

# “Financial inclusion and banks' performance: Evidence from Palestine”

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Fadi Shihadeh (Palestine)

# FINANCIAL INCLUSION AND BANKS' PERFORMANCE: EVIDENCE FROM PALESTINE

## Abstract

This study aims to examine the relationship between financial inclusion indicators and bank performance in Palestine. The study population and its sample include all 15 banks operating in Palestine and cover the period 2006 to 2016 with panel data from 162 observations. To interpret the variables, the study uses the volume of loans to SMEs (usage), banking penetration, number of ATMs and branches (access), and on-line banking, the latter if it is a dummy variable. Further, the study uses operational profits, total revenues and ROE as bank performance indicators and dependent variables. Using empirical analysis, the results indicated that banking penetration tools, branching and ATMs, could enhance bank performance. Despite the decline in lending to SMEs, this factor could positively improve the performance of banks in Palestine. In general, financial inclusion helps banks improve their performance and increase their revenues. This study recommends that government organizations can use the obtained results to formulate their strategies and agendas for improving financial inclusion in Palestine and other developing countries.

## Keywords

financial services, banking penetration, SME loans,  
online banking, individuals

## JEL Classification

G20, G21

## INTRODUCTION

Banks play a critical role in financial and economic development; they attract deposits and offer direct and indirect financial services, such as; loans, mortgages, credit and debit cards, etc. (Beck et al., 2015). Thus, these institutions have the main goal of making profit and maximizing stockholder value (Pilloff, 1996). Meanwhile, banks' achievement of these supply-side targets depends on companies, SMEs and individuals, whom they consider to be a demand side of banking services, where the main problem on the demand side is the trading and investment process by looking for financial services offered by banks.

On the supply side, banks seek to increase profits and maximize stockholder value. On the demand side, individuals and SMEs look for more innovative financial services, at affordable prices and with flexible guarantee conditions to improve their living standards and financial performance. To achieve a balance between supply and demand sides of bank financing, as well as to enhance economic development, government institutions work to improve their financial systems. On the one hand, governments reform their financial systems by developing rules and regulations and enhancing financial awareness to encourage members of society to access the services offered by the financial system. On the other hand, governments push banks to innovate and increase their penetration, especially in rural areas, while offering affordable prices for loans to disadvantaged people, so they can earn more revenue.

By offering innovative services, banks can increase the number of people who open and maintain formal accounts and, thus, attract deposits, increase the number of borrowers, and invest more in business, education, and health. Therefore, by increasing the number of individuals and SMEs that borrow from banks and use other banking services, banks can increase their revenues and profits, and thus, enhance their performance indicators. This will lead them to invest in more affordable services that target the disadvantaged, thereby enhancing financial inclusion for everyone in these banks' communities on an ongoing basis. Therefore, financial inclusion means that all community members can access and use financial services at an affordable cost at any time (World Bank, 2017). The philosophy of financial inclusion focuses on enhancing access to financial services through banking penetration in the provision of electronic services and more business credit at affordable prices. Thus, all lead to poverty alleviation, decreased unemployment, and increased job creation and, thus, to sustainable economic development (CGAP, 2016). To this end, financial inclusion is a key factor in financial economic development.

The G20 identified three main indicators that measure financial inclusion: (1) access to finance; (2) rate of usage of financial services; and (3) quality of both the products and the service delivery (GPFI, 2012). This study will use some of these financial inclusion indicators as explanatory variables to link it with the performance of banks in Palestine. On the supply side, the access indicator of banking penetration is the number of bank branches and ATMs. On the demand side, where SMEs present more than 90% of firms in Palestine, the analysis uses the volume of loans granted to SMEs by Palestinian banks during the study period as a usage indicator. Recently, the importance of technology in banking has increased, so online banking is used as both a dummy variable and an explanatory variable. Banking penetration, loans to SMEs and online banking services are considered reasons to open accounts, deposit money and offer credit (Shihadeh, a2020). Moreover, as several factors affect bank performance, this study uses bank assets as an internal control variable and GDP as an external control variable. The analysis also includes total revenues, net profits and return on equity (ROE) as the bank performance indicators and dependent variables. Therefore, this study has the main objective, namely to examine the relationship between financial inclusion and bank performance in Palestine. Thus, it presents an evidence from one of developing countries that enhancing financial inclusion and promoting their tools can improve a bank's performance and revenues.

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## 1. LITERATURE REVIEW AND HYPOTHESIS

This section presents and discusses the literature related to banks as financial intermediaries' play a significant role in enhancing financial inclusion. Furthermore, it links the target of financial inclusion with banks' target to enhance their performance by reducing risk and thereby maximizing stockholder wealth.

Several studies have examined how banks can earn more revenues if loans, branches, ATMs, and electronic tools are improved. Studies also found that access and use of formal financial services could enhance the lives of disadvantaged people and improve the performance of SMEs, while at the same time giving banks a chance to enhance their performance. Humphrey (1994) concluded that ATMs increase bank revenues and profits, but in

some cases these increases were weak and consistently insignificant. Jegede (2014) found that ATMs could effectively enhance the growth of Nigerian banks. Muiruri and Ngari (2014) found that all internet banking and mobile banking significantly influenced bank profits. Burgess and Pande (2005) pointed out that banking penetration through rural branches could alleviate poverty and that, in turn, poverty alleviation increased the volume of loans and deposits.

With its role in economic development, financial inclusion aims to include SMEs and disadvantaged people in the financial system through access to bank accounts, making deposits and access to borrowing. Understanding the link between the demand for and supply of financing is important to achieving financial inclusion and enhancing bank performance. Beck and Demirgüç-Kunt (2006) note that access to financial resources

is considered to be a main obstacle to SMEs' development and performance. IMF (2014) pointed out that whereas loans to SMEs in MENAP are around 10% of the total volume of loans in the region, these SMEs face obstacles such as excessive collateral requirements in accessing financial sources. Ifeakachukwu and Olasunkanmi (2013) concluded that SMEs could enhance their short- and long-term manufacturing processes through access to bank loans. Also, improved regulations and rules regarding collateral requirements and interest rates could increase both the number and volume of loans to SMEs.

Stoica et al. (2015) found that few Romanian banks could use internet banking to enhance their performance and that other Romanian banks used internet banking to reduce their costs. Nguyen (2014) points out that bank branches are important to disadvantaged communities and that branch closures lead to a lack of lending, especially to small firms. Harimaya and Kondo (2012) conclude that if banks concentrate their activities within their specific regions, they can improve their cost efficiency. In addition, if regional banks do not expand their branches, they will achieve a low level of efficiency and, consequently, low profits. Malhotra and Singh (2009) found that there was no statistically significant relationship between adapting to internet banking and ROA and ROE, but the influence of internet banking on private banks was significant and negative. Siam (2006) found that the need for electronic banking services increased in line with customer needs. Akhisar (2015) found that internet banking had a negative effect on return on assets (ROA) and ROE as bank performance indicators.

Abu Zuaiter (2006) studied some of the factors that affect the profitability of commercial banks as measured by ROA and ROE. The study concludes that bank branches are significantly correlated with ROA and ROE. Hirtle (2007) pointed out that the number and volume of deposits increased and the cost of deposits decreased as a result of expanding branch networks. Furthermore, there is no significant relationship between network size and bank performance as measured by profitability. Hensel (2003) found that large banks could improve cost efficiencies by expanding their branch networks. Berger et al. (1997) found that

banks could earn more revenue when they provide some suitable places for customers in terms of branches. Also, more branches can reduce overall costs. Skillern (2002) pointed out that when bank branches are closed, the fees charged for alternative financial services are higher and customers find it difficult to access credit products from traditional bank branches. McAndrews (2003) pointed out that ATMs had benefits for banks and customers, as customers can use their accounts at any time in several places, while banks can reduce costs for some customers. Recently, Shihadeh et al. (2018) linked financial inclusion with banks performance in Jordan. They used several indicators regarding financial inclusion such as SME deposits and credits, credit cards, ATMs, thereby linking these indicators with ROA and gross income as bank performance indicators. The study covered the period from 2009 to 2014 and 13 banks as a sample. The results showed that promoting financial inclusion could have a positive effect on the performance of banks, while the effect is clearer in the gross income than ROA. Shihadeh and Liu (2019) covered 701 banks from 189 country to test the relationship between enhancing financial inclusion indicators and bank's performance and risk. The study used bank branches, formal accounts, formal loans, formal saving, credit cards, and debit cards as indicators for financial inclusion. The results indicated that banks could decrease their risks by enhancing financial inclusion, where is the effect not clear on bank's performance. Shihadeh (2020b) examined whether financial inclusion could influence bank's risk and performance among MENAP region, therefore, covered 271 banks from 24 countries from the region. Following same indicators which used by (Shihadeh and Liu, 2019), the study found out that, banking branching positively could influence banks performance in the region.

The above studies cover several topics related to the variables used in this study, such as bank branches, ATMs, online banking and loans to SMEs. These studies examined the effects of bank services and innovation on bank performance, SME performance, and poverty alleviation. In this study, banking penetration, loans to SMEs, and online banking, as financial inclusion indicators, are linked with total bank revenues, operational profits, and ROE as bank performance indica-

tors. Few studies have been found to address the demand side of financial inclusion, while research related to the supply side is scarce. This prompted this study to examine the relationship between financial inclusion and bank performance in order to fill the gap in the financial inclusion literature, especially on the supply side. Based on previous research, the following hypothesis is put forward:

*H: Financial inclusion has a significant influence on the bank's performance in Palestine.*

## 2. METHODOLOGY

Data for this study were collected manually from the annual reports of banks operating in Palestine. These data are also available through the Palestine Monetary Authority (PMA), the Palestine Exchange (PEX), and the Association of Banks in Palestine (ABP). The study population and sample include all 15 banks operating in Palestine – 13 commercial banks and two Islamic banks. As these banks have different classification in their financial statements, the annual reports of the ABP were used that reformulated some categories of Islamic banks to enable empirical analysis and discussion. The study covers the period from 2006 to 2016 with panel data from 162 observations. The data on the number of branches and ATMs, bank assets, ROE and online banking were collected from the annual reports of banks, and GDP from the PMA's annual reports. In terms of the volume of loans to SMEs, banks, as directed by the PMA, will begin to classify loans by company and firm size in 2016. Some banks have used this classification and published in annual reports, while most banks do not provide such data in annual reports. For banks, this classification and data on SME loan were not available, thus using the percentage published by the European Commission (2016), which is 6% of total loans, to calculate it and thus include in the analysis.

This study has mainly one limitation in testing the influence of financial inclusion on bank performance; this limitation is related to the data availability. As several studies aimed at empirically examining some of the issues related to the banking industry, access to data sources becomes an obstacle to this kind of research (Frame & White 2004).

This limitation influences finding data about clients for each bank, such as the number of clients before and after adopting the financial inclusion strategy. Also, 15 banks participated in this study over 11 years, which makes the study period a bit short and researchers cannot get more data to analyze.

After reviewing the literature on banks, the studies used several indicators of bank performance (i.e., return on equity (ROE), return on assets (ROA), operational profits, and total revenues) (see Berger, 1995; Heffernan & Fu, 2008; Chantapong, 2005; Ben Naceur & Goaid, 2008; Ben Naceur & Omran, 2008; Sufian & Habibullah, 2009). Therefore, this study uses operational profit and total revenues as profits indicators and ROE as a bank performance indicator and outcomes. Thus, all these indicators (ROE, profit indicators and a performance indicator) will be used in this study as performance indicators.

For Interpreter variables, the study uses the volume of loans to SMEs (usage), banking penetration, the number of ATMs and branches (access), and online banking, the latter if it is a dummy variable, thus, following the annual reports, which indicated in which year the bank adopted online banking. In addition to the financial inclusion indicators as key variables, the analysis uses bank assets and GDP as control variables to determine the internal and external variables that can influence bank performance. Meanwhile, explanatory variables are lagged at first differences in terms of capturing their real effect on outcomes, because it may take time for explanatory variables to feed through the income statement.

This study employed an empirical method based on the bank data collected from the annual reports of 15 Palestinian banks. Therefore, the effect of financial inclusion on operational profits, total revenues, and ROE is examined as bank performance indicators. Thus, it is hypothesized that financial inclusion has a significant effect on bank performance, the latter of which is based on the banks' targets for profits and revenues and, thus, on maximizing stockholder value. Asking individuals and SMEs to offer places to access bank services could enhance the

performance of banks and the living standards of community members. Previous studies also covered these variables, but they did not link them to financial inclusion. This study links financial inclusion to the supply side of banking services, including providing access to credit accounts for SMEs and online banking. Thus, it represents a new area of research of financial inclusion by using a new method to study the influence of financial inclusion on bank performance (supply side).

To proceed with empirical analysis, the study uses several estimations to obtain robust results (GLS, fixed effects, random effects, GMM estimations), thereby developing an empirical model based on the following conditions:

$$Y_{it} = f( ASS_{it}, FI_{it}, GDP_{it} ). \quad (1)$$

Thus, the re-estimation of equation (1) by considering financial inclusion (FI) is as follows:

$$Y_{it} = ASS_{it} + FI_{it} \begin{cases} Branches \\ ATMs \\ SMEs\ loans \\ Online\ banking \end{cases} + GDP_{it} + \varepsilon_i. \quad (2)$$

Using a PCA technique, the number of branches and the number of ATMs are considered as one variable to measure banking penetration in Palestine. Thus, the empirical model that includes financial inclusion proxies and control proxies is as follows:

$$Y_{it} = \beta_0 + \beta_1 \ln Assets_{it-1} + \beta_2 BP_{it-1} + \beta_3 \ln SMEs\ loans_{it-1} + \beta_4 GDP_{it-1} + \beta_5 Online\ banking_{it} + \varepsilon_i, \quad (3)$$

where  $Y$  refers to bank performance, operational profit, total revenues and ROE. While  $i$  refers to a bank and  $t$  to a year,  $\beta_0$ : a constant intercept;  $Assets$  is the amount of net bank assets;  $BP$ : the number of branches and ATMs component;  $SME\ loans$ : amount of loans for SMEs;  $GDP$ : the annual growth of GDP;  $Online\ banking$ : dummy variable, and  $\varepsilon$ : error term. The variables are numeric and logarithmic, except for ROE and GDP. The model presents bank performance indicator regression models.

Breusch-Pagan test is used to testify whether the data have heteroskedasticity problem or not. The result indicates that prob. > chi2 is 0.0000, 0.0000, and 0.0359 for operational profit, total revenues, and ROE, respectively as in Table 1). Ayadil and Ellouze (2015) pointed that if chi2 values are less than 5%, it is mean, and there is a heteroskedasticity problem in the study data. The GLS considers serial correlation between residuals and heteroskedasticity for covariances between cross-sections and the period. Therefore, the GLS estimator can interpret the relationship between independent and dependent variables. The Generalized Least Squares (GLS) regression is uses as an analysis technique to test the impact of predictors on the outcomes through the bank sample and how the independent variables can affect the performance of banks. In addition to a GLS estimator, random effect, fixed effect and the Generalized Method of Moments (GMM) are used to get robust results and to enhance the conclusion.

**Table 1.** Heteroscedasticity

Breusch-Pagan test	Chi2(1)	Prob.>chi2
Operational profit	18.01	0.0000
Total revenues	50.85	0.0000
ROE	4.40	0.0359

### 3. RESULTS AND DISCUSSION

This section presents descriptive statistics, correlation coefficients of all of the variables, and the results of estimations (GLS, fixed effects, GMM). Also, the results of empirical estimates are discussed.

#### 3.1. Descriptive statistics

Table 2 provides descriptive statistics, including definitions of variables, mean and standard deviation, and minimum and maximum observations for outcome variables and predictors. It also includes all the variables used in the analysis. The number of branches and ATMs is reduced to a single variable using a principal component analysis (PCA) to assess banking penetration in Palestine.

**Table 2.** Variable definitions and descriptive statistics

Variables	Definition	Obs.	Mean	St. dev.	Min	Max
Operational profit	Logarithm of net profit: comes from fees and interest	162	16.294	1.166	13.221	18.820
Total revenue	Logarithm of the net revenue: from all income sources	162	16.491	1.175	13.246	18.994
ROE	Return on Equity, %	162	0.0733	0.1077	-0.53	0.622
Assets	Logarithm of net assets	162	19.716	1.004	17.395	22.138
SMEs Loans	Logarithm of the amount of SME loans	162	15.400	1.676	10.554	19.621
Dummy	Equals 1 if a bank offers online banking, zero if something else	162	0.472	0.501	0	1
GDP	Annual GDP growth, %	162	0.050	0.043	-0.039	0.124
Banking penetration	Component for branches and ATMs using PCA	162	0.015	1.003	-0.881	5.894

Note: Author's calculations.

Table 3 presents the correlation matrix between operational profit, total revenues, and ROE as dependent variables and explanatory variables.

Table 3 shows that there is a high positive correlation between financial inclusion indicators (banking penetration and loans to SMEs) and operational profit as bank performance indicators at 91% and 89%, respectively. The asset correlation coefficient is 99% with a positive sign, which is a little higher than the financial inclusion indicators. Furthermore, for online banking as a dummy variable, the correlation coefficient is 37%, which is still positive but very low for a correlation coefficient. The correlation coefficient for GDP as a control variable has a negative value at 5%.

Table 3 shows a high positive correlation between financial inclusion indicators (banking penetration and loans to SMEs) and total revenues as bank performance indicators at 89% and 88%, respectively. Besides, the assets and GDP correlation coefficients are 99% and -0.01%, respectively, where

the correlation coefficient for online banking as a dummy variable is 37%.

Table 3 also shows that correlation coefficients between ROE and assets and banking penetration are higher than correlations between other variables, and they all are positive. The correlation coefficient between ROE and SME loans is around 35% with a positive sign. Furthermore, the correlation coefficients for operational profits and total revenues are higher than those that are linked to ROE. These results provide primary indicators for the relationship between bank performance indicators and explanatory variables, especially those on financial inclusion. More details are discussed in the next two sections. To test whether independent variables have multicollinearity, the variance inflation factor (VIF) test is used. The results of the VIF test indicate that there is no multicollinearity problem in the explanatory variables. Table 4 shows that the VIF factor is 3.98 (Field, 2000; Hassan, 2009) and that VIF should be less than 10.

**Table 3.** Correlation matrix

Variables	Operational profit	Total revenues	ROE	Assets	Banking penetration	SME loans	Online banking	GDP
Operational profit	1.000							
Total revenues		1.000						
ROE			1.000					
Assets	0.989	0.991	0.482	1.000				
Banking penetration	0.905	0.888	0.418	0.891	1.000			
SME loans	0.889	0.877	0.345	0.905	0.794	1.000		
Online banking	0.366	0.352	0.073	0.371	0.444	0.318	1.000	
GDP	-0.046	-0.018	0.096	-0.030	-0.063	-0.047	-0.209	1.000

Note: Author's calculations.

**Table 4.** Variance inflation factor

Variable	VIF
Banking penetration	7.84
SME loans	5.10
Assets	4.66
Dummy	1.28
GDP	1.04
Mean VIF	3.98

### 3.2. Empirical results

In this section, the estimation regressions are run to find out whether there is a relationship between bank performance indicators as dependent variables and financial inclusion indicators and other variables as independent variables. Table 5 presents the GLS estimation results; operational profit, total revenues, and ROE are used as outcomes, while bank assets, banking penetration, loans to SMEs, online banking, and GDP are used as explanatory variables.

**Table 5.** GLS estimation results

Source: Author's calculations.

Variables	Operational profit	Total revenues	ROE
Constant	-1.935*** (0.755)	-1.748** (0.846)	-1.141*** (0.166)
Assets t-1	0.892*** (0.049)	0.868*** (0.056)	0.072*** (0.010)
Banking penetration t-1	0.144** (0.040)	0.092** (0.042)	0.003 (0.009)
SME loans t-1	0.057** (0.030)	0.091*** (0.033)	-0.012*** (0.004)
Online banking	-0.126*** (0.037)	-0.163*** (0.036)	-0.040*** (0.007)
GDP t-1	0.253 (0.353)	0.094 (0.332)	-0.131* (0.078)
Observations	147	147	147
Wald chi2(5)	3571.26	2898.82	210.31
Prob. > chi2	0.0000	0.0000	0.0000

Note: Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Variables in logs except for BP, ROE, GDP and online banking.

The regression results show that bank assets have a relationship with all of the performance indicators with positive values. For banking penetration, which is a component variable for the number of ATMs and branches, there is a significant positive relationship with all of the bank performance indicators, except ROE. Banking penetration has a high influence on operational profit and total revenues.

Here, when more branches are opened, this leads to more banking penetration and, thus, an increase in bank revenues. Banks usually install ATMs near their branches. However, after PMA encouraged banks to increase their penetration in all areas, they started to open ATMs in large malls, at universities, and in other centers in rural communities. The idea here is that banking penetration could encourage the disadvantaged and SMEs to use formal financial services to enhance their lives and businesses. ATMs are considered to be low-cost delivery channels for bank services and an easy way for clients to use these services at any time. This channel is consistent with the financial inclusion philosophy of encouraging individuals to use electronic tools, thereby decreasing branch visits and their inherent costs (PMA, 2013). The results obtained are in line with Jegede (2014), Shihadeh et al. (2018) that ATMs affect bank performance.

Thus, as a result of the PMA agenda to enhance the banks' penetration, the number of bank branches in rural area increased to 55%, and in large cities – 45% of the total number of branches as of 2013 (Muiruri & Ngari, 2014). Furthermore, more branches were opened in rural areas and small cities in the last three years, which can enhance financial inclusion in Palestine (PMA, 2017). These figures support the study methods to use the number of branches and ATMs as financial inclusion indicators from the supply side. Furthermore, banks' annual reports posted the banks' strategy for penetration in a rural area.

The effect of loans to SMEs is significant and positive at the 1% level with operational profits and total revenues as bank performance indicators, while the relationship between loans to SMEs with ROE is significant and negative. Thus, loans to SMEs could enhance a bank performance indicator through operational profits and total revenues. This result is in line with Shihadeh et al. (2018). While the percentage of loans to SMEs is extremely low, compared to total credits, SMEs make important contributions to job creation and economic growth. Therefore, greater penetration in rural areas will enhance SMEs' access to finance, and branches in the SME region know more about the situation in their region than other branches (Harimaya & Kondo, 2012).

Banks can benefit from the PMA encouragement to lend more to SMEs through some advantages such as easing the conditions for rescheduling of defaulted SMEs loans, exempting banks from creating a risk reserve of SME credits, developing collateral conditions. Furthermore, two conferences were held in 2013 and 2016 to establish the rules and regulation for banks, formal institutions, and global organizations (World Bank, International Financial Corporation) regarding highlighting the critical roles of SMEs in the economic growth (PMA, 2013, 2017). Furthermore, banks can benefit from the programs adopted by EPCGF with ten banks in Palestine. This fund is directed to guarantee loans for SMEs. Therefore, these policies, through the PMA and the EPCGF, can enhance banks' ability to lend more to SMEs through covering some risks related to SME loans.

The effect of online banking as a dummy variable appears to be significant and negative for all bank performance indicators. Banks operating in Palestine have started to invest more in electronic banking services such as online banking and mobile banking. At first, the low uptake of these new services resulted in low revenues as more time was needed for customers to come to rely on these types of banking transactions. Furthermore, the main issue is that customers are still unfamiliar with online banking, and internet costs are very high, especially when using cellphone data, which leads to less use of these banking tools. According to the Palestinian Central Bureau of Statistics, in 2014, a total of 48.3% of Palestinian households had access to the internet; the same figures for the Arab world and globally were 40% and 44%, respectively (World Bank, 2016). The figures for May 2017 show that 57% of residents in Palestine had internet access (PCBS, 2017), compared to 56.3% in the Middle East (Miniwatts, 2017). These figures indicated that using the internet is important in daily life and banks can hire this to offer their services and enhance financial performance. The results show that there is no relationship between bank performance indicators and GDP as a country indicator for economic growth, except for ROE, which is significant and negative. Table 5 shows that independent variables are statistically significant in predict-

ing operational profit, total revenues, and ROE as bank performance indicators (as shown in the model). The results present a significant value of  $p \leq 0.01$ , which indicates a statistically significant relationship at the 1% level.

### 3.2.1. Additional analyses and robustness

In this section, the analysis run fixed-effect, random-effect and GMM regressions to compare results with other estimators. Further, the Hausman test was used to choose whether a fixed effect or a random effect should follow. The test result indicates that  $\text{prob.} > \text{chi}^2$  is less than 5% (see Table 6). The result supports the alternative hypothesis, which indicates the need to use a fixed-effect estimator (Greene, 2008). Table 7 presents fixed-effect and GMM estimator results for the model. The table shows the coefficients of the variables, standard error, and the level of significance. These estimators indicate robust results that can enhance the results and conclusions.

**Table 6.** Hausman test

Breusch-Pagan test	Chi2(1)	Prob. > chi2
Operational profit	177.66	0.0000
Total revenues	26.11	0.0001
ROE	12.64	0.0270

The fixed-effect estimation results indicate that bank assets have a positive relationship with all of the bank performance indicators. Furthermore, banking penetration as a financial inclusion indicator has a positive effect at the 1% level on banks' operational profits, and a negative effect with ROE, while there is no effect for banking penetration on banks' total revenues. These results are consistent with the GLS estimation (see Table 5) for operational profit and inconsistent for total revenues and ROE. As for loans to SMEs, the results are generally in line with those shown in Table 4. That is, loans to SMEs can positively affect banks' operational profits and total revenues, but there is a negative relationship between SME loans and ROE. Online banking as a dummy variable can affect operational profits, while no relationship links this variable to total revenues and ROE. Moreover, GDP can affect ROE since

**Table 7.** Fixed-effect and GMM estimation results

Variables	Fixed-effect			GMM		
	Operational profit	Total revenues	ROE	Operational profit	Total revenues	ROE
Constant	3.017*** (0.785)	1.264 (1.344)	-0.468** (0.237)	2.708** (1.398)	3.500 (2.286)	0.635 (0.733)
Assets <sub>t-1</sub>	0.612*** (0.048)	0.727*** (0.076)	0.035*** (0.013)	0.353*** (0.137)	0.735*** (0.122)	-0.017 (0.040)
Banking penetration <sub>t-1</sub>	0.070*** (0.027)	-0.020 (0.035)	-0.028*** (0.008)	0.115* (0.071)	0.253** (0.122)	-0.010 (0.028)
SME loans <sub>t-1</sub>	0.086*** (0.021)	0.064*** (0.023)	-0.012*** (0.008)	0.045 (0.035)	-0.022 (0.052)	-0.014 (0.015)
Online banking	0.070* (0.025)	0.018 (0.031)	-0.008 (0.007)	0.044 (0.054)	-0.030 (0.087)	-0.006 (0.023)
GDP <sub>t-1</sub>	0.136 (0.186)	0.189 (0.242)	-0.094* (0.058)	-0.043 (0.312)	-0.171 (0.483)	-0.048 (0.139)
Observations	147	147	147	132	132	132
No. of groups	15	15	15	15	15	15
Prob. > chi2	0.0000	0.0000	0.0000	0.000	0.0000	0.0220
Wald chi2	15527.51	7775.54	530.80	708.55	211.72	14.79

Note: Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Variables in logs except for BP, ROE, GDP and online banking. Author's calculations.

banks' performance moves in a negative direction, while there is no relationship between GDP and operational profits and total revenues as bank performance indicators. Finally, it can be noted that forecasting variables can significantly affect operational profits, total revenues, and ROE as bank performance indicators.

In addition, some of the results for the GMM estimation are the same as for the fixed effect, and some are different. That is, in GMM estimation results, there is a significant and positive relationship between bank assets and operational profits as a bank performance indicator. Also, there is a positive relationship between banking penetration as a financial inclusion indicator and operational profit. However, there is no relationship between loans to SMEs as a financial inclusion indicator and operational profit, as well as between online banking as a dummy variable and GDP. For total revenues, when using the GMM technique, the results are expressed as operational profit. Table 7 shows that bank assets and banking penetration have a significant and positive relationship with total revenues. However, there is no relationship between loans to SMEs, online banking and GDP with banks' total revenues, and the coefficient is negative. Table 7 shows that there is no relation-

ship between all predictive variables with ROE as a bank performance indicator. Finally, predictive variables can significantly affect banks' performance indicators through the results of the GMM estimator.

From the above results and explanations, loans to SMEs have a significant effect on bank performance indicators through all of the estimators used in this study, except for GMM. More effort should be directed toward encouraging banks to lend more to SMEs. These loans will not only improve SMEs' performance, but also enhance the performance of banks. Furthermore, banking penetration has a significant effect on enhancing banks' operational profits and total revenues, while there is an unclear relationship between banking penetration and ROE among the estimations used in this study. Moreover, previous research suggests banking penetration can enhance the lives of the disadvantaged; the results of this study also suggest that banking penetration will increase the profits of banks in Palestine. Therefore, banks can profit more from investing in further penetration, especially in rural areas, and from extending credits to the disadvantaged, and then this will contribute to economic development and poverty reduction in rural areas.

## CONCLUSION

This study uses bank data for the period 2006 to 2016 to investigate whether Palestinian banks can increase their revenues and improve their performance by enhancing financial inclusion to individuals and SMEs in Palestine. Operational profits, total revenues, and ROE are used as bank performance indicators; loans to SMEs, banking penetration, and online banking are used as indicators of bank penetration and financial inclusion. Assets and GDP are used as control variables and predictors.

By using empirical analysis, it has been found that financial inclusion helps banks improve their performance and increase their revenues. Therefore, the results are in line with the hypothesis of this study that financial inclusion significantly affects banks' performance and revenues. When considered separately, some financial inclusion variables had insignificant effects on bank performance. A banking penetration variable, which included the number of ATMs and branches, had a significant impact on operational profits and total revenues as bank performance indicators. Increasing the number of ATMs and branches provides services to rural areas or improves services for those living in crowded areas. This encourages more customers to open bank accounts and use bank services and, thus, enhances bank performance. Moreover, the ability to obtain convenient bank services at any time is reflected in the banks' ability to promote services and lend money and thus generate more revenue. Banking penetration as a financial-inclusion indicator is seen to have a significant effect on bank performance when GLS is used as the main regression estimator. Moreover, there is a significant positive effect on operational profits when the fixed effect is used as an estimator, and a significant positive effect on operational profits and total revenues when the GMM is used as an estimator. Further, there is a significant negative effect on ROE when the fixed effect is used, while there is no effect on ROE when GMM is used as an estimator.

The volume of loans to SMEs in Palestine is low compared to the contribution of SMEs to GDP and employment. Besides, loans to SMEs have a significant positive effect on banks' performance, operational profits and total revenues, and indicators, and significant negative effect on ROE when the GLS and fixed effect are used as estimators. Furthermore, there is no relationship between loans to SMEs and all bank performance indicators when the GMM is used as an estimator. This indicates that increasing SMEs' access to credit can enhance bank performance. This, in turn, will be reflected in SMEs' enhanced performance and in overall economic development, due to SMEs' considerable contribution to GDP and employment. All of the regression estimators, except GMM, show that an increase in the volume of loans granted to SMEs has a significant effect on bank performance indicators. These results support the PMA's agenda on enhancing loans to SMEs and encourages banks to lend more to small enterprises. It has been found that all of the financial inclusion indicators are significant to banks' performance indicators. This means that banks can increase the volume of loans to SMEs in Palestine, especially after the loan guarantee contracts between the banks and the EPCGF are activated and after the enhancing banking rules and regulations in cooperation between the PMA, the Palestinian Capital Market Authority, the Ministry of National Economy and other formal institutions.

The results of this study are consistent with those of previous studies and international organizations. They show that banks in Palestine can improve their performance and earn more revenue by enhancing financial inclusion and that this, in turn, can improve the lives of disadvantaged people. Thus, these results can support the efforts of global organizations in their quest to alleviate poverty by improving access and use of formal financial services.

## RECOMMENDATIONS

The benefit of this study is that bank managers, credits managers, and financial and monetary policymakers in Palestine and other developing countries can use its results. Therefore, it is necessary to

develop a banking agenda and lending strategies to link the sector to disadvantaged people on the demand side, and to bank performance on the supply side. However, more empirical research is needed on financial inclusion and banks' performance. In addition, future studies could use more variables such as the number of depositors, creditors, branches and ATMs locations, depending on the data available. Further research on financial inclusion in large and small economies is recommended to better understand the role it plays in bank performance and poverty alleviation.

## AUTHOR CONTRIBUTIONS

Investigation: Fadi Shihadeh.

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