Banking sector in India: An Empirical study

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ABSTRACT

This study analyzes the cost efficiencies of 35 Indian commercial banks over the Period 2007 to 2013. We use Trans log cost function to evaluate economies of scale in the Indian banking sector. Trans log cost function is estimated for total cost, Operating cost, non-operating cost, interest expenses, and employee cost. We estimate cost efficiencies with respect to output and output is defined in three different ways--total assets, total deposits, and total loans of Indian banks. Estimates of cost elasticity show that Indian commercial banks are reaping economies of scale With respect to total assets, total deposits, and total loans, because with every rupee Increase in assets or deposits or loans, cost is rising less than proportionately. We also find that ownership structure of a bank (public sector or private sector) plays arole in determining cost efficiencies in the Indian banking industry.

 INTRODUCTION

The banking industry in India has come a long way from the nationalization of its banks in 1969 to the liberalization of the financial system since 1991. During the reform process that started in1991,the banking sector was opened up with the objective of improving the efficiency of the banking system in India through increased competition from private and foreign banks. With this view, the government initiated the process of removing interest rate controls. The government also introduced capital adequacy requirements and other safety norms
to ensure a sound banking system. The objective is to strengthen banking supervision and increase competition through licensing of private banks and foreign banks.The ultimate goal is to integrate Indian banks into the global financial system.Although the amount of assets and deposits managed by the Indian banking Industry has increased several folds, empirical research on economies of scale and Cost efficiencies in the Indian banking industry is still limited. The issue of Economies of scale and cost efficiencies in the banking industry is important for Several reasons:-

Firstly, the Indian economy is the second fastest growing economy in the World after China. Since these nations represent an engine of growth for the world economy, a large amount of capital is flowing to the stock markets of these nations.

Banks, as financial intermediaries, are playing a crucial role by bringing enhanced Liquidity and promoting market efficiency by facilitating smooth transfer of funds Between borrowers and lenders that will promote capital mobility among nations. A sound and efficient banking system is essential for a smooth integration of in financial markets with the rest of the world,

because banks play a crucial role in facilitating transfer of funds between borrowers and lenders. Therefore, the size of the banking system is bound to grow further.

Secondly, previous studies show that a country's financial sector influences future economic growth.The banking sector is the most important part of the financial markets. If the Indian banking sector is sound and efficient, it will have a positive impact on India's growth.

Thirdly, we examine the cost efficiencies of Indian commercial banks during The period 2007 to 2013. This time period covers "before-crisis" and "after-crisis"time. Findings from this study will highlight the cost behavior of the Indian banking sector during and after the global financial crisis. This study will also help the banking industry as well as regulatory agencies Such as the Reserve Bank of India (RBI) get a better understanding of the impact of growth of a bank on a bank's expenses and its benefits to bank shareholders in the form of higher returns and increased shareholder wealth.

We distinguish our study from previous studies in two ways. We distinguish our
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 Firstly, this study provides a more comprehensive view of the cost efficiencies in the Indian banking sector. Cost efficiency studies require specifications of input and output variables. This study evaluates cost efficiencies by studying economies of scale not only in total cost, but also in each component of the total cost. Specifically, we evaluate economies of scale in operating cost, non-operating cost, interest expenses, and employee cost. By studying each component of the total cost, we will be able to identify the source of cost efficiencies in total cost. Furthermore, we estimate cost efficiencies with respect to output and output is defined in three different ways--total assets, total deposits, and total loans.

Secondly, this study covers the period of the global financial meltdown and We evaluate the cost efficiencies of the Indian banks during and after this meltdown. This paper has six sections. Section II provides a discussion of previous Research related to this topic. Section III briefly describes our data. Section IV Describes our methodology and gives information on banks used in this study.
SectionV presents our empirical results. Section VI gives our conclusions.

II. PREVIOUS RESEARCH

Several studies have examined economies of scale in the banking industry. Edirisuriya and O'Brien (2001) studied economies of scale for Australian banks after Financial deregulation. They found evidence of economies of scale and scope in four Major Australian banks. Toby (2006) reviewed previous studies on economies of Scale in the banking industry and concludes that smaller banks are more efficient in Comparison to larger banks in most countries. Stimpert and Laux (2011) reported that while costs decline and profitability increases as bank size increases, these relationships do not hold indefinitely and diseconomies of scale are experienced by larger banks. When size is measured by total assets,

larger banks begin to encounter lower levels of net income, but the very largest banks are able to enjoy net income that increases at an increasing rate as size increases. When size is measured by total deposits, net income increases at an increasing rate for a wide range of bank sizes and only begins to decrease for the largest banks. McNulty (2000) measured economies of scale for six large Canadian banks. He reported economies scale in Canadian banking industry due to technological and regulatory changes. Margono And Sharma (2010) estimated cost efficiency, economies of scale, technological progress, and productivity growth among Indonesian banks from 1993 to 2000. They found that average cost efficiency for the banking sector over this period was 70%. They also reported a marked difference in cost efficiency before and after the Asian economic crisis. The banking sector cost efficiency was 80% prior to the crisis And 53% after the crisis. Moreover, results indicated that private-owned banks and Joint venture/foreign banks were more efficient than public-owned banks. . Kasman (2005) examined the cost efficiency and scale economies of banks Operating in Poland and the Czech Republic during the period from 1995 to 2000. They found that Polish banks are, on average, more efficient than Czech banks. The Study also suggested that foreign banks operating in the Czech banking sector had Significantly higher efficiency levels than those of domestic banks.   He found that often a Bank is operating in the region of diminishing returns to scale ut is not a candidate
For break up.

III DATA

Data covers the fiscal year ending March 31st 2007 to March 31st 2013. The Data sample consists of 20 state owned banks and 15 private sector banks for each year in the sample except for 2012 and 2013. In 2012 and 2013, we have 14 private sector banks. Operating expenses have increased by 120 percent (108 percent for Public sector banks and 144 percent for private sector banks);Non-operating expenses have increased by 279 percent (279 percent for public sector banks and 259 percent for private sector banks);Interest cost that represents of cost of funds for banks has gone up by 280 percent (280 percent for public sector banks and 261 percent for private sector banks); Employee cost has gone up by 165 percent (140 for public sector banks and 265 percent for private sector banks); total assets have increased by 196 percent (192 percent for public sector banks and 191 percent for private sector banks); Total deposits have gone up by 195 percent (196 percent for public Sector banks and 174 percent for private sector banks), and   Loans have gone up by 215 percent (218 percent for public sector banks and 200 percent for private sector banks).   Thus, there is more thanproportionate increase in total expenses relative to assets, deposits, and loans. Most of the increase in total expenses is due to increase in non-operating expenses that have gone up by 279 percent during the period 2007 to 2013. Operating expenses, on an average, show a lower percentage increase Relative to increase in assets, deposits, and loans . Public sector banks also show a relatively higher increase in total a deposits, and loans in comparison to private sector banks.

Employee cost has gone up significantly more for private sector banks in Comparison to public sector banks during the eight year period of 2007 to 2013.

IV METHODOLOGY

Our methodology involves estimation of the coefficients of a translog cost function to determine which factors ontribute to economies of scale and their Degree of contribution. We then estimate cost elasticity with respect to the amount Of assets using the first derivative of the translog cost function. Cost elasticity is Estimated for the total sample for each year and for subsets of the annual samples.

The subsets are created according to ownership of the bank. In order to investigate economies of scale in banks, we use a two-part methodology. The first part is an estimation of coefficients for a translog cost function to determine which factors contribute to economies of scale and the extent to which they contribute for each of the eight years in the period 2007 to 2013. We estimate economies of scale for total expenses of a bank and also with respect to each component of the total expenses, namely operating expenses, non-operating expenses, interest expense (cost of funds), and employee cost. The second part is an estimation of coefficients for a translog cost function using the panel data approach. The panel data approach allows for pooling of observations on a cross-section of banks over eight years. When observations possess the double dimension (cross section and time series), the crucial aspect of the problem is to have a clear understanding of how differences in behavior across individuals and/or through time could and should be modeled. A panel data set offers several econometric benefits over traditional pure cross section or pure time series data sets. The most obvious advantage is that the number of observations is typically much larger in panel data, which will produce more reliable parameter estimates and, thus, enable us to test the robustness of our linear regression results. Panel data also alleviates the problem of multicollinearity, because when the explanatory variables vary in two dimensions (cross-section and time series), they are less likely to be highly correlated. Panel data sets make it possible to identify and measure effects that cannot be detected in pure cross section or time series data. For instance, sometimes it is argued that cross section data reflect short-run behavior, while time series data emphasize long-run effects. By combining the cross-section and time series features of a data set, a more general and comprehensive dynamic structure can be formulated and estimated. The use of panel data suggests that individuals, firms, states, or countries are heterogeneous (Balestra 1995). Time series and cross-section studies not controlling for this heterogeneity run the risk of obtaining biased results (Baltagi 2000). Panel data controls for individual heterogeneity. The most intuitive way to account for individual and/or time differences in the context of panel data regression is to use the fixed effects model. The fixed effect model assumes that difference across banks can be captured in differences in the constant term.

V EMPIRICAL RESULTS

The regression coefficients (the slope parameters) across groups in this model are Unknown, but fixed parameters. It is also known as the least square dummy variable (LSDV) model and we use the LSDV fixed-effect model to estimate cost efficiencies in the Indian banking industry In financial economics, the translog model is the most pervasive approach for Investigating economies of scale.3 The translog cost model implicitly assumes a U-Shaped

average cost function. It is used here because it allows economies of scale to vary with level of bank assets.

The estimation of scale economies with a translog cost function requires cost And output measures. For the banking industry, the output in this paper has been defined in three different ways:

Total assets

Total deposits

Loans

Total cost of each bank is defined as the total expenses of operating its banks, including its management fee. A bank's total expense is modeled as a function of total assets and control variables that affect level of expenses. We use translog cost function to estimate economies of scale in the Indian banking industry. Ordinary least squares (OLS) regression is used to find coefficients of the independent variables. Equations 1a to 1c show the translog cost functions to estimate economies of scale for the Indian banks (See Latzko, 1999).

$$\text{Ln COST} = \text{ß0} + \text{ß1 ln ASSETS} + \tfrac{1}{2}\,\text{ß2(ln ASSETS)2} + \text{j ßjXj} + \text{e} \quad (1a)$$
$$\text{Ln COST} = \text{ß0} + \text{ß1 ln DEPOSITS} + \tfrac{1}{2}\,\text{ß2(ln DEPOSITS)2} + \text{j ßjXj} + \text{e} \quad (1b)$$
$$\text{Ln COST} = \text{ß0} + \text{ß1 ln LOANS} + \tfrac{1}{2}\,\text{ß2(ln LOANS)2} + \text{j ßjXj} + \text{e} \quad (1c)$$

In the translog function, definition of COST depends on the input variable with respect to which we are computing economies of scale. Therefore, cost can be the dollar amount of a bank's total expenses, operating expenses, non-operating expenses, total interest expenses, and employee cost. In Equation 1a, ASSETS represent the total assets under management at a thrift company. Equation 1b shows the translog cost function to estimate economies of scale with reference to total deposits of a bank. Equation 1c shows the translog cost function to estimate economies of scale with reference to loans made by banks.

Xj includes control factors that affect the costs of management and administration of a bank. In equation 1a, we do not use any control variables. In equation 1b and 1c, we use size of the bank as measured by total assets as control variables.

VI SUMMARY AND CONCLUSIONS

India started the process of economic reforms and opened up its banking Sector in 1991. The goal was to improve the efficiency of the Indian banking sector with an aim to integrate into the global financial sector. This study analyzed the cost Efficiencies of Indian commercial banks over the period 2007 to 2013. We used the translog cost function to evaluate economies of scale in the Indian banking sector. The translog cost function was estimated for total cost as well as for each component of total cost, namely operating cost, non-operating cost, interest expenses, and employee cost. We estimated cost efficiencies with respect to output and output was defined in three different manners--total assets, total deposits, and total loans. Estimates of cost elasticity showed that Indian commercial banks are reaping

economies of scale when output is measured in terms of total assets of a bank. This study showed that total cost increases less than proportionately to increase in assets, which points to economies of scale with reference to assets. This study also found evidence of cost efficiencies in operating expenses, non-operating expenses, interest expenses, and employee cost when the size of the bank as measured by total assets rises.

When output is measured in terms of total deposits and total loans, Indian Banks continue to enjoy cost efficiencies with less than proportionate increases in Total expenses, operating expenses, non-operating expenses, interest expense, and Employee cost with every rupee increase in total deposits.

Results also show that ownership structure of a bank plays a role in Determining cost efficiencies in the Indian banking industry. The study found that Private sector banks spend less on employee cost for every rupee increase in assets, Which points to higher efficiency or productivity for private sector employees.

When output is measured in terms of deposits, public sector banks enjoy higher cost efficiencies in total expenses, non-operating costs, interest expenses, and employee costs. For every rupee increase in deposits, public sector banks spend less in comparison to private sector banks. Public sector banks have branches all over India including rural India and it is easier for them get deposits in comparison to private sector banks.

REFERENCES

1. Allen, J., & Liu, Y. 2007, "Efficiency and Economies of Scale of Large Canadian Banks." The Canadian Journal of Economics, 40, 225-244.

2. Arrow, K., H. Chenery, B. Minhas, and R. Solow, 1961, "Capital-Labor Substitution And Economic Efficiency." Review of Economics and Statistics, 45, 225-247.

3. Altunbas, Y. and P. Molyneuz, 1996, "Economies of Scale and Scope in European Banking." Applied Financial Economics, 6, 367-375.

4. Balestra, P., 1995, "Introduction to Linear Models for Panel Data." The Econometrics of Panel Data—A Handbook of the Theory with Applications, edited by László Mátyás and Patrick Sevestre, Kluwer Academic Publishers.

5. Altagi, B., 2000, Econometric Analysis of Panel Data, John Wiley and Sons,England.

6. Bers, M. and T. Springer, 1997,"Economies of Scale for Real Estate Investmen Trusts." Journal of Real Estate Research, 14, 275-290.

7. Clark, J. and P. Speaker, 1994, "Economies of Scale and Scope in Banking: Evidence From a Generalized Translog Cost Function." Quarterly Journal of Business And Economics, 33, 3- 25.

8. Das,A., & S. Das, 2007. "Scale Economies, Cost Complemet Technical Progress in Indian Banking: Evidence from Fourier Flexibal Function aermine, J. and L. Roller, 1992, "Economies of Scope and Scale in French Mutual Funds." Journal of Financial Intermediation, 2, 83-93 .

9. Drake, L., 1992, "Economies of Scale And Scope in UK Building Societies: An   Application of the Translog Multiproduct Cost." Applied Financial Economics, 2, 211-219.

10. Edirisuriya, P., and G.O'Brien, 2001, "Financial Deregulation and

    Economies of Scale and Scope: Evidence from the Major Australian Banks." Asia –Pacific Financial Markets, 8, 197-197.

11. Goldberg, L., G. Hanweck, M. Keenan, and A. Young, 1991, "Economies of Scale and Scope in the Securities Industry." Journal of Banking and Finance, 15, 91-107.

12. Kasman, A., 2005, "Efficiency and Scale Economies in Transition Economies: Evidence from Poland and the Czech Republic." Emerging Markets, Finance & Trade, 41, 60-81 .

13.   Kmenta, J., 1967,"On estimation of the CES production function." International Economic Review , 8, 180-189.

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