عنوان مقاله:

Measuring Productivity: application of data envelopment analysis and Malmquist Index

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خلاصه مقاله:

The purpose of this paper is to develop an output oriented methodology with both constant return to scale (CRS) and variable return to scale (VRS) assumptions for measuring productivity growth using data envelopment analysis (DEA) and malmquist productivity index (MPI). In this regard, we have used the double frontier (optimistic and pessimistic points of view) DEA simultaneously for two-stage processes. The MPIs measured from the two different DEA points of view reflects the productivity growth of decision making units (DMUs) over time more truly and more comprehensively than the traditional optimistic DEA-based MPI. This approach considers not only the optimistic technical efficiency changes of DMUs but also their pessimistic technical efficiency changes, and not only the shifts of efficiency frontiers but also the movements of inefficiency frontiers. Hence, it is more comprehensive and realistic than the traditional optimistic DEA-based MPI. The MPI values measured from the pessimistic DEA point of view, together with those from the optimistic DEA point of view, provide a panoramic view of the productivity changes over time. The proposed DEA-based MPI can be easily extended to the global MPI and measures the optimistic efficiencies with a unified efficiency frontier and the pessimistic efficiencies with a unified inefficiency frontier for time periods t and t + 1.

کلمات کلیدی:

Data envelopment analysis, Malmquist productivity index

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