

**Generating new Families of Total Factor Productivity Malmquist Indexes  
based on a new Family of Quasi-proportional Directional Distance  
Functions.**

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**Abstract.** Based on the recently developed Multiplicative Inefficiency Measure for the proportional Directional Distance Function (pDDF), by Pastor et al. (2018), we proposed hereby the corresponding extension to a new defined family of “quasi-proportional” Directional Distance Functions (qpDDFs). Considering any qpDDF, a new definition of three Malmquist indexes is provided, which end up being Total Factor Productivity (TFP) indexes. Additionally, a new decomposition of each Malmquist index is proposed that breaks down productivity change into the ratio of two components, productivity change due to output change in the numerator and productivity change due to input change in the denominator.

**Keywords.** Quasi-proportional Directional Distance Functions, Multiplicative Inefficiency Measure, Malmquist total factor productivity index, Data Envelopment Analysis.

**JEL Codes.** C43, C61, O33