

The Impact of Financial Technological Advancement (FinTech) on the Economic Growth: Evidence from Palestine

Abstract

This study examined the impact of financial technology on economic growth in Palestine. The study used annual time series data from the Palestinian Ministry of National Economy (MoNE), the Palestinian Ministry of Finance and Planning (MoFP), as well as the Palestinian Central Bureau of Statistics (PCBS) and the Palestinian Monetary Authority (PMA), in addition to investigating the current study of the impact of FinTech on Palestinian economic development for the period (2008 to 2021). In addition, co-integration was evaluated using a distributed autoregressive approach, and a vector error correction model was used to consider long- and short-term causation. However, the data shows that FinTech products (number of people using the Internet, number of broadband subscriptions, number of mobile cellular subscriptions, number of automated transfer machines, number of branches) contribute to the growth in financial inclusion, which in turn fuels the growth economy in Palestine. Moreover, these results indicate that the (PMA) in Palestine is focusing more on expanding access to financial services. Moreover, this study aims to explore the opinions and attitudes regarding the emergence of financial technology in the future financial services industry in Palestine. The objectives of the study were also achieved by speaking to a group of managers in the banking and financial services industries, who were administrative employees from departments with technical, software and information technology departments, in addition to departments specialized in technological fields and electronic payment services. The study analysis was performed based on the objectivity of the data collected. The approach used in this study was used to produce and rank data-related results for these traits and patterns. According to the findings of the study, it is critical that existing banking and financial institutions, academic institutions, technology companies and business incubators work together to build a supportive environment for the Fintech system in Palestine. According to the results of the ADFGLS co-integration test, all variables are stable at the initial difference. The results of the ARDL technique show that the co-integration of the variables occurs and that the null hypothesis is rejected. The VECM results show that fintech products have a long-term and short-term causal relationship with both economic growth and financial development. The results indicate that financial technology in Palestine has many obstacles: rules and regulations, cybersecurity, customer distrust of digital services, etc. All of this is believed to have a direct and beneficial impact on the Palestinian economy.

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

JEL Classifications: B22, B23, G21, F65, L26, O16.

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.

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. Data Sources and materials are presented in Section 3, while Section 4 provides methodology and empirical findings. Conclusions are covered in Section 5, section 6 covers 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 Review and Hypothesis Development

2.1 Literature Review

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, (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 81% 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 businesses followed by (COVID-19) (PMoH, 2022; PMA, 2022).

There is some literature support regarding the infrastructure (Schueffel, P, 2016), regulation (Puschmann, 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, FinTech, and the government are important success factors to create a conducive environment for FinTech (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 mobility in 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 was 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 Goaid, 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 the proxies 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., et al., 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.; et al., 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.

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. & Goaid, 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. 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. Moreover, 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 62% 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.

2.2 Hypothesis Development

The financial system's main objective is to transfer money from surplus to deficit units. It facilitates economic growth by making investing and saving simpler. Additionally, the financial system links lenders and borrowers, lowering the risks associated with money transactions. The financial system reduces transaction costs and information asymmetry as a result.

The time and money required to match borrowers and lenders, as well as any associated legal charges, are considered transaction costs. Information asymmetry is the term used to describe how lenders and borrowers get information in different ways. Financial institutions also provide corporate governance and supervision, both of which support economic expansion (PMA, 2022).

However, increasing expenses and risk-taking are typically a problem for the traditional financial system, which leads to financial crises. Because fintech makes extra difficult tasks like consumer testing, risk assessment, and information exchange simpler, its rise may successfully reduce transaction costs and relieve the issues of information asymmetry (PMA, 2021).

This encourages entrepreneurship, commerce, household consumption, financial development, financial inclusion, and household income, all of which are proxies for economic growth, hence the following is our hypothesis:

Hypothesis 1 (H1). FinTech has a favourable effect on Palestine's economic growth.

FinTech can hinder the expansion of the economy. FinTech platforms receive funding as it grows from the actual economy. This might lead to financial hoarding, which would decrease domestic credit availability, exacerbate the financial crisis, and impede economic development by reducing investment and production. FinTech, for instance, was shown to reduce the positive correlation between bank capitalization and deposit growth. Additionally discovered, FinTech hinders banks' liquidity (PMA, MoNE, 2022). As a result, we speculate:

Hypothesis 2 (H2). FinTech has a detrimental effect on Palestine's economic growth.

FinTech's effects on economic growth in Palestine's various provinces and areas might vary widely. For instance, compared to all areas in Palestine, all regions have advanced FinTech development. As a result, there may be a rise in employment and investment in all areas in Palestine, while there may be a decrease in the influence of FinTech on economic growth in Palestine (PMA, MTIT, 2021). Additionally, the growing impact of FinTech is influenced by several variables, including employment, investment, and financial development. In comparison to the other areas in Palestine, these elements are more developed in the central areas. These elements support extending FinTech's economic growth spillover impact (PMA, MoFP, 2022). As a result, compared to the western areas in Palestine, which have comparatively lower levels of financial development, investment, and employment, the eastern and central areas may see faster economic growth. As a result, the following conclusion is reached:

Hypothesis 3 (H3). Depending on the cities and areas, different FinTech developments have varying effects on economic growth in Palestine.

3. Materials and Method

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 for the sample period of the other variables such as internet (INT), broadband (BRD), mobile (MOB), automated teller machines (ATMs), branches (BRA) for the period from (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 (2008 to 2021)

Variables	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 (BRD)	Fixed Broadband subscriptions (per 100 people)	56	48.6	26.2	188	0.11
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

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 Co-integration Test (with Trends and Constants)

Variable	ADFGLS stat	Variable	ADFGLS stat	I(d)
LGDP _t	-4.3260	ΔLGDP _t	-6.2367*	I(1)
LINT _t	-4.7623	ΔLINT _t	-9.6324**	I(1)
LBRD _t	-4.2369	ΔLBRD _t	-7.3324*	I(1)
LMOB _t	-4.8791	ΔLMOB _t	-9.7762**	I(1)
LA TM _{st}	-4.6626	ΔLATM _{st}	-7.6776***	I(1)
LBRA _t	-4.9822	ΔLBRA _t	-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 co-integration 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:

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

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. There is no co-integration between the variables if the F(Statistics) value is smaller than the lower bound critical amount.

Empirical Results

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(1)
(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:

$$\begin{bmatrix} \Delta LGDP_t \\ \Delta LINT_t \\ \Delta LBRD_t \\ \Delta LMOB_t \\ \Delta LATM_{st} \\ \Delta LBRA_t \end{bmatrix} = \begin{bmatrix} \beta_{1t} \\ \beta_{2t} \\ \beta_{3t} \\ \beta_{4t} \\ \beta_{5t} \\ \beta_{6t} \end{bmatrix} + \sum_{i=2}^k \begin{bmatrix} \alpha_{11i} & \alpha_{12i} & \alpha_{13i} & \alpha_{14i} & \alpha_{15i} & \alpha_{16i} \\ \alpha_{21i} & \alpha_{22i} & \alpha_{23i} & \alpha_{24i} & \alpha_{25i} & \alpha_{26i} \\ \alpha_{31i} & \alpha_{32i} & \alpha_{33i} & \alpha_{34i} & \alpha_{35i} & \alpha_{36i} \\ \alpha_{41i} & \alpha_{42i} & \alpha_{43i} & \alpha_{44i} & \alpha_{45i} & \alpha_{46i} \\ \alpha_{51i} & \alpha_{52i} & \alpha_{53i} & \alpha_{54i} & \alpha_{55i} & \alpha_{56i} \\ \alpha_{61i} & \alpha_{62i} & \alpha_{63i} & \alpha_{64i} & \alpha_{65i} & \alpha_{66i} \end{bmatrix} \begin{bmatrix} \Delta LGDP_{t-2} \\ \Delta LINT_{t-2} \\ \Delta LBRD_{t-2} \\ \Delta LMOB_{t-2} \\ \Delta LATM_{st-2} \\ \Delta LBRA_{t-2} \end{bmatrix} + \begin{bmatrix} \lambda_{1t} \\ \lambda_{2t} \\ \lambda_{3t} \\ \lambda_{4t} \\ \lambda_{5t} \\ \lambda_{6t} \end{bmatrix} [ECT_{t-1}] \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \\ \varepsilon_{6t} \end{bmatrix}$$

(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 (lambda it). In contrast, the F(statistics) on the lag variables (α_{ij}) 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) F(Statistics)	0.70 796 (0.00)
$\Delta LBRD_t$	0.689	0.076**		
$\Delta LMOB_t$	0.783	0.026***		
$\Delta LATM_{st}$	0.674	0.033***		
$\Delta LBRA_t$	0.765	0.022***		
ECT_{t-1}	Long-Term t(Statistics)			
	Coefficient	P(Value)	Normality Test	4.672 (0.422)
	-0.979	0.022***	(Jarque-Bera)	

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; Idu & 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. Discussion and conclusion

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 co-integration 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. 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:

- 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.
- 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 swept the globe and positively affected all developing economies.

In terms of the short and 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 findings along with its conclusions and suggestions show 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.

References

- Abdo, S. D., & Ayman, D. (2010). The effect of the global financial crisis on migrant workers among MENA countries. *International Conference on Economic Modeling*.
- Al-Siraj, Hussein, "Impact of the Global Financial Crisis on the Egyptian Exports", *Arab Economic Journal*, No, 18-19, 2010.
- Altig, D., Baker, S. R., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., & Mizen, P. (2020). Economic uncertainty before and during the Covid-19 pandemic (No. w27418). *National Bureau of Economic Research*.
- Arnon, A and Spivak, A. (1994). Economic Pros and Cons of Introducing a Palestinian Currency. *Monaster Center for Economic Research*, Ben-Gurion University.
- Atkeson, A. (2020). What will be the economic impact of covid-19 on us? rough estimates of disease scenarios (No. w26867). *National Bureau of Economic Research*.
- Awad I, Al-Ewesat, A. (2017). Volatility Persistence in Palestine Exchange Bulls and Bears: An Econometric Analysis of Time Series Data. *Review of Economics and Finance*. 9:83–97

- Awad I, Hallam A, Alialhuseen, M. (2017). Testing the validity of Okun's rule of thumb across Palestine and Israel. *Rev Appl Econ* 13:1–2
- Badwan N.L. (2019). Influence of the movement of financial capital on economic growth in Palestine // *Finance and Credit*. - 2019. - Vol. 25, №. 10. - P. 2250 - 2265. <https://doi.org/10.24891/FC.25.10.2250>.
- Badwan, N. (2021). The Impact of Capital Flight on Economic Growth and Financial Stability in Palestine / N. Badwan // *Asian Journal of Economics, Business and Accounting*. – 2021. – 21 (11). – pp. 85-101. DOI: <https://doi.org/10.9734/ajeba/2021/v21i1130446>
- Badwan, N. (2021). The Relationship of Economic Growth and Foreign Direct Investment on Financial Development: Empirical Evidence from Palestine / N. Badwan // *Asian Journal of Economics, Business and Accounting*. – 2021. – 21 (20). – pp. 14-35. DOI: <https://doi.org/10.9734/ajeba/2021/v21i2030508>
- Badwan, N., Atta, M. (2019). Empirical Investigation of Capital Flight and Illicit Financial Flows, Economic Growth in Palestine. / N. Badwan, M. Atta // *Journal of Economics, Management and Trade*. – 2019. – 25 (5). – pp. 1-15. DOI: [10.9734/jemt/2019/v25i530207](https://doi.org/10.9734/jemt/2019/v25i530207).
- Badwan, N., Atta, M. (2020). The Impact of International Capital Flows on Economic Growth in Palestine. / N. Badwan, M. Atta // *Journal of Economics, Management and Trade*. – 2020. – 26 (11). – pp. 23-37. DOI: [10.9734/jemt/2020/v26i1130307](https://doi.org/10.9734/jemt/2020/v26i1130307)
- Badwan, N., Awad, S., & Jbara, L. (2022). The Effects of Education and Sustainable Development on the Palestinian Economy and Business Student Behaviour / N. Badwan, S. Awad, L. Jbara / *South Asian Journal of Social Studies and Economics*. – 15 (1). – pp. 29-52. DOI: <https://doi.org/10.9734/sajsse/2022/v15i130397>
- Badwan, N.L. (2017). Increasing the Efficiency of the State Fiscal and Budgetary Policy in Modern Conditions / N.L. Badwan / N M. Blazhenkova / E V. Klicheva / A K. Karaev / R.R. Yarullin // *International Journal of Applied Business and Economic Research*. – 2017. – Vol. 15. – IS. 22. – pp. 125-138.
- Badwan, N.L. (2017). The impact of common problems between the sectors of industry and capital and ways of their solutions in the Russian Federation / N.L. Badwan // *Journal of Sciences and Research Publishing*. – 2017. № 1. – (5). – pp. 19-39.
- Badwan, N.L. (2019). Cognitive Modeling for the Intellectual System of Supporting Decision Making on Regulating Reproduction and Accumulation of Financial Capital / N.L. Badwan, G.V. Gorelova // *International Research Journal of Finance and Economics*. – 2019. – IS. 175. – pp. 70-82.
- Badwan, N.L. (2019). Cognitive Modeling of Sustainability of the Russian Financial Market / N.L. Badwan, E.A. Panfilova // *International Journal of Financial Research*. – 2019. – Vol. 10. – № 6. – pp. 133-145.
- Badwan, N.L. (2022). Perspective Chapter International Financial Markets and Financial Capital Flows: Forms, Factors and Assessment Tools / N.L. Badwan // In: Ibrahim, M. J., editor. *Macroeconomics [Working Title] [Internet]*. London: *Intech Open*; 2022 [cited 2022 Mar 04]. Available from: <https://www.intechopen.com/online-first/80683> DOI: <https://doi.org/10.5772/intechopen.102572>
- Badwan, N.L. (2022). The Impact of Global Financial Crisis on the Palestinian Economy / N. Badwan // *Asian Journal of Economics, Business and Accounting*. – 22 (7). – pp. 85-106. DOI: <https://doi.org/10.9734/ajeba/2022/v22i730581>
- Barro, R, Ursua, J., & Weng, J., (2020). The coronavirus and the Great Influenza Pandemic: lessons from the Spanish flu for the coronavirus' potential effects on mortality and economic activity, *NBER Working*.
- Bashir, Z. (2003). Effects of economic reforms on agriculture and agricultural trade in India and Pakistan. Macquarie University (*division of economic and financial studies, Department of Economics*), pp 101–119.
- Batrancea I., Rathnaswamy M.K., Batrancea L., Nichita A., Gaban L., Fatacean G., Tulai H., Bircea I., Rus M.-I. (2020). A Panel Data Analysis on Sustainable Economic Growth in India, Brazil, and Romania. *Journal of Risk and Financial Management*. 13 (8), 170; DOI: [10.3390/jrfm13080170](https://doi.org/10.3390/jrfm13080170)

- Batrancea, I.; Batrancea, L.; Maran Rathnaswamy, M.; Tulai, H.; Fatacean, G.; Rus, M.-I. Greening the Financial System in the USA, Canada and Brazil: A Panel Data Analysis. *Mathematics*. 2020, 8, 2217.
- Batrancea, L., Rathnaswamy Malar, M., Batrancea, I., Nichita, A., Rus.M.I, Tulai, H., Fatacean, G, Masca, E.S., Morar, I. D. (2020) Adjusted Net Savings of CEE and Baltic Nations in the Context of Sustainable Economic Growth: A Panel Data Analysis. *J. Risk Financial Manag.* 2020, 13, 234.
- Bekhet, H.A. & Mugableh, M.I. (2012). Investigation equilibrium relationship between macroeconomic variables and Malaysian stock market index through bounds tests approach. *International journal of economics and finance*, 4 (10), 69-81.
- Bekhet, H.A. & Mugableh, M.I. (2016). Blueprinting the equilibrium relationships between inward FDI and employment in the Malaysian economic sectors: time series models' approach. *Global Business & Economics Review*, 18(2), 136–150.
- Ben-Naceur, E. A., De Groen, W. P., & Ayadi, R. (2013). Financial development, Bank efficiency and economic growth across the Mediterranean. Retrieved 1 5, 2014, from www.medpro-foresight.eu
- Bernini, C. & Brighi, P. (2017). Bank branches expansion, efficiency and local economic growth. *Regional Studies*, 52(10), 1332 - 1345.
- Boissay, F. & Rungcharoenkitkul, P. (2020). Macroeconomic effects of Covid-19: an early review. *Bank for International Settlements Bulletin*. ISBN: 978-92-9259-369-8.
- Campello, M., Graham, J., & Harvey, R. C. (2009). *The real effects of financial constraints: Evidence from a financial crisis*. Retrieved from <http://www.nber.org/paper/w15552>. (Accessed: 17 July 2022).
- Caporalea GM, Collic SD, Robe Salvoc RD, Lopez JS. (2016). Local banking and local economic growth in Italy: some panel evidence. *Applied Economics*, 48(28):2665–2674.
- Carby Y, Craigwell R, Wright A, Wood A. (2012). Finance and growth causality: a test of Patrick's stage-of-development hypothesis. *International Journal of Business and Social Sciences*, 3(21):129–139.
- Cecchetti SG, Kharroubi E. (2012). Reassessing the impact of finance on growth. *BIS working papers*, n. 381.
- Chatterjee, A. (2020). Financial inclusion, information and communication technology diffusion, and economic growth: a panel data analysis. *Information Technology for Development*, 26(3), 607-635.
- Chen, H., Xu, W., Paris, C., Reeson, A., & Li, X. (2020). Social distance and SARS memory impact public awareness of the 2019 novel coronavirus (COVID-19) outbreak. *Med Rxiv*.
- Cheng, C., Chien, M. & Lee, C. (2021). ICT diffusion, financial development, and economic growth: an international cross-country analysis. *Economic Modelling*, 94.
- Shkarlet, S., Dubyna, M. Zhuk, O. (2018). Determinants of the financial services market functioning in the era of the informational economy development. *Baltic Journal of Economic Studies*, 4(3), 349-357.
- Das, A., Chowdhury, M. & Seaborn, S. (2018). ICT diffusion, financial development and economic growth: new evidence from low and lower-middle-income countries. *Journal of the knowledge economy*, 9, 928-947.
- development in CO2 emissions and economic growth. *Environmental Science and Pollution Research*, 27, 1912–1922.
- Salahuddin, M. & Gow, J. (2016). The effects of Internet usage, financial development and trade openness on economic growth in South Africa: A time series analysis. *Telematics and Informatics*, 33(4), 1141-1154.
- Dickey, D.A., Fuller, W.A. 1979. Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74 (366), 427-431.
- Diop, S., & Asongu, S. A. (2020). The Covid-19 Pandemic and the New Poor in Africa: The Straw that Broke the Camel's Back, *African Governance and Development Institute*. Working Paper, No. 20/038, Yaoundé.
- Dong, J.; Yin, L.; Liu, X.; Hu, M.; Li, X. Impact of internet finance on the performance of commercial banks in China. *International Review of Finance*. Anal. 2020, 72, 101579. [CrossRef].

- Economic and Social Commission for Western Asia (Escwa). (2009). *The impacts of the financial crisis on Escwamember countries: Challenges and opportunities*. Retrieved from <http://www.un.org/regionalcommissions/crisis/escwacri3.pdf>. (Accessed: 13 July 2022).
- Economic Studies, 4(3), 349-357.
- Usman, M., Jahanger, A., Makhdum, M.S.A., Balsalbre-Lorente, D. & Bashir, A. (2022). How do financial development, energy consumption, natural resources, and globalization affect Arctic countries' economic growth and environmental quality? An advanced panel data simulation. *Energy*, 241.
- Ekone MS. (2010). Money supply - economic growth Nexus in Nigeria. *Kamla-Raj, Journal of Social Sciences*, 22(3):199–204
- El-Jafari, Mahmoud and Yousef Daoud, *Palestinian Capacity, United Nations Conference on Trade and Development*, 2010, forthcoming.
- El-Jafari, Mahmoud, “Determinants and Consequences of Remittances. The Case of Palestine”, *Journal of Economic Cooperation*, forthcoming.
- El-Jafari, Mahmoud, “Possibilities of Promoting Trade and Employment Under Siege: The Case of the EU – Palestine Partnership and Cooperation”, *Journal of World Investment and Trade*, Vol 8, No.5, 2001.
- El-Jafari, Mahmoud, *Palestine Trade Policies: Options and Alternatives, Palestine Economic Policy Research Institute*, Ramallah, 2002. empirical evidence. 1(3):42–48.
- Engle R and Granger C. (1987). Cointegration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55: 251–276.
- Engle, R.F., & Granger, C.W.J. (1987). Cointegration and error correction representation: estimation and testing. *Econometrica*, 55, 251–276.
- European Economic Forecast Winter (2018) (Interim), European Commission, ISSN 2443–8014 (online)
- European Economy. (2009). *The Impact of the Global Crisis on Neighbouring Countries of the EU Countries of the EU*, Occasional Papers 48, Directorate-General for Economic and Financial Affairs. Retrieved from http://ec.europa.eu/economy_finance/publications
- Fornaro, L., & Wolf, M. (2020). Covid-19 coronavirus and macroeconomic policy. *Barcelona GSE, Working Paper Series*, No 1168, pp 1-10.
- Fosu SB. (2013). Financial Development and Economic Growth in Africa: A Dynamic Causal Relationship. *The University of New Hampshire*, pp 45–53.
- Gorelova, G.V., Badwan N.L. (2018). Intersectoral movement of financial capital // *Bulletin of ASU*. – issue 2. (220). – 2018. – pp. 132-143.
- Granger C. (1981). Some properties of time series data and their use in econometric model specification. *Journal of Economics*, 16(1):121–130.
- Greene W. (2012). *Econometric analysis*, 7th edn. Prentice-Hall, Upper Saddle River
- Guttentag MJ. (2011). Financial development and economic growth: the Bolivian case. *The University of Manchester Hargreaves C. (1994). A review of methods of estimating Cointegrating relationships. Oxford University Press Inc., New York*
- Guo, P.; Shen, Y. (2016) The impact of Internet finance on commercial banks' risk-taking: Evidence from China. *China Finance and Economics Review*. 2016, 4, 16. [CrossRef].
- Hodrob Rami (2017). The Impact of Foreign Direct Investment on Palestinian Economic Growth. *International Journal of Economics and Financial Issues*. 2017. 7 (4), 550-557.
- Hou, X.; Gao, Z.; Wang, Q. Internet finance development and banking market discipline: Evidence from China. *Journal of Finance and Stability*. 2016, 22, 88–100. [CrossRef].
- Hurd, D. M., & Rohwedder, S. (2009). *Effects of the financial crisis and great recession on American households*. Retrieved from <http://www.nber.org/paper/w16407>
- Hussien, A. (2009). Impact of the global financial crisis on the Egyptian economy. *Munich Personal RePEc Archive (MPRA)*.
- Idun, A.A. & Aboagye, Q.Q.A. (2014). Bank competition, financial innovations and economic growth in Ghana. *African Journal of Economic and Management Studies*, 5(1), 30-51.

- IMF, *Macroeconomic and Fiscal Framework for the West Bank and Gaza Fourth Review of Progress*, 2009. *Informatics*, 33(4), 1141-1154.
- Insights, C. (2019). The Global Fintech Report: Q3'17.
- International Monetary fund (IMF), *Macroeconomic and Fiscal Framework for the West Bank and Gaza: Fifth Review of Progress*, 2010.
- Johansen S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics Control*, 12:231–254.
- Johansen S, Juselius K (1990) Maximum likelihood estimation and inferences on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52:169–210
- Johansen, S. & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration — with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52(2), 169–210.
- Jordaan, A. C. (2010). Financial sector development and economic growth in Botswana: a causality analysis. Retrieved 2014, *the University of Pretoria*.
- Kim, Y., et al. (2015). An Empirical Study on the Adoption of “Fintech” Service: Focused on Mobile Payment Services. *Advanced Science and Technology Letters*, 114, 136-140.
- KS, Sailaja K, Demissie WM. (2012). The long-run impact of Bank credit on economic growth in Ethiopia: evidence from Johansen’s multivariate Cointegration approach. *European Journal of Business and Management*, 4(14):20–33.
- Labour Force Survey. (2014). Annual Report: 2014. State of Palestine Palestinian Central Bureau of Statistics, Ramallah
- Liang, F., & Huang, W. (2011). The relationship between money supply and the GDP of the United States. Retrieved 2014, from *Hong Kong Baptist University*, www.hkbu.edu.hk/eng
- Lessons from the MENA region. *Telecommunication Policy*, 37(4-5), 252-261.
- Li, G. & Wei, W. (2021). China has financial development, openness, innovation, carbon emissions, and economic growth. *Energy Economics*, 97.
- Liu, Y., Luan, L., Wu, W., Zhang, Z. & Hsu, Y. (2021). Can digital financial inclusion promote China’s economic growth? *International Review of Financial Analysis*, 78.
- Lucas R. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1):3–42.
- MA thesis Gonzalo J. (1994). Five alternative methods of estimating long-run equilibrium relationships. *Journal of Economics*, 60(1–2):203–233.
- Maduka AC, Onwuka KO. (2013). Financial market structure and economic growth: evidence from Nigeria data. *Asian Economics and Finance Review*, 3(1):75–98.
- Martins, G. M. (2020). On the concept of health capital and the demand for health. *Journal of Political Economy*. 80(2), 223-255.
- MAS - Palestine Economic Policy Research Institute. *Economic Monitor*, various issues. 2021.
- MAS - World Bank. (1997). Development under Adversity? *The Palestinian Economy in Transition*.
- Masih M, Al-Elg A, Madani H (2010) Causality between financial development and economic growth: an application of vector error correction and variance decomposition methods to Saudi Arabia. *Applied Economics*, 41(13):1691–1699.
- Meifang, Y.; He, D.; Xianrong, Z.; Xiaobo, X. (2018). Impact of payment technology innovations on the traditional financial industry: A focus on China. *Technol. Forecast. Soc. Change* 2018, 135, 199–207. [CrossRef].
- Ministry of Finance and Planning. The State of Palestine. (2021) *Financial Reports*. <http://www.pmf.ps/pmf/en/index.php>. (Accessed: 11 July 2022).
- Ministry of National Economy. The State of Palestine. (2021). *The economy of Palestine*. <http://www.mne.gov.ps/DesktopDefault.aspx?lng=1>. (Accessed: 13 July 2022).
- Ministry of Telecom & Information Technology, State of Palestine. (2021). Facts and Numbers. <https://www.mtit.pna.ps/>. (Accessed: 11 July 2022)

- Ministry of Transport and Communications, 2021. Monthly Vehicle Registration Data, 2008-2021. Ramallah, Palestine.
- Mohamed Sghaier, I., Abida, Z. (2013). Foreign Direct Investment, Financial Development and Economic Growth: Empirical Evidence from North African Countries. *Journal of International and Global Economic Studies*, 6 (1), 1-13.
- Naqib, Fadel Toward a Palestinian Development Vision, *Palestine Economic Policy Research Institute*, Ramallah, 2003.
- Nasir NM, Ali N, Khokhar I. (2014). Economic growth, financial depth and lending rate Nexus: a case of oil-dependent economy. *International Journal of Financial Research*, 5(2):59–68
- Ndlovu G (2013) Financial sector development and economic growth: evidence from Zimbabwe. *International Journal of Economics and Finance*, Issues 3(2):435–446 NY: Oxford University Press.
- Ogundele, K. (2020). Updated: FG Places Travel Ban on China, Italy, US, UK, Nine Others. *The Punch*, March 18, 2020.
- Ozili, P.K. & Arun, T.G. (2020). Spillover of COVID-19: Impact on the Global Economy. *Working paper*.
- Palestine Economic Monitor Issue 66, Second Quarter, 2021.
- Palestine Economic Policy Research Institute (MAS) Comprehensive Response to Socio-Economic Impacts of The Covid-19 Pandemic in Palestine Under Occupation: Pillar Three: *Resilient Communities and Access to Key Services*, Ramallah -Palestine.
<http://www.mas.ps/files/server/2021/main%20services%203%20a.pdf>. (Accessed: 16 July 2022).
- Palestine Forum for Israeli Studies – *Madar, Strategic Report*, Ramallah, 2010.
- Palestine Monetary Authority (PMA) & Palestinian Capital Market Authority (PCMA) (2017): Financial Inclusion Study in Palestine. Available at: http://fsd-mena.org/wp-content/uploads/2019/01/FI-Study-Summary_en-1.pdf
- Palestine Monetary Authority (PMA), P. M. (2016). Statistics Time series data. Retrieved 2016, <http://www.pma.ps/>
- Palestine Monetary Authority (PMA). (2020) *Economic Forecast Reports*, <http://www.pma.ps/Default.aspx?tabid=509&language=en-US>. (Accessed: 16 July 2022).
- Palestinian Central Bureau of Statistics (PCBS) (2016): http://www.pcbs.gov.ps/site/lang_en/1/default.aspx
- Palestinian Central Bureau of Statistics (PCBS). (2022) *Statistics & Publications*, <http://www.pcbs.gov.ps/default.aspx>. (Accessed: 20 July 2022).
- Palestinian Central Bureau of Statistics 2022, Quarterly Balance of Payments Statistics, 2000-2021. Ramallah, Palestine.
- Palestinian Ministry of Health (PMoH). (2022). <https://www.moh.gov.ps/portal/health-report/>
- Palestinian Ministry of Higher Education and Scientific Research (PMoHE&SR). (2022). Reports. <https://www.mohe.pna.ps/>
- Palestinian Monetary Authority (PMA), *Annual Report of 2009*, 2010.
- Parkin M. (2012). Economics, p. 37, 10th edn. *Addison-Wesley*, Ontario
- PCBS. (2021). Quarterly National Accounts Statistics, 2000-2021. Ramallah, Palestine.
- PCBS and PMA 2021, IIP and Quarterly External Debt Statistics, 2008-2021. Ramallah, Palestine.
- PCBS. (2021). Economic Environmental Survey, 2021. Ramallah, Palestine.
- Pesaran, B. & Pesaran, M.H. (2009). Time Series Econometrics using Microfit 5.0. New York,
- Pesaran, M.H., Shin, Y. & Smith, R.J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289–326.
- PMA. (2021). PMA Business Cycle Index, 2019-2021. Ramallah, Palestine.
- Precious C, Palesa MK (2014) Impact of Monetary policy on economic growth. *Mediterr Journal of Social Sciences*, 5(15):76–84
- Presidential Task Force. (2020). Implementation Guidance for Lockdown Policy. Abuja, Nigeria: Presidential Task Force. relationships. *Journal of Applied Econometrics*, 16, 289–326.
- Puschmann, T. (2017). FinTech. *Business & Information Systems Engineering*. 59, 69-76.

- Raed W. Rajab (2015): Assessment of Palestinian Policies to Facilitate Access to Finance for MSMEs. Available at: https://pfesp.ps/uploads/Assessment_of_Palestinian_Policies_to_Facilitate.pdf. (Accessed: 21 July 2022).
- Raheem, I.D., Tiwari, A.K. & Balsalobre-Lorente, D. (2020). The role of ICT and financial development in CO2 emissions and economic growth. *Environmental Science and Pollution Research*, 27, 1912–1922.
- Sami J (2013). Remittances, banking sector development and economic growth in Fiji. *International Journal of Economics and Financial Issues*, 392:503–511
- Sassi, S. & Goaid, M. (2013). Financial development, ICT diffusion and economic growth: Lessons from MENA region. *Telecommunication Policy*, 37(4-5), 252-261.
- Schueffel, P. (2016). Taming the Beast: A Scientific Definition of Fintech. 4, 32–54.
- Schumpeter JA (1939). Business cycles: a theoretical, Historical, and Statistical Analysis of the Capitalist Process, pp 1–20 Schumpeter JA (1954) *History of economic analysis*. Oxford University Press, New York, p 111
- Shaw E (1973). Financial deepening in economic development. Oxford University Press, New York.
- Simwaka KT. (2012). Financial development and economic growth in Malawi: an empirical analysis. *Banks and Bank Syst* 7(3):85–96
- Shen, Y., Hu, W. & Hueng, C.J. (2021). Digital financial inclusion and economic growth: a cross-country study. *Procedia Computer Science*, 187.
- Slavin SL (2009) *Macroeconomics*, ninth edition. 10020.: McGraw-Hill Companies, Inc, New York, p 390
- Soininen, J., Puumalainen, K., Sjögrén, H., & Syrjä, P. (2012). The impact of the global economic crisis on SMEs. *Management Research Review*.
- Song, N.; Appiah-Otoo, I. (2022) The Impact of Fintech on Economic Growth: Evidence from China. *Sustainability*. 2022,14,6211. <https://doi.org/10.3390/su14106211>
- Sweeney, D. (2015). What is Fintech and what does it mean for small businesses?
- Taha Z, Anis O, Hassen S (2013). Banking intermediation and economic growth: some evidence from MENA countries. *Advances in Management and Applied Economics*, 3(4):51–57
- Timsina N, Pradhan RS (2016). Effects of Bank lending on economic growth in Nepal. *Journal of Advanced Academic Research*. 3:53–75
- UNCTAD (2022): Integrated Simulation Framework - II Model for Palestinian Economic Policy: https://unctad.org/system/files/official-document/gdsapp2022d1_en.pdf. (Accessed: 20 July 2022).
- UNCTAD. (2003). Foreign Direct Investment and Performance Requirements: New Evidence from Selected Countries. *United Nations Publications*, Switzerland.
- UNCTAD. (2018). World Investment Report (2018): Investment and new Industrial policies. *United Nations Publications*, New York.
- UNCTAD. 2021. World Investment Report (2019): Special Economic Zones. *United Nations Publications*, New York.
- Unicef. (2021). *Impact of the economic crisis and food and fuel price volatility on children and women in the MENA region*. ODI Working Papers 310. Retrieved from <http://www.odi.org.uk/resources/details.asp?id=4422&title=economic-crisis-food-prices-fuel-children-women-mena>. (Accessed: 22 July 2022).
- United Nations Conference on Trade and Development (UNCTAD) (2007). *UNCTAD World Development Report*. www.unctad.org/wir-UNCTAD/WIR/2007. (Accessed: 22 July 2022).
- United Nations Conference on Trade and Development (UNCTAD) (2009). *UNCTAD World Development Report*. <https://unctad.org/WorldInvestmentReport2009>. (Accessed: 26 July 2022).
- United Nations Conference on Trade and Development (UNCTAD), *Policy Alternative for Sustained Palestinian Development and State Formation*, Geneva, 2009.
- Wong, Z., Li, R., Zhang, Y., Kong, Q. & Cai, M. (2021). Financial services, spatial agglomeration, and the quality of urban economic growth—based on an empirical analysis of 268 cities in China. *Finance Research Letters*, 43.

- World Bank (2021): Gaza Rapid Damage and Needs Assessment. <https://documents1.worldbank.org/curated/en/178021624889455367/pdf/Gaza-Rapid-Damage-and-Needs-Assessment.pdf>
- World Bank (2021). World Development Indicators 2021 on CD- ROM, *World Bank*, Washington.
- World Bank (2022). Financial and economic indicators of Palestine, available online at: <https://data.worldbank.org/country/JO>, (Accessed: 12 August 2022).
- World Bank, (1985). World Development Report 1985: International Capital and Economic Development. New York: *World Bank*; New York: Oxford University Press.
- World Bank, (1985). World Development Report 1985. Washington, D.C. *World Bank*.
- World Bank, (1985). World Development Report, Washington DC: *World Bank*. (Accessed: 26 July 2022).
- World Bank, (1994). Developing the Occupied Territories, vol. 2. *Private Sector Development*.
- World Bank, (2010). World development indicators & global development finance. Available from: <http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2010> (Accessed: 22 July 2022).
- World Bank, (2021). World development indicators & global development finance. Available from: <http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2020> (Accessed: 28 July 2022).
- World Bank. 2001. Global Development Finance 2001. *Oxford University Press*, New York.
- Yazdi SK, Khanalizadeh B (2013). The financial development and agriculture growth in Iran: ARDL approach. Recent advances in energy, *environment and financial planning*, ISBN: 978-960-474-400-8, pp 335–342
- Younas, Z.I., Qureshi, A. & Al-Faryan, M.A.S. (2022). Financial inclusion, the shadow economy and economic growth in developing economies. *Structural Change and Economic Dynamics*, in press.