



The Role of Financial Technology in Bridging the Gender Financial Inclusion Gap in Developing Countries: The Case of Algeria

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Abstract :

This study examines the role of financial technology (Fintech) in reducing the gender gap in financial inclusion and promoting gender equality in developing countries, with a case study of Algeria. It highlights Fintech's potential to address traditional barriers such as high costs, limited access to financial services, and socio-cultural constraints. Through a survey targeting women from diverse age, educational, and geographical backgrounds, the study identified factors influencing the adoption of financial technology, including ease of use, financial literacy, and existing challenges. The findings reveal that Fintech significantly contributes to enhancing financial inclusion and gender equality but still faces challenges such as digital illiteracy and weak infrastructure, necessitating targeted policies to achieve sustainability.

Key Words: Fintech, gender equality, financial inclusion, digital illiteracy, Algeria

JEL Classification : G21, G28, J16

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Introduction:

Financial technology (Fintech) has emerged as a transformative force in the global financial landscape, offering innovative solutions to address long-standing issues of financial exclusion. Among these, the persistent gender gap in access to financial services has garnered significant attention, as women, particularly in developing regions, face systemic barriers that hinder their participation in traditional financial systems. These barriers include socio-cultural norms, high costs, and logistical challenges that limit women's ability to access and effectively utilize financial services. Fintech, with its potential to provide accessible, affordable, and flexible financial tools, offers a promising pathway to bridge this gap and promote gender equality.

**Research Problem:**

Despite the promise of fintech in reducing gender disparities, significant challenges remain. These include limited digital literacy, inadequate infrastructure, and entrenched cultural norms that impede women's adoption of fintech solutions. This study explores the role of fintech in achieving gender equality through a field study conducted in Algeria, specifically in Tlemcen Province, which represents a diverse demographic and cultural landscape encompassing both urban and rural areas. The research seeks to address the following question:

How effectively does financial technology (fintech) overcome the barriers women face in accessing financial services, thereby bridging the gender gap and promoting gender equality?

Hypotheses:

- Fintech innovations enhance financial inclusion for women by overcoming traditional barriers such as cost and accessibility.
- Digital literacy and acceptance of socio-cultural norms significantly influence women's adoption of fintech .
- The adoption of fintech positively impacts gender equality by empowering women economically and socially.

Methodology:

A field survey was used as the primary data collection tool, targeting a diverse sample of women in Tlemcen Province, covering various age groups, geographic areas (urban and rural), and educational levels. The survey was designed to examine four key dimensions:

- Ease of Use: Assessing how accessible fintech platforms are to women in Tlemcen with varying levels of digital literacy.
- Financial Literacy: Measuring the impact of financial knowledge on women's ability to adopt and utilize fintech solutions.
- Challenges and Barriers: Identifying obstacles such as high costs, weak infrastructure, and societal constraints faced by women
- Economic and Social Impact: Evaluating the role of fintech in promoting women's economic empowerment and achieving gender equality.

Significance of the Study:

This research contributes to understanding the relationship between fintech and gender equality in the Algerian context, focusing on Tlemcen Province as a case study reflecting the diverse socio-economic and cultural realities. By identifying the factors influencing women's adoption of fintech and the challenges they face, the study provides valuable insights for policymakers, financial institutions, and technology developers on promoting financial inclusion for women. The findings



aim to support the design of inclusive technological solutions that address women's unique needs in Algeria, offering a roadmap for achieving more equitable and sustainable economic development.

I. The Role of Financial Technology in Achieving Gender Equality:

Financial technology (fintech) is a transformative tool for reducing gender disparities in financial inclusion. By offering accessible and cost-effective alternatives to traditional banking, fintech empowers women to overcome barriers such as logistical challenges, high costs, and socio-cultural constraints. However, its full potential requires complementary efforts, including digital literacy programs and inclusive policies, to ensure sustainable and equitable impacts. Fintech thus serves as a critical driver of gender equality and economic empowerment.(Yeyouomo, Asongu, and Agyemang-Mintah 2023)

A study conducted in India during the COVID-19 pandemic highlights the pivotal role of financial technology in fostering financial inclusion, particularly for women. Key initiatives, such as mobile banking and digital payment platforms, ensured access to essential financial services during lockdowns, benefiting underserved populations significantly. For instance, the Pradhan Mantri Jan Dhan Yojana (PMJDY) program resulted in the opening of over 430 million bank accounts, with women owning 55% of them. This remarkable achievement underscores the ability of fintech to bring unbanked women into the formal financial system and promote economic empowerment.

Despite these successes, the study points out persistent challenges, including limited digital and financial literacy, as well as cultural and societal norms that hinder women's full participation in the fintech ecosystem. These barriers are particularly pronounced in rural areas, where access to technology and education remains limited.

To overcome these challenges and fully leverage fintech's potential for gender equality, the study emphasizes the need for targeted interventions. These include improving digital infrastructure, implementing tailored financial literacy programs, and addressing societal constraints through awareness campaigns. By adopting such measures, fintech can act as a powerful enabler of inclusive growth, aligning with broader developmental goals to empower women and bridge the financial inclusion gap. (Akhlq and Khan 2022)



II. Literature Review:

- The study *"Access to Finance in Sub-Saharan Africa: Is There a Gender Gap?"* (2013) by Reyes Aterido, Thorsten Beck, and Leonardo Iacovone explores the challenges women face in accessing financial services in Sub-Saharan Africa. Drawing on extensive data from over 11,000 formal firms, 2,400 informal enterprises, and household surveys, the authors highlight significant barriers women encounter in accessing formal financial services. However, these gaps largely disappear when factors like income, education, firm size, and industry type are taken into account. The study also reveals that female-owned businesses, while generally smaller and less export-oriented, tend to be more innovative, suggesting that structural conditions rather than outright discrimination are the primary drivers of these disparities. (Aterido, Beck, and Iacovone 2013)
- The study: *"The Fintech Gender Gap"* (2023) by Sharon Chen, Sebastian Doerr, Jon Frost, Leonardo Gambacorta, and Hyun Song Shin explores gender disparities in the adoption of financial technology across 28 countries, using survey data from over 27,000 respondents. The research reveals a persistent gender gap, with men being significantly more likely to use fintech products than women. This gap exceeds the traditional gender differences in bank account ownership. Factors such as privacy concerns, differences in product suitability, and attitudes toward financial technology explain a significant portion of the disparity. The study highlights that while fintech holds potential for promoting financial inclusion, current products and services often fail to meet the needs of female users, indicating the need for tailored solutions and inclusive policies to bridge the gap. (Chen et al. 2023)
- The study: *"Mobile Fintech, Digital Financial Inclusion, and Gender Gap at the Bottom of the Pyramid: An Extension of Mobile Technology Acceptance Model"* (2023) by Muhammad Ashoer, Charles Jebarajakirthy, Xim-Jean Lim, Masdar Mas'ud, and Zaenal Arifin Sahabuddin explores the adoption of mobile fintech and its impact on digital financial inclusion among the Bottom of the Pyramid (BOP) demographic in Indonesia. Utilizing the Mobile Technology Acceptance Model (MTAM), the study examined factors like mobile usefulness, ease of use, digital financial literacy, perceived costs, and behavior. Data collected from 200 respondents revealed significant gender disparities, with men showing greater usage and benefiting more from digital financial inclusion than women. The findings emphasize the need for targeted strategies to address gender-specific barriers in fintech adoption, such as enhancing digital financial literacy and access to affordable mobile technologies for women in underserved communities. (Ashoer et al. 2024)
- The study: *"Gender Political Inclusion and Inclusive Finance in Africa"* (2024) by Tii N. Nchofounga, Simplicie A. Asongu, and Vanessa S. Tchamyou examines the relationship between women's political empowerment and financial inclusion across 37 African countries from 2004 to 2020. The study employs methodologies



such as OLS, Tobit regression, and System GMM to assess the impact of political inclusion on financial inclusion. Findings reveal that increased political representation of women positively influences financial inclusion, with governance playing a significant mediating role. The research emphasizes that integrating gender and governance reforms can enhance financial accessibility, providing a crucial pathway for inclusive economic development in Africa.(Nchofoung, Asongu, and Tchamyoun 2024)

- The study: *"Fintechs and the Financial Inclusion Gender Gap in Sub-Saharan African Countries"* (2023) by Aurelien Kamdem Yeyouomo, Simplicie A. Asongu, and Peter Agyemang-Mintah explores the impact of fintech development on reducing gender disparities in financial inclusion across 27 Sub-Saharan African countries between 2011 and 2017. Using a multilevel Tobit regression model, the research demonstrates that fintech innovations significantly reduce the gender gap in access to and use of formal financial services. Despite these advances, the study notes that fintech alone cannot fully bridge the gap, advocating for complementary policies to target structural barriers and social norms that perpetuate gender inequalities.(Yeyouomo et al. 2023)
- The study: *"Closing the Gender Gap in Financial Inclusion through Fintech"* (2019) by Erica Paula Sioson and Chul Ju Kim examines how fintech innovations can address the persistent gender gap in financial inclusion, particularly in Asia and the Pacific. The research highlights barriers such as distance to banks, insufficient documentation, and cultural attitudes that prevent women, especially in rural areas, from accessing financial services. The study underscores the transformative role of fintech in increasing accessibility, lowering costs, and empowering women by enabling digital transactions, savings, and financial management. While acknowledging the challenges fintech providers face, the authors emphasize the importance of tailored services and supportive policies to ensure broader financial inclusion for women.(Paula Sioson and Ju Kim 2019)
- The study: *"Fintech on Women's Financial Inclusion: Bringing the Gender Gap through Innovative Solutions"* (2024) by Sanjana Agarwal, Dhruv R. Jain, Gourav Agarwal, Tanishq M., Hrishikesh, and Siddharth examines the role of financial technology in addressing gender disparities in financial inclusion. The research highlights barriers such as limited access to traditional banking, lack of digital literacy, and biases in credit scoring, which hinder women's financial empowerment. It emphasizes how fintech innovations, like mobile banking, digital payments, and alternative credit systems, enhance accessibility and affordability of financial services for women. The study also underscores the importance of digital literacy, targeted fintech apps, and partnerships with NGOs to address gender-specific challenges. Despite progress, findings reveal persistent gender gaps in fintech adoption and emphasize the need for inclusive regulatory frameworks and tailored solutions to bridge these disparities and promote economic empowerment.(Agarwal, Jain, and Agarwal 2024)

**Table 1 :Summary of Studies**

Study Title	Authors	Year	Research Problem	Methodology	Findings
Access to Finance in Sub-Saharan Africa: Is There a Gender Gap?	Reyes Aterido and al.	2013	Gender differences in financial service access in Sub-Saharan Africa.	Descriptive statistics, regression, decomposition.	Gender gaps diminish after accounting for structural factors; female firms are innovative but face barriers.
The Fintech Gender Gap	Sharon Chen and al.	2023	Disparities in fintech adoption across 28 countries.	Survey analysis from 27,000+ respondents.	Men use fintech more; privacy concerns and product gaps widen the disparity.
Mobile Fintech, Digital Financial Inclusion, and Gender Gap at the Bottom...	Muhammad Ashoer and al.	2024	Adoption of mobile fintech and its effects on digital inclusion in Indonesia.	Mobile Technology Acceptance Model and survey data.	Gender gaps persist; digital literacy and affordability are key barriers.
Gender Political Inclusion and Inclusive Finance in Africa	Tii N. and al.	2024	Women's political empowerment and its role in financial inclusion in Africa.	OLS, Tobit regression, System GMM.	Political empowerment increases financial inclusion; governance reforms are essential.
Fintechs and the Financial Inclusion Gender Gap in Sub-Saharan Africa	Aurelien Kamdem and al.	2023	Fintech's impact on gender disparities in financial access in Sub-Saharan Africa.	Multilevel Tobit regression.	Fintech reduces gaps but requires complementary policies to address social norms.



Closing the Gender Gap in Financial Inclusion through Fintech	Erica Paula Sioson, Chul Ju Kim	2019	Addressing gender disparities in Asia-Pacific financial inclusion through fintech.	Review and analysis of barriers and innovations.	Fintech expands access, but challenges like documentation and cultural norms remain significant.
Fintech on Women's Financial Inclusion: Bringing the Gender Gap...	Sanjana Agarwal and al.	2024	Role of fintech in reducing gender financial inclusion gaps globally.	Qualitative and quantitative exploration of fintech solutions.	Persistent gaps highlight the need for digital literacy and inclusive policies tailored to women's needs.

Source : By authors

1. Commonalities:

- **Focus on Gender Inequality:** All studies analyze disparities in financial access or fintech usage by gender.
- **Role of Technology:** Fintech is consistently emphasized as a transformative tool for addressing financial gaps.
- **Barriers Identified:** Common barriers include digital literacy, affordability, and structural biases.

2. Differences:

- **Geographic Scope:** While some studies focus on specific regions (e.g., Sub-Saharan Africa, Indonesia, Asia-Pacific), others take a global approach.
- **Methodology:** The methodologies range from statistical modeling (e.g., regression) to surveys and qualitative analyses.
- **Focus Areas:** Some studies focus on fintech's impact on financial inclusion, while others examine the broader socio-political implications.

3. Research Gaps:

- ✓ **Insufficient Gender-Specific Data:** Many studies call for more disaggregated data to better understand women's financial behaviors and needs.
- ✓ **Evaluation of Long-Term Impact:** The actual long-term effectiveness of fintech interventions in bridging gender gaps is underexplored.



- ✓ **Intersectionality:** Few studies examine how factors like age, education, and rural/urban divide interact with gender in fintech adoption.

III. In-Depth Analysis of the Relationship Between The Financial Technology and Gender Equality

This study aims to analyze the role of financial technology in achieving gender equality, based on a survey conducted with 100 women from various regions, educational levels, and age groups in Tlemcen. The study focuses on four main aspects: the first addresses the ease of using financial technology as a tool to access financial services, the second emphasizes the importance of financial literacy in enhancing confidence and the ability to use these technologies effectively. The third highlights the challenges women face, such as weak technological infrastructure and high costs. Lastly, the fourth aspect explores the role of financial technology in promoting gender equality by providing equal economic opportunities and breaking traditional barriers.

1. Analysis of the First Aspect: Ease of Use of Financial Technology

The first aspect focused on evaluating the ease of use of financial technology among women. The results indicate that most participants believe that financial technology saves time and effort compared to traditional banking services and is suitable for women regardless of their educational level or technical skills.

More than 70% of participants indicated that ease of use was a key factor in adopting financial technology. Additionally, the data revealed that women from diverse educational backgrounds feel comfortable using this technology, reflecting the effectiveness of simple and inclusive design approaches.

2. Analysis of the Second Aspect: Financial Literacy in Financial Technology

- This aspect focuses on measuring women's level of financial awareness and its impact on enhancing the use of financial technology.
- The results show that 65% of participants believe that financial literacy is a key factor in empowering them to confidently use financial technology.
- The majority also indicated that integrating financial literacy into educational curricula and dedicated training programs could bridge the knowledge gap among various groups.



3. Analysis of the Third Aspect: Challenges Facing Women in Using Financial Technology

- This aspect addresses the obstacles women face in utilizing financial technology.
- The findings revealed that the most significant challenges include weak technological infrastructure (50% of participants), high internet and digital service costs (45%), and cultural and social barriers (40%).
- These obstacles represent a barrier to maximizing the benefits of digital services and contribute to gender disparity.

4. Analysis of the Fourth Aspect: The Role of Financial Technology in Gender Equality (Dependent Variable)

- This aspect evaluates participants' perceptions of the role of financial technology in achieving gender equality.
- The results indicate that 70% of women consider financial technology an effective tool for accessing financial resources and achieving equal economic opportunities.
- Participants also emphasized that financial technology provides flexible solutions to overcome traditional barriers faced by women in financial transactions.

IV. Data Processing and Statistical Analysis

1. Data Cleaning and Encoding

Data were cleaned to remove missing values and responses were encoded numerically using a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The average scores for each section were calculated to quantitatively represent the analytical dimensions.

2. Internal Consistency Analysis (Cronbach's Alpha):

Cronbach's Alpha was used to measure the internal consistency of each section. The results indicate that the sections exhibit a good level of consistency, enhancing the reliability of the findings.

**Table 2 : Internal Consistency Analysis (Cronbach's Alpha)**

Section	Cronbach's Alpha Value	Interpretation
Ease of Use of Financial Technology	0.82	Good Internal Consistency
Financial Literacy	0.85	Very Good Internal Consistency
Challenges of Financial Technology	0.78	Good Internal Consistency

Source: Established by authors from the case study

3. Ease of Use of Financial Technology (0.82):

- This value reflects good internal consistency among the questions evaluating ease of use.
- It indicates that participants provided similar and consistent responses regarding the ease of using financial technology, showcasing the effectiveness of the survey design for this section.

4. Financial Literacy (0.85):

- This value represents very good internal consistency, suggesting strong interrelations among the questions in this section.
- The result reflects a clear understanding by participants of the importance of financial literacy in using financial technology.

5. Challenges of Financial Technology (0.78):

- This value indicates good internal consistency, although slightly lower compared to the other sections.
- It suggests minor variations in participants' views about the challenges, which is reasonable given the diverse nature of obstacles they may face.
- All Cronbach's Alpha values fall between 0.7 and 0.9, indicating a good level of internal consistency across all sections.
- These results affirm the quality of the survey design and its ability to measure different aspects effectively.



6. Correlation Analysis:

Pearson's correlation coefficient was used to determine the strength and direction of the relationship between the independent aspects (ease of use, financial literacy, challenges) and the dependent aspect (gender equality). The results indicate significant and meaningful relationships.

Table 2 : Correlation Analysis

Independent Aspect	Correlation Coefficient	P-Value	Interpretation
Ease of Use of Financial Technology	+0.65	0.001	Strong Positive Relationship
Financial Literacy	+0.58	0.002	Moderate Positive Relationship
Challenges of Financial Technology	-0.42	0.01	Moderate Negative Relationship

Source: Established by authors from the case study

V. Economic Interpretation of the Analysis Results:

The findings highlight the critical role of financial technology in promoting gender equality by economically empowering women and providing equal opportunities. However, challenges related to technological infrastructure and the high costs of digital services hinder the full realization of these benefits.

1. Ease of Use of Financial Technology:

- A strong positive relationship exists between ease of use and achieving gender equality.
- Simple and inclusive design increases women's ability to benefit from financial services, especially those with limited technical skills.

2. Financial Literacy:

- The moderate positive relationship emphasizes the importance of financial literacy in empowering women to effectively use financial technology.
- Financial literacy enhances confidence and the ability to make independent financial decisions.



3. Challenges Related to Infrastructure and Costs:

- The negative relationship between these challenges and gender equality indicates that weak infrastructure and high costs of internet and digital services are significant barriers.
- These challenges particularly limit women's ability, especially in rural areas, to utilize financial technology effectively.

Conclusion:

In Algeria, financial technology represents a genuine opportunity to address the gender gap in access to financial services, particularly in interior provinces and rural areas where infrastructure and traditional financial services are lacking. Specifically, in Tlemcen Province, a study involving 100 women from various regions revealed the significant potential of financial technology in enhancing financial inclusion and promoting gender equality. Women from both rural and urban areas emphasized the importance of financial technology in providing equal access to financial services. However, the study also highlighted major challenges, including inadequate digital infrastructure in rural areas, high costs of internet and digital services, and limited financial literacy. Nevertheless, the positive reception among women regarding the ease of using financial technology underscores its potential to overcome traditional barriers if appropriate measures are implemented.

Recommendations:

- Enhance Digital Infrastructure:
 - Improve high-speed internet coverage in rural areas.
 - Provide free or low-cost access points to support women's access to digital services.
- Launch Financial Literacy Initiatives:
 - Organize training programs targeting women in both rural and urban areas to enhance their financial awareness.
 - Engage schools and local centers in awareness campaigns to foster an understanding of financial technology.
- Develop Tailored Financial Solutions:
 - Design user-friendly financial platforms suitable for varying levels of education.
 - Offer targeted financial products such as microloans and savings programs that meet women's specific needs.
- Address Cultural and Social Barriers:
 - Launch awareness campaigns to challenge stereotypes about women's roles in the economy.



- Create community support platforms to encourage women to use financial technology with confidence.
- Strengthen Collaboration Between Sectors:
 - Foster partnerships between the government, local banks, and technology providers to expand the reach of digital financial services .
- Establish monitoring systems to evaluate and enhance the effectiveness of these initiatives.

By implementing these recommendations, stakeholders can establish a robust ecosystem where financial technology acts as a catalyst for gender equality, enabling women to fully participate in economic development.

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