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Effect of Loan Diversification on Risk and Returns: An Empirical Study of Central Cooperative Banks in Punjab

Dr. Ravi Inder Singh[1]

Abstract

The paper attempts to analyze the cause and effect relationship between loan diversification, return and risk in cooperative banks after the adoption of New Economic Policy (NEP) in 1991. In the wake of reconstruction in the organization w.r.t business, the role of financial intermediaries needed reexamination. Through statistical measures, investigation into the nature and form of interrelationship between the variables was measured. The study carried on Central Cooperative banks of Punjab found that diversification has adversely affected the yield on assets. Further, diversification has not helped the banks in reducing risk.

Keywords: Cooperative banks, Diversification, Financial Intermediary, Risk, Return on Investment, Credit, Debt

Introduction

India witnessed substantial changes in various dimensions of business post the genesis and implementation of new economic reforms in the nineties. Concurrently the Indian banking sector actively responded to the metamorphosis in corporate ownership patterns, business strategy and tactics in a proactive manner. The conventional classification of commercial banks providing loans for short term, development banks providing long term loans and cooperative banks meeting the financial requirement of farmers and village artisans has lost its relevance.

Today commercial Banks besides short term lending also provide long-term loans; have entered into business lines related to the capital markets by establishing their subsidiary companies and have entered the insurance sector as well.

[1] University Business School, Panjab University Regional Centre, Civil Lines, Ludhiana, Punjab, India.

Similarly, cooperative banks are now providing loans to traders, serviceman and industry besides meeting the financial requirements of the farmers and village artisans for whom they were initially established. Whether this diversification affects risk-return profile of the banks favorably is a critical issue of post reformist banking practices particularly in the light of failure of large number of big and small banks of late.

We have heard about two important idioms which talk about the role of diversification in alternating ways i.e. "Don't put all your eggs in one basket" supporting the theory of diversification and the other "Put all your eggs in one basket and watch that basket" which favours the focusing strategy i.e. confining organizations to specialized areas of business. It further illustrates the dilemma and dichotomy of banks w.r.t effects of loan diversification not only in North America and Western Europe but also in global South, especially India.

Diversification of Cooperative Banks assumes greater significance in the current financial environment. These specialized banks have undergone substantial business diversification. They have expanded their nature and scope exponentially to become from banks only for the farmers to replicas of other commercial banking institutions.

Cooperative banks: The subset under the microscope

The cooperative movement began in Europe in the 19th century, primarily in Britain and France. However, the first documented consumer cooperative was founded in 1769, in a barely furnished cottage in Fenwick, East Ayrshire named the Fenwick Weavers' Society(Bonner, 1962).

By 1830, there were several hundred co-operatives. Some were initially successful, but most cooperatives founded in the early 19th century had failed by 1840. It was not until 1844 when the Rochdale Society of Equitable Pioneers established the 'Rochdale Principles' on which they ran their cooperative, that the basis for development and growth of the modern cooperative movement was established(Holyoake, 1908). The Rochdale consumer co-operative was founded on three principles: equality, equity and mutual self-help (Holyoake, 1908; Shaffer, 1999). Rochdale is seen as the foundation of the modern co-operative movement.

In India cooperative movement existed in informal manner in many areas, but the first attempt to formalize the cooperative movement in India was made in 1904 through the enactment of Cooperative Societies Act 1904. This act put in place a system of registration of 'Agriculture Credit Societies'. This act was enacted on the recommendation of Nicholson, a British officer. The act of 1904 was repealed by 1912 Cooperative Societies act. The act of 1912 allowed establishment of cooperative societies for purposes other than-agriculture credit. The agriculture credit societies established in 1904 led to formation of association of farmers and small artisans based on mutual cooperation(NCUI)[2]. These associations helped in liberating to some extent the village farmers and small artisans from the clutches of *sahukars* and indigenous banker. A full- fledged structure was put in place for transfer of resources from those members who have the excess to those who were in need. At the village level, Primary Cooperative Society (PACS) was established to act as channel for transfer of funds. At the district level, one District Central Cooperative Bank (DCCB) was created to act as an intermediate link between PACS with surplus funds and those who are facing shortage of funds in meeting the requirement of their members. Similarly at the state level for transferring funds from one DCCB to other, a third tier i.e. State Central Cooperative Bank was established.

Over the years, this functional system has moved away from association for mutual help ushering significant changes especially with respect to credit creation. The cooperative credit structure has ventured into new business areas including loaning to segments in sharp contrast to the fundamental principles of cooperative credit movement. Cooperative Banks, the central cooperative credit structure particularly, has become full-fledged banks. Like commercial banks they are lending money to people such as traders, industrialists, serviceman etc. Financial assistance is available from cooperative banks in high innovative loan schemes like Loan against Property, Traders Limit and Personal Loans etc. Additionally cooperative banks are also performing non-fund business activities like renting lockers, issuing drafts etc.

The salience of this study lies in the fundamental critique of the benefits of loan diversification to the banks. Moreover limited research exists on the issue vis-à-vis cooperative banks in India.

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[2] National Cooperative Union of India. Retrieved from website: www.ncui.coop/**history**-coop.html, 2014.

Since there is a shift from fundamental essence and basic cooperative principles of mutual help and uplifting of rural poor people to cater to the requirements of people other than farmers, real members and village artisans, this study becomes pertinent as an inquiry into the future of these banks in times to come

Objectives

The specific objectives of the study are:

1. To examine the average effect of banks' loan portfolio diversification on profits.
2. To examine the effect of banks' loan portfolio diversification on risk profile.

Review of Literature

Related studies on the effect of loan diversification on bank performance and risk have shown divergent results creating legitimate space to explore the relationship between the stated variables afresh.

Boyd and Prescott (1986) stated that delegated monitoring is recommended as it is optimal for a bank to be fully diversified across sectors or "projects".

Diamond (1984) found that perfect diversification followed by delegated monitoring helps the banks to maximize the gains. **Hellwig (1998)** confirmed the findings of Diamond (1984) on the conditions when banks concentrate on some large projects and their monitoring costs are low.

Berger, Demsetz and Strahan (1999) stated that consolidation in financial services industry led to greater diversification of risks on average but didn't provide any proof of cost efficiency improvements.

Winton (1999) in his model stated that the gains from diversification and those from focusing depend on the riskiness of the bank. He stated that the gains from diversification are most dominant when the bank has a medium risk level; for low risk and for high risk banks diversification does not pay. He found out that when debt is risky and the central tendency of distribution is low relative to the level of debt, diversification can in fact increase the probability of default.

Elyasiani and Deng (2004) in their study conducted on banks in the United States found that diversified banks are less risky and less profitable.

Stomper (2004) shows in an equilibrium model that both types of banks exist in equilibrium: perfectly diversified and specialized.

Stiroh (2004) in their studies stated the gains from diversification in terms of reduced risk are only weak**.**

Hayden et al. (2005) found that diversified banks tend to show weaker results than specialized banks.

Heitfield et al. (2005) analyzed portfolios of Syndicated National Credits (SNC) and found that the portfolio risk increases with increased concentration in industry.

In India ,the empirical study by **Acharya et al. (2006**) stated that it is better from the economic point of view to have specialized banks than diversified banks. "Diversification does not provide any guarantee of superior performance or greater bank safety and soundness".

Research Methodology

This study focuses on the impact of diversification on risk and return of the cooperative banks. Cooperative Banks have been selected as a source because of their change in identity as banks to help the farmers and the small artisans in meeting their financial requirements. Secondly, the study purposely selected cooperative banks in the state of Punjab as they are considered highly diversified[3] banks in the country. Out of the sampling frame of 20 Central Cooperative Banks in Punjab, a sample size of 19 district central cooperative banks[4] has been carefully selected. Secondary data from published data files of ten financial years from 2002-03 to 2011-12 was used for the purpose of this study.

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[3] DCCBs Gurdaspur, N'shahr and Jalandhar have almost around 50% of their lending outstanding in other than non-agriculture loans as on 31-03-2012(Source: Comparative Data Statements published by Punjab State Cooperative Bank Limited, Chandigarh).

[4] Central Cooperative Bank, SAS Nagar is ignored as this bank was established in 2006 and data of ten years in respect of this bank was not available.

The data was analyzed with statistical tools like Hirschmann-Herfindhal Index, weighted average and simple linear regression model. The findings were discussed qualitatively to arrive at conclusive results.

a) Methodogical Framework : Hirschmann-Herfindahl Index[5]

To examine the level of diversification, Hirschmann-Herfindahl Index has been calculated. It is the sum of the squares of exposures as a fraction of total exposure under a given classification and is represented by the following formula:

$$\sum_{i=1}^{n} (X_i / X)^2$$

where n is the number of groups and Xi measures exposure in a particular loan scheme i. The smallest and the largest possible values for the Herfindahl Index are given by $1/n \leq H \leq 1$. Hence, lending is more concentrated the closer the Herfindahl Index is to one and is perfectly diversified if H equals 1/n. The degree of diversification calculated for each DCCB as per Herfindahl Index is given below in table 1.

[5] Werden, J. George,(1998), "Using Herfindhal-Hirschman Index" in Applied Industrial Economics by Louis Philip, Cambridge University Press. pp. 368-74.

Table 1: Diversification Index as per Hirschmann-Herfindahl Index

DCCBs*	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Avg. HFI
Amritsar	0.235635	0.234951	0.25212	0.279144	0.405022	0.328411	0.372307	0.433284	0.436099	0.447536	0.342451
Bathinda	0.432422	0.374085	0.343032	0.394223	0.610215	0.410556	0.397987	0.404644	0.396365	0.371226	0.413476
F.Sahib	0.352127	0.343095	0.393538	0.391367	0.492152	0.377427	0.365605	0.361586	0.368421	0.340151	0.378547
Fazilka	0.367719	0.31446	0.346022	0.342881	0.490297	0.350712	0.337968	0.360693	0.362066	0.387275	0.366009
Ferozepur	0.470796	0.454166	0.567492	0.542306	0.662055	0.499713	0.517934	0.561206	0.563744	0.595097	0.543451
Faridkot	0.321059	0.27072	0.289201	0.289879	0.421975	0.348435	0.330027	0.369345	0.348314	0.360111	0.334906
Gurdaspur	0.246252	0.236588	0.225143	0.214342	0.226452	0.235577	0.245151	0.268749	0.273689	0.272873	0.244482
Hoshiarpur	0.283202	0.257949	0.259945	0.266592	0.373373	0.293846	0.30429	0.312857	0.324923	0.343728	0.30207
Jalandhar	0.41486	0.323385	0.246723	0.222593	0.2501	0.302596	0.249214	0.254629	0.260283	0.282609	0.280699
Kapurthala	0.317213	0.258756	0.238104	0.236773	0.305413	0.260222	0.259536	0.266172	0.265519	0.279088	0.26868
Ludhiana	0.327424	0.320661	0.414398	0.422035	0.640845	0.404876	0.448796	0.46778	0.450266	0.43647	0.433355
Mansa	0.405662	0.354341	0.35682	0.383112	0.546906	0.443784	0.428282	0.450448	0.487432	0.440473	0.429726
Moga	0.391729	0.344544	0.415953	0.370545	0.536827	0.427055	0.406766	0.426952	0.440359	0.497667	0.42584
Muktsar	0.545779	0.528764	0.546263	0.49191	0.619031	0.475942	0.441716	0.460711	0.482876	0.485088	0.507808
N.Shahr	0.297869	0.249551	0.21299	0.228937	0.201731	0.238178	0.212039	0.246128	0.222726	0.224194	0.233434
Patiala	0.290313	0.283686	0.300476	0.311064	0.439333	0.333577	0.356474	0.367891	0.368493	0.384166	0.343547
Ropar	0.2543	0.247735	0.272808	0.337275	0.25594	0.242268	0.249219	0.288947	0.306111	0.312755	0.276736
Sangrur	0.327132	0.311492	0.334835	0.314007	0.461923	0.378114	0.40174	0.435394	0.433059	0.452202	0.384997
Tarn Taran	0.343528	0.3242	0.348527	0.333284	0.481927	0.375598	0.371326	0.391733	0.408293	0.408789	0.37872

* DCCB stands for District Central Cooperative Bank; **Source**: Calculated on the basis of outstanding advances in various schemes of State and Central Cooperative Banks as published in Comparative Data Statements by Punjab State Cooperative Bank Limited, Chandigarh.

a) Return

For the purpose of return, we have taken 10 years weighted average yield on assets for each of the District Central Cooperative Bank. Weighted average yield on assets is the sum of weighted averages of the return on money lent in various schemes by the bank.

The equation for calculating the weighted average return is:

$$Rw = W_1X_1+W_2X_2+W_3X_3+W_4X_4\ldots\ldots\ldots\ldots\ldots\ldots$$

Where W_1, W_2,W_3,W_4 represents the proportion of money invested in a particular loan scheme and X_1,X_2,X_3, and X_4 represents the rate of interest charged on loans given in schemes 1,2,3 and 4 respectively. Rw represents weighted average yield. Other options for return parameter such as profits and return on investments(ROI) are not considered in this study as they are affected by number of factors like employee efficiency and size through economies or diseconomies of scale. On the other hand, in case of weighted average yield on assets, diversification is the major affecting factor. Weighted average yield for each of the nineteen district central cooperative banks of Punjab are given below in table 2.

Risk

Risk represents the degree of default in loan repayments by the borrowers. The ratio of percentage of Non-Performing Advances to total assets (NPA) was used as the indicator representing degree of risk. The ratio of NPA to total advances of each bank is given below in table 3.

Table 2: Weighted Average Yield on Assets

DCCB	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Average
Amritsar	9.74	9.58	8.49	8.17	6.58	7.12	6.71	6.86	6.55	7.09	7.689
Bathinda	9.77	9.21	8.48	7.69	6.34	6.87	6.77	6.83	6.52	7.76	7.624
F.Sahib	10.64	10.06	9.22	8.27	6.67	7.17	7.19	7.27	7.51	7.63	8.163
Fazilka	10.76	10.02	9.01	8.1	6.44	7.01	7.21	7.27	6.89	7.36	8.007
Ferozepur	10.62	9.87	9.02	7.86	6.31	6.7	6.09	6.09	5.64	6.05	7.425
Faridkot	11.52	10.51	9.49	7.84	6.83	7.23	7.58	7.38	7.36	7.85	8.359
Gurdaspur	10.43	9.44	8.56	7.96	6.6	6.98	7.34	8.19	8.13	7.44	8.107
Hoshiarpur	10	9.01	8.26	7.74	7.05	8.43	7.93	7.53	6.98	8.03	8.096
Jalandhar	9.84	9.07	7.84	7.4	7.35	8.63	8.81	8.12	7.43	8.34	8.283
Kapurthala	9.91	9.19	7.95	7.72	7.68	8.62	8.84	8.23	7.53	8.42	8.409
Ludhiana	9.82	9.53	8.56	7.65	6.43	7.21	7.19	7.01	6.96	7.54	7.79
Mansa	10.22	10.38	7.85	7.5	5.73	6.4	6.09	5.77	5.93	6.85	7.272
Moga	10	9.44	8.79	8.38	6.67	6.58	7	6.72	6.78	6.64	7.7
Muktsar	9.64	9.08	8.13	7.68	5.15	6.31	6	6.18	5.46	6.79	7.042
N.Shahr	9.92	8.94	7.72	7.29	7.41	8.55	9.11	8.01	6.66	8.18	8.179
Patiala	10.38	9.52	9.75	8.68	6.67	7.17	6.88	7.07	7	7.34	8.046
Ropar	10.46	9.73	8.9	7.9	7	8.06	7.64	6.71	7.1	7.72	8.122
Sangrur	9.91	8.86	8.31	7.59	6.17	6.88	6.65	6.42	6.81	6.84	7.444
Tarn Taran	9.96	9.51	9	7.71	6.46	7.31	7.23	6.77	7.6	6.54	7.809

Source: Calculated on the basis of data published in Comparative Data Statements of the State and District Central Cooperative Banks by The Punjab State Cooperative Bank Limited, Chandigarh.

Table 3: NPA as a Percentage of Total Advances

DCCB	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Average
Amritsar	9.3	11.88	15	17.01	16.78	15.98	16.76	13.62	12.15	9.4	13.788
Bathinda	3.49	3.3	3.25	3.67	3.6	4.62	6.47	5.93	4.58	3.87	4.278
F.Sahib	7.92	8.29	8.31	7.3	7.6	6.2	6.5	4.96	4.69	4.12	6.589
Fazilka	5.72	5.03	5.52	5.26	4.96	4.92	4.9	4.75	5.41	6.44	5.291
Ferozepur	6.39	6.56	6.82	6.67	5.52	4.78	5.47	4.11	3.84	4.59	5.475
Faridkot	1.68	4.21	5.26	6.42	6.1	7.3	6.37	4.77	3.96	4.29	5.036
Gurdaspur	12.84	18.59	15.09	21.36	16.9	13.91	14.9	20.32	15.1	13.18	16.219
Hoshiarpur	6.87	9.9	7.87	8.62	8.8	5.95	5.23	6.24	5.39	4.58	6.945
Jalandhar	1.41	1.75	3.03	5.94	4.82	3.12	3.87	3.81	3.18	2.86	3.379
Kapurthala	3.36	4.62	5.48	4.98	4.86	4.05	4.23	3.28	2.64	2.37	3.987
Ludhiana	8.39	7.72	9.28	9.05	7.38	6.96	6.9	5.5	4.88	3.67	6.973
Mansa	8.04	7.86	9.95	10.67	8.57	7.95	8.45	13.95	11.91	7.79	9.514
Moga	5.1	4.72	5.15	5.93	5.09	4.65	4.53	4.32	4.11	3.46	4.706
Muktsar	3.07	3.02	3	5.39	6.19	6.69	6.92	6.47	5.87	6.93	5.355
N.Shahr	2.47	2.6	3.84	5.09	3.85	2.88	3	3.58	2.99	2.57	3.287
Patiala	6.52	7.38	7.27	8.24	6.78	6.25	7.25	5.61	4.75	4.36	6.441
Ropar	8.06	6.21	7.66	6.56	8.09	7.18	9.85	8.34	6.96	5.6	7.451
Sangrur	3.68	4.48	5.34	4.98	5.25	5.22	5.45	5.14	4.37	3.84	4.775
Tarn Taran	11.59	11.72	11.03	11.82	11.03	9.54	9.5	8.82	8.11	7.33	10.049
TOTAL	5.98	7	7.48	8.33	7.56	6.73	7.26	6.97	6	5.27	6.858

Source: Calculated on the basis of data published in Comparative Data Statements of the State and District Central Cooperative Banks by The Punjab State Cooperative Bank Limited, Chandigarh

To examine the effect of portfolio diversification on risk and return, the hypotheses are:

Diversification and Profitability

H0: Loan Portfolio Diversification is not significantly related to the Returns of Cooperative Banks

Ha: Loan Portfolio Diversification is significantly related to the Returns of Cooperative Banks

Diversification and Risk

H0: Loan Portfolio Diversification is not significantly related to the Risk faced by Cooperative Banks
Ha: Loan Portfolio Diversification is significantly related to the Risk faced by Cooperative Banks
Linear Regression model as represented by the following equation is used to test the above hypotheses
$Y = a+bx+\epsilon$
Y here represents dependent variable, a is intercept, b is constant and x represents coefficient of independent variable, ϵ is the error term.

The average of 10 years of Herfindhal Index, the weighted average yield on assets and the ratio of NPA as a percentage of total advances of each of the nineteen banks is calculated to examine the hypotheses. Computer program SPSS is used to apply the regression analysis.

Data Tabulation and Analysis

Effect of Diversification on Yield

Standard Capital Market theories as given by Markowitz(1952) and Sharpe(1964) state the kind of relationship between risk and return in terms of higher the risk, higher the return. Klein and Saidenberg (1998) and Morgan and Samolyk (2003) in their studies conducted on geographic diversification of US banks stated that greater degree of diversification does not lead to increased profits. In this section of the study, we have tried to examine the relationship between diversification and yield for the cooperative banks of Punjab.

Table 1.1: Relationship Between Diversification and Return

Model	R	R Square	Adjusted R Square	Std. Error
dimension0 1	.811[a]	.658	.638	.23121831

a. Predictors: (Constant), diversification

Table 1.2: Relationship Between Diversification and Return

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.748	1	1.748	32.698	.000***
	Residual	.909	17	.053		
	Total	2.657	18			

a. Predictors: (Constant), Herfindhal Index(representing degree of diversification)
b. Dependent Variable: Risk.
c. *** significant @1% level

Table 1.3: Relationship between Diversification and Return

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.203	.239		38.541	.000
	Slope	-3.672	.642	-.811	-5.718	.000

a. Dependent Variable: Return

Effect of Loan Diversification on Risk

The standard theory regarding relationship between diversification and risk states inverse relationship between risk and diversification as is also explained in terms of a well accepted wisdom phrase in finance i.e. "Don't put your all eggs in one basket". However, important studies like Acharaya et.al(2006) conducted on risk and diversification relationship for Italian banks have found no relationship between risk and diversification. In this section of the study, we have tried to examine the relationship between diversification and risk in the context of central cooperative banks of Punjab.

We could not find significant relationship between risk and diversification (table 2.2); value of significance is 0.543. Therefore, the null hypotheses may be accepted.

Table 2.1: Relationship between Diversification and Risk

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.149[a]	.022	-.035	3.49318

a. Predictors: (Constant), Diversification

Table 2.2: Relationship between Diversification and Risk

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.710	1	4.710	.386	.543[a]
	Residual	207.440	17	12.202		
	Total	212.149	18			

a. Predictors: (Constant), Diversification
b. Dependent Variable: Risk

Table 2.3: Relationship between Diversification and Risk

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.003	3.608		2.496	.023
	Slope(Risk)	-6.027	9.701	-.149	-.621	.543

a. Dependent Variable: Risk

In this study the effort was made to examine the effect of diversification on risk and return of Central Cooperative Banks of Panjab. Key conclusive arguments are:

1. Diversification and Return are negatively related. Diversification didn't help the central cooperative banks in increasing return rather it has adversely affected the return.
2. Further, whereas diversification couldn't help the banks in reducing risk. We could not find significant association between diversification and risk

Therefore, it is recommended that Central Cooperative Banks of Punjab should examine their policy of loan diversification as neither it is helping in increasing returns nor it helped in reducing risk.

Above findings suggest that focused approach of lending money to farmers and village artisans was better for the cooperative banks, it is therefore advised that DCCBs should put in efforts to strengthen their business of lending to farmers, small artisans and traders.

It is evident that diversification has not helped the Cooperative Banks to reduce risk. It can be attributed to the main reasons to the lack of training amongst the cooperative bank personnel.

The bank employees were trained in lending and recoveries of loans related to agricultural purposes and were not accoutered with appropriate skills to evaluate loan proposals of traders, industrialists and serviceman. Significant to note is that lending to agriculture is regulated lending where the loan amount is fixed as per "per acre" loan amount fixed by the government and the farmers land holding. Whereas evaluation of industrial loan projects, loans to traders and serviceman is a technical process. Furthermore strategy required for recovery of other than non-agriculture loans is entirely different from that of agricultural loans. For one, the recovery of loan given for agricultural purposes is done mostly on bi-annual basis, whereas recovery of loans for other than non-agricultural purposes is mainly done on monthly basis.

Conclusion

Expansion coupled with development of line extensions has marked the changes in banking sector post millennium. The present study conforms to the results found in works of {Achraya et.al (2004) and Hayden et. al.(2005)} lending credence to the negative relationship between loan diversification and returns. It can be argued that in the geo demographic setup of the north Indian Punjab, diversification as a concept and practice needs to be critiqued to develop a domestic model for cooperative banks in expansionary phase. Mere adoption of constructs from western landscape will not make banking reforms progressive and customized for neo liberal business environment.

It is imperative to take cognizance of the integration of command and market economic systems in the country to create space for co-existence of universalized and specialised financial system in India. Niche functions rooted in segmented microcosm must also find its worthy place.

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