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**Article**

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## FINANCIAL ECONOMICS | RESEARCH ARTICLE

# Does financial inclusion affect monetary policy in SAARC countries?

Sanjaya Kumar Lenka<sup>1\*</sup> and Arun Kumar Bairwa<sup>1</sup>

**Abstract:** Alike the role of heart for human body, finance is the focal point of an economy, whereas savings and investment are its tubes and vessels. Hence, a solid financial system is a fundamental character of an enduring economy. The frozen financial system endures longer if its foundation is concrete and subsists in the people of grass-root level. They are those, who live in villages and small towns, earn meager income, work in primary sector, spend more on food, and have lesser social securities. In this setting, the process of bringing these people into the main stream of financial activities is called financial inclusion. This study describes the impact of financial inclusion on monetary policy of South Asian Association for Regional Cooperation (SAARC) countries from 2004–2013. The study uses principal component analysis (PCA) to construct a Financial Inclusion Index that serves as a proxy variable for the accessibility of financial inclusion in the SAARC countries. Adding to it, three different models like FEM, REM, and Panel-corrected standard errors are used for the analysis. In this study, an empirical result of generalized least square (GLS) estimation shows that financial inclusion, exchange rate, and interest rate are negatively associated with inflation in SAARC countries.

**Subjects:** International Economics; International Finance; Statistics for Business, Finance & Economics



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### PUBLIC INTEREST STATEMENT

Financial inclusion is an attempt to provide formal banking services to all the people of a society including the poorest of poor people. This paper investigates the impact of financial inclusion on monetary policy for the South Asian Association for Regional Cooperation (SAARC) nations. No study has found relationship between financial inclusion and its effect on monetary policy for the SAARC countries.

In the analysis part, the proxy variables for monetary policy are exchange rate, interest rate, and inflation. In addition, for financial inclusion are geographical penetration, demographic penetration, and banking penetration. The study constructed a Index of Financial Inclusion (IFI) by analyzing the data from 2004 to 2013 by the tool named: principal component analysis (PCA). It is found in the study that financial inclusion, interest rate, and exchange rate are negatively associated with inflation in SAARC countries. Along with this, the financial inclusion also helps in price stabilization and controlling the inflation in an economy which is essential for a sustainable economy.

**Keywords:** financial inclusion; monetary policy; principal component analysis (PCA); panel-corrected standard errors (PCSEs)

**JEL classifications:** E44; E51; E52; F36

## 1. Introduction

The South Asian Association for Regional Cooperation (SAARC) is a common platform for the selected eight South Asian countries for their collective social, economic, cultural, and technical development. This association was established in December 1985 as an impetus for the social development of the member countries. The objective of financial inclusion was endowed in the inception of this organization. The first elected chairperson of SAARC proposed to make “determined efforts towards the goal of total financial inclusion for all sections of the people of SAARC countries,” which means getting greater financial inclusion in all the SAARC countries.

Financial inclusion means making affordable the banking services to the vast segment of the society whether they are poor or excluded (Kelkar, 2010). It helps to eliminate the problem of leakages from subsidy and welfare distribution, boosts saving, increases credit availability, and breaks the vicious circle of poverty of a nation (Ellis, Lemma, & Rud, 2010). This helps in better circulation of money in an economy. It also intensifies the rate of investment and purchasing power parity with reducing the rate of inflation. Therefore, all the SAARC countries are now on the way to get greater financial inclusion and for the same they are working hard. The financial inclusion helps to ensure monetary stability of an economy by increasing the scope of savings, investment, and consumption decisions among the peoples. It is a basic understanding that widening financial inclusion reduces the cost of cash management, and shields the strengths of the local currency, while promoting a healthy financial system in the economy (Mbutur & Uba, 2013).

The aim of the paper is to measure the financial inclusion and assess its effectiveness on the monetary policy in the SAARC countries. The paper is arranged in the following sections: Section 1 introduces the title of the paper, Section 2 presents the literature review, and then Section 3 describes the contribution of the paper. Section 4 explains the data and methodology of analysis. In Section 5, results of the econometric estimations are given. Section 6 summarizes the paper with recommendations and finally section shows the reference part of the paper.

## 2. Literature review

Financial inclusion is a well-known topic for the developed nation, but it is a new area for the developing nations. Here, these developing nations are mostly Asian, African, and Latin American countries. There have been many studies in the developed countries for the developed countries and about financial inclusion, but there is an acute shortage of literature on this topic for developing countries. Since all the SAARC countries are developing countries, and have greater scope of financial inclusion, so to fill the said gap of literature and find the new possibilities in this area, the study has reviewed the following literature before proceeding to further steps of the research.

Financial inclusion strategies aimed at increasing the number of people having bank accounts for bringing in their savings and investment in the formal financial system. It also stimulates the usages of formal and modern banking usages tools e.g. ATM, net banking, and mobile banking. The financial inclusion can be achieved easily if adult population has easy access to financial services at an affordable cost. People with higher financial awareness have greater chances for getting better financial services by optimum utilization of their savings and investment.

Financial inclusion is generally defined as an ensuring access to formal financial services at an affordable cost in a fair and transparent manner. It brings the rural unbanked people in to the mainstream banking fold. In addition, financial inclusion is a necessary condition for the sustainable and equitable growth of an economy (Subbarao, 2009). The rural cooperative banks, micro financial inclusion, and postal banking services played an important role for increasing the level of financial

inclusion in India. In particular, the Indian rural banks have greater role in bringing the people into formal banking system, and then utilizing their role positively for the faster development of Indian banking system, as well as the overall Indian economy (Burgess & Pande, 2005). In this way, the impact of monetary policy changes were implicitly reflected on the rural households as they were been affected in terms of their savings and investment decisions. The effects mostly occurred with positive externalities by bringing them out from the trap of landlords, utilizing the launched schemes of government, minimizing the corruption, and fueling back the money in the economy which they were accustomed to keep idle with them (Kelkar, 2010).

In 1961, The Reserve Bank of India (India's central bank) performed its first banking nationalization phase and directed every bank to open four rural branches before opening an urban bank branch. This policy drastically changed the picture to Indian banking sector, and in its outcomes, the rural household borrowing from banks surged extensively by slashing the share of landlords in issuing loans. It also reduced the overall level of rural poverty from the country (Burgess & Pande, 2005). Since many financial problems were drawn out, it reduced farmers' suicide rate also (Burgess & Pande, 2005; Kelkar, 2010; Mehrotra & Yetman, 2015).

Rural households' life is much challenging as they have limited income sources. The accessibility of banking facilities avails them to use the facility of crop insurance, rainfall insurance, farm income insurance, and calamity relief fund (Kelkar, 2010). Financial inclusion expands financial services to all the segments of society including the poorest of the poor people by providing them bank accounts. Here, those who are financial included are found to invest more in education and business than on consumption (Ellis et al., 2010). Spending on education and business gives return as well as endowments and makes the life better. The expansion in rural branches increases the total per capita output of a country, which helps the rural households to take credit on lesser interest rate (IR) than of moneylenders (Burgess & Pande, 2005). In addition, investment on education also gives them long-term return as it increases the human capital of the country. In Kenya, education was the prime choice of investment for starting the business (Ellis et al., 2010).

Along with safety and security, it is appreciable for the public to deposit their money with banks as they give interest on the principle and provides borrowing facility also. Therefore, the liquidity with the rural population can be controlled by the monetary policy decisions of the central bank. The prime barriers in the demand side of financial inclusion process are lack of money to deposit, lack of necessity of loan, lack of financial literacy, etc. In contrast, the supply-side barriers also affect the financial inclusion e.g. the lack of bank branches, higher transaction charges, need of a witness for opening an account, and need of a guarantor for loan etc. (Ellis et al., 2010). It has also been argued that the speed of financial inclusion can be achieved faster if banks pay more attention towards providing modern banking facilities e.g. internet banking, mobile banking, and ATM facility (Kumar, 2013). Price stabilization and liquidity control are the main objectives of monetary policy, where the tools used by central bank for the same can be effective only if people use the formal financial market (Banks and other financial institutions, e.g. insurance companies, mutual funds, etc.), and it is well proved that solid presence of banking sector assists to collect and redistribute the scattered savings (Ratti, 2012). This will not only help in economic growth but also in the effectiveness of the monetary policy. People at grass-root level are the least affected by the monetary policy because they do not have any direct relation with the savings and investment. Such people consume most of their income that does not increase investment and if they save them than they keep their savings idle (Mehrotra & Yetman, 2014). If the bank account facility is provided to the poor and rural people then they may keep their money with banks and this way the money will not be idle, and it is evident that enhanced financial inclusion spurs the effectiveness of monetary policy (Mehrotra & Yetman, 2015). However, it is also found that the operating and transaction costs in the rural area are very high, and this problem can be solved by availing the modern banking facilities that have low operating and transaction costs like internet banking, mobile banking, and ATMs. (Ratti, 2012). Financial inclusion also controls actively controls the price level in an economy by controlling the rate of inflation (Mbutor & Uba, 2013; Ray & Pravu, 2013).

### 3. Contribution of this study

There is an abundant literature dealing with the close relationship of finance-growth nexus, but only few studies have paid attention towards the measurement part of financial inclusion and its relationship with economic growth of the countries. However, no study has found the relationship between financial inclusion and its effect on the monetary policy for the SAARC countries. Though the importance of financial inclusion is widely recognized, the literature on financial inclusion lacks comprehensive measures to evaluate the extent of financial inclusion in an economy. In the earlier studies, researcher used different types of dimensions adjusting to their suitability and availability of data sources for measuring financial inclusion of the countries.

Most of the researchers widely used different dimensions of financial accessibility variables like commercial bank branches per 100,000 adults, number of ATMs in 1,000 km<sup>2</sup>, credits and deposits as a ratio of GDP to measured financial inclusion of the countries. And very few studies have used index of financial inclusion using different financial dimensions with different methodology for measuring financial inclusion (Chakravarty & Pal, 2013; Chattopadhyay, 2011; Sarma, 2015). Since, the present paper included all possible dimensions (like banking penetration, demographic penetration, and geographic penetration) for construction of the financial inclusion index. So, this index will be more indicative and accurate than previous indexes. Here, we propose to use the principal component analysis (PCA) method to assign the weight of factors in financial inclusion index. Along with it, we extended this study to explore the impact of financial inclusion on effectiveness of the monetary policy in the SAARC countries.

### 4. Data and methodology

#### 4.1. Model specification

In the journey of literature survey, we could not find any study that has empirically investigated the impact of financial inclusion on monetary policy in SAARC countries. So there are many different initial challenges that need to be overcome to set the stage for the analysis. We know that, the main objectives of effective monetary policy are full employment, price stability, increasing economic growth, and maintaining balance of payments. The main role of monetary policy is to control inflation in an economy and stabilize the price level. So, inflation is taken as a proxy variable to measure the success of monetary policy. Thus the operating model is:

$$INF_{i,t} = \alpha + \beta_0 + \beta_1 IFI_{i,t} + \beta_2 Ctrl_{i,t} + \mu_{i,t} \quad (1)$$

Here, in Equation (1), the explained variable (INF) is inflation rate. The explanatory variables are Index of Financial Inclusion (IFI) which includes several financial accessibility variables like geographic penetration (commercial bank branches per 1,000 km<sup>2</sup>, number of ATMs per 1,000 km<sup>2</sup>), demographic penetration (commercial bank branches per 100,000 adults, number of ATMs per 100,000 adults), and banking penetration (Outstanding loans from commercial banks (% of GDP) and outstanding deposits with commercial banks (% of GDP)). The “Ctrl” are control variables which include commercial bank lending IR and Foreign Exchange rate (ER). The study covers the data from 2004–2013 of the SAARC countries. So the above model is extended to:

$$INF_{i,t} = \alpha + \beta_0 + \beta_1 IFI_{i,t} + \beta_2 ER_{i,t} + \beta_3 IR_{i,t} + \mu_{i,t} \quad (2)$$

#### 4.2. Data sources

The study used annual data for the period of 2004 to 2013 of all the SAARC countries.

The scale of per 100,000 adults and per 1,000 Km<sup>2</sup> has been used for measuring the respective density of commercial bank branches and number of ATMs. Alongside, the data have also been taken about the volume of outstanding credits and deposits to the private sector as a proportion of country’s GDP. The required data have been collected from the International Financial Statistics, Financial Access Survey from the International Monetary Fund. The data for Inflation, ER, and Lending Interest Rate were collected from World Development Indicators of World Bank database.

## 5. Results and discussion

Here, we have described the used terminology of the formula and its selected variables. Subsequent to it, we gave the detailed analysis, and then finally the discussions of the findings.

### 5.1. Result of PCA

The study used the PCA method to comprise the six selected indicators of financial development in a single index. According to this procedure, the  $j$ th factor Index can be expressed as:

$$\text{Index}_j = W_{j1}X_1 + W_{j2}X_2 + W_{j3}X_3 + \dots + W_{jP}X_P \quad (3)$$

where  $\text{Index}_j$  is the Financial Inclusion Index;  $W_j$  is the weight on factor score coefficient;  $X$  is the respective original value of the components; and  $P$  is the number of variables in the equation.

Here, the composite financial inclusion index has been formed by three dimensions where each dimension consist two factors. Therefore, in brief, our Financial Inclusion Index comprises three dimensions and six factors. The three dimensions are: geographic penetration, demographic penetration, and banking penetration.

(a) **Dimension 1 (Geographic Penetration):** In this index, we used data of the number of commercial bank branches and the number of ATMs per 1,000 km<sup>2</sup> to measure the geographic dimensions of financial inclusion.

(b) **Dimension 2 (Demographic Penetration):** The data on the number of commercial bank branches and number of ATMs per 100,000 adults have been used for measuring the demographic dimensions of financial inclusion.

(c) **Dimension 3 (Banking usage Penetration):** We know that utilization of an inclusive system can be of many forms e.g. credits, deposits, payments, transfers, etc. In the present index, we used data of volume of outstanding credits and deposits of the private sector as a proportion of the total GDP of the nation to measure this dimension.

Through PCA method, we calculated eigenvalues of the all six factors included. The highest eigenvalue of the components retains more standardized variance among others. Generally, eigenvalue greater than 1 is considered for the analysis. If the value contains more than one component, then we may consider more than one principal component in the financial analysis. Thereafter, taking factor score (weights) calculated by PCA, and multiplying it with the respective variable then adding them all for getting the final index. By doing so, we get a composite single value Index. In this process, we evaluated each countries financial inclusion Index. That index is showed in Table 1.

**Table 1. Estimation of Financial Inclusion Index in SAARC Countries (2004–2013)**

Year	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
2004	0.913623	22.24774	6.238509	19.23399	33.50233	14.00077	-6.84958	28.06155
2005	1.666284	23.222	5.403389	20.13162	39.54445	14.27803	-7.18278	29.22175
2006	2.598237	24.37713	6.434186	21.41485	44.10607	14.64039	-5.86279	31.55397
2007	3.426204	24.84532	7.209269	23.20876	60.73221	16.4323	-5.7628	31.41066
2008	4.942955	26.1404	9.006068	25.71476	63.58293	18.4517	-4.91747	29.65952
2009	5.831994	28.04923	10.87591	27.37336	63.29038	20.47838	-3.23722	30.11434
2010	5.929801	31.25946	12.73085	28.68261	62.30436	19.90586	-2.71582	31.6879
2011	5.118591	35.29514	15.06425	30.8511	62.55089	20.53461	-1.44513	34.54832
2012	4.638968	38.45721	13.91911	33.4304	66.24482	23.75418	-1.28512	36.32603
2013	4.710304	40.77595	15.09492	35.91499	69.05059	26.45857	-0.44414	36.50372

Source: Calculated by authors using PCA method.

In this table, one can notice that Maldives has ranked first in the overall financial inclusion followed by Bangladesh and Sri Lanka, whereas Pakistan got negative index for financial inclusion, which means extreme condition of financial exclusion. From all the selected countries (excluding Pakistan) Afghanistan has been placed in the worst condition. However, the countries like India, Nepal, and Bhutan are placed in the middle segment of financially inclusive countries that means all these countries have medium level of financial inclusion.

**5.2. Result of different regressions models**

The regression model contained three different models, namely fixed effect model, random effect model, and panel-corrected standard error model. Using these models, Table 2 has been constructed. Table 2 explains the impacts of financial inclusion, ER, and IR on the inflation of an economy, which was used for effective and sound monetary policy. The model I (Fixed Effect Model) shows a negative and significant relationship between financial inclusion and inflation, which is used as a dependent variable. It states that 1% increases in financial inclusion reduces 0.284% level of the inflation. Similarly, ER and IR are also negatively associated with inflation of the SAARC countries. But ER is not statistically significant. Again, the IR shows that 1% increases in the IR decreases the inflation in an economy by 0.743%. Therefore, there is a negative relationship between financial inclusion and inflation rate in an economy.

The model II (Random Effect Model) explains a negative relationship between IFI, ER, and IR with Inflation (INF). However, they are not statistically significant except ER. The coefficient shows that 1% increase in ER reduced inflation by 0.042% in SAARC counties in the year 2004–2013. After applying both FE and RE models, we used Hausman test to check the best fitted model between both models. Here, probability value less than 10% shows that RE model is best fitted to explain the variables because our null hypothesis shows that RE is best fitted for the analysis. In addition, here we reject the null hypothesis and accept the alternative hypothesis that indicates that FE is good for the analysis. Subsequently, to address the problem of heteroscedasticity and autocorrelation in the panel data, the Modified Wald test, and Wooldridge test are used. It shows that the model has the presence of heteroscedasticity and auto correlation exists in the data. The panel-corrected standard error (PCSEs) is used for overcoming the problem of heteroscedasticity and auto correlation. The model III (PCSEs) shows that variables IFI, IR, and ER are statistically significant and negatively associated with INF. The study indicates 1% increase in the explanatory variables (IFI, ER, and IR) decreases the dependent variable (INF) by 0.015, 0.042 and 0.114%, respectively.

**Table 2. Estimation of regression results (2004–2013)**

Variable	I	II	III
IFI	-0.284* (2.23)	-0.023 (0.56)	-0.015* (2.67)
ER	-0.095 (-1.00)	-0.042* (1.93)	-0.042* (2.36)
IR	-0.743** (1.87)	0.167 (0.66)	-0.114 (1.98)**
Constant	-1.675 (-0.27)	2.819 (0.69)	3.701 (1.08)
Model	FEM	REM	PCSEs
Hausman	5.91**		
BP	3.45		
Colinearity	0.759		
Heteroscedasticity	540.6		
Observation	80	80	80
Prob	0.095	0.4086	0.0962

Source: Calculated by authors.

Note: Bracket value of first, second and third model indicates t-value, z-value and again z-value respectively.

\*Level of significance at 5%.

\*\*Level of significance at 10%.

## 6. Conclusion and policy implication

The aim and objective of this paper is to examine the impact of financial inclusion on effectiveness of monetary policy in the SAARC countries. Again, we have proposed an IFI, a multidimensional measure of financial inclusion index that captures information of financial access in the SAARC countries. The empirical investigation of this paper finds that the impact of financial inclusion on monetary policy is highly significant. The association between financial inclusion and inflation, which was used for measuring effectiveness of monetary policy, is highly negative and statistically significant. It indicates that, if the financial accessibility (financial inclusion) increases then it may reduce the inflation rate in an economy, which causes the stability of the price level. Again, the lending IR of banks that usually meets the short- and medium-term financial needs of the private sector is in negative relation with the inflation of countries. The negative coefficient between Inflation (INF) and IR shows that if IR increases it will help to reduce inflation in the market and vice versa. Lastly, this study investigated that, the ER, the price of one country's currency expressed in terms of another and inflation negatively associated with each other signifies that if ER increases it force to reduce the inflation of the countries.

Based on these research outcomes, the following implications can be drawn: the most important task of the Government of SAARC countries is to improve efficiency of the domestic financial sector and the financial inclusion drive at the grass-root level, as financial inclusion helps to stabilize the price level and controls the inflation in an economy which is essential for sustainable economic growth. For the time being, the analysis is confined with SAARC countries only, but in future, we will include more countries including under-developed, developing, and developed countries to identify the relationship between financial inclusion and effectiveness of monetary policy extensively.

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