

The importance of digital financial innovations developed by startups in promoting financial inclusion

أهمية الابتكارات المالية الرقمية المطورة من قبل المؤسسات الناشئة في تعزيز الشمول المالي

Djaouida Belaa¹

Setif University 1 – Algeria
djaouida.belaa@univ-setif.dz

Received: 01/12/2022

Accepted: 12/03/2023

Published: 11/06/2023

Abstract:

This research aims to highlight the role and importance of digital financial innovations developed by start-ups in closing the financial inclusion gap. The financial sector occupies the largest share of the digital transformation process owing to the financial market's linkage to the global market and the resulting update to technological developments in the sector.

Digital transformation has been accompanied by significant growth of start-ups concerned in financial technology, including payment services, banking services, financial consulting, capital and insurance markets.

The research has reach that despite the benefits of fintech, innovations must not be expanded at the expense of the integrity and robustness of the financial system, consumer protection, and information security. A balance should therefore be created between avoiding risks and moving towards fintech innovation, digitization, and artificial intelligence, ensuring that new technological innovations do not become instruments of fraud and piracy, and do not threaten financial stability.

Key words: digital financial innovations, start-ups, Fintech, financial inclusion.

ملخص:

يهدف هذا البحث إلى تسليط الضوء على دور وأهمية الابتكارات المالية الرقمية التي طورتها الشركات الناشئة في سد فجوة الشمول المالي. يحتل القطاع المالي الحصة الأكبر من عملية التحول الرقمي نظرا لارتباط السوق المالية بالسوق العالمية وما يفرضه ذلك من مواكبة لآخر التطورات التكنولوجية في هذا القطاع .

لقد رافق التحول الرقمي نموا كبيرا للمؤسسات الناشئة المختصة في مجال التكنولوجيا المالية والتي تشمل خدمات المدفوعات والخدمات البنكية والاستشارات المالية، وأسواق راس المال والتأمين.

توصل البحث إلى أنه على الرغم من فوائد التكنولوجيا المالية، يجب ألا يتم توسيع الابتكارات على حساب سلامة ومتانة النظام المالي وحماية المستهلك وأمن المعلومات. لذلك يجب خلق توازن بين تجنب المخاطر والانتقال نحو ابتكار التكنولوجيا المالية والرقمنة والذكاء الاصطناعي، وضمان ألا تصبح الابتكارات التكنولوجية الجديدة أدوات للاحتيال والقرصنة، ولا تهدد الاستقرار المالي.

الكلمات المفتاحية: ابتكارات مالية رقمية، مؤسسات ناشئة، تكنولوجيا مالية، شمول مالي.

¹ - Corresponding author: Djaouida Belaa, belaadjaouida@yahoo.com.

1. INTRODUCTION

Start-ups are an important tool for achieving sustainable economic development in developing and developed countries. They constitute a source of creativity and innovation and do not require substantial funds as for large enterprises. Start-ups are technology-related and mainly dependent on them whatever their area of activity. As the fintech (financial technology) sector has become a revolution in global and Arab financial systems, financial technology start-ups have succeeded in providing a variety of financial services such as payments, digital currencies, and money transfer services, as well as lending, crowdfunding, wealth management, and insurance services, thus competing with traditional financial brokerage institutions. These services are efficient, fast-delivering, and low-cost, enabling a wide range of financially excluded individuals and institutions to benefit from them.

The main problem could therefore be put forward as follows: **What is the importance of digital financial innovations developed by start-ups in promoting financial inclusion?**

Research hypotheses

To answer the problem of research, the following hypotheses can be formulated:

- Fintech start-ups have revolutionized global financial systems;
- A large group of institutions and individuals are marginalized and excluded from the Arab countries' financial system;
- Digital financial innovations developed by start-ups in Arab countries contribute to closing the financial inclusion gap;

Objective and importance of research

This research aims to highlight the role and importance of digital financial innovations developed by start-ups in closing the financial inclusion gap. It is interested in reviewing the advantages of start-ups and their role in financial innovation that promotes financial inclusion.

Method and Tools

The research relied on the descriptive approach as the appropriate approach to showcase all aspects of start-ups and the digital financial innovations developed by them. It also relied on the analytical approach to analyze the relationship between these innovations and financial inclusion.

To tackle the subject, the research was divided into:

- general concepts about start-ups.
- General concepts of financial inclusion.
- digital financial innovations of start-ups.
- The role of financial innovations in closing the financial inclusion gap.

1. General concepts on financial inclusion

Financial inclusion is one of the most widely discussed concepts of recent times. The term financial inclusion has received considerable attention from financial professionals, as well as from international bodies working in this domain, as it is a factor for development. So what are the concepts of financial inclusion?

1.1. Definition of financial inclusion

Many definitions of financial inclusion have emerged, but the most appropriate one is that developed by the Washington Financial Inclusion Center, which states that financial inclusion is “a situation where all individuals are able to access a full range of financial services of good quality, at appropriate prices, and in a comfortable manner that preserves the dignity of customers.” (Dev 2006, 4310)

The World Bank also stated that 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 Oct 02, 2018)

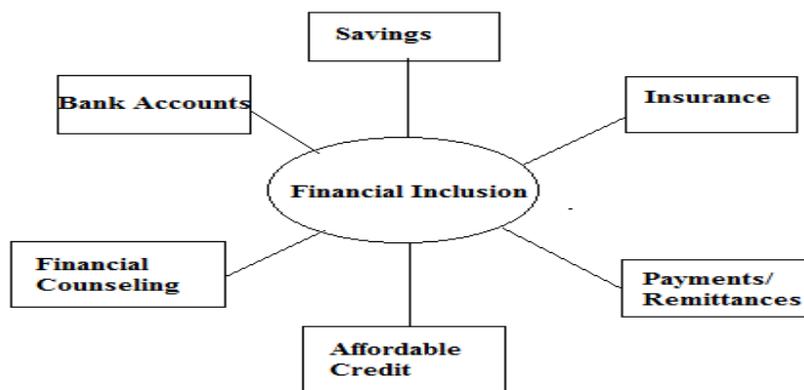
The OECD/INFE has defined financial inclusion as follows: “The process of promoting affordable, timely and adequate access to a range of regulated financial products and services, and broadening their use by all segments through innovative approaches, including financial awareness-raising and education, to promote financial well-being and social and economic integration. (Adele Atkinson 2013, 11)

Through the above definitions, it can be said that financial inclusion is a concept aimed at mainstreaming bank services and financial products to all members of society with its different segments, by devising appropriate, high-quality, and affordable financial services through formal methods, including awareness-raising and financial education.

Therefore, measures of use are likely to reflect access, cost and quality, and vice versa. To the extent that more detailed data on specific aspects of financial inclusion are available either within or across countries, the definition can be expanded to include access, quality, and cost dimensions as well. (Adolfo Barajas 2020, 5)

These definitions illustrate the scope of financial inclusion as shown in the following figure.

Figure 01: scope of financial inclusion



Source: (Kalunda 2012, 101)

1.2. Importance of financial inclusion

It should be noted that mainstreaming financial services and expanding participation in the formal financial system are key to achieving the goals of sustainable development, improving the standard of living, financially empowering women, financing small and medium-sized enterprises, reducing poverty and inequality, creating jobs, promoting economic growth, and integrating the parallel economy into the formal economy. (Fozan Fareed 2017, 6)

The importance of financial inclusion is also to enable low-income people to benefit from high-quality financial services and their acceptable costs, as well as give them the appropriate importance and priority within the framework of economic policies taken and develop legislation, regulations, and regulatory frameworks that help to improve the spread of financial and banking services and encourage innovation in this field. Therefore, broadening the range of beneficiaries of financial services contributes to the empowerment of society as a whole and the strengthening of the financial stability of individuals, as well as supporting the banking sector and promoting savings. The importance of financial inclusion stems from the fact that it is an important axis in supporting entrepreneurs and start-ups by providing support and funding so that these start-ups shift to small and medium-sized enterprises that generate businesses and job opportunities. (Shamshad Akhtar 2010, 1)

1.3. objectives of financial inclusion

In addition to the importance of financial inclusion, it aims to: (CGAP and IFC October 2013, 2)

- Increase the rate of financial capacities of the society's target segments by developing the financial culture and knowledge among women, youth, and the unemployed, as well as enhancing their confidence in financial service providers in the banking and non-banking financial sector;
- Encourage all segments of society to have access to and use services, financial products, and sources of financing, particularly in rural and marginalized areas;
- Raise consumer awareness and education about financial services and products, as well as increase their understanding of the rights and responsibilities that come with using such services and products, in order to protect their rights;
- Support the banking sector by diversifying bank assets, attracting new customers, stabilizing deposits and reducing liquidity risk, providing the bank with a large database that serves to analyze how new products can be introduced to meet the needs of these segments, and building credit valuation models to facilitate access to funding.

1.4. Financial inclusion indicators

G-20 leaders agreed with the recommendation of the Global Partnership for Financial Inclusion (GPII) to support financial inclusion data efforts, nationally and globally, based on a core set of indicators to measure financial inclusion. These indicators deal with the measurement of three main dimensions: ((GPII) 2011, 1)

- Access to financial services: It refers to the ability to use financial services from formal institutions;
- Usage of financial services: It indicates the extent to which clients use financial services provided by financial institutions;
- Quality of financial services: The development of indicators to measure quality is a challenge in itself. Over the past 15 years, the concept of financial inclusion has moved to the agenda of developing countries, where access to financial services had to be improved. It is an unclear dimension where there are many factors affecting the quality of financial services (cost, consumer awareness, effectiveness of the compensation mechanism as well as consumer protection services and financial guarantees, transparency of competition, and other factors).

1.5. Challenges of achieving financial inclusion

There are several challenges and obstacles to achieving financial inclusion. (Asli Demirguc-Kunt 2017, 19) The most important of which are:

- Human barriers include financial literacy skills, financial issues for people, and issues related to the age and gender of clients;
- Institutional barriers include failure to adapt to the new variables imposed by the financial and banking environment, limited understanding of customer needs, the poor quality or lack of services provided, and an inadequate regulatory framework;
- Infrastructure barriers include location, high cost, lack of knowledge about technology use, lack of ICT-based transactions as well as lack of incentives for banks.

1.6. Conditions of achieving financial inclusion

In order to achieve financial inclusion, some conditions must be met: (Abheek Barua 2016, 4)

- Countries should identify the objectives through which financial inclusion can be achieved and improved;
- The banking market should be thoroughly studied to determine how useful existing products are and how well they fit members of society;
- Study the demands and needs of the market for banking services to be achieved on the ground;
- Work to launch new services covering all financial and banking needs of all segments of society;
- Monitor clients' satisfaction with the services available and provide them with all the information they need on their accounts;
- Providing advisory services to clients and assisting them in selecting the most appropriate services to help manage their finances properly;
- Work to activate the role of the various regulators, thereby gaining clients' confidence in the services provided and implement a fair policy.

2. General Concepts About Startups

2.1. Definition of Startups

The definition or concept of startups depends on several criteria. One of the most important criteria used in the definition of startups is the quantitative criterion, which concerns a set of

economic technical indicators (Green 2017): Minimum and maximum labor criterion; invested capital criterion; labor and capital criterion; volume or value of production criterion; sales value criterion; value-added criterion; productive capacity criterion; and the labor intensity criterion.

The English Dictionary defines the term startup as a small project that has just begun. Startup consists of two parts: start expresses the idea of starting and up expresses the idea of strong growth. The term startup began to be used after World War II with the emergence of venture capital companies, spreading its use thereafter widely.

The French dictionary la Rousse defines this term as the young innovative institution in the modern technologies sector.

According to Eric Ries, a startup is a human entity designed to create a new product or service under extreme uncertainty in the surrounding business environment. (Ries 2011, 37)

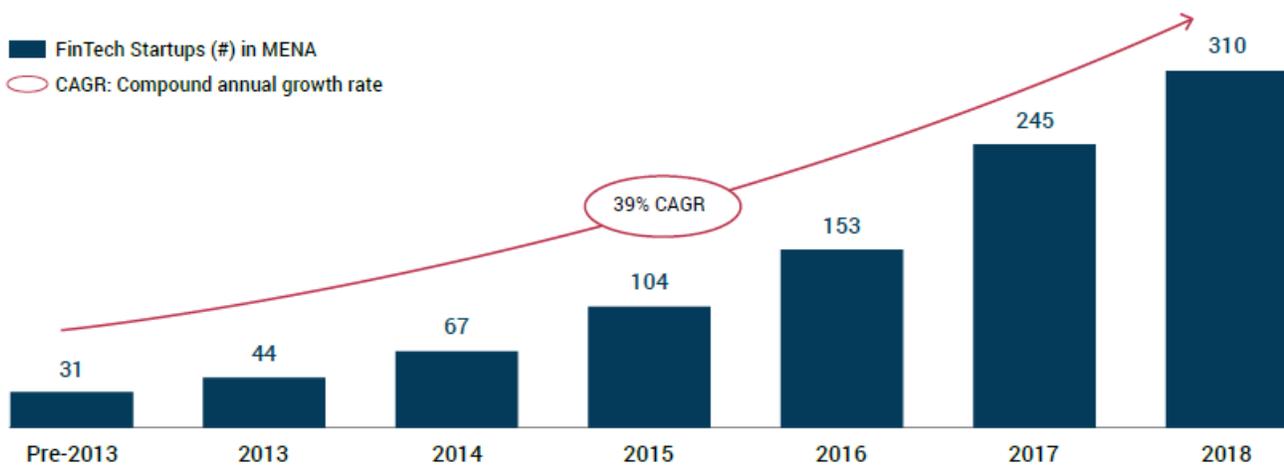
Patrick Fredenson considers that the formation of a startup is not linked to the issue of age, size, or sector of activity, but requires the following (Noémie Chaniaud 6 et 7 Juillet 2017, 2): strong potential growth; the use of new technology; substantial funding, access to various types of contributions; and being in a new market where risk is difficult to assess.

The term startup is also defined by the Investopedia website as a company in the first stages of operations. Startups are founded by one or more entrepreneurs who want to develop a product or service for which they believe there is demand. By their nature, traditional startups tend to enjoy their limited business when they are incorporated and start from an initial investment amount made by the founders or a relative. A startup is based on a viable business, growing in a very fast and efficient way compared to a traditional small or medium-sized enterprise that needs to invest certain amounts of money to enter the market, and requires some time to show returns.

Thus, startups can be defined as an enterprise that seeks to market and offer a new product or innovative service with which to target a large market, regardless of size, sector, or area of activity. They are also characterized by high uncertainty and high risk in exchange for strong and rapid growth with the potential for huge profits if they succeed. Therefore, startups are enterprises that bet on the value of innovation and its reception by the potential market. (Marty 2015, 6)

After discussing the concept of startups in general, more attention will be paid to the activity of those institutions specialized in financial technology, which in 2018 numbered 310 enterprises in the Middle East and North Africa region, as shown in the following figure. Since 2012, the number of FinTech startups has seen a compound annual growth rate (CAGR) of 39%. (MAGNiTT,ADGM, 2019, p. 25)

Number of FinTech startups in the Middle East and North Africa (MENA), pre-2013 – 2018



Source : (MAGNiTT,ADGM, 2019, p. 25)

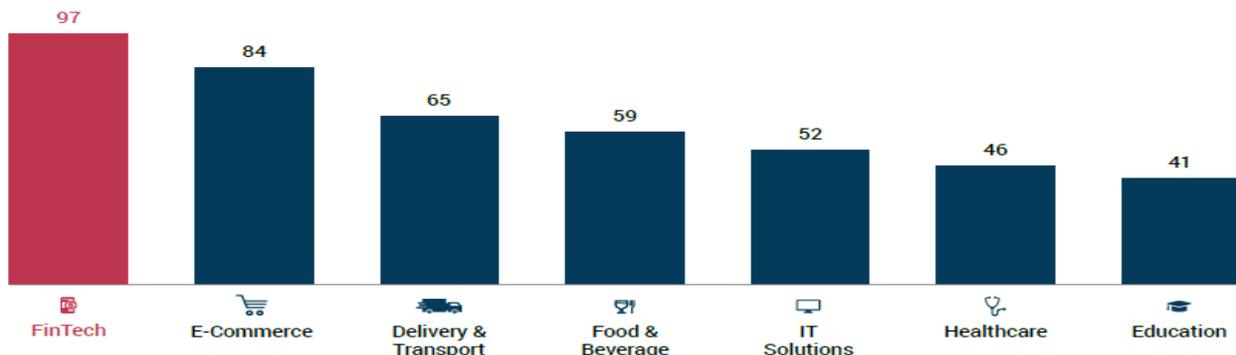
Financial technology is those products and services that rely on technology to improve the quality of traditional financial services. This technology is faster, cheaper, easier, and more people can access it. In most cases, these services and products are developed by startups (wamda and payfort, 2016, p. 7). Fintech links the information and communication technology and financial sectors.

Thus, startups in the field of financial technology are those that promise to improve banking services for individuals and institutions, in cooperation or competition with existing financial service providers.

In 2018, FinTech overtook more traditionally invested industries, such as e-commerce and transport, and became the most popular by number of deals across MENA. Despite this, funding amounts are still low, given that investment has predominantly been at the early stage of investment.

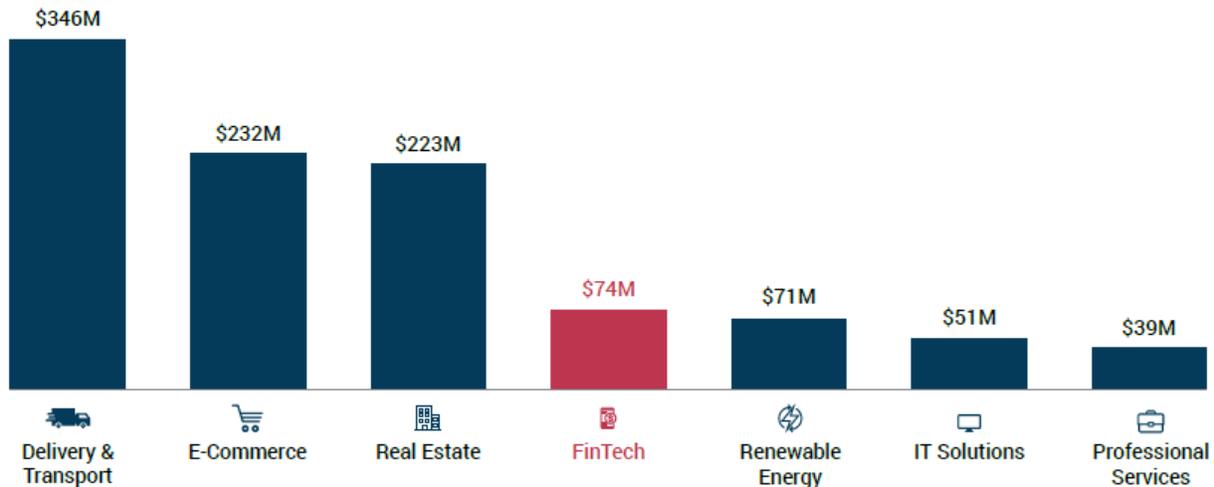
The following figures show the position of startups in the field of financial technology in the Middle East and North Africa in terms of the number of deals and the volume of financing during the period 2018-2019:

Top 7 industries by Number of Deals in startups in the Middle East and North Africa Region, 2018-2019



Source : (MAGNiTT,ADGM, 2019, p. 7)

Top 7 industries by total funding (\$), 2018 – 2019 YTD



Source : (MAGNiTT,ADGM, 2019, p. 7)

2.2. Features of startups

In the light of previous definitions, a set of points that distinguish startups can be inferred as follows:

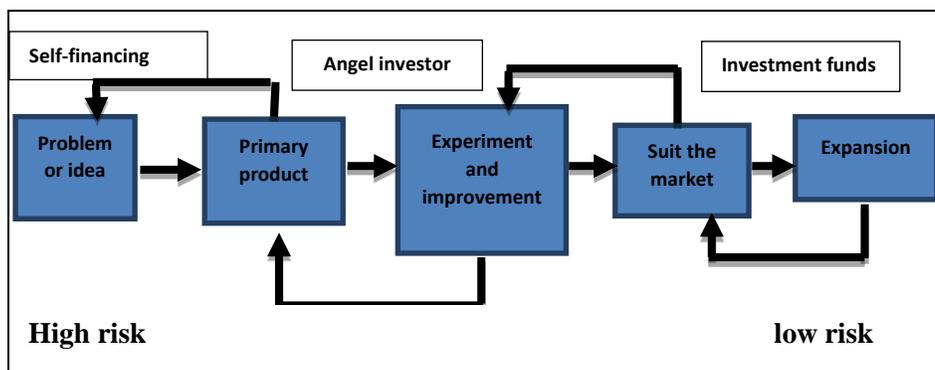
- They are new institutions, i.e. young institutions and not small ones. Many mistakes are made when it comes to classifying small enterprises and molding them as start-ups. Still, a very important factor differentiating a startup from a conventional company is an ambition to grow. (K. Rostek 2017, 192–208)
- Startups are characterized as young enterprises with two choices of either developing and becoming successful enterprises or losing and exiting the market.
- The startup is connected to technology and relies mainly on it as its business is based on innovative pioneering ideas (Pisit Potjanajaruwit 2019, 225), and on satisfying the needs of the market in a smart and modern way.
- They are institutions with an opportunity for gradual and increasing growth as the startup has the potential to grow rapidly and generate much faster revenue than it requires to operate.
- A startup is a rapidly growing enterprise characterized by increased production and sales without increasing costs, resulting in a significant growth in its profit margin; enterprises that are able to generate very large profits.
- A startup relies on technology to grow and advance (Hovenkamp 2020, 353), as well as to access funding through online platforms and by obtaining help and support for business incubators.
- A startup requires lower costs compared to the profits it earns, and these profits usually come quickly and suddenly. Examples include Amazon, Google, Microsoft, etc.

Hence, a startup is a newly established institution, which has emerged from a creative entrepreneurial idea with high prospects for rapid growth and prosperity.

2.3. Startups life cycle

Startups go through several stages before reaching the top. This can be explained in the following figure:

Figure (01): a startup life cycle (the innovative project)



Source: (Haroun 2017)

Through the figure, it is clear that startups or innovative projects go through several stages known as investment rounds, which can be illustrated as follows:

2.3.1. Pre-Seed funding: this phase extends from the idea until the initial product is built; Where someone, or a group of people, proposes a creative or new idea and thoroughly studies it, as well as the market, behavior, and tastes of the target consumer (Mohammed DJELTI 2016, 109), to make sure that it can actually be embodied, developed, and sustained in the future. This phase is often funded by founders, friends, and family, or by what is known as “FFF” (Friends, Fools, Family), as well as donors, investors, and angels. The aim of this phase is to assist and support the entrepreneur in transforming his idea into reality or into an experimental program.

2.3.2. Seed Funding: it follows the processing of the primary product and aims to test and improve the primary product by building the final product, studying the market, understanding the target segment of the product, or building the team (non-founders). This phase is often financed by angel investors and bold capital (risks). This stage is a black spot for the entrepreneur because the likelihood of failure is high, with the death risk of the enterprise in the first two years reaching 70% and in the first five years reaching 90%. (Marchesnay 1987, 152)

2.3.3. Series A Funding: After reaching the final product, this phase aims to test the product's expansion and experience on new segments, as well as arrange the organization and structure of its operations. This phase is mostly financed by bold capital.

2.3.4. Series B Funding: with the institution reaching this stage, it can be said that it has begun to move from an emerging to a mature institution. This phase aims to expand operations at a regional or global level, team-building, and acquisition of other institutions. (Gagnon 2018, 36) This phase is jointly financed by bold capital and private ownership.

2.3.5. Series C Funding: enterprises reaching this stage have proven to be mature. This stage aims to prepare the enterprise to become mature and solid, and can publicly rollout or distribute profits. The work done at this stage is a repeat of what was done in Series B but on a larger and wider level. Financing is made at this stage by bold capital and private ownership, and the more the enterprise develops, the greater the interest in private ownership.

2.4. Difference between startups and traditional enterprise

The startup differs from the traditional institution on several points, but the main one is significant growth. The points of difference can be summarized as follows (Shah 2019, 253):

- The life cycle of a traditional enterprise goes through the launch phase, growth, maturity, and then starts to decline. On the other hand, a startup undergoes a series of regressions and unpredictable progress between the launch and growth phases, and once it reaches maturity it will continue to rise and grow, such as Twitter and Apple.
- Startups offer its product to a very large market as opposed to traditional enterprises.
- Investment takes place in startups despite the high risk i.e. focus is placed on the significant potential return if the project is successful, while in traditional enterprises, the investor heads to a market where uncertainty is low and normal profits are achieved. (Ries, *Le Modèle Start-Up, Devenir une entreprise moderne en adoptant le management entrepreneurial*, 2018, 35)
- There is a difference in sources of financing where a startup relies on an angel investor, venture investor, venture capital, or venture capital institutions. These institutions are not based on capital in the form of loans, as in the case of bank financing, but on partnership. The partner finances startups without guaranteeing the return, thereby risking his funds, and thus assists the newest or expansionary startups that face difficulties in this area. The bank system refuses to grant them loans because of the lack of guarantees or because they are high-risk projects.

The importance of venture capital to a startup lies in many elements, including (John Freeman 2007, 107):

- The venture capital institution's contribution is not limited to money, but extends to follow-up, advice, and guidance, enabling the startup to manage its projects well and benefit from modern management expertise and techniques. The most important problem for an entrepreneur is access to finance and management. (Marcil 2013, 91)
- Venture capital financing is not done all at once but is done through several stages, where the results of the work done for each funded phase are presented, thereby ensuring the seriousness of the investment and giving the enterprise a new opportunity to make up for its failure before it accumulates losses.
- Venture Capital enterprise does not withdraw from the startup until the latter can produce and grow on its own.
- The funds of the venture capital enterprise are not due or payable if the situation of the startups does not permit, as it has become part of its own funds and shares losses with the enterprise.

Although there are differences between the startup and the traditional enterprise, there are relationships between them, where the startups can cooperate with other institutions and provide them with services that benefit the latter, thus serving as a turning point for it. Many large enterprises have benefited and relied on the services of start-ups, for example, in the area of renewal of enterprise culture, there are Dell, Google, and Rabobank, and in the area of innovation of large

brands, there are Telefónica, Accenture, and Microsoft. Moreover, in the area of solving business problems, there are Unilever, Diageo, and ghh Hotels, and in the field of expanding future markets, there are BMW and Enel. (Valerie Mocker 2014, 17)

4. digital financial innovations of start-ups

Fintech start-ups developed digital financial innovations and were able to influence traditional financial services. They diversified business models include savings, electronic payment networks, as well as financing some SMEs through e-applications. The industry is undoubtedly of interest to many decision makers and investors around the world because of its profitable future. During the first half of 2019, Fintech's global market saw 838 investments totaling up to \$15 billion, of which 238 were worth up to \$471 million in the Middle East and North Africa.

Financial technology went through waves where the first wave included payments and lending solutions and relied on crowdfunding platforms, P2P direct lending networks, and payment solutions such as PayPal, and on major trends in the emerging internet economy: the participatory economy, social networking, and e-commerce.

The second wave involved international financial transfer, wealth management, and insurance. It then relied on the blockchain, which could play a pivotal role beyond funding. Fintech's enterprises integrate artificial intelligence, big data, and cloud technology into traditional financial sectors to make them safer, faster, and more efficient as they help them detect fraud, regulatory compliance, and wealth management.

Innovations by start-ups in the financial sector have included:

4.1. Trading in the financial markets (Investors' Banking Services)

Innovative online trading platforms facilitate online trading instantly. Social trading networks allow investors to monitor the commercial behavior of their peers and expert traders and follow their investment strategies in the currency exchange market and financial markets. (Williams, 2011, p. 28)

These platforms require little or no knowledge about financial markets. They have been described as relatively negative tools because they provide a low-cost and sophisticated alternative to traditional wealth managers.

4.2. Automated advisors (Automated investment or wealth management applications)

"RPA" robotic process automation technology is used, which can complete the task faster and more efficiently. Automated financial advisors provide financial advice or online investment management with little human intervention. (Krzysztof Waliszewski, 2020, p. 157)

They provide digital financial advice based on mathematical bases or AI algorithms. An automated advisor is a low-cost alternative compared to a human advisor.

4.3. Data security (Cyber Security and resilience)

All fintech organizations suffer from security or privacy issues associated with web applications and APIs, so priority has been given to enhancing Internet and data security to prevent weaknesses in the financial system. Violations cause financial losses and weaken the user's confidence. According to research by ImmuniWeb, a Geneva-based global institution with security testing techniques, 98% of global fintech start-ups are vulnerable to major cyber-attacks, including fraud and app security attacks on mobile and the web.

Because of these security breaches and in order to minimize damage, financial institutions must provide data security mechanisms, (Rohit KALAKUNTLA, 2019, p. 115) because preventing all cyberattacks is almost impossible due to the different ways in which consumers interact with their money and the many weaknesses that exist, regardless of the amount of time and energy put in place to push the threat of cyberattacks. The latter includes mobile apps and web portals to third-party networks and even vulnerabilities provided by employees and customers themselves. These are the most important cybersecurity risks for the fintech sector. Moreover, leading global fintech institutions are proactively moving towards cloud computing technologies to meet information security requirements.

4.4. Artificial intelligence

AI algorithms can be used to predict changes in the stock market, give insight into the economy and customer spending habits, and allow financial institutions to better understand their customers. Artificial intelligence has created a major impact on the financial industry from fraud detecting, smart investing, point of sale to efficient financial data visualization. (khanna, 2022, p. 4)

According to a PricewaterhouseCoopers (PwC) study, the majority of financial service decision-makers invest in artificial intelligence. He confirmed that 52% of executives make significant investments in artificial intelligence, while 72% believe that this investment will be a commercial advantage. The cost savings expected to reach \$447 billion by 2023 are one of the reasons why the rest believe in AI's potential in the financial industry.

The banking sector uses artificial intelligence to serve customers through voice robots and to facilitate mobile banking 24/7. AI also enables financial institutions to enhance security, prevent, and detect fraud. (OECD, 2021, p. 7)

4.5. Blockchain (Cryptocurrencies)

The blockchain is a huge open, distributed, and centralized record that does not need the authority to operate (Blockchaintrainingalliance, 2017, p. 7), highly encrypted because the data is not kept in one place but distributed across millions of computers, making it impossible to change it, so ending and stopping the blockchain is similar to ending the internet network and is almost impossible. The blockchain is not limited to financial transactions but all transactions are valuable.

The blockchain was first used in bitcoin as a distributed database that can track transactions in a permanent and verifiable manner. The blockchain can de-guard the portals and third parties in the loan and credit system while making borrowing money and lowering interest rates safer because it is transparent, very safe, and relatively cheap to operate. This technology exchanges information and existing funds through smart contracts.

4.6. Big Data

Financial technology institutions use big data in the finance sector to predict customer investments and market changes, create new strategies and portfolios, analyze customer spending habits and thus improve fraud detection, and help banks create fragmented marketing strategies that can be used to improve the company's operations. According to the International Data Company's Big Data Expenditure Manual, the banking sector is currently one of the largest investors in data solutions and large business analyses. Furthermore, data management is important in terms of the amount of data generated by the financial industry such as credit card transactions, ATM withdrawals, and credit eligibility points. (Bhadani, 2016, p. 18)

Financial institutions can use big data in identifying market trends and learn more about customers and to be able to make real-time business decisions including recognizing customer's spending habits, managing sales such as dividing customers to improve marketing as well as cross-selling products, dealing with fraud and risk, reporting, and analyzing customer feedback.

Large data also helps financial institutions streamline internal and external processes and reduce risk.

4.7. Robotic processes automation

Robotic process automation technology "RPA" can complete the task faster and more efficiently, process financial information such as accounts payable and debtors more efficiently and accurately than a manual process, and increases the productivity of the financial institution. (EY building a better working world, 2016, p. 3)

Automating processes through customer service chatbots helps banks deal with low-priority queries from customers, such as account and payment questions to free human customer agents to deal with high-priority concerns. In insurance institutions, process automation is used to automate parts of claims-handling processes.

Process automation also affects financial institutions by helping them ensure compliance in a highly regulated industry. Automated processes can save employment and operational costs and reduce errors.

4.8. Cloud computing

Cloud computing is a technology for storing data and providing computing services, including servers, databases, networks, software, analytics, and others. When an individual or enterprise wants

to use the cloud, they will pay the cloud provider based on usage using the instant payment system. Leading global fintech institutions are proactively turning to cloud technology to meet security and finance requirements together. Artificial intelligence and advanced data analysis will be key in stopping cyberattacks and preventing the theft of more than 1 billion euros from more than 100 financial institutions in 40 countries.

Cloud computing makes customer service possible 24/7 from anywhere, expands the range of services, and makes it easier and faster as customers only pay for the services they use. Cloud computing also helps financial institutions control costs and enables secure online payment, digital wallets, and online remittances. (EBF Cloud Banking Forum, 2020, p. 9)

Now that start-ups are flooding the market, many of them are developing services that are intended to be provided by scaled FIs. Since these businesses are frequently "cloud native," banks and insurers who use the cloud to engage with start-ups can manage more efficient on-boarding. (The Institution Of International Finance, 2018, p. 4)

5. The role of financial innovations in closing the financial inclusion gap

1- It is increasingly important to activate the role of fintech enterprises in promoting financial inclusion by providing new platforms for borrowers (money market) compared to credit cards, insurance and leasing products, and other bank products available to these enterprises. In addition, its role in establishing open banking platforms allows service providers to access bank customers' data based on their consent for the purpose of providing them with appropriate products, i.e. providing crowdfunding and online lending platforms.

2- Innovation of fintech helps provide financial services to the largest proportion or segment of the population that does not deal with the banking system. The expansion of using mobile phones to an extent that exceeds the number of bank accounts in many Arab countries and the adoption of digital identity, asset records, and smart contracts helps to reduce the proportion of the population without bank accounts. Providing alternative sources of financing for underfunded households and institutions, not exceeding 9% of total loans and facilities granted by Arab banks, and overcoming the difficulty of accessing financial markets to mobilize the sources of financing required for their activity, will reduce unemployment rates, support economic growth and the structural transformation of Arab economies, and address the challenges associated with enhancing financial inclusion. Most financial technology institutions operate under the slogan "Empowering the Unbanked", that is, empowering the financially excluded because the real measure of fintech success as an industry or sector is not the development of tools to ensure the convenience of bank customers, but the extent to which they contribute to enhancing the financial inclusion of financially excluded groups. The Arab region recorded the lowest levels of financial inclusion in the world (excluding GCC countries), with 37.2% of adults having bank accounts, while 63% are excluded from official financial and financing services.

3- Financial technological innovations in support of enterprise finance are not limited to providing credit and equity, but also to facilitating bank credit and new lending channels, thereby overcoming

a number of financial inclusion constraints associated with a lack of credit information, limited competition, and relatively high cost of meeting these institutions' financing needs.

4- Developing digital solutions and expanding payments via the mobile and Internet, and governments' adoption of payroll, pension, and social security benefits through bank transfers improve financial inclusion (digital payments). Also, using mobile phone or Internet to access bank accounts and using the Internet to pay bills or shopping is easy. Launching digital payments through the activation of digital mobile portfolio service to develop and digitally empower the e-commerce sector provides opportunities to enhance financial inclusion through the use of digital financial services and the need to invest in infrastructure development projects, including telecommunications technology, telecommunications networks, and the Internet.

5- Developing digital financial services helps overcome the challenges of the physical spread of financial and banking institutions and the traditional ways in which they provide services. E-commerce costs 20 times less than phone service and 60 times less than face-to-face service. Hence the importance of this digital development and financial technology concerning financial inclusion appears, which aims to introduce or integrate financially marginalized groups, whose low financial income does not allow them to engage in banking operations to deal with the banking system through the digital business system or in other words to complete financial transactions in an electronic manner.

6. CONCLUSION

Fintech and its various applications present both opportunities and challenges for banks and other financial institutions as well as regulators, requiring attention to how to balance between maintaining the integrity and robustness of the financial system and developing innovation in the financial and banking sector. This enhances the safety and durability of banks and financial stability, protects consumers, and ensures compliance with laws and legislation without harming beneficial innovations in financial services, especially those aimed at financial inclusion. Despite the benefits of fintech, innovations must not be expanded at the expense of the integrity and robustness of the financial system, consumer protection, and information security. A balance should therefore be created between avoiding risks and moving towards fintech innovation, digitization, and artificial intelligence, ensuring that new technological innovations do not become instruments of fraud and piracy, and do not threaten financial stability.

The following are a set of proposed **recommendations** for making good use of fintech innovations to promote financial inclusion in Arab countries, including Algeria:

- Adopt a comprehensive strategy based on digital payments and financial technology as a key tool to promote financial inclusion and transition to a non-monetary economy by modernizing telecommunications infrastructure and integrating ICT in the financial sector.
- Central banks and regulatory authorities should adopt new rules that eliminate impediments to fintech, especially electronic payments, and recognize mobile enterprises as providers of

financial services and not merely a financial broker, which provide banks with broader coverage, especially in remote areas and reduce financial allocations to create branches.

- Establishing legal frameworks for payment institutions that contribute to developing and disseminating technological financial products to enable marginalized groups to access the payment system.
- The need to invest modern technologies such as blockchain in the development of electronic financial services to reduce traditional ways of using cash.
- The need for banks and financial institutions to pay attention to training their staff in fintech and artificial intelligence mechanisms and techniques, given their role in diversifying economic activity and developing banking work to become more responsive to the changing and multiple needs of the widest segments of clients in this leading and vital sector.
- Encourage central banks to pay attention to artificial intelligence and the process of transforming financial and banking sectors from the traditional to the digital economy while containing the risks and consequences of this transition.
- Increase AI spending to improve banking services provided to customers, especially through applications and electronic technologies.

5. Bibliography List

- *CGAP and IFC . (October 2013). Financial Inclusion Targets and Goals: Landscape and GPFII View. for the GPFII Data and Measurement Sub-Group.*
- *(GPFII), t. G. (2011). G20 Financial Inclusion Indicators. Cannes Summit.*
- *Abheek Barua, R. K. (2016, April). The Status of Financial Inclusion, Regulation, and Education in India. ADBI Working Paper Series(No. 568), p. 4.*
- *Adele Atkinson, F.-A. M. (2013). Promoting Financial Inclusion through Financial Education: OECD/INFE, Evidence, Policies and Practice. OECD Working Papers on Finance, Insurance and Private Pensions(No. 34), p. 11.*
- *Adolfo Barajas, T. B. (2020, August). Financial Inclusion : What Have We Learned So Far? What Do We Have to Learn? IMF Working Papers, p. 5.*
- *Asli Demirguc-Kunt, L. K. (2017, April). Financial Inclusion and Inclusive Growth, A Review of Recent Empirical Evidence. (F. a. Development Research Group, Éd.) Policy Research Working Paper (8040), p. 19.*
- *Bhadani, A. J. (2016). Big data: Challenges, opportunities and realities. Dans & K. M.K., Effective Big Data Management and Opportunities for Implementation (p. 18). Pennsylvania, USA: IGI Global.*
- *Blockchaintrainingalliance. (2017). What is Blockchain. Copyright.*
- *Dev, S. M. (2006, October 14). , Financial Inclusion: Issues and Challenges. Economic and Political Weekly, Vol. 41(No. 41), p. 4310.*
- *EBF Cloud Banking Forum. (2020). The use of Cloud Computing by Financial Institutions. EBF Cloud Banking Forum.*
- *EY building a better working world. (2016). Robotic process automation in the Finance function of the future. Ernst & Young Accountants LLP.*

-
- Fozan Fareed, M. G. (2017). *Financial Inclusion and Women Entrepreneurship: Evidence from Mexico*. OECD Economics Department Working Papers(No. 1411), p. 6.
 - Gagnon, S. (2018, Novembre 16). *L'innovation Ouverte En Support A La Phase D'expansion De La Startup. Mémoire En Concentration Gestion De L'innovation*, 36. Montréal, L'école De Technologie Supérieure, Université Du Québec.
 - Green, A. (2017). *Attracting investment in the USA: 10 criteria for a startup*.
 - Haroun, D. (2017, 11 05). *Startup Corporate Assessment, Ready for Your Investment Project*, World of Start-Ups, startups-wd.com/2017/11/05/startups-valuation, 05/11/2017. . *Startup Corporate Assessment, Ready for Your Investment Project*,. . (0. startups-wd.com/2017/11/05/startups-valuation, Éd.) World of Start-Ups.
 - Hovenkamp, K. A. (2020). *Startup Acquisitions, Error Costs, and Antitrust Policy*. *the University of Chicago Law Review*, 353.
 - John Freeman, J. S. (2007). *Models of innovation: Startups and mature corporations*. *alifornia Management Review*, 50(1), 107.
 - K. Rostek, A. S. (2017). *Differentiating Criteria and Segmentation of Polish Startup Companies*. *Problemy Zarządzania*, 15(1), 192–208.
 - Kalunda, J. A. (2012). *Financial Inclusion and Financial Sector Stability With Reference To Kenya: A Review of iterature*. (Scienpress, Éd.) *Journal of Applied Finance & Banking*, vol. 2(no. 6), p. 101.
 - khanna, D. (2022, March 14). *Artificial Intelligence In Financial Market*. Consulté le 11 21, 2022, sur <https://www.researchgate.net/publication/359221113>.
 - Krzysztof Waliszewski, M. Z.-S. (2020, September). *ROBO-ADVISORS AS AUTOMATED PERSONAL FINANCIAL PLANNERS – SWOT ANALYSIS*. *Journal of Finance and Financial Law*, 3(27), 157.
 - MAGNiTT,ADGM. (2019). *MENA FinTech Venture Report*, MAGNiTT report in collaboration with Abu Dhabi Global Market (ADGM).
 - Marchesnay, M. (1987). *la stratégie: du diagnostic à la décision industrielle*. Alger: OPU.
 - Marcil, F. (2013, Juin). *Incuber L 'Entrepreneur Pour Développer L 'Économie Locale: L 'Expérience Lacere À Acton Vale. Mémoire En Administration Des Aff Aires, 91. Trois-Rivières, L'université Du Québec*.
 - Marty, O. (2015, September). *Life of Startup (S') Investing in Innovative Companies*. *HAL Open Archive in Human Sciences and Society*, 6.
 - Mohammed DJELTI, B. C. (2016, 03 31). *Etat des lieux des incubateurs en Algérie, Cas de l'incubateur de l'INTTIC d'Oran*. *Revue algérienne d'économie et gestion*, 9(1), 109.
 - Noémie Chaniaud, C. J. (6 et 7 Juillet 2017). *Open innovation: une nouvelle method Pour sélectionner de jeunes partenaires Innovants, ,. Confere'17/N°24, (p. 2)*. Seville, Espagne.
 - OECD. (2021). *Artificial Intelligence, Machine Learning and Big Data in Finance Opportunities, Challenges and Implications for Policy Makers*. OECD.
 - Pisit Potjanajaruwit, L. G. (2019). *Creative innovation of startup businesses in Thailand 4.0 era*. *Journal of International Studies*, 12(3).
 - Ries, E. (2011). *The lean startup (éd. 1)*. New York: the Crown Publishing.
 - Ries, E. (2018). *Le Modèle Start-Up, Devenir une entreprise moderne en adoptant le management entrepreneurial*,. France: Pearson.
 - Rohit KALAKUNTLA, A. B. (2019). *Cyber Security*. *HOLISTICA*, 10(2), 115.

- Shah, R. (2019, February). *Difference Between Startup And Small Business. GAP Interdisciplinarity*, 2(1), 253.
- Shamshad Akhtar, D. P. (2010, June). *microfinance in the arab world: the challenge of financial inclusion, MENA Knowledge and Learning. Quick note Series(Number 25)*, p. 1.
- The Institution Of International Finance. (2018). *CLOUD COMPUTING IN THE FINANCIAL SECTOR PART 1 : AN ESSENTIAL ENABLER*. copyright.
- The World Bank. (Oct 02, 2018). *Financial Inclusion, Financial inclusion is a key enabler to reducing poverty and boosting prosperity*.
- Valerie Mocker, S. B. (2014). *WINNING TOGETHER, A GUIDE TO Successful Corporate–Startup Collaborations. Startup Europe Partnership*, p. 17.
- wamda and payfort. (2016). *fintech report in collaboration between wamda and payfort, fintech in the middle east and north africa, financial services sector trends*.
- Williams, R. T. (2011). *An Introduction to Trading in the Financial Markets : Trading, Markets, Instruments, and Processes. Library of Congress Cataloging-in-Publication Data*.

6. Citations

Djaouida Belaa, (2023), The importance of digital financial innovations developed by startups in promoting financial inclusion, Journal Of North African Economies, Vol .. / N°(..) 2023, P x.