

## Total Factor Productivity and Technical Efficiency in Turkey: A Stochastic Frontier Analysis

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### Abstract:

The aim of this study is to examine total factor productivity (TFP) change and technical efficiency (TE) of manufacturing and services industries in Turkey using firm level panel data obtained from Annual Industry and Service Statistics over the period 2005-2015. Firms in our sample are classified according to NACE Rev.2 criteria and 14 manufacturing and 9 services industries are defined. Stochastic frontier model with four error component which separates persistent and transient inefficiency from unobserved firm heterogeneity is utilized to estimate technical efficiency of firms with 20 and more employees. TFP change is decomposed into technical change, technical efficiency change, scale change and allocative efficiency change for each industry. Comparison with different stochastic frontier models shows that TE and TFP are sensitive to model specifications and firm heterogeneity has a significant effect on inefficiency estimates. Results indicate that TE and TFP change vary across industries and exhibit volatility. Findings also suggest that industries experienced a fall in technical efficiency during the 2008 crisis.

**Keywords:** manufacturing; service; stochastic frontier analysis; technical efficiency; total factor productivity

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