Update on BEA’s Industry Economic Accounts

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Inforum Outlook Conference
College Park, Maryland
December 11, 2014
Outline

- Fully Integrated Accounts
- Satellite Accounts
- Quarterly GDP by Industry
- Integrated GDP & Productivity Account at the Industry level
- Efforts to measure the economic impact of Global Value Chains
Integration of the National and Industry Economic Accounts

- 2014 comprehensive revision marks the first time that the Industry Economic Accounts (IEAs) and National Income and Product Accounts (NIPAs) are fully consistent with one another

- Benchmark I-O accounts establish both levels and commodity composition of GDP final use categories
  - Provide critical information for estimating GDP (by extrapolation) for periods after benchmark years

- Fully consistent benchmark I-O accounts
Revised statistics beginning with 1997, including 2007 BM I-O

Fully consistent with NIPAs and ITAs

Expanded industry detail

Expanded final uses for fixed investment
Satellite Accounts
“The positive value of arts and culture on society has been understood on a human level for millennia. With this new effort, we are now able to quantify the impact of arts and culture on GDP for the very first time.”

Penny Pritzker
U.S. Secretary of Commerce
Uses BEA’s I-O framework to provide:

- Information on a select group of arts and cultural goods and services that are currently in the U.S. GDP accounts, but not clearly visible

- A detailed accounting of the economic contribution of the arts and cultural sector

- An estimate of arts and culture employment
Quarterly GDP by Industry Statistics for the United States
Motivation

- Great Recession and subsequent recovery highlighted need for more “real-time” data

- Supplement existing quarterly/monthly indicators of industry performance—such as employment, sales & shipments, profits, prices

- Comprehensive and consistent picture of industries’ overall performance
  - Analyses of business cycle dynamics and the sources of U.S. economic growth
Quarterly GDP by Industry

- Launched April 25th; 2005:I –2013:IV
- Available within 30 days after “3rd” release of GDP
  - Feature real value added by industry
  - Integrated statistics for gross output and intermediate inputs
  - 22 major industry sectors to begin ...
- Made possible with the expansion of source data, particularly for the services sector
  - Census Bureau Quarterly Services Survey
  - Bureau of Labor Statistics Producer Price Indexes
Methodology: balanced input-output framework and double deflation

<table>
<thead>
<tr>
<th>INDUSTRIES</th>
<th>FINAL USES</th>
<th>Total Commodity Output and Value Added</th>
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<tbody>
<tr>
<td>Mining and Construction</td>
<td>Personal Consumption Expenditure</td>
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<td>Manufacturing</td>
<td>Private Fixed Investment</td>
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<td>Trade and Transportation</td>
<td>Change in Private Inventories</td>
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<td>Utilities</td>
<td>Net Exports</td>
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<td>Finance, Insurance, and Real Estate</td>
<td>Government Consumption and Investment</td>
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<td>A function of Gross Domestic Income</td>
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<td>and Gross Output by Industry</td>
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Comparisons with Real GDP

Percent Changes in Real GDP, Value Added, and Gross Domestic Income, 2005Q2-2014Q2

- Real gross domestic income
- Real GDP
- Proposed Real value added for all industries
GDP increased 4.6 percent in the second quarter of 2014, after decreasing 2.1 percent in the first quarter.

- Goods sector rebounds — led by durable-goods manufacturing
- Services sector turns up – reflecting an upturn in the finance and insurance sector
Future directions for quarterly statistics

- Expand industry detail from 22 to 71
- Accelerate release to coincide with 3\textsuperscript{rd} estimate of U.S. GDP

- Longer run:
  - “Advance” release of GDP by industry?
  - A 3\textsuperscript{rd}, “production” measure of GDP?
Integrated GDP & Productivity Account at the Industry Level
Motivation

- Long-standing call for statistics on the sources of growth
  - Solow (1957), Denison (1967), Griliches and Jorgenson (1967)
  - Postwar Recovery, Big Slump, IT Boom, the Great Recession
  - “… differences between the BEA and BLS estimates have led many researchers to construct their own measures …”

- The Advisory Committee on Measuring Innovation in the 21st Century: A Report to the Secretary of Commerce (January 2008)
  - “Develop annual, industry-level measures of total factor productivity …”
GDP integrated with productivity statistics

- Allows for integrated analysis on the sources of growth in the economy
  - Jorgenson and Landefeld (2006) provided blueprint for United States
  - Fleck, Rosenthal, Russell, Strassner, and Usher (2013) integrated account for GDP at the industry level
  - Rosenthal, Russell, Samuels, Strassner and Usher (2014) incorporated 2013 comprehensive revision
    - [www.bea.gov/industry/index.htm#integrated](http://www.bea.gov/industry/index.htm#integrated)
Big picture questions

- What are the industry sources of GDP and multifactor productivity (MFP) growth?
  - For example, what is the role of manufacturing?

- What is the contribution of:
  - Information-communications-technology to growth and productivity?
  - Intellectual property products to growth and productivity?
Sources of U.S. economic growth, 1998-2012

Real Value Added Contributions by Sector

Sources of Real Value Added Growth

- MFP
- College Labor
- Other Capital
- R&D
- Software
- IT Equipment
- Non-College Labor

Average annual percentage point

- Other
- FIRE
- Prof. and Business Services
- Trade
- Information
- Manufacturing

Real Value Added Contributions by Sector

Sources of Real Value Added Growth
- Computers and electronic products accounts for about 50% of MFP growth!
Industry sources of growth analysis

- Requires an industry-level production account
  - Industry-level outputs and inputs in current and constant prices
    \[ Y_Q Y_P = K_Q K_P + L_Q L_P + X_Q X_P = VA_Q VA_P + X_Q X_P \]
  - Symmetric treatment of outputs, intermediate inputs, and value added inputs

- Consistent with aggregate GDP constructed within an Input-Output Framework
  - Gross output, intermediate input, value added: BEA
  - Capital input: BLS, based on BEA Fixed Assets
  - Labor input: Hours from BLS, Composition from BEA
Gross output growth and sources

Output Growth By Component Contribution, 1998-2012

Data processing, internet publishing, and other information services
Support activities for mining
Warehousing and storage
Computer systems design and related services
Broadcasting and telecommunications
Securities, commodity contracts, and investments
Computer and electronic products
Social assistance
Insurance carriers and related activities
Educational services
Ambulatory health care services
Water transportation
Hospitals and Nursing and residential care
Management of companies and enterprises
Performing arts, spectator sports, museums, and related activities
Miscellaneous professional, scientific, and technical services
Funds, trusts, and other financial vehicles
Real estate
Wholesale trade
Administrative and support services
Amusements, gambling, and recreation industries
Retail trade
Rental and leasing services and lessors of intangible assets
Federal
Oil and gas extraction
Food services and drinking places
State and local
Other transportation and support activities
Miscellaneous manufacturing
Waste management and remediation services
Federal Reserve banks, credit intermediation, and related activities
Publishing industries, except internet (includes software)
Other transportation equipment
Rail transportation
Transit and ground passenger transportation
Motion picture and sound recording industries
Truck transportation
Accommodation
Petroleum and coal products
Motor vehicles, bodies and trailers, and parts
Machinery
Farms
Chemical products
Primary metals
Food and beverage and tobacco products
Other services, except government
Legal services
Mining, except oil and gas
Forestry, fishing, and related activities
Fabricated metal products
Utilities
Plastics and rubber products
Construction
Paper products
Air transportation
Electrical equipment, appliances, and components
Nonmetallic mineral products
Wood products
Pipeline transportation
Printing and related support activities
Furniture and related products
Textile mills and textile product mills
Apparel and leather and allied products

K Contribution
L Contribution
E Contribution
M Contribution
S Contribution
MFP Growth

Average Annual Percentage Point

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Contributions to aggregate MFP by industry

Contribution to Aggregate MFP Growth, 1998-2012

[Average Annual percentage point]

- Computer and electronic products
- Real estate
- Broadcasting and telecommunications
- Computer systems design and related services
- Oil and gas extraction
- Motor vehicles, bodies and trailers, and parts
- Securities, commodity contracts, and investments
- Administrative and support services
- Farms
- Wholesale trade
- Ambulatory health care services
- Federal Reserve banks, credit intermediation, and related activities
- Motion picture and sound recording industries
- Publishing industries, except internet (includes software)
- Miscellaneous manufacturing
- Primary metals
- Printing and related support activities
- State and Local Government
- Other transportation equipment
- Food services and drinking places
- Machinery
- Support activities for mining
- Electrical equipment, appliances, and components
- Federal Government
- Water transportation
- Data processing, internet publishing, and other information services
- Performing arts, spectator sports, museums, and related activities
- Warehousing and storage
- Wood products
- Pipeline transportation
- Utilities
- Truck transportation
- Other transportation and support activities
- Apparel and leather and allied products
- Forestry, fishing, and related activities
- Food and beverage and tobacco products
- Waste management and remediation services
- Rail transportation
- Mining, except oil and gas
- Textile mills and textile product mills
- Funds, trusts, and other financial vehicles
- Plastics and rubber products
- Insurance carriers and related activities
- Furniture and related products
- Fabricated metal products
- Transit and ground passenger transportation
- Social assistance
- Paper products
- Amusements, gambling, and recreation industries
- Accommodation
- Nonmetallic mineral products
- Air transportation
- Educational services
- Chemical products
- Hospitals, Nursing and residential care facilities
- Retail Trade
- Miscellaneous professional, scientific, and technical services
- Petroleum and coal products
- Legal services
- Rental and leasing services and lessors of intangible assets
- Management of companies and enterprises
- Other services, except government
- Construction
Sources of U.S. economic growth

<table>
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<tr>
<th></th>
<th>1998-2012</th>
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<tbody>
<tr>
<td><strong>GDP</strong></td>
<td>2.02</td>
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<tr>
<td>IT-producing industries</td>
<td>0.31</td>
</tr>
<tr>
<td>IT-using industries</td>
<td>0.98</td>
</tr>
<tr>
<td>Non-IT industries</td>
<td>0.73</td>
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<tr>
<td><strong>Capital input</strong></td>
<td>1.19</td>
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<td>IT-producing industries</td>
<td>0.04</td>
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<tr>
<td>IT-using industries</td>
<td>0.59</td>
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<tr>
<td>Non-IT industries</td>
<td>0.56</td>
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<td><strong>Labor input</strong></td>
<td>0.36</td>
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<td>0.00</td>
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<tr>
<td>IT-using industries</td>
<td>0.30</td>
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<tr>
<td>Non-IT industries</td>
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<tr>
<td><strong>Multifactor productivity</strong></td>
<td>0.47</td>
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<td>IT-producing industries</td>
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<tr>
<td>IT-using industries</td>
<td>0.09</td>
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<tr>
<td>Non-IT industries</td>
<td>0.11</td>
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</tbody>
</table>

- Capital input accounted for about 60 percent of growth
  - 50 percent due to IT-using industries
- Labor input accounted for a bit more than 15 percent
- MFP accounted for about 25 percent
  - 60 percent due to IT-producing industries
Efforts to measure the economic impact of Global Value Chains
How to measure impact of globalization?

- Increased need to assess impacts of globalization/global value chains (GVCs) on national economies

- One approach to measurement:
  - Trade in Value Added (TiVA)-led by OECD

- Requires global Supply-Use tables
  - National tables linked together through bilateral international trade flows
  - Extensions: New work looks to introduce firm-level heterogeneity into National Supply-Use tables
    - E.g., ownership characteristics, exporter/nonexporter
    - How much of value created is captured domestically or is repatriated?
OECD TiVA Example: China’s trade surplus with the US?

$62bn

$16bn

Source: OECD illustrative estimates

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BEA Engagement: International working groups

- United Nations Statistical Commission “Friends of the Chair” on trade and economic globalization
  - Handbook on Extended International Accounts
  - Establishment of Work Group akin to that for National Economic Accounts (ISWNGA)

- OECD Expert Group on “Extended” Supply-Use Tables
  - Introduce firm-level heterogeneity to fine-tune TiVA statistics; 2-year time horizon

- APEC TiVA Technical Group
  - Consistent goals to that of OECD but for APEC member countries (20); 4-year time horizon
Industry Accounts

- Supply-Use tables consistent with International guidelines
- Research to assess Import Use table assumptions using data on U.S. multinational enterprises
- Estimate import use tables that reflect data by major trade partner

Development of a North American Regional Supply Chain Model

- Proposed by the USITC in collaboration with BEA, Statistics Canada, and INEGI (Mexico Bureau of Statistics)

Extensions to introduce firm-level heterogeneity

- Short run: “Proof of Concept” project based on comparisons of published enterprise data by BEA and by IRS Statistics of Income
- Longer-run: BEA-Census link projects on multinational enterprises, trade in goods and services, and establishment-level data