Nexus between Non-Performing Assets and Productivity Change in Scheduled Commercial Banks in India: DEA-Based Malmquist Productivity Analysis with Bootstrapping

Amarjit Singh Sethi
Guru Nanak Dev University, Amritsar
ajss.gndu@gmail.com

Anu Bajaj
Assistant Professor, Department of Economics, JC DAV College, Dasuya

Since 1992-93, India has gone in for a radical restructuring of its financial sector by way of liberalisation and deregulation. Due to a series of financial sector reforms, competition and flexibility among the Indian banks has drastically increased, thereby affecting their efficiency and productivity. But, at the same time, Indian banks have been infested with precariously high levels of Non Performing Assets (NPAs), owing primarily to Global Financial Crisis; large-scale frauds & scams; etc. In fact, NPAs are viewed as financial pollutants, inducing ill-effects for both economic development and social welfare. Since the Indian banking system has been reeling under the incidence of alarming extent of NPAs, it therefore makes sense to gauge as to through what extent do such assets affect productivity of the banks. Consequently, an attempt was made in this paper to examine connectivity, if any, between volume of bad loans and different measures of productivity of the Indian Scheduled Commercial Banks (SCBs). It was primarily an empirical investigation, for which time series information (for 17 years from 1995-96 to 2011-12) on a number of both bank-specific and macro-economic indicators in respect of 65 SCBs (constituted by 26 public sector, 18 private and 21 foreign banks) was compiled through various secondary sources. For measuring banks' productivity and its break-up (in the panel data frame work), we have considered three inputs: fixed assets, number of employees and loanable funds and two outputs: net interest income and non-interest income. Following Caves et al. (1982), DEA-based Malmquist productivity index (MPI) between time period t and t + 1 was defined as geometric mean of the distance functions. For computing MPI and carrying out its decomposition at various points in time, we have resorted to the input oriented (i.e., cost minimisation) approach through the use of FEAR package (Wilson, 2010). Following Fare et al. (1994), MPI was fragmented into (i) Pure Efficiency, reflecting improvement via managerial skills; (ii) Scale Efficiency, reflecting improvement via augmentation in size of the set-up; and (iii) Technical Efficiency, reflecting improvement via technological upgradation.

The FEAR package was suitably adapted by the senior author of this paper in R-language. Through the package, 95% bootstrap confidence limits of each of the break ups were also

computed, which enabled us to identify the banks having experienced significant changes in productivity. It may be clarified that as per the cost minimisation approach adopted, upper bootstrap limit falling below unity would indicate a significant reduction in the volume of inputs required to produce a given level of outputs (thereby implying a significant improvement in productivity). On the other hand, lower bootstrap limit exceeding unity would imply that there has been a significant increase in the inputs required for achieving a given level of outputs (and thus there has been significant productivity regress). And, the bootstrap limits enclosing the value of unity would amount to saying that there has neither been any improvement nor regress in the productivity during the two points in time (Lothgren and Tambour, 1999). The analysis was performed in respect of each of the successive points in time. The computations were also made by viewing the entire data span (from 1996 to 2012) as sub-divided into two periods: 2008 versus 1996; and 2012 versus 2008. Further, the analysis was carried out separately for each of the three types of the SCBs and then for all the banks taken together. Pooling of the values of the indexes and their decomposition was done through geometric mean. Finally, nexus, if any, between NPAs and different breakups of productivity was assessed through panel-data based multiple linear regression analysis.

As regards the main findings, productivity pattern differed grossly among different types of banks, as also over different spans of time. Within public sector category, IDBI was the lone bank having shown productivity improvement during 2008 versus 1996. During 2012 versus 2008, however, two of the banks, viz. Punjab & Sind Bank and State Bank of Patiala had registered productivity improvement. And during the entire span (2012 versus 1996), again just two banks (viz. State Bank of Mysore and State Bank of Patiala) experienced productivity improvement. Notably, a large majority of the public sector banks experienced productivity regress. The productivity deterioration occurred primarily due to technical inefficiency in the first span (2008 versus 1996) and scale inefficiency in the second span (2012 versus 2008). In private banks, no productivity change could be noticed. Among foreign banks, Deutsche Bank faced productivity regress, whereas Sonali Bank enjoyed productivity improvement. In fact, foreign banks experienced a gross reshuffling in their productivity performance. We could thus say that it was the foreign banks which have witnessed productivity shock relatively largely by way of Global Financial Crisis.

As regards the nexus between volume of NPAs and different measures of productivity, there existed a very strong and direct association between NPAs, on one hand, and each of Malmquist Productivity Index (MALM) and Technical Efficiency (TEFF), on the other. Since, with the input-oriented approach adopted, smaller the values of the indexes, better would be the productivity, and vice versa. Thus, as per findings from the analysis, with a rise in the level of NPAs, each of MALM and TEFF would suffer adversely. Consequently, from policy perspective, we may say that in the light of the findings on adverse effect of rising NPAs on aggregated productivity, in general, and technical efficiency, in

particular, earnest efforts need be made to bring down the ever-rising level of NPAs, specifically among public sector banks. For social security reasons, adoption of the practice of loan waivers could be fine, but the same needs be done in a judicious manner (in respect of economically backward cohort of the people). However, if such loan waivers are motivated by populist background, then there is every reason to apprehend that our banking system would become sick.