

Fintech in International Trade: Opportunities and Challenges from an Algerian Perspective

التكنولوجيا المالية في التجارة الدولية: الفرص والتحديات من منظور جزائري

Almi Hassiba^{1,*}, Hamza Zakaria²

¹ Laboratory of Economic and Human Development in Algeria (DEHALG); Badji Mokhtar – Annaba University (Algeria), hassiba.almi@univ-annaba.dz

² Laboratory of Research in Economic Intelligence and Sustainable Development (LRIEDD); Badji Mokhtar – Annaba University (Algeria), zakaria.hamza@univ-annaba.dz

Received 2024/11/22; Accepted: 2024/12/18

Abstract: This paper explores Algeria's perspective on FinTech in international trade, emphasizing opportunities to enhance efficiency and challenges impeding adoption. FinTech can reduce transaction costs, improve transparency, and expand market access for Algerian firms. However, barriers such as regulatory uncertainty, weak infrastructure, and low digital literacy hinder progress. The study concludes that addressing these challenges through regulatory reforms, infrastructure development, and capacity-building is crucial. Such measures can enable Algeria to fully leverage FinTech, enhancing its competitiveness in global trade and fostering economic growth through expanded trade opportunities.

Keywords: Fintech; International Trade; Algeria; Infrastructure; Financial Inclusion.

Résumé : Cet article explore la perspective de l'Algérie sur la technologie financière (FinTech) dans le commerce international, en mettant l'accent sur les opportunités d'améliorer l'efficacité et les défis entravant son adoption. La FinTech peut réduire les coûts des transactions, améliorer la transparence et élargir l'accès au marché pour les entreprises algériennes. Cependant, des obstacles tels que l'incertitude réglementaire, des infrastructures faibles et une faible culture numérique freinent le progrès. L'étude conclut qu'il est crucial de relever ces défis par des réformes réglementaires, le développement des infrastructures et le renforcement des capacités. Ces mesures permettraient à l'Algérie de tirer pleinement parti de la FinTech, renforçant sa compétitivité dans le commerce mondial et stimulant la croissance économique grâce à l'expansion des opportunités commerciales.

Mots-clés : FinTech ; Commerce international ; Algérie ; Infrastructure ; Inclusion financière.

ملخص: تستكشف هذه الورقة منظور الجزائر حول التكنولوجيا المالية (FinTech) في التجارة الدولية، مع التركيز على الفرص لتعزيز الكفاءة والتحديات التي تعيق تبنيها. توصلت الدراسة أنه يمكن للتكنولوجيا المالية أن تقلل من تكاليف المعاملات، وتحسن الشفافية، وتوسع الوصول إلى الأسواق للشركات الجزائرية، ولكن مع ذلك، تواجه تحديات مثل عدم وضوح اللوائح، وضعف البنية التحتية، وانخفاض مستوى الثقافة الرقمية. وتخلص الدراسة إلى أن معالجة هذه التحديات من خلال إصلاحات تنظيمية، وتطوير البنية التحتية، وبناء القدرات أمر بالغ الأهمية. يمكن لهذه الإجراءات تمكين الجزائر من الاستفادة الكاملة من التكنولوجيا المالية، وتعزيز تنافسيتها في التجارة العالمية ودفع النمو الاقتصادي من خلال توسيع فرص التجارة.

* The name Corresponding author.

I- Introduction :

Fintech has been a strong driver of change in global trade. It is changing the traditional processes of international commerce toward better efficiency, transparency, and inclusiveness. Now, integrating blockchain, artificial intelligence, and big data analytics enables Fintech to bring a sea of change in innovations that can make trade finance smoother, reduce transactional costs, and lower risks. In international trade, Fintech improves the smoothness of cross-border transactions and makes it easier for businesses, especially SMEs, to access the international market.

Algeria, one of the prime players in the African and Mediterranean trade scene, gradually opens itself up to Fintech as part of broader economic modernization. Much emphasis on diversifying the economy from hydrocarbons gives way to an understanding that Fintech can play a huge role in increasing international trade activities. However, the pace of adoption and integration of Fintech in Algeria is still embryonic—in other words, full of opportunities and challenges.

The current paper attempts to shed some light on the Algerian perspective as to the role that Fintech could play in international trade, and more specifically, the opportunities to enhance the efficiency and competitiveness of trade and the challenges that need to be overcome to realize this potential. The current state of Fintech adoption in Algeria calls for identifying key trends, regulatory frameworks, and infrastructural developments influencing its integration into the trade sector. The barriers to Fintech adoption that will be looked into during the study include technological, regulatory, and capacity-building constraints by the Algerian financial institutions.

Research Question

- The primary research question is: How does FinTech impact international trade practices in Algeria, and what are the significant opportunities and challenges related to its adoption?

Sub-Questions

- What is the current adoption of FinTech in Algeria's international trade industry?
- What does FinTech offer the chief opportunities to improve Algeria's international trade?
- What are the key challenges to implementing FinTech in Algeria's international trade?

Hypotheses

- H1: Adopting Fintech significantly enhances the efficiency and transparency of international trade practices in Algeria.
- H2: Regulatory and infrastructural challenges are the primary barriers to Fintech adoption in Algeria's international trade sector.
- H3: The effective implementation of Fintech in Algeria can lead to increased competitiveness in global markets.

Study Objectives

- To analyze the current state of Fintech adoption in Algeria's international trade sector.
- To identify and evaluate the opportunities provided by Fintech for Algeria's international trade.
- To investigate the challenges facing the adoption of Fintech in Algeria.
- To propose strategies for overcoming these challenges and maximizing the benefits of Fintech in Algeria's international trade.

II. Theoretical Framework

II.1 Overview of Financial Technology (Fintech)

Fintech is the incorporation of technology within offerings to enhance the utilization of financial services companies. The evolution of FinTech itself has taken giant steps of development, through which traditional banking and financial services have been made accessible, efficient, and user-friendly. This overview will try to discover some of the most critical aspects of Fintech, its influence on financial services, and its possible development in the future with the help of supporting literature.

Fintech involves various applications and services, including mobile banking, online payment systems, peer-to-peer lending platforms, robo-advisors, and blockchain technology. The term received wide limelight after the global financial crisis of 2008, which, in a way, led financial authorities to look for technology-driven solutions in the delivery of financial services (Okoli & Tewari, 2020).

Today, it is considered one of the prime drivers of innovation in the financial domain, changing how customers and businesses interact with financial institutions. The impact Fintech has had on financial services is profound. It democratized financial services by giving access to the underserved populations in society. For example, mobile banking and digital wallets have allowed people in remote areas to conduct transactions without traditional banking infrastructure (Dahi, 2024).

At the same time, it gives rise to financial inclusion and empowers SMEs better with alternative financing choices outside their traditional reach (Meziane & Bouguetaia, 2023). In addition, Fintech has increased the efficiency of financial transactions. Blockchain enables faster and more secure transactions; this helps to reduce the time and costs associated with cross-border payments.

According to (Ng & Kwok, 2017), it reduces the time and costs of cross-border payments. On the other hand, Fintech solutions automate processes, minimizing human error and increasing operational efficiency for a financial institution.

According to (Meziane & Bouguetaia, 2023) banks and financial service providers are increasingly adopting innovations offered by Fintech to be competitive in the market, which is evolving rapidly.

II.2. Fintech and International Trade

- **Payment Processing Efficiency:** Fintech innovations, particularly blockchain-based solutions, have significantly reduced the time and cost of cross-border payments, enhancing trade efficiency by providing faster and more secure transaction methods.
- **Improved Access to Trade Finance for SMEs:** Fintech platforms have introduced alternative financing options, such as peer-to-peer lending and invoice financing, through which SMEs can access capital and proceed into the world. Advanced data analytics and

machine learning improve creditworthiness assessments to the advantage of companies that banks mostly turn down on this basis.

- **Automation of Trade Documentation:** Fintech solutions, including digital document management platforms and smart contracts, automatically generate, verify, and execute trade documents. This helps reduce paperwork, minimize errors and fraud, and smoothen trade transactions.
- **Promotion of Financial Inclusion:** Fintech helps extend financial services to unserved or underserved populations, especially in developing nations, through mobile banking and digital wallets; as such, they can engage in cross-border trade, substantively contributing to economic growth.
- **Evolving Regulatory Landscape:** Fintech disruption has caused regulators to change frameworks to accommodate new technologies. Regulators, financial institutions, and Fintech companies should collaborate to foster innovation while ensuring consumer protection and the financial system's stability. Key to this are regulatory sandboxes.
- **Geopolitical Risk Mitigation:** Fintech provides businesses with alternative payment and financing systems in case of financial system instability or stringent regional regulations. Thus, it supports global operations and mitigates geopolitical risks. (Cumming, Johan, & Reardon, 2023)

III– Methods and Materials:

III.1 Current State of Fintech in Algeria

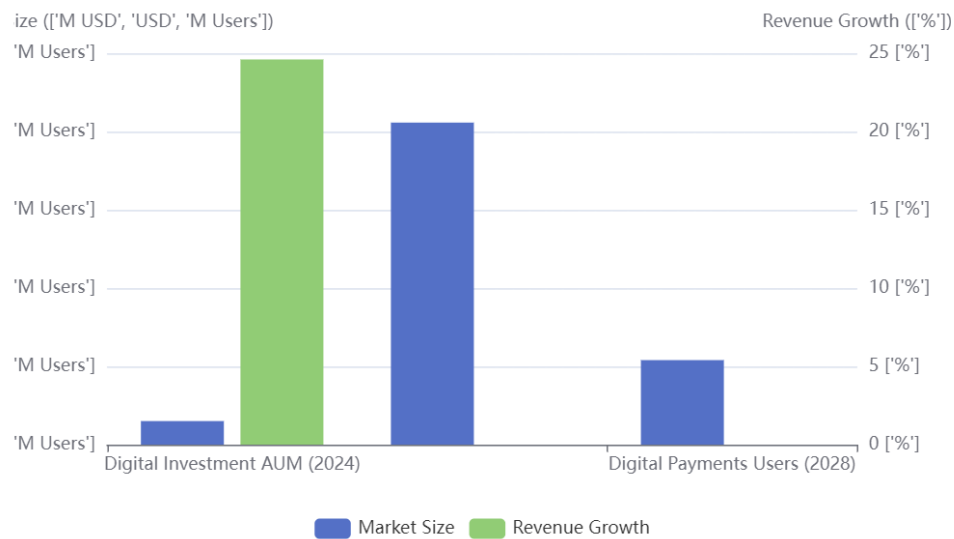
The Fintech sector in Algeria has witnessed significant growth in recent years, driven by advancements in technology and changing consumer preferences. Mobile banking and digital payment solutions have gained traction, particularly after the COVID-19 pandemic, which accelerated the shift toward contactless transactions (Al khatib, Alshaib, & Kanaan, 2023).

Algerian banks are increasingly adopting mobile applications that allow customers to perform various financial transactions, including fund transfers, bill payments, and account management, all from their smartphones. This shift enhances customer convenience and aligns with global trends toward digital banking (Flici, 2023).

Moreover, the rise of alternative financing options, such as peer-to-peer lending and crowdfunding platforms, has provided Algerian SMEs with greater access to capital. These Fintech solutions enable businesses to secure funding without relying solely on traditional banking channels, which can be restrictive.

By leveraging technology, Fintech companies can assess creditworthiness more accurately, allowing them to offer loans to businesses that conventional banks may have overlooked due to insufficient credit history. (Hacini, Mohammedi, & Dahou, 2022)

Figure (1): The Algerian Fintech Industry



Source: (Statista, 2024)

The current state of fintech in Algeria is characterized by significant potential and notable challenges. Here are the key points summarizing the industry, recent developments, and the hurdles it faces:

- **Growth and Potential:** Despite a growing number of fintech companies and an expanding user base, investment activity in Algeria's fintech sector has slowed in recent years. The largest market segment is expected to be Digital Investment, with assets under management (AUM) projected to reach \$6.02 million by 2024.
- **Key Segments:** The fintech market in Algeria includes digital payments, digital investments, digital capital raising, digital assets, and net banking. Digital payments are particularly significant, with users expected to reach 21.59 million by 2028. (Statista, 2024)

III.2 Adoption and Usage in International Trade

The adoption of FinTech in Algeria's sphere of international trade is at a very nascent stage. In the past, the Algerian banking sector has had antiquated technology infrastructures and underdeveloped payment systems, which have limited the rapid diffusion of FinTech solutions.

However, there is increasing awareness of the need to renovate the financial sector to increase the efficiency and security level of the transactions carried out in international trade. First and foremost, adopting e-payment systems, among other digital innovations, is an essential step toward integrating Fintech in trade practices. Government efforts to digitalize all sectors have accorded regulatory support for adopting Fintech.

This has come in the form of initiatives geared at enhancing financial inclusion through digital identity systems and innovation in financial technologies. However, challenges persist in the low adoption rates of digital payments due to most people's cultural preferences for cash and general lack of trust in online transactions.

Table (1): Case Studies of Fintech Applications in Algerian Trade

Category	Case Study	Challenges Faced	Benefits Realized
Digital Payments	Growth of the Digital Payments Market	- Resistance to adoption - Preference for cash usage - Limited digital literacy	- Projected market volume of USD 12.21 billion by 2028 - Facilitated transactions for e-commerce and mobile payments
Mobile Money	Mobile Money Services	- Low adoption rate (16% usage) - Cultural preference for cash - Infrastructure and trust issues	- Enables quick, secure transactions - Enhances accessibility, especially in areas with limited banking services
E-commerce Platforms	Integration of Fintech in Platforms (e.g., Jumia)	- Payment processing complexities - Limited payment method adoption	- Streamlined payment processes - Enhanced user experience - Broader market reach for businesses
Crowdfunding	Platforms like My-Tree Online	- Limited awareness - Regulatory challenges	- Alternative financing for sustainable projects - Promotes social responsibility
Neobanking	Digital-only Banks	- Competition with traditional banks - Trust and regulatory challenges	- Reduced cost and complexity of transactions - Convenient financial products accessible via mobile apps
Beyn	A fintech startup providing digital banking and payment services, with 11 banks as clients.	Resistance to digital financial services and low trust in fintech.	Potential to revolutionize the financial sector and facilitate international trade by offering innovative digital solutions.
Barid Pay	Algeria Post launched a contactless mobile payment application, allowing secure transfers without physical cards or cash.	Low adoption due to a culture of cash usage and limited digital literacy.	Facilitates smoother transactions for businesses engaged in international trade, enhancing transaction efficiency.
Digital Investment	Growth in the Digital Investment Market	- Regulatory uncertainty - Digital literacy gap - Inadequate infrastructure	- Increased accessibility to financial services - Efficiency and cost reduction - Significant user growth projected by 2028
MSMEs' Financing	Overcoming Financing Gaps through Fintech Innovations	- Access to credit issues - Awareness and trust challenges among	- Alternative financing options (e.g., peer-to-peer lending) - Speed and convenience in accessing funds - Improved financial inclusion for MSMEs

		MSMEs	
Public Banks	Digital Transformation of Algerian Public Banks	- Late adoption of digital technologies - Cultural resistance - Limited technical resources	- Improved customer experience - Cost savings through automation - Enhanced competitiveness of public banks

Source: Prepared by the researchers based on: (Zhang, Ashta, & Barton, 2021); (Suryono, Budi, & Purwandari, 2020)

IV- Results and discussion :

IV- 1. The Opportunities:

- **Economic Growth and Trade Expansion:** There is enormous potential for economic growth and trade expansion by integrating Fintech into the international trading sector. Digital payment systems, blockchain technology, and solutions in the sphere of trade finance may offer opportunities for enhancing trade efficiency by reducing transactional costs and time and improving transparency. For Algeria, Fintech can provide SMEs with easier access to cheaper financial services and trade finance solutions to compete in the global marketplace. This will result in high efficiency and reducing barriers to entry, which makes it possible for the economy to grow while simultaneously keeping pace with reducing poverty and avoiding other crises occurring in the economy of Algeria. (Xiong & Sun, 2019)
- **Financial Inclusion:** Fintech offers an excellent opportunity to increase the financial inclusion of trade activities in Algeria. Expanding digital financial services, particularly in unserved or underserved areas, will probably empower people and businesses to participate more actively in international trade. Through mobile banking, e-wallets, and other innovative Fintech solutions, individuals will make their transactions outside banking systems, thus reducing barriers and the costs of trades. These technologies were. Therefore, an alternative means to secure capital and manage trade risks for Algerian SMEs, many of whom struggle to access conventional financing. (Wu, Xia, & Zhou, 2022)
- **Integration with Global Markets:** Adopting Fintech solutions could further make Algeria integrate better into world markets. In other words, digital payment systems, blockchain technology, and AI-driven analytics can make Algeria a better player in international trade. Algeria can use these technologies to improve its relations with the global trade community and attract foreign investment in international partnerships and collaborations, primarily via cross-border Fintech platforms. The development of Sharia-compliant Fintech products presents an excellent opportunity for Algeria to serve the sizeable Muslim population and further cement its role in world markets. (Meltzer, 2023)

IV- 2. The Challenges

- **Regulatory and Legal Barriers:** The Fintech regulatory environment in Algeria is particularly harmful to the growth and integration of international trade. Whereas there has been a recent will to establish a framework that would enhance this sector, these regulations are often outpaced by the ever-quickenning technological change; hence, there might be a case of regulatory uncertainty. The lack of detailed laws tailored to Fintech makes it ambiguous, deterring investment and hampering innovation. Moreover, the existing legislation and regulation issues over data security, AML, and customer protection are usually challenging for Fintechs to comply with. The inability to build a robust legal framework hampers not only further development but also makes the process of trust-building by prospective users rather difficult, thus impeding the Fintech impact on the stimulation of international trade (Cumming, Johan, & Reardon, 2023).

- **Technological Infrastructure:** Another significant barrier is the weak technological infrastructure in Algeria. The country's digital infrastructure—internet penetration, cybersecurity measures, and digital literacy—is underdeveloped, especially in rural areas. Fundamentally, reliable internet access lies at the very core of the operation of Fintech services. However, many regions of the country still have connectivity issues today, limiting the outreach feasible for digital financial services. Furthermore, cybersecurity concerns remain high since the digitalization of financial services increases vulnerability to several cyber-attacks and data exposure. The inadequacy of measures on cybersecurity leads to the erosion of user trust. At the same time, low digital literacy among people limits the implementation of Fintech services, thus complicating the efforts to improve international trade. (Karathanasopoulos, 2020)
- **Socioeconomic and Cultural Factors:** This is furthered by resistance to change, driven by a lack of awareness of and understanding of digital financial services. There seems to be much fear concerning online transactions in Algeria, especially when making digital payments; they do not trust them at all and have a highly suspicious nature towards issues related to security and privacy. This cultural bias toward cash is extreme and constitutes the major hindrance to adopting Fintech solutions, which are vital in facilitating international trade. Economic disparities further worsen these challenges because those with low incomes may not have easy access to digital devices and internet services, significantly narrowing their chances of participating in Fintech. (Meltzer, 2023)

IV- 3. Analysis and Discussion

The analysis of the Algerian perspective of Fintech in international trade points toward a very promising landscape but with significant challenges. The main findings referred to the duality of Fintech adoption in Algeria: a country holding unrealized opportunities for improvement in efficiency within international trade and simultaneously economic growth but in a situation dulled by technological and regulatory barriers.

- **Fintech Adoption in Algeria:** The adoption of Fintech in Algeria is at the introductory stage. As much as the country has advanced in mobile banking and digital payment solutions, little has been done to incorporate them into international trade. Unsupportive technology infrastructures, underdeveloped payment systems, and a cultural preference for cash-based transactions may drive this slow rate. Notwithstanding, with growing awareness in the financial sector and political will to transform prevailing practices in trade, there is an emerging openness to Fintech innovations that can assist in this regard.
- **Opportunities for Economic Growth and Trade Expansion:** Fintech can open up a whole new world of possibilities for increasing the volume of international trade for Algeria through decreased transaction costs, enhanced transparency, and access to sources of trade finance that can act as an incentive for SMEs. With digital payment systems and blockchain technology integrated, goods and services from Algeria would better position themselves in global markets, attract foreign investment, and be more competitive. Moreover, the Sharia-compliant Fintech products open up a unique channel for Algeria to leverage its Muslim majority population in catering to a global market in demand for these services.
- **Challenges in Adoption and Integration:** One of the significant challenges to Fintech adoption in international trade for Algeria includes regulatory and legal barriers, weak technological infrastructure, and a lack of digital literacy. Indeed, the regulatory environment in Algeria is still trying to keep up with the rapid pace of technological change, introducing a degree of uncertainty that discourages innovation. The digital infrastructure remains underdeveloped, characterized by considerable gaps in internet penetration and even more so in cybersecurity measures, especially in rural areas. Indeed, these shortcomings greatly limit the scalability of Fintech solutions and reduce user trust, hindering further adoption.
- **Strategic Implications:** To fully realize Fintech's benefits, Algeria must address these challenges through a coordinated approach involving regulatory reforms, infrastructure investments, and capacity-building initiatives. Regulatory frameworks must be updated to

accommodate Fintech innovations while ensuring consumer protection and financial stability. Simultaneously, improving digital infrastructure and promoting digital literacy are essential for fostering a Fintech-friendly environment.

V- Conclusion:

The study highlights that Fintech has the potential to revolutionize Algeria's international trade sector by enhancing efficiency, transparency, and inclusiveness. However, fully realizing these benefits is contingent upon overcoming significant regulatory, technological, and cultural challenges. Algeria's gradual adoption of Fintech and targeted interventions could position the country as a key player in global trade. Therefore, a strategic focus on regulatory reforms, infrastructure development, and financial inclusion is crucial for leveraging Fintech's potential to drive economic growth and trade expansion in Algeria.

Findings

- Current State of Fintech Adoption: Fintech adoption in Algeria is in its infant stages, characterized by a comprehensive digital infrastructure and regulatory framework gap.
- Opportunities in Efficient Trade: Fintech shows enormous potential for reducing transaction costs, improving trade transparency, and giving SMEs access to broader markets.
- Regulatory and Technological Challenges: More than anything, regulatory uncertainty, along with a weak technological infrastructure and low digital literacy, were the chief reasons acting as significant barriers to the adoption of Fintech.
- Strategic Interventions: To enable Fintech to reach its full potential in Algeria, most of these challenges will require regulatory reforms, infrastructure investments, and capacity-building efforts.

Recommendations

- ✓ Regulatory Reforms: This shall establish an all-rounded regulatory framework on Fintech, particularly toward data security, anti-money laundering measures, and consumer protection.
- ✓ Infrastructure Development: This will involve investment in digital infrastructure up-gradation in rural areas to ensure reliable internet access and strong cybersecurity.
- ✓ Capacity Building: Facilitate digital literacy and diffuse awareness about gains accruing various businesses and consumers from Fintech to encourage its adoption.
- ✓ Public-Private Collaboration: Encourage the government, financial institutions, and Fintech companies to collaborate to drive innovation and create an enabling environment that fosters the adoption of Fintech.
- ✓ Focus on Financial Inclusion: Expand financial services inclusion to underserved populations through mobile banking and digital payment solutions that help them participate more fully in world trade.

VI- Referrals and references:

- Al khatib, A. M., Alshaib, B. M., & Kanaan, A. (2023). The interaction between financial development and economic growth: a novel application of transfer entropy and nonlinear approach in Algeria. *SAGE Open*, 13(4).
- Cumming, D. J., Johan, S., & Reardon, R. C. (2023). Global fintech trends and their impact on international business: a review. *Multinational Business Review*, 31(3), 413-436.
- Dahi, B. E. (2024). Fintech solutions for West African SMEs: post-crisis challenges. *International Journal of Social Sciences and Humanities Invention*, 11(04), 8110–8118.
- Flici, F. (2023). The limits of parametric reforms in sustaining the Algerian retirement system in the context of population aging. *International Social Security Review*, 76(3), 47-67.
- Hacini, I., Mohammedi, K., & Dahou, K. (2022). Determinants of the capital structure of small and medium enterprises: empirical evidence in the public works and hydraulics sector from Algeria. *Small Business International Review*, 6(1).
- Karathanasopoulos, A. (2020). The role of blockchain in modernizing trade finance. *International Trade Journal*, 34(3), , 287-303.
- Meltzer, J. P. (2023). Fintech and international trade: Advancing economic growth through innovation. *World Economy*, 46(5), 1023-1037.
- Meziane, M. T., & Bouguetaia, S. (2023). Impact of financial technology on Algerian bank performance. *Journal of Innovations and Sustainability*, 7(4), 07.
- Ng, A. W., & Kwok, B. K. (2017). The emergence of fintech and cybersecurity in a global financial center. *Journal of Financial Regulation and Compliance*, 25(4), 422-434.
- Okoli, T. T., & Tewari, D. D. (2020). An empirical assessment of fintechs heterogeneous transmission channels to financial development among African economies. *Cogent Economics & Finance*, 8(1), 1829273.
- Statista. (2024). Retrieved from <https://www.statista.com/outlook/dmo/fintech/algeria#:~:text=Despite%20the%20growing%20number%20of,number%20of%20investments%20since%202017>.
- Suryono, R. R., Budi, I., & Purwandari, B. (2020). Challenges and trends of financial technology (fintech): a systematic literature review. *Information*, 11(12), 590.
- Wu, T., Xia, J., & Zhou, X. (2022). Digital financial inclusion and international trade: Evidence from developing countries. *Journal of Financial Stability*, 60, 100936.
- Xiong, W., & Sun, J. (2019). Research on the change and development of international trade under the environment of electronic commerce. *Journal of Business Research*, 105, 137-144.
- Zhang, B. Z., Ashta, A., & Barton, M. E. (2021). Do fintech and financial incumbents have different experiences and perspectives on adopting artificial intelligence? *Strategic Change*, 30(3), 223-234.