

# “The relationship between foreign direct investment and financial inclusion in MENA countries: Evidence from the General Method of Moments”

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# THE RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND FINANCIAL INCLUSION IN MENA COUNTRIES: EVIDENCE FROM THE GENERAL METHOD OF MOMENTS

## Abstract

The study delves into the nuanced interaction between foreign direct investment (FDI) and financial inclusion in the MENA region, spanning the years 2003 to 2022 and employing the General Method of Moments for rigorous analysis. Its primary objectives are to elucidate how financial inclusion influences FDI and to examine the mediating role of economic growth and inflation as key factors. Key findings reveal a robust positive correlation between financial inclusion and FDI inflows within MENA countries. Specifically, the study uncovers significant relationships between FDI and the various dimensions of financial inclusion, including access, availability, and usage. This underscores the pivotal role of inclusive financial systems in attracting foreign investment. Moreover, the study highlights the symbiotic relationship between economic growth and FDI, indicating that heightened levels of economic prosperity attract greater investment. This underscores the importance of fostering conducive economic conditions to attract foreign capital. Furthermore, the study underscores the critical role of financial inclusion in shaping monetary policy and mitigating investment risks. By facilitating access to capital and reducing uncertainty, financial inclusion promotes transparency and stability, thereby enhancing the attractiveness of foreign markets for investment.

## Keywords

panel data, financial inclusion, foreign direct investment, MENA countries, GMM

## JEL Classification

C31, C33, F47, G29

## INTRODUCTION

Financial inclusion stands as a cornerstone in global economic systems, acknowledged by the World Bank Group as a critical driver in reducing poverty and fostering shared prosperity. With the ongoing COVID-19 crisis, its significance in enabling individuals and businesses to navigate unexpected financial challenges has become even more pronounced. By facilitating access to essential financial services such as credit, insurance, and savings, financial inclusion empowers people to pursue opportunities for business growth, investment in education and health, and effective risk management. This inclusive approach to finance not only enhances individual financial well-being but also contributes to overall economic growth and stability. The concept of financial inclusion aims to extend the reach and benefits of financial services to diverse populations, ensuring accessibility and affordability for all. This inclusivity encompasses various economic offerings, including insurance, savings, transactions, credit facilities, and access to ATMs. As a result, nations stand to benefit from increased economic opportunities and enhanced resilience. Despite significant progress,

there remains a substantial portion of the global population without access to basic financial services, highlighting the need for continued efforts to promote financial inclusion.

The advent of digital financial services has revolutionized the landscape of financial inclusion, offering innovative solutions to bridge existing gaps. Technologies such as Electronically Know Your Customer, Immediate Payment System, Aadhaar Enabled Payment System, and Mobile Banking have facilitated greater access to financial services, particularly in regions with limited traditional banking infrastructure. FDI serves as a conduit for transferring these technologies across borders, potentially reducing the cost barriers, and improving the accessibility of financial services in underserved communities.

## 1. LITERATURE REVIEW

FDI refers back to the investment made by a person, a corporation, or a government in one country into business interests located in another country. This investment involves obtaining a large and lasting hobby in overseas establishments, commonly within the shape of possession or controlling stake. According to IMF (2004), the conceptualization of FDI reflects its function as a complex, dynamic, and transformative economic pastime that includes possession, management, generation switch, and diverse reasons. The literature underscores the importance of coverage, lengthy-time period dedication, and broader socio-economic impacts in understanding and harnessing the potential of FDI for financial improvement and worldwide business integration.

Financial inclusion is characterized as “a system facilitating seamless access, extensive availability, and effective utilization of formal economic services throughout all segments of an economy” (Al-Smadi, 2023). Financial inclusion is the provision and use of all financial services by various segments of society (individuals, institutions, or governments), such as bank savings accounts, payment and transfer services, and innovating financial services (Chen et al., 2023; Abu-AlSondos et al., 2020; Bataineh et al., 2024; Almestarihi et al., 2024). Thus, according to the World Bank report (2022) the financial inclusion Factors are presented as follows:

- **Access** indicators reflect the depth of outreach of financial services, such as the penetration of bank branches or point of sale (POS) devices in rural areas, or demand-side barriers that customers face to access financial institutions, such as cost or information.

- **Usage** indicators measure how clients use financial services, such as the regularity and duration of the financial product/service over time (e.g. average savings balances, number of transactions per account, number of electronic payments made).
- **Quality or Available** measures describe whether financial products and services match clients’ needs, the range of options available to customers, and clients’ awareness and understanding of financial products such as the (number of ATMs and Bank branches).

As explored by some researchers (Al-Smadi et al., 2023; Bilir et al., 2019), this principle posits that complete fiscal services have to be universally reachable to all individuals within a nation. Furthermore, a collaborative attempt among numerous entities is important to extend financial inclusion offerings to a broader target audience. Camera and Taste (2014) emphasized that agencies have to collectively strive to combine financially underserved populations into the monetary machine in pursuit of extra financial inclusion outreach.

A variety of studies has yielded various insights into the affiliation among financial inclusion and FDI, as demonstrated by the works of Chen et al. (2023), Al-Smadi et al. (2023), Majeed et al. (2021), Omoush & Al-Smadi (2020), Bilir et al. (2019), Desbordes and Wei (2017), Lestari et al. (2022), and Odugbesan et al. (2022).

Chen et al. (2023) investigated the effect of financial inclusion on FDI using the DCCE method for the 2000 to 2020 period. The outcomes of this study discover a noteworthy, wonderful effect of financial inclusion on FDI in better prof-

its. Likewise, Al-Smadi (2023) scrutinized the interaction between digital finance and financial inclusion throughout a sample of 12 incredible international locations. Using three variables as indicators of financial inclusion, which are access, availability, and utilization, the gadget-generalized approach of moments (GMM) was used for the 2004 to 2020 period. The results of this study showed that there is a correlation between digital finance and financial inclusion, particularly in the Middle East and North Africa (MENA) countries.

Other researchers have studied the link between financial development and FDI, for example, Lestari et al. (2022) and Chipunza and Fanta (2022). These studies identified the relationship between (FDI) and financial development in developing countries and found a significant relationship between FDI and financial development. Odugbesan et al. (2022) examined the relationship among FDI, financial development, and financial inclusion in 33 Sub-Saharan African international locations for the 2004 to 2018 period and used the Panel Granger causality test. The result of this study showed that there is bidirectional causality running from financial inclusion to FDI as well as between financial development and FDI.

Furthermore, Majeed et al. (2021) examined the connection among FDI, openness, government consumption, inflation, and financial inclusion in Asia, Europe, Africa, and Latin America for the 1990 to 2017 period using the generalized least squares model. The results of this study show that there are relationships among FDI, alternate openness, government consumption, inflation, and financial inclusion. Also, Desbordes and Wei (2017) explored the relationship between economic development, financial development, and FDI using causal relationships among these variables. Their findings established that financial development has bidirectional causality to FDI (Almahadin et al., 2023; Alkhwaldi et al., 2023; Bataineh et al., 2023).

Likewise, Qamruzzaman and Wei (2019) examined the relationship between financial inclusion, stock market development, and FDI for the 1993 to 2017 period, and the Dynamic Panel (GMM) approach was used. The result of this study established that there are high links among financial

inclusion, stock market development, and FDI. Chirila-Donciu (2013) examined the relationship between globalization and FDI in Europe and found that there is an important link between FDI and globalization in Europe. Also, Dempere and Modugu (2021) investigated the nexus between globalization and FDI in the GCC countries for the 1971 to 2017 period using the panel fully modified ordinary least square regression. The results of this study show that there is a significant positive relationship between globalization and FDI (Al Omari, 2023; Al-Gasaymeh, 2022; Abu-AlSondos et al., 2023; Salameh et al., 2023; Sahioun et al., 2023).

Bede et al. (2020) examined the direction of causality between digital finance and financial inclusion in African countries for the 2007 to 2017 period, and the Error Correction Method (ECM) was used. The results indicated that there is bidirectional causality running from digital finance to Financial Inclusion in the long run. Also, Siddik and Kabiraj (2020) explored the impact of Digital Finance on Financial Inclusion in 189 international countries for the 2004 to 2016 period. This study confirmed that there is a significant relationship between digital finance and financial inclusion.

Various studies have explored the relationship between financial inclusion and foreign direct investment (FDI). Findings indicate significant correlations, with financial inclusion positively impacting FDI inflows. Additionally, research highlights bidirectional causality between financial development and FDI. Digital finance also plays a crucial role in enhancing financial inclusion. Overall, these studies contribute to understanding the dynamic interplay between financial inclusion and FDI. This study aims to investigate the relationship between financial inclusion and foreign direct investment (FDI) in the Middle East/North Africa (MENA) region. By employing the System Generalized Method of Moments (Sys-GMM) technique, the study seeks to empirically examine the dynamic interplay between FDI inflows and financial inclusion indicators across ten MENA countries. Additionally, the study explores the role of key economic mediators such as GDP growth and inflation in shaping this relationship. Thus, to achieve the aims of this study and to empirically examine the dynamic relationship be-

tween foreign direct investments (FDI) and financial inclusion in MENA countries, the following Hypothesis 1 should be developed:

*H1. There is a significant relationship between financial inclusion and FDI in MENA countries.*

## 2. METHOD

### 2.1. Data and variables

To examine the relationship between the financial inclusion and FDI in MENA selection countries (Algeria, Egypt, Morocco, Tunisia, Bahrain, Jordan, Qatar, Saudi Arabia, Kuwait, UAE) for the 2003–2022 period, the data are collected from the World Bank for FDI, economic growth and consumer price index, and all financial inclusion indicators are collected from the International Monetary Fund database.

Moreover, the critical attention of this paper is focused on the relationship between FDI as the dependent variable and financial inclusion as the independent variable. However, the financial inclusion in this study is measured by three sub-dimensions, which are firstly Availability measured by the number of ATMs, secondly, Access determined by the number of deposit accounts with commercial banks per 1,000 adults, and thirdly, Usage utilizes outstanding loans from commercial banks to GDP. Furthermore, there are two control variables used in this study, which are the consumer price index and GDP.

### 2.2. Econometric model

To analyze the link between financial inclusion and foreign direct investment in MENA countries, the General Method of Moments (GMM) is used to examine the relationship between the study variables following several previous studies (Al-Smadi, 2023; Bahraini & Qaffas, 2019)

The methods hired in the present study have been informed by the works of Al-Smadi (2023) and Bahraini and Qaffas (2019), in which the GMM is the version followed for the estimation of variable coefficients. However, the GMM technique

provides awesome benefits, especially in mitigating troubles related to economic-particular effects while working in an encompassing more than one region pattern (Arellano & Bond, 1991). Consequently, following the previous study, the following equations (1, 2, and 3) could be developed as follows:

$$FDI_{it} = \beta_0 + \beta_1 FDI_{i(t-1)} + \beta_2 ACI_{i,t} + \beta_3 GDP_{i,t} + \beta_4 CPI_{i,t} + \varepsilon_i, \quad (1)$$

$$FDI_{it} = \beta_0 + \beta_1 FDI_{i(t-1)} + \beta_2 AVI_{i,t} + \beta_3 GDP_{i,t} + \beta_4 CPI_{i,t} + \varepsilon_i, \quad (2)$$

$$FDI_{it} = \beta_0 + \beta_1 FDI_{i(t-1)} + \beta_2 USE_{i,t} + \beta_3 GDP_{i,t} + \beta_4 CPI_{i,t} + \varepsilon_i, \quad (3)$$

where availability, access, and usage are three dimensions used as a measurement of Financial Inclusion,  $t$  is denoting the country, and  $I$  is time,  $FDI$  is foreign direct investment, while other factors,  $GDP$  and  $CPI$ , are control variables, and  $\varepsilon_t$  (the error term). The coefficient  $\beta_1$  is the coefficient to be estimated to assess any potential effect, and  $\beta_2$ ,  $\beta_3$ , and  $\beta_4$  are the coefficients to be estimated to evaluate any significant relationship between  $FDI$  and  $ACI$ ,  $AVI$ ,  $USE$ ,  $GDP$ , and  $CPI$  during the study period.

## 3. RESULTS

### 3.1. Descriptive outcome

The descriptive statistics results for the models are presented in Table 3 for all variables of 10 selection countries for the 2003 to 2022 period. Furthermore, the findings indicate that the minimum recorded value for ATMs stands at .1.10, and the maximum is recorded at 185.5. Moreover, the highest Std. Dev is recorded by Deposit account number and the lowest value is recorded by GDP (see Table 1).

Furthermore, Table 1 found that the mean for the number of FDI, ATMs, and the ratio of outstanding commercial loans are 15.50, 28.22, and 76.72, respectively. Moreover, between the control variables, the Deposit account number records the

**Table 1.** Descriptive results

Factors	Stander Devotion.	Mean	Minimum.	Maximum.
Foreign direct investment (FDI)	16.30	15.50	2.05	88.02
Deposit account number (ACI)	234.2	601.1	103.5	1225.2
Number of ATMs	44.11	28.22	1.10	185.50
Outstanding commercial loans (USE)	20.21	76.72	19.75	107.25
Gross domestic product (GDP)	2.22	5.22	5.15	8.78
Change of consumer price index (CPI)	3.80	2.44	2.08	66.53

highest Std. Dev 3.80, which denotes a high variation among chosen countries. Table 2 shows the results of stationarity (panel unit root tests) using LLC and IPS panel unit root tests. However, the results confirmed that all the selection variables are integrated in order I(1).

**Table 2.** Results of stationarity

Variables	LLC		IPS Decision		???
	I(0)	I(1)	I(0)	I(1)	
$FDI_t$	5.32b	12.34a	2.34b	5.11a	I(1)
$ACI_t$	6.34a	13.57a	3.56a	5.23a	I(1)
$ATM_{st}$	7.89a	14.21a	3.89a	5.92a	I(1)
$USE_t$	5.44b	11.79a	3.78a	6.34a	I(1)
$GDP_t$	8.11a	16.61a	3.98a	7.60a	I(1)
$CPI_t$	4.36b	9.45a	2.52b	4.69a	I(1)

Notes: (1) a and b denote statistical significance at 1% and 5% levels. (2) LLC is tested by Levin, Lin, and Chu (2002); IPS is Im, Pesaran, and Shin (2003) test; (2) VIF denotes the variance inflation factor test.  $H_0$  of multicollinearity is rejected if the values of the VIF test < 3.

Also, the variance inflation factor (VIF) is used to test the problems of multicollinearity (Bahraini & Qaffas, 2019) and confirmed no possibility of negative effects of multicollinearity.

### 3.2. GMM results

This section reports the results of the equations (models 1, 2, and 3). In model (1), model (2), and model (3), the findings confirmed a significant relationship between FDI and financial inclusion measurement by Access measured by the number of deposit accounts with commercial banks per 1,000 adults, Availability measured by ATM, and Usage measured by outstanding loans. The results in Table 4 show a significantly positive relationship between FDI and Access measured by the number of deposit accounts with commercial banks per 1,000 adults) at a 1% significance level, which implies that an increase in the number of deposit accounts with commercial banks by 1% will lead to

an increase in FDI by 1.7426%. Also, in model 2, the result shows that an increase in ATMs by 1% will lead to an increase in FDI by 1.521%. Moreover, in model 3, the results show that an increase in outstanding loans by 1% will lead to an increase in FDI by 1.051%. This means that financial inclusion in MENA countries has a high-quality effect on attracting FDI inflows, and these results are confirmed by Dempere and Modugu (2021), Fanta and Makina (2019), Qamruzzaman and Wei (2019), Shihadeh and Liu (2019), and Ozili (2018). This confirmed that financial inclusion improves and promotes financial profits, increases the wide variety of individuals, and permits them access to financial products. Also, the inflow of FDI in the countries is intricately related to improved monetary policy, enabling overseas establishments to reinforce their presence both via the status quo of overseas subsidiaries or the acquisition of indigenous corporations, which means a high-quality correlation between financial inclusion and FDI (see Table 3).

**Table 3.** Regression (GMM) results

Variables	Mod (1)	Mod (2)	Mod (3)
$FDI_{t/(t-1)}$	1.7426 <sup>a</sup>		
$FDI_{t/(t-1)}$		1.5210 <sup>a</sup>	
$FDI_{t/(t-1)}$			1.0511 <sup>a</sup>
GDP	0.9871 <sup>b</sup>	0.870 <sup>b</sup>	0.7159 <sup>b</sup>
CPI	0.0024	0.0140	0.0022
AR test (1) (p-value).	0.3320	0.3701	0.2275
AR test (2) (p-value).	0.4742	0.3863	0.2603
Sargant test (p-value).	0.1231	0.1770	0.3102

Notes: a and b mean significance at 1 and 5 percent, respectively.

Also, the results of the models (1, 2, and 3) show a large association between GDP and FDI in MENA countries. This result explained that enhancing the income level will increase the FDI inside the chosen countries. Thus, these results are confirmed by Al-Smadi and Malkawi (2020), Al-Smadi (2020), and Bekhet and Al-Smadi (2015).

## 4. DISCUSSION

The findings of the current study confirmed a significant relationship between FDI and financial inclusion measurement by Access in MENA countries. This alignment corroborates findings from Dempere and Modugu (2021), Fanta and Makina (2019), Qamruzzaman and Wei (2019), Shihadeh and Liu (2019), and Ozili (2018), underscoring the financial inclusion role in enhancing financial profitability and accessibility. Moreover, the results show a significantly positive relationship between FDI and Access. FDI inflows are closely intertwined with monetary improvements, facilitating the establishment of foreign subsidiaries or the acquisition of local businesses. This correlation highlights financial inclusion as a crucial factor in attracting investment and offering comprehensive financial services to previously excluded populations. Alghusin (2020), Al-Okaily (2023), Al-Omouh (2023), Alqudah (2022), Alzoubi (2022), Kasasbeh (2022), Oudat (2019), Rabaai (2022), and SalemOudat (2021) further support this notion, emphasizing the importance of inclusive financial systems in fostering economic growth and development.

Furthermore, the findings indicate that a 1% increase in outstanding loans results in a 1.051% increase in FDI. This suggests that financial inclusion in MENA countries significantly contributes to attracting FDI inflows, a conclusion supported by studies such as those by Dempere and Modugu (2021), Fanta and Makina (2019), Qamruzzaman & Wei (2019), Shihadeh and Liu (2019), and Ozili (2018). These studies confirm that financial inclusion not only enhances and stimulates financial gains but also broadens the range of individuals with access to financial products. Moreover, the inflow of FDI is closely linked to enhancements in the financial sector, enabling foreign entities to strengthen their presence either through establishing overseas subsidiaries or acquiring local companies. This underscores a strong correlation between financial inclusion and FDI inflows

The results of this study discovered a large association between Gross Domestic Product and Foreign Direct Investment in MENA countries. In models 1, 2, and 3, the results indicate that a 1% increase in FDI leads to a 0.98%, 0.87%, and 0.71% increase in GDP, respectively. This means that the significant association between Gross Domestic Product and Foreign Direct Investment in MENA countries underscores the crucial role that FDI plays in contributing to economic growth and development in the region. This result explained that enhancing the income level will increase the FDI inside the chosen countries. Thus, these results are confirmed by Al-Smadi and Malkawi (2020), Al-Smadi (2020), and Bekhet and Al-Smadi (2015).

Prospects for research in this area include delving deeper into the mechanisms through which financial inclusion fosters FDI inflows in MENA countries. This could involve exploring the specific types of financial products and services that have the most significant impact on attracting investment, as well as examining the role of regulatory frameworks and policies in promoting inclusive financial systems. Additionally, future studies could focus on the long-term effects of increased FDI resulting from improved financial inclusion. This could involve assessing how these investments contribute to job creation, technology transfer, and overall economic growth in the region. Furthermore, there is potential for research to investigate the potential challenges and barriers to achieving greater financial inclusion and how addressing these challenges can further enhance FDI attractiveness. This could include analyzing issues such as financial literacy, digital infrastructure, and regulatory compliance. Overall, future research in this field could make valuable contributions to the understanding of the relationship between financial inclusion and FDI inflows, ultimately informing policymakers and stakeholders on strategies to promote sustainable economic development in MENA countries.

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## CONCLUSION

The study delved into the intricate relationship between FDI and financial inclusion in MENA countries from 2003 to 2022, utilizing the General Method of Moments. The findings underscored a significant correlation between FDI and financial inclusion indicators, including access, availability, and usage

measures. Financial inclusion emerges as a pivotal factor in attracting investment, mitigating risks associated with investment and entrepreneurial activities, and uncertainty in foreign markets. This highlights the importance of offering comprehensive financial services to previously excluded segments of the population, thereby fostering economic growth and stability.

Policy implications suggest the need for heightened attention to financial inclusion initiatives, including increasing financial awareness and improving infrastructure, particularly in digital financial services, to attract more FDI inflows. Future research directions may explore the link between risks in digital financial services and the financial sector, as well as the impact of financial technology and financial inclusion on economic development. Additionally, comparative studies on financial inclusion and FDI in different regions could provide valuable insights for both policymakers and researchers.

## AUTHOR CONTRIBUTIONS

Conceptualization: Raed Walid Al-Smadi, Arkan Walid Al-Smadi.

Data curation: Raed Walid Al-Smadi, Arkan Walid Al-Smadi.

Formal analysis: Raed Walid Al-Smadi, Arkan Walid Al-Smadi.

Funding acquisition: Raed Walid Al-Smadi, Arkan Walid Al-Smadi.

Investigation: Arkan Walid Al-Smadi.

Methodology: Raed Walid Al-Smadi.

Software: Arkan Walid Al-Smadi.

Supervision: Raed Walid Al-Smadi.

Writing – original draft: Raed Walid Al-Smadi.

Writing – review & editing: Arkan Walid Al-Smadi.

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