THE ROLE OF FINANCIAL TECHNOLOGY IN PROMOTING FINANCIAL INCLUSION, WITH REFERENCE TO THE CASE OF ALGERIA

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Abstract: This research paper aims to identify the concepts of financial inclusion and its relationship to financial technology in terms of its contribution to creating products that serve digital financial transformation and increase the ownership of individuals and institutions of financial and bank accounts, to achieve sustainable development and combat poverty, by presenting some indicators of financial inclusion in Algeria During the study period 2016-2021, using the descriptive analytical approach.
The study concluded that indicators of financial inclusion know a slow development according to the data available from the World Bank data, and this is due to the weak financial culture, weak infrastructure, and the gradual shift from the traditional economy to the digital economy. The study recommends that efforts be made to digitize the financial and banking sector in Algeria, benefit from financial technology products, work on developing computer programs and make them available, and develop network readiness indicators.
Key words: Financial inclusion; Financial technology (Fintech); Algeria; ATM.
Jel Classification Codes : G20, G21, O47, O11.

1.Introduction

Since the early 2000s, the concept of financial inclusion has attracted attention from governments and central banks worldwide for its contribution to the goal of economic and financial developments. Greater entry to formal financial services in households and firms' levels in both developing and developed countries helps to reduce poverty and foster economic positions. Simultaneously, in the aftermath of the 2007-2009 global financial crisis, financial stability issue has emerged and gained interests from researchers and policy makers across the globe due to the realization of mitigating systemic financial risk and enhancing financial stability to the strategy of sustainable developments of countries (PHAM & DOAN, 2020, p. 47)

Many central banks, financial regulators, and ministries of finance in emerging and developing economies are concerned about collecting savings in order to employ them in profitable development project. Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way (world bank, 2022).
Technology advancements in the area of financial services are oriented towards, delivering an enhanced user experience to the customers. This is one of the fundamental reasons for the evolution of financial technology. From the inception of such powerful field of study, its dynamics and growth are being tracked down all over the world.

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Algeria, like other developing countries, is striving to integrate into the digital economy, and its financial and banking institutions are working to provide advanced banking services, through financial literacy and marketing for its banking services.

From the above, we see the following problem:

-What is the reality of financial inclusion and financial technology in Algeria?

To answer the main question, we ask the following sub-questions:

- What is the concept of financial inclusion and what are its indicators?
- What is the concept of financial technology and its relationship to financial inclusion?

1.1 Study hypotheses:

- Financial inclusion is an enabling factor for reducing extreme poverty and promoting common prosperity. It is one of the main goals of developing countries.
- Algeria lags behind in terms of levels of financial inclusion in most indicators.

1.2 Research importance

The importance of this research stems from the knowledge of the development in financial technology that swept the world, as the financial innovations provided through them contributed to raising the performance of financial and banking institutions by improving the quality of services provided to clients, and this is what makes financial technology a necessary requirement that should be adopted today in the financial sector and the banking in light of the changes in financial and banking transactions in the world.

1.3 Research aims:

This research paper aim to identify the concepts of financial inclusion and its relationship to financial technology in terms of its contribution to creating products that serve digital financial transformation and increase the ownership of individuals and institutions of financial and bank accounts, that can be used to achieve sustainable development and fight poverty. And the measurement of these indicators on Algeria.

1.4. Research methodology

The study relied on the descriptive approach, with the aim of defining the conceptual framework for financial inclusion and some of its indicators, in addition to highlighting the relationship between financial technology and its role in promoting financial inclusion, with reference to the case of Algeria in some indicators.

Literature Review

According to most empirical studies, financial inclusion leads to increased economic growth and a more stable banking system (Habib & AK MD, 2016).

The impact of financial development and financial innovations on the economy and financial system has been the subject of theoretical and empirical research in recent decades (GHaith N, Al-Own, & Bani-Khalid, 2022)

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

David Mhlanga,2022

The problem of the study aimed to answer the following question, what is the role played by financial technology in facing the challenges or risks associated with climate change in the Fourth Industrial Revolution? The study finds that financial inclusion from FinTech can help with the resilience of households, individuals and businesses in the event of a rapid weather event or the gradual effects of changing precipitation patterns, rising sea levels or saltwater incursion. Insurance, savings, credit, money transfers, and new digital distribution channels can help victims of climate change and those responsible for dealing with new environmental realities. As a result, the study recommends promoting financial inclusion through financial technology as one of the channels that can help manage the risks of climate-related concerns and achieve sustainable development goals through development patterns, governments, and civil society. We benefited from the study in its part related to financial inclusion and financial technology. (Mhlanga, 2022)

Rabia Benzeid, Amina Kadja. Lamia Ammeni, Study titled: The Impact of Fintech Application on the profitability of the banking sector in Algeria: An analytical and Statistical Econometric Study for Period (2010-2022)

This study aimed to detect the impact of the application of financial technology services, represented by the number of automated teller machines (ATMs) per 100,000 adults and the number of interbank payment cards (CIB) issued in Algeria, on the profitability of the Algerian banking sector as measured by the rate of return on equity (ROE) for annual data during the period (2010-2019), using a multiple linear regression model. This was preceded by a statistical study of the reality of the application of financial technology services in Algeria during the period (2016-May 2022). The study found a positive significant effect of the two indicators of financial technology on the rate of return on equity (ROE). In order to benefit the banking sector in Algeria from the advantages of financial technology the concerned authorities should pay attention to the need to develop the banking sector and provide technical infrastructure and appropriate financial technology services (Benzeid, Kadja, & Ammeni, 2022).

2. The concept of financial inclusion and its most important indicators

2.1 The concept of financial inclusion

Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way (The world bank, 2022).

Financial inclusion refers to the availability and utilization of affordable and useful financial products and services provided by businesses or individuals to meet needs, such as transactions, credit payments, and savings, and the delivery of these services to them in a responsible and sustainable manner. It has been suggested that better inclusion improves the effectiveness and availability of financial services while being a safe, convenient, secure, and cost-effective approach (Salah F.A, Erine , Aymen , IBRAHIM A, & HAMZA, 2022)

Achieving financial inclusion and financial security are not an end but a means to an end. They are broadly recognized as critical to reducing poverty and achieving inclusive economic growth. Studies show that financial inclusion enables individuals to start and expand businesses, invest in education, manage risks better and absorb financial shocks.

The 2017 Global Financial Inclusion and Consumer Protection (FICP) Survey provides a global data source to benchmark efforts by financial sector authorities to improve the enabling environment for financial inclusion and financial consumer protection (THE WORLD BANK, 2017).

The following figure shows the household's access to financial services

Figure 1: Household access to Financial Services

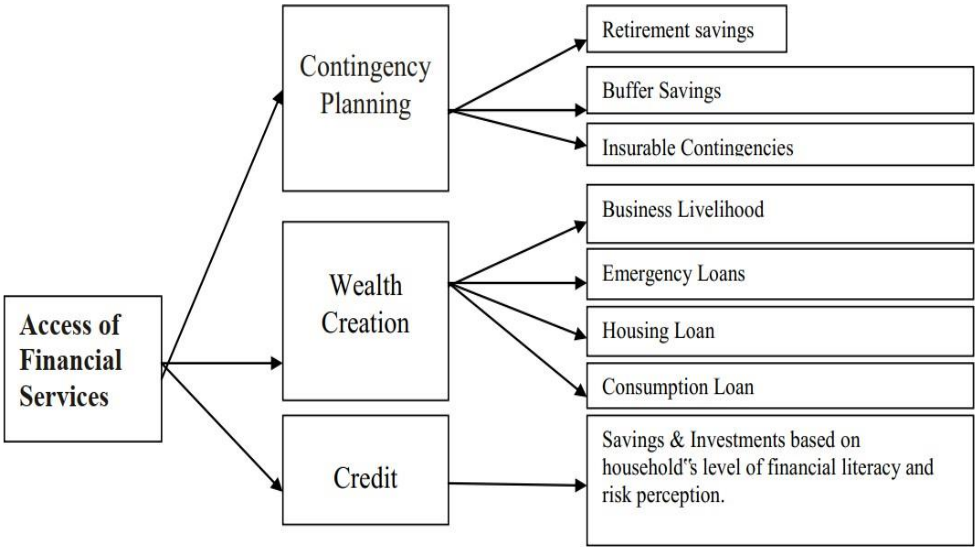


Figure 1: Household access to Financial Services

Source : Ramananda, S., & Sankharaj, R. (2015). Financial Inclusion: A Critical Assessment of its Concepts. *Asian Journal of Research in Business Economics and Management*, 14

2.2 Indicators of financial inclusion: Financial inclusion is measured in three dimensions: (G20 FINANCIAL INCLUSION INDICATORS, n.d.)

1. access to financial services
2. usage of financial services
3. quality of the products and the service delivery

Some indicators of financial inclusion

Indicators: bank asset concentration, ATMs per 100, Account at a formal financial institution, Account ownership at a financial institution or with a mobile-money-service provider, Account used for business purposes, Account used to receive government payments, Account used to receive remittances, Account used to receive wages, Automated teller machines, Average transaction cost of sending remittances to a specific country, Bank Z-score, Bank branches per 100, Bank capital to assets ratio, Bank capital to total assets, Bank concentration, Bank cost to income ratio, Bank credit to bank deposits, Bank deposits to GDP, Bank lending-deposit spread, Bank liquid reserves to bank assets ratio, Bank net interest margin, Bank non-performing loans to gross loans, Bank noninterest income to total income, Bank nonperforming loans to total gross loans, Bank overhead costs to total assets, Bank regulatory capital to risk-weighted assets, Bank return on assets, Bank return on equity, Banking crisis dummy, Borrowers from commercial banks, Broad money, Broad money growth, Broad money to total reserves ratio, Central bank assets to GDP, Checks used to make payments, Claims on central government, Claims on governments, Claims on governments and other public entities, Claims on other sectors of the domestic economy, Claims on private sector, Commercial bank branches, Consolidated foreign claims of BIS reporting banks to GDP, Consumer price index, Credit card, Credit to government and state-owned enterprises to GDP, DEC alternative conversion factor, Debit card, Deposit interest rate, Deposit money bank assets to deposit money bank assets and central bank assets, Deposit money banks" assets to GDP, Depositing/withdrawing at least once in a typical month, Depth of credit information index, Domestic credit to private sector (Algeria - Financial Sector, 2023).

Table 1: Some indicators of financial inclusion for the G20

Indicator	Category	Source
Usage indicator Adults	-Adults with an account; -Number of accounts; -Adults with credit at regulated institutions; -Adults with insurance; -- Cashless transactions; - Adults using digital payments; - Payment using mobile phone or the internet -from an account-; - Payment using a mobile phone; - Payment using a bank card; -- Payment using account; - Saving propensity;	WB Global Findex IMF Financial Access Surveys
Usage indicator: **ENTERPRISES**	- Formally banked enterprises; - Enterprises with outstanding loan or liene of credit at regulated institutions; - Digital payments to or from enterprises.	IMF Financial Access Surveys WB Enterprise Surveys
ACCESS INDICATORS: PHYSICAL POINTS of SERVICE	• Points of service POS terminals per 100,000 adults Agents of payment service providers per 100,000 adults	IMF Financial Access Surveys

	POS terminals per 100,000 adults Access to a mobile phone (% age 15+) • Debit card ownership; • Enterprise points of services;	
QUALITY INDICATORS: FINANCIAL LITERACY AND CAPABILITY	• Financial Knowledge; • Financial Behaviour.	WB Financial Capability Surveys and OECD National Financial Literacy and Inclusion Surveys;
QUALITY INDICATORS: MARKET CONDUCT AND CONSUMER PROTECTION	• Credit Barriers	WB Enterprise Surveys and OECD SME Scoreboard WBG Doing Business

Source: Prepared by researchers: Depending on the website: Global partnership for Financial Inclusion(GPFI) https://databankfiles.worldbank.org/data/download/g20fidata/G20_Financial_Inclusion_Indicators.pdf

An economy's financial markets are critical to its overall development. Banking systems and stock markets enhance growth, the main factor in poverty reduction. Strong financial systems provide reliable and accessible information that lowers transaction costs, which in turn bolsters resource allocation and economic growth. Indicators here include the size and liquidity of stock markets; the accessibility, stability, and efficiency of financial systems; and international migration and workers\ remittances, which affect growth and social welfare in both sending and receiving countries (Algeria - Financial Sector, 2023).

2.2.3 Financial inclusion in developing economies

In developing economies, the share of adults making or receiving digital payments grew from 35 percent in 2014 to 57 percent in 2021. In high-income economies, the share of adults making or receiving digital payments is nearly universal (95 percent). Receiving a payment directly into an account is a gateway to using other financial services. Indeed, 83 percent of adults in developing economies who received a digital payment also made a digital payment, up from 66 percent in 2014 and 70 percent in 2017. Almost two-thirds of digital payment recipients also used their account to store money for cash management; about 40 percent used their account for saving; and 40 percent of payment recipients borrowed formally. (Financial inclusion is a key enabler to reducing poverty and boosting prosperity., 2022)

3.Fintech and financial inclusion

3.1.1 Financial technology -Fintech -concept

What is financial technology? At its core, financial technology is the use of technology to provide new and improved financial services. Part of the impetus for the rise of fintech is that while information technology has made everything - from computers to cars - cheaper and more efficient, it appears that the unit cost of financial intermediation has not changed much in more than a century. Whereas, the unit cost of financial brokerage in the United States has remained at around 2% for the past 130 years. Thus, one of the promises of fintech is to uncover cheaper ways to overcome financial contracting problems and reduce the cost of financial services to improve consumer well-being (NAILI & LEMMOUCHI , 2022, p. 108).

The areas covered by fintech can be broadly described as: (1) Credit, deposits, and capital raising services; (2) Payment, clearing and settlement services, including digital currencies; (3) Investment management services (including trade); And (4) Insurance 4. Blockchain technology is a very important part of FinTech (NAILI & LEMMOUCHI , 2022, p. 108).

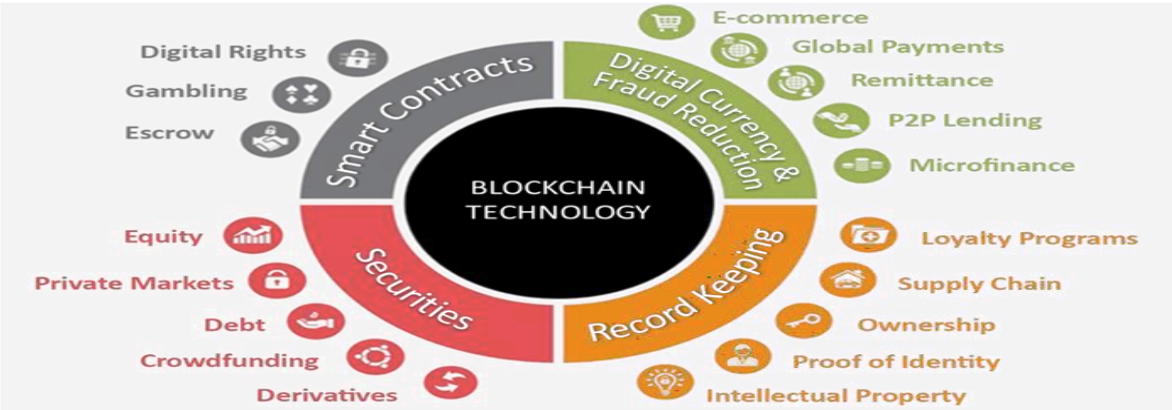
3.1.2 Area of Financial technology

- **Blockchain mechanisms**

Blockchain:

a decentralized digital ledger of economic transactions that can be programmed to record financial transactions by allowing digital information to be distributed but not copied or changed. Data packages, 'blocks ‘, are stored in a linear chain. This technology was originally devised for the digital currency Bitcoin, but today presents other potential uses (NAILI & LEMMOUCHI , 2022, p. 111)

Fig2: Blockchain applications



Source: Yaga, D., Mell, P., Roby, N., & Scarfone, K. (2018). Blockchain Technology Overview Draft NISTIR 8202 NIST US. Journal ofCryptology, 3(2), 99-111.p 105

The use of big in finance

Big data refers to data sets that are too large or complex for traditional data processing application software to deal with adequately, but that are powerful in revealing patterns, trends, and correlations, and applied big-data techniques to provide new insights to FinTech-related (NAILI & LEMMOUCHI , 2022, p. 112).

3.1 Fintech and financial inclusion

As a new term in the technological revolution, FinTech is the application of technology in financing the advent of cloud computing, smartphones and high-speed internet, the sector has expanded dramatically over the last decade. Today, FinTech describes a new era of digital finance around the world that extends from the application of artificial intelligence and machine learning to big data, and from the use of biometric identification to block chain technology. Indeed, the most obvious method is mobile money — the provision of e-money on mobile phones — where the greatest success story was in Kenya with Vodafone's M-Pesa product. In the case of Algeria, the E-rselli service is an online payment service that allows customers to recharge their prepaid (national or international account) and postpaid lines, Thus, the real opportunity FinTech affords is the development of an entire digital financial ecosystem that meets the needs of both individuals and SMEs. This is the essential next phase in the journey to comprehensive (tahraoui, 2022, p. 27)

3.2 Position of Fintech

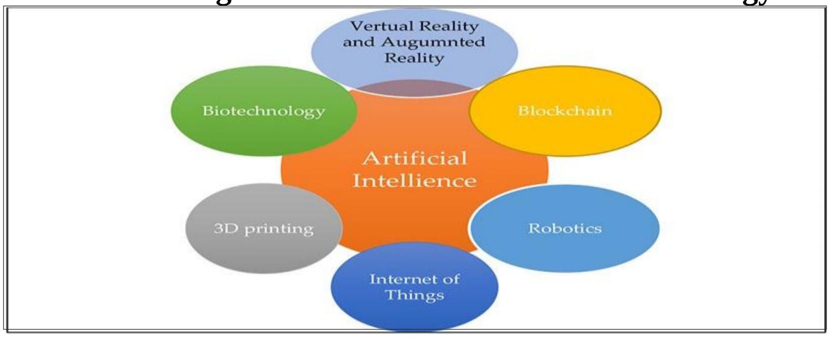
FinTech stands for “financial technology” and refers to “all the technologies that are being utilized to enhance, digitize, or disrupt conventional financial services”. FinTech refers to all “software, algorithms, and applications for both computer and mobile-based tools”. FinTech isn’t a new industry, but it’s growing at a rapid pace. The introduction of credit cards and automated teller machines, among other technology, has been a component of the financial business. According to Puschmann (2017), FinTech is the “fusion of the Financial and Technology.” According to Puschmann (2017), the word FinTech was “originally suggested in the early 1990’s by Citicorp’s chairman John Reed in the context of a newly formed Smart Card Forum consortium, Speaking a language of cooperation across firms and industries.” FinTech, according to Puschmann (2017), is an "umbrella term that comprises new financial solutions enabled by technology, as well as start-up companies that supply those solutions, albeit it also includes traditional financial services providers such as banks and insurers." FinTech, as the name implies, is the confluence of finance and technology, according to Goldstein et al. (2019). Goldstein et al. (2019) also stated that technology has always had an impact on the financial business, with innovations affecting how it runs (Mhlanga, 2022, p. 5).

3.3 Advancing into new dimensions

Key technologies from information technology and computer science are responsible for the rapid changes in financial service models and products Companies are adopting them to enhance the user experience, and to create a secure environment for operations. Block chain technology, emerged as a safest technology, where the ledger keeping of transactions became highly secure. Crypto currency like Bitcoin, whose usage is surpassing the control of monetary authority, is also based on the block chain **(Vijay Kiran, 2022)**

One dimension of risk factor may be associated with security of the customers data, and the other is about the unfortunate events that might collapse any such large fintech player which can potentially damage the economy. Hence, the enabling policies are to be framed with much detailed insights into technology and its pros and cons. Decentralization is the by product of these developing technologies, and the best example to it is the introduction of crypto currency like Bitcoin which have alarmed the central banks realizing the potential of it in trading beyond their control.

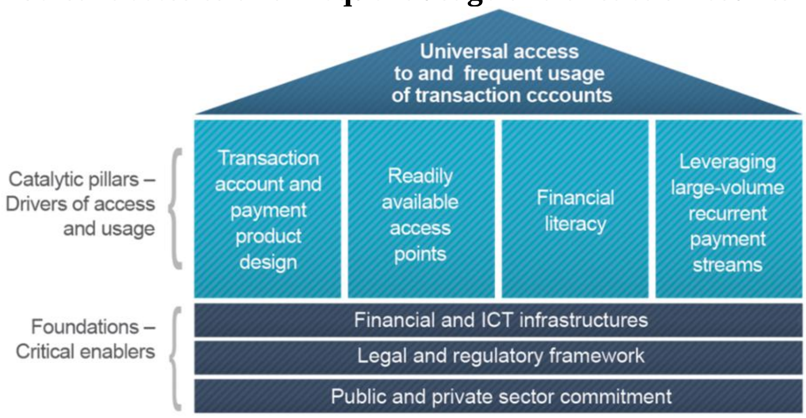
Figure 3: Technologies used to enhance financial technology



Source: Mhlanga, D. (2022, September 15). the role of financial inclusion and FIN Tech in addrising climate-related challanges in the industry 4.0: Lessons for sustainable development goals. doi: 10.3389/fclim.2022.949178,p:04.

Figure 3 depicts some of the technologies that are driving the Fourth Industrial Revolution's advancements. "Artificial intelligence, virtual reality, augmented reality, biotechnology, 3D printing, blockchain, robots, and the internet of things are examples of these technologies."

Figure 4: Universal access to and frequent usage of transaction counts



Source: CPMI-WBG Payment Aspects of Financial Inclusion Report, 2015 , https://blogs.worldbank.org/arabvoices/how-digital-financial-services-can-provide-path-toward-economic-recovery-algeria

While Algeria has made progress in promoting fintech innovations and developing digital financial services, more can be done to raise awareness of their benefits and stimulate their growth. By expanding access to DFS, Algeria will promote economic activity and facilitate the daily life of its people, allowing them to increase their assets or make productive investments (Delorte & Poupareat, 2021).

4. The reality of financial inclusion and fintech in Algeria

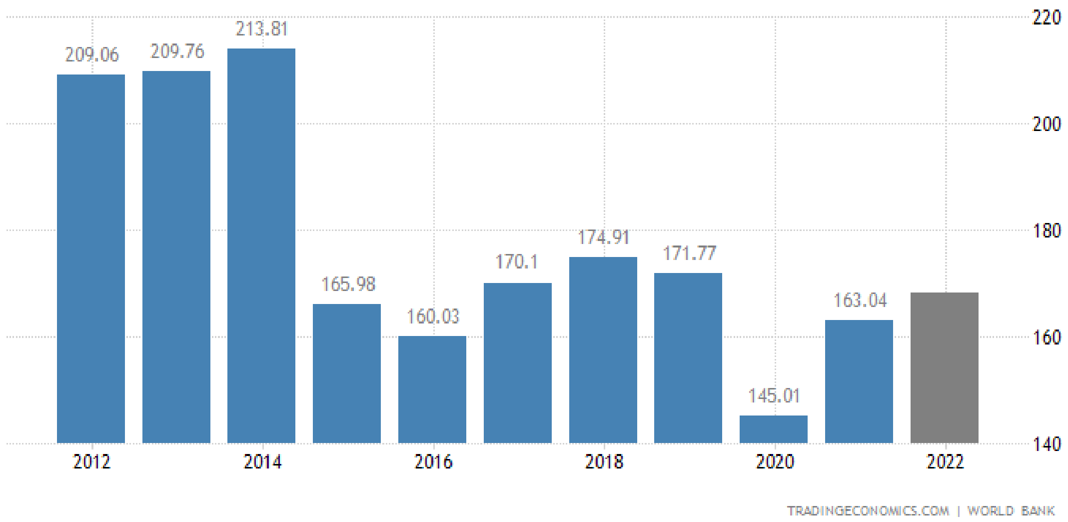
4.1 The Algerian economy was affected by the Covid-19 pandemic through the gross domestic product

Algeria economy's growth aspects are pressing for self- reliance in every possible area of its different sectors. But at this juncture we are witnessing the consequences of the impact of COVID-19 pandemic from the year 2020. The figure 1 shows the trends of economy Algerian from 2016 to 2021. The effect of pandemic resulted in decrease of GDP (Gross domestic product).

Algerian economy is highly dependent on petroleum and natural gas exports. It is estimated that hydrocarbons account for roughly 60% of budget revenues, 30% of GDP, and over 95% of export earnings. To insulate the Algerian economy from volatility in gas & oil prices, the stabilization fund was set up in 2000, which currently has more than 50 billion dollars under management. State dominance over the economy, corruption and bureaucracy continue to hamper further development and diversification of the economy. (Algeria - Automated Teller Machines (ATMs) (per 100;000 Adults), s.d.)

The Gross Domestic Product (GDP) in Algeria expanded 1.60 percent in the first quarter of 2022 over the same quarter of the previous year. The Gross Domestic Product (GDP) in Algeria was worth 163.04 billion US dollars in 2021, according to official data from the World Bank. The GDP value of Algeria represents 0.07 percent of the world economy (world bank, 2022).

Figure 5: Algeria gdp growth annual



Source: TRANINGECONOMICS On the website: https://tradingeconomics.com/algeria/automated-teller-machines-atms-per-100-000-adults-wb-data.html, View it on: 17/1/2023

economy. The gross domestic product (GDP) is equal to the total expenditures for all final goods and services produced within the country in a stipulated period of time. (Algeria - Automated Teller Machines (ATMs) (per 100;000 Adults), n.d.)

Algeria, like the entire MENA region, has been hit by economic shocks exacerbated by the COVID-19 pandemic, including the drop in oil prices. The country's economy is projected to post a significant real GDP contraction in 2020, according to the latest Economic Monitor. Digital transformation, one of Algeria's main development goals before the crisis, is now a key element of the country's recovery. (Delorte & Poupareat, 2021)

4.2 Financial inclusion index in Algeria

In Algeria, the Central Bank of Algeria has defined financial inclusion as the availability and use of all financial services by different segments of society including institutions and individuals through official channels, including current and savings accounts, payment and transfer services, insurance services, financing and credit services with competitive and reasonable prices. It also targets to protect the rights of consumers of financial services so that they can properly manage their funds and savings and prevent some consumers from using informal channels, which are not subjected to any supervision and which charge relatively high prices, inducing the non-satisfaction of the needs for financial and banking services **(Bank of Algeria, 2015)**

For financial inclusion, dimension such as automated teller machines (ATMs) per 100,000 adult, commercial bank branches per 100, 000 adults, borrowers from commercial banks per 1,000 adults, domestic credit to GDP ratio, and depositors of commercial banks per 1,000 adults were used. The first two measurement criteria relate to accessibility of banking products/services and the last three relates to usage of banking services, as dimensions of financial inclusion. These financial inclusion dimensions were then used to construct the financial inclusion index as postulated by Sarma (2008) **(Benaini & Metair, 2022, p. 46)**.

As a result, the IFI values computed for Algeria during the period 2004-2019 are presented in figure1 (3- dimensional IFI):

Figure6: The trend of Financial Inclusion Index in Algeria (2004-2019

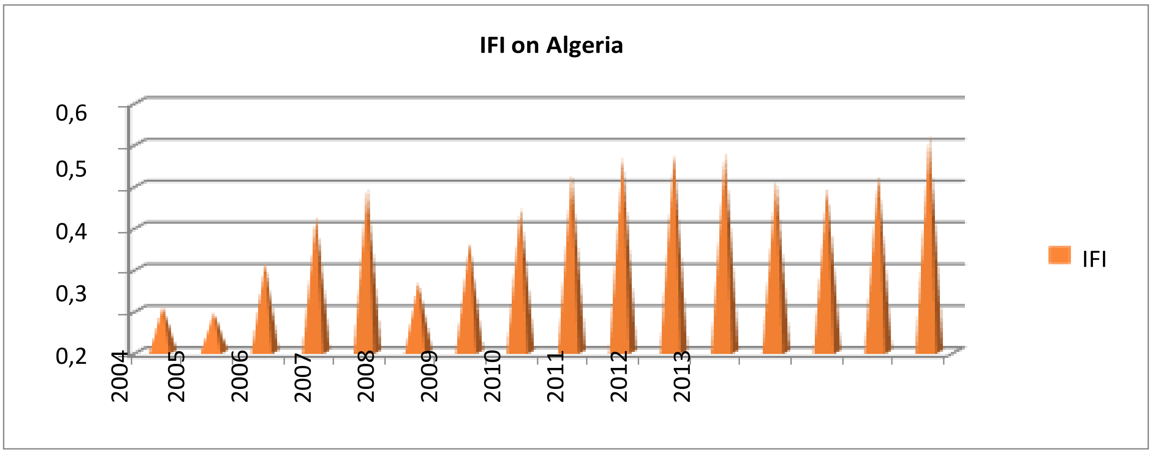


Figure 5 :The trend of Financial Inclusion Index in Algeria (2004-2019

Source: PHAM, M., & DOAN, T. (2020, May 07). The Impact of Financial Inclusion on Financial Stability in Asian Countries. *Journal of Asian Finance, Economics and Business* , *7*(6), pp. 047-059. doi:10.13106/jafeb.2020.vol7.no6.047,P47.

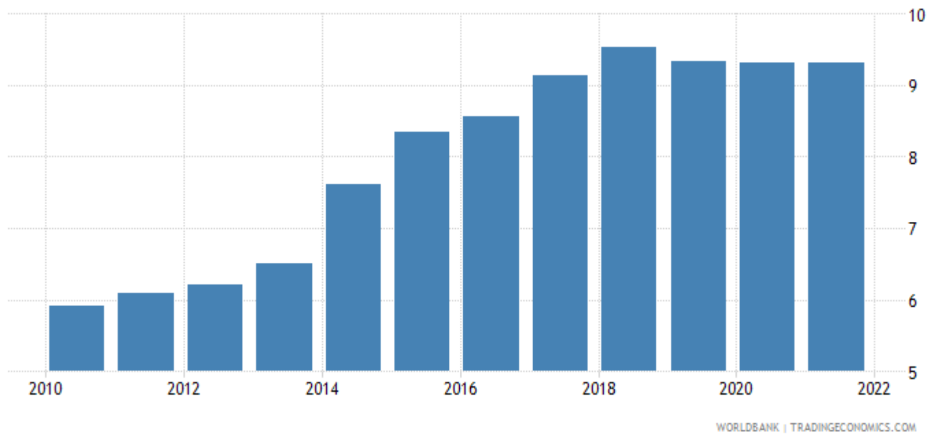
Figure (1) shows that the values of the financial inclusion index that was compute in Algeria range between 0.08 and 0.5, and based on Table No. 2, it can be said that it is an average indicator as it did not exceed the threshold of 0.5, and this corresponds to the report of the World Bank Group, which classified Algeria in the region Medium Financial Inclusion (Benaini & Metair, 2022, p. 47)

From Figure 4: above, we note that the Algerian government is making great efforts to enhance financial inclusion during the study period, as the financial inclusion index reached its highest level in 2019 (0.51).

4.2.1 ATMS IN ALGIRIA

Automated teller machines (ATMs) (per 100,000 adults) in Algeria was reported at 9.3046 ATMs in 2021, according to the World Bank collection of development indicators, compiled from officially recognized sources. Algeria - Automated teller machines (ATMs) (per 100,000 adults) - actual values, historical data, forecasts and projections were sourced from the World Bank on January of 2023. (TRANDING ECONOMIE, n.d.)

Figure7: Algeria automated teller machines atms-per-100-000-adults



Source: https://tradingeconomics.com/algeria/automated-teller-machines-atms-per-100-000-adults-wb-data.html

Automated teller machine ATMs per 100,000 adults

Table2: Automated teller machine ATMs per 100,000 adults(2016-2020)

YEAR	2016	2017	2018	2019	2020
ATMs per 100,000 adults	8.57	9,13	9.54	9.33	9.31

Source: Prepared by researchers based on the website: https://data.worldbank.org/indicator/FB.ATM.TOTL.P5

In Algeria, Automated Teller Machines (ATMs): per 100,000 Adults data was reported at 9.305 Number in 2021. This records a decrease from the previous number of 9.311 Number for 2020. Automated Teller Machines (ATMs): per 100,000 Adults data is updated yearly, averaging 6.360 Number from Dec 2004 to 2021, The data reached an all-time high of 9.540 Number in 2018 and a record low of 1.268 Number in 2004. Automated Teller Machines (ATMs): per 100,000 Adults data remains active status in CEIC and is reported by World Bank. Here we notice a slow development in the development of ATMs, and this is due to the establishment of ATMs that cost the bank additional expenses.

4.2.2 Borrowers from commercial banks per 1,000 Adults

Table3: Borrowers from commercial banks per 1,000 Adults(2016-2019)

YEAR	2016	2017	2018	2019	2020		
B f b Per_1000 adults	150,8	156	172,8	155,8	/		

Source:____Prepared by researchers based on the website: https://data.worldbank.org/indicator/FB.CBK.BRWR.P3

We note that there is a fluctuation in the number of borrowers per 1,000 adults during the period 2016-2021, and this is due to the lack of financial education for citizens (financial illiteracy)._In addition to the repercussions of Covid-19, which caused a global economic crisis, through which income declined in some sectors, especially in 2019 and 2020.

Table 4: Commercial bank branches per 100,000 adults (2016-2021)

YEAR	2016	2017	2018	2019	2020	2021		
C b b 100,000 adults	12,3	11,7	11,4	11	10,7	11,2		

Source: Prepared by researchers based on the website: https://data.worldbank.org/indicator/FB.CBK.BRCH.P5

From the above table, we notice a decline in the number of commercial bank branches in Algeria, and this is due to the increasing population and the high costs of opening additional branches of commercial banks per 100,000 adults.

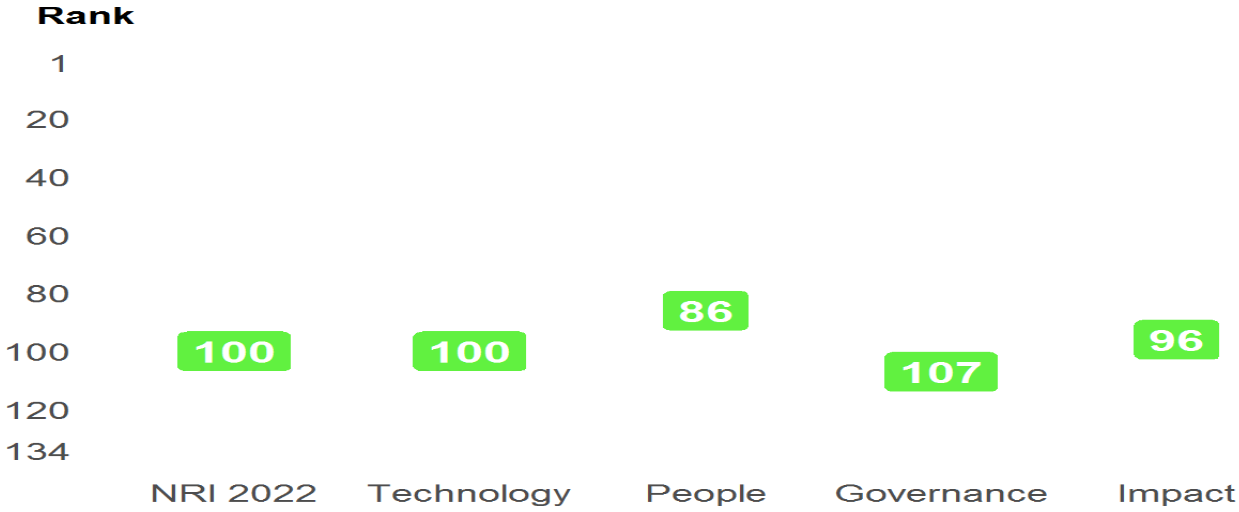
4.3 Network Readiness Index 2022 Algeria

The Network Readiness Index (NRI) is one of the leading global indices on the application and impact of information and communication technology (ICT) in economies around the world. In its latest version of 2022, the NRI Report maps the network-based readiness landscape of 131 economies based on their performances in four different pillars: Technology, People, Governance, and Impact **(portulance institute, 2022, p. 1)**.

4.3.1 Global NRI position of Algeria

Algeria ranks 100th out of the 131 economies included in the NRI 2022 (Figure5). Its main strength relates to people. The greatest scope for improvement, meanwhile, concerns Governance **(portulance institute, 2022, p. 1)**.

Figure8: Algeria global ranking, overall and by pillar



4.3.2 Strongest and weakest indicators

The indicators where Algeria performs particularly well include 3.2.4 E-commerce legislation, 3.3.5 rural gap in use of digital payments, and 4.2.3 income inequality (Table 3). By contrast, the economy's weakest indicators include. 3.3.1 E-Participation, 3.2.1 Regulatory quality, 1.3.4 Computer software spending, and 3.1.3 Online access to financial account **(portulance institute, 2022)**.

Table5: Algeria's strongest and weakest indicators

Strongest indicators	Rank		Weakest indicators	Rank
3.2.4 E-commerce legislation	1		4.3.2 SDG 4: Quality Education	76
3.3.5 Rural gap in use of digital payments	3		1.3.4 Computer software spending	120
4.2.3 Income inequality	10		3.1.3 Online access to financial account	120
4.1.5 Prevalence of gig economy	33		3.2.1 Regulatory quality	128

2.1.1 Mobile broadband internet traffic within the country 36		3.3.1 E-Participation	129
2.2.4 Annual investment in telecommunication services 44 2.2.4 Annual investment in 44 4 4.3.1 SDG 3: Good Health and Well-Being 50			

Source: **Source:** Prepared by researchers: https://networkreadinessindex.org/country/algeria/ View it on: 17/1/2023

4.4 The challenges and the main pillars to promote the financial inclusion approach in Algeria

4.4.1 The challenges of financial inclusion

Referring to an article published by the Technology HQ website in February 2021, The State of Financial Inclusion reveals that challenges remain in this area, notwithstanding advances in access to financial services. Policy-makers must overcome. e key obstacles to achieving higher rates of financial inclusion These barriers include **(THAROUMA, 2022, pp. 369-370)**:

1. The need to improve financial literacy.
2. Lack of official identification doucuments.
3. Consumer protection.
4. The rural poor and gender inequality.

4.4.2 The main pillars to promote the financial inclusion approach in Algeria

As many measures are needed to promote financial inclusion, efforts should be made to simultaneously improve the following **(THAROUMA, 2022, pp. 375-377)**:

- Modernization of the payment system;
- Encouraging digital innovations;
- Strengthening transparency in pricing and service quality;
- Establishing a National Financial Inclusion Strategy;
- Development and diversification of financial services;
- Encourage the use of other non-bank players(postal services; insurance, public treasuries) and telecommunication operators;
- Improving consumer protection and promoting financial literacy;
- Build a database.

Conclusion

This research paper aims to identify the concepts of financial inclusion and its relationship to financial technology and to identify some indicators of true financial inclusion in Algeria. In this study, we dealt with some indicators of financial inclusion in Algeria and among them, Through the indicator of ATMs per 100,000 adults (2016-2020), which witnessed a slow development from 2016 until 2020, the number of ATMs per 100,000 adults decreased, hence we note that this indicator knows very low rates. We note that there is a fluctuation in the number of borrowers per 1,000 adults during the period 2016-2021, and this is due to the lack of financial education for citizens (financial illiteracy). In addition to the repercussions of Covid-19, which caused a global economic crisis, through which income declined in some sectors, especially in 2019 and 2020. And through the indicator of the number of commercial bank branches in Algeria per 100,000 adults, this indicator declined from 2016 to 2021. This is due to the increase in the population and the high costs of opening additional branches of commercial banks per 100,000 adults.

The indicators where Algeria performs particularly well include E-commerce legislation, rural gap in use of digital payments, and income inequality. By contrast, the economy's weakest indicators include. E-Participation, Regulatory quality, Computer software spending, and Online access to financial account.

Through this study, we found that financial inclusion is an enabler for reducing extreme poverty and promoting shared prosperity. It is one of the main goals of developing countries, so the first hypothesis is correct .and we found that Algeria lags behind in terms of levels of financial inclusion in most indicators, and therefore the second hypothesis is correct.

from this study it can be said, financial inclusion is highly recommended to facilitate the different financial services such as payments, savings accounts, transfers, and credits, in other word, financial inclusion refers to efforts to make financial products and services accessible and affordable to all individuals and businesses, regardless of their personal net worth or company size.

The resultant expansion of financial inclusion is assisting to improve livelihoods of millions, especially the poor. Financial inclusion remains a policy priority and efforts to reach the unbanked population including the poor, SMEs and rural population should continue across in Algeria.

Recommendations

- ✓ The resultant expansion of financial inclusion is assisting to improve livelihoods of millions, especially the poor. Financial inclusion remains a policy priority and efforts to reach the unbanked population including the poor, SMEs and rural population should continue across in Algeria.
- ✓ Fin-Techs and Banks should endeavor to come up with client centered innovations and products targeting the financially excluded. With the increasing role of mobile money, there is need to ensure appropriate competition, especially between banks and non- banks to foster financial inclusion.
- ✓ Introducing banking services, through electronic marketing by banks, and the presence of a strong infrastructure, expanding the communication network and the Internet in rural areas helps eradicate financial illiteracy and raises the rates of financial inclusion.
- ✓ Rebuilding trust in the financial system: by providing financial protection to customers who demand transparency, quality, advice, cost reduction, information and clarity regarding the opportunities and risks associated with each product or service, not to mention maintaining confidentiality, protecting data and accounts, and responding to the preferences and tastes of financial consumers.
- ✓ Expanding the scope of the use of electronic money, with the extensive use of financial technology, which is one of the most important aspects of progress in the provision of banking services, which Algerian banks must keep pace with, in order to achieve speed in the performance of services and reduce bureaucratic burdens.

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