

# The Digital Economy: Free Assets and Services

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# Digital technologies: free assets and services

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- Free services may be produced by
  - consumers (“self service”, such as travel)
  - volunteers (Wikipedia etc)
  - platforms that sell advertising and collect users’ data
- Free assets: software and data
- Concerns that we are mismeasuring GDP, prices, capital, welfare
- Some key considerations
  - Production – what is produced and how, and does it fall within the SNA production boundary?
  - Who produces it – households, NPISH, corporations, governments?
  - What is the nature of the product -- asset, intermediate, or final consumption?

# “Free” products in the current GDP framework

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- IMF (2018): Change in framework of GDP to directly include “free digital services” in consumption...not warranted
  - GDP is a measure of market and near market production valued at market prices
- SNA research agenda: some consideration of measuring free products in GDP
- Some free services can be captured by quality adjusting deflators
- Research on measuring data as investment is warranted
- Indicators of welfare from free digital products should be developed for measurement of non market production outside of GDP
- Measurement challenges require cooperation across agencies, with private partners

# “Free” products: measurement

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- Existing research suggests that potential GDP adjustments would not account for the productivity slowdown
  - Open source software (Greenstein and Nagle, 2014; Robbins et al, 2018)
  - Volunteer production, wikipedia (Ahmad and Reinsdorf, 2017)
  - Free media supported by advertising (Nakamura, Samuels, Soloveichik 2017)
  - Possibly unmeasured capital in the form of servers (Byrne, Corrado, Sichel 2017)
  - Online experiments (Brynjolffson, Collis, Diewert, Eggers, Fox, 2019)

# “Free” products: measurement (cont’d)



- Research to change the treatment of free media funded by advertising and collection of users’ data would be helpful
- Contributions to GDP vs welfare/consumer surplus
- Some “free” products are already included in GDP
  - Free products produced by government/NPISH (sum of costs)
  - Included in the price of advertised products (Google’s value added includes payments for advertising services)
  - The cost of “free” media supported by advertising is included in product prices
- Price and volume index can capture “free digital replacements”
  - A smartphone camera can be captured by quality adjusting smartphone price
- It may be difficult to agree on consistent, standardized methods to be applied across all countries

# Free assets as intangible capital

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- Software
  - Current treatment includes software that is purchased or own account
  - Excludes software acquired free from others
  - But free software still serves as an asset for production
- Data as GFCF
  - Current treatment: capitalize “files of data organised to permit resource-effective access and use of the data”
  - Existing statistics typically capture purchased data but not own account data
  - Data can be considered a knowledge based asset
- Measurement challenges: expenditures, prices, depreciation

# Valuation methods

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- Market-based
  - Transactions valued at market prices
  - If no market price, use price of comparable product
- Cost-based
  - Value is measured by cost of production
- Income-based
  - Value is measured as discounted present value of returns
- Valuation of data
  - Price lists for compiled databases, from brokers
  - Mergers and acquisitions
  - Insurance

# Valuation methods (cont'd)

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- Free products
  - Advertising
  - Payments in kind
  - Patient investors /loss leaders
  - State intervention
  - Online experiments