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## Article

# Financial Inclusion and the Performance of Banking Sector in Palestine

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**Abstract:** Despite evidence on the social and economic importance of financial inclusion (FI), the relationship between FI and bank profitability remains unclear. In this research, we evaluated the association between financial inclusion and the performance of banks in Palestine using dynamic panel analysis applied to a sample of 11 banks, with two econometric models representing profitability indicators over a nine-year period (2012–2020). In addition to linear regression models, the generalized method of moments estimator was utilized. The results showed that access to financial services (e.g., the number of automated teller machines (ATMs) and the number of bank branches), service delivery (including the average costs to maintain a current account), and the quality of the products improve banks' profitability. However, point-of-sale terminals have no impact on profitability. Additionally, financial service utilization reflected in bank account number and credit to small and medium-sized enterprises do not affect bank profitability, and among bank-specific variables, the nonperforming loan ratios, the cost-to-income ratios, and liquidity were found to be the main drivers of profitability. Policymakers in Palestine must prioritize FI by adopting rules that encourage lending to practices of financial institutions.

**Keywords:** bank performance; Palestine; ATMs; branches; financial inclusion

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## 1. Introduction

Financial inclusion refers to the availability and utilization of affordable and useful financial products and services provided by businesses or individuals to meet needs, such as transactions, credit payments, and savings, and the delivery of these services to them in a responsible and sustainable manner. It has been suggested that better inclusion improves the effectiveness and availability of financial services while being a safe, convenient, secure, and cost-effective approach (Vo and Nguyen 2021; Ikram and Lohdi 2015). There is growing evidence that progress in financial inclusion enhances financial stability and contributes to banks' economic growth, financial efficiency, and performance. The government also immensely benefits from increased local economic activities that decrease economic inequality at the macroeconomic level (Chikalipah 2017). Despite an increased focus on the development of initiatives to promote FI in Asian countries, fostering continues to present challenges in the region (Marcelin et al. 2022; Le et al. 2019). Policymakers have recently focused on attracting the “unbanked” populations into existing financial systems. A lack of access to finance has been found to have adverse effects on

economic growth and the reduction of poverty. In low-development markets, populations face difficulties accumulating savings, investing in a project generating income, and building their assessment approach to minimize risk. Khatib et al. (2021b) highlighted several advantages of low financial constraints, as they encourage entrepreneurial individuals to positively contribute to growth by investing more and taking risks. Their study showed that entrepreneurship has a large influence on per capita GDP (Neaime and Gaysset 2018). In Middle East countries, including Palestine, there has not been success in decreasing the presence of financial exclusion and poverty despite the expansion of bank branches and the increasing presence of microfinance institutions. Limited accessibility to essential financial services remains a significant barrier for populations in these countries. Policymakers are increasingly recognizing the limitations that exist for banks to reach underprivileged populations despite significant growth in profitability and efficiency. Therefore, we examined the interrelationship between FI and bank performance in this study.

Palestine is a developing nation with an emerging economy that exhibits certain characteristics that set it apart from other economies (Awad and Al Karaki 2019). Among these characteristics is a lack of local currency and a reliance on the three main currencies of the Israeli shekel, Jordanian dinar, and the US dollar. Additionally, no effective strategy has been developed by Palestinian officials to consistently redirect resources from unproductive to productive sectors, thus lowering unemployment and increasing aggregate demand and GDP growth in the long term. In Palestine, small and medium-sized enterprises (SMEs) are essential for enhancing the GDP, lowering unemployment, and encouraging domestic investment. These firms account for nearly 99% of Palestinian businesses and 82% of all jobs. According to the 2018 Establishment Census, there were 151,066 enterprises in Palestine, with 102,344 of them located in the West Bank and 48,722 located in the Gaza Strip (Ahmad and Ramadan 2018).

Furthermore, the Palestinian economy is reliant on international assistance and is classified as a service economy. However, the banking sector appears to be relatively sound (Awwad and El Khoury 2021). Palestine's financial system is still in its infancy, with 17 banks and 232 branches and offices; one is a foreign bank, nine are Arab banks, and seven are domestic banks (Abusharbeh 2020; Awwad and El Khoury 2021). The bank industry in Palestine dominates the financial system; the collective balance sheet of banks exceeds the stock capitalization by more than twofold. In the last five years, however, the performance of the Palestinian banks has experienced instability. It is therefore critical to evaluate factors that enhance the performance of this sector for better management and policy implementations that eventually promote the country's market development.

Empirically, the majority of research on FI has focused on the definition, measurements, and antecedents of financial inclusion (Allen et al. 2014; Patwardhan 2018; Jegede 2014; Kumar 2013). Bank-specific determinants include nonperforming loans, liquidity, bank capital, bank efficiency, cost management, and bank size. Nevertheless, FI's influence on bank performance is currently unknown (Kumar et al. 2021; Le et al. 2019). There have been a few studies on it in some countries (Chikalipah 2017), especially Palestine. However, contemporary developments have the potential to nurture or, at the very least, change Palestine's financial inclusion position, including the rise of mobile banking and increased economic growth. Additionally, there have been relatively few studies on the association between FI and the performance of banks (Shihadeh et al. 2018; Bhattacharyya et al. 2021; Kumar et al. 2021; Vo and Nguyen 2021). It has been reported that financial inclusion significantly influences the performance of banks. However, prior studies have applied few proxies of financial inclusion. For instance, Shihadeh (2021) only used two out of three dimensions of FI (utilization and access to financial service) with four FI indicators. Kumar et al. (2021) only utilized four proxies to measure this variable. Nevertheless, the Global Partnership for Financial Inclusion (GPFI) has developed and identified three significant dimensions—service delivery and quality of products, the usage of financial services, and access to financial services (GPFI 2012)—with several measurements.

Unlike prior studies, we used all three attributes of financial inclusion—quality, access, and usage of financial services and delivery (Goel and Sharma 2017; Sarma and Pais 2008; Ajefu et al. 2020)—with six indicators for a sample of eleven banks during the years of 2012–2020 in the current research. The indicators are: the average cost of maintaining a primary bank current account, the number of point-of-sale (POS) terminals per 100,000 inhabitants, the number of automated teller machines (ATMs) per 100,000 adults, the number of branches per 100,000 adults, the percentage of SMEs with outstanding loans or lines of credit, the number of individuals with deposit accounts per 1000, and the number of adults with deposit accounts per 1000.

This study contributes to the body of knowledge on the subject matter since there has been no previous examination of the impact of the variables employed here (the previously discussed financial inclusion indicators). Understanding the role of all indicators would encourage financial institutions to offer superior financial services at a reasonable price and contribute to the objective of FI and the country's financial development. Our study adds to the continuing discussion in favor of FI as a viable tool for poverty reduction in developing and impoverished nations. Furthermore, in this study, we used a GMM dynamic panel technique model following the work of Kumar et al. (2021). Finally, Palestine, a developing country, is a suitable case to study because of the important role financial inclusion can play in addressing urgent problems and issues such as high levels of poverty, unemployment, low economic growth rates, and economic and social differences between individuals. In addition, the contribution of FI can enhance the levels of financial stability.

## 2. Literature Review and Hypotheses Development

FI, defined as monetary services, significantly impacts economic development. Individuals not impacted by financial exclusion have the ability to create businesses and invest in education, which is attributed to reducing poverty and increasing economic growth. This occurs as a result of providing individuals with an opportunity to have a secure place to save, thereby encouraging financial stability resulting from high levels of bank deposits being utilized to contribute to a stable deposit base for banks (Fungáčová and Weill 2015). According to the financial intermediation theory, the financial service institutions offer is seen as a means to connect surplus spenders to deficit units within an economic space. As Diamond (1984) argued, financial mediators serve as designated agents of savers and can attain economies of scale. As a result, those who save entrust their funds to these intermediaries to be invested in whatever ventures they deem viable, such as digital credit, with investors possessing the ability to fund withdrawals at any time via predetermined circumstances.

As mentioned earlier, few empirical studies have been devoted to the investigation of financial inclusion performance outcomes. Nevertheless, attention toward this topic has increased in recent years, with emerging literature focusing on understanding the impact of FI on financial stability (Ramzan et al. 2021; Ozili 2018), the determinants of FI (Abel et al. 2018; Kumar 2013; Chikalipah 2017), and FI's development (Arun and Kamath 2015). It has been reported that the reduced access to banking services in underprivileged populations has been displayed in countries where the belief is that FI can only increase GDP by growing the income of the privileged and leaving the underprivileged behind. The authors of different studies have used different measures and indicators of financial inclusion. Most previous studies have applied few proxies of financial inclusion. To measure this variable, Kumar et al. (2021) only utilized four proxies. Nevertheless, the Global Partnership for Financial Inclusion (GPFI) designed and identified three significant attributes—quality, access, and usage of services (GPFI 2012)—with several measurements. Additionally, Shihadeh (2021) only used two out of three attributes of FI (utilization and access to funds services), with four financial inclusion indicators. Generally, financial inclusion can be measured by three attributes: access, usage, and quality of financial services

and delivery (Goel and Sharma 2017; Sarma and Pais 2008; Ajefu et al. 2020), and it was considered here in terms of seven indicators for a panel of 11 banks from 2012 to 2020.

The number of bank branches is an indicator of access to finance (Kumar et al. 2021). This variable is suggested to positively and significantly influence bank profitability (Kumar et al. 2021) and CSR activities (Ramzan et al. 2021). Goel and Sharma (2017) argued that ignoring the absence of nearby branches or a dearth of items fit the weaker part's requirements. Bank branches are critical for underserved segments of society, and eliminating branches limits the amount of credit available to small businesses. It should be noted that increased branch presence results in a rise in client base, boosting deposit and loan portfolios and diversifying risk.

Regarding the number of ATMs, Ramzan et al. (2021) suggested that the more a bank invests in CSR activities, the greater its inclusion in the form of additional banks. Banks must create extensive branch and ATM networks in order to reach and service a greater number of consumers and to consequently increase their performance (Shihadeh 2021). Byukusenge (2021) argued that adding ATMs is a critical and very successful strategy since they enable clients to access their accounts to withdraw or deposit money, just as digital banking, debit cards, and smart cards do. However, the authors of some studies have reported that ATMs do not influence bank performance (Kumar et al. 2021), suggesting that transaction and direct expenses may be sufficient to counterbalance the increased revenue from extra loan accounts.

Banks grow their customers via branch locations, ATMs, point-of-sale (POS) locations, and other electronic terminals (Shihadeh and Liu 2019). This expansion is expected to enhance the performance of banks as it leads to more customers, although point-of-sale terminals might increase the capital expenditure and profit might not be significantly high as a result of cost increment (Shihadeh et al. 2018), banks use branches, ATMs, and POS locations to increase customer reach, attract deposits, and offer services (Shihadeh et al. 2018).

Almaleeh (2020) argued that bank goals might be accomplished by enabling SMEs' access to funds resources. Despite the large percentage of SMEs in the Palestinian economy, comprising 97% of total businesses, they suffer from financing problems. According to the World Bank, the share of SMEs in Palestine's total banking credit portfolio does not exceed 10% because banks are conservative in lending to them and consider them high-risk projects. Regarding the number of adult deposit accounts in Palestine, the percentage is still low, at no more than 24% of the adult population. Shihadeh et al. (2018) argued that Jordanian banks are uninterested in lending to small and medium-sized businesses.

Deposit accounts are important sources of funds that financial institutions use for loans and generating profit. Ozili (2021) suggested that more financial sector concentration is connected with increased access to deposit accounts and loans, and nations with regulatory frameworks that let banks participate in a larger range of activities have a higher level of FI. In India, however, while deposit accounts have improved over time, their penetration has not kept pace with population increase over the research period (Kumar 2013). Although it is expected that the greater the number of deposit accounts, the greater the bank performance, some studies have failed to support this association, such as those by Akhisar et al. (2015) and Almaleeh (2020). Finally, the average cost of maintaining a basic current bank account significantly positively impacts profitability (Trujillo-Ponce 2013). Based on the assumption of financial intermediation theory, where financial intermediation is a process in which financial institutions collect deposits and provide loan information to support investment in the economy (Ratnawati 2020), as well as the abovementioned arguments, the following hypotheses were tested:

**H1.** Banks' performance is positively affected by the number of bank branches.

**H2.** Banks' performance is positively affected by the number of ATMs.

**H3.** *Banks' performance is positively affected by the number of POS.*

**H4.** *Banks' performance is positively affected by credit for SMEs.*

**H5.** *Banks' performance is positively affected by the number of customer deposit accounts.*

**H6.** *Banks' performance is positively affected by the average cost of maintaining a basic current bank account.*

### 3. Research Methodology

#### 3.1. Sample Population

In this study, 13 banks operating in the Palestinian market were initially included in the analysis: 10 conventional banks and three Islamic banks. The study sample comprised the entire Palestinian banking sector. Two conventional small banks were excluded due to their newness and insufficient data. Using the financial statements of banks, the reports of the Palestinian Monetary Authority, and the Association of banks in Palestine, the data were collected during 2012–2020 after Palestine joined the Alliance for Financial Inclusion (AFI) in 2010. All data sources used in the current study were considered reliable, and the time period of the research sample was selected due to data availability.

#### 3.2. Variable Measurements

##### 3.2.1. Dependent Variable

In line with prior studies (Angori et al. 2019; Banda 2021; Khatib et al. 2022a; Khatib et al. 2022b; Gupta and Mahakud 2020; Mbekomize and Mapharing 2017), we used return on assets (ROA) and net interest margin (NIM) as measures of bank profitability. ROA is an indicator of a bank's efficiency in utilizing assets and producing net income, while NIM is a measure of the net return on a bank's earning assets. These measures effectively indicate a bank's efficiency in using its total assets (Hay et al. 2018). Table 1 provides a summary of the research variables.

##### 3.2.2. Independent Variables

Following the Global Partnership for Financial Inclusion (GPFI) recommendations of the basic set of financial inclusion indicators, which represent the three central dimensions of financial inclusion (access, usage, and quality of financial services and delivery), we employed six independent variables that represent the financial inclusion dimensions in this study. The number of branches per 100,000 adults, the number of ATMs per 100,000 adults, and the number of POS terminals per 100,000 inhabitants represent the access to financial services dimension, while the number of customer deposit accounts per 1000 adults and credit for SMEs represent the usage of financial services dimension. Finally, the average cost of maintaining a primary bank current account (annual fees) represents the quality of products and service delivery dimension. It should be noted that the authors of some previous studies only used four indicators of financial inclusion (Kumar et al. 2021).

##### 3.2.3. Control Variables

We used a set of bank-specific variables that have robust effects on profitability, namely, nonperforming loan ratio (NPLR), liquidity ratio (LAT), cost-to-income ratio (CIR), and capital adequacy ratio (CAR). Based on the assumption that increased exposure of a bank to credit risk is associated with decreased profitability, CAR stands for capital adequacy ratio, which is defined as a proportion of tier 1 and tier 2 capital to risk-weighted assets (Forcadell et al. 2020; Kumar et al. 2021). Though previous studies have indicated that CAR has an effect on bank profitability, the direction of this association is unknown (Kumar et al. 2021). Researchers often use NPLR as a metric to evaluate credit risk

management. Y.-K. Chen et al. (2018) and Tran and Nguyen (2020) found that NPLR reduced bank profitability. The liquid-assets-to-total-assets ratio (LAT) is commonly used as a liquidity indicator. There have been mixed findings regarding the impact of liquidity on bank profitability. Alshatti (2015) found a negative effect on profitability, while Islam and Nishiyama (2016) found a positive relationship between both factors. CIR is often used to measure cost efficiency. The authors of many studies have employed this ratio as a determinant of bank profitability (Neves et al. 2021; Ch 2017), and most suggest that it has a negative effect. Finally, CAR is often used as a credit risk management indicator. CAR is the ratio of a bank's capital in relation to its risk-weighted assets and is determined by the country's central bank. Capital adequacy is an indicator of a bank's ability to absorb potential shocks and losses before becoming insolvent. Again, there is no consensus regarding the impact of CAR on bank profitability. Islam and Nishiyama (2016) found a positive impact on profitability measured with ROA, while Bitar et al. (2018) found a negative relationship.

**Table 1.** Summary of the variables employed in the research.

Variable	Measurement	Symbol	Dimension
Dependent variables			
Return on assets	Net income/total assets	ROA	
Net interest margin	Net interest income/earning assets	NIM	
Return on equity	Net income/total equity	ROE	
Independent variables			
Number of branches	Number of branches per 100,000 adults	FIN_BRANCH	Access
Number of ATMs	Number of ATMs per 100,000 adults	FIN_ATM	Access
Number of POS terminals	Number of POS terminals per 100,000 inhabitants	FIN_POS	Access
Credit for SMEs	Credit for SMEs/total outstanding loans	FIN_SME	Usage
Number of customer deposit accounts	Number of customer accounts per 1000 adults	FIN_DEPOSIT	Usage
Average cost of maintaining a basic current bank account (annual fees)	Logarithm of the amount of annual fees	FIN_COST	Quality
Control variables			
Nonperforming loan ratio	Nonperforming loans/total loans	NPLR	
Liquidity ratio	Liquid assets/total assets	LAT	
Cost efficiency ratio	Cost-to-income ratio	CIR	
Capital adequacy ratio	Tier 1 capital and tier 2 capital/risk-weighted assets	CAR	

Note: ROA, Branch, ATMs, POS, SMEs, CAR, Quality, and CAR were directly taken from the Bankscope database, while NIM, NPLR, LAT, and CIR were self-calculated with the help of data taken from Bankscope.

### 3.3. Model Specification

The regression models used in this study are specified below. The models test the association between FI and bank performance.

$$ROA_{it} = \beta_0 + \beta_1 FIN\_BRANCH_{it} + \beta_2 FIN\_ATM_{it} + \beta_3 FIN\_POS_{it} + \beta_4 FIN\_SME_{it} + \beta_5 FIN\_DEPOSIT_{it} + \beta_6 FIN\_COST_{it} + \beta_7 NPLR_{it} + \beta_8 LAT_{it} + \beta_9 CIR_{it} + \beta_{10} CAR_{it} + \mu_{it} \quad (1)$$

$$NIM_{it} = \beta_0 + \beta_1 FIN\_BRANCH_{it} + \beta_2 FIN\_ATM_{it} + \beta_3 FIN\_POS_{it} + \beta_4 FIN\_SME_{it} + \beta_5 FIN\_DEPOSIT_{it} + \beta_6 FIN\_COST_{it} + \beta_7 NPLR_{it} + \beta_8 LAT_{it} + \beta_9 CIR_{it} + \beta_{10} CAR_{it} + \mu_{it} \quad (2)$$

where  $i$  indicates an individual bank;  $t$  refers to the time period (year);  $\beta_0$  is the constant intercept; ROA and NIM are the profitability proxies of the bank; FIN\_BRANCH, FIN\_ATM, FIN\_POS, FIN\_SME, FIN\_DEPOSIT, and FIN\_COST measure the Financial Indicators; NPLR, LAT, CIR, and CAR are the bank-specific control variables;  $\beta_1$ – $\beta_{10}$  are the coefficients of the function; and  $\mu_{it}$  is the error term. The research models were developed based on relevant prior studies (Chauvet and Jacolin 2017; Shihadeh 2020; Al-Eitan et al. 2022; Almaleeh 2020; Kumar et al. 2021).

When the sample size is small and data consist of a mixture of time series, pooled panel data analysis is the most appropriate tool to utilize. In this study, we tested three models to choose that which fit the analysis: the fixed-effect model, the random effect model, and pooled ordinary least square estimation. Hausman and Breusch–Pagan tests were run to validate the model specification.

The results of the Hausman test indicated a significant  $p$ -value of 0.008, which led to the conclusion that the fixed-effect model would be more appropriate. The results showed a  $p$ -value of 0.014, which was less than the significance level of 5%. Thus, the null hypotheses were rejected, which meant that the fixed model best fit the sample data.

Furthermore, endogeneity issues, including dynamic endogeneity, simultaneity, and time-invariant unobserved heterogeneity among banks, plague panel regression studies. The two-step system GMM estimator is commonly utilized to mitigate the endogeneity problem in banking datasets (Kabara et al. 2022). Several researchers have suggested that GMM is a good analytical tool to overcome the endogeneity problem (Zamil et al. 2021; Hazaea et al. 2022; Khatib et al. 2021a; Khatib et al. 2022a). The idea is to find an instrument that is simultaneously correlated with its corresponding endogenous variables (financial inclusion) and uncorrelated with bank performance. Here, we used the strategy provided by Schultz et al. (2010), in which chosen lags are associated with the regressors but uncorrelated with contemporaneous error. As a result, we used the instrumental variable estimate approach to circumvent the endogeneity issue. More precisely, we utilized the age of the bank as an instrumental variable and the first lag of the independent variable to control for potential endogeneity issues. The age of organization has been commonly utilized by prior studies to control for this problem (Zhang et al. 2020; Alsaifi et al. 2020; Bhattacharyya et al. 2021). The Sargan test, which evaluates instruments' overall validity by assessing the sample analogue of the moment circumstances employed in the estimate procedure, was used in this study to test for over-identification issues (Lee and Chang 2009). Both the Sargan test and the Hansen test of over-identification of restrictions were not found to be statistically significant ( $p$ -value > 0.10), implying the chosen instruments' validity. Additionally, in all models, the coefficient of delayed bank performance was substantial, confirming the study's use of a dynamic model. The AR (2) had  $p$ -values less than 10%, suggesting that the instruments were valid and the findings were dependable. The regression results showed that the null hypothesis for AR (1) was rejected because of the presence of first-order autocorrelation, and the null hypothesis for AR (2) was not rejected because of the absence of second-order correlation.

## 4. Empirical Results and Discussion

### 4.1. Descriptive Statistics

Table 2 summarizes the descriptive statistics for the variables used in the research; it contains precise information about the independent and dependent variables in the form of standard deviation, mean, minimum, and maximum. The findings suggested that there were differences in the mean and standard deviation of ROA and NIM. The results indicated a variation between the mean values and standard deviation of ROA and NIM as profitability measures from 2012 to 2020 among Palestinian banks. It was revealed that the average loan to SMEs was 11%, which was extremely low compared with the total credit. This implied that Palestinian banks were conservative in extending credit to SMEs, which negatively affected the economy. Palestinian banks had a varied number of ATMs,

ranging between 0.38 and 5.90. The ATM average was 2.1 for every 100,000 adults. Similarly, there was one bank branch for every 100,000 adults, with a standard deviation of only 0.635. Regarding the average cost of maintaining a basic current bank account (annual fees), the mean was 13.9, which was relatively high compared with the total revenue.

**Table 2.** Descriptive statistics.

Variable	Obs.	Min	Max	Mean	St. Dev.
Profitability measurements (dependent variables)					
ROA	99	−0.01	0.02	0.0089	0.00494
NIM	99	0.03	0.09	0.0506	0.01577
Independent variables					
FIN_BRANCH	99	0.23	3.21	1.0245	0.63561
FIN_ATM	99	0.38	5.90	2.1138	1.39870
FIN_POS	99	199.00	232.00	219.6667	14.63330
FIN_SME	99	0.00	0.25	0.1176	0.04858
FIN_DEPOSIT	99	1104.00	1234.00	1177.5000	49.24765
FIN_COST	99	11.51	15.73	13.9068	1.14972
Control variables					
NPLR	99	0.01	0.08	0.0365	0.01846
LAT	99	0.21	0.57	0.3781	0.06809
CIR	99	0.49	0.99	0.7238	0.10526
CAR	99	0.11	0.34	0.1829	0.06580
Valid N (listwise)	99				

#### 4.2. Correlation Matrix

Multicollinearity diagnostics were conducted with both VIF and tolerance tests to provide a more reliable and accurate study. The correlation between the variables was quite good in the absence of a high correlation between the variables and, hence, the lack of a multicollinearity issue, as shown in Table 3. Additionally, the Durbin–Watson test was conducted to test for autocorrelation. As seen in Table 4, no autocorrelation was detected.

**Table 3.** Correlation matrix and multicollinearity diagnostics.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ROA (1)	1											
ROE (2)	0.523	1										
FIN_BRANCH (3)	0.489	0.398	1									
FIN_ATM (4)	−0.331	−0.423	−0.416	1								
FIN_POS (5)	0.065	−0.142	0.089	0.160	1							
FIN_SME (6)	−0.417	−0.579	−0.375	0.244	0.216	1						
FIN_DEPOSIT (7)	0.021	−0.058	−0.041	0.135	0.014	−0.026	1					
FIN_COST (8)	0.473	0.464	0.394	−0.298	0.138	−0.407	−0.061	1				
NPLR (9)	−0.309	−0.507	−0.411	0.392	0.146	0.513	0.065	−0.302	1			
LAT (10)	0.063	0.044	0.066	−0.114	0.039	−0.116	−0.033	0.158	−0.013	1		
CIR (11)	−0.216	0.096	−0.083	0.147	−0.126	0.217	−0.096	−0.088	−0.066	−0.201	1	
CAR (12)	−0.381	0.258	0.094 ***	−0.122 **	0.213 *	−0.191 **	−0.313 **	−0.057 **	0.196 **	0.065	−0.126	1
Diagnostics of multicollinearity												
VIF	-	-	1.26	1.29	1.16	1.62	1.02	1.39	1.53	1.04	1.87	1.63
Tolerance	-	-	1.51	0.77	0.86	0.61	0.97	0.71	0.65	0.95	0.67	0.66

Note: \*, \*\*, and \*\*\* indicate statistical significance at 10%, 5%, and 1%, respectively.

**Table 4.** Full sample regression results.

Variables	Panel A		Panel B	
	ROA		NIM	
	(1) Fixed effect	(2) GMM	(1) Fixed effect	(2) GMM
Constant	0.000 *** (2.205)	0.021 ** (3.244)	0.009 *** (1.598)	0.083 * (4.347)
L_ROA		0.002 *** (1.067)		0.089 * (2.087)
FIN_BRANCH	0.003 *** (0.1429)	0.049 ** (0.1273)	0.024 ** (0.1921)	0.081 * (0.7691)
FIN_ATM	0.002 *** (0.1573)	0.001 *** (0.1231)	0.081 * (0.1343)	0.1563 (0.2823)
FIN_POS	0.140 (0.07314)	0.132 (0.0482)	0.4398 (0.1096)	0.2367 (0.4398)
FIN_SME	0.341 (0.1031)	0.154 (0.1598)	0.3671 (0.0156)	0.9521 (0.2671)
FIN_DEPOSIT	0.642 (0.1173)	0.3273 (0.2854)	0.3761 (0.1041)	0.6341 (0.4129)
FIN_COST	0.064 * (0.1061)	0.123 (0.3154)	0.0710 * (0.1485)	0.093 * (0.6132)
NPLR	0.007 *** (−0.3244)	−0.082 * (0.2210)	0.0031 *** (−0.2901)	0.0412 ** (0.2319)
LAT	0.024 ** (0.1342)	0.039 ** (0.6132)	0.5419 (0.3861)	0.1634 (0.6598)
CIR	0.026 ** (−0.2910)	−0.076 * (0.3121)	0.002 *** (−0.2387)	−0.058 * (0.3992)
CAR	0.069 * (−0.022)	−0.1834 (0.8653)	0.6123 (−0.0923)	−0.2671 (−0.1527)
R-squared	0.706		0.406	
Adj R-squared	0.565		0.304	
F-stat	13.945		3.963	
Prob F-stat	0.000		0.007	
Durbin–Watson	1.932		1.884	
Year Fixed Effects	Yes		Yes	
AR1 ( <i>p</i> -value)		0.003		0.005
AR2 ( <i>p</i> -value)		0.380		0.414
Sargan Test ( <i>p</i> -value)		0.414		0.521
Difference-in-Hansen Test ( <i>p</i> -value)		0.829		0.560

Note: \*, \*\*, and \*\*\* indicate statistical significance at 10%, 5%, and 1%, respectively. Coefficient value between brackets.

#### 4.3. Regression Results

Table 3 presents the empirical results of the panel data estimation methods for both econometric models, with ROA (panel A) and NIM (panel B) as the dependent variables. In addition, both estimation results for each model are presented (GMM and fixed-effect regression). The results indicated that the number of branches (FIN\_BRANCH) significantly impacts bank profitability. Therefore, consistent with the work of Akhisar et al. (2015), Y.-K. Chen et al. (2018), and Shihadeh (2021), we accept H1: “There is a positive relationship between the number of bank branches and the profitability of banks.” In this

context, it should be mentioned that the Palestinian Monetary Authority (PMA) has implemented many activities and measures to enhance financial inclusion and awareness. Regarding developments in the use of electronic financial and banking services, the number of branches and offices has continued to increase, reaching 379 by the end of 2020, accompanied by 703 ATMs spread across different provinces (PMA 2020). All these have led to an improvement in the degree of competitiveness of the Palestinian banking market in terms of both the deposit and credit markets, which have positively affected profitability. Banks encourage their clients to use electronic delivery channels, such as ATMs, POS, card payments, and other tools, because these channels have lower costs compared with human tellers, thus decreasing bank costs (PMA 2020).

Regarding the number of ATMs (FIN\_ATM), the analysis revealed a significant impact on bank profitability, which was in line with the second hypothesis (H2). Although bank ATMs and ATM services have related costs, such as maintenance and securities, these services increase a bank's profitability as they attract more customers. Therefore, bank management should enhance ATM inclusion despite the fact that such services do not provide direct revenues for banks because basic services are usually offered without fees. Studies conducted by Akhisar et al. (2015), F.W. Chen et al. (2018), and Shihadeh (2021) support this finding. Hence, ATMs are critical and very successful since they enable clients to access their accounts in order to withdraw or deposit money for digital banking or other purposes (Byukusenge 2021).

In all of the models, the coefficients for the number of point-of-sale terminals (FIN\_POS) were shown to be positive but not statistically significant for either of the performance measures (ROA or NIM), implying that banks expand their networks through point-of-sale terminals to increase customer reach, attract deposits, and offer services. However, capital expenditure will grow as a consequence of this strategy, profit margins may not be as high as anticipated due to cost inflation (Shihadeh et al. 2018), and the majority of banks are unable to outperform this short-term trend.

Similarly, a positive but not statistically significant relationship was found between credit to SMEs (FIN\_SME) and bank profitability measures ROA and NIM. Hypothesis H3 was therefore rejected. This finding could have been due to the lack of interest among Palestinian banks in lending SMEs in the market. In similar context, Shihadeh et al. (2018) argued that Jordanian banks are uninterested in lending to small and medium-sized businesses. Taking the positive coefficient into count, through the issuance of various rules and regulations, government financial authorities such as central banks encourage banks and other financial institutions to deliver financial services that meet the interests of both people and small and medium-sized organizations. Almaleeh (2020) argued that bank objectives could be achieved by facilitating the access of SMEs to financial sources. Despite the large percentage of SMEs in the Palestinian economy, comprising 97% of total businesses, they suffer from financing problems. According to the World Bank, the share of SMEs in Palestine's total banking credit portfolio does not exceed 10% because banks are conservative in lending to them and consider them high-risk projects. Regarding the number of adult deposit accounts in Palestine, the percentage remains low at no more than 24% of the adult population.

Furthermore, the number of deposit accounts (FIN\_DEPOSIT) were found to exert a positive but insignificant effect on bank profitability measures (ROA and NIM), suggesting that these variables do not affect the profitability of banks in Palestine. Therefore, we rejected hypothesis H5: "There is a positive relationship between the number of customer deposit accounts and the profitability of banks." These findings are consistent with those of Akhisar et al. (2015) and Almaleeh (2020). Finally, the average cost of maintaining a basic current bank account (FIN\_COST) was found to significantly positively impact both profitability measures, ROA and NIM. Therefore, we accepted H6: "There is a positive relationship between the average cost of maintaining a basic current bank account and the profitability of banks." These findings are consistent with those of prior studies, such as that by Trujillo-Ponce (2013).

These findings are also in line with the financial intermediaries theory, under which intermediaries with higher financial inclusion serve to reduce transaction costs and informational asymmetries, thus leading to higher performance. Kinyua and Omagwa (2020) supported the financial intermediaries theory and found that financial inclusion promoted the financial stability of the banking industry.

Among the bank-specific control variables, our results suggest that credit risk management indicators (NPLR) and cost-efficiency indicators (CIR) are the key factors underlying bank profitability. The coefficients of NPLR and CIR were found to be negative and statistically significant for both models' profitability measures (ROA and NIM). There is strong evidence that banks with high-risk-taking behavior are exposed to higher levels of nonperforming loans, which reduces their profitability. Moreover, the higher the costs of collecting funds from the market, accompanied by increases in other operating expenses, lower a bank's profitability. These findings support the previous studies of Chowdhury and Rasid (2016), Dietrich and Wanzenried (2011), Inegbedion et al. (2020), and Neves et al. (2021). Despite plenty of controversy regarding CAR and its impact on profitability, there is no consensus about the nature of this relationship. The coefficient of CAR was found to be negative and significant in the first model, where ROA measures profitability, while in the second model, CAR was shown to have an insignificant negative impact on NIM. These results show that capital is not significant in influencing bank profitability since most banks operating in Palestine are small in size and capital. One of the justifications for this negative relationship is that Palestinian banks are conservative in granting loans with relatively high levels of risk, which leads to improvements in CAR and the simultaneous weakening of profits. Regarding liquidity (LAT), our findings revealed a significant positive impact on bank profitability in the first model and an insignificant impact in the second model. These findings are consistent with those of Islam and Nishiyama (2016) and Tran et al. (2016). The positive relationship between LAT, ROA, and NIM can be explained by the 35% liquidity ratio of Palestinian banks in 2020. This high ratio of liquid assets added stability since liquid assets represent a cushion against liquidity shocks, and this liquidity can be wisely invested. A final note on this positive relationship: banks with better liquidity positions can charge an extra margin on their extended credit.

#### 4.4. Additional Analysis

Table 4 shows the findings of the robustness check. To check the robustness of the results, we used another indicator of bank performance, namely, return on equity (ROE); the results are presented in panel B. As shown in Table 5, we also reanalyzed regression models 1 and 2 with additional control variables, as presented in panel A. The authors of past studies of financial inclusion/performance relationships also employed bank size (B\_SIZE) and bank age (B\_AGE) as control variables. As another robustness check, we re-estimated our models by adding these factors as additional control variables. We found similar financial inclusion and bank performance results, confirming our regression results for ROA and NIM.

**Table 5.** Robustness regression results.

Variables	Panel A	Panel B	
	ROA	NIM	ROE
	(1)	(1)	(1)
	Fixed effect	Fixed effect	Fixed effect
Constant	0.000 *** (3.505)	0.000 *** (1.819)	0.031 ** (2.515)
FIN_BRANCH	0.062 * (0.9153)	0.036 ** (0.2104)	0.004 *** (0.3831)
FIN_ATM	0.001 *** (0.731)	0.032 ** (0.435)	0.0971 * (0.1473)
FIN_POS	0.201 (0.735)	0.3982 (0.2196)	0.4543 (0.257)
FIN_SME	0.152 (0.321)	0.6810 (0.1665)	0.1624 (0.0643)
FIN_DEPOSIT	0.417 (0.738)	0.4121 (0.4011)	0.7662 (0.6241)
FIN_COST	0.041 ** (0.283)	0.0611 * (0.2451)	0.0814 * (0.8523)
NPLR	0.005 *** (−0.472)	0.0022 *** (−0.981)	0.0001 *** (−0.3201)
LAT	0.018 ** (0.4220)	0.4181 (0.6122)	0.9263 (0.1234)
CIR	0.035 ** (−0.9101)	0.001 *** (−0.8712)	0.002 *** (−0.7543)
CAR	0.045 * (−0.143)	0.3312 (−0.1731)	0.2783 (−1.2876)
B_SIZE	0.0710 * (0.1485)	0.000 *** (0.289)	
B_AGE	0.081 * (0.1343)	0.049 ** (0.031)	
Year Fixed Effects	Yes	Yes	Yes
R-squared	0.1206	0.4326	0.606
Adj R-squared	0.551	0.464	0.6234
F-stat	12.451	3.7131	4.963
Prob F-stat	0.000	0.004	0.000

Note: \*, \*\*, and \*\*\* indicate statistical significance at 10%, 5%, and 1%, respectively. The coefficient values are between brackets.

## 5. Conclusions and Recommendation

In this study, we examined the relationship between FI and bank performance in Palestine by applying dynamic panel analysis to a sample of 11 banks and using two econometric models representing profitability indicators over a nine-year period (2012–2020). In addition to the linear regression models, the generalized method of moments estimator was utilized. Return on assets (ROA) was defined as a profitability measurement in the first model, and net interest margin (NIM) was defined as a profitability measurement in the second model. Unlike previous studies, we employed six independent variables to represent the financial inclusion dimensions in this research. The number of branches per 100,000 adults, the number of ATMs per 100,000 adults, and the number of POS terminals per 100,000 inhabitants represented the access to financial services dimension. In contrast, the number of customer deposit accounts per 1000 adults and credit for SMEs represented

the usage of the financial services dimension. Finally, the average cost of maintaining a basic current bank account (annual fees) represented the quality of products and service delivery dimension. A set of bank-specific variables with robust effects on profitability, namely, the nonperforming loan ratio, the liquidity ratio, the cost-to-income ratio, and the capital adequacy ratio, was employed. This study has established that financial inclusion is important and very effective because it facilitates customers' access to bank services. This enables banks to increase sales and influence their financial performance.

Our findings indicated that access to funds (the number of ATMs and the number of branches), product quality, and the manner in which it is delivered (average cost of maintaining a bank's current account) improve a banks' profitability, but POS terminals were found to have no impact on profitability. Furthermore, the usage of financial services, which was reflected in the number of bank accounts and credit to SMEs, was not found to affect the performance of banks. Among the bank-specific variables, NPLR, CIR, and LAT were the main drivers of performance.

One implication of this study is that officials in Palestine should prioritize FI by enacting legislation that encourages lending practices by financial institutions. Furthermore, banks must encourage customers to diversify their assets rather than just relying on cash and deposits. Hence, the findings of this research may contribute to the development of more effective financial sector reform policies by illustrating how expanding access to banking services may directly affect a bank's performance. The Palestinian banking sector is the main source of credit in the domestic market; however, it still does not fulfil its required developmental role. Although SMEs in Palestine represent more than 95% of total business and play an important developmental role, the loans granted to them are still very low and do not exceed 11% of total loans. Most banks operating in Palestine have small capital and may not be able to expand and spread, which contradicts the philosophy of financial inclusion that is based on providing financial services for everyone at a reasonable cost. Policymakers should be aware of these circumstances and encourage banks to merge in order to expand and spread so that all parties can benefit.

This study had certain limitations that future studies can address. The research sample size was small; further research might consider a larger sample size. Moreover, researchers should be encouraged to use a cross-country dataset in order to highlight the role of differences in government regulations on this topic. In this study, we only used two accounting performance measurements; therefore, the authors of future studies may use a market-based measurement (e.g., Tobin's Q) or the performance efficiency of banks.

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**5. Conclusions and Recommendation**In this study, we examined the relationship b...

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**4.3. Regression Results**Table 3 presents the empirical results of the panel data est...

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