INNOVATION AND PRODUCTIVITY GROWTH

by

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The puzzle confronting economists has been that the rate of growth of output that was being observed has been much larger than the rate of increase in the principal resources that were being measured. It is now clear that this puzzle is of our own making because we have been using measures of capital and labor which had been refined and narrowed in ways that excluded many of the improvements that have been made in the quality of these resources.

Measuring Productivity

OECD Manual

MEASUREMENT OF AGGREGATE AND INDUSTRY-LEVEL PRODUCTIVITY GROWTH

OECD
Productivity

Information Technology and the American Growth Resurgence

Dale W. Jorgenson, Mun S. Ho, and Kevin J. Stiroh
NEW FRAMEWORK FOR MEASURING PRODUCTIVITY

- Constant Quality Labor Input
- Constant Quality Capital Input
- Production Possibility Frontier

EU KLEMS: 25 of 27 EU Members; Australia, Canada, Japan, Korea, and the U.S.
MEASURING INNOVATION IN THE 21ST CENTURY ECONOMY

The proposed new ‘architecture’ for the NIPAs would consist of a set of income statements, balance sheets, flow of funds statements, and productivity estimates for the entire economy and by sector that are more accurate and internally consistent. The new architecture will make the NIPAs much more relevant to today’s technology-driven and globalizing economy and will facilitate the publication of much more detailed and reliable estimates of innovation’s contribution to productivity growth.

Advisory Committee on Measuring Innovation in the 21st Century Economy to the U.S. Secretary of Commerce (2008)
By associating these estimates with the standard breakdown of value added, the contribution of labor and capital to production can be portrayed in a form ready for use in the analysis of productivity in a way entirely consistent with the accounts of the System.

The net operating surplus is an accounting residual which does not possess quantity and price dimensions of its own. It may also be negative, of course.

It is not possible, therefore, to decompose the net operating surplus into its own price and volume components.

United Nations (1993), System of National Accounts 1993, Chapter 16
BLS/BEA TIMELINE

1979: Rees Report

1983: BLS TRENDS IN MULTIFACTOR PRODUCTIVITY

1994: BLS Constant Quality Labor Index

2006: Jorgenson, Landefeld, and Nordhaus, *A NEW ARCHITECTURE FOR THE U.S. NATIONAL ACCOUNTS*

2008: Advisory Committee on Measuring Innovation in the 21st Century Economy

2008: Completion of EU KLEMS Project: International Comparisons of 25 of 27 EU Member Countries, Australia, Canada, Japan, Korea, and the U.S.

2009: BEA/BLS Aggregate Production Account
MEASURING PRODUCTIVITY AT THE INDUSTRY LEVEL

Develop annual, industry-level measures of total factor productivity by restructuring the NIPAs to create a more complete and consistent set of accounts integrated with data from other statistical agencies to allow for the consistent estimation of the contribution of innovation to economic growth.

Advisory Committee on Measuring Innovation in the 21st Century Economy to the U.S. Secretary of Commerce (2008)
1960: First Official Measure of Total Factor Productivity

1980: Gardner Report

1991: Revised Official Measure of Total Factor Productivity

1999: First Official Measure of Total Factor Productivity by State

2007: International Comparisons of the US and the EU
SOURCES OF U.S. AGRICULTURAL GROWTH

Average annual growth rates, weighted by the income share
SOURCES OF U.S. ECONOMIC GROWTH

Average annual growth rates, weighted by the income share
SOURCES OF WORLD ECONOMIC GROWTH
Average annual growth rates, weighted by the income share
INNOVATION AND PRODUCTIVITY GROWTH

Implementation of the New Framework for Productivity Measurement

Implementation of the New Architecture for the U.S. National Accounts

Economic Impact of Innovation: A New Perspective on Policy

Investment versus Innovation: A New View of Growth Economics