (0.0731492) 1.49 0.140 (0.127313) 3.12 0.003*** (0.1373284) 3.15 0.002*** 92.07% 77.72 76 127.02 0.0000*** 77 76 127.02	Gross Income Coefficient T-test Std. Error (0.3825403) 5.71 0.0670457 0.000*** (4.210913) 5.63 0.7477252 0.000*** (0.3671712) 5.27 0.0696242 0.000*** (0.2484968) 1.32 0.1878817 0.190 0 0.0289705 0.603 (0.0731492) 1.49 0.0489803 0.140 (0.127313) 3.12 0.0408703 0.003*** (0.1373284) 3.15 0.0435884 0.002*** 92.07% 77.72 76 127.02 0.0000*** 77 76 127.02	$\begin{tabular}{ c c c c c c } \hline Gross Income & \hline Coefficient & T-test & Std. Error & Coefficient \\ \hline \hline Coefficient & T-test & Std. Error & Coefficient \\ \hline \hline (0.3825403) & 5.71 & 0.0670457 & (0.0055673) \\ 0.000^{***} & & 0.000^{***} \\ \hline (4.210913) & 5.63 & 0.7477252 & (0.0499989) \\ 0.000^{***} & & 0.000^{***} \\ \hline (0.3671712) & 5.27 & 0.0696242 & (0.0030965) \\ 0.000^{***} & & 0.000^{***} \\ \hline (0.2484968) & 1.32 & 0.1878817 & (-0.0034782) \\ 0.190 & & 0.000^{***} \\ \hline (0.029876) & 0.1 & 0.0289705 & (0.0002389) \\ 0.603 & & 0.031^{**} \\ \hline (0.0731492) & 1.49 & 0.0489803 & (-0002893) \\ 0.140 & & 0.557 \\ \hline (0.127313) & 3.12 & 0.0408703 & (-0.0001916) \\ 0.003^{***} & & 0.904 \\ \hline (0.1373284) & 3.15 & 0.0435884 & (-0.0001916) \\ 0.002^{**} & & 0.021^{*} \\ 92.07\% & & 49.89\% \\ 77.72 & & 0.0025 \\ 76 & & 75 \\ 127.02 & & 11.67 \\ 0.0000^{***} & & 0.0000^{***} \\ 77 & & 76 \\ \hline \end{tabular}$	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$

Table 5. OLS Estimation Results, Models 2 and 4.

Notes: Significant at 1%***, 5%**, 10*. Variables in logs except the ROA.

P-value for ATM services and new services became insignificant in model 2. SMEs credits and deposits remain significant at the 1% level with a positive coefficient. Lagged gross income was included in our model as an independent variable, which means that the bank's gross income (at present) as an indicator of bank performance depends on its gross income in past periods.

Some of the results for model 4 in Table 5 are slightly different from those for model 3 in Table 4. The results for model 4 indicate that ATMs, ATM services, credit cards, and SMEs deposits are significant at 1%, 1%, 5%, and 10 %, respectively, when ROA is used as an indicator of bank performance. However, the coefficient for ATM services and SMEs deposits became negative, which means that ATM services and SMEs deposits have negative effects on ROA. This finding suggests that when ATM services and SMEs deposits increase by 1%, the expected ROA will decrease by 0.34 % and 0.07 %, respectively. New services and SMEs credits are insignificant with negative coefficients. Lagged ROA also has a significant effect at the 1% level with a positive coefficient. Lagged ROA is included in our model as an independent variable to capture the effect of the bank's ROA in the previous year on that in the present year.

4.1. Additional Analyses and Robustness

We ran random effect and fixed effect regressions to compare the result with that of other estimators. We then ran the Hausman test to determine whether we should follow the fixed effect or random effect. Table A3 in the Appendix presents the result of the Hausman test, which indicated that Prob.> chi2 is 0.392. This result supports the null hypothesis, which indicates the need to use the random effect estimator (Greene, 2008). In Table 6, we present the random effect estimators for models 1 and 3. The table presents the variables' coefficients, P-value, z- test, standard error, and level of significance.

Table 6 shows that the random effect produced similar results with regard to ATMs, SMEs credits, and deposits presented in Table 4 with regard to gross income as an outcome. The intercept in the two estimation results was positively significant. The credit card variable was insignificant for both estimators when gross income was used as outcome. However, the coefficient is negative in the OLS results. While the random effect estimator for model 1 as shown in Table 6 provided different results regarding ATM services which was insignificant, the results for new services are insignificant in this test but significant under OLS. The coefficients for our variables were positive in both estimators, except for the credit cards in the result of OLS estimation.

Variables	Gr	Gross Income			ROA		
	Coefficient	z-Test	Std. Error	Coefficient	z-Test	Std. Error	
Intercept	(10.27677) 0.000***	11.83	0.8688302	(-0.0082805) 0.616	-0.5	0.016502	
ATMs	(0.6879288) 0.000***	7.3	0.094208	(+0.0013616) 0.427	0.79	0.0017144	
ATM services	(0.0696744) 0.642	0.47	0.1497563	(-0.0027656) 0.397	-0.85	0.0032652	
Credit cards	(0.0083428) 0.648	0.46	0.0182918	(0.0003019) 0.465	0.73	0.0004135	
New services	(0.0482431) 0.132	1.51	0.0320432	(0.0007098) 0.32	0.99	0.0007139	
SMEs credit	(0.142936) 0.003***	3	0.037392	(0.0005183) 0.591	0.54	0.0009649	
SMEs deposit	(0.1232571) 0.001***	3.3	0.0007965	(0.0005331) 0.503	0.67	0.0007965	
Wald chi2(6) Prop>chi2	135.74 0.0000***			5.5 0.4817			
Observations Groups	78 13			78 13			

Table 6. Random Effect Estimation Results, Models 1 and 3.

Notes: Significant at 1% ***, 5% **, 10% *.

Also, Table 6 shows the result of the random effect estimator with regard to ROA as an outcome. While in Table 4, the results indicate that credit cards, new services, and SMEs deposits are insignificant with positive coefficient, other variables have a significant effect; however, ATM services and SMEs credits have negative coefficients. The result was entirely different when we ran the random effect estimator for model 3, wherein the variables are insignificant for ROA and the coefficients are positive except, for intercept and ATM services.

5. CONCLUSION

This study investigated whether Jordanian banks can earn more profits by enhancing FI. The study used bank's data from 2009 to 2014. This study used gross income and ROA as bank performance indicators and SMEs deposits and credits, ATMs, ATM services, and new services, and credit cards as predictors. By conducting regression analysis, we found that FI helps banks to improve their performance and can earn more profit. Therefore, we support the research hypothesis that indicates a significant effect of FI on bank profit and performance. We also conclude that new services as a variable of bank innovation has a significant effect on performance. Some FI variables had insignificant effects on bank performance when they were considered separately.

The variables for the number of ATMs and number of ATM services have a significant effect on gross income and ROA as bank performance variables. Increasing the number of ATMs and ATM services as electronic channels to deliver services to areas where banks cannot open a branch or somewhere crowded with customers encourages customers to open accounts in the banks. Moreover, the ability to obtain convenient bank services at any time is reflected on the banks' ability to lend, earn more profits, and promote services.

Banks generally gain more profits from credit cards, especially if these cards are used outside the issuing country. In this study, the effect of credit cards was insignificant when gross income and ROA are used as performance indicators. We used the number of credit cards issued even when they were unused by customers. This approach might explain the result. Different results can be obtained if the number of active cards were used.

Providing new services as an indicator of innovation can attract customers to use bank services for their needs. Most bank services require opening an account, which leads to increased deposits and credits and ultimately profits. Our result shows that new services have a significant effect on gross income as bank performance, whereas the effect is insignificant when ROA is used as a performance indicator.

SMEs credits levels in Jordan are low compared with the level of SMEs to GDP and employment levels. The effect of SMEs credits on bank performance is significant with gross income and ROA. This result means that increased credit for SMEs can enhance bank performance, which will be reflected on SMEs performance and economic development. SMEs deposits provide financial sources for banks, thereby improving the liquidity and credit of individuals and SMEs and influencing bank performance and economics. In our study, SMEs deposits have a significant effect on gross income as bank performance, whereas the effect is insignificant when ROA is used as performance indicator.

We found that FI indicators (except credit cards) are significant when gross income is used as an indicator of bank performance. New services as an indicator of bank innovation have a significant effect on gross income. FI indicators, which include number of ATMs, number of ATM services, and SMEs credits, have significant effects on ROA as the performance indicator. SMEs deposits and credit cards had insignificant effects on ROA. Thus, new services as an indicator of bank innovation had insignificant effect on ROA.

This finding encourages banks to enhance FI. Banks can gain more profit and improve their performance with enhanced FI. These efforts will reflect on the economic development and economic stability of countries. These outcomes enhance the efforts of global organizations to alleviate poverty through access to financial services.

Therefore, we recommend further individual and cross-country research to achieve an improved understanding of FI and bank performance. Future researchers may use different variables that can provide additional insights into FI literature.

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Jordan Securities commission. http://www.jsc.gov.jo

Jordan deposit Insurance Corporation. www.dic.gov.jo

Global Findex Database, World Bank. www.worldbank.org/en/programs/globalfindex

APPENDIX

Table A1.	Multicollinea	rity Test

Variable	VIF
ATM services	3.18
ATM	3.06
SMEs deposits	2.31
SMEs credits	1.89
Credit cards	1.72
New services	1.11
Mean VIF	2.21

	•	
Breusch-Pagan test	chi2(6)	Prob > chi2
Model 1	0.52	0.4724
Model 3	2.29	0.1306

Table A2. Heteroskedasticity Test

Table	<i>A3</i> .	Hausman	Test

	Prob. > chi2	Chi2 (6)
Hausman test	0.392	6.29