# Measuring the Economic Value of Data and Cross-Border Data Flows

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ASSA/AEA Annual Convention
San Diego, 3 January 2020


Disclaimer

This research has been co-funded by the OECD as part of the research programme of the Economic Statistics Centre of Excellence (ESCoE).

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# The world's most valuable resource is no longer oil, but data

*The data economy demands a new approach to antitrust rules*


The Economist, print edition, 6th May 2017

# Introduction

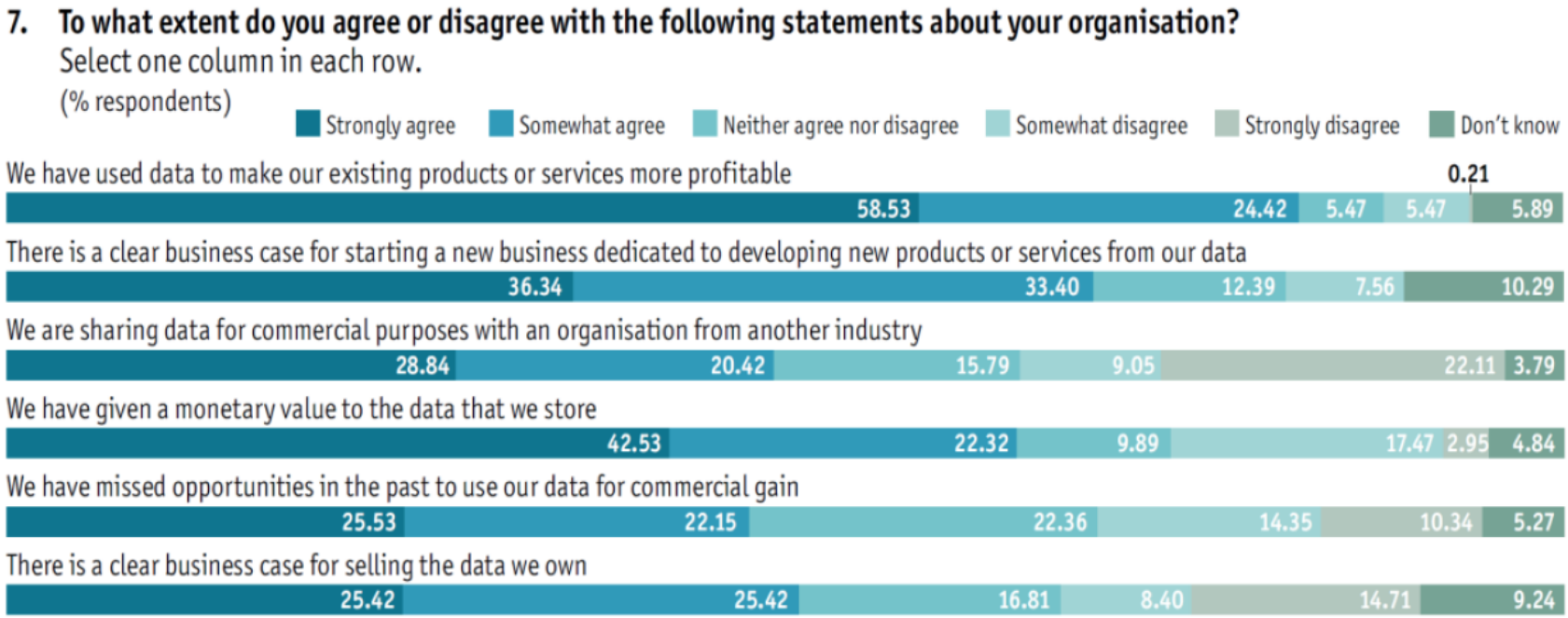
- With the ongoing digitalisation of the economy the **scale and scope** of how businesses use data changes.
- Not all data is created equal. It comes in many shapes and forms. We **focus on business value of data** (not public good).
- Broad view on data as *"unordered and unprocessed representation of any types of observations that are quantified and stored in symbols"*.
- It's **value depends on the information content** and not its 'volume'. The 'value of information depends on ways to monetise it' (now or in the future).
- This paper is **meant to be a guide** that describes some of the relevant dimensions and characteristics and reviews measurement approaches.

# Overview

1. Data-enhanced and data-enabled businesses
2. The global data value cycle
3. Data monetisation across business models
4. Data types and characteristics
5. Empirical approaches to measurement

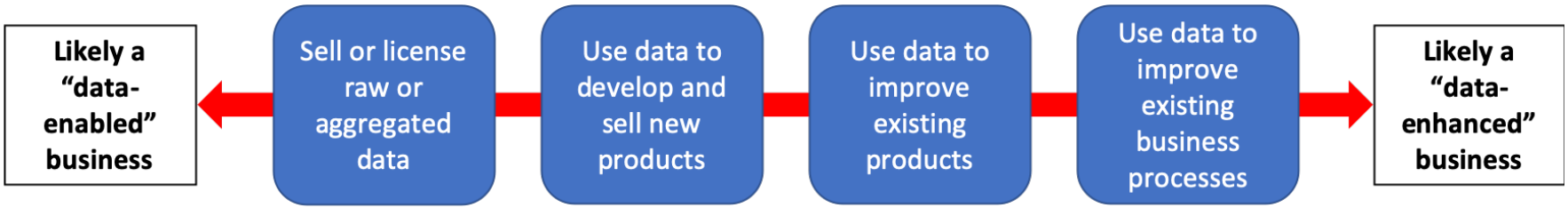
# Insights from business surveys

- 80% use data to improve products; 70% see case for new data business; 50% see business case in selling their data




Source: "The Business of Data", The Economist Intelligence Unit report (2015).

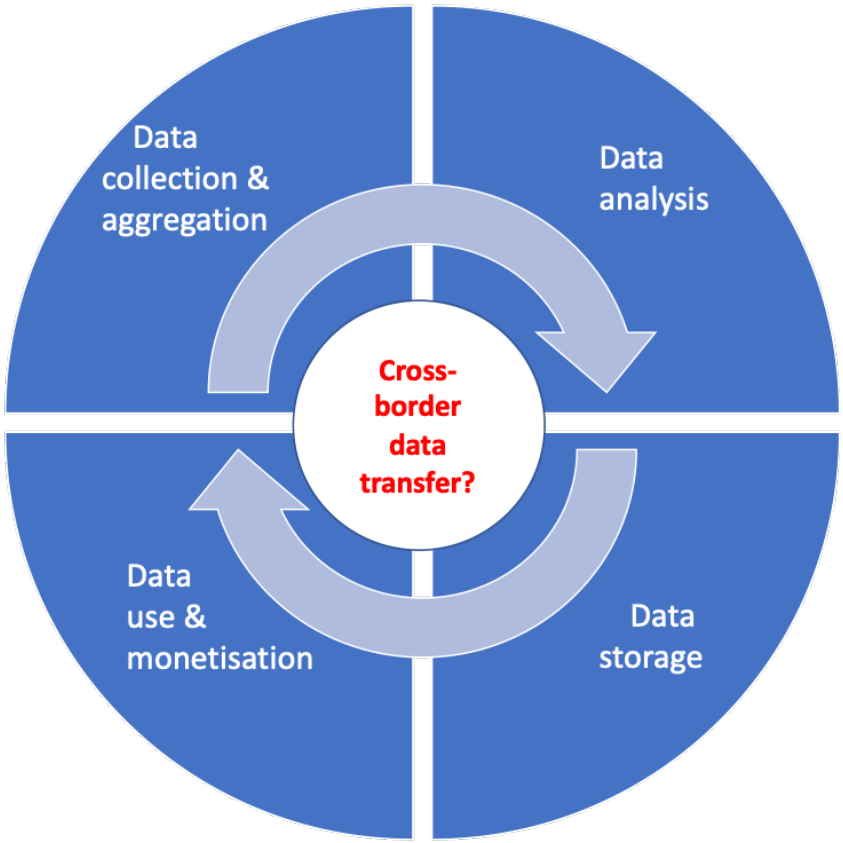
# Data-enabled vs data-enhanced businesses




Some examples:

- Twitter Premium or Enterprise API
- Airbus Skywise predictive maintenance
- DeepMind medical image scanning
- AWS and VW Industrial Cloud connecting machines across plants
- New data protection law California (50% threshold)

# The Global Data Value Cycle (1/2)

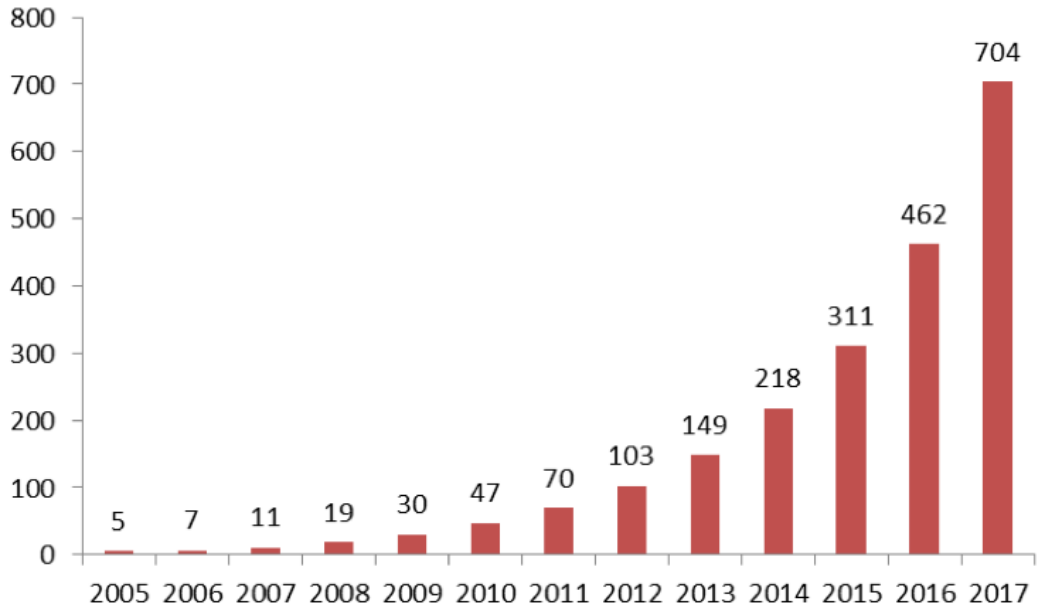



- Value can arise at any stage of the cycle
- Stages can be in different countries
- Businesses can specialise in certain stages
- Enabled by cloud computing (cheap, sophisticated), IoT, AI

# The Global Data Value Cycle (2/2)

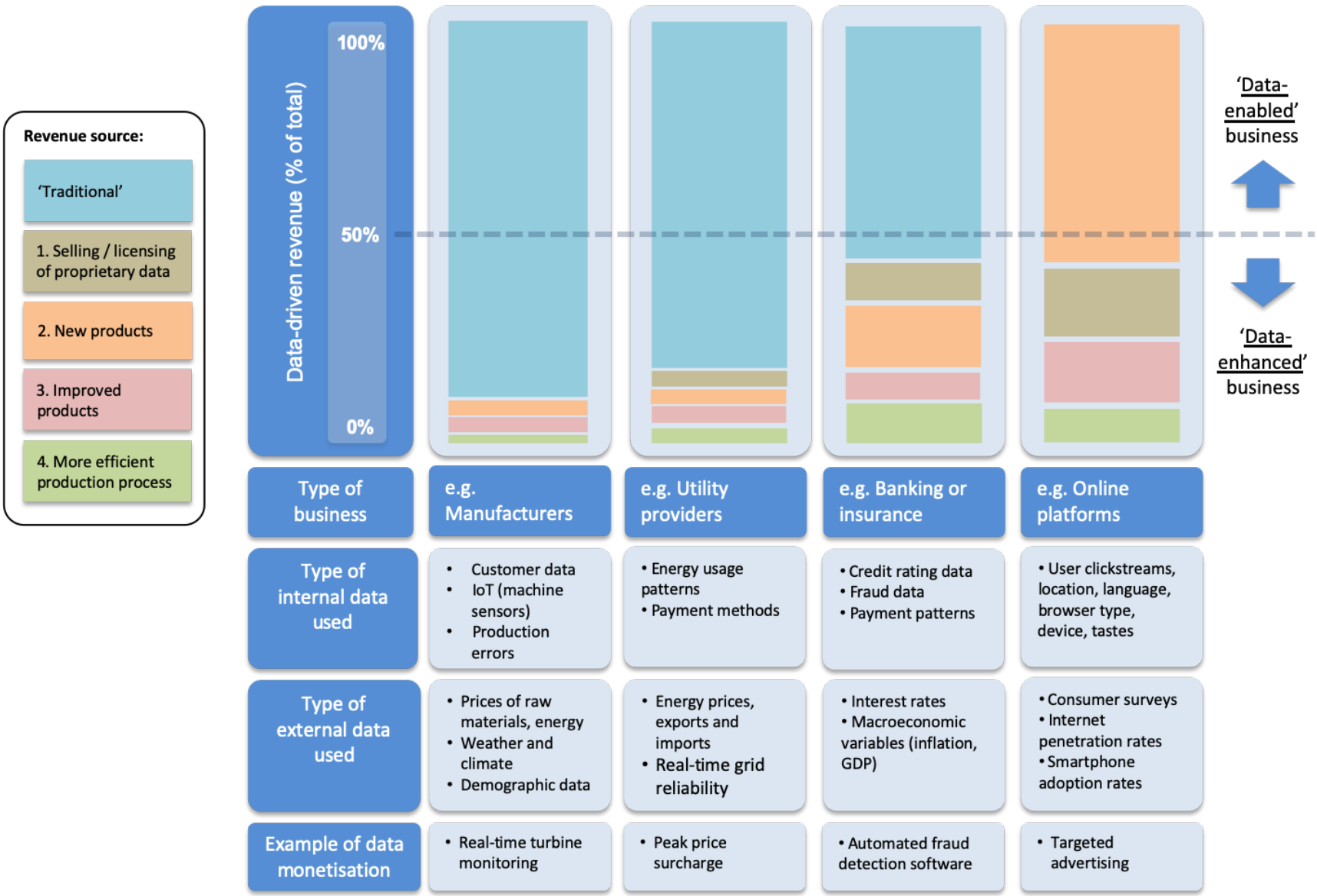
## Total used cross-border bandwidth in TB per second, 2005-17

- Issue of where to record/report value if aggregated in few data hubs (often transferred between affiliates)
- Global Value Chains further fragmented by digitalisation

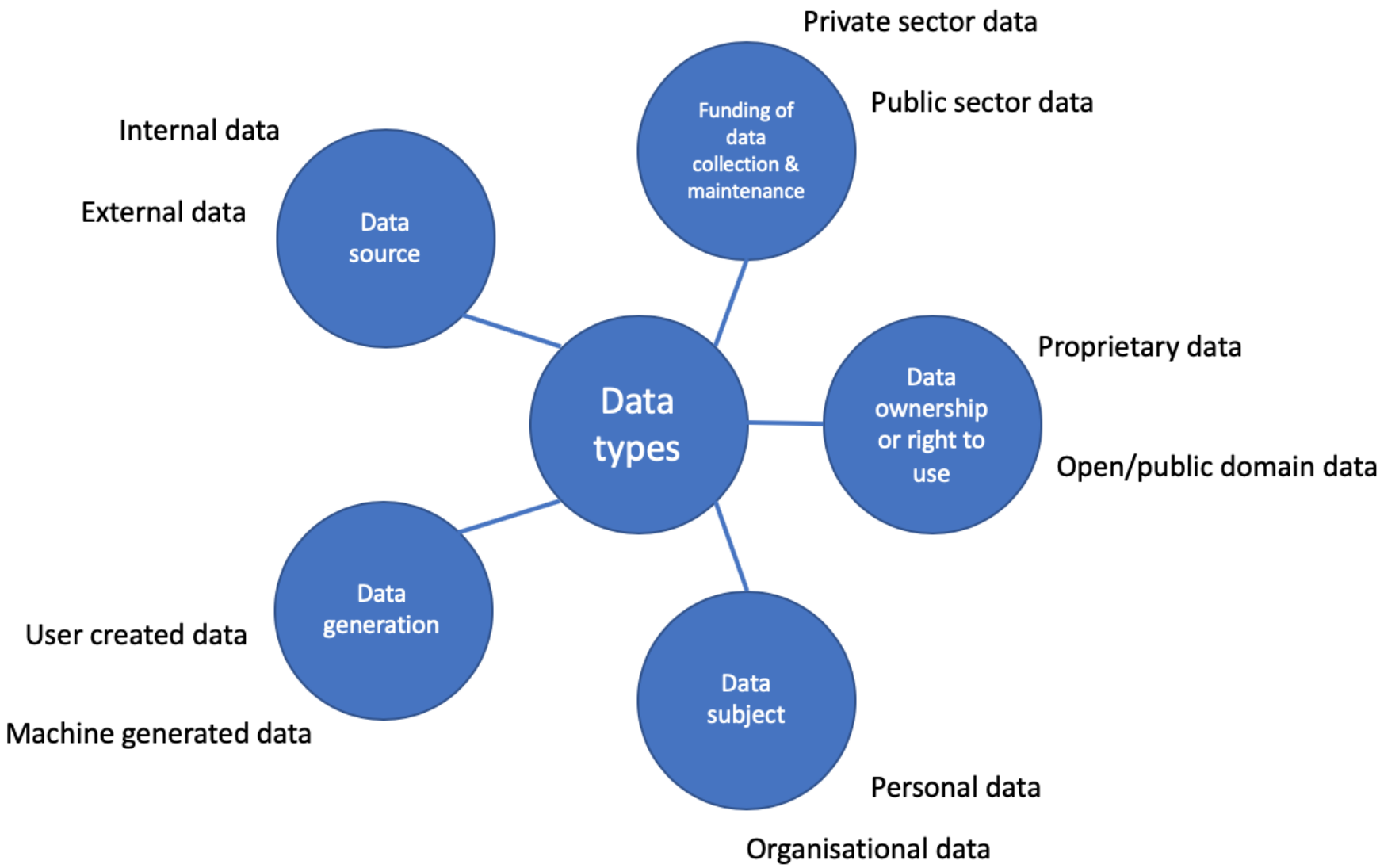



TeleGeography, McKinsey, 2019

# Data monetisation across business models



# Types of data



# Data characteristics

## Linkable, Accessible, Disaggregated, Timely, Trustworthy, Representative, Scarce

| Data characteristic | Description |
|---|---|
| *Linkable* | Ability to (easily) merge with the other datasets |
| *Accessible* | Ability to (easily) retrieve and/or integrate into business processes |
| *Disaggregated* | Availability at the desired level of aggregation |
| *Timely* | Updated with sufficient frequency to meet the business requirements (annually, daily or in real time) |
| *Trustworthy* | Deemed credible by users; unbiased and impartial, and not dependent on judgment, interpretation, or evaluation of individuals |
| *Representative* | Records do not contain missing fields and are representative enough to meet business requirements |
| *Scarce* | Data are proprietary or secret, difficult to come by |

# Empirical approaches to measurement (1/4)

## 1. Market-based approaches

- Challenge: no well-defined market and infrequent transactions
- Value is context-dependent. WTA of individuals to reveal social security number is US$ 240 but it can be bought for US$ 15 on the market
- Data brokers such as LexisNexis or Experian collect, aggregate, store and sell information on individuals. Pricing models unknown.
- Opportunity: explore data-seeking M&A activities or insurance market (e.g. against data breaches)

# Empirical approaches to measurement (2/4)

## 2. Data as knowledge-based asset

- Insights and measurement approaches from intangibles literature
- Databases qualify as asset under SNA 2008, but "data" explicitly excluded.
- Databases only include management systems and cost of digitisation (Ahmad & van de Ven, 2018).
- Value of data in firm acquisitions is goodwill and database acquisitions it is GFCF. Data as intermediate input invisible in accounts?
- Experimental: Explore bankruptcy cases where value of data has been negotiated in court (e.g. RadioShack in 2015)

# Empirical approaches to measurement (3/4)

## 3. Valuation based on business models and data value cycle

- Select key businesses for different business models and analyse data monetisation at different stages of the value cycle
- Use similar methods to capitalisation of R&D to infer value of data
- Li et al. (2019) estimate value of Amazon Marketplace data is US$ 125 billion (16% of market cap)

# Empirical approaches to measurement (4/4)

## 4. Use input-output tables to track data flows

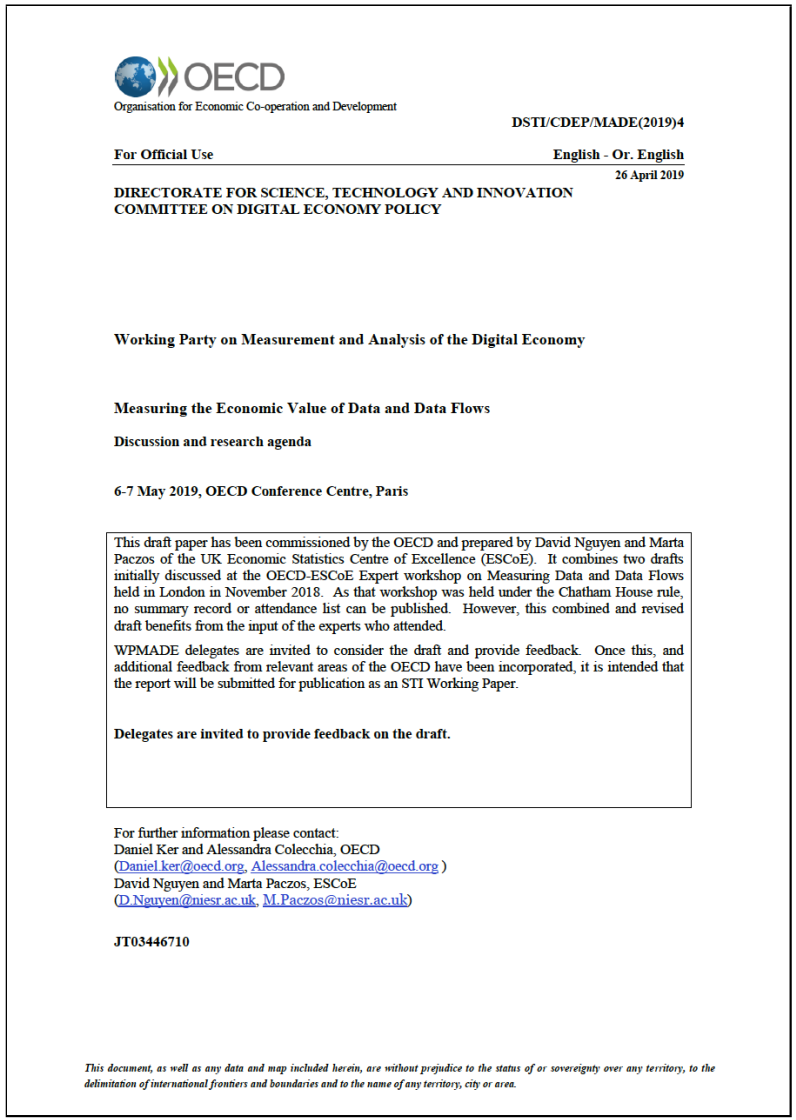
- Data as intermediate good
- Challenge: need to assign "data intensity" of sector outputs and assume depreciation rates
- Opportunity: Use information job openings in data-related jobs. Statistics Canada recently published some assumptions on "time spent producing data" by occupation
- For Canada this method yields annual investment in data in range of 7-11 billion USD

# Discussion and conclusion

*Can we see data everywhere but in business balance sheets?*

1. Our economies are increasingly powered by data. Consistent and comparable measures are needed for policy design.
2. Data is a special intangible asset: its value is highly context- and characteristics-dependent, costs of reproduction close to zero, and moving data around globally is easy, fast, and cheap (cloud computing as GPT). We need global approach to measurement.
3. As first step, statistical offices should introduce new questions in surveys.
4. Much more research needed on how businesses monetise data across different business models.

# Thank you for listening!



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DSTI/CDEP/MADE(2019)4

For Official Use — English - Or. English

26 April 2019

DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INNOVATION
COMMITTEE ON DIGITAL ECONOMY POLICY

Working Party on Measurement and Analysis of the Digital Economy

Measuring the Economic Value of Data and Data Flows

Discussion and research agenda

6-7 May 2019, OECD Conference Centre, Paris

This draft paper has been commissioned by the OECD and prepared by David Nguyen and Marta Paczos of the UK Economic Statistics Centre of Excellence (ESCoE). It combines two drafts initially discussed at the OECD-ESCoE Expert workshop on Measuring Data and Data Flows held in London in November 2018. As that workshop was held under the Chatham House rule, no summary record or attendance list can be published. However, this combined and revised draft benefits from the input of the experts who attended.

WPMADE delegates are invited to consider the draft and provide feedback. Once this, and additional feedback from relevant areas of the OECD have been incorporated, it is intended that the report will be submitted for publication as an STI Working Paper.

**Delegates are invited to provide feedback on the draft.**

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JT03446710

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