

CIFREM SEMINARS

THE SHAPE OF AGGREGATE PRODUCTION FUNCTIONS: EVIDENCE FROM ESTIMATES OF THE WORLD TECHNOLOGY FRONTIER

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The article provides multifaceted evidence on the shape of the aggregate country-level production function, derived from the World Technology Frontier, estimated on the basis of annual data on inputs and output in 19 highly developed OECD countries in the period 1970-2004. A comparison of its estimates based on Data Envelopment Analysis and Bayesian Stochastic Frontier Analysis uncovers a number of significant discrepancies between the non-parametric estimates of the frontier and the Cobb-Douglas and translog production functions in terms of implied efficiency levels, partial elasticities, and returns-to-scale properties. Furthermore, the two latter characteristics are found to differ markedly across countries and time, providing strong evidence against the constant-returns-to-scale Cobb-Douglas specification, frequently used in related literature. We also find notable departures from perfect substitutability between unskilled and skilled labor, consistent with the hypotheses of skill-biased technical change and capital-skill complementarity.