

# The role of financial literacy in achieving financial inclusion: A theoretical and applied study in Arab Countries for the period (2004-2020)

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**Abstract---**This paper contributes to the study of the role of financial literacy in promoting financial inclusion by examining the relationship between the composite financial inclusion index (IFI) and the literacy rate, and the percentage of the population between the ages of 25 and 64 years, which represents the variable of financial literacy and its relationship to financial depth and financial literacy between the sexes of the selected Arab countries during the period from 2013 to 2020. Using a multiple linear regression model according to the method of least squares (OLS) under panel data (panel), based on models of fixed and random effects, and to choose the appropriate model for the study, we conducted the Hausman test. The results of the tests showed a positive relationship between financial inclusion and financial literacy, regardless of gender, as well as a positive relationship with financial depth. A negative relationship was observed with GDP, indicating the contribution of financial literacy in promoting financial inclusion in the studied countries. This requires better financial education.

**Keywords---**financial inclusion, financial depth, financial literacy.

## I. Introduction

Financial inclusion is a key factor in eradicating poverty and promoting prosperity. It is measured by access to and use of financial services and is considered an crucial policy tool to attain universal

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financial access and the Sustainable Development Goals (SDGs) by various development bodies, which is of great importance to policymakers. But more than 1.7 billion underfunded adults have been counted globally and a lack of financial literacy is one of the main reasons for this. This led economists to study the consequences and causes of financial illiteracy in order to better understand the causes of poor retirement planning, which leads to many families approaching retirement age with little or no wealth. Many families are ignorant of the simple economic concepts necessary to make saving and investment decisions, where they have noticed the widespread spread of this financial illiteracy, especially among young people and the elderly in countries that suffer from a lack of sufficient knowledge of basic financial accounts, which has serious implications, whether on saving, retirement planning, mortgages, and other decisions. However, low levels of financial literacy are worrying in itself, especially for policymakers who are most concerned about the potential effects of financial illiteracy on economic behavior. One example is his presentation (Hogarth, Christoslav E, & Jinhook, 2005), where they found that low-educated consumers are disproportionately represented within the “unbanked” category, that is, those who do not have any bank accounts. Financial literacy helps individuals improve their understanding of financial issues, enabling them to process financial information and make informed decisions about their personal finances. Financial literacy is also directly related to the well-being of individuals. Previous studies indicate that people with low levels of financial literacy have problems managing personal finances, such as saving, borrowing, investments, retirement planning, etc. Financial education is the concept of how, where and when to make wise decisions about money and what to do with it, including, but not limited to, budgeting, saving, investments, favorable loan terms, credit mitigation strategies, and diversified retirement plans. So, having the skills, knowledge, and procedures is what enables individuals to make informed decisions about money and its derivatives. One measure or evidence of financial literacy is taking the right steps to achieve the right financial results, not just understanding the facts about money. Hence, the problem of our research falls into the main question:

**Does financial literacy have a role in promoting financial inclusion in selected Arab countries during the period 2004- 2020?**

#### ✓ Sub-Questions

- How does financial literacy affect the expansion of financial inclusion?
- Does the size and importance of financial literacy differ from financial depth to financial inclusion?
- Does the greater the financial literacy rate, the greater the financial inclusion, and the higher the economic growth in the selected Arab countries?
- Is there a difference between the financial literacy of men and women in expanding financial inclusion in selected Arab countries?

#### Research hypotheses

- ✓ Financial literacy has a positive affect on financial inclusion across both genders
- ✓ financial literacy positively influences financial depth within the economy
- ✓ there is a positive relationship between Financial literacy and Gross Domestic Product (GDP)

#### Literature Review

A study by (salem,2023) indicate that Financial literacy in Egypt significantly enhances the ability of individuals to evaluate financial products,leading to an increased usage to financial services.In Jordan ,a study found that knowledge of financial products and consumer rights was a strong predictor of financial inclusion among youth,highlighting the importance of comprehensive financial education (Alqam & Hamshari,2024).Furthermore,a study by (Ibor,2023) indicates that financial inclusion in Arab countries contributes to economic stability by inabling vulnerable populations to manage risks and improve their financial well-being.Another study by (Ahmed & Al-Nuaimi,2022) showed that the depth of financial services in Arab countries correlates positively with financial inclusion,suggesting that enhancing financial literacy can lead to better service offerings and accessibility.

Provide (Sanjib, 2016) a review of existing research on financial literacy, and try to monitor gaps. He began by defining the term “ financial literacy” and identified approaches to measuring the level of financial literacy in different studies with an analysis of the determinants of the level of financial literacy among different groups of people.

A study shows (Antonia, Theres, & Lukas, 2018) that the high level of financial literacy also has a clear positive impact on financial inclusion. They studied this impact at the country level, allowing for the study of institutional variation. Regarding “access to finance,” they considered financial infrastructure and financial literacy as key alternatives. However, in relation to the 'use of financial services', the influence of high financial literacy reinforces the influence of financial depth and what underpins the causal interpretation of these findings are regressions. Furthermore, the positive influence of financial literacy extends across income levels and multiple subcategories within countries.

Conducted a study (Falak, Muhammad, & Salma, 2022) in mapping, scientific analysis, and content analysis by compiling studies on the intersection of financial literacy and financial inclusion from a sample of 10,091 studies, distributed over the past 45 years, on a sample of more than 850,000 individuals around the world. The number of researches is increasing, with finance and economics dominating the literature by fields; most studies are dominated by countries.

(Samanwita & Chandan, 2025) In his study, he relied on a resource-based theory to probe the impact of sustainable financial literacy on women as they contribute in sustainable entrepreneurship by focalizing on digital financial inclusion as an intermediary.. Experimental data were accumulated from 266 female students from various prestigious Indian institutes; with the research hypotheses tested using the modeling of least squares partial structural equations with the help of Smart PLS 4. The study showed that sustainable financial literacy significantly affects women's intention towards sustainable entrepreneurship. Moreover, digital financial inclusion partially intermediates the relationship between sustainable financial literacy and entrepreneurship intention. These findings provided policymakers with a constructive model for applying sustainable financial literacy to promote and generate intent among women to engage in sustainable business.

## **I. Framework Looking at Financial Inclusion in Financial literacy for Financial Inclusion**

### **1. Theoretical Framework for Financial literacy**

Finance is an integral part of everyday life, and financial education is an essential life skill, so it has a prominent place in the policy agenda of the world's emerging economies. which promotes the continuous growth and development of financial services and demographics, in addition to the global pursuit of policies that expand and promote financial inclusion.

#### **1.1. Definition and Importance of Financial literacy**

According to the global demographics, which indicate a lack of understanding by many citizens of their financial needs or the available financial tools/products and how to access them usefully.

##### **1.1.2 Definition of Financial literacy**

The Organisation for Economic Co-operation and Development (OECD, 2005) has described “ financial education” as that “operation by which financial consumers/investors better their understanding of financial products and concepts and, through objective information, guidance and/or advice, enhance the skills and confidence needed to become more aware of financial risks and possibilities to make informed choices, know where to turn for help, and take other efficient actions to improve their financial situation”

##### **a) Definition**

Financial literacy is about learning how to manage our finances wisely, which allows us to plan ahead, by making smart financial choices, by thriving in times of uncertainty by wisely exploring investment

opportunities, understanding risk, and taking actions in line with this conception to secure our future. (Bassey, 2023)

#### **b) Definition of Digital Financial literacy**

Digital financial literacy is the acquisition of appropriate information technology-based knowledge, skills and competencies for the safe and transparent use of digital financial products and services. Almost all financial products and services are available to everyone through the Internet and are the link between financial literacy and financial inclusion, which is of great interest to all countries around the world (Bassey, 2023)

#### **c) Definition of Islamic Financial literacy**

The Islamic financial literacy is defined by a person's ability to use his knowledge, skills and financial attitudes in order to manage financial resources in correspondence with Islamic teachings and its purpose is to ameliorate the quality of financial decision-making to change an individual's behavior in managing his financial affairs according to his needs and capabilities. (Anriza & Marlya, 2019)

### **1.2 Objectives of Financial Literacy**

The goal of financial education is to increase access to financial services for disadvantaged individuals, families and communities, and vulnerable, rural, and poor groups, who are often financially excluded from traditional financial services. Thus, it can be limited to three basic principles, namely:

- (a) the development of income beyond the level of expenditure;
- (b) Achieving success and financial independence ;
- (c) Be prepared for unforeseen shifts of events and contingencies , resulting from changes in living conditions and/or the size of disposable income. This requires knowledge of the types of insurance or other hedging plans available (Bassey, 2023)

### **1.3 Determinants of Financial Literacy**

Financial literacy shows some determinants that have a significant impact on the level of financial literacy of individuals . Societal factors include: age, gender, education, profession, income, place of residence. These determinants provide a comprehensive view of the factors that affect the level of financial literacy of individuals as follows :

#### **✓ Age :**

According to some studies, age is one of the important determinants of financial literacy and is an important factor in explaining the level of financial literacy in individuals. Financial ability varies greatly with age in a non-linear way as it increases rapidly with age (Mark, 2011)

#### **✓ Gender:**

Many studies have shown that gender significantly affects the level of financial literacy, considering that men are more financially literate compared to women (Annamaria & Olivia, 2007)

#### **✓ Education**

Scientific qualification and academic specialization are directly determined by the level of an individual's financial literacy. (Dahlia, Rabitah,, & Zuraidah, 2009)In their study, they found that students from business/economics and finance majors have more financial knowledge than others

#### **✓ Occupation**

Job is directly and closely related to financial literacy as it was found working in non-government jobs are more financially conversant compared to those working in government jobs, and people working in urban areas are more financially literate compared to those living in rural areas (Puneet & Yajulu, 2013).

#### **✓ Income**

The income of individuals is highly correlated with the level of financial literacy, as young people with limited income lack the financial knowledge to access the main financial institutions, while individuals from wealthy families are more financially literate (Puneet & Yajulu, 2013).

#### 1.4 Dimensions and rules of financial literacy

To build a financial literacy, you must rely on the following four rules: budgeting, tracking expenditures, managing debts, and planning for retirement based on the following dimensions:

- Budgeting,
- Savings,
- Debt management,
- Invest
- An individual must be prepared for unexpected events and emergencies resulting from changes in living conditions and/or available income. This requires knowledge of the types of insurance or other hedging plans available. (Bassey, 2023)

#### 5. Assess the level of financial literacy in the world

According to the [CSSF](#) (Commission de surveillance du Secteur Financier Global) survey conducted by GLEF in 2015, only one in three adults understands basic financial concepts. Without understanding these concepts, people are not qualified to make informed financial management decisions, such as saving, investing, borrowing, etc. The survey covers a wide range of 143 countries and is based on more than 150,000 interviews of financially literate adults aged 15 to 55, with at least 3 correct answers out of 4 (adult percentage) including questions about interest rate, compound interest, inflation, and risk diversification. Levels of financial literacy ranged from 71 percent to 13 percent.

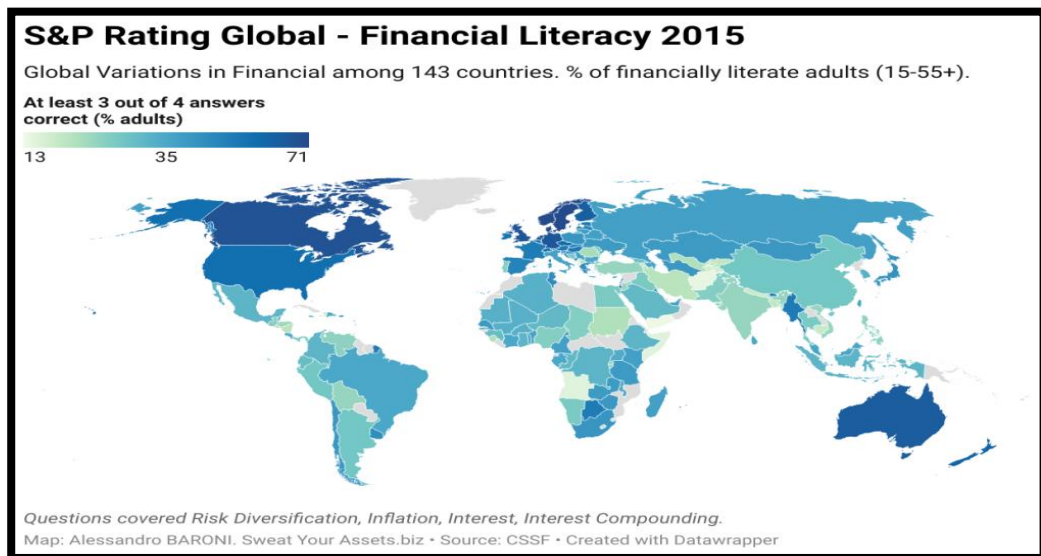


Figure 01. Represents the world map of levels of financial education

According to Figure 01, the level of financial education in both Sweden and Denmark reached 71 percent, which is the highest percentage of the other 3 correct answers out of 4 for adults aged between 15 and 55. The lowest percentage was estimated at 13 percent in Yemen, and the average percentage was 35 percent in Brazil and Bulgaria, while Algeria had a financial education level of about 33 percent.

## II. Theoretical Framework for Financial Inclusion

### 1. Definition of Financial Inclusion

Financial inclusion ensures that all individuals and businesses have access to affordable and appropriate financial products and services, and is of critical importance in the Arab world. Despite some progress

in recent years, many countries in the Arab region continue to suffer from low levels of financial inclusion

## **2. Determinants of financial inclusion**

Specific social and economic factors affecting financial inclusion can be identified, through areas of social and economic development, such as education and income inequality, that require an increased focus to promote financial inclusion. These are as follows :

### **2.1 Income levels**

Income is one of the main determinants of financial inclusion. Due to the high level of income associated with increased access to financial services. As for individuals with fixed income, they are more likely to have bank accounts that have access to credit facilities. This is due to the employment situation, which plays an important role in facilitating access to financial services through salary accounts or financial products sponsored by the employer.

### **2.2 Financial Education and Knowledge**

Education is a key factor in enriching an individual's understanding of and use of financial services. Higher educational levels are associated with the raised financial literacy, which in turn leads to better interaction with financial services (Losardi and Mitchell, 2014). Financial literacy campaigns and programs can significantly enhance financial inclusion, particularly in areas with low levels of formal education.

### **3.2 Demographic Factors:**

- Age, Gender and Ethnicity

Age, gender, and ethnicity are crucial factors in understanding the contrasts in financial inclusion. For example, younger and older age groups may face different barriers in accessing financial services (Campeiro and Kaiser, 2013). Gender disparity in financial inclusion is a major problem. Women often face greater barriers in accessing financial services due to factors such as legal restrictions or societal norms (Demirguc-Kunt et al. 2013). Ethnic minorities and natives peoples can also face unique challenges, often stemming from systemic inequality or discrimination.

### **4.2 Technological factors and geographical location (urban vs. rural):**

Geographical location plays a focal role in promoting financial inclusion. Residents of rural areas often acquire less access to financial services than their urban counterparts due to factors such as distance from financial institutions and lack of infrastructure (Beck et al. 2007). Technological solutions, such as mobile banking, have begun to bridge this urban-rural divide, as documented in studies of mobile money in African countries. Socio-cultural

Cultural and social norms influence attitudes toward money, savings, and credit, which can affect financial inclusion. In some cultures, traditional forms of savings and lending may be favored over formal financial services. Trust in financial institutions is another key aspect. In areas where banking systems are historically mistrusted, people are less likely to interact with formal financial services.

- **Government policies & regulations**

Government policies and regulatory environments can facilitate or hinder financial inclusion. For example, policies that encourage branch expansion in underserved areas or that mandate financial literacy in school curricula can promote financial inclusion. Similarly, regulation that lowers entry barriers for non-traditional financial service providers would enhance access to services and competition.

## **III. Financial Inclusion and Financial Education in the Arab Countries**

According to the World Bank, there is a large disparity in financial inclusion in the Arab countries, where the average prevalence of adult bank accounts in the Arab world is about 40%, compared to the

global average of 60%. This is largely due to several factors such as the low levels of financial literacy, the inability of rural and remote areas to access banking services in addition to the weakness of the financial infrastructure. During the past ten years, governments of Arab countries and their financial institutions have made great efforts to promote financial inclusion by establishing regulations and laws in order to increase access to financial services through microfinance and digital financial services. Some Arab countries have set goals and strategies for financial inclusion. ( World Union of Arab Bankers, 2025)

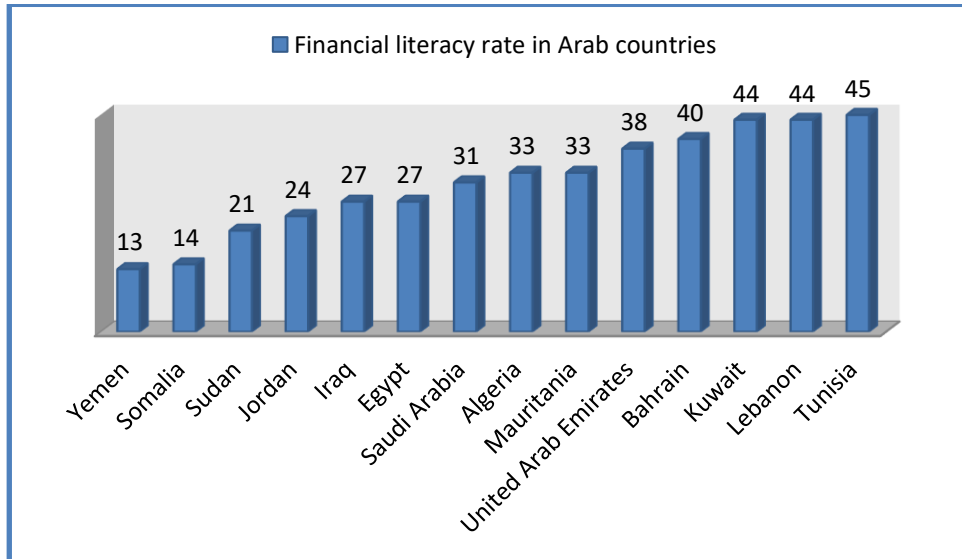


Figure 02. Represents the levels of financial education in the Arab countries in 2015  
Source: Prepared by researchers based on [CSSF](#) data

Figure 02 represents the level of financial education for some Arab countries, based on global [CSSF](#) data conducted by GLEF in 2015, where the highest level of financial education in Tunisia was 45 percent, and the lowest was estimated at 13 percent in Yemen, while the average was 31percent in Algeria.

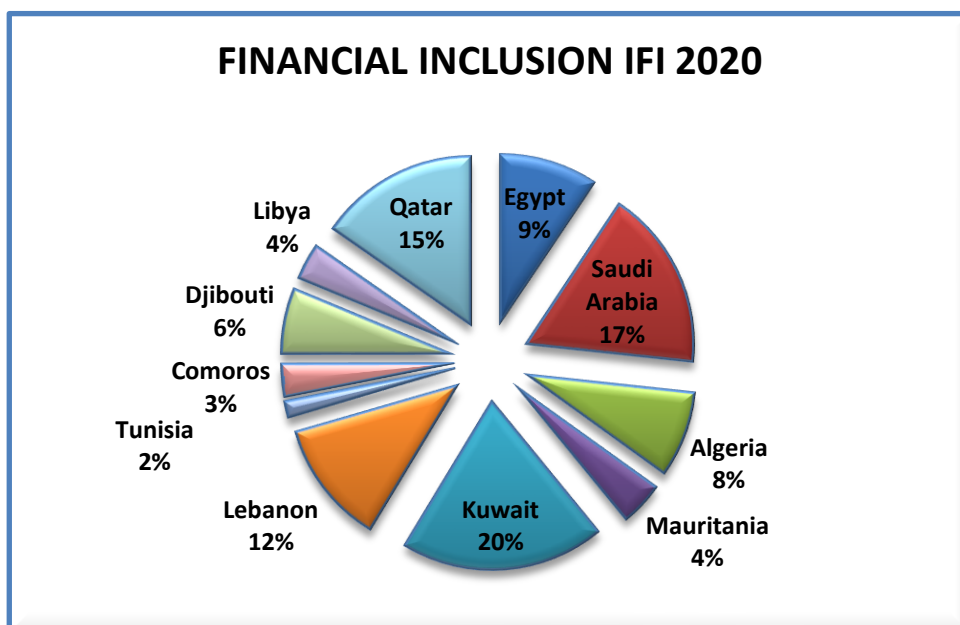


Figure 3. Financial Inclusion Ratio (IFI) in Arab Countries for 2020  
Source: Prepared by researchers based on World Bank data

Figure 03 indicates the composite financial inclusion index calculated according to the sarma method for some Arab countries for the year 2020. We note that Kuwait reached the highest percentage of financial coverage, which amounted to 20 percent, and the lowest percentage known to Tunisia was estimated at 2 percent, while the average values were estimated at 09 percent in Egypt, while Algeria had a financial coverage rate of 8 percent.

#### IV. The relationship of financial inclusion to financial literacy

Financial inclusion demands financial literacy activities for population groups excluded from the formal financial sector due to either their lack of knowledge or awareness. However, the dimension of access points to financial services with weak infrastructure may pose a challenge and one of the reasons for financial exclusion due to the speed and effectiveness of financial education initiatives in expanding access to financial services for poor and vulnerable groups, in addition to micro, small and medium enterprises. Where national policies are based on the realization that many non-financial personal circumstances, such as lack of education, insufficient technical skills, difficulty in accessing markets, lack of information, and unreliability of infrastructure, constrain and discourage companies and individuals. To overcome these factors, it is necessary to intensify financial education campaigns that lead to improved productivity, access to markets, and profitability. that provides the knowledge needed to make effective decisions about the complexities of the financial world (Bassey, 2023)

#### V. Testing the relationship of financial inclusion and financial literacy in selected Arab countries

We test a relationship between financial inclusion (the composite index of financial inclusion (IFI)) calculated according to the methodology (Sarma, 2005) and financial literacy

**1. Estimating the relationship of the Financial Inclusion Index (IFI) to financial literacy**

In this section, we test the influence of financial literacy on financial inclusion. We define the variables of the study and then estimate the relationship model with the analysis of its results. The data used in this test include the Financial Inclusion Index (IFI) previously calculated according to the Sarma method (2005), as a dependent variable and the independent variables: Financial literacy (FL), which is measured by: The variable "financial education" consists of five survey items. These survey items are gathered by GALOB, along with the World Bank and the Center for Global Financial literacy in a representative survey of more than 1000 adults per country in 143 countries around the world in 2014. The elements ask questions about four concepts, i.e. risk diversification, inflation, interest rate, compound interest rate and degree of financial literacy proposed in Klapper et al. (2015), which has been used here is a fictitious variable, giving a "1" if a person correctly answers three out of four questions about financial literacy concepts.

In this test, we used the OLS method, the multiple linear regression model under panel data, for thirteen Arab countries that possess the data, represented in each of (Tunisia, Algeria, Mauritania, Saudi Arabia, Qatar, Kuwait, Lebanon, Egypt, Libya, Comoros, Djibouti, Syria, and Yemen) for sixteen years from 2004 to 2020 depending on the World Bank data through the panel tests for fixed and random effects and the Hausman test to choose the best model, which are statistical models for cross-sectional observations of time periods. Our tests are divided into three sections. In the first section, we test the impact of financial literacy on financial inclusion and control variables of GDP and population ratio. In the second section, we test the impact of financial literacy on financial depth and represented by the private credit variable and control variables of GDP and population ratio. In the third section, we test the interaction of financial literacy and financial inclusion of women and men and consider GDP and private credit as control variables, and follow a study that (Antonia, Theresa, & Lukas, 2018) takes the following form :

$$ifi_{it} = \beta_0 + \gamma Fl_{it-1} + \beta_1 loggdp_{it-1} + \beta_2 pop_{it-1} + \varepsilon_{it} \dots \dots \dots (01)$$

Where:

*ifi<sub>it</sub>*: Calculated index of financial inclusion, for country i for the period t.

*fl<sub>it-1</sub>* : Literacy rate, population aged 25-64, both sexes country for the period t-1.

*loggdp<sub>it-1</sub>* : Logarithm of GDP per capita, PPP (in international dollars) current) of the country for the period t-1.

*pop<sub>it-1</sub>*: Proportion of population aged 15-64 (% of GDP), for country i for the period t-1.

*ε<sub>it</sub>*: Random error.

**The null hypothesis is as follows:**

H<sub>0</sub>: The random effects model is the appropriate model.

H<sub>1</sub>: The fixed effects model is the appropriate model.

**Assessment Results:**

Table No. (01): Results of estimating the relationship of financial literacy and financial inclusion

R-squared		FE		RE		HAUSMAN
Variable	R-squared	Coefficient	t-Statistic (Prob)	Coefficient	t-Statistic (Prob)	Chi-Sq. d.f. (Prob)
FL <sub>(t-1)</sub>	<b>0.829740</b>	0.003998	4.119792*** (0.0005)	0.003436	3.998249 ***(0.0004)	<b>(0.829740)</b>
loggdp <sub>(t-1)</sub>		0.000274	0.041828 ***(0.9671)	-0.001476	-0.253547 (0.8016)	

R-squared	FE		RE		HAUSMAN Chi-Sq. d.f. (Prob)
pop(t-1)	0.011866	4.569660 **(0.0002)	0.013228	5.683693 *** (0.0000)	

Moral score at 10% \*\* Moral score at 5% \*\*\* Moral score at 0%

Source: Prepared by researchers based on the outputs of (Eviews6)  
World Bank data

It is clear from Table No. (01), which includes the results of estimating the financial literacy and the financial inclusion index. The results showed that the statistical value of t-Statistic in most of the tests used is statistically significant. For the Hausmann test, we note that the probability of k-square A is greater than 0.05 for all variables. For the alternative hypothesis  $H_0$ , we reject  $H_1$ , that is, the weighting was in favor of the random effects model, where we note that the coefficient of determination exceeds 50 percent, and therefore the model is explained by more than 50 percent of the dependent variables and the coefficient of both the variable financial literacy FL and the percentage of the population pop and is statistically significant and its indication is positive, which explains the existence of a positive relationship with the financial inclusion index. As for the GDP, it is not significant because the probability of the coefficient is greater than 10 percent and its indication is negative, and from it our results confirm that financial literacy has a strong and significant impact on financial inclusion through the quality of education and calculation, the type of computational skills that represent the foundations of good financial literacy are considered essential, especially if learned early in life. It is likely that if the population of any country has good foundations in numeracy they will have higher levels of financial literacy.

## 2. Estimate the relationship of financial literacy, financial inclusion and financial depth

Following a study, our model (Antonia, Theres, & Lukas, 2018) takes the following form:

$$ifi_{it} = \beta_0 + \gamma Fl_{it-1} + \beta_2 pri_{it-1} + \beta_3 loggdp_{it-1} + \beta_4 pop_{it-1} + \varepsilon_{it} \dots (02)$$

Where:

$ifi_{it}$ : Calculated index of financial inclusion, for country i for the period t.

$fl_{it-1}$ : Literacy rate, population aged 25-64, both sexes  
country for the period t-1.

$pri_{it-1}$ : Ratio of private credit through deposit banks and other financial institutions to  
GDP Total

$loggdp_{it-1}$ : Logarithm of GDP per capita, PPP (in international dollars)  
current) of the country for the period t-1.

$pop_{it-1}$ : Proportion of population aged 15-64 (% of GDP), for country i for the period  
t-1.

$\varepsilon_{it}$ : Random error.

**The null hypothesis is as follows:**

$H_0$ : The random effects model is the appropriate model.

$H_1$ : The fixed effects model is the appropriate model.

**Assessment Results:**

Table No. (02): Results of estimating the relationship of financial literacy and financial inclusion to financial depth

R-squared	FE		RE		HAUSMAN Chi-Sq. d.f. (Prob)	
Variable	R-squared	Coefficient	t-Statistic (Prob)	Coefficient	t-Statistic (Prob)	Chi-Sq. d.f. (Prob)
<b>FL<sub>(t-1)</sub></b>	0.868953	0.003740	4.374984 *** (0.0004)	0.003630	4.791941 *** (0.0000)	<b>(0.9453)</b>
<b>PRI<sub>(t-1)</sub></b>		0.001349	3.422419 *** (0.0030)	0.001380	3.819603 *** (0.0007)	
<b>loggdp<sub>(t-1)</sub></b>		-0.000212	0.033045 (0.9740)	0.001100	0.179159 (0.8451)	
<b>pop<sub>(t-1)</sub></b>		0.010540	4.565953 *** (0.0002)	0.010458	4.918805 *** (0.0000)	

Moral score at 10% \*\* Moral score at 5% \*\*\* Moral score at 0%

Source: Prepared by researchers based on the outputs of (Eviews6)

World Bank data

It is clear from Table No. (02), which includes the results of estimating the relationship of financial literacy and the financial inclusion index with financial depth. The results showed that the value of the statistical probability t-Statistic in most of the variables used is statistically significant except for the logarithm variable of the gross domestic product, which has no statistical significance. For the Hausman test, we note that the probability of k-square A is greater than 0.05 for all variables on the alternative hypothesis  $H_0$ . We reject  $H_0$ , that is, the weighting was in favor of the random effects model, where we note the coefficient of determination is more than 50 percent for the independent variables. Therefore, the model of effects of independent variables is explained by more than 50 percent of the dependent variables and the coefficient of variables, both the financial literacy FL and the private credit pri), which represents the financial depth (and the percentage of the population pop is positive, which explains the existence of a direct relationship between all variables and the financial inclusion index, except for the total domestic product is not significant because the probability of the coefficient is greater than 10 percent.

These results suggest that increased financial literacy in the population increases financial inclusion, and this effect is greatest in countries with low financial depth levels. High levels of financial literacy can compensate for the lack of financial infrastructure. On the other hand, the impact of increased financial literacy on the use of financial services in the form of savings in a formal financial institution is elevated in countries with high levels of financial depth. Thus, financial literacy education improves financial inclusion as a result of the positive relationship between financial depth (private credit relative to GDP) and financial inclusion.

**3. Estimate the relationship of financial inclusion and financial literacy for women and men**

Following a study, our model (Antonia, Theres, & Lukas, 2018) takes the following form:

$$ifi_{it} = \beta_0 + \beta_1 Flw_{it-1} + \beta_2 Flm_{it-1} + \beta_3 pri_{it-1} + \beta_4 loggdp_{it-1} + \varepsilon_{it} \dots \dots \dots (03)$$

Where: Calculated  $ifi_{it}$  index of financial inclusion, for country i for the period t.

$flw_{it-1}$  : Literacy rate, population aged 25-64, women country for the period t-1.

$flm_{it-1}$  : Literacy rate, population aged 25-64, men

country for the period t-1.

$pri_{it-1}$ : Ratio of private credit through deposit banks and other financial institutions to Total GDP

$loggdp_{it-1}$ : Logarithm of GDP per capita, PPP (in international dollars) current) of the country for the period t-1.

$\varepsilon_{it}$ : Random error .

**The null hypothesis is as follows:**

H<sub>0</sub>: The random effects model is the appropriate model.

H<sub>1</sub>: The fixed effects model is the appropriate model.

### 3.1. Estimation Results

Table No. (03): Results of estimating the relationship of financial inclusion and financial literacy for women and men

		FE			RE R-squared		HAUSMAN Chi-Sq. d.f. (Prob)
Variable	R-squared	Coefficient	t-Statistic (Prob)	R-squared	Coefficient	t-Statistic (Prob)	Chi-Sq. d.f. (Prob)
FLw(t-1)	0.868 953	0.006168	5.620066 ***(0.0000)	0.908571	0.005244	5480199 ***(0.0000)	(0.3706)
PRI(t-1)		0.001032	2.900852 ***(0.0110)		0.001147	3.737294 ***(0.0010)	
loggdp(t-1)		-0.008860	1395785 (0.1831)		-0.002683	0.533602 (0.5983)	
FLm(t-1)	0.878779	0.006996	2.555816 ***(0.0219)	0.828700	0.006281	2.630918 ***(0.0144)	(0.9271)
PRI(t-1)		0.001210	2312082 ***(0.0354)		0.001312	2926311 ***(0.0072)	
loggdp(t-1)		0.000712	0.078350 (0.9386)			0.552054 (0.5858)	

Moral score at 10% \*\* Moral score at 5% \*\*\* Moral score at 0%

Source: Prepared by researchers based on the outputs of (Eviews6)

World Bank data

We note through Table No. (03) related to the results of estimating the relationship of the financial inclusion index to the financial literacy of women and men with financial depth. The results showed that the value of the statistical probability t-Statistic, in most variables of statistical significance except for the logarithm variable of the gross domestic product, which has no statistical significance. For the Hausman test, we note that the probability of k-square is greater than 0.05 for all variables on the alternative hypothesis  $H_1$ . We reject  $H_0$ , that is, the weighting was in favor of the random effects model, as we note that the coefficient of determination exceeds 50 percent for the model is explained by more than 50 percent of the dependent variables and the coefficient of the variables, both the financial literacy of women FLw and the financial literacy of FLm men and the private credit pri positive, which explains the existence of a direct relationship between all variables and the financial inclusion index, except for the gross domestic product is not significant because the probability of the coefficient. In general, the described regressions show people with a high financial literacy are more financially inclusive.

Our analysis covered the relationship between the proportions of the population in a country that can be considered financially literate and the indicator of composite financial inclusion. We found a positive

and statistically significant relationship between financial literacy and financial inclusion. This result is achieved when controlling a large number of state, financial and institutional characteristics. Thus, the results indicate that improving financial literacy is a worthwhile option, both at the micro level and even at the macro level, that is, financial literacy can be an important tool for financial development and the expansion of financial infrastructure. This is because the financial services provided and the financial literacy are instrumental in increasing financial inclusion. If inclusion is about the use of financial services, financial literacy has a supplementary and mutually reinforcing effect on financial depth. Economically, the use of a bank account requires both the infrastructure and the related understanding.

## VI. Conclusion

Financial literacy has gained great importance in recent times, especially with the availability of increasingly complex financial products that are easily accessible to a wide segment of the population. As governments seek to enhance access to financial services, the number of people with bank accounts and access to credit products is expanding rapidly. In addition, financial ignorance carries high charges. Consumers who fail to understand compound interest spend more on transaction fees resulting in larger debt and higher interest rates on loans. They end up borrowing more and saving less money at the same time. The potential benefits of financial literacy are numerous, as people with higher financial skills do a better job of planning and saving financially for retirement. Financially savvy investors are more inclined to diversify risk (i.e., hedge) by distributing funds over several projects. Good financial literacy contributes to making sound financial decisions. However, to know whether financial literacy affects financial inclusion and how this influence varies according to country-specific variables, it is critical for policymakers who seek to increase financial inclusion. At the same time, this study (financial literacy and financial inclusion) at the level of different countries provides great credibility compared to research that uses country-specific data.

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