

## **Bayesian estimation of capital stock and depreciation in the production function framework**

### Abstract

The common measures of capital stocks and depreciation rates typically hinge on accounting conventionalities. Data availability, particularly in the form of industry-level, constant-price time series tends to be problematic too. These conditions can be considered a limitation for growth accounting studies, as well as dynamic simulation experiments, in which capital accumulation plays an important role. Therefore, we propose an approach, in which the capital stock and the depreciation rate are estimated jointly with the production function parameters, using the data on output, employment and investment expenditure.

The problem is characterized by a relatively high number of estimated parameters, but at the same time rather strong prior knowledge is available, making it a case for the Bayesian approach. We specify the Bayesian model and show preliminary estimation results for Poland. Worth emphasizing, the use of production function ensures that the estimated capital measure refers to the current productivity of the assets (capital services) rather than their market or book value. Similarly, depreciation rates are connected to age-efficiency profile of the assets. This makes the estimates conceptually preferable to the gross or net fixed assets which are more readily available from the public statistics.

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