



**ECONOMIC RESEARCH FORUM 29th Annual  
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Path – Risks and Opportunities in an Emerging**

**World Order**

**Financial technology as a driver of financial inclusion and  
inclusive development in the MENA region: Risks and  
opportunities**

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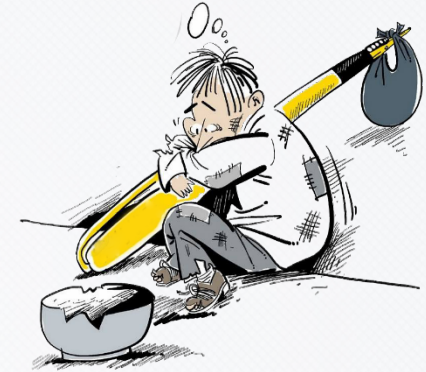
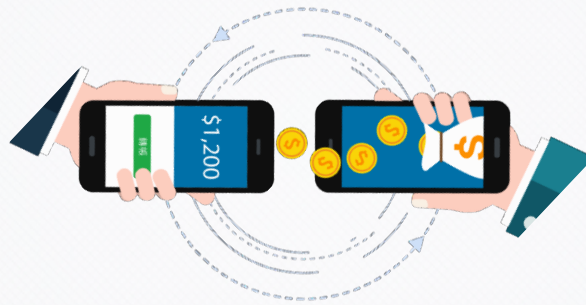
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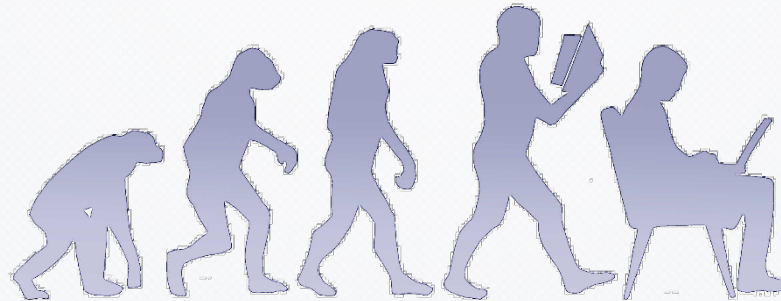


**Reducing inequalities**

# FINANCIAL TECHNOLOGY



**Poverty Alleviation**



**Empowerment of individuals**



- Fintech, a contraction of “**Financial Technology**” refers to players in the banking industry that use technological innovations to conduct financial activity.
- Fintech is seen as a key instrument for financial inclusion, which has become an area of renewed interest in recent times.
- Fintech innovations provide excluded populations with mobile banking applications that solve problems related to the remoteness of bank branches, the high cost of financial services, and the lack of trust in the traditional financial system.
- Fintech innovations also offer already financially included populations efficient and more suitable financial services.



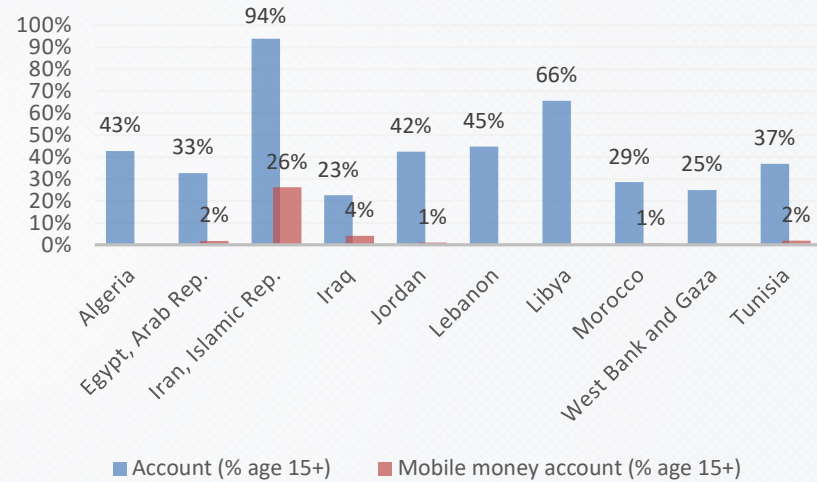
- Fintech platforms offer innovative tools for firms to control their operational costs and expand their financial product offerings (Chinnasamy et al., 2021).
- The fintech industry in the MENA region is growing rapidly, accounting for 12% of transactions conducted in the region (World Bank, 2022).
- However, the fintech industry is still at an early stage and requires financial sector supervisors in the MENA region to establish the necessary technological infrastructure and regulatory frameworks to foster its growth.





- The adoption profiles of digital financial services in the MENA region vary by country.
- Despite these variations, the dominant observation across all countries in the region is that cash-based culture remains prevalent.
- With the exception of Iran, where 26% of the adult population had a mobile bank account in 2017, most MENA countries have recorded low rates of mobile bank account usage (Figure 1).

Figure 1: Digital financial inclusion : MENA region

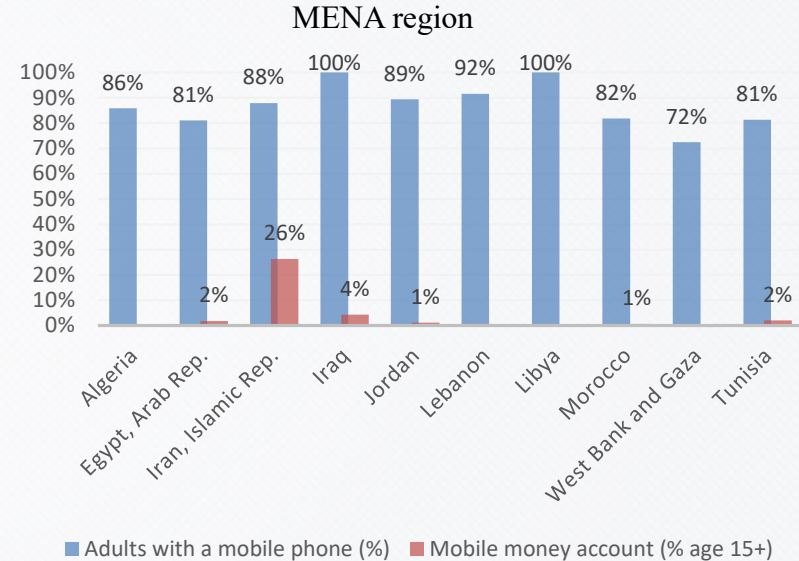


Source: authors' elaboration based on the World Bank Global Findex database 2017



- Financial technologies require mobile phone subscription and internet penetration, which are present in most MENA countries.
- Mobile phone subscription levels are over 80% in most MENA countries (Figure 2).
- However, digital financial inclusion may not be enough to reach segments excluded by the traditional financial system, especially in the absence of financial education.
- Efforts to promote financial education alongside digital financial inclusion are essential for ensuring that all segments of society can benefit from these technologies

Figure 2: Mobile phone subscription and digital financial inclusion:



Source: authors' elaboration based on Gallup World

Poll 2017 database.



Authors	Main Question	Methodology	Results
Chu, 2018	What is the impact of digital financial services on financial inclusion in the financial services industry?	Literature review	Digital financial services enable financial inclusion for unbanked and underbanked populations by providing affordable, real-time financial services anywhere.
Beyene Fanta and Makina, 2019	What is the impact of ICT development on financial inclusion levels in 168 countries, including 48 African countries?	Descriptive analysis	Access to the internet promotes financial inclusion.
Kouladoum et al, 2022	What is the impact of digital technology on financial inclusion in sub-Saharan Africa?	Regression analysis	Digital technology has significant positive effects on financial inclusion rates in sub-Saharan Africa.
Niu et al, 2022	What is the effect of large-scale infrastructure construction on digital financial inclusion in rural China?		Broadband infrastructure contributes significantly to digital financial inclusion in rural areas, driven by human capital, social capital, and financial system penetration levels.
Ozturk and Ullah, 2022	What is the relationship between digital financial inclusion, economic growth, and environmental quality?	Panel data analysis	Digital financial inclusion stimulates economic growth but generates more CO2 emissions, which negatively impacts environmental sustainability.





Authors	Main Question	Methodology	Results
Zheng and Li, 2022	What is the relationship between digital financial inclusion and carbon dioxide emissions in China?		Digital financial inclusion in terms of depth of use and digitalization level contributes to the reduction of carbon dioxide emissions.
Shen et al., 2021	What is the relationship between digital financial inclusion and economic growth in 105 countries?	Panel data analysis	Digital financial inclusion has a significant positive effect on economic growth.
Liu et al, 2021	What is the impact of digital financial inclusion on economic growth in China?	Panel data analysis	Digital financial inclusion has a positive effect on economic growth, moderated by the promotion of domestic consumption and entrepreneurship and with a threshold effect related to the internet penetration level.
Yang et al, 2022	How can digital financial inclusion promote women's entrepreneurship?		Digital financial inclusion contributes to reducing women's financing and information constraints, improves their work flexibility, and promotes women's empowerment.
Franklin A., 2021	What are the benefits of fintech to economies and financial systems in the MENA region?	Conceptual analysis	<b>Fintech can increase financial inclusion and reduce inequality for households and businesses in high-income and middle-income MENA countries.</b>
Belouafi, 2021	What is the current state and prospects of fintech in the MENA region?	Descriptive analysis	<b>The Dubai Financial Center is the most developed fintech ecosystem in the MENA region and will play a leading role in the coming years as a model for other sectors in the region.</b>



- What emerges from a careful reading of the literature is that Financial technology (fintech) has become a popular topic in recent years for promoting financial inclusion for both individuals and businesses.
- However, the majority of contributions focused on the Middle East and North Africa (MENA) region have been either theoretical or descriptive.
- Theoretical contributions include Khwaja (2020), Holle (2020), Franklin (2021), Chinnasamy et al. (2021), and Stefanie (2021).
- Descriptive approaches include Arezki and Senbet (2020) and Belouafi (2021).
- Despite the attention on fintech, there is a lack of empirical research investigating the potential risks and opportunities that the digital divide in the financial sector could have on already excluded segments of the population due to lack of digital financial education.





The **main question** of our article is as follows:

“How to ensure that the digital divide in the financial sector "*Financial Technologies*" does not further exclude population segments (women, elderly ...) financially excluded by the conventional financial system in the **MENA region**”.



To answer this main question, research epistemology provides us with the positivist paradigm by adopting a hypothetical-deductive reasoning mode and a mixed methodological approach (quantitative and qualitative) to investigate the different sub-issues of our main research question and drawing practical implications on the mediating role of financial technologies in financial inclusion and development in the MENA region. To this purpose, other secondary questions arise:

1. How are MENA countries progressing in terms of digital financial inclusion?
2. How individual characteristics are associated with financial technologies use in the MENA region?
3. How the digital divide could preclude some segments from being financially included as a result of a lack of financial literacy (*risks*)?
4. How FinTech could promote financial inclusion of segments excluded by the conventional financial system (women, elderly) and consequently the inclusive development of the MENA region (*opportunities*).





**Data source:** We have mobilized micro-level data on **9,053 individuals** extracted from the World Bank's latest Global Findex 2021, which includes micro-level data on 125,000 adults from 120 economies.

**Approach:** A mixed-methods approach, which will utilize two methods:

**Method 1:** Principal component analysis method to construct synthetic indices that quantify Digital Financial Inclusion across MENA countries.

**Method 2:** Binary choice modeling to investigate the determinants of financial technology use.



## II. Implications



1. **Practical implications:** The study provides valuable policy implications for international institutions and policymakers in the MENA region to improve digital financial inclusion based on a large sample.
2. **Research implications:** The study fills the literature gap by conducting comparative analyses of digital financial inclusion levels in the MENA region and examining the drivers of digital financial inclusion and how the digital divide can increase the exclusion of certain already excluded segments of the MENA population.



Figure 1: Digital financial inclusion index Sub-indicators

<b>Variables</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>
Used a mobile phone or the internet to check account balance (% age 15+)	0.197	0.0220	0.630
Used a mobile phone or the internet to buy something online (% age 15+)	0.167	0.0700	0.310
Used a mobile phone or the internet to pay bills (% age 15+)	0.0739	0.00500	0.350
Made a utility payment: using a mobile phone (% age 15+)	0.0395	0.000900	0.250
Received wages: through a mobile phone (% age 15+)	0.00487	0	0.01000

Source: Authors' calculations based on data from the World Bank database



## Weight computation and index aggregation

The principal component analysis (PCA) method is mobilized to reduce these sub-indicators. The weight of each sub-indicator in the synthetic index is:

$$w_j = \textit{Weight}_j = \frac{(LF_j)^2}{VT}$$

“LF is the loading factor and VT is the total variance measured by the sum of the eigenvalues in the explained variance table. The composite index for country  $i$  in year  $t$  is”:

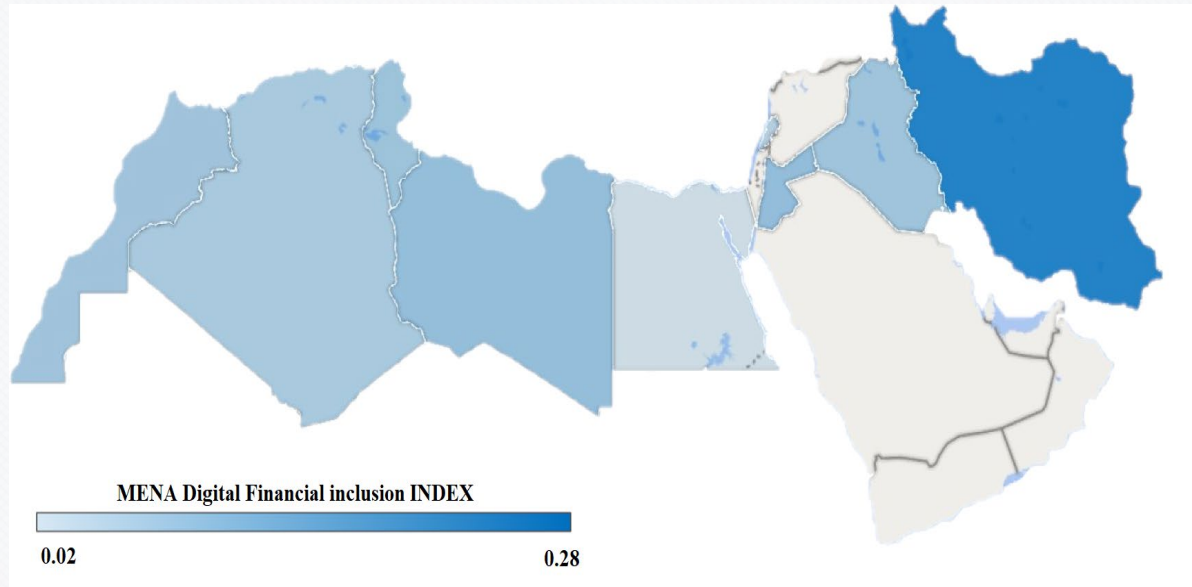
$$\textit{Digital financial inclusion Index (DFII)}_t = \sum_{j=1}^J w_j \times \textit{Indicator}_{jt}$$

Index  $j$  refers to one of the 05 sub-indicators aggregated to obtain the synthetic index.





Figure 3: MENA' Digital financial inclusion map, 2021



Source: authors' elaboration. (Countries not displayed are those for which data on mobile banking use are not available).



**Question 1:** How are MENA countries progressing in terms of digital financial inclusion?

- Our comparative analysis revealed that the majority of MENA countries have a low digital financial inclusion level.
- Iran comes in first position with a digital financial inclusion index equal to 0.27 followed by Tunisia with 0.08.
- The gap between Iran and other countries is very pronounced.

Let's now deepen our analysis to understand the reasons for MENA's lagging achievement in Digital Financial Inclusion.



To investigate the determinants of digital financial inclusion and what role technology and internet infrastructure plays in MENA region, we mobilize the Probit model methodology used in a broad empirical literature. The specification of our model on the microeconomic data is as follows:

$$Y_i = \alpha_0 + \alpha_1 * Female_i + \alpha_2 * Age_i + \alpha_3 * Age_i^2 + \alpha_4 * Income_i + \alpha_5 * Education_i + \alpha_6 * Workforce_i + \alpha_7 * Location_i + \alpha_8 * Mobile\ phone_i + \alpha_9 * Internet_i + \varepsilon_i$$

Endogenous variables (**Y**) for digital financial inclusion are captured for individual *i*. **Gender** (1 for female, 0 for men), **Age**,  $Age^2$  (to check for non-linear relationship), **Income** (divided into four quantiles, binary variables with 1 indicating belonging to the quantile), **Education** (three levels: primary or less, secondary, tertiary or more), **Workforce** (1 for participating in the labor market, 0 otherwise), **Location** (1 for urban, 0 for rural), **Mobile phone**, and **Internet** (binary variables indicating access to technological infrastructure).





**Question 2:** How individual characteristics are associated with financial technologies use in the MENA region?

- In the MENA region, digital financial inclusion is determined by educational attainment, labor market participation, and widespread access to information and communication technologies and the Internet.

**Question 3:** How the digital divide could preclude some segments from being financially included as a result of a lack of financial literacy (*risks*)?

- Financial technologies are not conducive to the financial inclusion of elderly people, women, individuals with limited education, and poor social classes.





**Question 4:** How FinTech could promote financial inclusion of segments excluded by the conventional financial system (women, elderly) and consequently the inclusive development of the MENA region (*opportunities*).

- Policymakers in the MENA region should prioritize promoting access to internet and equipping citizens with cell phones to enhance their digital financial inclusion, contributing to the inclusive development of the MENA region.
- To facilitate access to digital financial services, the study identifies education and labor market participation as effective instruments, which could contribute to the inclusive development of the MENA region.
- Regulatory institutions should implement financial education programs (women, elderly...) and protect personal data to increase people's trust in financial technologies, promoting their uptake and contributing to digital financial inclusion, which in turn could lead to the inclusive development of the MENA region.



- The study highlights the potential of financial technology as a driver of financial inclusion and inclusive development in the MENA region. However, it also warns of the risks associated with financial technology, such as privacy and security concerns, and emphasizes the need for regulation and oversight to mitigate these risks.
- Overall, the study suggests that the MENA region can leverage financial technology to promote financial inclusion and inclusive development, but it requires a concerted effort from policymakers, regulators, and other stakeholders to ensure that the benefits are widely distributed and the risks are managed effectively.



- **Limit**

The sample size of MENA countries for which data is available on digital financial inclusion indicators is limited to 10 countries. As a result, our Digital Financial Inclusion Index may not include some countries that have made significant strides towards the use of financial technologies in the region, thus potentially underestimating the level of digital financial inclusion in the MENA region.

- **Future research**

Can digital financial inclusion be the silver lining in the post-COVID-19 clouds, by providing a pathway out of poverty and inequality in MENA region?





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**Thank you for your attention**

