Measuring the Digital Economy: Plans and Progress

Erich H. Strassner
Advisory Committee Meeting
May 10, 2019
Measuring the Digital Economy

• In 2016, BEA began work on a satellite account to better measure the digital economy and to further capture technology’s role in economic growth
  – Partly supported through a reimbursable agreement with the National Telecommunications and Information Administration

• Strategies include:
  – Define the digital economy and capture its contribution to economic growth
  – Improve price and volume measures of high-tech goods and services
  – Evaluate the changing role of data and (re)consider its treatment in the National Accounts
  – Estimate the contribution of “free” digital media and internet services
• The U.S. is one of the first countries to produce experimental estimates on the digital economy
  – Initial results were published in March 2018
  – In April 2019, BEA updated experimental digital economy estimates for the period 1997-2017:
    • https://www.bea.gov/data/special-topics/digital-economy
• Initiative is consistent with guidance from the OECD Advisory Group on “Measuring GDP in a Digitalized Economy”
  – BEA chairs the Advisory Group
Toward a Digital Economy Satellite Account

**Producers (Who)**
- Corporations
- Households
- Government
- NPISH
- ROW

**Product (What)**
- Goods
- Services

**Nature (How)**
- Digitally Ordered
- Digitally Delivered

**Users (Who)**
- Corporations
- Households
- Government
- NPISH
- ROW

- Included in the SNA production boundary
- Excluded in the SNA production boundary

Digital intermediary platform-enabled
Digital-enabling infrastructure is the basic physical materials and organizational arrangements that support the existence and use of computer networks, which are the foundation of the digital economy.

Digital-enabling infrastructure includes:

- Computer hardware
- Software
- Telecommunications equipment and services
- Structures
- The Internet of Things (IoT)
- Support services
E-commerce is the broad term used to describe all transactions involving the purchase and/or sale of goods and services that occur over computer networks.

E-commerce includes:

- Business to business (B2B) e-commerce, including manufacturing and wholesale e-commerce
- Business to consumer (B2C) e-commerce, including retail
- Peer-to-peer (P2P) transactions, or what is sometimes referred to as the ‘sharing’ or ‘on-demand’ economy, which involve the exchange of goods and services between consumers facilitated through a digital intermediary
Digital media consists of content that is created, accessed, stored, or viewed on digital devices

Digital media includes:

- Direct-sale digital media sold to consumers in exchange for a fee, either on an item-by-item basis or through a subscription service (e.g., Netflix)

- Free digital media—usually supported by advertising or marketing revenue (e.g., Google Search)

- Big data that companies collect during operations and sell to other firms—this could include data on consumer behavior or preferences (e.g., Facebook)
Experimental Digital Economy Estimates

1. Digital-enabling infrastructure
   • Hardware
   • Software
   • Telecommunications equipment and services
   • Support services
   • Structures
   • The Internet of Things (IoT)

2. E-commerce
   • Business-to-business
   • Business-to-consumer
   • Peer-to-peer

3. Digital media
   • Direct sale
   • Free
   • Big data

*Italicics denotes ongoing work not yet included in experimental estimates*
Digital Economy Share of GDP

Digital Economy Current-Dollar Value Added and Share of Total Current-Dollar Gross Domestic Product

Billions of dollars
1,500
1,200
900
600
300
0

Percent
7.5
7.0
6.5
6.0
5.5
5.0

Value added
Share of total gross domestic product

U.S. Bureau of Economic Analysis
Components of the Digital Economy

Components of the Digital Economy: Current-Dollar Value-Added Share of Total

- Support services
- Telecommunications
- Software
- E-commerce and digital media
- Hardware

Percent

- 2017
- 2007
- 1997

U.S. Bureau of Economic Analysis
Contributions to GDP Growth

Contribution to Real Value Added

Percentage points

Digital economy  All other industries  GDP growth

U.S. Bureau of Economic Analysis
Components of the Digital Economy

Components of the Digital Economy:
Real Value-Added Average Annual Growth, 1998–2017

- Total economy
- Digital economy
- Hardware
- E-commerce and digital media
- Support services
- Software
- Telecommunications

Percent change

U.S. Bureau of Economic Analysis
Employment and Compensation

Digital Economy and Industry Share of Total Employment, 2017

- The digital economy supported 5.1 million jobs or 3.3% of total employment.
- Average annual compensation per employee in the digital economy totaled $132,233 compared to $68,506 for the total economy.
Quality-Adjusted Price and Volume Measure for High-Tech Goods and Services

• Progress: 2018 Comprehensive Update
  – Improved software prices
  – Introduced new quality-adjusted prices for electro-medical equipment
  – Incorporated new and revised quality-adjusted prices (including cellphones) from the Federal Reserve Board

• Plans: 2019 Annual Update
  – Incorporate new BLS quality-adjusted CPIs for cellphones, available as of January 2018
  – Incorporate historical smartphone prices and improved nominal consumer spending based on Aizcorbe, Byrne and Sichel (2019)
• What is the role of data in a modern economy?
• What is an appropriate typology of data?
• How are data currently treated in national accounts and how are data valued in the private and public sectors?
• Who owns data?
• What are the different methods that national statisticians could use to assign a value to data?
• What is the value of data?
“Free” Internet Services

• Many Internet services do not involve direct payment of fees by users, but rather are funded by advertising
  – Google search, Facebook, Instagram, etc.

• Consumers, however, undoubtedly value these services and would be willing to pay for them

• Economists argue that the value to consumers is “missing” in household final consumption expenditures/GDP
Conclusion and Next Steps

• Fall 2019, BEA plans for an update of the Digital Economy Satellite Account, focused on estimates for cloud computing and online platforms
  – A first step is profiling MNE data collections for cloud and digital intermediaries

• Next steps are many:
  – Ongoing work to update the satellite account to reflect guidance from the OECD Advisory Group
  – Further considerations on the treatment of data, “free” internet services
  – Continued work to prioritize improvements to price and volume measures for “digital” goods and services