Estimating Capital Services in the U.S.: An Empirical Assessment of Implementation Differences

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Paper prepared for the IARIW 34th General Conference
Dresden, Germany, August 21 – 27, 2016

Presented by Erich Oltmanns

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The framework

Theory of capital services

- Link between assets used in production and value added
- Focus on production and productivity

Guidelines

- System of National Accounts 2008, Chapter 20

Calculated by

- Some statistical offices
- In the context of research projects
Aim of the study

Empirical comparison of different measures of capital services

- BLS methodology (for integrated production accounts)
- Jorgenson, Ho, and Stiroh (2005), consistent with the BEA accounts

Age-efficiency function as a major conceptual difference

Implementation issues
Structure of the paper

General outline of method

Explaining the compared methods
  - BLS Methodology
  - Approach of Jorgenson, Ho, and Stiroh (2005)

Comparison

Data and implementation issues

Results
Measuring capital services

Calculation of productive capital stock

- using the PIM
- Age-efficiency function

Calculation of rental prices

- for each industry x asset cell
- representing the implicit rental cost of using the asset in production

Aggregation
Comparison

Methods
Numerical modelling
Empirical results
Age-efficiency profile

BLS Methodology

Hyperbolic function

\[ \lambda(\alpha, \Omega) \begin{cases} \frac{\Omega - \alpha}{\Omega - \beta \alpha} & \alpha < \Omega \\ 0 & \text{otherwise} \end{cases} \]

Very flexible form

Assumptions for \( \beta \)

Jorgenson/Ho/Stiroh (2005)

Geometric function

\[ K_t = \sum_{\tau=0}^{\infty} (1 - \delta)^\tau I_{t-1} \]
\[ = K_{t-1} (1 - \delta) + I_t \]
Figure A: Age-Efficiency Profiles

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Figure B: Age-Efficiency/Price Functions

- Age-Efficiency L-bar = 11
- Age-Price L-bar = 11
- Geometric Age-Efficiency/Price
Data and implementation

BEA’s fixed investment statistics in both approaches

Differences for

- Equipment
- Structures
- Intellectual property products

Others

- Wealth stock
- Capital Income
- Rates of return
- Capital Service Prices
Table 1: Growth in Aggregate Value-Added and the Sources of Growth
Direct Aggregation across Industries

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Notes: Average annual percentages. Aggregate value added growth is the aggregate of share weighed industry value added growth. The contribution is the domar-weighted industry contributions.
Figure 1: Capital Input Growth Rates 1998-2012: JHS versus BLS
Results

Generated growth rates are very similar

Differences in some industries

- Due to differences in the estimates of capital composition
- And due to implementation choices)
Comments/question to the authors

Structure of the paper ok
Explanation for similar growth rates?
BEA DJA BLS JHS?
Thanks for your attention!

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