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# **Financial inclusion's contribution to accelerating Egypt's economic growth during (2000-2022)<sup>(1)</sup>**

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## Abstract

This paper intends to assess how financial inclusion contributed to economic growth from 2000 to 2022. To test the hypothesis of the study, a multiple regression model was used through the statistical program Stata V4. The study emerged to a conclusion with various findings, the most significant of which was a favorable and significant relationship between financial inclusion and economic growth in Egypt. As a result, this indicator must be activated by improving financial services and raising awareness among people of the significance of achieving economic growth.

**Keywords:** Financial inclusion, Economic growth, Egypt, Determinants of Financial Inclusion, Global Index of financial inclusion.

## المخلص

### مساهمة الشمول المالي في تسريع وتيرة النمو الاقتصادي في مصر خلال (2000-2022)

تهدف هذه الورقة إلى تقييم مدى مساهمة الشمول المالي في النمو الاقتصادي من عام 2000 إلى عام 2022. ولاختبار فرضية الدراسة، تم استخدام نموذج الانحدار المتعدد من خلال البرنامج الإحصائي Stata V4. وخلصت الدراسة إلى نتائج مختلفة أهمها وجود علاقة إيجابية ومعنوية بين الشمول المالي والنمو الاقتصادي في مصر. ونتيجة لذلك، لا بد من تفعيل هذا المؤشر من خلال تحسين الخدمات المالية وزيادة الوعي بين الناس بأهمية تحقيق النمو الاقتصادي. الكلمات المفتاحية: الشمول المالي، النمو الاقتصادي، مصر، محددات الشمول المالي، المؤشر العالمي للشمول المالي.

## 1. Introduction

Most governments in emerging economies place a high focus on financial inclusion because it promotes economic growth. The fundamental building blocks of every economy are the financial systems that support and sustain economic growth.

Egypt has made financial inclusion one of the top priorities on its government's agenda at the moment as a result of Vision 2030, which supports a number of initiatives aimed at achieving maximum financial inclusion, including luring the informal sector and increasing employment

opportunities while achieving sustainable growth (Al-Zaini,2023, pp 1679 – 1782).

Financial inclusion, which is defined as the ease with which all members of the economy may access and use formal financial services, is one of the most important concerns facing the globe today. Particularly, a low level of financial inclusion impedes economic expansion. since an accessible financial system establishes a foundation for inclusive long-term economic growth, generates more jobs, aids small firms in raising capital, upholds financial and social stability, and furthers other national objectives (Burgess & Pande, 2005, pp 780-795)

Since more than 90% of the unbanked people who lack access to and usage of formal financial services are found in developing countries, fostering greater financial inclusion is viewed as one of the major concerns that developing countries must address promptly (Demirguc-Kunt et al., 2018). Therefore, financial inclusion is not only crucial but also designated as a top priority for all emerging countries.

Financial services, such as credit, deposit accounts, and payments, as well as are essential to development. where accounts allow its owners to send and receive money for daily costs, save for emergencies, and make successful investments in the future. while, persons without accounts are compelled to manage their money informally, such as using cash, which can be more expensive, less trustworthy, and riskier.

**The paper problem** lies in discovering out how far financial inclusion has been implemented in Egypt and what obstacles stand in the way of raising financial inclusion levels? and its contribution to economic growth?

### **The paper questions**

- What does the term "financial inclusion" represent and what are its goals?
- What is Egypt's view on applications for financial inclusion?
- How can financial inclusion be measured?
- What challenges does Egypt face in achieving financial inclusion?

**This paper aims** to study the theoretical framework of financial inclusion, methods for measuring financial inclusion with an analysis of data on

financial inclusion in Egypt, an explanation of the challenges facing Egypt in promoting financial inclusion, and investigate how financial inclusion may have accelerated Egypt's economic progress.

**Hypotheses:** Economic growth in Egypt is positively impacted by financial inclusion.

**Methodology:** test the hypothesis of the study, a multiple regression model was used through the statistical program Stata V4.

**Study plan:** Following the introduction, the research is split up as follows: the findings of the previous studies, financial inclusion, its importance, Egypt's financial inclusion, the relationship between financial inclusion and economic growth, and the factors influencing financial inclusion in literature. Financial Inclusion, Digital Transformation, and Economic Stability are covered in the second section. The global context for financial inclusion is covered in the third section, and the global index of financial inclusion is covered in the fourth. The Financial Inclusion Indicators in Egypt are discussed in the fifth section. The study's model and estimation results are covered in Part Six, while the research findings and suggestions are the focus of Part Six.

## 2. Literature Review

### 2.1. *Financial Inclusion as an Idea in Literature*

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As pointed out by Schumpeter (Schumpeter, 1912), for businesspeople to successfully engage in an innovation process, a robust financial sector is a must. Because the initial investment is not often paid by the entrepreneurs themselves, but rather new enterprises need financing. Without a banking sector to channel capital from, innovation would be almost impossible, and there would be no long-term economic advancement.

Financial inclusion becomes crucial for economic growth based on this concept since it offers cutting-edge financial products to help low-income workers to save more (Odeniran & Udejaja, 2010, pp 91-124).

The phrase "financial inclusion" is a dynamic term that is continually developing as more research on the issue is done. Financial inclusion is a

procedure that gives low-income, financially disadvantaged people access to financial services. (Awad & Eid, 2018, pp 11-25).

Financial inclusion, according to the OECD, is a low-cost, straightforward process that offers a variety of regulated financial goods and services. Financial inclusion should advance financial literacy and understanding while fostering social and economic inclusion (Atkinson & Messy, 2013, pp 1-55).

(Lenka & Barik, 2018, pp 1-19) Give another definition of financial inclusion, stating that it is the process of giving those who are financially disadvantaged access to financial services. such as payments, credit, savings, and online banking. A financial inclusion process must meet a number of conditions, including the presence of reliable financial institutions supported by regulatory bodies, easy access to credit for all people, especially those from economically excluded groups, and long-term sustainability of financial intermediaries.

(Cámara & Tuesta, 2014) Carried out one of the most significant types of research in this area. They offered a distinctive perspective on evaluating financial inclusion at the county level by not only using supply-side data but also taking into account demand-side information. This was accomplished by creating a composite index for 137 developed and developing nations. According to the authors, there are three factors that can be used to gauge financial inclusion, namely utilization, barriers, and access to the financial system. They put up the hypothesis that a hidden structure lies beneath the covariation of a group of linked variables connected to the idea of financial inclusion. This idea enabled them to calculate an accurate evaluation of the financial inclusion level.

## ***2.2. The significance of financial inclusion in Literature***

The availability of financial services has been shown to improve families' and enterprises' resilience to financial shocks.

Low-income women in Chile were able to lessen their dependency on debt and increase their capacity to survive an economic emergency by joining microfinance organizations and receiving free savings accounts (Pomeranz & Kast, 2022). For instance, mobile money users in Kenya who lost their employment unexpectedly were able to obtain cash from a more geographically dispersed social network of relatives and friends, avoiding the

need for them to reduce household spending. (Jacket & Suri, 2014, pp. 183-223). Mobile money accounts allowed Bangladesh's extremely impoverished rural households with family members who had relocated to the city to receive higher remittance payments, enabling them to spend more on food and other essentials, reduce borrowing, and lessen their chance of experiencing extreme poverty. (Lee,et al., 2021, pp. 38-71).

Women's economic empowerment and financial independence can both be aided by accounts. Women who used commitment savings products in the Philippines, which encouraged regular deposits into personal bank accounts, had more power over household decisions and spent their money on necessities rather than frivolous purchases. (Ashraf,et al., 2010, pp 33-44).

Development objectives may be aided by receiving government funding and earnings immediately into an account. One study found that employees who received their pay by direct deposit had more earnings than those who received their compensation in cash (Blumenstock et al., 2018,pp. 2868-2901).

Bangladeshi industrial employees who earned their pay straight into an account mastered the skill of using it independently and avoiding costs associated with unauthorized withdrawals (Breza et al., 2020,pp 1-45).

The availability of financial services has been shown to improve families' and enterprises' resilience to financial shocks (Bruhn & Love, 2014,pp 1347-1376).

According to studies like (Malady, 2016,pp 389-401) due to the fact that most banks do not prioritize serving marginalized communities like rural communities, having more formal bank branches does not always result in greater financial inclusion. Additionally, it is difficult to reach socially excluded groups like women, the poor, or the ignorant when there is a weak ICT infrastructure.

Initiatives to enhance ownership of banking accounts and beneficial use have been prompted by such evidence of the benefits of financial inclusion.

### ***2.3. Financial inclusion in Egypt in Literature***

In this paper (Fahmy&Ghoneim,2023, pp1-30), demand-side financial inclusion determinants are empirically examined. It investigates the effects of these elements on a person's degree of financial inclusion. It is

noteworthy that the statistic used assesses utilization of financial services rather than just access and goes beyond the simple possession of a bank account. The results suggest that there is little connection between financial inclusion and financial literacy. Also suggest that financial exclusion is associated with low trust in financial institutions, low-income level, low education level and being elderly, with a more substantial influence on income and education.

The goal of this study (Mansour et al.,2023, pp493-514) is to look into the elements particularly financial inclusion that support Egypt's economy's growth. It examined the impact of financial inclusion on economic growth in Egypt between the years of 2004 and 2019. It did this by using a probabilistic fuzzy regression. They came to the conclusion that financial inclusion had no impact on economic growth. The study suggests giving higher priority to financial illiteracy to enhance financial inclusion, build the foundations of the financial system, and improve disclosure and transparency in banking transactions.

This study (El kmath &Mohamed,2023, pp1-23) looks at how financial inclusion affects banks' profitability as assessed by the number of ATMs, loans, and commercial banks per 1000 adults as well as the GDP-based economic development in Egypt. It is dependent on a quantitative strategy that makes use of the factors influencing the bank's profitability and economic expansion. The study spans the years 2014 through 2019. The findings indicating the ROA and ROE profitability measures (loan accounts and ATM numbers) are statistically significant suggest that these variables have an effect on bank profitability in Egypt. On the other side, the quantity of branches has a negative impact on bank profitability.

In this study( Helmy,2024, pp227-224) the forward and backward connections between financial inclusion and human development are examined, along with the ultimate impacts on Egypt's and the BRICS nations' economic development. Financial indicators of the level of financial inclusion will be based on how deposits and private credit react to domestic savings and how private credit reacts to deposits. Unemployment, unequal income distribution, and poverty will be used to illustrate the current economic development. According to the study, financial inclusion and human development are interdependent in the BRICS nations in order to promote economic growth; Human development and financial inclusion in Egypt

operate in opposing directions, which could have unfavorable effects on the country's economic development, as a result of the distribution of income and educational inequality.

#### ***2.4. The connection between financial inclusion and economic expansion in Literature***

The connection between financial inclusion and economic expansion appears through the impact of policies to activate financial inclusion on the variables that would raise the rate of economic growth.

The extent of the dissemination and use of financial services is related to the degree of social justice in societies, in addition to having a favorable effect on labor markets, and there is a direct correlation between these two variables. More small businesses are moving from the informal sector to the formal sector thanks to increased use of and access to financial services. (Institute of Banking Studies, 2016).

Experience has demonstrated that increasing the simplicity of access to financial services for both individuals and institutions and raising their quality contribute to promoting opportunity equality and maximizing the economy's potential. Such services assist in giving the underprivileged, especially women and young people, the ability to make tiny but effective investments that will boost their productivity and incomes, which may stimulate consumption and move the economic wheel. Opening a current account could open the door to a wider selection of impactful financial services that will assist people and businesses manage their financial risks, achieve seamless consumption, and invest in business, health, and education programs. Therefore, due to its effect on boosting prospects for growth and economic stability, as well as its contribution to attaining social justice and battling poverty, financial inclusion has become increasingly important in recent years in many nations around the world, particularly developing ones (Shanb et al., 2019, p113).

By selecting particular indicators for each nation to gauge financial inclusion, such as social, economic, infrastructure, and informational variables, The goal of the study was to look into how financial inclusion and development are related. According to the study's findings, levels of development and financial inclusion are related. (Sarma & Pais, 2011, pp 613-628).



An econometric analysis was used in this study (Wakdok, 2020, p 237) to assess how financial inclusion has affected economic growth in Nigeria. The timeframe covered by the data was 1990–2014, and the Error Correction Model was employed to evaluate the hypotheses. According to the research's empirical analysis, financial inclusion has a positive and significant effects on economic growth in Nigeria through financial deepening variables that are influenced by financial inclusion variables like broad money, credit to the private sector, loan deposits of the countryside, and commercial banks' liquidity ratio.

### ***2.5. Determinants of Financial Inclusion in Literature***

There is a significant correlation between the location of bank branches and the possibility that persons with low incomes hold bank accounts, according to numerous research studies.

(Allen et al., 2016, pp 1-30) carried out a study using information from 123 countries and more than 124,000 people, and found a link between environmental sustainability and financial inclusion that makes financial services easily accessible, including cheaper banking fees, more closely access to branches, greater legal safeguards, political steadfastness, and fewer account opening paperwork requirements.

According to (Chen & Yuan, 2021, pp 1-30), dangers and difficulties still exist in China despite the country's recent outstanding progress toward financial inclusion. Many people in China still hold a simplistic perspective of financial inclusion that is detrimental to its ability to contribute to sustainable development. Examples include targeted lending, credit subsidies, and charity endeavors. This study suggested that in order to advance the long-term financial stability of the populace and businesses, it is necessary to call for more commercially sustainable business models, more diverse and appropriately-designed products and services addressing various market segments, and more thorough and robust financial infrastructures.

In order to assess how easily accessible financial services are to people and businesses, as well as how financially literate they are, this paper (Awad & Eid, 2018, pp 11-25) will use Egypt as a case study. Using a survey, Since Egypt has the largest population in the MENA area, a diverse range of genders, ages, and socioeconomic statuses were included in the random sample that was used for this study 140 people made up the sample. When

the survey data are presented and examined, it is clear that 63% of respondents were female, university graduates make up about 60% of the sample, and the public sector makes up nearly two-thirds of the total.

The proportional percentages of people opening bank accounts who are 15 years of age or older are displayed in Table 1. Compared to the rest of North Africa and the Middle East, only 27.44% of Egyptians age 15 or older have bank accounts.

**Table 1. Accounts with financial institutions 2021  
(Percentage of people 15 years of age or older)**

Country	Accounts (% age15+)
<b>Algeria</b>	44.10%
<b>Egypt</b>	27.44%
<b>Iran</b>	89.98%
<b>Iraq</b>	18.57%
<b>Jorden</b>	47.12%
<b>Lebanon</b>	20.70%
<b>Morocco</b>	44.37%
<b>Tunisia</b>	36.85%
<b>West Bank and Gaza</b>	33.64%

Source: Global Findex Database 2021

The literature review only offers a qualitative examination of the general aspect of financial inclusion. Current literature focuses more on regional financial inclusion initiatives than on the results of particular nations. The relationship between financial inclusion, financial inclusion indices, and economic growth in Egypt is explained in this research, making it relevant. There are also suggestions on how Egypt could promote financial inclusion more effectively.

### 3. Financial Inclusion, Digital Transformation and Economic Stability

The Egyptian government is working to put the mechanisms of the transition to the digital economy into place because it is one of the key components of Egypt's Vision 2030. They are doing this by establishing the legal framework and supporting the necessary infrastructure to create a favorable environment for the digital economy and its application to all sectors of the national economy, which will help to draw in significant investments and foster economic growth.

The law "regulating the use of non-cash means of payment" offers opportunities for the private sector to invest in electronic mechanisms for "non-cash" payment and collection in a way that maximizes efforts to transition to a non-monetary society. This law includes new mechanisms to expand the base of financial inclusion.

The National Council for Payment has been established in 2017. The council is focused on eliminating the usage of currency outside of banks, encouraging the use of digital payment methods, and aiming to promote financial inclusion by integrating the greatest number of individuals into the banking system. Egyptian authorities began e-collecting tax payments on May 2019. Financial inclusion helps to reduce local liquidity, which helps to lower inflation rates.

Dealing with banknotes has decreased as a result of financial inclusion and digital transformation, and has been replaced by bank transfers and other electronic payment methods. This has significantly decreased the amount of unofficial financial transactions. Additionally, using electronic payment methods helps prevent money laundering, terrorism financing, and corruption.

#### 4. Global Context for Financial Inclusion

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Globally, account holder and account usage have increased dramatically as a result of financial digital services, such as mobile money, cards, e-wallets, and direct account-to-account payments.

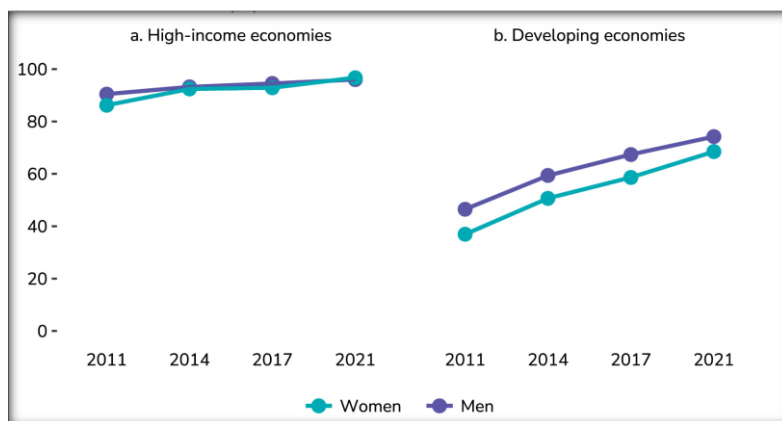
Around the world, account ownership jumped by 50% in the ten years from 2011 to 2021, reaching 76.2% of the adult demographic. In 2021, 76% of individuals worldwide held an account with a bank or a licensed organization like a credit union, a microfinance institution, or a provider of mobile money services.

The effect of using and adopting digital financial services on account use significant factor in the rise in account ownership in Sub-Saharan Africa, as well as in some other countries like Bangladesh and Peru.

Improvements in financial inclusion have coincided with shrinking gender disparities in account ownership globally. According to data from the Findex Database for 2021, the difference between males and women's access to financial services has decreased by 3 percentage points since 2017. In worldwide, 78% of men and 74% of women have accounts, a 4 % difference

between the sexes (Figure 1). Where there is a gender gap, it is only present in developing nations and does not exist in high- income nations.

**Figure1: Adults with accounts (percentage), 2011–21, gender gap reduction efforts**



Source: Global Findex Database 2021

## 5. Global Index of Financial Inclusion

The World Bank Group conducts many global surveys aimed at obtaining Comprehensive data and a future outlook that helps in the generalization of financial services, and prepares the financial inclusion database( Global Findex) is the most objective source in its field and relates to the database These offer up-to-date statistics on the use of formal and informal financial services as well as access to them. It also includes more information on how financial technology is used, such as how mobile phones and the Internet are used for financial transactions (moussa, 2018,p 4).

### Financial inclusion dimensions and indicators

The dimensions and indicators of financial inclusion have been divided by the World Bank into five dimensions, and each dimension contains a set of indicators.

- **Using bank accounts**

It includes the following sub-indicators:

- The proportion of adults with a bank account, a post office savings account, or another type of institutional financial institution.
- The accounts' intended use (personal or business).

- The quantity of withdrawals or deposits.
- Access to bank accounts via ATMs or bank branches.
  
- **Savings**
  - The proportion of adults who used official financial institutions (banks, post offices, etc.) to save money over the past 12 months.
  - The proportion of adults who used a non-profit savings institution representative or someone outside the family to save money in the last 12 months.
  - The proportion of adults who saved on their own dime over the previous 12 months.
  
- **lending**
  - The proportion of adults who borrowed money from a reputable financial institution within the last 12 months.
  - The proportion of adults who borrowed from informal, conventional sources in the last 12 months (including borrowing from relatives and friends).
  
- **payments**
  - The proportion of adults who received government earnings or payments in the last 12 months using an official account.
  - percentage of adults who have sent or received money from household members who resided elsewhere in the last 12 months using a formal account.
  - The proportion of adults who sent or received money by mobile phone in the last 12 months.
  
- **Insurance**
  - The proportion of adults that self-insure.
  - The proportion of adults who work in agriculture, forestry, or fishing who insure their livestock and crops against weather-related events like storms and heavy rain.

## 6. Financial Inclusion Indicators in Egypt

In order to start a stage New of financial inclusion, Egypt is working to become a world leader in the field of digital payments. financial inclusion works to integrate individuals' and institutions' informal economies into the formal economic system of the state. It also ensures the development of the services that financial institutions provide included in its scope. By confining particular elements of society, it also helps to raise the national standard of living and lower poverty rates. such the low-income, underprivileged, and small, medium, and micro project owners.

One of the key pillars supporting the achievement of several aims in Egypt's Vision 2030 is the attainment of financial inclusion. The Sustainable Development Strategy's (SDS) objective is to enhance financial inclusion by providing financial services access to hard-to-reach customers in remote and rural regions. Financial inclusion also aims to enhance consumer financial knowledge, financial skills, and the development of unique financial products that cater to their needs.

### **Strategic Goals for Financial Inclusion**

1. Protecting consumers' interests and fostering their confidence in the banking industry
2. Increasing financial literacy, enhancing consumer and MSMEs' financial skills.
3. enhancing bank workers' and policymakers' understanding of the ideas of financial inclusion
4. Fostering innovation and new company initiatives by providing non-financial services and a comprehensive and efficient infrastructure.
5. Providing emerging MSMEs with access to financial services and fostering their integration into the formal economy.
6. Using digital financial services more widely
7. Increasing banking services, securing them, and encouraging savings

The National ID number (the unique identification) was used by the Central Bank of Egypt to collect data from financial institutions and banks, including Egypt Post, to creating a database for consumers that Classified breaks down financial inclusion data by gender.

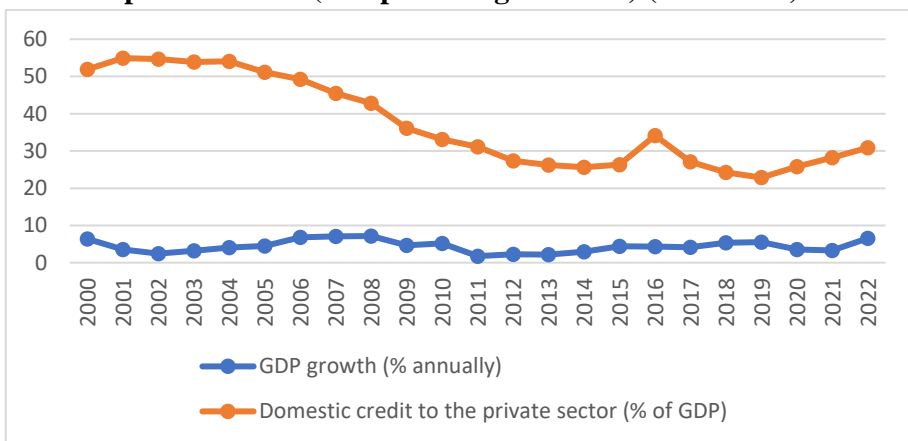
Financial inclusion was defined by the Central Bank and Banking Sector Law No. 194 of 2020 as: The availability of various financial products for use by all societal sectors through official channels, with acceptable quality and cost while respecting the rights of these services' customers, enabling them to manage their money sensibly.

The database indicators show that the percentage of citizens (+16) who are financially included went from 27.2% in 2016 to 64.8% in 2022, with a growth rate of 147% over that time period. Consequently, 42.3 million Egyptians, or 64.8% of the country's population (+16) now have transactional accounts, according to indicators of financial inclusion for natural individuals issued by Central Bank of Egypt. This increase is caused by the growth of prepaid cards and mobile phone wallets, whose growth rates during the years 2020–2022, respectively, reached 54% and 31% respectively.

Access points, which include financial institution branches, automated teller machines, electronic points of sale, and payment service providers, saw increase of 107% between 2020 and 2022.

Women who were financially included climbed from 5.9 million in 2016 to 18.3 million in 2022, growing at a rate of 210% throughout that time. Therefore, in 2022, 57.6% of Egyptian women will have financial security.

**Figure 2: Egypt's GDP growth and domestic credit to the private sector (as a percentage of GDP) (2000-2022)**



Source: World Bank

## 8. Data, variables and methods

The study relies on the method of multiple linear regression analysis, by the least squares method OLS, where the purpose of the test is to establish the relationship between the independent and dependent variables. The study model was developed to determine the impact of financial inclusion on economic growth in Egypt during the period from 2000 to 2022.

The financial structural school highlights that the relationship between the expansion of the financial system and economic growth is attained by the system's comprehensiveness and the variety of services it offers. These factors have a positive impact on saving and investment behaviors, which raises the rate of economic growth. (Marty, 1961,pp56-62) also pointed out that the developed financial system makes privatization possible. Because of the variety of financial institutions and the effective use of available funds, financial intermediaries are more competitive, which guarantees that resources are allocated to the most profitable investment projects, boosting economic growth.

Therefore, we expect a positive effect of financial inclusion on economic growth in Egypt according to economic theory.

$$y_{it} = a + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + \varepsilon \dots\dots\dots(1)$$

$$GDPG = \beta_0 + \beta_1 Atm + \beta_2 loa + \beta_3 dep + \beta_4 bra + \beta_5 Acc + \beta_6 FinIN + \beta_7 Mobil + \beta_8 prep + \beta_8 cred + \varepsilon_{it} \dots\dots\dots(2)$$

So, (GDPG) is (GDP) growth (% annually), and (Atm) means Automated teller machines (per 100,000 adults), and (loa) means Borrowers from commercial banks (per 1,000 adults), and (dep) means Deposit, commercial banks (per 1,000 adults), also, (bra) means Commercial bank branches (per 100,000 adults), (Acc) means Account ownership at a financial institution or with a mobile-money-service provider, poorest 40% (% of population ages 15+), (FinIN) Financially included citizens in millions, (Mobil) Mobile wallets (million wallets) Mobile phone wallets, (prep) Cards Prepaid cards (one million cards), (cred) Domestic credit to the private sector (% of GDP).

To measure the proposed study models, many statistical tests were used, such as the normal distribution test for the data to detect the extent of symmetry of the data and to treat outliers, the variance inflation factor test to



evaluate each model separately, as well as correlation and multiple regression tests.

### 8.1. Descriptive statistics result

We conclude from Table No. (2) that the average economic growth in Egypt during the period from 2000 to 2022 reached 4.4% annually, the average automated teller machines reached 11.2 machines per 100,000 adults, and the average borrower from commercial banks reached 76.2. For every 100,000 adults, the average deposit in commercial banks reached 174.65, the average number of commercial bank branches reached 4.55 per 100,000 adults, the average number of accounts owned by individuals over 15 years old reached 7.1, the average number of financially included citizens in millions reached 12.8, the average mobile wallets reached 7.9 million wallets, the average prepaid cards reached 8.5 million cards, and the average domestic credit to the private sector reached 37.27% of GDP.

**Table 2. Descriptive Statistics Result**

. summarize GDPG Atm loa dep bra Acc FinIN Mobil prep cred					
Variable	Obs	Mean	Std. Dev.	Min	Max
GDPG	23	4.402844	1.643354	1.764572	7.156284
Atm	23	11.02838	8.38966	1.383317	29.7648
loa	23	76.29656	37.94942	17.33557	129.0492
dep	23	274.6517	134.6836	58.87972	479.85
bra	23	4.553739	1.356727	1.983624	7.3332
Acc	22	7.122693	6.91061	.7798195	20.32
FinIN	23	12.81761	12.5979	1.269694	42.3
Mobil	23	7.967443	8.285749	.7674387	30.4
prep	23	8.516954	8.413282	.8488337	28.6
cred	23	37.27475	11.87197	22.84873	54.93114

Source: The author's computation using Stata V14 Output.

### 8.2. Normality Test

Table 3 show results of Skewness test is range between (0.006 to 0.654), and the results for Kurtosis test range between (0.001 to 0.946), Thus, it indicates that the data of the study variables follow a normal distribution, and the significant results of the chi2 test range between (0.056 to 0.691), are greater than 5%. Also, that means all variables follow a normal distribution.

**Table 3. Normality Test Result**

Skewness/Kurtosis tests for Normality						
----- joint -----						
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj_chi2(2)	Prob>chi2	
Atm	23	0.103	0.946	2.980	0.225	
loa	23	0.654	0.007	6.770	0.134	
dep	23	0.411	0.008	6.820	0.133	
bra	23	0.504	0.617	0.740	0.691	
Acc	22	0.067	0.290	4.570	0.102	
GDPG	23	0.620	0.205	2.050	0.359	
FinIN	23	0.023	0.711	5.160	0.076	
Mobil	23	0.006	0.145	5.210	0.117	
prep	23	0.017	0.500	5.760	0.056	
cred	23	0.364	0.001	4.450	0.089	

Source: The author`s computation using Stata V14 Output.

### 8.3. Unit Root Test

The unit root test aims to evaluate the consistency of the time series under study, and the outcomes of the unit root test in Table 4 demonstrate that the variables (Atm -loa -dep -FinIN -Mobil -prep) are stability at the level, because the ADF value for each variable at the level is greater than the critical values of McKinnon, while the variables (bra -Acc -GDPG -cred) have been proven for the first difference and the ADF value has become greater than the critical values for McKinnon, and the following table shows the ADF values and critical values for McKinnon.

**Table 4. Unit Root Test Results**

Variable	ADF value at level	ADF value at first difference	McKinnon at 5%	Degree of integration
Atm	-3.949	-	-3.450	I(0)
loa	-3.855	-	-3.418	I(0)
dep	-5.168	-	-3.175	I(0)
bra	-0.899	-4.812	-3.628	I(1)
Acc	2.220	-5.970	-4.065	I(1)
GDPG	-3.851	-4.812	-4.594	I(1)
FinIN	-4.352	-	-3.637	I(0)
Mobil	4.629	-	-4.349	I(0)
prep	-5.312	-	-4.915	I(0)
cred	-3.742	-4.812	-3.891	I(1)

Source: The author`s computation using Stata V14 Output.

### 8.4. Correlation test

Table 5 shows that there is a weak direct relationship between the dependent variable (GDPG) and the independent variable (Atm -loa -dep - FinIN -Mobil -prep- bra -Acc -GDPG -cred), also the correlation value reached between (0.061 to 0.225), At the significance level less than 5%, These results indicate that there is no problem of autocorrelation between variables.

**Table 5. Correlation test Result**

**Matrix of correlations**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) GDPG	1.000									
(2) Atm	0.138	1.000								
(3) loa	0.154	0.932	1.000							
(4) dep	0.241	0.889	0.974	1.000						
(5) bra	0.061	0.901	0.885	0.864	1.000					
(6) Acc	0.079	0.921	0.829	0.781	0.757	1.000				
(7) FinIN	0.109	0.974	0.866	0.809	0.882	0.901	1.000			
(8) Mobil	0.130	0.977	0.848	0.789	0.871	0.898	0.993	1.000		
(9) prep	0.126	0.979	0.860	0.803	0.875	0.903	0.997	0.999	1.000	
(10) cred	0.225	-0.843	-0.950	-0.971	-0.795	-0.707	-0.751	-0.729	-0.742	1.000

Source: The author`s computation using Stata V14 Output.

### 8.5. Test hypothesis

**Variance Inflation Factor (VIF):** Table VI show that the coefficient of variance inflation ranged between (1.18 to 4.82) and is greater than 1 and less than 5, which indicates the model is good for making regression analysis test.

**Table 6. Multicollinearity Test**

	VIF	1/VIF
prep	2.967	0.337
Mobil	2.818	0.355
FinIN	1.343	0.745
Atm	4.824	0.207
dep	1.659	0.603
cred	2.669	0.375
loa	3.389	0.295
Acc	2.71	0.369
bra	1.182	0.846
Mean VIF	2.71	-

Source: The author`s computation using Stata V14 Output.

**Heteroskedasticity Test:** The difference between the variance test (heteroskedasticity) and the p-value of 0.3752, which is greater than 0.05, indicates that the study model does not have a problem with variance and that the model is good and suitable for testing.

**Table 7. Breusch-Pagan test for heteroskedasticity**

```

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of GDPG

      chi2(1)      =      0.79
      Prob > chi2   =      0.3752
    
```

Source: The author`s computation using Stata V14 Output.

**Test for multivariate normality:** Table 8 shows the normal distribution test for the residuals of the study model. The Doornik-Hansen test was used. so, the study's findings indicate that the value of chi2 is 1.133, with a significant level of prob > chi2 = 0.5675, which indicates that the residuals of the study model follow a normal distribution. Because the significance value of the test is greater than 0.05.

**Table 8. Multivariate normality Test**

```

. mvtest normality resid2

Test for multivariate normality

      Doornik-Hansen      chi2(2) =      1.133      Prob>chi2 =      0.5675
    
```

Source: The author`s computation using Stata V14 Output.

**Hypothesis test Results:** To analyze the study hypothesis based on Equation No. 2, multiple regression analysis techniques were used for the study variables during the period from 2000 to 2022, and the results of the test were as follows:

**Table 9. hypothesis test Results**

GDPG	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
FinIN	0.405	0.738	3.250	0.030	-2.014	1.203	**
Atm	0.511	0.870	4.440	0.005	-0.385	3.408	**
loa	0.006	0.054	2.810	0.046	-0.113	0.124	**
dep	0.054	0.019	5.510	0.001	-0.096	-0.012	**
bra	0.638	0.991	4.350	0.006	-0.521	3.797	**
Acc	-0.094	0.202	3.160	0.033	-0.533	0.346	**
Mobil	0.430	2.904	4.910	0.002	-12.758	-0.103	**
prep	0.576	3.485	4.300	0.007	-2.017	13.168	**
cred	0.070	0.184	3.080	0.035	-0.472	0.331	**
Constant	0.049	9.915	3.310	0.028	-15.553	27.652	**
Mean dependent var		4.304		SD dependent var		1.610	
R-squared		0.566		Number of obs		22.000	
F-test		4.740		Prob > F		0.000	
Akaike crit. (AIC)		83.988		Bayesian crit. (BIC)		94.898	

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: The author`s computation using Stata V14 Output.

The results of the regression test indicate that the P-value for the model variables ranges between (0.001 - 0.046) and is significant at the 0.05 level. The F-test coefficient reached = 4.740, and the P-value = 0.000, which is less than 0.05, which indicates that the model is appropriate and we can use it in prediction. In addition, the value of the Breusch-Pagan test confirms that there is no problem of autocorrelation between the errors of the regression model.

The interpretation coefficient of the R2 model also shows that (Automated teller machines - Borrowers from commercial banks - Deposit, commercial banks - Commercial bank branches - Account ownership at a financial institution - Financially included citizens in millions - Mobile wallets (million wallets) Mobile phone wallets - Cards Prepaid cards (one million cards) - Domestic credit to the private sector (% of GDP)), increasing economic growth in Egypt, also, These variables explain 56% of the change in economic growth. As for the individual effect of each variable, financially included citizens has a positive effect on economic growth, as it explains

(0.40) of the changes in economic growth, and Automated teller machines explains (0.511) of the changes in economic growth.

Also, Borrowers from commercial banks explains (0.006) and Deposit, commercial banks explain (0.054) changes in economic growth, and the Commercial bank branches explains (0.638) and (Account ownership - Mobile wallets - Cards Prepaid cards - Domestic credit to the private sector) explains (-0.094 / 0.430 / 0.576 / 0.070) of the changes in economic growth. Based on the previous results, we accept the hypothesis of the study, which states that “Financial inclusion positively and significantly affects economic growth.” From Table (6) we can deduce the following regression equation:

$$\text{GDPG} = \beta_0 + 0.511 \text{ Atm} + 0.006 \text{ loa} + 0.054 \text{ dep} + 0.638 \text{ bra} + 0.094 \text{ Acc} + 0.405 \text{ FinIN} + 0.430 \text{ Mobil} + 0.576 \text{ prep} + 0.070 \text{ cred} + \text{eit}$$

The multiple regression coefficients show commercial bank branches have the most influence on economic growth. So, if commercial bank branches increase by one-unit, economic growth increases by 0.63, which is the variable with the greatest influence on economic growth. Also, whenever the variable Cards Prepaid Cards increases by one unit, it leads to an increase in economic growth of (0.57), and whenever the variable Automated teller machines increases by one-unit, economic growth increases by (0.51).

Also, whenever mobile wallets increase by one-unit, economic growth increases by 0.43. Whenever the variable Financially included citizens increases by one unit, economic growth increases by 0.40; if the variable Account ownership increases by one unit, economic growth increases by 0.094; and whenever the variable Domestic credit to the private sector increases by 0.094, One unit, economic growth increased by (0.070), and whenever the variable deposit from commercial banks increased by one unit, economic growth increased by (0.054), and if the variable borrower from

commercial banks increased by one unit, economic growth increased by (0.006).

We finally conclude from the above that **the study's hypothesis is correct, there is a positive effect of financial inclusion on economic growth in Egypt**, agreeing with the content of economic theory and previous literature, despite the presence of fluctuation in the data of the independent variables and the dependent variable in the study due to the economic and political conditions that Egypt went through during the study period. Despite this movement, the independent variables as a whole and the dependent variable were moving together, which helped us conclude the positive relationship between financial inclusion and growth through descriptive analysis and econometric analysis of the relationship between financial inclusion and economic growth in Egypt during the period (2000-2022).

## 9. Conclusion and Discussion

- The implementation policies still need more support to future development prospects for financial inclusion and the growth of the Egyptian economy, so though the efforts made to enhance the level of financial inclusion.
- In order to ensure that residents can easily meet their needs for financial services without having to shoulder any additional obligations, the Egyptian government has made enormous efforts to increase financial inclusion.
- Egypt has a low level of financial inclusion in relation to the rest of the globe, particularly Africa, due to consumer behavior and people's propensity to store money in liquid form. In order to ensure poverty reduction and advance economic growth, financial inclusion should be recognized as a requirement for integrating into the global economy and attaining its digital financial evolution. We come to the conclusion that

granting low-income, financially excluded populations access to financial services is a process that contributes to financial inclusion.

- Because it has a favorable impact on economic growth, financial inclusion is a key component of effective state intervention measures.
- Our findings also show that Egypt's level of financial inclusion has increased in 2021 as we track a significant change in the proportion of people who are financially involved. This change is the result of a significant increase in accessibility, which also increased the level of usage of financial services, both formal and informal
- The study also discovered a decrease in the number of people who are financially excluded in 2021. This drop can be attributable to access having significantly improved. Finally, our findings imply that the Egyptian government is on the correct route in implementing policies to enhance financial inclusion and remove the obstacles that cause involuntary exclusion.
- Despite the large number of banks in Egypt, there is limited competition in the banking market, and there is weakness in branch networks and fewer ATMs in villages and remote areas. We therefore need to encourage existing banks to open more branches and ATMs in these areas to raise the level of competition in the market and provide banking services in the villages.

## 10. Recommendations

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- Governments, the commercial sector, development partners, and even consumers must exercise proactive leadership, coordination, and consistent effort to realize financial inclusion since working together improves outcomes.
  - implementing macroeconomic strategies to lower the rates of inflation, unemployment, and poverty as a result, citizens are able to earn money



in cash and have more ability to save and invest. Consequently, promoting financial inclusivity

- A proactive approach is needed to guarantee that financial inclusion permeates the Egyptian economy. Two essential criteria are raising people's financial awareness and knowledge.
- Funding for financial literacy measures, including as television advertisements, educational programs, and extending bank branches to serve both urban and rural inhabitants, is the responsibility of the government and central bank.
- Future economies must be oriented toward a sustainable future and rely only on information and communication technologies to achieve it.
- Preparing awareness workshops for youth to encourage them to deal with various banking services.

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