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Explanatory Factors of Cooperative Banks' Performance : Evidence from Punjab

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Abstract

The present study aims at examining the factors affecting the performance of the central cooperative banks of Punjab. 10 years' data from 2002-03 to 2011-12 of the 19 DCCBs of Punjab was analyzed using forward multiple regression model. Return on Assets ratio is considered as a measure of bank performance. Bank-Size and Financial Margin were found to have positive relationship with Return on Assets (ROA). Relationship of independent variables credit risk, cost of working, financial leverageas separately noticed with dependent variable Return on Assets was inverse. Borrowings, own funds, branch productivity, employee productivity and non-fund income were found to have insignificant relationship with Return on Assets. Amongst the macro level factors, inflation rate was found to be inversely associated with ROA. Insignificant association was noticed between Gross Domestic Product and ROA. With the objective of improving profitability position, cooperative banks in Punjab introduced high yielding loan schemes in 1990s. One of the most startling findings of the study is high degree of inverse relationship between degree of diversification and bank profitability. Increase in credit risk, cost of appraisal and monitoring associated with new lending schemes led to fall in bank profits.

Key Words

GDP, ROA, Credit Risk, Financial Margin, Average Working Funds

INTRODUCTION

Reforms process of 1990s has affected almost all segments of the economy.

Central Cooperative Banks which were started as farmers' bank have not remained aloof of reforms process developments. Substantial portion of business of these banks is now related to dealing with non-farmers, non-fund income activities and return from investments like commercial banks, further central cooperative banks which around two years ago were regarded as non-profit entities only, are now evaluated on the basis of their profits. These banks have diversified their deposit and loan portfolio in a big way, have increased their non-fund income-based business, have increased the number of their branches, have started hiring highly qualified employees and are in the process of becoming technology driven banks on the lines of commercial banks. In the light of all this, the important questions are whether this expansion and diversification of business, increase in number of branches, hiring of highly qualified staff has affected the performance of these banks profitably or not. What are the factors which are deriving the performance of cooperative banks of Panjab? In this study, an effort has been made to examine the micro and macro factors affecting performance of central cooperative banks in Punjab.

An in-depth scanning of literature was done to find out if any study has been conducted recently to examine the factors affecting the performance of the central cooperative banks of Punjab. Though we found a number of studies examining the factors affecting the performance of banks, but most of these studies were focused on commercial and private sector banks, we could not find any study wherein factors affecting the performance of cooperative banks were examined. Further, substantial changes taking place in the cooperative banking system necessitates examination of the effect of these changes on the performance of banks. This study is conducted to find the factors deriving the performance of central cooperative banks in Punjab.

REVIEW OF LITERATURE

A large number of studies related to determination of factors affecting profitability of banks have been found in literature. But most of these studies are either related to developed countries and/or private and public sector commercial banks.

Short (1979)in his study titled "the relation between commercial bank profitability and banking concentration in Canada, Western Europe and Japan" stated that size is closely related to the capital adequacy. Relatively large banks tend to raise less expensive capital and, hence, appear more profitable.

Molyneux and Thorton (1992) in their study titled "Determinants of European Bank Profitability : A Note" examined the determinants of bank performance.

This study focused on eighteen European countries and examined the data between the period 1986 and 1989. This study found that increased concentration is rather a reflection of increasing deviations from competitive market structures which lead to higher profitability. Further study reported that ownership status is irrelevant for explaining profitability. Study found negative relationship between level of liquidity and profitability.

Kalyankar (1983) in his study titled, "Wilful Default in Loans of Co-operatives" reported that the cropping intensity, irrigation facility and working capital of the societies were the major factors responsible for overdues at primary agricultural credit societies' level. The socio-economic factors were not found to be responsible for increasing overdues at the borrowers' level.

Patel (1995) in his paper on viability of rural banking, reported that proportion of non-farm sector lending in total loan portfolio of rural banks is increasing. He further found that low volume of business per branch and per employee and high level of credit deposit ratio are the major factors responsible for causing losses in rural banking system.

Berger (1995) in his study reported that superior management and increased market share were found positively associated with bank profitability particularly in the case of small to medium-sized banks. He further stressed that increased concentration is the result of higher managerial efficiency and a positive relationship between profit and concentration may be fake.

Demirguc-Kunt and Huizing (1998) in their study conducted on the data of banks for eighty countries for the period 1988-95 found that macro-economic and regulatory conditions have a pronounced impact on margins and profitability.Lower market concentration ratios were found to be positively associated with lower margins and profitability. Foreign banks were found to have higher margins and profitability compared to domestic banks in developing countries, while in developed countries, reverse was found true.

Bikker and Hu (2002) found that higher capital ratios reflect the soundness and safety of banks. Study found positive association between size of capital andprofitability. Large banks tend to raise less expensive capital, thus appearing to be more profitable.

Koeva (2003) examined the impact of financial liberalization on the performance of Indian commercial banks. Study reported negative relationship between increase in competition during financial liberalization with intermediation costs and profitability of the Indian banks.

Goddard *et al.* (2004) in their study conducted on the performance of European banks across six countries found a relatively weak relationship between

size andreturn on equity. However, study found significant persistence of cummulative abnormal returns even though competition among banks is thought to have increased over the period 1992-1998.

Chen *et al.* (2005) in their study conducted on 43 Chinese banks from 1993 to 2000 found that the large state-owned and smaller banks are more efficient than medium-sized banks. They further found that financial deregulation in 1995 improved cost efficiency levels.

Sanyal and Sankar (2007) studied the impact of ownership and competition on performance of eighty nine Indian banks for the post-deregulation period of 1990- 2001. Study reported that private sector banks, in terms of profitability, have shown better gains as compared to public sector banks. Foreign banks have been found to perform better than Indian private sector banks. Productivity has increased across all bank categories. When competition is taken into account, results showed that private banks have lower spread than public banks.

Yao *et al.* (2007) in their study conducted on 22 banks for the period covering 1995-2001 found that private banks are found to be 8-18% more efficient than state banks. Banks facing a hard budget constraint are found to perform better than those relying on substantial government capital injections.

Shih *et al.* (2007) in their study conducted to analyze and compare bank performance among the Chinese big four, joint-stock, and city commercial banks using cross-section data for 2002 found that mid-size joint-stock banks performed significantly better than state-owned and city commercial banks. Evidence for positive association between bank size and performance couldn't be found.

Lin and Zhang (2008) examined the effect of bank ownership on the performance of 60 Chinese banks. Study on the basis of data from 1997 to 2004 reported negative relationship between size and selected dependent variables i.e. profitability, efficiency and asset quality. Banks subject to a foreign acquisition or public listing demonstrated better performance.

Athanasoglou, *et al.* (2008)in their study regarding profitability behavior conducted on a sample of south eastern European banking industry for the period 1998 -2002 reported that the effect of market concentration is positive, while the results regarding macroeconomic variables are mixed. They suggested that enhancement of bank profitability in these countries can be brought by putting in place new standards of risk management and operating efficiency.

Davydenko (2011) conducted a study on determinants of bank profitability in Ukraine. Based on the analysis of financial statements from 2005 to 2009 study reported that low quality of loans adversely affected Ukrainian banks. Study further found difference in profitability patterns of banks with

foreign capital versus exclusively domestically owned banks. Researcher advised consolidation of banks as economies of scale resulting from consolidation seemed to bring benefits.

RESEARCH METHODOLOGY

Effect of macro and micro level factors on the performance of district central cooperative banks of Punjab is examined in the study. Bank-size, degree of diversification, financial margin, branch productivity, employee productivity, credit risk, cost of operations and financial leverage factors have been considered as the micro level factors while growth rate of GDP and rate of inflation are considered in the category of macro level factors affecting bank performance. The data regarding growth rate of GDP and rate of inflation of the ten years (2002-03 to 2011-2012)was taken from www.worldbank.org. Out of the 20 DCCBs in Punjab we have considered the data of 19 DCCBs as data of one DCCB (Sahibjada Ajit Singh Nagar District Central Cooperative Bank Limited) was not available for ten years as it was established in 2006. Secondary data as published in the comparative statistical statements of the District Central Cooperative Banks of Punjab have been considered for the purpose of this study. High degree inter-factor correlation was noticed (see Table 2 below on multi-collinearity) among independent variables, therefore, we have used Forward Regression Analysis method of Multiple Linear Regression model to find out the overall impact of all selected variables on bank profitability. Forward regression analysis is used to provide selection of variables when a large group of variables exists with high degree of the existence of multi-collinearity among independent variables. Process of forward regression analysis begins with no variable in the model. Then variables are selected one by one on the basis of highest R-Square value. Process stops adding variables when none of the variables remaining are significant.The equation for multiple linear regression model is :

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 \ldots\ldots\ldots + \epsilon$$

Here Y represents Return on Assets (dependent variable) and x_1, x_2, x_3…… represents the independent variables i.e. degree of diversification represented by HHI, operating cost, size of bank, ration of non-performing advances to total advances, non-fund income, employee productivity, branch productivity, financial margin, growth rate of GDP and inflation rate, ϵ is an error term. Besides, multiple regression, effect of each of the selected independent variable on dependent variable is examined separately using linear regression equation :

$$Y = a + bx$$

The various determinants considered for this study include :

Size

Due to emergence of the benefit of economies of scale with increase in the size of a business, size is assumed to have positive association with the profitability. As a part of economic reforms process, merger of banks is taking place in a big way so as to increase the competitive strength of these organizations in the international market. However, there is a strong need to examine 'How does bank size affect bank profitability?' Haslem (1968), Short (1979), Bourke (1989), Molyneux and Thornton (1992) Akhavein *et al.* (1997), Smirlock (1985),Demirguc-Kunt and Maksimovic (1998) Bikker and Hu (2002) and Goddard *et al.* (2004), find a positive and significant relationship between size and bank profitability. However, other researchers (Berger *et al.*, 1987) suggest that little cost saving can be achieved by increasing the size of a banking firm. Average Working Fund (AWF) is used as a proxy of size in this study though different studies have used different proxies (capital adequacy, share capital etc.) for bank size. AWF is calculated on the basis of "13 months' average of the sum of values of assets and liabilities minus contra items". Due to economies of scale benefit, size of bank is supposed to be positively associated with the profitability.

Operating Cost

High operating cost is supposed to adversely affect the profitability of the bank.However, Bourke (1989) and Molyneux and Thornton (1992) find a positive relationship between operating cost and profitability. Ratio of cost of management to average working funds is considered in this study as a parameter representing operating cost. We have taken ratio of cost of management to average working funds instead of cost of management to overcome the effect of bank size.

Credit Risk

Credit risk represents the risk of default in repayment of loan by the bank loanees. Bourke (1989) found negative relationship between credit risk and bank profitability. In this study percentage of non-performing advances to total advances ratio has been considered as an indicator representing credit risk.

Loan Portfolio Diversification

Cooperative Banks started as farmers' bank, however, in order to improve their profits these banks over the last two decades have significantly diversified their loan portfolio. They are now lending money to industry, traders and other segments of the society. There is a need to examine "Whether this diversification

into high yield loan categories have benefitted the central cooperative banks or not?" Hirschmann-Herfindahl Index is used as a measure of degree of loan portfolio diversification.

(a) Methodogical Framework : Hirschmann-Herfindahl Index

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 if Herfindahl Index is closer to one and is perfectly diversified if H equals 1/n.

Non-Fund Income

Non-fund income is another important source of income for the banks. This income is earned in the form of commission on making demand drafts, collection of cheques, bills and on renting of lockers etc. Banks with higher non-fund income are supposed to have higher profitability.

Productivity

Due to increase in competition, banks are under severe strain to improve upon their productivity levels i.e. to increase profitability without increasing inputs or retain profitability by lowering the quantity of inputs. Profit per branch and profit per employee are the proxies taken for level of productivity in this study. Profits per branch and per employee are supposed to be positively related to the overall bank performance. Patel (1995) found low business per employee and per branch as the major factors causing losses in rural branches.

Financial Leverage

Financial leverage refers to the proportion of borrowed funds and owners' funds in the total funds invested in a business. Molyneux and Thorton (1992) reported that ownership status is irrelevant for explaining profitability. Koeva (2003) suggest that ownership type has a significant effecton bank profitability. In the present study, ratio of own funds to average working funds is taken to represent the degree of financial leverage.

Inflation and Profitability

Inflation rate is assumed to have adverse relationship with bank profitability. High rate of inflation forces central banks to tighten the monetary and credit policies leading to high lending rates causing reduction in loan off-takes.Revell (1979) found that the effect of inflation on bank profitability depends on whether banks' wages and other operating expenses increase at a faster rate than inflation. Perry (1992) states effect of inflation on bank's profitability is dependent upon the bank's ability to forecast inflation rates and adjust interest rates in order to increase their revenues faster than their costs and thus acquire higher economic profitability. An inflation rate fully anticipated by the bank's management implies that banks can appropriately adjust to increase profitability. Bourke (1989) and Molyneux and Thornton (1992) have also shown a positive relationship between either inflation or long-terminterest rate and profitability.

Growth Rate of Gross Domestic Product

GDP growth rate indicates the economic growth rate of the economy. GDP growth rate and the performance of banks are supposed to be positively associated with each other. In this study, an attempt has been made to examine the relationship between bank profitability and growth rate of GDP.

Bank Profitability

Profitability parameter considered for the purpose of this study is Return on Assets (ROA). Return on assets is the dependent variable. It is calculated by dividing the profits before taxes with total investment.

Following hypotheses are set to examine the relationship of various identified factors with bank profitability :

H_1 : There is no relationship between bank size and bank profitability

H_2 : There is no relationship between operating cost and bank profitability

H_3 : There is no relationship between credit risk and bank profitability

H_4 : There is no relationship between loan portfolio diversification and bank profitability

H_5 : There is no relationship between non-fund income and bank profitability

H_6 : There is no relationship between bank productivity and bank profitability

H_7 : There is no relationship between financial leverage and bank profitability

H_8 : There is no relationship between rate of inflation and bank profitability

H_9 : There is no relationship between GDP growth rate and bank profitability

DATA ANALYSIS AND DISCUSSION

Table 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	19	-.41	4.01	1.3042	1.37334
HHI	19	.2242	.5951	.385342	.0917275
COM/AWF	19	1.2145	3.1269	2.150877	.4577064
Borrowings	19	6690.1980	39818.6930	1.667891	8.6785747
AWF	19	22382.1050	91750.3850	4.809230	2.1217803
Non-Performing Advances	19	3.2870	16.2190	6.817789	3.4330857
Non-Fund Income	19	19.6450	103.7610	47.846105	24.7710708
Own Funds	19	1757.6900	12390.6470	4626.427737	2.90606
Financial Margin	19	2.1020	3.8630	3.098947	.4747636
Branch Productivity	19	-1.1050	18.7210	6.118105	5.5567448
Employee Productivity	19	10.5180	30.1640	19.326053	4.9252136
Leverage	19	.7592	8.6710	4.854916	2.8048995
GrowthGDP	19	3.88	9.57	7.0142	1.85546
Inflation	19	3.70	13.20	7.4263	3.13561
Valid N (listwise)	19				

ROA has varied in a range of 4.42 with a small standard deviation of 1.3734 and has a mean of 1.30. Highest fluctuations were noticed in case of Non-Fund Income (NFI) as revealed through standard deviation of 24.77 and lowest standard deviation of .091 was noticed for diversification (HHI) Index.

Table 2

Correlation Among Dependent Variables

Pearson Correlation Sig. (2-tailed)	HHI	Cost of Management/ Average working funds	Borrowings	Average Working Funds	Non-Performing Advances	Non-Fund Income	Own Funds	Financial Margin	Branch Productivity	Employee Productivity	Leverage	Growth GDP	Inflation
HHI	1												
Cost of Management/ Average working funds	-.021 .931	1											
Borrowings	.301 .211	-.248 .307	1										
Average Working Funds	-.471* .042	.026 .914	.248 .307	1									
Non-Performing Advances	.012 .961	.360 .130	-.003 .990	-.197 .419	1								
Non-Fund Income	-.388 .101	.348 .145	.254 .294	.656** .002	.344 .150	1							
Own Funds	-.554* .014	-.173 .480	-.155 .527	.766** .000	-.266 .271	.344 .150	1						

Contd.

Contd. Table 2

Financial Margin	-.557*	.265	-.486*	.475*	-.055	.293	.682**	1					
	.013	.273	.035	.040	.822	.223	.001						
Branch Productivity	-.641**	-.437	-.212	.512*	-.397	.110	.822**	.675**	1				
	.003	.061	.384	.025	.092	.655	.000	.002					
Employee Productivity	.040	-.905**	.233	-.119	-.179	-.266	.084	-.373	.291	1			
	.872	.000	.336	.627	.463	.270	.734	.116	.226				
Leverage	.579**	-.116	.643**	-.444	.045	-.253	-.749**	-.890**	-.704**	.171	1		
	.009	.635	.003	.057	.854	.295	.000	.000	.001	.483			
Growth GDP	.279	-.483*	-.014	-.420	-.232	-.571*	-.184	-.146	.078	.547*	.176	1	
	.247	.036	.953	.073	.339	.011	.450	.550	.751	.015	.472		
Inflation	.052	-.235	.320	-.097	-.028	-.088	-.097	-.261	.054	.188	.242	.011	1
	.834	.333	.182	.694	.911	.719	.693	.281	.825	.441	.318	.965	

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).

As can be seen from Table 2, there is high degree of correlation amongst few independent variables. Therefore, we have used forward method of multiple linear regression model to find out the impact of determinants on the bank profitability. Besides the combined effect, study also examined the effect of each factor individually on profitability using linear regression model. Table 3 below gives the results of the regression model applied to examine the factors affecting bank profitability.

Table 3

Factors Affecting Bank Profitability

Independent Variable	R-Square	Coefficient	p-value
HHI	0.456	-10.111	0.000*
Cost of Management / Average Working Funds	0.051	-0.676	0.095***
Borrowings	0.159	-6.308	0.002*
AWF	0.340	3.771	0.009*
NPA	0.164	-0.162	0.002*
NFI	0.023	0.008	0.223
Own Funds	0.695	0.000	0.149
Financial Margin	0.602	2.224	0.001*
Branch Productivity	0.843	0.227	0.673
Employee Productivity	0.007	0.023	0.534
Leverage	0.682	-0.404	0.000*
Growth Rate GDP	0.002	-0.030	0.259
Inflation Rate	0.020	-0.061	0.049**
Overall R-Square	0.957		

*1% level of significance, **5% level of significance, ***10% level of significance

Diversification as measured through Hirschmann-Herfindahl Index is found to be significantly associated @1% level with bank profitability, but the relationship is found to be negative as indicated by negative coefficient of 10.11. Further, R-Square value of 0.456 explains that around 45% of the variation in bank profitability is explained by diversification factor. The results are in consensus with the findings of Acharya *et al.* (2006) for Italian banks, these results are also consistent with the findings of Hadeyan *et al.* (2006) for German banks. It means diversification

into sectoral and industrial segments doesn't guarantee high returns for the cooperative banks.

Operating expenses, measured in terms of ratio of cost of management to average working funds are found to be associated with bank profitability @ 10% significance level. However, the relationship is inverse as indicated by negative coefficient of 0.676. The findings of this study are in contradiction with the findings of Molyneux & Thornton (1992). They observed a positive relationship between the two.

Cooperative banks borrow money mainly from the National Bank for Agriculture and Rural Development (NABARD). Borrowings and Cooperative Banks' profitability relationship is found to be significant @ 1% level of significance. However, negative coefficient (-6.038) indicates that higher the quantum of borrowings, the lower is the banks' ROA.

Bank size (AWF) and Bank profitability are found to be associated @1% level of significance. Positive coefficient (3.77) indicates direct relationship between bank size and its profitability. This finding for cooperative banks is consistent with the findings of studies of Haslem (1968), Short (1979), Bourke (1989), Molyneux and Thornton (1992) Akhavein *et al.* (1997), Smirlock (1985), Demirguc-Kunt and Maksimovic (1998) Bikker and Hu (2002) and Goddard *et al.*(2004), did for other banking segments and countries. Further, R-Square of 34% indicates that 34% of the variation in bank profitability is caused by bank size.

Credit risk is found to be significantly (@1%) and inversely (negative coefficient) associated with ROA. This finding is consistent with the results reported by Bourke (1989). Financial margin is found to have positive (coefficient 2.224) and significant association @1% . R-Square value indicates that more than 60% variation in ROA is explained by financial margin. Leverage here represents the ratio of borrowed funds (i.e. borrowings from NABARD and depositors in the form of deposits of various kinds) to own funds of shareholders(i.e. paid up share capital plus reserves and surplus). It is found that leverage and ROA are associated @1% significance level. Negative coefficient (-0.404) indicates that higher the proportion of borrowed funds in the total capital employed, the lower is the ROA. Rate of Inflation is found to be associated with ROA @ 5% significance level but the relationship is inverse as indicated by negative coefficient of 0.061. Prevailing high rates of inflation are adversely affecting bank profitability.

Present study, could not find any association between quantum of own funds, branch productivity, employee productivity, growth rate of GDP and non-fund income.

R-Square value calculated for the combined effect of all the variables on

ROA found with the help of forward method of linear regression model is 95.6%. It means that more than 95% variation in the ROA is explained by the selected variables.

CONCLUSION AND SUGGESTIONS

Loan portfolio diversification has not helped cooperative banks in increasing their profitability, rather it has adversely effected the ROA of these banks. The reasons for this adverse relationship may be, are the increased cost of loan appraisals and monitoring and increase in credit risk. Cooperative banks should follow focused approach.Expansion of business by entering into new ventures though has not helped these banks but expansion through mergers is expected to generate better benefits as Bank-size and bank profitability are found to be positively associated with each other. The economies of scale might have helped the larger banks to earn better ROA. In the long run, for better returns, managements of DCCBs may think of bank consolidation through mergers.Financial margin is found to be directly associated with ROA. Operating cost and NPA are found to be inversely associated with the ROA. Hence, effort should be made to keep both the operating cost and NPA under check. Borrowings are inversely related with ROA, hence there is a need to reduce dependence on borrowings. More and more funds should be raised either through injection of fresh capital or in the form of deposits. Insignificant association is noticed between independent variable i.e. bank profitability and dependent variables employee productivity, own funds, branch productivity and non-fund income. Amongst the macro economic factors, inverse association is found between rate of inflation prevailing in the economy and bank profitability. Insignificant association is found between growth rate of GDP and bank profitability.

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