Relation between PACS and GSDP (Agriculture and Allied Activities): Study from Five States of India

Dr. Disha Pathak
Assistant Professor (Finance)
Amity Global Business School,
Hyderabad

Dr. Sweety Shah
Assistant Professor (Finance)
L. J. Institute of Management Studies,
Gujarat Technological University

Abstract

Indian economy is basically dependent on agriculture since decades. Agriculture sector in India contributes 16 percent to Gross Domestic Product (GDP) and offers 50 percent employment in countries workforce (Union Budget 2018-19).There is a paradigm shift in this sector from informal sector to formal sector for financial requirement.Formal sector includes commercial banks, micro-finance institutes and co-operative credit societies. This study has focused on analyzing the growth of Primary Agriculture Credit Societies (PACS) for the selected five states of India from 2002-03 to 2017-18. Current study has analyz edimpact of PACS on Gross State Domestic Product (GSDP) for the study period. The study result shows that there was moderate growth in number of PACS in India. Regression analysis result revels that there is no significant impact of PACS on GSDP (agriculture and allied activities). The reasons for that are penetration, operation inefficiency, resource availability and structure of the PACS.

Keywords: Agriculture sector, Gross State Domestic Product, Commercial banks, Primary Agriculture Credit Societies (PACS), Micro-finance Institutes.

Introduction

Agriculture plays a significant role in India's economy. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. The share of primary sectors (including agriculture, livestock, forestry and fishery) was estimated to be 20.4 percent of the Gross Value Added (GVA) during 2016-17 at current prices (Agriculture in India: Information About Indian Agriculture & Its Importance, 2018). As shown in Table 1, there have been trends of reduction in the share of population engaged in Agriculture over the decades.

Table 1: Share of Agriculture and Allied Sector in Employment and GDP

	1951	1961	1971	1981	1991	2001	2011
Share of population	69.9	69.5	69.7	60.5	59	58.2	54.6
Contribution to GDP	51.9	46.3	40.5	35.4	28.5	22.4	14.4

Source: Registrar General of India and CSO

In India it can be observed that from the table also, the input is relatively higher than output. It is faced by India due to many reasons. Fragmentation of the holdings is one of the main causes of our low agricultural productivity and backward state of our agriculture (Mondal). Also other things like lack of proper agricultural inputs (seeds, pesticides, manure etc.), lack of proper irrigation, lack of mechanization, inadequate transport and storage facilities etc. add up to the misery of agriculture. Along, problems which are related to market infrastructure, irrigation infrastructure and transport infrastructure tends to add significant cost to farmer's operations but it is observed that many problems arise because of inadequate credit availability to the farmers. Agriculture also, like any other economic activity requires capital and role of capital input is becoming more important because of the advancements in farm technology. It is seen that the majority of farmers' capital is locked up in his stocks and land, which impairs the financial stimulation required for production.

Agricultural finance in India is not just one requirement of the agricultural business but a symptom of the distress prevailing among the majority of the farmers (Suman). The basic problem is lack of collateral and guarantors with the farmers which do not make the farmers eligible for finance from formal institutions. Because of this, the farmers turn to informal financial sources which charge high interest rates due to risk attached to agriculture and lack of collateral. Many loans are for short term and comes with high interest rates, the lead time of agriculture is long and therefore the output cannot match the servicing of debt. Apart from that, many farmers are unaware of the various sources like Government schemes which are available in the market which can help them to obtain finance.

There areissues with the supply side of agricultural credit where there is an information asymmetry regarding the use of the loan and the repayment capacity of the borrowers. Banks and other suppliers of finance lack the information about the idiosyncrasies of the borrowers and the type of agricultural activities of that particular area and their credit worthiness that creates adverse selection problem. All this add up to risk of providing financial assistance and increases the probability of loan getting converted to a non-performing asset which discourages the credit supplier to provide with finance. Also, the loans are small in amount and this does not provide the supplier of finance with the economies of scale so to cover such losses either the supplier will collect high interest rate or the transaction costs but both the ways of covering losses is a discouragement to the borrowers. So with such problems like information asymmetry, adverse selection and moral hazard there exists a market failure. As the private players are the exploiters of the farmers, it become imperative for the Government to intervene the market and correct the market failure.

Since the country's early national plans of the 1950s, the narrative that is constant over the years is improving access to credit and reducing poverty. With various government policies like Nationalizations of banks, priority sector lending etc., the government has always tried to correct the market failure persisting in the agricultural credit. To improve financial access for India's poor, who are concentrated in rural areas, motivated the nationalization of commercial banks in the late 1960s, 1970s and 1980s to expand rural banking (Basu). These actions were coupled with policies making it mandatory for banks to provide subsidized credit to rural house- holds. The 1990s saw the partial deregulation of interest rates, a gradual reduction in the government's stake in commercial banks, and increased competition in the banking sector. With these initiatives, today, India has over 32,000 rural branches of commercial banks (mostly public sector commercial banks) and regional rural banks (RRBs), some 14,000 cooperative bank branches, 98,000 Primary Agricultural Credit Societies (PACS), thousands of mutual fund sellers, several non-bank finance companies (NBFCs), and a large post office network with 154,000 outlets that are required to focus on deposit mobilization and money transfers. Not surprisingly, India compares favorably with other developing countries in terms of the average population served per bank branch, and the average geographical area served per branch.

Rural credit has gone through significant changes and various institutional agencies have started extending loans to farmers on easy term. The institutional finance agencies are as follows.

1. Commercial Banks
2. Microfinance Institutes
3. Cooperatives Credit Societies

Literature Review:

Basu in her report of "Improving access to finance for India's rural poor" talks about the narrative of the government pertaining to the improvement of link between finance and rural poor and the report says that there is inadequate finance for the rural poor even though constant narrative of financial inclusion persisted from more than 50 years. The report explores the various types of rural finance sources and their inadequacies. It does show statistics relating to the credit penetration of India. The report provides with the reasons for inadequacies in rural credit and why the financers are reluctant to provide loans to farmers and rural poor. Agriculture being a risky venture, high NPAs, lack of collateral; are reasons mentioned in the report pertaining to the reluctance of the financers. Despite of recent years' growth in microfinance and the partnerships government, non-governmental organizations (NGOs), and banks, the approaches have not yet shown significant results and still informal sector lenders retain a strong presence in rural India.

Khan (2014) in his speech at the National Seminar on Rural finance organized by the National Bank for Agriculture and Rural Development (NABARD), listed down various issues and challenges of agriculture credit which are faced today. He mentioned that it has been repeatedly recognized that majority of the people in rural areas depend on agriculture as a source of living though non-farm activities are gradually gaining significance in the rural economic development. It was also recognized that agriculture is riskier economically than industry and trade and, therefore, the perception that rural population are un-bankable. Additionally, he had stated that rural economy is imperfect, lacks information, communications and infrastructure coupled with geographical spread of rural population and diversity of need for small ticket size financial transactions, developing an inclusive rural financial system is a challenge.

NadiaYusuf (2014) paper focused on the use of rural financing in Northern India for poverty alleviation through agriculture. It has also indicated that many farmers rely on sellers of seeds, equipment, and chemicals for credit in order to meet their needs. This was ineffective because of inaccessibility and high transaction costs. She mentioned climate change and trends in financing have resulted in plateauing of production in the region, and which in turn need for more financing in order tosustain production. She stated that the formal strategies adopted by the government as well as private institutions in addressing poverty in the region lack adequate financing and have been ineffective because of sectoral constraints.The findings of her survey show that rural financing through formal strategies has been ineffective in Northern India. The number of people with access to rural financing through banks is low, and the most widely undertaken strategy is cooperative societies. These have been undertaken as a way of increasing the negotiating power of farmers in marketing their produce. Cooperative societies such as the PACS are ineffective in providing accessibility to financing because they do not integrate credit and marketing.

Dr.Yashoda stated that for the development of agricultural sector and allied activities adequate and timely finance are essential. But many financial problems are increasing in the process of development of co-operative system they are lack of adequate and trained staff, lack of professional management, lack of necessary funds, poor industrial relations climate, lack of professional management, political interference, change in economic conditions, over dues and limited source ofincome of the farmers and so on these societies are unable to provide adequate finance to the members and they are making delay in the sanctioning of loan. Therefore, the solution that the study mentioned to increase the efficiency of the society and to serve the rural agricultural people is that the co- operative banking should be made strong and efficient to face the challenges in competitive environment.

Dr. K.C. Chakrabarty (2010) concluded that it is an accepted fact that the rural cooperative credit institutions with vast network of PACS have a great potential to increase flow of credit to agriculture especially to small and marginal farmers.

Research Methodology

Research Objective:

· To study trend and issues related to Primary Agriculture Credit Societies (PACS) and Gross State Domestic Product (GSDP- Agriculture and Allied activities) for five different states of India.

· To analyze the relation and impact of number of PACS on the GSDP for five different states of India.

Scope of the Study:

The scope of the research is limited to five states which are Maharashtra, Goa, Gujarat, Rajasthan and Madhya Pradesh.

The scope of the research is limited to the period from 2002-03 to 2017-18

Data Collection

Current study is based on the secondary data only. For the purpose of collection of secondary data for our research we have used:

Research papers and Journals

Government published documents

Hypothesis

H0: There is no relationship between the Number of Primary Agriculture Credit Societies (independent variable) and Gross State Domestic Product (Agriculture and Allied activities).

H1: There is relationship between the Number of Primary Agriculture Credit Societies (independent variable) and Gross State Domestic Product (Agriculture and Allied activities).

Degrees of Freedom = 14

Level of Significance = 5%

Data Analysis

Primary Agriculture Credit Societies

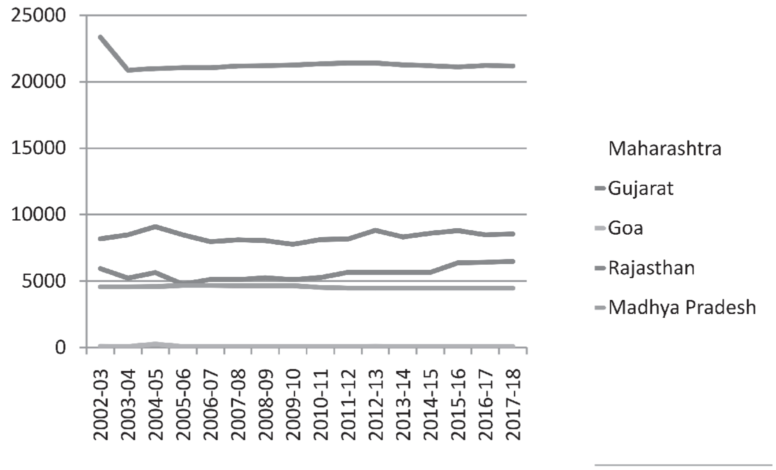
The development of cooperatives has been leaps and bounds. As far as rural areas are concerned, the cooperatives have 100 percent penetration through the Primary Agriculture Credit Societies (PACS). The share of cooperatives in financing the agricultural credit and their growth trajectory shows that there is huge potential for this sector to expand their reach and cater the farmers and others who are employed in allied activities.

Table 2:Number of PACS of five different states of India for the period from 2002-03 to 2017-18.

Year	Maharashtra	Gujarat	Goa	Rajasthan	Madhya Pradesh
2002-03	23340	8176	87	5941	4568
2003-04	20866	8482	84	5236	4568
2004-05	20984	9093	255	5651	4586
2005-06	21045	8487	75	4772	4663
2006-07	21045	7956	77	5129	4663
2007-08	21184	8092	75	5127	4633
2008-09	21199	8044	75	5255	4633
2009-10	21240	7763	79	5127	4633
2010-11	21343	8117	81	5264	4526
2011-12	21402	8154	77	5671	4457
2012-13	21394	8810	100	5671	4457
2013-14	21268	8313	79	5671	4457
2014-15	21199	8605	79	5671	4457
2015-16	21094	8804	79	6365	4457
2016-17	21217	8484	81	6411	4457
2017-18	21181	8535	81	6472	4457

Source: National Federation of State Cooperative Banks Ltd.

Chart 1: Number of PACS of five different states of India for the period from 2002-03 to 2017-18.



As per Table 2, the growth in number of PACS for five different states has been moderate.

Gross State Domestic Product (Agriculture and Allied Activities)

As per NITI Aayog, Gross State Domestic Product (GSDP) is defined as a measure, in monetary terms, of the volume of all goods and services produced within the boundaries of the State during a given period of time, accounted without duplication. Data describes average annual growth rates in GSDP at CurrentPrices.

Here, the research focuses on the level of production of agriculture and allied activities. It is one of the most important macro-economic indicators and also helps the government in devising various policies. The GSDP of agriculture and allied activities depends on many factor like the type of climate, geography, share of population engaged in such activities etc. Table 3 reported GSDP (Agriculture and allied activities) for five states from 2002-03 to 2017-18.

Table 3: GSDP (Agriculture and Allied activities) for five different states (in Lakhs)

Year	Maharashtra	Gujarat	Goa	Rajasthan	Madhya Pradesh
2002-03	3911277	2023600	76955	2083683	2111758
2003-04	4522581	2762500	61849	3192273	2906610
2004-05	3442261	2674600	66193	2791717	2753979
2005-06	3989710	3532300	84062	2912790	3058330
2006-07	5097125	4207500	76244	3519674	3415396
2007-08	6471248	5107700	84486	4232949	3593132
2008-09	5919787	5108800	90531	4773855	4400691
2009-10	6867883	5870700	94924	5041357	5300467
2010-11	10713458	9401448	103919	8109082	5919124
2011-12	10192975	7950972	102417	7346942	7333369
2012-13	10829458	6767738	108207	8389344	10540450
2013-14	13677580	9556409	126747	8599905	12457846
2014-15	11514126	9664066	138488	8109082	13094566
2015-16	11756392	9393472	157776	8339254	13632853
2016-17	16301340	11262773	188882	8805134	19044920
2017-18	13959813	12861480	219988	8846668	19194920

Source: Central Statistics Office (CSO)

Establishing relationship between Number of Primary Agriculture Credit Societies (PACS) and Gross state domestic product (Agriculture and Allied activities) through Regression

The role of finance is to bring stability and growth to the earnings of any economic activity. Like other economic activities, Agriculture also requires funds for growth and stability. Agriculture being of risky nature tends to require more funds. Additionally, farmers require liquidity when the lead time of a particular crop is long. Therefore, we can safely assume that finance is directly proportional to the growth of productivity.

Hence, here the study is trying to establish a relationship between the presence of PACS and GSDP (Agriculture and allied activities) of five different states which are under the purview of research. As through PACS, there is a 100 percent penetration in the rural areas it will be interesting to know the type and extent of the relationship between both variables.

Table 4: Regression Analysis

State	Regression Model
Maharashtra	GSDP[1]= 33254926.89-1152.23 (PACS)+ u*
Gujarat	GSDP = -2035449.65+ 1050.76(PACS)+ u
Goa	GSDP = 135875.9 -267.99 (PACS)+ u
Rajasthan	GSDP = -10547668.65+ 2950.29(PACS)+ u
Madhya Pradesh	GSDP = 257729027.8-54971.73(PACS)+ u

([1] Here, GSDP means Gross State Domestic Product for Ag riculture and Allied activities *is the error term)

As per the Regression Analysis reported in Table 4, the intercept of all states except Gujarat and Rajasthan are positive and big in nature. It shows that if there are no PACS in that state, still those states (Maharashtra, Goa and Madhya Pradesh) will produce that much amount i.e. Gross State Domestic Product (GSDP) value.To the contrast of above mentioned three states, Guajarat and Rajasthan have a negative intercept indicating that if there are no PACS in the state the GSDP will be negative. As there cannot be negative production, the intercept of Guajart and Rajasthan does not make in any sense.

Analyzing the beta value provides us idea and extent of the impact of the independent variable on the dependent variable. It is known as the slope of the regression line. It shows change in dependent variable on one unit change in independent variable. As reported in Table 4, the beta value of Gujarat and Rajasthan are positive in nature which indicates that increase in PACS in the state will lead to increase in the GSDP (Agriculture and Allied activities) of that state. We can say that there is a positive relationship between the two variables for Gujarat and Rajasthan. Even both states have negative intercept but once the number of PACS reach a particular extent and grow after that then there will be an increase in GSDP (Agriculture and Allied activities).

Looking towards the Beta value of the regression models the states of Madhya Pradesh, Maharashtra and Goa have a negative beta value. This indicates that with increase in number of PACS in that particular state will lead to decrease in the GSDP (Agriculture and Allied activities) of that state. It was assumed above that finance and level of production have a positive relationship. But the results for the states of Madhya Pradesh, Maharashtra and Goa seem to vary. This might indicate that there are other factors which are affecting the level of production of these states.

Though the relationship is established between the two variables, it is important to know the significance of this relationship. Therefore, through "Hypothesis Testing of Regression Coefficient" the study tries to determine whether there is a significant linear relationship between an independent variable (Number of PACS) and a dependent variable (GSDP (Agriculture and Allied activities)).

Hypothesis: Relationship between Number of Primary Agriculture Credit Societies (independent variable) and Gross State Domestic Product (Agriculture and Allied activities)

H0: There is no relationship between the Number of Primary Agriculture Credit Societies (independent variable) and Gross State Domestic Product (Agriculture and Allied activities).

H1: There is a relationship between the Number of Primary Agriculture Credit Societies (independent variable) and Gross State Domestic Product (Agriculture and Allied activities).

Degrees of Freedom = 14

Level of Significance = 5%

For hypothesis testing t-test is used. According to the rule, if absolute(t) value is greater than t critical value we reject the null hypothesis and if absolute(t) value is less than t critical value we fail to reject the hypothesis.

Table 5: Hypothesis testing of the regression coefficient of thefive states

State	Absolute t value	Critical t value	Result
Maharashtra	-0.5896	2.145	Fail to reject H0
Gujarat	0.4216	2.145	Fail to reject H0
Goa	-1.0204	2.145	Fail to reject H0
Rajasthan	2.6753	2.145	Reject H_0
Madhya Pradesh	-5.01339	2.145	Fail to reject H0

Result of hypothesis testing of the regression coefficient of the five states reported in Table 5. From that it is clear that for all the states except Rajasthan, the absolute(t) value is less than t critical value. Therefore, with the results of the hypothesis testing we fail to reject the null hypothesis that there is no relationship between the Number of Primary Agriculture Credit Societies (independent variable) and Gross State Domestic Product (Agriculture and Allied activities). In case of Rajasthan, the absolute(t) value is greater than t critical value so there is a relationship between the Number of Primary Agriculture Credit Societies (independent variable) and Gross State Domestic Product (Agriculture and Allied activities).

Issues and Conclusion:

Based on the research conducted above, it gives an idea about the impact of financial source like PACS on the agricultural productivity of the state. It can be concluded that the PACS don't have a significant relationship with the GSDP of agriculture and allied activities. This can be due to various reasons:

The large farmers have derived the maximum benefits from the co-operative societies. The small farmers, for whom the co-operative movement was originally initiated, found it increasingly difficult to meet all their credit needs through these institutions.

The movement of PACS is deep-rooted in only a few states like Bihar and Rajasthan. This is because, in most areas unscrupulous moneylenders have worked against the movement.

In many cases, the PACS delay sanctioning of loan on time so farmers rely on moneylender for getting financial assistance. The resources of the PACS are inadequate in relation to the short-and medium-term credit needs of the rural economy.

Large over-dues have become a big problem for the PACS. The NPA's impairs the circulation of loanable funds, reduce the borrowing as well as the lending power of societies and bring bad reputation.

Also PACS moves from one category to another and to study the impact of finance on the production becomes difficult if the PAC shift between the category (viable, potentially viable and dormant)

The societies do not provide full credit even for all productive agricultural activities. The credit given is confined mainly to crop finance (seasonal agricultural operations) and medium-term loans for identifiable purposes such as digging of wells, installation of pump sets, etc. which doesn't allow agriculture productivity to grow.

References:

Basu, P. (2006). Improving access to finance for India's rural poor. The World Bank.

Charkrabarty K.C (2010). Cooperative Banking A view point. The Cooperator, Vol. 48, No. 10, July, pp 7-9.

Khan, H. R. (2014).Rural finance – issues & challenges

NadiaYusuf. (2014). Role of rural finance in reduction of poverty in the Agriculture sector: Northern India. International Journal of Business and Economic Development, 2 (2), 97-105.

Sir, Y. (2017). Role of Primary Agricultural Co-Operative Society (PACS) in Agricultural Development in India. Global Journal of Management And Business Research.

Virendra Kumar, K. G. Wankhede, H. C. Gena. Role of Cooperatives in Improving Livelihood of Farmers on Sustainable Basis.American Journal of Educational Research. Vol. 3, No. 10, 2015, pp 1258-1266. http://pubs.sciepub.com/education/3/10/8

Webography:

http://nafscob.org/

http://www.mospi.gov.in/central-statistics-office-cso-1

https://www.rbi.org.in/