

Measuring Financial Inclusion for MENA Countries Using Sarma (2016) Approach

Abderrazek Elkhaldi (Corresponding Author)¹, Amna Abdul Ameer Abdul Kareem², Mongi Arfawi³ and Edib Smolo⁴

ABSTRACT

The main objective of this paper is to measure the Financial Inclusion as one of the main components of sustainable development for a sample of MENA countries. The study consists of applying Sarma (2016) approach to build an index of Financial Inclusion. Based on 13 MENA countries divided into oil producing and oil non-producing economies, during the period between 2004 and 2022, we found that the level of financial inclusion differs from a country to another and from a period to another. Oil producing countries seem to have more stadial development of their level of financial inclusion. They are also characterized by a high level of resilience to economic, social, and financial shocks as they have maintained a progress of their indexes during last distress moments such as the financial crisis of 2008, the social and political crisis of the Arabic Spring and the COVID-19 pandemic.

ملخص

يتمثل الهدف الرئيسي من هذه الورقة البحثية في قياس الشمول المالي باعتباره أحد المكونات الرئيسية للتنمية المستدامة لمجموعة مختارة من بلدان الشرق الأوسط وشمال أفريقيا. تنطوي الدراسة عن استخدام طريقة سارما (2016) لبناء مؤشر للشمول المالي. استنادا إلى 13 بلدا من بلدان الشرق الأوسط وشمال أفريقيا مقسمة إلى بلدان منتجة للنفط وبلدان غير منتجة للنفط، وجدنا خلال الفترة بين عامي 2004 و 2022 أن مستوى الشمول المالي يختلف من بلد إلى آخر ومن فترة إلى أخرى. يتبين أن البلدان المنتجة للنفط لديها تنمية مكانية أكثر تطورا بالنسبة لمستوى شمولها المالي. كما تتميز بمستوى عالٍ من المرونة في مواجهة الصدمات الاقتصادية والاجتماعية

¹ Department of Finance and Banking Department, (College Of Business), Dar Al Uloom University, Riyadh, KSA, Orcid E-mail: a.khaldi@dau.edu.sa

² University of Sousse, Tunisia. Email: amnaamiry@gmail.com

³ Faculty of Economics and Management of Mahdia, University of Monastir, Tunisia.

University La Manouba, ESCT , LARIMRAF Research Laboratory, LR21ES29, Campus universitaire, Manouba, 2010, Tunisia Email: arfaoui.mongi@gmail.com

⁴ Department of Accounting and Finance, College of Business, Effat University, Saudi Arabia Email: edib.smolo@gmail.com

والمالية حيث حافظت على تقدم مؤشراتهما خلال لحظات الضيق الأخيرة مثل الأزمة المالية لعام 2008 والأزمة الاجتماعية والسياسية المرتبطة بالربيع العربي بالإضافة إلى جائحة كوفيد-19.

RESUME

L'objectif principal de ce document est de mesurer l'inclusion financière comme l'une des principales composantes du développement durable pour un échantillon de pays de la région MENA. L'étude consiste à appliquer l'approche de Sarma (2016) pour construire un indice d'inclusion financière. Sur la base de 13 pays de la région MENA divisés en économies productrices et non productrices de pétrole, au cours de la période entre 2004 et 2022, nous avons constaté que le niveau d'inclusion financière diffère d'un pays à l'autre et d'une période à l'autre. Les pays producteurs de pétrole semblent avoir un développement plus statique de leur niveau d'inclusion financière. Ils sont également caractérisés par un niveau élevé de résilience aux chocs économiques, sociaux et financiers, puisqu'ils ont maintenu une progression de leurs indices durant les derniers moments de détresse tels que la crise financière de 2008, la crise sociale et politique du printemps arabe et la pandémie de COVID-19.

Keywords: Financial Inclusion, Sustainable development, Banks and Microfinance Institutions, Euclidian Distance

JEL Classification: C43, Q01, G21, C02.

1. Introduction

Financial inclusion is considered among the most important components of sustainable development because it ensures equal access to finance, avoids the use of wealth by a restrictive number of individuals, and reduces the domination of financial markets by developed countries. Financial inclusion provides the opportunity to reduce the gap between developed and developing countries; a gap that Demircuc-Kunt et al. (2012) consider senseless, considering the number of people in developing countries deprived of access to formal financial services. Such exclusion is paradoxical in a world where equality is considered one of the fundamental universal values.

Since financial inclusion has become the target of many international financial institutions, such as the World Bank and the International Monetary Fund, many studies have focused on proposing an index for financial inclusion. The first set was composed of a so-called significant

proxy for financial inclusion consisting of the proportion of population/households of an economy having a current or saving account, as considered by Honohan (2008). Such a proxy was criticized by Sarma (2016) as it ignores many aspects of financial inclusion, such as the effective use of bank accounts and individuals' accessibility to financial services.

More recently, in 2011, the Alliance of Financial Inclusion (AFI) proposed a more developed index including indicators related to the number of current accounts per 1000 adults, the number of bank branches and ATMs per million people, the volume of bank credit and deposit as ratio of GDP. However, despite the significance of such indicators as measurements of the levels of penetration, availability, and usage, which Sarma (2016) considers as the most important indicators of financial inclusion, they provide incomplete images since they are taken individually. Hence, the need for their aggregation and to compute a synthetical index has been felt among many researchers in the field, leading some to compute an index based on arithmetic and geometric averages. Both averages suffer from the substitutability effect because the increase of one dimension could be neutralized by the decrease of another. Hence, Cámara and Tuesta (2014) have considered the previous dimensions, but in terms of weighted averages using the Principal Components Analysis (PCA) and have concluded that the dimension access is the most important for measuring financial inclusion and that access is a necessary but not sufficient condition for using formal financial services. Sarma (2016) considered the same dimensions to construct her index using a distance-based approach, which computed the average distance between the ideal and the worst outcome. The constructed index consists of a multidimensional measure capturing the different aspects of financial inclusion with different levels between 0 for the worst level and 1 for the highest.

This paper aims to verify the financial inclusion index as proposed by Sarma (2016) for a sample of MENA countries and to test the extent of its reliability. Hence, the second section will provide a literature review of the different approaches to setting up financial inclusion indexes. The third section will describe the model of calculating the financial inclusion index (FII); section four will present the results of the application of the model of Sarma (2016) on a sample of MENA countries. Then, section five will discuss the study's results, and finally, section six will conclude.

2. Literature review

Financial inclusion has acquired an important role among economists because of its perceived importance in the economic development agenda and its many proponents and agents within and outside government structures. The literature on financial inclusion consists of different approaches and viewpoints, demonstrating that the issue is multi-disciplinary. Multiple studies have tried to create a sound financial inclusion index, generally done through a survey questionnaire system that collects statistical data from different developing nations. Though such indexes might evaluate certain qualities, it should be noted that there should be better tools for monitoring such indexes over time. To overcome this limitation, the OECD has shown that involving several countries in conducting international research on the level of financial inclusion may be more effective. The survey aims to assess many aspects comprehensively and use a representative sample of at least a thousand participants. Nevertheless, the cited surveys show that different levels of financial inclusiveness exist among the countries involved. Moreover, the inconsistency in calculating the index among the different periods makes cross-time comparisons questionable.

Literature portrays the multifaceted nature of financial inclusion, with researchers exploring different tools to capture its multifaceted nature. While some studies try out the method of Non-Parametric tests, which is a linear approach (Gharbi & Kammoun, 2023), others prefer the parametric approach such as Principal Component Analysis (PCA) and Common Factor Analysis (CFA) (Gharbi & Kammoun, 2023; Sarma, 2016). Gharbi and Kammoun (2023), Fungáčová and Weill (2015), Cámara and Tuesta (2014), and Demirgüç-Kunt and Klapper (2012) have contributed to the discourse by giving evidence-based data showing a strong relationship between financial inclusion and income levels and financial inclusion using multidimensional financial inclusion indices. Considering the wide variety of research approaches, this section is intended to present a complete picture of the literature on financial inclusion, which includes multiple perspectives, methodologies, and findings.

The recognition of financial inclusion as the top priority by many economies, India included (Sethi & Sethy, 2019), and the economic consequences of exclusion from financial services, estimated at one

percent of GDP (Chattopadhyay, 2011), has driven researchers' and international organizations' attention. It is everyone's opinion that the three levels of financial inclusion are accessibility, availability and usage, however there is a wide disagreement on the most important one.

Demnerguc-Kunt et al. (2015) have done a great job with financial inclusion, showing that more than half of the world's adults now have an account, as demonstrated by the Global Index on Financial Inclusion (Global Findex) data results. They discovered that accounts' penetration jumped significantly after mobile money services were launched and improved. The next research conducted by Demirgüç-Kunt et al. (2017) indicate that technology is the principal reason for financial inclusion and this is particularly true in Sub-Saharan and emerging economies. Also, it's similar to Avom et al. (2023), which focuses on the role of financial innovations, especially mobile money services, in the provision of access to financial services. The researchers' work shows that the mobile money expansion in this area tremendously increases accessibility and improves financial inclusion, particularly in African states.

Allen et al. (2016) are proponents of a broad-based financial inclusion initiative that takes care of the aspects of financial inclusion at an individual and national level. Their holistic methodology would include an in-depth look into the various problems stemming from urban poverty, rural isolation, and gender inequality. Policy formations are being proposed to remove fee-related barriers, improve the performance of the effective regulatory framework, and provide universal access to financial services to encourage financial inclusion.

Moreover, Gharbi and Kammoun (2023) introduce a multifaceted approach to assess the financial inclusion of different countries. Such studies undoubtedly underline the fact that financial inclusion greatly depends on people's economic situation. The study highlights the main objective of providing equal opportunities in financial services regardless of social strata.

The work of Huang and Zhang (2020) pointed out a vital interconnection between financial inclusion, economic prosperity, and the disposal of inequality among members of OIC countries. In conducting the current study, the research emphasizes the urgent need to find financial inclusion as one of the major problems faced in these countries. The investigation highlights the constructive role of financial inclusion in terms of stability

and its effort to reduce income disparity by purposeful intervention to ensure sustainable development. Next, Cámara and Tuesta (2014) focus on the determinants of financial inclusion. They highlight that the most important factors are usage, access, and obtaining barriers. Such a study affirms two guiding principles of policy: to increase the relevance and effectiveness of formal financial services and to remove the financial barriers, as both strongly relate to the overall goal of economic prosperity and reduction of inequality.

Furthermore, the papers by Beck et al. (2009) and Honohan (2008) showed that the lack of financial inclusion can create economic inequalities and affect economic growth. Their report finally suggests that there should be a marginal effect in eradicating barriers and inclusivity to the equitable development process, which may bring about the two dominant factors, economic stability and growth, through financial inclusion. Also, Nguyen (2021) brings in a comprehensive methodology for measuring financial inclusion in developing countries and spotlights the issue of inequality and regions in the existing literature. Moreover, Kling et al. (2022) correlate the effect of the disparity in household incomes in building access to financial services, stressing the necessity of formal and informal channels of financial inclusion in which one can develop the financial inclusion paradigm.

In conclusion, Park and Mercado (2018) examine, in detail, the nuances of financial inclusion across global and regional (namely Asian) economies, illuminating the complicated interrelationships and outcomes of poverty and inequality. This in-depth examination reveals the intricacy of financial inclusion dynamics and urges to adopt all-encompassing approaches to addressing the barriers to inclusivity development at the regional and global levels.

Ultimately, the literature on financial inclusion accentuates its core position as the driver of economic growth and inequality quality. This study will employ multiple approaches and points of view to internalize and provide further in-depth information on this complicated issue and advise on the policies that gravitate towards inclusiveness and unity in society.

3. Method and materials

3.1 Data description

Our study targets financial inclusion measurement across the sample of MENA countries. We have meticulously selected 13 countries for our analysis: Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, Oman, Saudi Arabia, Tunisia, United Arab Emirates, Qatar, and Kuwait. To ensure comprehensiveness, we have examined data spanning from 2004 to 2022, using available data for each respective year. In instances where data were missing, we followed the approach Little and Rubin Field (2002) recommended by replacing them with the previously available data point.

Our study spans 19 years, encompassing a panel of 13 individual countries, resulting in 247 annual observations. The data utilized in our analysis were sourced from reputable sources, including the World Bank Global Findex and the International Monetary Fund Financial Access Survey for the period ranging from 2004 to 2021. For the latest available data in 2022, we meticulously collected information from various sources, including the websites and reports of local monetary authorities within each respective country.

3.2 Variables of financial inclusion

It is widely acknowledged that financial inclusion is characterized by three fundamental variables: Availability, Accessibility, and Usage. However, the specific items associated with each variable may vary from one study to another. While proponents of Principal Components Analysis, such as Avom et al. (2023), Cámara and Tuesta (2014), and Gharbi and Kammoun (2023), consider each variable as comprising different sets of items, others like Sarma (2016) and Van et al. (2021) advocate for retaining a single item to represent each variable. In our study, we align with the approach outlined by Sarma (2016), defining our three variables as follows:

- (1) *Accessibility*: Considering the previous review of literature, accessibility is a crucial component of financial inclusion, representing the ease with which individuals and businesses can access formal financial services. It involves the physical proximity and availability of financial institutions, such as banks and branches, as well as the distribution and density of automated teller machines

(ATMs) and other banking infrastructure. Additionally, accessibility considers the affordability of financial services, including account opening costs, transaction fees, and minimum balance requirements. As it expresses the range of the bank's proximity to the population, the suitable proxy could be the proportion of individuals with bank accounts. However, as for Sarma (2016) this variable is not available for most countries, so we consider the mean value between the number of deposit accounts with commercial banks per 1,000 adults and the number of borrowers from commercial banks per 1,000 adults since we cannot be a depositor or a borrower without having a bank account.

(2)*Availability*: Availability, which determines financial literacy, is one of the main components of financial inclusion appraisal. It concentrates on the number and variety of financial products and services that can be effectively offered to individuals and businesses. It is the range of financial services that banks provide, such as savings accounts, credit facilities, insurance products, investment options, and payment systems. Accessibility measurement is concerned with access to a wide variety of financial services to all population segments irrespective of income level or social status. This also entails the assessment of the distribution and reach of financial institutions in both urban and rural areas to make it possible for individuals to access financial products. Besides, it encompasses the investigation approach around the availability of financial services exclusively to particular sectors, including microinsurance or microfinance to small business owners or insurance products for vulnerable groups. We measure it by using the number of deposit bank accounts per 1000 adult population.

Moreover, financial service availability is mainly provided by banks. Hence, the physical existence of bank branches close to the population is considered a representative proxy for availability. As Sarma (2016) recommended, we consider the average between the number of commercial bank branches per 100,000 adults and the number of ATMs per 100,000 adults.

(3)*Usage*: Sarma (2016) considers that the best measurement of usage variables is credit, deposit, payments, remittances, transfers, etc. However, such data is only continuously available in some countries. Hence, Sarma (2016) recommends using data related to the volume of outstanding deposits with commercial banks (% of GDP) and outstanding loans from commercial banks (% of GDP)

Table 1: Measurement of the variable Accessibility

Country Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Algeria	326	329	345	370	369	234	268	278	295	302	308	303	292	282	277	309	283	278	N/A
Iraq	101	110	112	114	115	120	140	146	157	166	178	189	189	190	192	197	197	199	201
Egypt	197	197	197	205	217	213	213	210	217	255	256	260	270	361	395	426	429	416	429
Tunisia	36		58	64	68	71	76	84	93	99	104	110	114	114	114	118	121	123	125
United Arab Emirates	N/A	N/A	N/A	N/A	N/A	460	480	497	497	441	806	859	916	965	968	945	1001	989	1071
Saudi Arabia	44	53	65	70	81	460	465	468	462	548	561	589	645	685	690	708	767	916	1032
Oman	320	346	375	411	448	467	486	529	511	560	537	541	545	528	528	528	528	528	528
Qatar	169	169	162	164	158	145	115	103	106	109	109	112	122	119	117	114	110	117	117
Jordan	392	404	405	395	401	404	322	322	326	295	265	246	249	248	249	252	251	266	268
Kuwait	94	99	103	97	94	94	92	89	78	93	101	103	106	106	107	105	105	108	112
Morocco	162	153	170	191	206	329	340	362	383	402	433	461	477	503	511	535	551	518	588
Lebanon	544	544	565	589	646	692	755	771	791	687	613	612	631	671	699	776	706	678	676
Libya	59	58	57	58	74	77	68	68	68	68	68	68	68	69	70	70	71	72	75

Source: Authors computed using data from World Bank Global Findex and the International Monetary Fund Financial Access Survey for the period 2004-2021 and local monetary authorities for the year 2022 and following Sarma (2016) approach.

Table 2: Measurement of the variable Availability

Country Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Algeria	3.0	3.1	3.7	4.4	4.7	5.2	5.5	5.6	5.7	5.9	6.4	6.8	6.9	7.2	7.4	7.3	7.3	7.3	N/A
Iraq	2.1	2.1	2.1	2.1	2.1	3.0	3.8	3.6	3.8	3.2	3.4	3.4	3.2	3.4	4.0	4.1	4.6	4.6	4.6
Egypt	3.1	3.4	4.0	4.6	5.3	5.9	6.3	6.6	7.1	7.4	7.9	8.7	9.7	10.7	11.2	12.6	13.6	16.2	17.9
Tunisia	9.8	10.7	11.7	13.6	14.7	15.9	18.0	18.6	19.3	20.1	21.3	22.6	23.6	25.2	25.8	26.7	27.1	27.3	27.4
United Arab Emirates	17.1	29.9	27.9	27.3	26.9	32.0	31.6	34.4	36.6	37.7	38.7	40.2	40.5	40.0	39.6	37.4	32.2	31.7	31.6
Saudi Arabia	17.2	18.1	21.7	24.8	27.3	28.9	30.1	31.3	32.7	34.6	37.6	40.5	41.0	40.8	40.8	39.6	38.2	34.9	33.8
Oman	30.4	30.4	30.4	30.4	30.4	30.4	30.4	29.5	28.3	28.2	25.9	25.2	24.9	26.1	24.9	27.8	27.8	27.8	27.8
Qatar	36.2	37.0	35.1	33.7	30.8	31.7	33.1	30.5	34.0	34.3	34.8	34.2	34.9	33.0	31.4	32.1	31.9	30.5	30.5
Jordan	15.2	16.2	17.2	18.2	19.4	20.1	21.4	22.0	22.5	22.0	20.5	18.9	19.7	19.9	20.8	19.1	20.9	21.0	20.9
Kuwait	21.8	24.5	27.3	30.9	33.1	34.0	33.4	33.5	34.4	33.3	35.3	35.2	38.6	39.7	41.9	44.4	37.8	40.0	40.0
Morocco	9.2	12.8	12.2	13.5	15.2	18.9	20.3	21.6	22.9	24.0	24.7	25.4	25.9	26.1	26.5	26.9	26.7	25.8	25.6
Lebanon	26.8	27.5	27.8	28.2	28.7	29.4	30.3	30.9	31.6	29.9	28.3	29.1	31.1	33.5	36.0	37.1	35.6	32.9	35.9
Libya	6.1	7.0	7.1	7.1	7.2	7.3	7.3	7.6	7.8	7.8	7.7	7.7	7.6	7.5	7.5	8.5	7.5	7.5	7.5

Source: Authors computed using data from World Bank Global Findex and the International Monetary Fund Financial Access Survey for the period 2004-2021 and local monetary authorities for the year 2022 and following Sarma (2016) approach.

Table 3: Measurement of the variable Usage

Country Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Algeria	34.5	31.3	31.9	34.9	34.2	39.2	36.1	34.3	33.9	37.2	43.6	46.7	45.8	47.9	49.2	50.5	57.4	47.4	0.0
Iraq	8.0	5.5	7.1	7.6	7.4	11.9	14.5	13.5	13.4	14.4	15.7	19.6	18.9	17.9	14.5	24.6	33.3	26.9	29.9
Egypt	75.2	73.1	67.0	62.0	57.9	52.2	49.8	46.5	42.0	43.2	49.8	55.2	74.8	65.3	60.2	54.6	62.3	71.5	80.7
Tunisia	49.6	50.1	50.2	52.1	53.7	56.4	57.8	61.7	62.3	62.4	62.9	63.1	64.9	68.0	67.0	65.9	73.2	72.0	69.9
United Arab Emirates	50.3	58.2	62.6	74.6	83.3	109.7	100.4	85.9	83.3	86.9	92.0	108.7	115.7	111.8	108.8	118.2	142.7	124.3	110.0
Saudi Arabia	39.6	38.3	38.6	42.1	40.8	52.1	44.4	38.6	40.6	44.6	49.2	59.1	60.7	55.1	47.7	49.5	52.9	56.5	53.5
Oman	32.0	32.0	33.0	40.3	38.3	51.1	42.5	42.1	42.4	45.4	50.4	65.3	73.7	72.6	68.7	73.1	89.4	0.0	0.0
Qatar	30.4	30.5	32.7	39.3	39.6	55.3	52.0	48.8	57.3	62.0	65.9	96.4	116.3	122.8	108.2	121.2	159.0	138.5	138.5
Jordan	108.5	115.7	113.4	111.9	96.5	96.1	95.6	95.7	95.0	94.9	94.5	97.8	98.3	97.9	96.9	97.8	105.1	107.9	110.3
Kuwait	54.7	46.9	46.0	50.7	47.1	66.2	62.7	51.8	48.9	53.4	59.8	84.6	89.3	83.2	76.6	80.9	111.0	91.7	78.4
Morocco	50.9	55.2	58.9	67.5	71.0	73.3	74.5	76.6	77.0	75.5	76.4	74.2	76.1	75.6	76.1	75.9	85.5	80.0	80.3
Lebanon	144.7	144.2	151.3	152.0	150.0	146.1	154.8	161.1	157.6	158.7	164.9	167.0	174.6	176.0	170.5	158.8	91.5	35.5	30.0
Libya	16.1	15.5	19.2	24.5	39.7	35.8	60.4	36.1	53.1	67.7	68.0	73.6	60.6	52.6	52.6	52.6	52.6	52.6	52.6

Source: Authors computed using data from World Bank Global Findex and the International Monetary Fund Financial Access Survey for the period 2004-2021 and local monetary authorities for the year 2022 and following Sarma (2016) approach.

3.3 Financial Inclusion Index (FII) Construction

To build the financial inclusion index (FII), Sarma (2016) uses the Euclidean space to indicate a country's achievements in each of the three considered variables. The Euclidean space allows us to identify extreme levels of achievements: the worst one denoted by m_i and the best one denoted by M_i . Then, Sarma (2016) recommends computing a dimension index d_i reflecting the country's achievements in each dimension i . The following formula is used to calculate each index:

$$d_i = w_i \frac{A_i - m_i}{M_i - m_i} \quad (1)$$

Where,

w_i is the weight related to each dimension i , $0 \leq w_i \leq 1$

A_i is the actual value of dimension i

m_i the worst (lower) level of achievements for the dimension i

M_i the highest (Upper) level of achievements for the dimension i

Sarma (2016) maintains that financial inclusion is a set of three variables. This means that each country has a definite level of achievement for each variable represented by a point $X = (d_1, d_2, d_3)$ on a 3-dimensional space. The origin point O has the following parameters: $O = (0, 0, 0)$, it refers to a country having the worst Availability, Accessibility, and Usage. However, the point $W = (w_1, w_2, w_3)$ refers to an ideal situation where a specified country has the best achievements of all three dimensions. Between both extreme points O and W , Sarma (2016) defines different combinations reflecting the level of financial inclusion of each country for a specified year. Then Sarma (2016) considers an average of normalized Euclidean distance between X and bad reference point O as expressed by formula 2, and between X and ideal reference point W , as expressed by formula 3.

$$X_1 = \frac{\sqrt{d_1^2 + d_2^2 + d_3^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2}} \quad (2)$$

$$X_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + (w_3 - d_3)^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2}} \quad (3)$$

Finally, Sarma (2016) defines the financial inclusion index (FII) as follows:

$$IFI = \frac{1}{2} [X_1 + X_2] \quad (4)$$

$$IFI = \frac{1}{2} \left[\left(\frac{\sqrt{d_1^2 + d_2^2 + d_3^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2}} \right) + \left(1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + (w_3 - d_3)^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2}} \right) \right] \quad (4a)$$

Table 4: Financial Inclusion Index: MENA Countries, 2004–2022

Country Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Algeria	0.362	0.362	0.382	0.414	0.418	0.336	0.365	0.372	0.386	0.400	0.424	0.428	0.419	0.415	0.413	0.443	0.423	0.412	-
Iraq	0.232	0.239	0.246	0.251	0.252	0.295	0.351	0.354	0.374	0.377	0.401	0.425	0.419	0.422	0.424	0.472	0.488	0.498	0.497
Egypt	0.247	0.247	0.246	0.251	0.261	0.257	0.258	0.255	0.259	0.290	0.302	0.317	0.349	0.416	0.438	0.457	0.477	0.484	-
Tunisia	0.190	0.207	0.251	0.276	0.293	0.308	0.332	0.358	0.386	0.403	0.422	0.442	0.458	0.471	0.473	0.482	0.499	0.499	0.497
United Arab Emirates	0.097	0.143	0.139	0.145	0.149	0.298	0.298	0.302	0.306	0.293	0.414	0.445	0.469	0.479	0.476	0.473	0.470	0.464	0.465
Saudi Arabia	0.133	0.135	0.149	0.164	0.173	0.328	0.325	0.322	0.325	0.370	0.388	0.415	0.441	0.453	0.445	0.452	0.476	0.481	0.475
Oman	0.321	0.335	0.352	0.380	0.397	0.424	0.420	0.435	0.426	0.447	0.441	0.460	0.468	0.467	0.458	0.477	0.476	0.370	0.370
Qatar	0.404	0.405	0.397	0.401	0.388	0.385	0.338	0.307	0.326	0.336	0.339	0.360	0.392	0.386	0.370	0.372	0.378	0.382	0.382
Jordan	0.441	0.456	0.463	0.465	0.466	0.471	0.418	0.420	0.425	0.397	0.368	0.348	0.354	0.354	0.358	0.354	0.364	0.378	-
Kuwait	0.369	0.380	0.394	0.397	0.392	0.416	0.404	0.387	0.355	0.399	0.428	0.459	0.482	0.478	0.475	0.480	0.477	0.492	0.480
Morocco	0.184	0.198	0.208	0.233	0.251	0.338	0.351	0.370	0.388	0.403	0.425	0.443	0.456	0.473	0.479	0.492	0.499	0.485	0.494
Lebanon	0.364	0.365	0.378	0.389	0.413	0.431	0.460	0.469	0.474	0.437	0.404	0.407	0.423	0.447	0.463	0.488	0.419	0.371	0.373
Libya	0.343	0.349	0.350	0.363	0.438	0.439	0.456	0.420	0.451	0.469	0.469	0.470	0.460	0.450	0.454	0.460	0.457	0.460	0.467

Source: Authors computed using data from the World Bank Global Findex and the International Monetary Fund Financial Access Survey for the period 2004–2021 and local monetary authorities for the year 2022.

4. Results and discussion

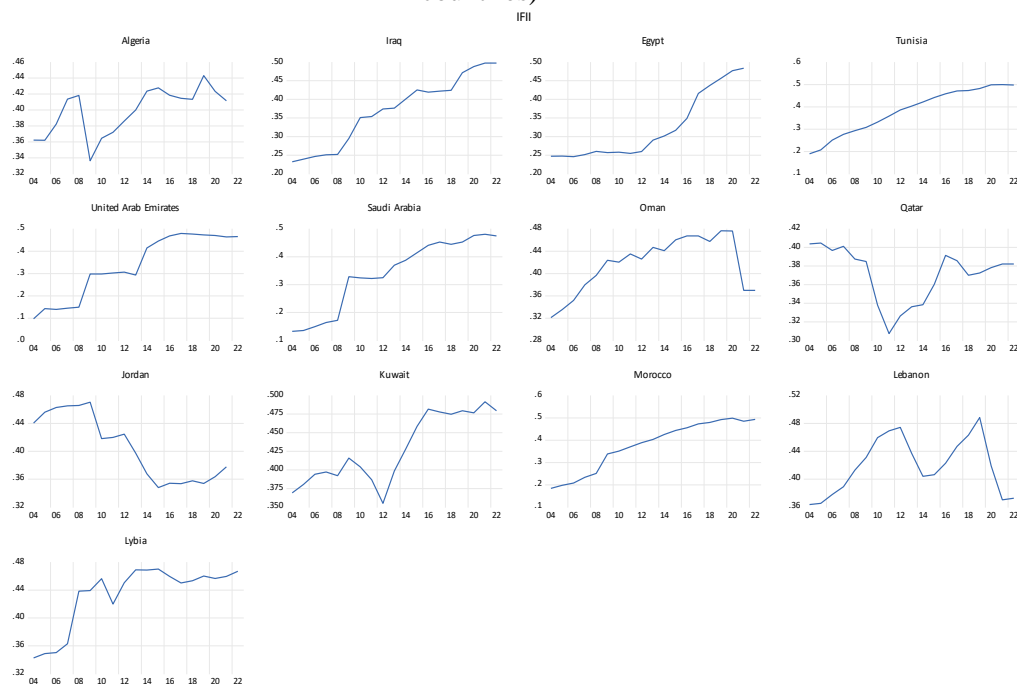
Table 4 illustrates the pioneering efforts in financial inclusion across MENA economies, notably spearheaded by Jordan, Qatar, Lebanon, and Algeria from 2004 to 2015. Subsequently, since 2016, there has been a significant advancement in financial inclusion across all countries, reflecting a concerted effort in this domain. However, an intriguing observation emerges regarding the impact of the COVID-19 pandemic, which has led to a notable surge in financial inclusion indices for most economies, albeit with exceptions noted in Jordan, Oman, and Lebanon.

Regarding Jordan, even though the banking sector managed to stay resilient during the global economic crisis of 2008, the Arab Spring protesters, and the Syrian conflict, the present-day challenges are driven by global economic headwinds, high energy and food prices, and increased interest rates. Such factors have weakened corporate and home loan balance sheets, hindering their access to bank credit according to their funding requirements.

Furthermore, Oman underwent a downturn caused by the failure to complete the digital transformation program 2021-2025 in time as the nearby countries like Saudi Arabia and the United Arab Emirates advance more rapidly. Lebanon, which used to be the one of the first adopters of financial inclusion, nowadays is hurdled by the implications of the economic and financial crisis on top of the COVID-19 pandemic and the Beirut port blast in 2020. As a consequence, Lebanese banks have witnessed a significant liquidity crisis and erosion of public confidence in the banking system which has resulted in a moving to cash transactions.

Conversely, Saudi Arabia and the United Arab Emirates have made substantial strides in digitalization and financial inclusion since 2009, with significant progress anticipated by 2020. Tunisia and Iraq embarked on their respective journeys in 2005 and 2010, marking significant milestones such as Tunisia hosting the World Information Society Summit (WSIS 2005), Iraq's declaration of independence, and the withdrawal of US forces. These developments are corroborated by Figure 1, which visually represents the trends outlined above.

Figure 1: Evolution of IF Index during the period 2004-2022 (MENA countries)



Source: Authors' representation using data from the World Bank Global Findex and the International Monetary Fund Financial Access Survey for 2004-2021 and local monetary authorities for 2022.

5. Conclusion

This study delves into Sarma's (2016) methodology for measuring financial inclusion across MENA countries. Our comprehensive analysis spans from 2004 to 2022, meticulously considering data availability. Notably, nations like Lebanon, Jordan, and Qatar emerged as early adopters of financial inclusion initiatives, albeit facing formidable challenges from the 2008 financial crisis, the Arab Spring, and the COVID-19 pandemic. However, this trend wasn't uniform, with countries like Tunisia, Saudi Arabia, Egypt, Iraq, Morocco, and the United Arab Emirates demonstrating sustained progress in financial inclusion.

The study period reveals two distinct sub-periods: from 2004 to 2010, characterized by moderate financial inclusion levels not exceeding 0.35, and from 2011 onwards, indicating a significant surge in financial inclusion across all MENA countries examined.

Interestingly enough, MENA countries have advanced steadily on many fronts of financial inclusion, being able to comply with international banking standards and regulations, as well as the Bank for International Settlements (BIS) and the Basel Committee recommendations. The sharp rise in GDP at the beginning of the 21st century greatly improved the quality of life, implying the establishment of better practices for financial management and diversification of financial institutions' portfolios. Besides that, the rapid adoption of information and communication technology (ICT) has also contributed significantly by ensuring the availability, accessibility, and secure usage of financial products and services.

Although performance monitoring of the financial inclusion index is critical, such quantification is only one of its possible applications. It is a powerful variable while studying its correlation with various economic and financial parameters, from high non-performing asset levels to market efficiency and macroeconomic issues like growth, poverty, and sustainable development.

Stakeholders, including policymakers and financial institutions, can use the results of our study to design specific policies and programs directed towards the enhancement of the inclusion of financial systems in MENA. Each country may face certain challenges and different possible pathways to reform. Moreover, governmental actions should include careful regulations that ensure the protection of consumers, transparency, and, fundamentally, the prevention of scams. Investing in financial education programs, especially applying ICT, could improve digital literacy, which implies that people can make informed financial decisions and use all available financial services optimally.

Furthermore, our study is useful for the dynamic analysis and continuous monitoring of policy initiatives on financial inclusion, and it has made it possible to develop evidence-based policies and promote cooperation among policymakers and financial institutions in the MENA region. Such area studies provide a more in-depth picture, stimulating joint initiatives to collect data and implement programs designed to suit regional needs. The result of this is financial inclusion workshops, conferences, and training programs that assist in exchanging ideas and facilitating innovative ideas.

Through utilizing our study's results and directed policies, the policymakers and financial institutions can drive economic growth, redress inequalities and consequently improve the overall welfare of the MENA region. Although universal solutions for financial inclusion are still daunting, the complex framework demands deeper research into the issue. In conclusion, our study illuminates the financial inclusion journey in MENA countries, accentuating achievements and areas warranting further exploration. The insights gleaned contribute significantly to the existing literature, providing a roadmap for advancing inclusive financial systems in the region.

Declaration of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

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