Focus on Two Areas of Preliminary Work

• Digital Economy Satellite Account

• Treatment of Data in National Accounts
Digital Economy Satellite Account
(Barefoot, Curtis, Jolliff, Nicholson, Omohundro 2018)
Step 1: Conceptual Definition

- **Digital-enabling infrastructure**: Goods and services needed for an interconnected computer network to exist and operate
  - Computer hardware
  - Telecom equipment and services
  - Internet of Things (IoT)
  - Software
  - Structures
  - Support services
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- **E-commerce**: Digital transactions that use the computer system
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• **Digital media**: Content that users create and access
  – Direct sale
  – Free
  – Big data
Steps 2 and 3: Identification

- **Step 2**: Identify digital goods and services
  - 200 categories of primarily digital products
    - Exclude categories that include digital and non-digital
    - Exclude structures and IoT infrastructure
    - Exclude P2P transactions
    - Exclude advertising-supported “free” digital media and big data
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• **Step 3**: Identify digital industries
  – Gross output: Sum of gross output for all in-scope products
  – Value-added: Derived from ratios of digital economy gross output to total gross output
  – Compensation
  – Employment
  – Price and quantity indexes: Double deflation method
Results: Growth Rates

<table>
<thead>
<tr>
<th></th>
<th>Total Economy</th>
<th>Digital Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Annual Growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Output</td>
<td>1.1%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Value-Added</td>
<td>1.5%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Prices</td>
<td>1.5%</td>
<td>-0.4%</td>
</tr>
<tr>
<td>Employment</td>
<td>1.7%</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

U.S. Bureau of Economic Analysis
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In 2016, the digital economy supported 5.9 million jobs, or 3.9 percent of total U.S. employment.
Results: Compensation of Employees

Average annual employee compensation, 2016

<table>
<thead>
<tr>
<th>Category</th>
<th>Compensation ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital economy</td>
<td>$114,275</td>
</tr>
<tr>
<td>Management of companies and enterprises</td>
<td>$107,350</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>$97,913</td>
</tr>
<tr>
<td>Information</td>
<td>$92,720</td>
</tr>
<tr>
<td>Professional, scientific, and technical services</td>
<td>$89,382</td>
</tr>
<tr>
<td>Transportation and warehousing</td>
<td>$82,797</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>$80,084</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>$79,671</td>
</tr>
<tr>
<td>Government</td>
<td>$74,703</td>
</tr>
<tr>
<td>Construction</td>
<td>$71,781</td>
</tr>
<tr>
<td>Health care and social assistance</td>
<td>$71,693</td>
</tr>
<tr>
<td>Educational services</td>
<td>$67,020</td>
</tr>
<tr>
<td>Arts, entertainment, and recreation</td>
<td>$65,408</td>
</tr>
<tr>
<td>Administrative and waste management services</td>
<td>$65,206</td>
</tr>
<tr>
<td>Other services, except government</td>
<td>$57,721</td>
</tr>
<tr>
<td>Agriculture, forestry, fishing, and hunting</td>
<td>$54,833</td>
</tr>
<tr>
<td>Retail trade</td>
<td>$53,145</td>
</tr>
<tr>
<td>Accommodation and food services</td>
<td>$49,772</td>
</tr>
</tbody>
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Average annual compensation per employee in the digital economy totaled $114,275 in 2016 compared to $66,498 for the total economy.
Treatment of Data in National Accounts
SNA Recommendations on Data

• Databases are within scope of the SNA asset boundary
  – Exclude value of data in own-account databases
  – Include value of data in market purchases of databases
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    (Ahmad 2004, 2005 and Ahmad and Schreyer 2016)
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• No guidance on data as intermediate consumption
  – May be exchanged in traditional B2B transactions
  – May be exchanged in non-traditional C2B transactions
Considerations for Data

• Ownership of data may depend on institutional factors
  – Who should have access?
  – How should access be managed?
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• Third product category for data (Mandel 2012, 2017)
  – Goods: tangible and storable
  – Services: intangible and non-storable
  – Data: intangible and storable
Roles of Data

• Marketing
  – Users exchange data for “free” content
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- Artificial intelligence
  - Output = f(capital, labor, data)
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• Online platforms (Li, Nirei, Yamana 2018)
  – Summarize business models for 8 types of platforms
Data Value Chain

Source: Moro Visconti et al. 2017
Financials for FATWINs and MAGAs

- Facebook
- Twitter
- Netflix

- Microsoft
- Amazon
- Google
- Apple

B2C: social media, entertainment
B2B: cloud computing, hardware

Source: SEC filings and YCharts
Stats Canada-BEA Collaboration on Data

• Five Questions
  – What is the role of data in a modern economy?
  – What is an appropriate typology of data?
  – What is the current state of play in valuing data in the national accounts and how are data valued by the private and public sectors?
  – What are the different methods that national statisticians could use to assign a value to data?
  – What specifically is the value of data in Canada and the United States?
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• Typology for online platforms (Li, Nirei, Yamana 2018)
References


