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Article

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Article

Financial Inclusion Indicators Affect Profitability of Jordanian Commercial Banks: Panel Data Analysis

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Abstract: Previous literature supports the view that the financial inclusion leads to economic growth and helps alleviate poverty; however, it is still unclear whether financial inclusion increases bank profitability. The study assumes that financial inclusion is significant in enhancing the economy and minimizing loan accounts, and along with this assumption, the deposit size decreases the Jordanian banks' profitability despite the fact that the financial services and access to them have no significant influence upon such profitability. The major profitability drivers examined in this study comprised financial inclusion and financial leverage. In this study, 13 Jordanian banks' data from 2009 to 2019 were examined to determine the above issue. The study applied fixed effects on a panel data regression model. The findings indicated that the number of loan accounts and size of deposits negatively and significantly impacted the profitability of the commercial banks in Jordan. However, the number of branches and ATMs had no significant effect on the bank's profitability. In sum, both leverage and bank size were the top two determinants of commercial banks' profitability in Jordan. Based on the findings, Jordanian policymakers can shift their focus to offering affordable financial services that support SMEs' loans and start-ups.



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1. Introduction

Since the financial inclusion concept was introduced in 2005, it has received significant attention from researchers and policymakers (Kumar et al. 2021). Financial inclusion is defined as the availability and equality of opportunities to access financial services. It refers to a process by which individuals and businesses can access appropriate, affordable, and timely financial products and services (Chen et al. 2018). It is evident that financial inclusion plays an important role in economic development and the stability of the financial system (Ikram and Lohdi 2015; Ahamed and Mallick 2019).

More importantly, the emergence of smartphones and the Internet has led to increased financial inclusion and increased opportunities for accessing digital financial services (Arun and Kamath 2015; Kanobe et al. 2017). According to 2017 Gallup World Poll data, 93% of adults in high-income economies have their own mobile phones, compared with 79% in developing economies (Gallup 2018). According to the database of Global Findex, advances in digital technology are key to achieving the World Bank goal of Universal Financial Access by 2020 (World Bank 2017).

Financial inclusion is on the rise globally. The 2017 Global Findex database shows that 1.2 billion adults have obtained an account since 2011, including 515 million since 2014. Between 2014 and 2017, the share of adults who have an account with a financial institution or through a mobile money service rose globally from 62 percent to 69 percent. In developing economies, the share rose from 54 percent to 63 percent (World Bank 2017).

In the Jordanian context, the percentage of adults owing accounts in financial institutions showed an increase from 2014 to 2017 (25–42%). This trend was also noted in the percentage of adults owning a debit/credit card in the same period (19–31%) (World Bank 2017). In addition, the Central Bank of Jordan (CBJ) has encouraged financial institutions to strengthen financial inclusion in Jordan by issuing guidance in the form of bank instructions and rules, which are also applied to other financial service providers in Jordan.

Financial inclusion is increasingly important as a measure used by policymakers, in the majority of countries, to improve economic growth and sustainability development (Sharma 2016; Shihadeh et al. 2018; Oz-Yalaman 2019; Ozili 2020; Al-Own and Bani-Khalid 2021). Financial inclusion is a top priority for policymakers for a variety of reasons, the first being that it is a key tool for achieving the United Nations' Sustainable Development Goals (SDGs) (Sahay et al. 2015; Demirgüç-Kunt and Singer 2017). The second reason is the role of financial inclusion in enhancing social inclusion levels in many countries (Bold et al. 2012), and third, it assists policymakers and government to alleviate poverty levels (Chibba 2009; Neaime and Gaysset 2018). It also provides extra socioeconomic benefits and improves the efficiency and accessibility of financial products/services while assuring security and reasonable costs (Ikram and Lohdi 2015; Andrianaivo and Kpodar 2011; Sarma and Pais 2011; Cull et al. 2012).

Viewed from a macro-level perspective, financial inclusion is capable of attracting more participants from various economic segments to the formal financial system (Neaime and Gaysset 2018). While financially excluded people are largely reliant on cash transactions that are independent of the Central Bank's monetary policy, financial inclusion is essential in bringing them into the mainstream of the formal financial system and, as a result, improving the effectiveness of the monetary policy transmission mechanism. The majority of international institutions and organizations, including the International Monetary Fund (IMF), the World Bank, and the Group of 20 (G20), have lately created adoption efforts to emphasize the importance of financial inclusion to economic development and sustainability. Several non-governmental organizations such as the Bill & Melinda Gates Foundation, the Consultative Group to Assist the Poor (CGAP), and the Alliance for Financial Inclusion (AFI), have also taken initiatives to promote and improve access to quality financial services. This is exemplified by Bill Gates' statement, in which he predicted that by 2030, 2 billion people who did not previously have a bank account will be using banks to store money and their phones to make payments, and mobile money providers will provide a variety of services ranging from interest-bearing savings accounts to credit and insurance.

Empirical researches along this line evidenced that the increase in financial inclusion on a global scale could increase household income through enhanced welfare, reduced poverty, initiating and expanding business and risk management, which will eventually lead to expansive opportunities for the banking sector (Bruhn and Love 2014; Kim 2016; Zachosova et al. 2018; Zhang and Posso 2019). The increase in the number of individuals who are financially included in the formal financial system is predicted to benefit the bank as this would increase the demand for financial services offered by the bank. According to Boot and Schmeits (2000), financial inclusion assists in obtaining higher diversification in banks and lowering risks.

Furthermore, policies promoting financial inclusion often promote the adoption of cashless money transfer technology and encourage clients to use formal financial services to accelerate economic and financial development. In the long-term, with an increasing number of people and businesses obtaining access to and demanding financial products and services, and participating in the formal banking system, the shadow economy size can be minimized. The shadow economy's existence considerably influences financial inclusion and in turn, the growth of the economy (Hajilee et al. 2017).

Banks' strategies place a greater emphasis on resource investment to improve services or the introduction of new services to meet the needs of customers and achieve higher returns for optimal performance. Opening new bank branches, installing more ATMs, or

implementing new e-facilities are examples of strategies that can have a major impact on profit, especially if the costs are unrelated to sales revenues (Shihadeh et al. 2018).

When talking about the problem of financial isolation, it is necessary to distinguish between two seemingly similar words: access and use. “Access” mainly refers to the provision of financial services, while “use” is determined by demand as well as supply (World Bank 2014). It is also critical to recognize the phenomenon of financial isolation, such as gradual withdrawal (isolation) from the financial services market. As the offer does not meet the needs of the client, people with low income, financial problems, or potential users of financial resources may come to him, but they will not want to use it. This is due to a lack of need or for cultural or religious reasons. The second type of exclusion, forced exclusion, is caused by the same factors mentioned above: a lack of income, discrimination against certain groups, a lack of branches because they are not commercially viable for financial institutions, high prices, or inappropriate products (Achugamonu et al. 2020; Kata and Walenia 2015; MetLife Foundation & Microfinance Centre 2014). Mylonidis et al. (2019) conclude that social participation has economically significant effects on financial exclusion. The results show that individuals who engage in pro-social religious behavior, as measured by charitable giving, are less likely to be financially excluded.

The objective of this paper is to examine the impact of financial inclusion on banks’ profitability: Does more financial inclusion lead to better financial results? The answer to this question represents the major continuation of this paper, the analysis shows that the impact of financial inclusion on banks’ profitability depends on the type of financial inclusion. The number of branches and ATMs had no significant effect on the bank’s profitability, while the number of loan accounts and size of deposits have a negative impact on the profitability of the banks. In addition, to the best of our knowledge, little attention has been given in the literature to the response of banks’ profitability to changes in financial inclusion in Jordan. To this end, the current study included indicators of financial inclusion in the analysis to examine the sensitivity of the profitability of 13 Jordanian commercial banks to these indicators during the period 2009–2019 in the panel data framework.

In the present work, financial inclusion is measured by several indicators and they are: availability of financial service, access to financial service, use of financial service, and financial inclusion index.

2. Literature Review

According to most empirical studies, financial inclusion leads to increased economic growth and a more stable banking system (Sharma 2016; Ahmed and Salleh 2016). The impact of financial development and financial innovations on the economy and financial system has been the subject of theoretical and empirical research in recent decades (Gebrehiwot and Makina 2015).

On the other hand, financial inclusion may pose a danger to financial system stability, with high potential risks linked to increased borrowing by low-income individuals (Van et al. 2021a) and therefore, financial inclusion outcomes on the financial system have to be examined, particularly as policymakers have begun viewing it as a priority around the globe (Ali et al. 2020; Sarma and Pais 2011). Added to this, related studies also indicated that efforts towards promoting financial inclusion have led to higher welfare, lower poverty level, and lower income inequality (Beck et al. 2005; Chibba 2009; Aduda and Kalunda 2012; Cull et al. 2012; Morgan and Pontines 2018; Kim 2016; Neaime and Gaysset 2018; Shihadeh et al. 2018). Similarly, empirical studies have shown that financial inclusion among small enterprises and lower socioeconomic groups—particularly those who find it difficult to expand their investments and conduct daily financial transactions utilizing the official financial system—is essential for their success. (Demirgüç-Kunt and Klapper 2012; Kim 2016; Iqbal and Sami 2017).

Although the topic has been of current interest among researchers and regulators, no universally accepted definition of the financial inclusion concept has been proposed as yet (Aduda and Kalunda 2012; Tita and Aziakpono 2017). The Center for Financial

Inclusion (CFA) described financial inclusion as a state within which everyone who uses it has access to a full variety of quality financial services, at reasonable prices, conveniently, and with respect and dignity. Other related studies ([Ratnawati 2020a, 2020b](#); [Ilahiyah et al. 2021](#); [Na'im et al. 2021](#)) described it as a process that ensures that marginalized groups, such as the weaker parts and low-income groups, have access to suitable financial products/services at reasonable costs in a fair and transparent manner through mainstream institutional actors.

Meanwhile, the World Bank referred to financial inclusivity as the access to invaluable and affordable financial products and services that satisfy the needs of the individual for insurance, credit, savings, payments, and other transactions ([Demirgüç-Kunt and Singer 2017](#)). Another definition of the financial inclusion concept came from [Sarma and Pais \(2011\)](#) and [Sarma \(2008\)](#) who described it as a process that ensures the ease of access, availability, and usage of the formal financial system for all members of an economy. Other relevant studies such as [Allen et al. \(2016\)](#) and [Ozili \(2018\)](#) defined it as the process where individuals, particularly poor ones, have access to basic financial products and services by using the formal financial system. Financial inclusion, according to [Hannig and Jansen \(2010\)](#) is the absence of price or non-price barriers in accessing or using financial services.

Some other authors in the literature described financial inclusion as the antithesis of financial exclusion, where the latter comprises the process of preventing specific social groups and individuals from having access to the formal financial system ([Leyshon and Thrift 1995](#)). Similarly, [Carbó et al. \(2005\)](#) defined financial exclusion as, broadly, the inability (however occasioned) of some societal groups to access the financial system. According to [Conroy \(2005\)](#), financial exclusion is a process that hinders poor and disadvantaged social groups from accessing formal financial systems in their own countries. Financial exclusion was described by [Mohan \(2006\)](#) as the situation that reflects the lack of access by specific societal segments to appropriate, fair, low-cost, and safe financial products and services from mainstream providers. Meanwhile, [Cámara and Tuesta \(2014\)](#) referred to the financial inclusion system as one that maximizes usage and access, while minimizing involuntary financial exclusion. [Bhanot et al. \(2012\)](#) explored the factors which are crucial in determining the extent of financial inclusion in geographically remote areas. The results showed that the level of financial inclusion in northeast India remains very low. Income, financial information from various channels and awareness of self-help groups (SHGs), and education are influential factors leading to inclusion. Nearness to post office banks increases the likelihood of inclusion. Factors such as area terrain and receipt of government benefit individually do not facilitate inclusion. However, recipients of government benefits in plain areas showed an increased level of inclusion.

In addition to the differences in the definitions of financial exclusion and inclusion in literature, studies have also pointed out differences among non-users or those that are involuntary excluded/unbanked. The first group comprises individuals and businesses that are unbankable by financial institutions owing to their lack of sufficient income or there being too high a lending risk. The second group may be discriminated based on social, religious, or ethnic reasons, while the third one may be because of the contractual and legal framework that limits financial institutions from extending towards specific groups, as in so doing, it may be too costly, or the financial services prices may be too high for such a group ([World Bank 2008](#); [Kim 2016](#)).

Therefore, based on the above different groups, and definition of both financial exclusion and inclusion, this study considers financial inclusion as the situation where individuals/firms have easy access to useful, affordable, and suitable financial products and services to satisfy their transactions, demands, savings, credit, insurance, and financial services types at an equitable price and in a sustainable manner.

More importantly, financial inclusion is becoming a popular paradigm in the development of finance, owing to its key role in easing access to formal financial services through the provision of bank accounts, credits, and saving through financial institutions ([Mohan 2006](#); [Cull et al. 2012](#); [Zins and Weill 2016](#); [Iqbal and Sami 2017](#)). In contrast, financial

exclusion outcomes can be detrimental and can lead to lower investment because of limiting access to credit or enabling the use of informal financing resources at significant rates of interest (Sarma and Pais 2011; Kim 2016).

Empirical findings in this line of study followed various themes in financial inclusion, indicating its potential to enhance the growth of the economy and the stabilization of the financial system. More specifically, empirical studies revealed and evidenced the key role that financial inclusion plays in economic growth and financial stability in several nations (Kim et al. 2018; Neaime and Gaysset 2018). Furthermore, despite the fact that some of them conducted an investigation into the relationship between financial inclusion and the profitability of banks, and these include Shihadeh and Liu (2019) and Ikram and Lohdi (2015), the findings concerning the effect of financial inclusion on the profitability of banks is still inconclusive.

Related studies include Kumar et al. (2021), who sampled 122 Japanese banks and obtained data from 2004 to 2018 to determine the impact of financial inclusion on the profitability of the banks. They found a positive relationship between the number of branches (proxy of financial inclusion) and the bank's profitability (ROA and ROE). Contrastingly, the authors found that financial inclusion in the form of the number of loan accounts and ATMs had no significant relationship to the profitability of the banks.

Moving on to other studies of the same caliber, Chen et al. (2018) and Shihadeh and Liu (2019) found a positive effect of financial inclusion on profitability, the former being measured by the number of branches. In Shihadeh and Liu (2019), with a study sample of 189 countries (national level) and 701 banks, the authors evidenced the positive impact of financial inclusion on the banks' activities, which in turn led to higher returns. They indicated that the number of branches had a positive relationship with ROA, ROE, and NI.

Moreover, Shihadeh et al. (2018) examined the effect of financial inclusion on gross income and ROA of 13 commercial Jordanian banks using data from 2009 to 2014. Six financial inclusion variables were employed, namely SMEs' deposits and credits, ATMs, ATM services, and new services and credit cards (predictors of the variable). Based on the obtained results, the profitability of the banks was affected in a positive direction by the number of ATMs, number of ATMs' services, and SMEs' credits, but it was not affected by credit cards and new services as well as SMEs' deposits.

The above finding was also similar to that reported by Ahamed and Mallick (2019), the focus of which is on the proliferation of bank branches, a decrease of banks' default risk and the non-performing loans, which ultimately enhances the revenues of the banks. Akhisar et al. (2015) investigated the effects of the bank's profitability performance of electronic-based banking services. The effects of ROA and ROE performance were analyzed as data, which are 23 developed and developing countries' electronic banking services through 2005 to 2013, by dynamic panel data methods. Results showed that bank profitability of developed and developing countries affected from the ratio of the number of branches to the number of ATMs is highly significant and electronic banking services insignificant.

Contrastingly, Jouini (2021) investigated the effects of financial inclusion on the performance of the banking sector, measured by the return on assets, for a set of 11 Arab countries over the 2013–2019 period in the dynamic panel data framework. In addition to financial inclusion indicators, they included bank-specific factors and macroeconomic variables into the analysis. The study revealed that the bank-specific factors are the most influential on banks' profitability, and to a lesser extent, the macroeconomic variables, regarding financial inclusion, the study did not find any evidence of significant effects of the distribution of ATMs and the number of bank branches on the return on assets.

In other studies, a positive relationship was found between banks' revenues and the number of bank branches (Bernini and Brighi 2018), and between branch expansion and bank efficiency for the years spanning from 1999 to 2009 (Harimaya and Kondo 2012). In the latter, a sufficient level of branch expansion should be conducted to experience a positive impact on profit and cost reduction. The empirical findings of Ikram and Lohdi (2015), in their examination of the effect of financial inclusion on Pakistani banks'

profitability, indicated that financial inclusion variables (financial services' use, access to financial services, and cost of financial services) had no significant relationship with the generation of the banks' revenues.

Shihadeh (2020) used a sample of 271 banks in MENAP countries to examine the influence of financial inclusion on bank risk and bank performance, and based on the data analysis, financial inclusion had a negative relationship with banks' risks but a positive relationship with bank performance. In the Asian countries, Van et al. (2021b) documented that a higher financial inclusion level had a positive effect on the stability of the bank sector as well as higher banks' revenues. At the same time, it had a negative effect on the banks' costs, but a positive effect on market share.

As evident from the above-reviewed studies, empirical studies in the literature that were dedicated to examining the effects of financial inclusion on bank profitability depended largely on accounting-based measures (ROA and ROE). In the present paper, the market-based measure (Tobin's Q) is adopted as the banks' profitability proxy—it is a measure that is obtained by the total market value over total assets. It is an effective profitability measure as it is capable of capturing future growth opportunities and long-term financial performance as predicted by the stock market (Aivazian et al. 2005; Alyousef et al. 2019).

The study findings can be leveraged by the governments and regulators, particularly when it comes to the effect of financial inclusion on the performance of banks, and an insight into the financial inclusion strategies' outcomes. The study investigates the relationship between profitability measures and financial inclusion indicators in the Jordanian banking sector based on the literature reviewed and the gap in the empirical studies concerning the topic.

Furthermore, studies indicated that bank leverage and bank size can be used to predict its profitability; for instance, Ramadan et al. (2011) revealed that one of the primary determinants of a bank's profitability is its lending activities. Bank size has also been found to control economies of scale and, as such, it is one of the determinants of a bank's profitability. However, empirical results indicated that the relationship between size and profitability has yet to be confirmed, with findings being inconclusive. Some studies such as Ramadan et al. (2011) and Almumani (2013) revealed no significant bank size-profitability relationship, whereas others such as Almazari (2014) found a negative relationship between the two. Some others found a positive relationship between bank size and bank profitability (Khrwish and Al-Sa'di 2011), and thus, these variables (financial leverage and size) were considered as control variables in the present study to be analyzed through regression.

3. Methodology

This study primarily aims to examine the effect of financial inclusion on the performance of commercial banks listed on the Amman Stock Exchange (ASE) in Jordan. Under this section, the methodology adopted in analyzing statistical relationships between the variables is presented, beginning with the definition of the study population and sample, the study variables, and the measurement methods. The section also covers the analysis methods and data collection sources.

3.1. Materials

To begin with, the study population comprises the entire banks listed on the ASE, while the sample of the study consists of commercial banks from the same list. Table 1 tabulates the sample selection procedure for the period 2009–2019, excluding all foreign and Islamic banks due to their distinct regulations that differ from the general commercial local banks.

The required data was gathered from secondary sources in the form of annual reports of banks, available on the Amman Stock Exchange website (<https://www.ase.com.jo/ar>), accessed on 10 December 2020, and the Securities Depository Center website (<http://www.sdc.com.jo>), accessed on 10 December 2020. The study focused on the years spanning from 2009 to 2019.

Table 1. Sample selection procedure.

Bank Population. All banks listed in (ASE)	24
Excluded: Foreign banks	7
Jordanian Islamic banks	3
Islamic foreign banks	1
Final sample (commercial)	13

With regards to the measurement of the variables, Tobin's Q (dependent variable) was measured as the total market value over total assets—this measure is deemed to be a more optimum profitability measure as it is capable of capturing future growth opportunities and long-term financial performance as predicted by the stock market (Aivazian et al. 2005; Alyousef et al. 2019), and as such, the paper adopts a market-based measure (Tobin's Q) to represent a bank's profitability.

Moving on to financial inclusion, several dimensions of the concept have been provided by researchers and institutions, which are as follows:

First, Availability of Financial Services (AFS): It is important for the comprehensive financial system services to have ready availability, and this may be reflected through the number of bank outlets and/or the number of ATMs, or the number of employees per customer in the bank, or the number of bank branches, for availability measurement.

Second, Access to Financial Services (SFS): this procedure ensures access to financial services and the provision of timely and sufficient credit when required by the marginalized groups such as the poorer sections and low-income sections, at a cost that is affordable for them (Dienillah et al. 2018).

Third, Use of Financial Services (UFS): in this dimension, the impetus is driven by the underbanked or marginally-banked concept as mentioned by Kempson et al. (2004), where in some nations with a higher level of banking, several people do not make use of the services offered although they have a bank account. Two primary services of the banking system, namely credit and deposit were used in the paper for the measurement of this variable.

3.2. Econometric Model

The simplest way to estimate and measure regression in an attribute is with aggregate regression, which involves estimating a single equation over all the data jointly (Brooks 2008):

$$y_{it} = \alpha + \beta x_{it} + u_{it} \quad (1)$$

where y represents the dependent variable, i unit, t time, x the independent variables, and u represents the random error term.

For financial research, there are two main models that can be applied. The fixed effects model and the random effects model (Verbeek 2012):

$$y_{it} = \alpha + \beta x_{it} + u_i + V_{it} \quad (2)$$

In general, the random effects model is more efficient than the fixed effects model because it measures fewer parameters.

The study tests the financial inclusion effect on the financial performance of commercial banks in Jordan by applying the multiple linear regression model, which is as follows:

$$TQ_t = \alpha_0 + \beta_1 AFS_{it} + \beta_2 SFS_{it} + \beta_3 UFS_{it} + \beta_4 II_{it} + \beta_5 L_{it} + \beta_6 S_{it} + \varepsilon_{it} \quad (3)$$

In the above equation, TQ_t denotes Tobin's Q, AFS_{it} denotes availability of financial services, SFS_{it} denotes access to financial services, UFS_{it} denotes the use of financial services, II_{it} denotes inclusion index, L_{it} denotes financial leverage and is used as control,

and S_{it} denotes the size of the commercial bank in Jordan and is used as a control variable. Finally, ε_{it} represents error terms.

The panel time analysis data is employed, including the characteristics of cross-sectional data as well as time series data in an approach that is characterized by the consideration of the effect of individual and time factors during the estimation of regression equations. The study used two statistical analyses and they are—descriptive statistics (means, standard deviations, minimum and maximum) and regression diagnostics (Hausmann test, multicollinearity test).

4. Empirical Results

This study is focused on investigating the effect of financial inclusion on the performance of Jordanian commercial banks for the years 2009 to 2019, using a panel data model. Prior to the regression analysis, a stationarity test was carried out for the independent variables of the model. In addition, the stability of the study variables data was tested using the Augmented Dickey–Fuller test (Dickey and Fuller 1979) and Phillips–Perron test (Phillips and Perron 1988)—these were also used to determine the time series data stability for the period of study, as unstable data could lead to inaccurate results of the regression.

The descriptive analysis results of the study variables are tabulated in Table 2. The analysis covers the mean, median, standard deviation, and maximum and minimum values for every study variable.

Table 2. Summary of statistics.

	Mean	Max	Min	Std. Dev.
TQ	1.088511	2.569251	0.251348	0.483238
AFS	129.942	346	19	90.76027
SFS	3145.659	9802	0	25.22979
UFS	0.09266	9.350473	0.00037	0.794728
II	4.140301	74.31163	9.93×10^{-6}	12.57232
L	0.85984	0.924952	0.78036	0.026403
S	9.32458	10.42043	8.477959	0.401994

One of the most common issues that statistical estimation of regression coefficients often faces is multicollinearity. This generally stems from the existence of a strong correlation between the study's independent variables (Gujarati 2014). The results of the Pearson correlations between the variables in the multivariate analysis are presented in Table 3, and from the table, the highest pair-wise correlation coefficient between variables is 0.774, which indicates no multicollinearity issue.

Table 3. Correlation Matrix.

	TQ	AFS	SFS	UFS	II	L	S
TQ	1						
AFS	0.1038	1					
SFS	−0.0047	0.0936	1				
UFS	−0.136	−0.0001	−0.017	1			
II	0.1827	−0.0972	−0.019	−0.0113	1		
L	−0.237	0.1488	−0.066	0.11136	−0.058	1	
S	−0.013	0.7745	0.0703	0.01348	−0.093	0.1252	1

The stability of the time series data of the variables, as mentioned, was tested by using both the Dickey–Fuller and Phillips–Perron tests. This test is important as unstable time series data could lead to inaccurate regression results. The two tests were thus conducted at the level and first difference of the study variables.

The entire variables were found to be unstable at the level and the nihilistic hypothesis providing the instability of the time series was accepted (Table 4). As such, the first difference was taken for the variables, after which a re-test was done (Dickey–Fuller and Phillips–Perron), by a moral value of lower than 5% for the tests. The study accepted the alternative hypothesis, stabilizing the study variables and indicating that the effect of temporary shocks fades in the long run, particularly since the Phillips–Perron test considers random errors, and this holds true for the Dickey–Fuller test.

Table 4. Unit root test results (ADF and PP).

		ADF	PP	Result
TQ	Level	12.8764	15.3727	Non-Stationary
	First difference	50.5403 ***	77.0847 ***	Stationary
AFS	Level	66.9278 ***	66.4362 ***	Non-Stationary
	First difference	63.7301 ***	79.1936 ***	Stationary
SFS	Level	32.7795	47.4273 **	Non-Stationary
	First difference	44.0050 **	143.177 ***	Stationary
UFS	Level	26.4161	55.9052***	Non-Stationary
	First difference	62.6269 ***	177.429 ***	Stationary
II	Level	18.5900	57.7385***	Non-Stationary
	First difference	33.0247 *	152.279 ***	Stationary
L	Level	12.0385	7.10706	Non-Stationary
	First difference	45.7422 **	87.8196 ***	Stationary
S	Level	11.4736	16.7457	Non-Stationary
	First difference	69.2081 ***	73.8610 ***	Stationary

Note: ***, **, * indicate statistically significant at 1%, 5%, and 10% level, respectively.

The *p*-values of the F-test at the significance level of 1% are presented in Table 5. This shows that the regression models had better data fit compared to models with no predictor variables and that a probability lower than 0.05 means that the null hypothesis is rejected, making the Fixed Effect Model more suitable for the analysis of the study model. The main study model investigates the impact of financial inclusions on commercial banks' performance in the context of Jordan and the results of the fixed effect model's regression analysis are tabulated in Table 5.

To begin with, the availability of financial services was found to have no significant impact on the profitability (with Tobin's Q as the proxy) of Jordanian commercial banks (coefficient of -0.000429 , $p > 0.10$). Similarly, for the access to financial services, no significant impact was found on the commercial banks' profitability (with Tobin's Q as the proxy) (coefficient of 1.19×10^{-7} , $p > 0.10$). This result is aligned with that reported by Kumar et al. (2021).

Moving on to the use of financial services, based on the results, the use of financial services has a significant negative impact on Tobin's Q (coefficient = -0.074335 , $p < 0.01$). This was the same for the index of financial inclusion, which was found to have a significant impact on the commercial banks' Tobin's Q but in the positive direction (coefficient = 0.000107 , $p < 0.01$). This is aligned with the result revealed by Kumar et al. (2021), Shihadeh and Liu (2019), and Chen et al. (2018).

Table 5. Panel data fixed effect model regression results.

Variable	Coefficient	t-Statistic	Prob.
C	8.407168	4.394342 ***	0.0000
AFS	−0.000429	−0.35484	0.7233
SFS	1.19×10^{-7}	1.171422	0.2438
UFS	−0.074335	−2.75102 **	0.0069
II	0.000107	4.255236 ***	0.0000
L	3.497607	2.196482 *	0.0300
S	−1.102226	−3.88012 ***	0.0002
R-squared	0.785839		
F-statistic	24.25871	Durbin–Watson	1.676
Prob (F-statistic)	0.00000		
Hausman test			
Test summary	Chi-sq. statistic	Chi-Sq. d.f.	Prob.
Period random	20.703546	6	0.0021

Note: ***, **, * indicate statistically significant at 1%, 5%, and 10% level, respectively.

The size was found to have a negative and significant impact on the financial performance of commercial banks in Jordan, which is consistent with the results reported by prior studies (Tan and Floros 2012; Almazari 2014).

5. Conclusions

It is evident from this study and the obtained results that financial inclusion has a significant role in banks. The findings indicated that the number of loan accounts and size of deposits negatively and significantly impacted the profitability of the commercial banks in Jordan. This result supports prior studies by Kumar et al. (2021), Shihadeh and Liu (2019), and Chen et al. (2018). However, the number of branches and ATMs had no significant effect on banks' profitability. In sum, both leverage and bank size were the top two determinants of commercial banks' profitability in Jordan. Based on the findings, Jordanian policymakers can shift their focus to offering affordable financial services that support SMEs' loans and start-ups.

Banks should also motivate households towards assets' diversification as opposed to just depending on cash and deposits. Banks, as well as other financial institutions, need to maintain their asset management fees to promote banking services' usage. Future studies can extend the examination by determining the effects of financial inclusion variables on bank risks. The policy implications of this study are that Jordanian commercial banks should increase their profitability and achieve the best results from financial inclusion. They must develop policies to promote financial inclusion. This implies that Jordanian commercial banks must be creative and innovative in their efforts to implement financial inclusion policies. Such policies should aim to increase the number of loans granted by providing affordable financial services to support SMEs' loans and start-ups.

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