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ABSTRACT

The present study attempts to estimate both partial factor productivity (PFP) and total factor productivity (TFP) at industry as well as firm levels in iron-steel and cement industries in India during the post-reform period from 1991-92 to 2012-13. The study also considers the inter-temporal changes in productivity growth into sub-periods, namely, 1991-92 to 2001-02 and 2002-03 to 2012-13. The study also attempts to examine the impact of trade-liberalization (measured as decline in input-tariffs, output-tariffs, effective rate of protection (ERP) and increase in trade openness) and other determinants viz. real effective exchange rate (REER), interest rate (IR), inflation rate (INFL) and construction sector growth rate (CSGR) on industry as well as firm level productivity (TFP) in both industries during the post-reform period from 1991-92 to 2012-13.

Research Methodology:

The industry level data has been taken from Annual Survey of Industries (various issues) and firm level data has been taken from CMIE-Prowess database. The industry level TFP has been estimated using Malmquist Productivity Index and firm level productivity has been estimated using Levvinsohn-Petrin approach. The firm level productivity growth has been estimated under balanced and unbalanced panels separately. The sample size for iron-steel industry is 25 and 210 firms with 550 and 2596 number of observations in balanced and unbalanced panels respectively while 15 and 44 firms with 330 and 755 number of observations in balanced and unbalanced panels respectively. Further, the firm level productivity growth in iron-steel industry has been estimated under four categories viz. aggregate level, according to size of firms, according to industry groups and according to ownership while in cement industry under two categories viz. aggregate level and according to size of firms.

Major Findings:

The iron-steel industry has reasonably performed well during the period of the study with output growth rate of 7.82%. The industry has also shown the increasing trends in consumption and trade of major iron-steel products. The PFP growth at industry level has shown increasing trends in respect of labour, capital and energy, declining trend in services and almost stagnant for raw materials. While the PFP growth trends at firm level are different in balanced and unbalanced panels. Industry level TFP growth has been positive (1.4%) during 1991-92 to 2012-13, however, it has significantly declined and became negative in sub-period 2. The MPI analysis shows that positive growth is attributed to technology adoption. On the other hand, firm level TFP growth rate has been found to be positive (0.20%) for the entire period in case of balanced panel, while it is observed to be negative (-0.11%) in case of unbalanced panel. The TFP growth under various categories has been found varying among the various heads of a category as well as between balanced and unbalanced panels.

The cement industry has also experienced significant growth in output (7.57%) during the period of the study. But in contrast to iron-steel industry, the cement industry has witnessed negative TFP growth (-0.70%) during 1991-92 to 2012-13. Like the iron-steel industry, the cement industry also has not experienced any change in technical efficiency and productivity growth is attributed to technology adoption. The firm level TFP growth rate is found to be negative in both balanced and unbalanced panels during 1991-92 to 2012-13.

The impact of trade liberalization and other economic measures has been examined using standard regression models (Ordinary Least Square, Pooled-OLS, Fixed and Random Effects, Generalized Least Square Regression and Arellano-Bond Estimator). The analysis has shown that trade liberalization program i.e. decline in tariff rates and opening up Indian economy for the foreign trade as well as decline in IR and INFL and increase in CSGR have significant positive impact on industry as well as firm level productivity of both iron-steel and cement industries in India during the post-reform period from 1991-92 to 2012-13.