

The impact of financial inclusion on sustainable development goals: Evidence from Egypt (2004-2021)

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Keywords

financial inclusion; financial inclusion index, sustainable development goals; SDG index.

Abstract

The research aims to investigate the relationship between the financial inclusion index and economic growth in Egypt during the period (2004-2021), assessing the impact of the financial inclusion index on specific SDGs (1,2,3,4,5,8). The research deploys six separate multiple regression models. The findings confirm a negative impact of financial inclusion on Poverty, one unit increase in FII leads to a decrease in Poverty by 3.64. A negative effect of FII on Hunger, one unit increase in FII contributes to a decrease in Hunger 1.6. Align with the expected strand of results confirm a positive effect of FII on good health and wellbeing, as a one-unit increase in FII contributes to an improvement in healthy lives and wellbeing by 2.34. Also, a positive effect of FII on quality education work, one unit increase in FII contributes to an increase in quality education by 3.07. Regarding gender equality, there is a positive effect, one unit increase in FII contributes to an improvement in Gender equality by 7.54. A positive effect of FII on providing Decent work is one unit increase in FII contributes to an increase in Decent work by three.

Introduction

Financial inclusion, which refers to the accessibility of financial services to all individuals and businesses, is increasingly seen as a crucial component of sustainable development (World Bank, 2022). Where Financial inclusion (FI) enables people and firms to have access to basic and affordable financial services in the formal financial sector (Ozili, 2021). Egypt is not an exception although the national vision focuses on financial inclusion and aims to realize sustainable development by 2030. Its objective is to bridge the formal and informal sectors, stimulate economic growth, and provide financial education to citizens through literacy programs, leading to a more resilient society. The road to achieving both financial inclusion and progress for SDGs is not easy paved yet. In 2023 The Central Bank of Egypt released a Core set of financial inclusion indicators which shows that there is an outstanding growth in financial inclusion rates in Egypt. Amongst the total adult population of 16 years and above, estimated to be around 66.4 million, almost half (46.9 million) have access to transactional accounts which include bank accounts, Egypt Post accounts, mobile wallets, and prepaid cards. Consequently, the financial inclusion rate reached 70.7% in 2023 as opposed to 64.8% in 2022 and 25.8% in 2006.

The Sustainable Development Goals (SDGs), also known as the Global Goals were adopted as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity (UNDP 2020).

Egypt's SDG index score is 69.1 in 2024 (SDR, 2024), and the index score reflects overall progress toward reaching all 17 SDGs. This suggests that Egypt has made moderate development. This research investigates the relationship between financial inclusion and long-term growth in Egypt. This study seeks to offer insight into the efficiency of current financial inclusion strategies in assisting Egypt's development track. We will look at how digital financial services can help bridge the gap and contribute to achieving Sustainable Development Goals (UNCDF, 2024).

The emanated notion of the crucial role of FI in boosting SDGS has made FI a top priority at a national level. Financial inclusion can be a moderator factor in alleviating poverty, promoting inclusive and

sustainable economic growth, reducing inequalities, narrow the gap between gender equality and women's economic empowerment to be tandem with the Sustainable Development Goals (SDGs). Financial access facilitates day-to-day living and helps families and businesses plan for everything from long-term goals to unexpected emergencies (World Bank, 2022). The view that improving making basic financial services available to all members of society would help to build an inclusive financial system should be the main goal (Sain, Rahman, & Khanam, 2016)

Several studies have tackled various dimensions of financial inclusion to point to the relationship between financial inclusion and economic growth (Honohan, 2004; Demirguc-Kunt and Klapper, 2013; Klapper et al., 2016; Hamdi and Hakimi, 2023). This study will try to fill the gap in tackling the impact of certain SDGs using quantitative analysis to examine financial inclusion's influence on specific SDGs in Egypt between 2004 and 2021. We focus on SDGs 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and Well-being), 4 (Quality Education), 5 (Gender Equality), and 8 (Decent Work and Economic Growth) as they are related and affected by financial inclusion. The research utilizes separate multiple regression models to investigate the impact of FI on each SDG separately. The findings were in line with the main literature.

The research is divided as follows; the introduction: Section 2 brief review of the impact of FI on each goal followed by the literature; Section 3 describes the data used; Section 4 methodology and the model specification; Section 5 the results.

Literature review

Brief review

The 2016 launch of the SDGs marked a significant shift towards evidence-based planning and programming for global sustainable development by 2030. While there is growing knowledge on how to implement SDGs, policymakers face challenges in putting this knowledge into action (Griggs et al., 2014). Financial inclusion is a crucial tool for achieving SDGs, especially for those related to poverty reduction and gender equality (Muhammad Al-Din, 2020). Despite progress, lot of people particularly women in rural areas, remain unbanked according to the (World Bank, 2017). The next lines will tackle Financial Inclusion and its Impact on Achieving the selected Sustainable Development Goals.

Poverty Reduction (SDG 1): The significant role of financial inclusion in empowering underprivileged groups, enabling them to access savings accounts, credit, and financial management tools, ultimately contributing to poverty alleviation (Muhammad Al-Din, 2020)) found a negative correlation between financial inclusion and poverty rates in the MENA region, indicating that increased financial access reduces poverty but has a smaller effect in MENA countries compared to the overall sample. Other research has used cross-national data to explore the relationship between finance and poverty (Honohan,2008) finding that financial access is adversely correlated with poverty.

Zero Hunger (SDG 2): Digital financial inclusion is crucial for achieving the UN's Sustainable Development Goals (SDGs), especially in promoting food security. It empowers low-income populations by enabling savings, credit for agricultural investment, and efficient digital payment systems (Ferrata,2019). Financial inclusion for farmers enhances food security, productivity, and growth, promoting growth and empowering individuals in the fight against hunger, despite not directly addressing the SDG (Sharma et al,2014). Farmers that have access to financial services, as indicated in the Nigerian setting (Central do Brazil, 2010), can invest in better crops, fertilizers, and irrigation, resulting in higher agricultural productivity.

Good Health and Well-being (SDG 3): Healthcare poverty in developing countries is due to inefficient or poorly funded healthcare, which burdens individuals with medical expenses. Innovations in financial services like health insurance schemes can reduce health emergency risks, especially for women during pregnancy and childbirth. The development of a mobile health wallet in Kenya improved health payments, savings, and access to credit, facilitating 150,000 patient visits to medical facilities (ILO,2018). Medical insurance can decrease the risks related to health (Ferrata,2019).

Quality education (SDG4): Financial inclusion has been recognized as a critical driver of progress towards achieving the Sustainable Development Goals (SDGs) (UNCDF, 2024). SDG4 aims to "ensure inclusive and equitable quality education and support lifelong learning opportunities for all (UNESCO. Several studies highlight the positive association between financial inclusion and educational attainment.

Ali (2020) emphasizes that access to financial services empowers individuals and families to invest in education, particularly for children from low-income backgrounds. Financial inclusion allows for saving for educational expenses, reduces vulnerability to financial shocks that could disrupt education, and potentially facilitates access to student loans (World Bank, 2022).

Gender Equality (SDG 5): *Financial inclusion helps women by giving them more control over their finances. Access to bank accounts, credit, and digital financial services can boost women's engagement in the workforce and entrepreneurship, as demonstrated in the Egyptian context (Muhammad Al-Din, 2020) by using a descriptive method, assessing existing data on women's access to financial services and economic engagement. In Kenya, access to mobile money in women-headed households led to a 22% decrease in extreme poverty and an increase in savings by 20% (UNSGSA,2018)*

Decent Work and Economic Growth (SDG 8): Increased access to financial services, particularly finance, enables firms to invest, develop, and create new jobs. Financial inclusion can also contribute to financial stability and economic resilience in Arab nations (Saadouni,2021). Mostafa et al. (2023) discovered a positive association between increased financial inclusion (FII) in 18 MENA nations and economic growth utilizing a two-step GMM approach. Baobab, an agent network in ten African countries, uses user-friendly tablets and biometric ID verification technology to offer financial services and encourages growth among 700,000 micro, small, and medium-sized companies (UNSGSA,2018).

Literature review on financial inclusion in Egypt

- Rashdan & Eissa (2020): This study investigates factors influencing financial inclusion in Egypt. They found no significant gender gap, but wealth, education, and age are positively correlated with financial inclusion. The main barrier found is a lack of money, hindering people from opening accounts. They used logistic regression analysis on the World Bank's Global Findex 2017 data.

- Hassouba (2022): This study examines the state of financial inclusion in Egypt and proposes improvement strategies. It emphasizes the importance of FI for all and its role in achieving SDGs. The research assessed the current level of FI, identify challenges, analyzed stakeholder perspectives (Central Bank, commercial banks, and regulators), and developed policy recommendations. The study used in-depth interviews with key stakeholders to understand FI management in Egypt. These studies offer valuable insights into financial inclusion in Egypt, highlighting factors that influence access and potential strategies for improvement. On one hand, although Egypt has been through many economic challenges in the past three decades, Egypt has managed to maintain growth in several areas of human development policy. The following graph shows the evolution of the selected SDGs during the period (2004-2021), which shows that Egypt has achieved moderate progress across all the six indicators.

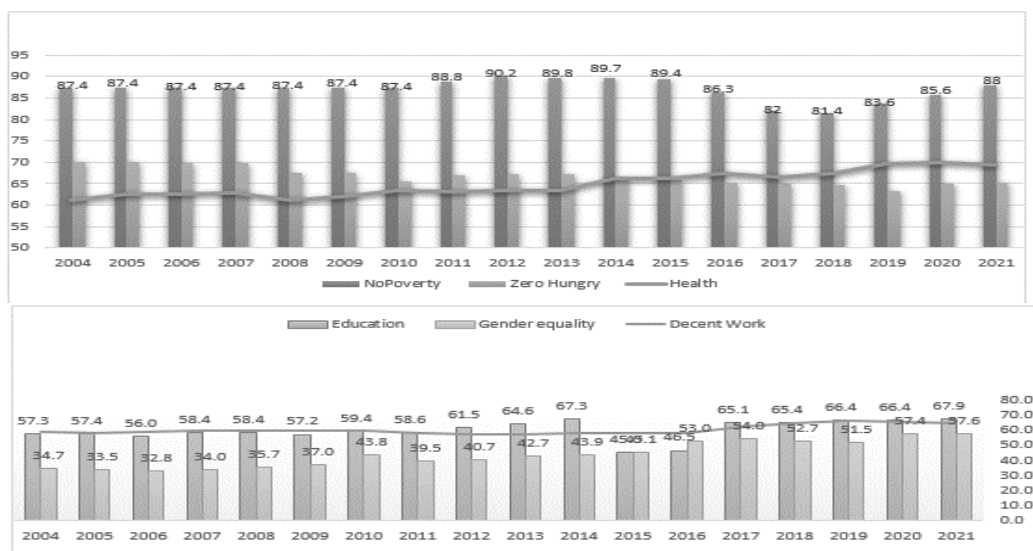


Figure (1): The evolution of SDGs indicators in Egypt (2004-2021)
Source: Sustainable Development Report 2023

On the other hand, for the progress of financial inclusion in Egypt, as Figure (2) depicts the financial inclusion rate in Egypt has steadily increased from 38.5% in 2016 to 70.7% in 2023, with a total of 27.4 million citizens included in the country. This growth is attributed to the country's commitment to financial inclusion, with the number of citizens reaching 70.7 million, a significant increase from the previous year

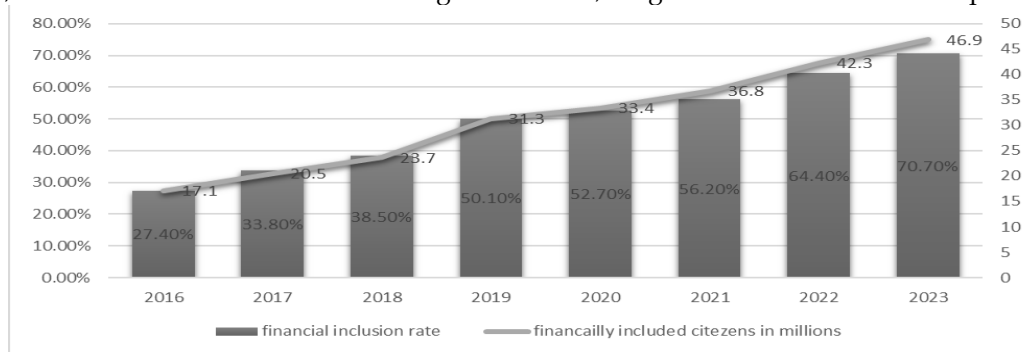


Figure (2): The progress of financial inclusion in Egypt (2016-2023)

Research Methodology

Data

Variables	Notation	Source
1. Financial Inclusion composite index	Independent	Based on the work of (Elmahdi,2023)
2. No Poverty Zero Hunger Good Health and Well-being Quality Education Gender Equality Decent Work and Economic Growth	Dependent SDG 1 SDG 2 SDG 3 SDG 4 SDG 5 SDG 8	Sustainable Development Goals Dashboard
3. Control variables: ▪ FDI ▪ GDP Rate ▪ Trade	Independent ▪ Foreign direct investment ▪ Gross domestic product growth rate ▪ Trade OPENNESS	▪ World Bank Open Trade (WDI) ▪ World Bank Open Trade (WDI) ▪ World Bank Open Trade (WDI)

Model Specification

This research employs a quantitative approach to investigate the relationship between financial inclusion and the achievement of specific Sustainable Development Goals in Egypt. The analysis utilizes six separate multiple regression models, one for each chosen SDG. This aligns with the work of Yap et al. (2023) and allows for a comprehensive examination of these relationships over time.

Each regression model follows the general form:

$$SDG\ Index_t = \beta_0 + \beta_1 FII_t + \beta_2\ Control\ Variables + \epsilon_t$$

where:

SDG Index_t: This represents the level of achievement for each specific SDG in Egypt at time t. FII_t (Financial Inclusion Index) This represents the level of financial inclusion in Egypt at time t. Control Variables: These are additional factors that influence SDG achievement and will vary depending on the specific model. β parameters: Coefficients will be estimated to determine the direction and strength of the relationships between variables. ε_t: This is the error term.

Findings**Table 1: Multiple regression model for SDG1**

Dependent Variable: GOAL1
Method: Least Squares
Date: 07/04/24 Time: 19:47
Sample: 2004 2021
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	80.22359	1.738558	46.14374	0.0000
FI	-3.644999	0.717485	-5.080246	0.0002
FDI	0.088384	0.440719	0.200544	0.8439
GDPGROWTH	0.608188	0.854482	0.711762	0.4883
R-squared	0.798187	Mean dependent var		83.45176
Adjusted R-squared	0.754941	S.D. dependent var		4.499208
S.E. of regression	2.227263	Akaike info criterion		4.632554
Sum squared resid	69.44981	Schwarz criterion		4.830414
Log likelihood	-37.69299	Hannan-Quinn criter.		4.659836
F-statistic	18.45700	Durbin-Watson stat		1.313858
Prob(F-statistic)	0.000039			

Table (1) presents the findings of the first multiple-regression model. The results indicate the following relationship, which is significant at a 95% confidence level: Financial Inclusion Index (FII): Financial inclusion hurts poverty. That is, each unit increase in FII decreases poverty by 3.64. These findings support the study hypothesis regarding the impact of financial inclusion in reducing poverty and achieving the first sustainable development goal.

Table 2: Multiple regression model for SDG2

Dependent Variable: GOAL2
Method: Least Squares
Date: 07/04/24 Time: 19:46
Sample: 2004 2021
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	61.65860	1.379927	44.68250	0.0000
FI	-1.595123	0.569481	-2.801010	0.0142
FDI	0.094524	0.349807	0.270216	0.7909
GDPGROWTH	0.006865	0.678219	0.010122	0.9921
R-squared	0.495397	Mean dependent var		62.27972
Adjusted R-squared	0.387268	S.D. dependent var		2.258412
S.E. of regression	1.767821	Akaike info criterion		4.170503
Sum squared resid	43.75269	Schwarz criterion		4.368363
Log likelihood	-33.53453	Hannan-Quinn criter.		4.197785
F-statistic	4.581532	Durbin-Watson stat		0.694609
Prob(F-statistic)	0.019537			

Table (2) presents the findings of the second multiple-regression model. The results indicate the following relationship, which is significant at a 95% confidence level: Financial Inclusion Index (FII): There is a negative effect of FII on Hunger. One unit increase in FII contributes to a decrease in Hunger 1.6. These findings indicate that financial inclusion has a significant impact on achieving the second sustainable development goal concerning ending hunger and achieving food security.

Table 3: Multiple regression model for SDG3

Dependent Variable: GOAL3
Method: Least Squares
Date: 07/04/24 Time: 03:03
Sample: 2004 2021
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	67.56767	0.718015	94.10337	0.0000
FI	2.343742	0.249381	9.398254	0.0000
GDPGROWTH	0.038942	0.154132	0.252653	0.8040
R-squared	0.859813	Mean dependent var		67.73899
Adjusted R-squared	0.841121	S.D. dependent var		2.513146
S.E. of regression	1.001730	Akaike info criterion		2.992346
Sum squared resid	15.05195	Schwarz criterion		3.140741
Log likelihood	-23.93111	Hannan-Quinn criter.		3.012808
F-statistic	45.99988	Durbin-Watson stat		0.971087
Prob(F-statistic)	0.000000			

Table (3) shows the results of the third multiple-regression model. The results indicate the following relationship, which is significant at a 95% confidence level: Financial Inclusion Index (FII): There is a positive effect of FII on Good health and well-being. One unit increase in FII contributes to an improvement in healthy lives and well-being by 2.34.

Table 4: Multiple regression model for SDG4

Dependent Variable: GOAL4
Method: Least Squares
Date: 07/04/24 Time: 02:57
Sample: 2004 2021
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	57.00969	1.018287	55.98590	0.0000
FDI	0.121647	0.147127	0.826818	0.4213
FII	3.067020	0.453194	6.767566	0.0000
R-squared	0.764310	Mean dependent var	57.77017	
Adjusted R-squared	0.732884	S.D. dependent var	3.587061	
S.E. of regression	1.853910	Akaike info criterion	4.223482	
Sum squared resid	51.55472	Schwarz criterion	4.371878	
Log likelihood	-35.01134	Hannan-Quinn criter.	4.243944	
F-statistic	24.32140	Durbin-Watson stat	0.765721	
Prob(F-statistic)	0.000020			

Table (4) shows the results of the fourth multiple-regression model. The results indicate the following relationships, which are significant at a 95% confidence level:

Financial Inclusion Index (FII): There is a positive effect of FII on quality education work. One unit increase in FII contributes to an increase in quality education by 3.07

Table 5: Multiple regression model for SDG5

Dependent Variable: GOAL5
Method: Least Squares
Date: 07/04/24 Time: 03:04
Sample: 2004 2021
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	44.63767	1.711407	26.08244	0.0000
FII	7.539917	0.761671	9.899180	0.0000
FDI	-0.344784	0.247272	-1.394353	0.1835
R-squared	0.867279	Mean dependent var	42.48225	
Adjusted R-squared	0.849582	S.D. dependent var	8.033829	
S.E. of regression	3.115816	Akaike info criterion	5.261871	
Sum squared resid	145.6246	Schwarz criterion	5.410266	
Log likelihood	-44.35684	Hannan-Quinn criter.	5.282333	
F-statistic	49.00937	Durbin-Watson stat	1.075194	
Prob(F-statistic)	0.000000			

Table (5) shows the results of the fifth multiple-regression model. The results indicate the following relationship, which is significant at a 90% confidence level:

Financial Inclusion Index (FII): There is a positive effect of FII on Gender equality. One unit increase in FII contributes to an improvement in Gender equality by 7.54.

Table 6: Multiple regression model for SDG8

Dependent Variable: GOAL8
Method: Least Squares
Date: 07/04/24 Time: 03:05
Sample: 2004 2021
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	52.79355	2.314478	22.81013	0.0000
FII	3.008044	0.624184	4.819165	0.0002
TRADE	0.216450	0.048681	4.446299	0.0005
R-squared	0.620757	Mean dependent var	62.93954	
Adjusted R-squared	0.570191	S.D. dependent var	2.504345	
S.E. of regression	1.641844	Akaike info criterion	3.980529	
Sum squared resid	40.43477	Schwarz criterion	4.128924	
Log likelihood	-32.82476	Hannan-Quinn criter.	4.000990	
F-statistic	12.27624	Durbin-Watson stat	0.842354	
Prob(F-statistic)	0.000695			

Table (6) shows the results of the sixth multiple regression model. The results indicate the following relationships, which are significant at a 95% confidence level:

1-Financial Inclusion Index (FII): There is a positive effect of FII on providing Decent work. One unit increase in FII contributes to an increase in Decent work by three.

2-Trade: There is a positive effect of FII on providing Decent work. One unit increase in trade contributes to an increase in Decent work by 0.22.

Discussion and Conclusion

In conclusion, this study examines the strong link between financial inclusion and progress toward achieving relevant SDGs in Egypt. We employed a quantitative method with multiple regression analyses to investigate the impact of financial inclusion on poverty reduction, hunger, good health and well-being, gender equality, decent work, and economic growth in Egypt from 2004 to 2021. Our findings reveal that financial inclusion has a highly positive and significant influence on all the SDGs we examined. Therefore, it supports that previous works recognized its essential role (Muhammad Al-Din, 2020)

- No poverty. SDG1: The negative coefficient of FII, as indicated in Table 1, supports hypothesis H1, which states that financial inclusion drives poverty reduction. This validates the conclusions of (Muhammad Al-Din, 2020). Easy access to financial services encourages people to manage their money wisely, save for the future, and make income-generating investments, so reducing poverty.

- Zero Hunger (SDG 2): Table 2 shows a negative coefficient for FII, supporting hypothesis H2. This is consistent with the findings of Ferrata (2019) and Sharma et al. (2014), who imply that financial inclusion decreases food insecurity by improving access to financing for agricultural initiatives and encouraging effective digital payment systems. Improved financial inclusion in Egypt can enable farmers to invest in more productive crops, fertilizers, and irrigation systems, resulting in higher agricultural output and food security.

- Good Health and Well-being (SDG 3): The positive coefficient of FII supports hypothesis H3 and strengthens that the relationship between financial inclusion and good health is positive. This also supports Ferrata's (2019) finding that financial services such as health insurance help to lower health risks. Higher financial inclusion in Egypt might help people afford health insurance and save for medical expenditures, thus improving health and well-being.

- Quality Education (SDG 4): The positive coefficient of FII supports the idea of a significant connection between financial inclusion and academic success. This is consistent with the findings of (Muhammad Al-Din, 2020) and UNCDF (2024), who emphasize the critical role financial inclusion plays in boosting educational possibilities.

- Gender Equality (SDG 5): The positive coefficient of FII in the gender equality model suggests that financial inclusion is associated with progress towards gender equality. This is consistent with research conducted by (Muhammad Al-Din, 2020) and UNSGSA (2018), which show that access to money enables women to participate actively in the labour and entrepreneur sectors.

- Decent Work and Economic Growth (SDG 8): Financial inclusion is crucial for job creation and economic growth, as indicated by the positive coefficient for FII in the model. This is consistent with Mostafa et al. (2023) and Saadouni (2021), who discovered a relationship between financial inclusion and economic growth. Improved access to financial services, particularly finance, enables businesses to invest, develop, and create new jobs. The positive correlation for Trade shows that boosting trade activities, together with financial inclusion, helps to improve SDG 8.

Limitation and direction of future research

This study has certain limitations to consider. First, the selected timeframe (2004-2021) is based on accessible data for Egypt, which can be considered in future research.

Secondly, the research focuses on a specific set of SDGs (1, 2, 3, 4, 5, 8). While they reflect a critical range, further research might investigate the impact of financial inclusion on other SDGs like SDG 10 (Reduced Inequalities), SDG 13 (Climate Action), and SDG 16 (Peace, Justice, and Strong Institutions). Examining the relationship between financial inclusion and a larger set of SDGs may provide a clearer understanding of its contribution to sustainable development. Finally, given the focus on Egypt, the implications for other countries may be limited. Future studies should use comparative case studies or investigate patterns within regions to better understand how financial inclusion affects SDGs in various circumstances. This would help us have a clearer understanding of the significance of financial inclusion in achieving the SDGs globally

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