

# Identifying Factor Productivity by Dynamic Panel Data and Control Function

## Approaches: A Comparative Evaluation for EU Agriculture

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The classical problem of agricultural productivity measurement has regained interest due to recent price hikes in world food markets. At the same time, there is a new methodological debate on the appropriate identification strategies for addressing endogeneity and collinearity problems in production function estimation. We examine the plausibility of alternative identification strategies for the case of agriculture and test two related, innovative estimators using farm-level panel datasets from seven EU countries. The control function and dynamic panel approaches provide attractive conceptual improvements over the received 'within' and duality models. Even so, empirical implementation of the conceptual sophistications built in these estimators does not always live up to expectations. This is particularly true for the dynamic panel estimator, which mostly failed to identify reasonable elasticities for the (quasi-) fixed factors. Less demanding proxy approaches represent an interesting alternative for agricultural applications. In our EU sample, we find very low shadow prices for labour, land and fixed capital across countries. The production elasticity of materials is high, so that improving the availability of working capital is the most promising way to increase agricultural productivity.



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