Seminar
Creation, Recognition and Valuation
of
Intellectual Assets

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The BEA-NSF R&D Satellite Account:

Overview, Methods, and Issues

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Overview, Methods, and Issues

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Introduction

- The knowledge economy and R&D
- Background and overview of R&D satellite account project at BEA
- Implications for BEA
- Estimating the R&D satellite account
- Future research issues

The Knowledge Economy and R&D

- Developing consensus on scope, concepts, and methods:
  - R&D
  - Human Capital
  - Firm-specific human capital
  - Brand equity
  - Organizational structure
Measuring Intangibles: Problems in Using Imputations Rather Than Direct Measures


Note: A number of analysts attributed the large difference between equity values and the replacement value of plant and equipment to intangibles during the market run-up in the late 1990s.

Implicit value of intangibles: $7 trillion (2000:I)
Implicit value of intangibles: -$2 trillion (2002:III)

Table 1 – Changes to National Accounts

<table>
<thead>
<tr>
<th>GDP Imputations, R&amp;D performed by</th>
<th>Net Domestic Product</th>
<th>Gross Domestic Income</th>
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</thead>
<tbody>
<tr>
<td>Current Measure of GDP</td>
<td>Adjusted GDP</td>
<td>Current Measure of GDP</td>
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<tr>
<td>Treatment of R&amp;D</td>
<td>Change in</td>
<td>Treatment of R&amp;D</td>
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<tr>
<td>Business</td>
<td>Commercial</td>
<td>Increase Increase</td>
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<td>Intermediate input</td>
<td>Reallocation to investment</td>
<td>Increase in profits and depreciation Increase</td>
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<tr>
<td>Nonprofit Institutions</td>
<td>Commercial</td>
<td>No change Increase</td>
</tr>
<tr>
<td>Consumption (PCE)</td>
<td>Reallocation to investment</td>
<td>Increase in returns to R&amp;D capital Increase</td>
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<td></td>
<td>2) Increase consumption + (returns to R&amp;D capital) Increase</td>
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<tr>
<td>Government</td>
<td>Government</td>
<td>No change Increase</td>
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<tr>
<td>Government consumption</td>
<td>Reallocation to investment</td>
<td>Increase in returns to R&amp;D capital Increase</td>
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<td>2) Increase consumption + (returns to R&amp;D capital) Increase</td>
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Background on R&D at BEA

- Carson, Moylan, and Grimm (1994) - Satellite Account for Research and Development using NSF expenditure data
- Fraumeni and Okubo (2002, 2005) - measured contribution of R&D using R&D data and a national accounts framework
- The National Science Foundation provided funds to produce an official satellite account (2004).
Results of Fraumeni/Okubo Account: 1961-2002

- Capitalizing R&D
  - Increases current dollar GDP by 2 percent.
  - Increases the real GDP rate of growth by 0.1 percentage point.
- The estimated contribution of R&D investment to overall GDP growth is 4 percent.
- The adjusted national savings rate is 2 percentage points higher than the current measure (of 19 percent).

Recent International Efforts with R&D Satellite Accounts

- Impact on current value of GDP
  - Israel 2 percent
  - Canada 1.2 percent
  - Netherlands 1.1 - 1.2 percent
  - Australia 1.4 - 1.6 percent

Progress and Changes

- Produced Frascati Manual-SNA bridge
- Began research on methodologies including rates of return, depreciation rates & deflators
- Expanded and updated R&D satellite account estimates first produced by BEA in 1994
- Began research to develop an I-O based R&D satellite account
- Advisory Expert Group recommended that R&D output be treated as a fixed asset (July 2005) in the SNA
Treating R&D as a Fixed Asset

- The upcoming SNA revision is likely to adopt capitalizing R&D in the national accounts system because of work by BEA and others.
- The R&D satellite account would provide the basis for experimenting in capitalizing R&D in the NIPAs and the Industry Accounts.

Schedule for R&D Satellite Account

- Technical conference on the R&D account, October/November 2006
- Feasibility study on producing an Industry R&D Satellite Account, Spring 2007
- Release of final R&D Satellite Account, September 2007
- User conference, November 2007

Inputs from Users

- Develop professional consensus on concepts and methods for capitalizing R&D in the national accounts.
- Obtain feedback on the approach used to estimate the preliminary R&D Satellite Account.
- Develop solutions to methodological and conceptual challenges for FY 2007.
Impact on BEA Accounts

- Treating R&D as an asset would have wide-ranging effects on the national accounts:
  - Annual and quarterly data on R&D.
  - Detailed industry data on R&D investment.
  - Impact on Regional Accounts.
  - R&D assets and capital services in the international accounts.

Preliminary R&D Satellite Account: Base Case

- The R&D Satellite Accounts will be consistent with the NIPAs—base case
  - Valuation of own account output
  - Returns to government and non-profit capital: only CFC, no net return
  - Zero Lags between creation of R&D and its impact as investment
  - No Externalities (Spillovers)
  - The funder of R&D is the best current proxy for ownership

Estimating the R&D Satellite Account

- Estimate the value of R&D output with input costs
  - R&D compensation
  - R&D supplies and materials
  - Consumption of fixed capital on the assets used to create R&D
  - Apply input deflators
  - Chain together the reals
  - Create capital stock estimates
2007 R&D Satellite Account: Improvements

- Improvements
  1) Improve the input deflators
  2) Improve estimates of consumption of fixed capital
  3) Improve assignment of ownership of R&D
- Framework for industry-based satellite account

Improve Identification of R&D Assets

- Improve Identification of Ownership of R&D Assets
  - Funder-performer transactions
  - Intellectual property rights
- The scope of capitalized R&D
  - Identify freely available R&D
  - Currently limited to science and technology

Longer Term Issues

- Measuring R&D output
- Identifying freely available R&D
- Depreciation of R&D and lag structure by industry
- Estimating private rates of return and spillovers from R&D
- Estimating rates of return for government and non-profit R&D
- Improving R&D source data for national accounting purposes