Original Research Article

The Impact of Financial Technology (FinTech) on the Economic Growth: Evidencefrom Palestine

Abstract

This study explored and examined the impact of financial technology (FinTech) on the economic growth in Palestine by using annual time-series data from the ministry of the Palestinian Economy and the Palestinian Ministry of Finance and Planning (MoFP), also the Palestinian Central Bureau of Statistics (PCBS). In addition, the current study examines how financial technology (FinTech) has affected economic growth in Palestine (2008 to 2021). Moreover, co-integration has been tested using the autoregressive distributed lag method, and long- and short-term causality has been investigated using the vector error correction model. In addition, the data, however, demonstrates that financial technology (FinTech) products (the number of people using the internet, the number of broadband subscriptions, the number of mobile cellular subscriptions, the number of automated transfer machines, and the number of branches) contribute to further growth in financial inclusion, which in turn boosts economic growth in Palestine. Moreover, these findings suggest that authorities in Palestine focus more on expanding access to financial services. Furthermore, this study aims to explore the opinions and attitudes related to the emergence of financial technology (FinTech) in Palestine's future financial services industry. The study's goals were also met by talking to a group of managers in the banking and financial services industries, who were administrative employees from divisions with technical, software, and (IT) departments, as well as departments specializing in technological domains and electronic payment services.The study Analysis based on objectivity was performed on the gathered data. The approach utilized in this study was used to produce and arrange the data-related outcomes for these traits and patterns. According to the study's findings, it is crucial for the current banking and financial institutions, academic institutions, technology firms, and business incubators to work together to build a supportive environment for Palestine's financial technology (FinTech) system. In addition, the findings indicate that financial technology (FinTech) in Palestine has several obstacles: rules and regulations, cybersecurity, customer mistrust of digital services, etc. All of this is thought to have a direct beneficial influence on the Palestinian economy.

Keywords: Financial Technology, Economic Growth, Financial Institutions, Financial Inclusion,Financial Services, ARDL, VECM, Palestine.

1. Introduction

Due to technological advancements, the globe has recently experienced enormous and quick changes. Information and communication technology (ICT) directly impact human existence, particularly in the economic, social, and cultural spheres. As a result, (ICT) has taken on the role of a nation's primary economic development driver. (ICT) made it possible for the globe to advance and adapt to the new environment, which presented governments with a growing issue. Internet applications including electronic banking, financial technology (FinTech), and electronic commerce have emerged and grown significantly in the contemporary period, allowing (ICT) to contribute to the creation of economic value(Cheng, C., Chien, M. & Lee, C., 2021).

One of the developments of the fourth industrial revolution was the creation of the (FinTech) model, which has enabled people to access financial services and save and borrow by creating mobile accounts, which are easier and less expensive to do than opening traditional financial accounts. These developments present an opportunity to increase economic expansion and financial inclusion across the board.

Various studies looked at how (FinTech) and (ICT) affected economic growth in established and emerging nations (Bernini &Brighi, 2017; Cheng et al., 2021; Li & Wei, 2021; Liu et al., 2021; Shen et al., 2021; Shkarlet et al., 2018; Usman et al., 2022; Wong et al., 2021; Younas et al., 2022).

Following the 2008 financial crisis, economic and financial authorities started to pay more attention to the problem of financial inclusion and the availability of financial services for various societal groups, particularly the marginalized and targeted groups. Social stability, political stability, financial development, economic development, and system protection for financial consumers are all impacted by this issue. About 62% of adults worldwide, according to data from the Palestine Monetary Authority (PMA) in 2022, do not use banks (PMA, 2022). As a result, financial, monetary, and economic authorities now have financial inclusion as one of their top priorities.

Furthermore, 67% of Palestinians over the age of 16 do not possess accounts and do not have access to the official financial system. 44% of people do not have access to any official financial services, and 33.6% of individuals receive neither formal nor informal financial services at all (PMA, 2022). Therefore, the primary goal of this essay is to investigate how (FinTech) products have affected Palestine's economic development. The current study uses various time series models to accomplish this goal, including qualitative and quantitative data for the period (2008 to 2021). The literature review is discussed in the section that follows. DataSources and materials are presented in Section 3, while Section 4 provides methodology and empirical findings. Conclusions are covered in Section 5, section 6 policy recommendations, and section 7 are covered the limitations and suggestions for future studies.

Since the (COVID-19)pandemic had such a significant negative effect on the expansion of the economy and the subsequent collapse, more people are working remotely and using the internet more often (Ak &Garcarz, 2020). This is true for many nations where non-cash payments were more frequently used to pay for goods during pandemics (MoNE, 2022).

Additionally, the integration of payment service markets allowed rivalry between banks and non-banks to show itself in the usage of a variety of payment instruments. The shift to a dual regime of labour (online and offline) has given businesses the chance to make quick profits, travel far distances, and service vast areas. Therefore, innovations might alter the financial architecture of industrialized and emerging nations (Bhasin, 2016; Grzeszczyk, 2020; Vrinceanu&Horobet, 2021).

Digitalization of financial services, the rise of mobile and E-banking, non-cash payment systems, mobile online payment systems, and a host of other factors have established the parameters for future advancements in financial technologies.Because of all that has been said above, the development of non-cash payments has turned into one of the most overlooked parts of the shift in everyday life.

Over time, many nations began to accept alternative forms of payment, such as credit and debit cards, and cash was no longer the sole option for making payments. Other forms of payment are gradually going out of style in the interim. The proliferation of consumer and business options for various payment methods led to an increase in turnover dematerialization (PMA, 2022).

The significance of this procedure lies in the fact that daily payments form the backbone of society and have a significant economic impact. According to certain academic research (Alvarez & Lippi, 2009; Mieseigha&Ogbodo, 2013; Bashir &Madhavaiah, 2014; Grzywiska-Rpca&Grzybowska-Brzeziska, 2015; Aliha et al., 2020), economic development and non-cash payments are related.

Even though other researchers (Polasik& Wisniewski, 2009; Nisa et al., 2013; Junadi&Sferianto, 2012), among others, concentrate on characteristics such as culture, strengthening, social effect, education, employment, etc., that influence the use of non-cash payments.

In general, the growth of a non-cash digital economy and E-banking has been aided by the creation of electronic money and other types of payments (Yousafzai et al., 2003; Rexha et al., 2003; Kumbhar, 2011).In their research, other writers have determined elements that are essential for effective online

banking and have collected findings from an interpretative analysis of banking customers' experiences (Wang et al., 2003; Shah & Siddiqui, 2006).
At the beginning of the transition to technological innovations, banking companies must undoubtedly consider the risks of expansion switched to financial technologies that favored living standards and sustainable development (Chen, 2019; Baloch et al., 2020; Raiien et al., 2021; Rymarczyk, 2020; Sieja&Wach, 2019).
The dominance of market-based medical operations, coupled with the lack of pre-payment methods and risk pooling, exposes a sizeable portion of the population to financial vulnerability and leads to catastrophic payments to cover costs, according to another study (Selvaraj & Subramanian, 2012; Alao&Sorinola, 2015). When the link between (GDP) and financial technology was already noted in other research, there is a rise in both profitability and financial stability of banks along with this danger (Krueger, 2017; Chernis&Sekkel, 2017; Luchko et al., 2019; Shy, 2020).

2. Literature Reviews

Despite having a fancy name, the term (Financial Technology), or simply (FinTech), refers to emerging technologies utilized for the development and delivery of financial services (Arner et al., 2015). (FinTech) according to (Schueffel, 2016), is a new financial business that uses technology to enhance financial activity. Even so, (Sweeney et al., 2015) and (Kim, Y., et al., 2015) defined (FinTech) as an innovation in financial services where reference to technology-enabled financial solutions is the key enabler and products or services in financial service companies that were created on highly innovative and disruptive service technologies.
Moreover, (Fintech) or finance-related technology has completely changed the way that financial services may be delivered on a global scale in terms of speed, effectiveness, and cost. Low-income people and small and medium-sized businesses (SMEs), which frequently struggle to save, invest, and guard themselves against economic dangers, may benefit from (FinTech) (PMA, 2021; MTC, 2022).
It is crucial to facilitate access to relevant financial products in Palestine in particular, where unemployment rates are high and (SMEs) employ 80% of the labour force, to sustain and generate jobs (PMA, 2022). In light of this, (GIZ's) new initiative "Alternative Approaches to Financial Inclusion of (SME) (A-FIN)" debuted in Palestine in January 2020 with the only objective of making (FinTech) useful for Palestinian businessesfollowed by (COVID-19) (PMoH, 2022; PMA, 2022).
There is some literature support regarding the infrastructure (Schueffel, P, 2016), regulation (Puschhmann, T, 2017), and collaboration (Insights, C, 2017). (Wonglimpiyarat, J, 2017) emphasize that framework conditions evolve with technology adoption, and the opportunity size warrants dealing with a lack of infrastructure and inefficient institutions and internalizing essential activities even if they do not core to the business. Indeed, a look at these studies shows that the collaboration between the telecommunication operators, financial institutions, (FinTechs), and the government are important success factors to create a conducive environment for (FinTechs) (MTIT, 2022).
The virus may have made it necessary for the project to modify its operations and its goals, but it has not prevented its dedication to the cause, which has proven to be more crucial than ever given the present situation. Unquestionably, there is a growing urgency for new technology business models that might take the role of local currency and mobilityin Palestine (MoNE, 2022; PMA, 2022).
In addition, it will be essential to increase resilience and give financial assistance by using alternatives to credit, also known as alternative financing choices, such as insurance and peer-lending solutions. especially when the upcoming (COVID-19) wave and limitations arrive or when the anticipated economic recessions occur (Barro, R, Ursua, J., & Weng, J., 2020).
Through (GIZ) assistance since 2012 and the regional project Financial Inclusion in the (MENA) Region (FIMENA), (A-FIN) expands on the already established partnership with the Palestinian regulatory authorities, the Palestine Monetary Authority (PMA) and the Palestinian Capital Market Authority (PCMA) (PEM, 2021). By assisting the (PMA) and the (PCMA) in their capacities as enabling regulators and (FinTech) promoters, as well as in their initiatives to build trust in alternative and digital financing

choices, the project intends to boost the framework conditions for innovative financial services in Palestine. The project's upcoming phase, which is scheduled to begin in 2021, will add a supplementary component to facilitate the creation and testing of creative financial solutions in Palestine (PMA, 2022).
The regulatory authorities must be ready for new (FinTech) and business providers in an era of fast technological change to strike the correct balance between responsible innovation for financial inclusion and a stable financial sector. As a result, (A-FIN) created the (FinTech Academy), a capacity-building training program for Palestinian regulatory agencies. The goal of the Academy is to develop (FinTech) competencies and institutions within the government to guarantee accurate evaluation, allow (FinTech) regulation, and facilitate regulated market entry (PMA, 2022).
Twenty-one regulators successfully joined the (FinTech) Academy in 2020 and have taken several webinars and online courses. The participants have had the opportunity to learn about fundamental theories and concepts in digital finance, digital payments and ecosystems, the fundamentals of peer-to-peer lending and crowdfunding solutions, as well as how to properly regulate and evaluate the risk of new technological advancements, starting with the (FinTech) foundations (PMA, 2022).
While the (FinTech) Academy's activities this year were restricted to online forms and interactions, the initiative is looking forward to a more optimistic and mobile 2021 in which peer-to-peer interactions and study trips to major (FinTech) economies and regulatory bodies will be made available. Moreover, the Academy will provide additional advanced courses the following year and give participants the chance to delve further into previously studied ideas and explore them using a practice-oriented approach (PCBS, 2022).
The establishment of the innovation and (FinTech) promotion structures within the regulatory authorities were supported by the study of best practices and regional approaches with the aid of literature, including (GIZ's)(FinTech Toolkit) and the paper (Approach for Digital Financial Transformation) in the Arab Region. (A-FIN) provided supplementary training and advising support for these initiatives. By enhancing collaboration with the business sector and other stakeholders, these new entities hope to overcome technical issues and encourage innovation. The project also aids in promoting discussions and interactions between the public and commercial sectors (MTIT, 2022).
Moreover, a dynamic panel data model was used by (Chatterjee, 2020) to investigate the effect of (ICT) on economic growth across 42 nations. The findings indicated that internet access and (ICT) applications like mobile phones contributed to economic expansion. (ICT) has a beneficial influence on economic growth, according to research by (Das et al., 2018) that examined the combined impacts of (ICT) on economic growth per capita for a sample of 42 developing countries from (2008 to 2021) (PMA, 2022).
(Idun and Aboagye, 2014) used the bound testing autoregressive distributed lag (ARDL) co-integration technique to investigate the connections between bank rivalry, financial innovations, and economic growth in Ghana. Long-term analysis of the results revealed that while financial innovation was inversely correlated with economic growth, bank competition was favourably correlated with it. Short-term economic growth was inversely correlated with bank competitiveness. The short-term relationship between financial innovation and economic development was similar. The findings indicated a unidirectional Granger causal relationship between bank rivalry and economic development. However, the Granger causation between financial innovation and economic development was bidirectional.
(ICT) and financial development's impact on economic growth for the G7 nations between (1990 and 2014) was examined by (Raheem et al., 2020). The findings showed that the rise of (ICT) and the financial sector had a detrimental impact on economic growth. (Salahuddin and Gow, 2016) used yearly time series data for South Africa from (1991 to 2013) to assess the effects of internet usage on economic development. The long-term connection is examined using the (ARDL) technique. Internet usage and economic growth have a favourable and strong long-term association, according to the (ARDL) methodology. By using a dynamic panel model, (Sassi and Goaied, 2013) investigated how (ICT) affected economic growth in a few Middle Eastern and North African nations, the outcomes demonstrated a large and favourable direct influence of theproxies of (ICT) on economic growth.
Furthermore, we looked at a few (FinTech) studies in this area. To evaluate the impact of (FinTech) on the banking sector discipline, the authors (Hou, X.; Gao, Z.; Wang, Q., 2016) employed a (FinTech) index

from (2000 to 2014). They found that fintech reduces the positive correlation between bank deposit growth and capitalization. They also found that the unfavourable relationships between banks' hazardous assets and deposit growth diminish as fintech development rises. By using data from (2014 to 2019), the authors (Song, N.; Appiah-Otoo, I., 2022)explored and examined how (FinTech) was affecting bank risk-taking in China. They found that while in the early stages of fintech development, banks' risks and management costs are reduced, these costs rise as the (FinTech) industry matures.

From (2006 to 2018), the authors (Dong, J.; Yin, L.; Liu, X.; Hu, M.; Li, X., 2020) analyzed the impact of fintech on the liquidity, profitability, growth, and security of banks in China. They discovered that while (FinTech) promotes growth, profitability, and security, it inhibits banks' liquidity. According to a study by reference (Meifang, Y.; He, D.; Xianrong, Z.; Xiaobo, X., 2018) that looked at the effects of third-party payments on Chinese commercial banks between (2007 and 2014), the industrial revolution was accelerated and the financial industry in China was pushed to grow.

Investor interest in creative businesses that want to upend and change the financial services industry has changed this year. According to a recent (KPMG) research, investments in financial technology (FinTech) businesses in Europe, the Middle East, and Africa (EMEA) totalled $39.1 billion across 792 agreements in the first half of 2021, nearly twice the $26 in (FinTech) investments made in the same period in 2020. Importantly, it is projected that over the next four years, the worldwide fintech sector would expand at a Compound Annual Growth Rate (CAGR) of around 20% (Guo, P.; Shen, Y., 2016).

The immense prospects that are being unleashed in this dynamic and quickly changing market in the post-(COVID-19) age are highlighted by the worldwide surge in (FinTech) investments in 2021 (PMoH, 2022). Indeed, developments in digital technologies like big data, artificial intelligence (AI), machine learning, crypto-assets, and blockchain have opened up revolutionary and larger potential. The emergence of (FinTech) businesses that seek to offer effective and reasonably priced solutions to issues in a variety of subsectors, including payments, open banking, personal finances, wealth management, insurance services, and many more, is a direct outcome of these technologies (McKibbin, W. J., & Fernando, R., 2020).

According to (UNCTAD, 2018; UNCTAD, 2022), (FinTech) companies in the Middle East and North Africa (MENA) region closed the most agreements to become the most financed industry in the first half of 2021. Buy now pay later (BNPL) firms received some of the year's largest rounds of funding, including the $110 million secured by Tamara, a Saudi Arabia-based company, in April 2021. More significantly, governments from around the region have begun to pay attention to the (FinTech) industry as they realize how crucial financial innovation is to leveraging digital transformation and attaining sustained economic growth. For instance, the UAE's Dubai International Financial Centre (DIFC) and Abu Dhabi Global Markets (ADGM) have both established a legislative framework for fostering, assisting, and growing (FinTech) businesses(Sassi, S. &Goaied, M, 2013).

Similar to Bahrain Fintech Bay, the Central Bank of Egypt (CBE) offers access to capital for Egyptian (FinTech) businesses through the (EGP) 1 billion funds that were established in 2019. The (CBE)also continues to offer cutting-edge services and infrastructure that encourage experimentation and innovation. Without a doubt, developing the (FinTech) sector throughout the (MENA) region can open up a variety of opportunities for economic empowerment through its role in lowering the cost of reaching the underbanked and financially excluded populations as well as the favourable spillover effects that could be realized across various industries and business verticals (Insights, C, 2017; UNCTAD, 2022).

Unfortunately, very few people would consider Palestine to be a (FinTech) powerhouse when discussing financial innovation in the (MENA) area. Given the hazy political landscape in the nation brought on by the protracted struggle, the occupation, and the severe economic constraints placed on the Palestinian people, this perspective is reasonable. The absence of a sovereign national currency and an autonomous monetary policy is, of course, two of the major challenges that have prevented the creation of an environment that is supportive of (FinTech) innovation (Insights, C, 2017; PMA, 2022).

Nevertheless, it is important to note that the Palestine Monetary Authority (PMA), despite the difficulties, has succeeded in carrying out most of the duties expected of any autonomous central bank, except the power to create a national currency. By following internationally acknowledged financial best practices, (PMA) has been able to guarantee the efficiency and stability of the banking industry (PEM, 2021). In

Palestine, over 60% of individuals (those 15 and older) already have bank accounts and may use basic banking services including borrowing and saving. Additionally, the Palestine Capital Market Authority (PCMA) has been crucial in regulating the non-banking financial sector, which includes firms that provide insurance, financial leasing, mortgage lending, and securities trading (PMA, 2022).

Policymakers and regulators in Palestine have recently begun to focus more on the (FinTech) industry and take into account its socioeconomic effects. For instance, the (PMA) authorized the use of digital wallets and mobile payment services in April 2020 (PEM, PMA, 2021). Additionally, it established the National (FinTech) Taskforce in January 2021 to streamline group initiatives to investigate the potential of the (FinTech) industry and promote it in Palestine. The National Strategy for Financial Inclusion in Palestine: 2018-2025, however, notes that the country continues to have low levels of access to and usage of financial services and that many individuals are still not included in the official financial system (PMA, 2022).

Real new ideas may originate from the most unlikely places, as history has demonstrated. To be more specific, transformational innovations in developing markets frequently address already-existing local problems; as a result, they are essential for solving development requirements and opening up a wealth of unexplored potential. While there are still 1.7 billion unbanked individuals worldwide, (FinTech) has the potential to increase the number of people who can access financial services (PMA, MoFP, 2022).

The success of the Kenyan mobile banking and money transfer startup (M-Pesa), which was able to effectively transform the difficulties of access to financial services into possibilities not only in Kenya but throughout Sub-Saharan Africa, is an encouraging example of the impact-driven (FinTech) industry. (M-Pesa) created a straightforward tech-enabled solution that allows individuals to withdraw, transfer, receive, and store money, pay for products and services, and obtain credit all using just their mobile phones to reach the enormous unbanked and financially excluded population.

Although 60% of individuals have bank accounts, only 10% of them also use credit cards, and only 8% of them are insured (PMA, 2021). Finally, it is projected that 1.57 million persons in Palestine, or 63.6% of the adult population, are considered to be financially excluded. In other words, having a bank account is thought of as the first step toward financial inclusion notwithstanding its significance.

As a result, tackling the problems of financial exclusion necessitates more governmental involvement as well as the existence of real public-private partnerships aimed at bringing more people into the mainstream financial system (PMA, 2022., PCBS, 2022).

3. Data Sourcesand Materials

Table 1 lists the definitions and statistical summaries of several terms associated with financial technology products and a proxy for Palestinian economic development. The World Bank provided the information that was utilized for this article (2022). Table 2 shows how Palestine's (GDP) per capita has changed over time (2008 to 2021). Particularly in 2008 and 2014, when it reported roughly 4662 USD and 4876 USD, respectively, it demonstrates a discernible rise in (GDP) per capita.

Table 1. Variables Definitions and Summary Statistics (2008to 2021)

Variable	Definition	Summary Statistics				
		Obs.	Mean	Sta. dev	Max	Min
Gross domestic product (GDP) per capita	It measures economic growth and a country's economic output per person and is calculated by dividing the GDP of a country by its population GDP per capita into constant local currency units, thousands of (USD)	62	6.70	8.40	70.3	-8.6
Internet (INT)	Individuals using the internet (% of the population)	56	58.5	33.5	66.2	0.11
Broadband	Fixed Broadband subscriptions (per 100 people)	56	48.6	26.2	188	0.11

(BRD)						
Mobile (MOB)	Mobile cellular subscriptions (per 100 people)	56	52.5	46.6	206	0.33
Automated Teller Machines (ATMs)	Is the number of automated teller machines (per 100000 people)	56	52.5	42.2	176.3	22
Branches (BRA)	Are bank branches (per 100000 people)	56	47.7	32.2	142.6	11.3

Source: Authors' Calculation

Table 2. Gross Domestic Product (GDP) of the State of Palestine and Development of (GDP)Per Capita in Palestine from (2008 to 2021)

Year	GDP Nominal (Current USD)	GDP Real (Inflation adj.)	GDP Change	GDP Per Capita	Pop. Change	Population
2008	$4,329,200,000	$6,302,630,142	10.34%	$4,662	1.84 %	3,505,32
2009	$4,831,800,000	$6,983,236,165	10.80%	$4,952	2.07 %	3,577,961
2010	$4,910,100,000	$6,710,848,171	-3.90%	$4,832	2.36 %	3,662,422
2011	$5,505,800,000	$7,153,132,898	6.59%	$4,904	2.57 %	3,756,460
2012	$6,673,500,000	$7,587,992,831	6.08%	$4,967	2.67 %	3,856,679
2013	$7,268,200,000	$8,245,305,385	8.66%	$4,083	2.62 %	3,957,670
2014	$8,913,100,000	$8,913,100,000	8.10%	$4,876	2.48 %	4,055,631
2015	$10,465,400,000	$10,019,539,737	12.41%	$4,415	2.32 %	4,149,649
2016	$11,279,400,000	$10,649,191,297	6.28%	$4,511	2.22 %	4,241,573
2017	$12,476,000,000	$10,885,328,831	2.22%	$4,512	2.17 %	4,333,523
2018	$12,715,600,000	$10,865,529,383	-0.18%	$4,453	2.19 %	4,428,639
2019	$12,673,000,000	$11,238,079,289	3.43%	$4,481	2.27 %	4,529,166
2020	$13,425,700,000	$11,767,216,976	4.71%	$4,538	2.35 %	4,635,654
2021	$14,498,100,000	$12,136,735,452	3.14%	$2,557	2.41 %	4,747,227

Source: World Bank, World population prospects, 2022

4. Methodology and Empirical Results

The (ARDL) strategy created by (Pesaran et al., 2009) is used in this investigation. To determine the co-integration connection in a limited sample size, the (ARDL) technique is statistically more aggressive

than other co-integration models (Engle & Granger, 1987; Johansen &Juselius, 1990). There are two phases in the (ARDL) co-integration technique. Examining if there is co-integration among the variables is the first step. The next stage is to estimate long-term and short-term causal linkages using the vector error correction model if there is evidence of co-integration among the variables (VECM).

Table 3. Results of ADFGLS Test (with Trends and Constants)

Variable	ADFGLS stat	Variable	ADFGLS stat	I(d)
$LGDP_t$	-4.3260	ΔLGDPt	-6.2367*	I(1)
LINTt	-4.7623	ΔLINTt	-9.6324**	I(1)
LBRDt	-4.2369	ΔLBRDt	-7.3324*	I(1)
LMOBt	-4.8791	ΔLMOBt	-9.7762**	I(1)
LA TMst	-4.6626	ΔLATMst	-7.6776***	I(1)
LBRAt	-4.9822	ΔLBRAt	-11.4423***	I(1)

(1) L indicates the log transformation.
Significant at: (10%)*, (5%)**, and (1%)*** levels
*Source:*Eviews software package

To make sure that none of the variables is integrated at I, run a unit root test first I(2). The stationarity levels are examined using the (Augmented Dickey-Fuller) generalized least squares (ADFGLS) test. All variables are stationary at the first difference (integrated at I(1)), according to Table 3. So, to assess cointegration, the (ARDL) technique is used. The following equation represents the estimate of the (ARDL) approach's long-term coefficients:

$$\begin{bmatrix} \Delta LGDP_t \\ \Delta LINT_t \\ \Delta LBRD_t \\ \Delta LMOB_t \\ \Delta LATMs_t \\ \Delta LBRA_t \end{bmatrix} = \begin{bmatrix} \beta 1t \\ \beta 2t \\ \beta 3t \\ \beta 4t \\ \beta 5t \\ \beta 6t \end{bmatrix} + \sum_{i=2}^{k=1} \begin{bmatrix} \delta 11i\ \delta 12i\ \delta 13i\ \delta 14i\ \delta 15i\ \delta 16i \\ \delta 21i\ \delta 22i\ \delta 23i\ \delta 24i\ \delta 25i\ \delta 26i \\ \delta 31i\ \delta 32i\ \delta 33i\ \delta 34i\ \delta 35i\ \delta 36i \\ \delta 41i\ \delta 42i\ \delta 43i\ \delta 44i\ \delta 45i\ \delta 46i \\ \delta 51\ \delta 52i\ \delta 53i\ \delta 54i\ \delta 55i\ \delta 56i \\ \delta 61i\ \delta 62i\ \delta 63i\ \delta 64i\ \delta 65i\ \delta 66i \end{bmatrix} \begin{bmatrix} LGDPt-2 \\ LINTt-2 \\ LBRDt-2 \\ LMOBt-2 \\ LATMst-2 \\ LBRAt-2 \end{bmatrix} + \begin{bmatrix} \varepsilon 1t \\ \varepsilon 2t \\ \varepsilon 3t \\ \varepsilon 4t \\ \varepsilon 5t \\ \varepsilon 6t \end{bmatrix} \quad (1)$$

It is possible to compare the F(Statistics) to the critical values of the upper and lower limits (Pesaran&Pesaran, 2009). The null hypothesis is rejected and there is co-integration between the variables if the F(Statistics) value is larger than the upper bound critical value. The null hypothesis is accepted and there is no co-integration between the variables if the F(Statistics) value is smaller than the lower bound critical amount.
In addition, the results of the computed F(statistics) values are shown in Table 4. The estimated F(statistics) values are more significant than the upper bound critical values, hence the null hypothesis that there is no co-integration is not accepted for all variables.

Table 4. Results of the Calculated F(Statistics) Test Values

Dependent Variable	SIC lag	Computed F(Statistics) Value	Result
FLGDP (LINT, LBRD, LMOB, LATMs, LBRA)	4	8.612*	Co-integrated
FLINT (LGDP, LBRD, LMOB, LATMs, LBRA)	4	7.322*	Co-integrated
FLBRD (LGDP, LINT, LMOB, LATMs, LBRA)	4	7,112*	Co-integrated
FLMOB (LGDP, LINT, LBRD, LATMs, LBRA)	4	9.661*	Co-integrated
FLATMs (LGDP, LINT, LBRD, LMOB, LBRA)	4	7.642*	Co-integrated

FLBRA (LGDP, LINT, LBRD, LMOB, LATMs)	4	6.226	Co-integrated
Critical Values of (Pesaran&Pesaran, 2009)	I(0)		I(l)
(5%)* Significance Level	4.627		5.827

The lag length is estimated using the Schwarz Information Criterion (SIC)
Source: MICRO FIT software package

The (ARDL) method examines if there is or is no co-integration among the variables, but not the direction of causality. The Granger causality test would be a vector autoregressive model in the first difference if there is no co-integration between the variables (Bekhet&Mugableh, 2016; Bekhet&Mugableh, 2012; Mugableh&Oudat, 2018). However, if co-integration among the variables has occurred, (VECM) is used to evaluate the causal linkages among the variables as in the following equation:

$$\begin{bmatrix} \Delta LGDP_t \\ \Delta LINT_t \\ \Delta LBRD_t \\ \Delta LMOB_t \\ \Delta LATMst \\ \Delta LBRA_t \end{bmatrix} = \begin{bmatrix} \beta 1t \\ \beta 2t \\ \beta 3t \\ \beta 4t \\ \beta 5t \\ \beta 6t \end{bmatrix} + \sum_{i=2}^{k=1} \begin{bmatrix} \alpha 11i\ \alpha 12i\ \alpha 13i\ \alpha 14i\ \alpha 15i\ \alpha 16i \\ \alpha 21i\ \alpha 22i\ \alpha 23i\ \alpha 24i\ \alpha 25i\ \alpha 26i \\ \alpha 31i\ \alpha 32i\ \alpha 33i\ \alpha 34i\ \alpha 35i\ \alpha 36i \\ \alpha 41i\ \alpha 42i\ \alpha 43i\ \alpha 44i\ \alpha 45i\ \alpha 46i \\ \alpha 51\ \alpha 52i\ \alpha 53i\ \alpha 54i\ \alpha 55i\ \alpha 56i \\ \alpha 61i\ \alpha 62i\ \alpha 63i\ \alpha 64i\ \alpha 65i\ \alpha 66i \end{bmatrix} \begin{bmatrix} \Delta LGDP_t - 2 \\ \Delta LINT_t - 2 \\ \Delta LBRD_t - 2 \\ \Delta LMOB_t - 2 \\ \Delta LATMst - 2 \\ \Delta LBRA_t - 2 \end{bmatrix} + \begin{bmatrix} \lambda 1t \\ \lambda 2t \\ \lambda 3t \\ \lambda 4t \\ \lambda 5t \\ \lambda 6t \end{bmatrix} [ECTt - 1] \begin{bmatrix} \varepsilon 1t \\ \varepsilon 2t \\ \varepsilon 3t \\ \varepsilon 4t \\ \varepsilon 5t \\ \varepsilon 6t \end{bmatrix}$$

(2)

Granger causality may be estimated for both the long and short terms using the (VECM). One might estimate the long-term causation by using the T(Statistics) on the lagged error correction terms (lambdait). In contrast, the F(statistics) on the lag variables (α_{ijt}) might be used to quantify short-run causality.

Table 5. The Results of the (VECM) Granger Causality (Dependent Variable is $\Delta LGDP_t$)

Variable	Short-Term Wald Test F(Statistics)		Diagnostic Tests	
	Coefficient	P(Value)	Test	Value
$\Delta LINT_t$	0.866	0.022***	Coefficient of Determination (R^2)	0.99
$\Delta LBRD_t$	0.689	0.076**		
$\Delta LMOB_t$	0.783	0.026***	F(Statistics)	796 (0.00)
$\Delta LATMs_t$	0.674	0.033***		
$\Delta LBRA_t$	0.765	0.022***		
ECT_{t-1}	**Long-Term t(Statistics)**			
	Coefficient	P(Value)	Normality Test (Jarque Bera)	4.672 (0.422)
	-0.979	0.022***		

Significant at: (10%)*, (5%)**, and (1%)*** levels
Source: EVIEWS software package

Table 5 showed the long-and short-term (VECM) Granger causality results, with the gross domestic product per capita as the dependent variable. The estimated coefficient of the lag-adjusted error correction (-0.801), starting with the long term, is statistically significant at the 1% level.
Therefore, there is a long-term causal relationship between the gross domestic product (GDP) per capita and the internet, broadband, mobile, (ATMs), and branches. There is a direct causal relationship between

all factors and (GDP) per capita in the near term. These outcomes match those attained by (Chatterjee, 2020; Cheng et al., 2021; Das et al., 2018; Idun& Aboagye, 2014; Salahuddin &Gow, 2016).
The extensive usage of (FinTech) products by society's participants promotes greater financial inclusion and Palestine's economic progress.

5. Conclusions

Using annual time series data from the World Bank, this paper attempts to determine how (FinTech) products (the number of people using the internet, the number of broadband subscriptions, the number of mobile cellular subscriptions, the number of automated transfer machines, and the number of branches) affect the economic growth in Palestine (2008 to 2021). According to the findings of the (ADFGLS) test, all variables are stable at the initial difference. The results of the (ARDL) technique show that cointegration between variables does occur and that the null hypothesis is rejected. The (VECM) results demonstrate that financial technology products have both a long-term and short-term causal relationship with both economic growth and financial development.
The conclusions have crucial policy consequences for Palestine. The Financial Technology (FinTech) and Financial Inclusion Association is a successful strategy for Palestine's economy. This policy's inability to accomplish its goal can be linked to weak financial infrastructure, insufficient financial literacy, and ineffective consumer protection rules.It is obvious that (FinTech) has assumed a significant position in the financial sector. (FinTech) has developed into a significant participant in the industry, and the added value it offers cannot be disputed. Financial institutions, in particular, must react to this appropriately. The purpose of this study is to investigate viewpoints and attitudes on the impact of (FinTech's) rise on Palestine's financial services industry in the future.
The results demonstrate that the participants' understanding and justifications of such (FinTech) vary. Despite 22% of the participants having lesser awareness, about 81% of the questioned individuals demonstrate their strong understanding of the features of fintech. Additionally, the same results indicate that Payments, peer-to-peer lending, and cloud computing will experience the highest levels of adoption in Palestine. The same findings also indicate that financial industry channels and technologies like (Blockchain, Big Data, IoT, and Robo advisors) have significant potential, but that there is still a need for more knowledge about these technologies and the difficulties that may arise after their adoption, such as data security, cyberattacks, and legal risk.
The results unambiguously show that (FinTech)can affect both the banking and financial sectors. This effect works both ways (positive and negative). Positive in that Financial Inclusion may take advantage of and benefit from the opportunities presented by the digital transition and (FinTech). Internal operating procedures may alter, financial institutions may be able to launch new business models, the products may become more transparent and efficient, and they may be able to offer more individualized and streamlined financial goods and services.On the other hand, this is unfavourable in that financial institutions continue to resist adopting new technologies and completely disregard this without implementing any sort of response strategy. As a result, financial institutions risk losing both market share and clients. And it appears that the financial sector is responding positively to the rise of (FinTech) and its potential effects.

6. Policy Recommendations of the Study

The following recommendations are made just for researchers in this field of technology and finance but also for banks and financial organizations, governments, incubators, regulators, and academic universities. Together, the sectors of banking, financial institutions, policymakers, and academic institutions should better understand this innovation to build a comprehensive national plan for the development of (FinTech) services in Palestine that are to current trends worldwide.
Palestine's banking and financial institutions could start implementing some enabling technologies and channels, such as artificial intelligence (AI), big data, blockchain, robot advisers, etc. Existing financial institutions all across the world are embracing these enabling technologies.

To adapt to this changing climate, Palestinian Financial Inclusion must engage in digital transformation. Policymakers, Banking, and Financial Institutions in Palestine should consider the risks and challenges that come with the digital era, such as cybersecurity, privacy, data sharing, etc., holistically. They must also look over these challenges and manage these risks prudently and effectively.

Palestine's banking and financial institutions require the right individuals to lead the digital transformation process. For banking and financial institutions, this will help keep them competitive in the age of (FinTech). To create sandboxes and publish legislation and instructions that enable the adoption of (FinTech) in Palestine, regulators and policymakers should collaborate with technical parties. This will increase the rate of digital transformation adoption in Palestinian financial institutions.

Palestinian banking and financial institutions must put a strong emphasis on customer service and comprehend the requirements and behaviours of the millennial generation in this digital age. They need to alter the way they interact with the clients. Creating digital goods and services with the user experience in mind rather than using the conventional technique is crucial at the same time.

7. Limitations of the Study and Suggestions for Future Studies

The study emphasized the effect of (FinTech) on economic expansion in Palestine by assessing the (ARDL) model of technique and effects. However, this harms the Palestinian economy, while on the other hand, it has a favourable effect on the country's financial stability and growth.To accomplish this goal, the period from (2008 to 2021) was selected based on the availability of data on the issues examined. The most pertinent findings, suggestions, and findings from earlier studies that dealt with the study's subject should be included.

As a result, the current study has some significant determinants, such as its reliance on prior studies, a scientific approach suitable to the study's problem, and the data analysis process. The study also used and analyzed qualitative and quantitative data from reputable official government sources, and it came to positive conclusions about the impact of (FinTech) on the economic growth in Palestine as well as on the financial development and stability of the financial system.

The conclusions and recommendations are reasonable based on the data analyzed by the authors, but another important limitation is that this study used the qualitative and quantitative methods to the data more thoroughly while the qualitative methodology was used less.The current study, which prominently highlights the facts, results, and recommendations, will be useful for future research and investigations. Furthermore, the scientific methods and strategy used in the study to address and explore the study's issue are pertinent and helpful for future research and studies, as well as for researchers who are interested in doing similar research.

The volume of incoming transfers between banks and other financial institutions, in the process of Palestinian economic growth and financial development in the state, is also one of the most significant factors in this study's significance, even though the impact was not as rapid as in other developing economies. (FinTech), which swept the globe and positively affected all developing economies.

In terms of the shortand long-term, it showed how each of the components analyzed had an impact on (FinTech) and the financial growth process in Palestine. The study proved this assertion with actual data from the current economic situation in Palestine.

The conclusions, suggestions, and concepts from the current study will thus be helpful for future research. It will assist the authors and other scholars working in this area in conducting further in-depth studies relevant to the topic and difficulty of the current study.Additionally, the conclusions of the study are limited by the quality of the data used. Moreover, there is a lack of data in this study due to a lack of available sources, and we are unable to use this data as it should be due to the length of the study. These limitations are caused by the inconsistent and inaccurate data provided by numerous government entities, private sector institutions, and even various departments in the state.

The Novelty of the Study

The study's uniqueness is centred on the innovative findings, interpretations, and recommendations that we have produced, which are helpful to national decision-makers in another way. Additionally, the study's data analysis and assessment of the qualitative and quantitative content of these data demonstrated that Financial Technology (FinTech), while not on all sectors as a whole, has had a favourable impact on the Palestinian economy. Furthermore, it should be noted that Financial Technology (FinTech) has accelerated the pace of financial development in Palestine and improved the nation's overall financial stability. Additionally, (FinTech) has aided the advancement of the nation's whole economic growth process.

Thus, the study's findingsalong with its conclusions and suggestionsshow that science has advanced significantly in recent decades. This advancement serves as a useful model for current and future research in the field and as a useful and appropriate component for decision-makers and national economic policies.

Declarations

The views, conclusions, and recommendations derived here are the narratives concluded by the authors, based on the data (Facts/Tables) derived in this paper, which do not reflect the official views and perspectives of the organizations where the authors are associated now. This study was conducted in (2022).

Data Availability Statement

The data and materials that support the findings of this study are available from the corresponding author upon request. Datasets are derived from public resources and made available to the author. Data analyzed in this study were a reanalysis of existing data, which are openly available at locations cited in the references section.

Supporting Information

No additional supporting information is available for this paper.

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