

Print ISSN: 2288-4637 / Online ISSN 2288-4645
doi:10.13106/jafeb.2023.vol10.no2.0029

Influences of Financial Inclusion on Sustainable Development of India: Using Internet Subscribers as a Moderator

Swapnil Singh THAKUR¹, Rahul Singh GAUTAM², Ajay Kumar YADAV³,
Hitesh PATOLE⁴, Aashi RAWAL⁵, Shailesh RASTOGI⁶

Received: November 10, 2022 Revised: February 21, 2023 Accepted: March 01, 2023

Abstract

The goal of this study is to understand how financial inclusion (FI) as influenced by Internet subscribers in India, affects India's Sustainable Development Goals (SDG). This study makes use of secondary data that was collected from 16 Indian states and one Union Territory between the fiscal years of 2018 and 2020. The goal of this study has been investigated using panel data regression analysis (PDR). And the study's findings indicate that wages received through MNREGA accounts and post office operating accounts under the supervision of Internet subscribers have a significant negative impact on India's SDGs, demonstrating how financial inclusion is harming the country's efforts to achieve sustainable development. This study suggests that it is important to pay attention to rural areas' access to the digital environment and their degree of digital literacy. These findings imply that improving the MGNREGA program and employees' pay might help the government alleviate poverty in India. Financial inclusion also depends heavily on financial literacy. The government should improve its digital infrastructure in rural and urban areas so that people there may better understand and utilize it given that it promotes financial inclusion, digitalization, economic advancement, rural development, and poverty reduction.

Keywords: Financial Inclusion, MNREGA, Post Office, India, Sustainable Development Goal

JEL Classification Code: O18, P2, P3

1. Introduction

The government of India and the Indian banking regulators have always focussed on Financial Inclusion by introducing various schemes to reach the last mile. In global forums as well, the key area of concern is not just development but sustainable growth. Various avenues and vehicles are available in India to help policymakers reach the last mile in providing financial services. In this regard, it is imperative to understand what is Financial Inclusion, India Post Payments Bank, SDG, MNREGA, and DBT, and their interrelationship. The first part of the introduction focuses on defining the key terms, and the second part focuses on their interrelationship (Gautam et al., 2022a, 2022c).

The Planning Commission (2009) defined financial inclusion as having access to a range of financial services. Additionally, at a fair price. Financial inclusion, according to the Government of India (2008), Singh et al. (2014, and Nguyen and Ha (2021) is the process of ensuring that weaker sectors of society and low-income groups have access to financial services and timely and enough credit when they

¹First Author. Ph.D. Scholar, Symbiosis Institute of Business Management, Symbiosis International (Deemed) University, Pune, India. ORCID ID: 0000-0002-0495-8158. Email: swappy.thakur5@gmail.com

²Corresponding Author. Ph.D. Scholar, Symbiosis Institute of Business Management, Symbiosis International (Deemed) University, Pune, India. ORCID ID: 0000-0002-4035-9638. [Postal Address: Symbiosis Knowledge Village, Gram Lavale, Tal Mulshi, Pune, Maharashtra 412115, India] Email: bouddhrahul@gmail.com

³Professor and Registrar, Alliance University, India. ORCID ID: 0000-0002-8356-3356. Email: ajaydav@rediffmail.com

⁴Food and Beverage Service Instructor, Symbiosis School of Culinary Arts, India. ORCID ID: 0000-0002-3173-5603. Email: si@ssca.edu.in

⁵Ph.D. Scholar, Symbiosis Institute of Business Management, Symbiosis International (Deemed) University, Pune, India. ORCID ID: 0000-0003-0075-0605. Email: aashi.rawal07@gmail.com

⁶Professor, Symbiosis Institute of Business Management, Symbiosis International (Deemed) University, Pune, India. ORCID ID: 0000-0001-6766-8708. Email: krishnasgdas@gmail.com

© Copyright: The Author(s)

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

need it at a reasonable price. India's Department of Posts (DoP), a government-run postal service, was established on April 1st, 1854. One such government-sponsored social security program is the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), which is carried out by the organization's Rural Business (RB) Division (2020).

The Sustainable Development Goals (SDGs) were created in 2015 by the United Nations General Assembly. The SDGs are in place for 15 years. There are 169 subgoals that make up the 17 basic goals of the agenda. By 2030, they want the world to have developed holistically and sustainably (Singh et al., 2022). Breuer et al. (2019) stated that these goals are related to the economy, society, and environment. The program of the Indian government is known as MNREGA or NREGA, the Mahatma Gandhi National Rural Employment Guarantee Act. The intention behind its implementation was to give India's rural people secure work. On August 25, 2005, the law was put into effect. In each fiscal year, there is a 100-day employment guarantee. In accordance with this program, jobs are offered to adult members of rural households who are willing to perform unskilled manual labor connected to public projects. The statutory minimum wage is also guaranteed by law (Badodiya et al., 2011; RBI, 2022).

One key factor in financial inclusion is to have bank accounts. India Post Payments Bank (PIIB) is incorporated by GOI to promote inclusiveness (Sultana, 2020). The primary focus of IPPB is serving migrant laborers, unorganized sector employees, and other low-income households in rural India. It focuses not only on the unbanked but also on the under-banked segments (Sultana, 2020). After having bank accounts, the next key thing is to have minimum touchpoints. That's where DBT - Direct Benefit Transfer comes in handy. It was launched in 2013 by the GOI. Its objective was to eliminate middlemen and, in turn, reduce corruption and delays in payment to low-income classes. DBT makes transferring government subsidies and wages directly to the beneficiary's bank account possible (Direct Benefits Transfers, n.d.).

To serve digitally, the key requirement is to have internet services in remote areas. In 1992, ITU Telecommunication Development Sector emerged. It boosted the internet user base from a few million to almost five billion. Our cultures and economy are still being transformed by it (Publication, 2022).

Financial Inclusion refers to the extent of the reach of financial services in the last mile of the geography. While as a nation, everyone wants development. But, development should not come at the cost of giving a bleak future to the next generation. That's where sustainable development comes into the picture. An improvement in one sector should not jeopardize the stability of another sector. United Nations, thus came up with the Sustainable Development Goals in

2015. It laid down the development plan for the next 15 years for the member countries. The challenge is, there are no clear and objective indicators for many of the goals given in the Sustainable Development Goal plan. If there are no KPIs – Key Performance Indicators to measure the progress against these goals, it's difficult to gauge the success or failure of the countries against SDGs.

In India, the government launches various schemes to provide jobs to unskilled rural people who are mostly illiterate. Making banking and financial products accessible to these people has always been a challenging goal for governments and policymakers. The rapid growth of digitalization, including in banking and financial services, has helped improve financial inclusion parameters. But, relying on banks alone would not have helped. The deep network of post offices in India is leveraged to reach the last-mile population. But, despite the 1,39,067 post offices in rural areas of India, in addition to the presence of banks and FinTechs, in some areas, bringing everyone under the ambit of banking is proving challenging. The growing usage of the Internet in rural areas brings some hope, though.

This study aims to investigate the relationship between the accessibility of internet services and the salaries provided to workers utilizing Direct Benefit Transfer - DBT accounts. The availability of finances to the distant population would improve with increased financial service penetration in rural regions. It in turn would bring prosperity to them. A major population in India still resides in rural areas. Prosperity to the masses implies higher economic growth in the country. And when the economy grows, India has a fair chance of ranking higher in the UN targets for the Sustainable Development Goal. The outbreak of COVID-19 has given a boost to digitalization in India and the world over. India is consistently breaking records in terms of the volume and value of digital payments made through UPI – Unified Payment Interface.

With rising competition among telecom service providers, the average cost of internet data has significantly reduced. It has increased the affordability of the consumption of internet data among the masses. To consume the data, consumers require internet-enabled mobile devices. With Chinese penetration in the mobile market, supported by the internet giants like Amazon and Flipkart, feature phones have also come within reach of people at an affordable price. Though the digital footprints appear stronger, there is still a bigger section of the rural population that is unbanked or relies on cash transactions. This paper attempts to find out the penetration of digital services to MNREGA laborers. The statistical study evaluates if the number of Internet subscribers increases and how it impacts the wages paid through post office accounts of the MNREGA laborers.

The objective of the study is to find out if the internet subscribers increase and does it increase the number of

people coming into the mainstream by getting connected to financial services through the post office accounts and thus contributing towards meeting the SDG targets for India. What makes this study novel is the fact that it statistically defines the interrelationship between Financial Inclusion, Financial Technology, and Sustainable Development Goals.

The study is restricted to India and considers only one financial product – MNREGA post office accounts. The subsequent section deals with the literature review and hypothesis development. It then discusses the data and methodology, and the models developed. The results section is followed by a brief discussion of the results which paves the way for the conclusion section of the paper.

2. Literature Review and Hypothesis Development

The existing studies on the topic focus on the relationship between two variables like FI and SDG, Digitalization and SDG. And very few studies have taken the statistical approach to study the impact of a moderator variable.

As the conceptual model above depicts (Figure 1), this study uses a moderator as Internet Subscribers to assess the influence of MNREGA post office accounts and MNREGA wage distribution through PO accounts on the SDG of India. The Sustainable Development Goals (SDGs) are not the first set of international objectives developed for international cooperation for a greener planet and just global society. Boeren (2019) asserted that the Millennium Development Goals (MDGs), which were part of the prior agenda, were created in 2000, the year we entered the twenty-first century. Eight targets were part of the MDGs, and their 2015 deadline was 15 years away. The main objectives were to reduce extreme poverty, provide primary education, advance gender equality and empower women, decrease infant mortality,

enhance mental health, fight deadly illnesses like HIV and malaria, and create a greener world, according to the UN (2000), Gabay (2015), and Boeren (2019).

The Millennium Development Goals (MDGs) and the Rio+ process for sustainable development are combined in the SDGs, which also significantly broadened the scope and complexity of the themes covered and signaled the need for a change in governance tactics, according to Breuer (2019). The integration of the 17 SDGs (i.e. action in one area affects the outcomes in other). However, “Financial Inclusion” is also intimately tied to the three goals of No Poverty (#1), Zero Hunger (#2), and Decent Work and Economic Growth (#7). In terms of MNREGA, the Ministry of Rural Development (MRD), Government of India, in collaboration with state governments, is keeping an eye on the program’s overall execution. According to Badodiya et al. (2011) and Sharma et al. (2022), the MNREGA legislation was implemented to increase the purchasing power of rural residents, particularly those in rural India who needed semi-skilled or unskilled labor. It makes an effort to close the gap between the country’s wealthy and poor (Rastogi et al., 2022a).

However, the primary objective of the MNREGA scheme is not Financial Inclusion. It works more towards removing poverty and providing employment. But, as far as bringing pay parity is concerned, with the wage range of MNREGA, it doesn’t appear promising. For the financial year 2022–23, per day wage is in the range of INR 204 to 333 as per WageRates (2022). So the average wage comes to INR 251 across 34 states and UTs. The act guarantees employment for 100 days a year. Therefore, this scheme approximately pours INR 25,100 per annum which is lower than the lowest per capita income of Bihar in 2021 at INR 28,127. To enhance financial inclusion, the post offices and their skills can serve as an alternative banking solution (Singh et al., 2014). Only post office accounts are the subject of this investigation.

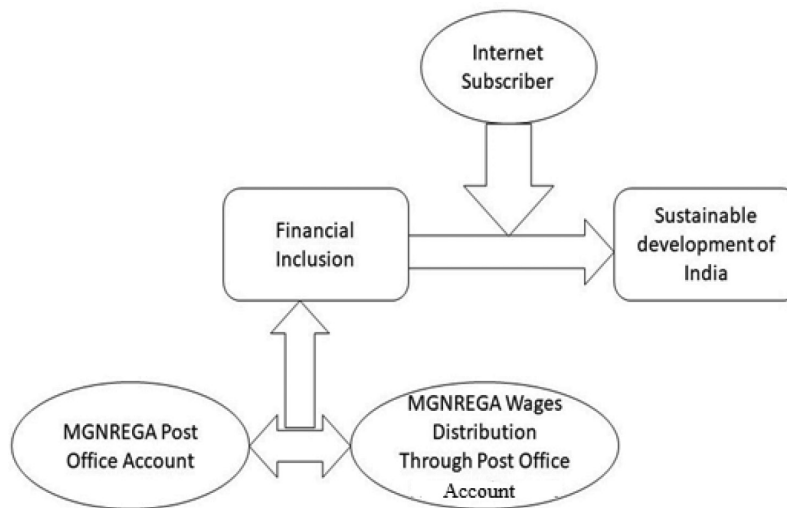


Figure 1: Conceptual Model

Social security payments, utility bill payments, domestic and international remittances, current and savings accounts up to INR 1 lac, distribution of insurance, mutual fund, and pension products, and serving as business correspondent to other banks for credit products, particularly in rural areas and among underserved segments of society are just a few of the payment services offered by IPPB. Debit cards and prepaid payment methods can be issued by them, but not by credit cards. With this extensive financial product range, post offices have the potential to improve the penetration of financial services in remote areas. But, how does it fare in terms of digitalization? The MNREGA scheme is particularly directed toward employing rural people in India. And discouraging wages in the form of cash is a step toward efficient and transparent governance. MNREGA accounts can be opened in banks as well as in IPPBs. This study focuses on post office accounts.

The advantages of DBT are being used by IPPB. As a DBT recipient, an MNERGA employee just has to attach his Aadhaar number to his IPPB savings account to get DBT funds. Following this connection, the recipients will have the DBT funds immediately credited to their IPPB accounts, which are kept at their local post office. According to research by Priyadarshie et al. (2010), providing financial services through post offices that are centered on social protection may help increase financial inclusion in rural regions while also increasing India Post's profits. Paying wages through IPPB accounts via the DBT scheme appears to benefit India on the financial inclusion parameter. Indian post offices are playing a vital role in making financial services available to people in rural and remote places.

Availability of financial products won't result in actual usage of the financial products. And the obvious reasons are literacy level in India. The literacy rate of India is 74% with the highest rate being in Kerala at 94% and the lowest being in Bihar at 61.8%, as per a study (PressRelease, 2022). So awareness about the benefits of availing of financial products would be lower. Along with literacy, digital literacy is also important to help people understand the importance of being a part of a financially inclusive community. India has "National Digital Literacy Mission" (NDLM) and "Digital Saksharta Abhiyan" (DISHA) from 2014 to 2016. A total of 5.367 million beneficiaries from these two programs were certified. The Union Cabinet authorized the "Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA)" program in 2017, which aims to promote digital literacy in rural India by providing coverage to 60 million rural households (one person per household). Around 57.8 million applicants have signed up overall, 49 million have received training, and 36 million have received certification as part of this program.

The Digital Divide will be closed in India by 2022–2033. Sustainable development will benefit from efforts to increase

digital literacy. India must, however, also contend with the issue of infrastructure. To increase the trust of workers in the system, services should be smooth. However, a study by Bishnoi et al. (2012) and Ratnawati (2020) found that a majority of MNREGA workers (44%) reported that they had trouble getting their wages paid on time, 23% reported having trouble getting access to banks, 21% said they were told to come back the next day, and the remaining respondents said the wage payment process took a long time.

Now, if the wages are not received timely, laborers may not be able to feed their families. Laborers generally live hand to mouth since they lack the savings. Also, if they don't have ways to access their funds immediately and from anywhere, which may happen due to a lack of smartphone, internet connectivity, absence of an online ecosystem in remote places, or digital illiteracy, labor would not be very keen on adopting for DBT in their accounts. According to a study in Publication (2022), one-third of the global population (2.9 billion people) either don't have a digital presence or have only basic connectivity. Having said that, access to the internet cannot be the sole determinant since the value which people derive out of internet access is critical. The estimated population of India as of 2022 is 1.4 billion. According to a report, as of 2022, there are 692 million active internet users in India. With 351 million rural population having access to the internet, the internet penetration percentage comes to around 37% only.

The new objective for the 2020–2030 Decade of Action to achieve Sustainable Development Goals is a universal and meaningful connection, which is defined as the prospect of a secure, fulfilling, enriching, productive, and cheap online experience for everyone (SDGs).

With this analysis of existing literature, the hypothesis this paper tests is:

H1: *Financial Inclusion positively impacts Sustainable Development Goals.*

3. Data and Research Methodology

3.1. Data

In this analysis, data from 16 Indian states and one union territory were utilized throughout three fiscal years (2018–2020). The information for the first two MGNAREGA factors has been collected from the MGNREGA website, while the information for SDG Ind has been obtained from the NITI Aayog website. Since there is only one dependent variable and three independent variables to be examined in the research, a total of four dynamic models have been created to explore the issue. A brief description of the factors employed in the investigation is provided in Table 1.

Table 1: List of Variables

S.No.	Variables	Type	Code	Definition	Citations
1	SDG India Index	DV	SDG_Ind	The SDG India Index provides a comprehensive evaluation of the social, economic, and environmental circumstances of the nation as well as those of its States and Union Territories.	NITI Aayog (2022)
2	MGNREGA No. of Post Office Account Opened	IV	MNREGA_POAOP	Bank services are offered to employees through MGNREGA No. of opened post accounts. A stand-in for financial inclusion is the mreg_p_ac.	Mahatma Gandhi - NREGA (n.d.)
3	MGNREGA Amount of Wages disbursed through post office Accounts	IV	MNREGA_AWD_POA	MGNREGA wages are paid to employees through post office accounts, and mreg_p_aw serves as a stand-in for financial inclusion.	Mahatma Gandhi - NREGA. (n.d.)
4	Number of Internet Subscribers (Per 100 Population)	MV	Int_subs	The Internet offers a platform for communication as well as access to the world wide web, digital banking, and email. The Int subs serve as a stand-in for digitization. And it is considered a moderator.	Performance Indicators Reports (2022); Internet users per 100 population (n.d)
5	MGNREGA No. of Registered people	CV	lnNREGA_Regd	The number of Registered people MGNREGA is used as a control variable.	Mahatma Gandhi - NREGA (n.d.)
6	MGNREGA NO. of Bank Account Opened	CV	lnNREGA_BaOP	Bank Account Open on MGNREGA is considered a control variable.	Mahatma Gandhi - NREGA (n.d.)

DV is a proxy of the Sustainable development of India and IV proxy of financial inclusion and digitalization.

3.2. Research Methodology

Analysis of state and UT data is done using the panel data model (PDM). The cross-sectional and time-series analysis models, respectively, are both prominent characteristics of the panel data model (Hsiao, 2007; Baltagi, 2008; Kanoujiya et al., 2022). As a result, PDM has been shown to yield more information than utilizing only one time series or cross-section analysis by several studies.

The model specifications are given as follows:

$$Y_{it} = \alpha + \beta_1 \ln MNREGA_POAOP_{it} + \beta_2 \ln MNREGA_Regd_{it} + \beta_3 \ln MNREGA_BaOP_{it} + u_{it} \quad (1)$$

$$Y_{it} = \alpha + \beta_1 \ln MNREGA_AWD_POA_{it} + \beta_2 \ln MNREGA_Regd_{it} + \beta_3 \ln MNREGA_BaOP_{it} + u_{it} \quad (2)$$

$$Y_{it} = \alpha + \beta_1 dMNREGA_POAOP_{it} + \beta_2 dMNREGA_POAOP_idInt_subs_{it} + \beta_3 \ln MNREGA_Regd_{it} + \beta_4 \ln MNREGA_BaOP_{it} + u_{it} \quad (3)$$

$$Y_{it} = \alpha + \beta_1 dMNREGA_AWD_POA_{it} + \beta_2 dMNREGA_AWD_POA_idInt_subs_{it} + \beta_3 \ln MNREGA_Regd_{it} + \beta_4 \ln MNREGA_BaOP_{it} + u_{it} \quad (4)$$

Where $\ln MNREGA_POAOP$ stands for a log of the number of post office accounts opened under the MNREGA scheme. The Y_{it} is the dependent variable, the sustainable development goals index. Further, $\ln MNREGA_AWD_POA$ is short for the amount of wages disbursed through post office accounts under the MNREGA scheme. Demean of these two dependent variables ($MNREGA_POAOP$ and $MNREGA_AWD_POA$) are also included in equations 3 and 4. In addition to this, the interaction variable is Int_subs which means the number of internet subscribers. The control variables in the study are $\ln MNREGA_Regd$ (log of the number of registered people) and $\ln MNREGA_BaOP$ (log of the number of bank accounts opened). Lastly, the u_{it} is the error term.

4. Empirical Results

As per the correlation matrix, the explanatory variable, $dMNREGA_POAOP$, is significantly correlated with $\ln MNREGA_AWD_POA$ while having values more than 0.80. Whereas $dMNREGA_AWD_POA$ significantly correlated $\ln MNREGA_POAOP$ and $dMNREGA_AWD_POA$ with similar more than 0.80 values in all the cases (Table 2). Other than these dependent variables, a few cases are present in which correlational values exceed the limit of

Table 2: Correlation Matrix and Descriptive Statistics

Variables	InMNREG A_POAOP	InMNRE GA_AW D_POA	dMNRE GA_PO AOP	dMNRE GA_AW D_POA	dInt_ subs	dMNRE GA_PO AOP_ idInt_ subs	dMNRE GA_AW D_POA_ idInt_ subs	InMNRE GA_ Regd	InMNRE GA_ BaOP
InMNREGA_ POAOP	1.0000								
InMNREGA_ AWD_POA	0.8764* (0.0000)	1.0000							
dMNREGA_ POAOP	1.0000* (0.0000)	0.9006* (0.0000)	1.0000						
dMNREGA_ AWD_POA	0.9006* (0.0000)	1.0000* (0.0000)	0.9006* (0.0000)	1.0000					
dInt_sub	-0.157 (0.2713)	-0.0754 (0.5988)	-0.157 (0.2713)	-0.0754 (0.5988)	1.0000				
dMNREGA_ POAOP_idInt_ subs	-0.1983 (0.1631)	-0.0707 (0.622)	-0.1983 (0.1631)	-0.0707 (0.622)	-0.3142* (0.0247)	1.0000			
dMNREGA_ AWD_POA_ idInt_sub	-0.1072 (0.4539)	-0.064 (0.6554)	-0.1072 (0.4539)	-0.064 (0.6554)	-0.4740* (0.0004)	0.8757* (0.0000)	1.0000		
InMNREGA_ Regd	0.2856* (0.0422)	0.1999 (0.1596)	0.2856* (0.0422)	0.1999 (0.1596)	-0.4427* (0.0011)	0.1271 (0.374)	0.2098 (0.1396)	1.0000	
InMNREGA_ BaOP	0.2585 (0.067)	0.169 (0.2359)	0.2585 (0.067)	0.169 (0.2359)	-0.3915* (0.0045)	0.1157 (0.4189)	0.1798 (0.2067)	0.9888* (0.0000)	1.0000
Descriptive Statistics	Mean	SD		Min		Max			
SDG_Ind	64.05882	6.833482		50		75			
MNREGA_ POAOP	49291.75	92124.64		0		525850			
MNREGA_ AWD_POA	1435.028	3632.351		0		24506.4			
Int_sub	56.23647	16.36794		25.28		88.92			
MNREGA_ Regd	1.1007	7535636		1284199		2.5407			
MNREGA_ BaOP	5895070	4145059		629680		1.6307			

*Represents a significant correlation coefficient at 0.05 and Mean, SD, Min, and Max are mean value, standard deviation, minimum, and maximum respectively.

0.80. Thus, Hence, the problem of multicollinearity is not restricted in almost all cases (Baltagi, 2008).

Table 2 illustrates, respectively, the description of statistics and the correlation matrix of the study's variables. It is computed that Indian states and union territories have a mean SDG Ind value of 64.05882, which represents a much greater level of investment in the SDGs created by Indian states and UTs. The standard deviation, on the other hand, is 6.833482, indicating that the score does not fluctuate much from the mean number. 50 is the minimum value, while 75 is the highest value. The variable MNREGA POAOP has an average value of 49291.75, which indicates that many post office accounts have been established throughout India. The estimated standard deviation is 92124.64, which shows that there is a significant amount of variability from the variable's value. The values range from 0 to 525850, with a huge disparity between the least and maximum numbers. The study's last key variable, MNREGA AWD POA, has a mean value of 1435.028, indicating that, on average, a sizable quantity of earnings have been dispersed through post office accounts. However, the computed variation from the mean value is 3632.351. 0 and 24506.4 are the minimum and highest values, respectively.

The regression analysis in the study involves the development of a total of four models (Table 3). The first two of them are analyzing the base association, whereas the other two depict the interaction effect of internet subscribers. For each situation, the current article applies the dynamic panel data model (Wooldridge, 2006; Baltagi, 2008; Bhimavarapu et al., 2022; Sidhu et al., 2022). The overidentification problem is limited by the Sargan test as having a non-significant p -value ($p > 0.05$). At 1 lag, the Arellano-Bond test is significant, negating the possibility of autocorrelation.

As per model 1, the relationship between SDG_index and \ln MNREGA_POAOP has been examined. It is evident that the \ln MNREGA_POAOP negatively influences the present SDG_index with a significant negative coefficient value. Furthermore, model 2 depicts the relationship between SDG_index and \ln MNREGA_AWD_POA. In similar terms, the association is of negative but significant nature.

As per model 3, the moderating impact of d MNREGA_POAOP_idInt_subs and d MNREGA_AWD_POA_idInt_subs is significantly positive in nature. As shown in models 3 and 4, the association between SDG_index and \ln MNREGA_POAOP as well as SDG_index and \ln MNREGA_AWD_POA is having positive coefficients with significant p -values.

4.1. Robustness of the Results

According to Table 3, the endogeneity problem among the variables in the study is confirmed by the Durbin Chi-square and Wu Hausman tests, both of which had negligible

p -values (Table 4). Thus, the tests demonstrated that the null of no endogeneity is rejected in all circumstances; nonetheless, the results are assured to be robust.

4.2. Interaction Graphs

A graphic representation of the association between the variables is provided by an interaction graph. In Figures 2 and 3, the solid line indicates the low moderating level and the solid dash line indicates the high moderating effect of the interaction variables. Int_subs serves as the moderator for all of the interaction terms, and d MNREGA_POAOP (Figure 2), and d MNREGA_AWD_POA (Figure 3) are the moderated variables respectively. As per Figure 2, a clear impact can be seen which represents that the interaction term d MNREGA_POAOP_idInt_subs moderates the relationship that exists between SDG_index and d MNREGA_POAOP. Furthermore, in graph 3, an impact of the interaction term d MNREGA_AWD_POA_idInt_subs is visible on the association between SDG_index and d MNREGA_AWD_POA.

5. Discussion

This paper uses dynamic panel data analysis. The statistical study shows that the MNREGA Post Office Accounts have a negative impact on the SDG of India. As the MNREGA post office accounts increase, the SDG parameters decrease. The wages paid through MNREGA Post Office Accounts also have negative signs on the SDG. As the wages increase, the number of MNREGA post office accounts decreases and vice versa. The interaction model also depicts a negative impact on the development goals. Therefore the hypothesis, Financial Inclusion positively impacts the Sustainable Development goals of India is rejected. Earlier studies are majorly descriptive. The general notion that with the increase in the provision of bank accounts to laborers, their financial health would improve is nullified. The survey conducted in earlier studies aligns with the statistical analysis of this study. The survey highlighted the ground reality. Labours had difficulties accessing the bank accounts and there were delays in wage payment as well. The inefficiencies in the implementation need to be removed. The barrier to digitalization would be literacy amongst the labor class. This class would still need handholding in the onboarding process. And it eventually means the presence of intermediaries with which delays are introduced in the overall wage payment system. The challenges before complete digitalization, especially in the products offered to the labor class, are security. So physical presence of the laborers during onboarding and in wage distribution is in the best interest of the laborers to make their transactions secure and avoid fraud.

Table 3: Results of Regression (Dynamic Model)

DV: SDG_Ind	Base Model 1 (Robust)			Base Model 2 (Robust)		
	Coeff.	S.E.	p-value	Coeff.	S.E.	p-value
SDG_Ind_L1-1	−0.213***	0.029	0.000	−0.250***	0.030	0.000
lnMNREGA_POAOP	−0.231***	0.103	0.009			
lnMNREGA_AWD_POA				0.153	0.084	0.210
lnMNREGA_Regd	−27.68***	3.326	0.000	−30.37 ***	1.929	0.000
lnMNREGA_BaOP	25.79***	3.857	0.000	28.51**	2.422	0.046
Cons.	125.02***	7.395	0.000	126.15***	8.172	0.000
Sragan Test	37.983 (0.4244)			38.68273 (0.3936)		
AR (1)	−1.6813 (0.0927)*			−1.6478 (0.0994)*		
AR (2)	0.51969 (0.6033)			0.44972 (0.6529)		
Durbin Chi-2	0.022039 (0.8820)			0.182009 (0.6697)		
Wu-Hausman Test	0.019426 (0.8899)			0.161039 (0.6905)		
DV: SDG_Ind	Interaction Model 3 (Robust)			Interaction Model 4 (Robust)		
	Coeff.	S.E.	p-value	Coeff.	S.E.	p-value
SDG_Ind_L1-1	−0.218***	0.063	0.001	−0.128*	0.084	0.128
dMNREGA_POAOP	−0.000***	2.48	0.000			
dMNREGA_AWD_POA				−0.001***	0.000	0.000
dInt_subs	0.355***	0.041	0.000	0.358***	0.038	0.000
dMNREGA_POAOP_idInt_subs	−2.77**	1.25	0.026			
dMNREGA_AWD_POA_idInt_subs				−0.000***	0.000	0.000
lnMNREGA_Regd	−27.94***	3.736	0.000	−24.38***	4.777	0.000
lnMNREGA_BaOP	26.81***	3.706	0.000	23.69***	4.848	0.000
Cons.	111.01***	12.17	0.000	95.78***	9.563	0.000
Sragan Test	38.70769 (0.3925)			36.18733 (0.5070)		
AR (1)	−1.6701 (0.0949)*			−1.7183 (0.0857)*		
AR (2)	0.38385 (0.7011)			−0.25302 (0.8003)		
Durbin Chi-2	1.7435* (0.1867)			1.80963* (0.1786)		
Wu-Hausman Test	1.55915 (0.2198)			1.62095 (0.2111)		

The sragan test is the test of over-identification issues under the GMM framework. The null hypothesis of the Sargan test is that there is no over-identification problem in the dynamic panel data model. The Arnello-Bond test used in the analysis is for serial autocorrelation in the first differenced error terms of order 1. A one-star *mark on the coefficient values are presenting a 1 percent significant level and a two-star **mark on the coefficient values is presenting a 5 percent significant level. Values in parenthesis () are p-values.

This study scientifically proves the negative correlation between FI factors and SDG goals (Gautam et al., 2021; Gautam et al., 2022d; Rastogi et al., 2022b). The future policies may focus not only on providing bank accounts to the remote population but also on improving per-day wages,

building the digital ecosystem in rural areas, and making the existing system efficient by addressing the pain points related to timely accessibility of wages earned and most importantly developing the trust in the government and related stakeholders involved in the system (Gautam et al., 2022a, 2022b).

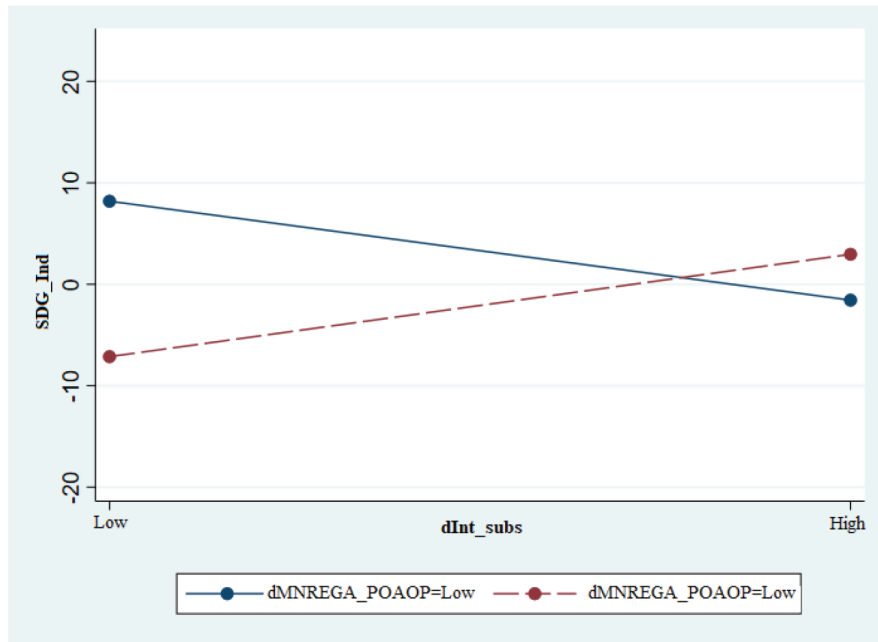


Figure 2: Model 3 (Interaction Graph)

Note: The long-dashed line in the graph represents the high-level influence, whereas the solid line in the graph represents the moderating variable's low-level effects.

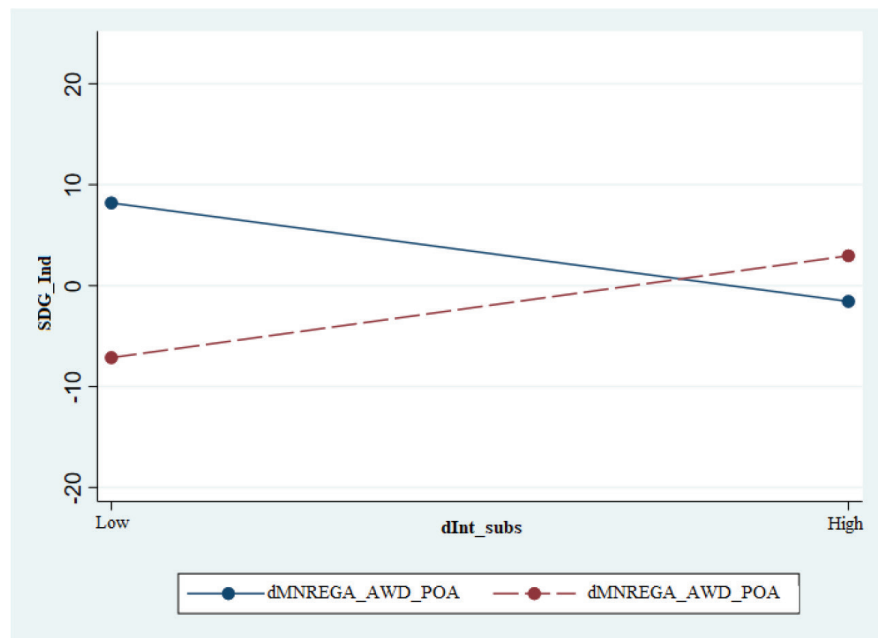


Figure 3: Model 4 (Interaction Graph)

Note: The graph's solid line indicates the moderating variable's low-level impacts, while the long-dashed line depicts its high-level influence.

6. Conclusion

With this study, it's proven that Financial Inclusion in India, with MNREGA post office accounts and MNREGA wages used as the proxy variable, negatively impacts the Sustainable Development Goals of India with internet subscribers acting as the moderator. The limitation of this paper is, it focuses only on post office accounts and not bank accounts which is another avenue through which MNREGA wages are paid. Future studies may be conducted on the selective states, using secondary data or combining the stats from MNREGA bank accounts with the MNREGA post office accounts. A comparative study of where India stands on SDG with respect to other key nations can also be performed to gauge the relative performance.

References

- Aayog, N. (2022). SDG India index | NITI Aayog. <http://www.niti.gov.in>. Retrieved August 08, 2022. <https://www.niti.gov.in/sdg-india-index#:~:text=The%20SDG%20India%20Index%20is,society%20and%20the%20general%20public>
- Badodiya, S. K., Kushwah, R. S., Garg, S. K., & Shakya, S. K. (2011). Impact of Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) on poverty alleviation. *Rajasthan Journal of Extension Education*, 19, 206–209.
- Baltagi, B. H., & Baltagi, B. H. (2008). *Econometric analysis of panel data* (Vol. 4). Chichester: John Wiley & Sons.
- Bhimavarapu, V. M., Rastogi, S., & Abraham, R. (2022). The influence of transparency and disclosure on the valuation of banks in India: The moderating effect of environmental, social, and governance variables, shareholder activism, and market power. *Journal of Risk and Financial Management*, 15(12), 612. <https://doi.org/10.3390/jrfm15120612>
- Bishnoi, I., Verma, S., & Rai, S. (2016). MNREGA: An initiative towards poverty alleviation through employment generation. *Indian Research Journal of Extension Education*, 12(2), 169–173.
- Boeren, E. (2019). Understanding sustainable development goal (SDG) 4 on “quality education” from micro, meso, and macro perspectives. *International Review of Education*, 65(2), 277–294. <https://doi.org/10.1007/s11159-019-09772-7>
- Breuer, A., Janetschek, H., & Malerba, D. (2019). Translating sustainable development goal (SDG) interdependencies into policy advice. *Sustainability*, 11(7), 2092. <https://doi.org/10.3390/su11072092>
- Direct benefits transfers. (n.d.). Retrieved from IPPB Online. <https://www.ippbonline.com/web/ippb/direct-benefit-transfers>
- Gabay, G. (2015). Perceived control over health, communication and patient–physician trust. *Patient education and counseling*, 98(12), 1550–1557.
- Gautam, R. S., Kanoujiya, J., Bhimavarapu, V. M., & Rastogi, D. S. (2021). Financial technology and its impact on poverty in India. *International Journal of Management and Humanities*, 6(3), 1–10. <https://doi.org/10.35940/ijmh.B1396.116321>
- Gautam, R. S., Rastogi, D., & Rawal, A. (2022a). Study of financial literacy and its impact on rural development in India: Evidence using panel data analysis. *Iconic Research and Engineering Journals*, 5(9), 483–492.
- Gautam, R. S., Rastogi, S., Bhimavarapu, V. M., & Rawal, A. (2022b). Financial technology and its influence on India's sustainable development. In *10th Region 10 Humanitarian Technology Conference (R10-HTC)*, Hyderabad, 16–18 September 2022 (pp. 118–123). Piscataway: IEEE Publications. <https://doi.org/10.1109/R10-HTC54060.2022.9929576>
- Gautam, R. S., Rastogi, S., Rawal, A., Bhimavarapu, V. M., Kanoujiya, J., & Rastogi, S. (2022c). Financial technology and its impact on digital literacy in India: Using poverty as a moderating variable. *Journal of Risk and Financial Management*, 15(7), 311. <https://doi.org/10.3390/jrfm15070311>
- Gautam, R. S., Rawal, A., & Rastogi, S. (2022d). Financial literacy and its impact on sustainable development of India using Internet subscribers as moderator. In *International Conference on Sustainable Islamic Business and Finance (SIBF)*, Online, 11–12 October 2022 (pp. 187–191). Piscataway: IEEE Publications. <https://doi.org/10.1109/SIBF56821.2022.9939760>
- Hsiao, C. (2007). Panel data analysis—advantages and challenges. *Test*, 16(1), 1–22.
- Internet Users Per 100. (n.d.). Retrieved August 17, 2022. https://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/econ_development/internet_users.pdf
- Kanoujiya, J., Rastogi, S., & Bhimavarapu, V. M. (2022). Competition and distress in banks in India: An application of panel data. *Cogent Economics and Finance*, 10(1), 2122177. <https://doi.org/10.1080/23322039.2022.2122177>
- literacy-rate. (2022). Retrieved from India census. <https://www.indiacensus.net/literacy-rate.php>
- Mahatma Gandhi – NREGA. (n.d.). Retrieved August 17, 2022. https://nrega.nic.in/Circular_Archive/archive/Operational_guidelines_4thEdition_eng_2013.pdf
- Nguyen, Y. H. D., & Ha, D. T. T. (2021). The effect of institutional quality on financial inclusion in ASEAN countries. *Journal of Asian Finance, Economics, and Business*, 8(8), 421–431. <https://doi.org/10.13106/JAFEB.2021.VOL8.NO8.0421>
- Performance indicators reports | Telecom regulatory authority of India. (2022, August 7). <http://www.trai.gov.in>. <https://www.trai.gov.in/release-publication/reports/performance-indicators-reports>. Telecom Regulatory Authority of India.
- Planning Commission (2009). Report on Financial Sector Reforms. (Chairman: Dr. Raghuram G. Rajan).
- Press release. (2022, September 16). [pib.gov. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1812277](https://www.pib.gov.in/PressReleasePage.aspx?PRID=1812277)
- Priyadarshiee, A., Hossain, F., & Arun, T. (2010). Financial inclusion and social protection: A case for India post. *Competition and Change*, 14(3–4), 324–342. <https://doi.org/10.1179/102452910X12837703615490>

- Publication, I. (2022, September 12). *22-00399A_WTDC_Connectivity-report_Executive_summary*. Retrieved from ITU. https://www.itu.int/itu-d/reports/statistics/wp-content/uploads/sites/5/2022/06/22-00399A_WTDC_Connectivity-report_Executive_summary.pdf
- Rastogi, S., Goel, A., & Doifode, A. (2022a). Open APIs in banking and inclusive growth: An innovation to support the poverty eradication programs in India. *Journal of Banking Regulation*, *16*, 1–13. <https://doi.org/10.1057/s41261-022-00206-3>
- Rastogi, S., Kanoujiya, J., Bhimavarapu, V. M., & Gautam, R. S. (2022b). The impact of competition on the profitability and Risk-Taking of commercial banks in India. *Journal of Asian Finance, Economics, and Business*, *9*(5), 377–388. <https://doi.org/10.13106/jafeb.2022.vol9.no5.0377>
- Ratnawati, K. (2020). The impact of financial inclusion on economic growth, poverty, income inequality, and financial stability in Asia. *Journal of Asian Finance, Economics, and Business*, *7*(10), 73–85. <https://doi.org/10.13106/JAFEB.2020.VOL7.NO10.073>
- RBI. (2022, September 16). Retrieved from RBI. <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>
- Sharma, A., Bhimavarapu, V. M., Kanoujiya, J., Barge, P., & Rastogi, S. (2022). Financial inclusion: An impetus to the digitalization of payment services (UPI) in India. *Journal of Asian Finance, Economics, and Business*, *9*(9), 191–203. <https://doi.org/10.13106/jafeb.2022.vol9.no9.0191>
- Sidhu, A. V., Rastogi, S., Gupte, R., Rawal, A., & Agarwal, B. (2022). Net stable funding ratio (NSFR) and bank performance: A study of the Indian banks. *Journal of Risk and Financial Management*, *15*(11), 527. <https://doi.org/10.3390/jrfm15110527>
- Singh, C., Mittal, A., Garg, R., Goenka, A., Goud, R. P., Ram, K., Suresh, R. V., Chandrakar, R., & Kumar, U. (2014). Financial inclusion in India: Select issues. *SRN Electronic Journal*, *56*, 474. <https://doi.org/10.2139/ssrn.2532876>
- Singh, S., Gautam, R. S., Agarwal, B., Pushp, A., Barge, P., & Rastogi, S. (2022). Impacts of financial inclusion on sustainable development in India. *Journal of Asian Finance, Economics, and Business*, *9*(10), 235–242. <https://doi.org/10.13106/jafeb.2022.vol9.no10.0235>
- Sultana, A. (2020). Role of the Indian postal service sector in financial inclusion with special consideration to India Post payments bank (IPPB). *PalArch's Journal of Archaeology of Egypt/Egyptology*, *17*(7), 5959–5966.
- U N. (2000). *Road Map towards the Implementation of the United Nations Millennium Declaration*, UN, New York. A/56/326.
- WageRates. (2022, September 16). Retrieved from MGNREGA. <https://mgntrega.cg.nic.in/WageRates.aspx>