Data as an Asset

Valuing the US Data Economy

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BEA Advisory Committee

Motivation

"Data is the new oil"
Clive Humby (2006)

"Why software is eating the world"
Marc Andreessen (2011)

Data is a key driver of innovation:

- Artificial Intelligence (AI)
- Advertisement
- Operation-optimizing
- Research and development

Data can be enabling, transformative, and productivity-enhancing.

Questions for the Committee

- Thoughts on deviations from the international recommendations regarding capitalization ratios, total production cost factors, or service life used for the depreciation rates?
- Thoughts regarding the interpretation of the definition of data as an asset for particular cases (e.g., patient records)?
- What level of detail should the account be published to best serve our stakeholders?

How to Measure?

Current Treatment

- Non-produced asset and thus outside the production boundary (Rassier, Kornfeld, and Strassner 2019).

Proposed Treatment

- Produced asset (Digitalization Task Team 2023).

BEA's Experience with Intellectual Property Products

Data as an asset has many parallels with software:

- Software and data both feature a significant portion of own account.
- Software and data both play a significant role in research and development, often as complements.
- The measurement of own account components for software and data both rely on the sum of costs approach.

What are Data?

Information content that is produced by accessing and observing phenomena; and recording, organizing, and storing information elements from these phenomena in a digital format, which provides an economic benefit when used in productive activities. – Digitalization Task Team (2023)

- Recording of an observation
- Digital format
- Provides economic benefit when analyzed

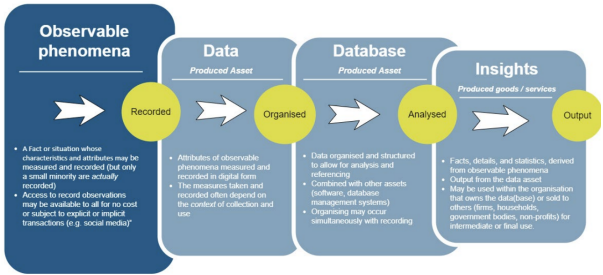
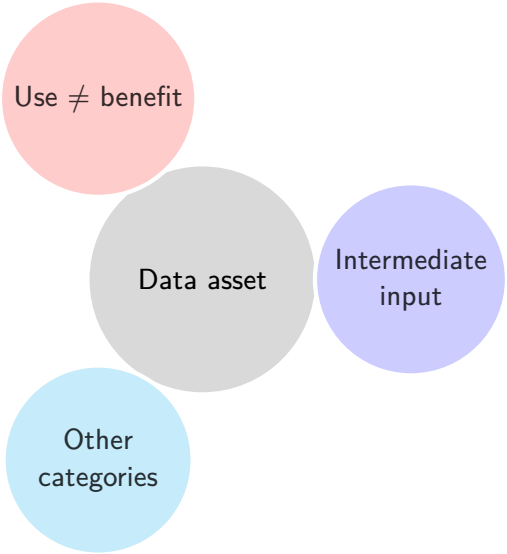


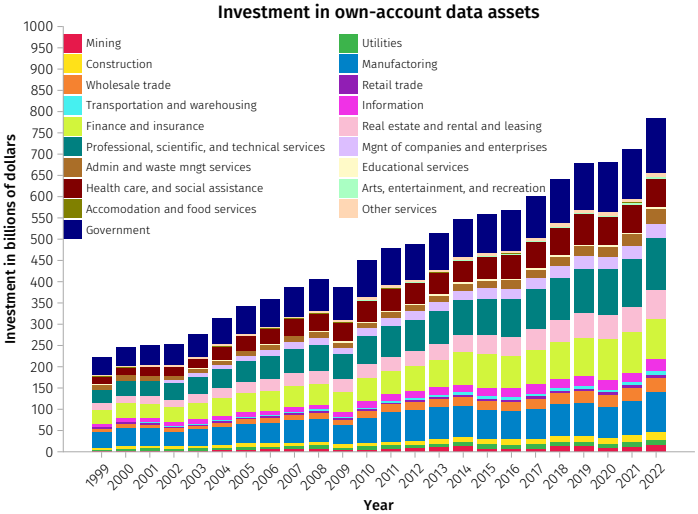
Figure: Data Chain
Source: Mitchell, Ker, and Lesher (2021)

What are Data Assets?



- How does the legal right of use affect the definitions (e.g., credit report, LLM using disputed fair use)?
- How to assess service life for streaming type of data (records that are constantly updated)?
- What are important considerations for particular data categories such as patient records and forensic data?

What Results to Expect?



Estimation Method

Data and databases assets

Own account | Purchased

Number of employees × Average wages × Involvement rates × Full production cost adjustment

By occupation, industry, and year | By occupation | By year

Estimating Hours and Compensation

Occupations that plausibly actively contribute to data assets
(O*NET Resource Center 2024; Bureau of Labor Statistics 2024)

↓

Map occupations to the reporting units for employment and compensation data (U.S. Bureau of Labor Statistics 2024)

↓

Using online job ads data to estimate the involvement rate
(Burning Glass Technologies 2019)

↓

Make adjustments to the involvement rates to correct for multiple counting
(Minnesota Population Center 2016; U.S. Bureau of Economic Analysis 2023)

Full Accounting

Payroll	Use number of employees, involvement rates, and average wages to estimate the payroll portion of data production costs.
Nominal	Use the implied production functions from representative industries (weighted average of NAICS: 518 & 5415) to adjust the payroll to account for the full production cost.
Real	Deflate with productivity adjusted weighted input price.
Net stock	Use the real investment and a three-year service life geometric depreciation rate to obtain the net stock through the perpetual inventory method

Impact on BEA Accounts

- The impact on real growth by industry and in the national aggregate accounts depends on the set of parameters chosen.
- In general, investment in data assets accounts by industry ranged from 1%-5% of value added and over 1% at the aggregate.
- In terms of private fixed assets, investment in data is comparable to software however it depreciates faster and represents a faster growth in IPPs, but slower compared to software.

Tuning parameters

Total production adjustment factor and capitalization ratios $\rightarrow$ levels.
Involvement rates $\rightarrow$ growth rates and industry contributions.

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- Additional thoughts!

Works cited

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