CHAPTER 8

CONCLUSION AND SUGGESTIONS

This chapter gives the summary of the important findings of this research study. Based on them, the policy implications are discussed for quantitative and qualitative development of the banking industry in India. Lastly, future areas for research are suggested on the basis of the clues obtained from the analysis.

The main objective of this study was to develop appropriate econometric models for measuring the economies of scale in the Indian Banking Industry. These models are based on cost function and profit function approaches to economies of scale, drawn from the available literature and adjusted for the Indian banking industry. These models have been estimated using both, time-series and cross-sectional data. The time-series analysis is undertaken for seventeen years (1970-86) seperately for the industry and the three bank groups:

1. Banking Industry (All Commercial Banks)
2. SBI Group
3. Nationalised Bank Group
4. Indian Private Sector Bank Group

The cross-sectional analysis relates to twenty eight public sector banks. The average of three years (1985-87) has been used for quantifying the variables for this purpose.

8.1 SUMMARY OF FINDINGS

8.1.1 Cost Function Analysis

The cost function used in the study is :

$$C = f(Q, Qm, TB, RB)$$

Where, C is cost, defined as total current expenses net of interest expenses. The establishment expenses in the time-series analysis, is also used besides the total cost as a dependent variable for finding out the source of economies/diseconomies of scale. Q is output variable defined in five alternative ways: 1) Volume of Business (VB) (2) Total Assets (TA) (3) Earning Assets (EA) (4) Total Deposits (TD) and (5) Total Operating Earnings (TOE). The reason behind trying different output variables are two fold: firstly, to examine the sensitivity of output variable used in the cost equation to elasticity results and secondly, to find out the most appropriate output variable for the banking industry. Qms are output-mix variables included in the cost functions to net out the effects of changes in bank output composition on costs. These variables are derived as percentage share of output components to respective total output. The total number of branches (TB) and the ratio of rural branches to total branches (RB) are the other two explanatory variables included in the cost model.

In the cross section analysis, the establishment expenses and non-labour expenses are used as two more dependent variables, in addition to total current expenses, for finding out the source of economies/diseconomies of scale for each sample bank. Further,

total number of branches (TB) is introduced as the sixth output variable besides the five output variable used in the time-series analysis.

Four functional forms (cubic, quadratic, linear and double-log) have been tried for estimating the cost functions and the best-fit functional form is selected for finding out the shapes of the cost curves.

The best-fit equation for different sample data is selected, both on the basis of economic theory and statistical inferences. Then, the selected cost equations are used to find out the relationships between the dependent and the independent variables. Finally, cost elasticities of output have been calculated to find out the economies/diseconomies of scale.

The main findings of the time-series analysis are:

1.   With four bank groups and five different output variables, there are in all twenty best-fit total cost equations. Out of these twenty cost equations, eleven are cubic, eight are linear and one is double-log in functional form. Thus, in the Indian banking industry, there is predominance of U shaped average and marginal cost curves. Further, for a given bank group, in majority of the cases, the cubic cost equations are statistically more significant then other best-fit cost equations.

2. Total assets (TA) turned out to be the most appropriate output (or size) variable for the banking industry in India. This finding assumes special significance in view of the wagging controversy on the uniform bank output measure in research work all over the world.

3. Cost elasiticity results are not found to be sensitive to the output measure used in the cost equations. The elasticity results of both,TA and surrogative measure(used for policy implications) are more or less the same.

4. Total number of branches (TB) has emerged as an important explanatory variable affecting cost, as this variable is listed in seventeen out of twenty total cost equations.

5. The ratio of rural branches to total branches (TB), has significant influence over the total cost in the case of Indian banking industry and the SBI group.

The findings of cross-sectional study are:

1. The estimated cost equations with all the cost components and output variables are found to be statistically very significant with high level of $\overline{R}^2$.

2. Fifteen out of total eighteen best-fit cost equations are cubic in functional form, indicating the presence of U shaped AC and MC curves.

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3. Total Assets (TA) has turned out to be the best output variable for Indian banks, endorsing the findings from time-series analysis.

4. Output-mix variables, included in the cost function, are not having significant influence over either of the cost components.

5. Elasticity results are found to be sensitive to the output measure used. Hence, for policy inference, surrogative value of all the elasticities has been used. The elasticity results from surrogative measure are very similar to the elasticity results with total asset as output variable.

6. None of the total cost equations listed TB and RB variables. However, in the case of labour cost, TB variable is listed in all the cost equations with positive sign to its coefficients and RB has emerged as an important independent variable listed in five cost equations with negative signs to its coefficients.

8.1.2. Profit Function Analysis

The profit function estimated is :

p = f (Pi, Qj, Zk,R1,Sm)

where

p = Profit
Pi = Input Prices (i = 1,2,3)
Qj = Output Prices (j=1,2,3)
Zk = Fixed factors of production (k=1,2)
R1 = Risk factors (1=1,2,3)
Sm = Social banking factors (m=1,2,)

The profit function mentioned above is an improvement over the ones found in the literature. We tried the above risk and social banking adjusted profit function in addition to three functions, namely, the conventional; $p = f(P_i, Q_j, Z_k)$, risk-adjusted; $p = f(P_i, Q_j, Z_k, R_l)$ and social banking factor adjusted; $p = f(P_i, Q_j, Z_k, S_m)$ profit functions. The estimated best-fit equation from each type of profit function was chosen for the analysis. The double-log functional form was used for the estimation.

The main findings of the estimated profit functions are -

1. For all the equations, both time-series and cross-sectional, except the one for the banking industry (All Commercial Bank Group) equations, the risk-adjusted profit function has given the best results. The social banking factors do not have significant listing in the estimated profit functions in the case of bank groups. However, in the case of the banking industry the risk and social banking adjusted profit function has given the best results. As the regional rural banks (RRBs), which are more involved in social banking, are included at the industry level, the influence of social banking factors on bank profits can be easily explained. On the whole, our findings suggest that the most important factor influencing bank profitablity is the portfolio management of the bank as revealed by the listing of the risk variables in the estimated profit models.

2.   Out of two alternative sets of fixed factors of
      production included in the profit functions, the set with
      total number of branches (Z1) and total deposits per
      branch (Z3) gives better results than the set with Z1 and
      fixed assets per branch (Z2).

3.   The theoretical basis of the profit function assumes that
      firms are price takers both, in the output and input
      markets. However, our analysis shows that in some cases,
      the estimated coefficients either fail to confirm in sign
      to 'a priori' specifications and/or turn out to be
      statistically insignificant. This finding is consistent
      with the finding of Mullineaux (1978) that banks are not
      always price takers in these markets.

4.   The fixed factors of production, according to 'a priori'
      specifications, should give positive coefficients and in
      the Cobb-Douglas functional form, the sum of these
      coefficients indicate the presence/absence of economies
      of scale. All the estimated profit function results
      confirm these 'a priori' specifications. However, in the
      case of SBI bank-group (time-series data), the fixed
      factors of production Z2 and Z3 have negative and
      fluctuating values of coefficients in repeatative
      exercises. Hence, in the final analysis, these two
      factors of production (Z2 and Z3) were dropped and Z1
      alone was used as a fixed factor of production.

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8.2 MAIN RECOMMENDATIONS BASED ON THE ELASTICITY RESULTS

8.2.1 At the System Level

1. The Indian commercial banking industry is enjoying the eco nomies of scale and hence, regulators can pursue policies leading to the expansion of output. On the other hand, as branch diseconomies are observed, overall contraction in number of branches is desirable. Further, only rural branches are found to be economical and hence, the share of rural branches may be increased in the total branch network. The labour cost is found to be marginally economical.

2. In the case of SBI and its subsidiaries, the diseconomies of scale prevail and hence, there is a need for overall reduction in the output level.The main source of diseconomies of scale is in the non-labour component, indicating the need for economising on the non-labour costs. Further, branch economies are noticed, suggesting the expansion of branches. However, as rural branches are not found to be economical, only the net-work of non-rural branches could be expanded. It may be noticed that SBI was made to carry the main burden of opening rural branches right from its inception.

3. The nationalised bank group analysis indicates scope for expansion of business and contraction of branch net-work. In view of this, it is recommended that the thrust of

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growth of business in future should be the responsibility of the nationalised bank group only.

4.   Indian private sector banks are operating at the optimum capacity. However, marginal scope for branch expansion exists for economising on costs.

8.2.2   At Bank Level

1.   Out of the total twenty eight public sector banks, eleven have economies of scale and the same number of banks have diseconomies of scale and the remaining six banks have reached the optimality point.

2.   The eleven banks, which are enjoying the economies of scale in total cost, are enjoying the economies of scale in both, labour and non-labour cost (except for United Bank of India) too. All these banks belong to nationalised bank group.

Out of these eleven banks, seven mentioned below, are enjoying branch economies too:

1.   Bank of Baroda
2.   Bank of India
3.   Canara Bank
4.   Indian Bank
5.   Indian Overseas Bank
6.   Syndicate Bank
7.   United Bank of India

These banks are ideal for launching all out programmes for expansion, both, in terms of branches and business turnover. Hence, they should be preferred for granting new branch opening licenses by the Reserve Bank of India.

However, the remaining four banks, enjoying economies of scale, are suffering from branch diseconomies. They are:

1. Central Bank of India
2. Punjab National Bank
3. Union Bank of India
4. United Commercial Bank

The policies of these banks should be tuned for increasing the output and reducing the branch network with ultimate objective of optimizing the cost allocation.

3. The eleven banks are found to be suffering from diseconomies of scale and hence, they should follow a policy of consolidation of bussiness. The source of diseconomies of scale in all these banks is the major cost component, non-labour cost. Thus, these banks should economise on labour expenses. The labour cost is showing economies of scale in all these eleven banks except the State Bank of India (SBI). Therefore, SBI should pursue the policy of economising on the wage bill too.

Seven of these eleven banks, mentioned below, enjoy branch economies:

1. Corporation Bank
2. New Bank of India
3. Oriental Bank of Commerce
4. Punjab & Sind Bank
5. State Bank of Indore
6. State Bank of Patiala
7. State Bank of Travancore

These banks mentioned above, need to contract their total output and expand the number of branches. The new branches would be advised to take-over business of

neighbouring branches to start with.

The remaining four banks in this group listed below are suffering from both, the diseconomies of scale as well as branch:

1. Allahabad Bank
2. Andra Bank
3. Bank of Maharashtra
4. State Bank of India

These banks need to embark on a total consolidation programme.

4. Only six banks out of the twenty eight public sector banks are operating at the optimum capacity. They are :

1. Dena Bank
2. State Bank of Bikaner and Jaipur
3. State Bank of Hyderabad
4. State Bank of Mysore
5. State Bank of Saurashtra
6. Vijya Bank

These banks are found to be enjoying economies of scale in labour cost and diseconomies of scale in non-labour cost. Therefore, they need to control the inefficient use of non-labour factors for bringing about the reduction in non-labour cost.

Further, these banks (except Dena Bank) are enjoying branch economies. Therefore, these six banks with optimality should increase their branch network and transfer some business from heavily loaded branches to the newly opened ones. Dena Bank is suffering from very marginal branch diseconomies.

The policy prescriptions mentioned above, if accepted, will surely help the ailing Indian banking industry to become viable in near future.

8.3 Areas For Future Research

Two major findings of this research, firstly, the AC and MC curves of banking industry usually take the U shape and secondly, total assets is the best measure of banking output, will be highly time saving for future research in the area of economies of scale in Indian banking, using the cost function approach.

A study of the comparative behaviour of cost curves and the economies of scale in the banking industry, in the pre and post bank nationalisation period, will make an interesting research proposal.

The equity and risk adjusted profit model, used for empirical testing in this work, need to be tested using different data sets from other developing countries for establishing its wider applicability.