



# Global Conference on Macroeconomic Statistics for the Future

Brussels, 10-11 November 2022

#Statistics4Future

# The Digital economy in the updated SNA Focus on Data and Free Services

## Session 3

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with Nicola Massarelli, Eurostat, and John Mitchell, OECD

# The digital economy in the updated SNA



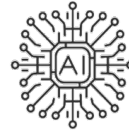
Recording of data in  
the national  
accounts



Increasing the  
visibility of  
digitalization in NA  
(Digital SUTs)



Cloud computing



Artificial  
Intelligence



Digital  
intermediation  
platforms



Crypto assets &  
Non-fungible tokens



Free products  
(valuation of free  
assets and free  
services)



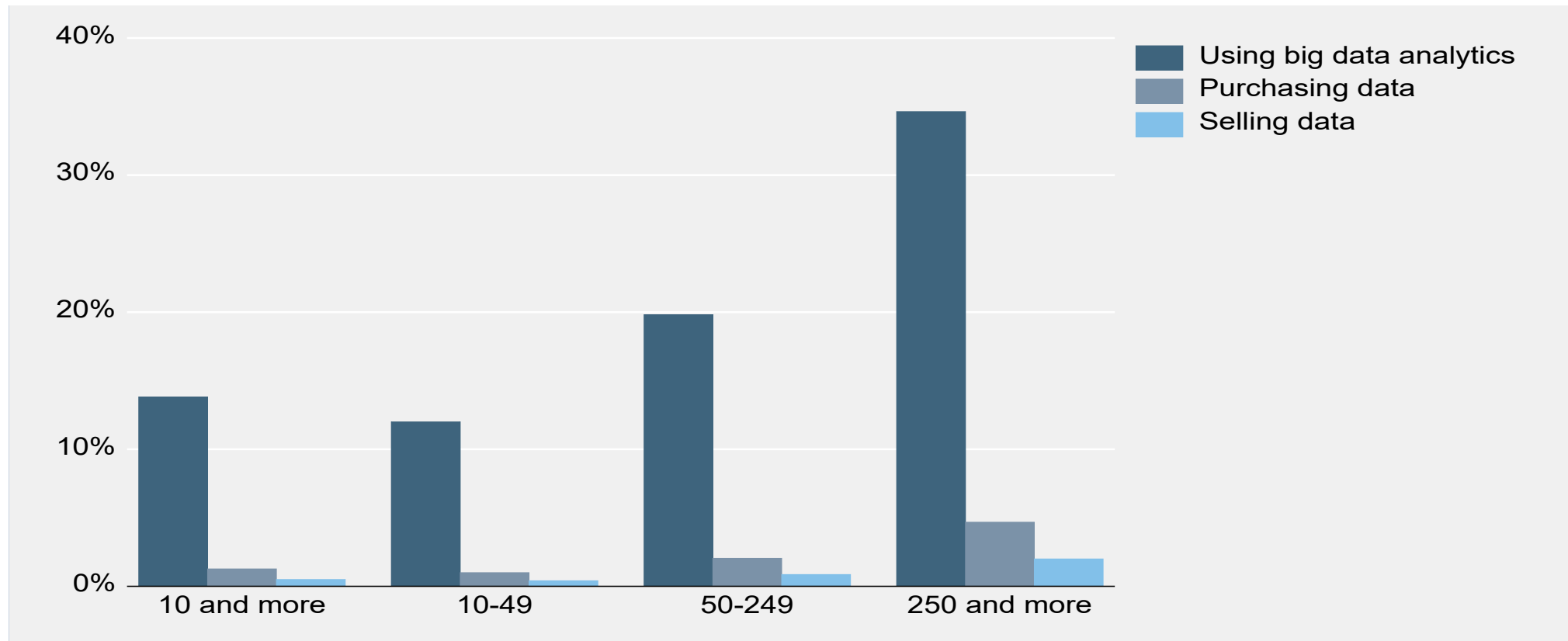
Price and volume  
measurement of  
goods and services  
affected by  
digitalization

# SNA 2008 on Data as an Asset

- Computer software and databases (SNA ¶10.109-114)
  - Category of intellectual property products
  - Grouped together in practice
- Definition of databases
  - Files of data organized in such a way as to permit resource-effective access and use of data.
    - Value should include the cost of preparing data in the appropriate format but exclude the cost of acquiring or producing data.
    - Databases for sale should be valued at their market price, which includes the value of the information content.
  - Inconsistent treatment for own-account and purchased data
    - Exclude value of data in own-account databases
    - Include value of data in market purchases of databases

# Purchasing or selling big data is rare, even among firms that conduct big data analytics

Average across 23 European countries by firm size (total number of employees), 2020



Source: Eurostat (2022), *ICT Usage in Enterprises*

# Digitalization Task Team (DZTT) on Data as an Asset

- Definition of data as a produced asset
  - Information content that is produced by *accessing* and *observing* phenomena and *recording, storing, and organizing* information elements from the phenomena in a digital format, which provide economic benefits in production
- Expansion of the *SNA* production boundary
  - Subcategory of computer software and databases
  - Sum of costs = labor + capital + intermediate inputs
  - Value includes Recording and Processing (R&P) costs and Observable phenomena procurement (OP-P) costs
- All own-account data is used in capital formation

# SNA 2008 on “Free” Digital Products

- No explicit reference to “free” digital products
  - Non-market production of governments and NPISH
  - Focus on digital platforms and digital apps
- Digital platforms supply “free” products that facilitate the interaction of two or more parties
  - Subsidized side (e.g., households)
  - Funder side (e.g., advertisers)
- Funder pays markup to cover cost of “free” products
  - Funder side recovers the cost in its sales
  - Subsidized side indirectly pays for use of “free” products

# DZTT on “Free” Digital Products

- Definition of “free” digital products
  - Digital content that is provided to households without monetary charge for the full value in order to access household observable phenomena that can be transformed into a data asset that can enrich the effectiveness of advertising messages or can be resold or otherwise used in production.
- No changes to *SNA* central framework
  - Clarify current *SNA* treatment
  - Propose *SNA* satellite account to promote visibility
- Intersection of “free” digital products and data assets
  - Three sectors: household, digital intermediary, advertiser



# DZTT on “Free” Digital Products: Three Satellite Account Options

- Option 1: household is final consumer (baseline)
  - Simply separate the values of “free” digital products and the advertised products they support with no effect on the value of the data asset
- Option 2: option 1 + digital intermediary is intermediate consumer of some “free” digital products
  - Intermediate consumption is an OP-P cost included in the value of the data asset
- Option 3: option 2 + digital intermediary is intermediate consumer of user-generated content
  - Intermediate consumption is an OP-P cost included in the value of the data asset

# DZTT on “Free” Digital Products

- Option 3 was preferred through global consultation for an *SNA* satellite account
  - Increases visibility of household’s role as a final consumer of “free” digital products and in production of digital content
  - Avoids double counting production of “free” digital products
  - Mitigates imputed transactions
- Sum of costs recommended for all three measures
  - Data assets
  - “Free” digital products
  - User-generated content

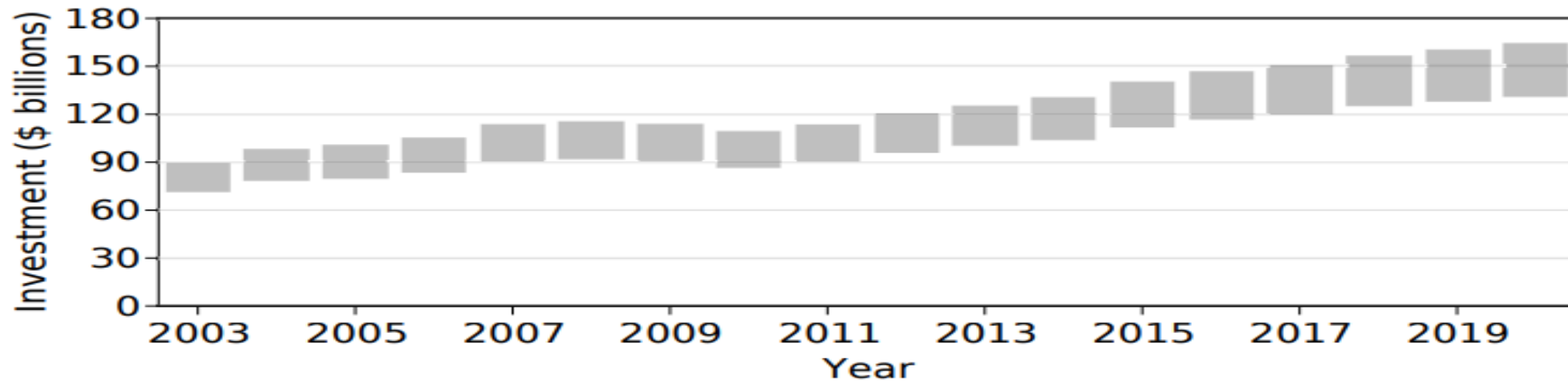
# Linkages between Data Assets & “Free” Digital Products under Option 3

		<u>Household</u>		<u>Intermediary</u>		<u>Advertiser</u>		<u>Total Economy</u>	
		Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources
Production Account	Output		5		515		280		800
	Predictive ad services				255				255
	"Free" products				20				20
	Software (platform asset)				150				150
	Software (database asset)				60				60
	Software (data asset-R&P)				15				15
	Software (data asset-OP-P)				15				15
	Advertised product							280	280
	User-generated content		5						5
	Intermediate consumption	5		15		255		275	
Predictive ad services					255			255	
"Free" products	5		10					15	
User-generated content			5					5	
Value-added	0		500		25		525		
Capital Account	Saving		-75		290		25		240
	Gross fixed capital formation	0		240		0		240	
	Software (platform asset)			150				150	
	Software (database asset)			60				60	
	Software (data asset-R&P)			15				15	
	Software (data asset-OP-P)			15				15	
	Net lending(+)/borrowing(-)	-75		50		25		0	

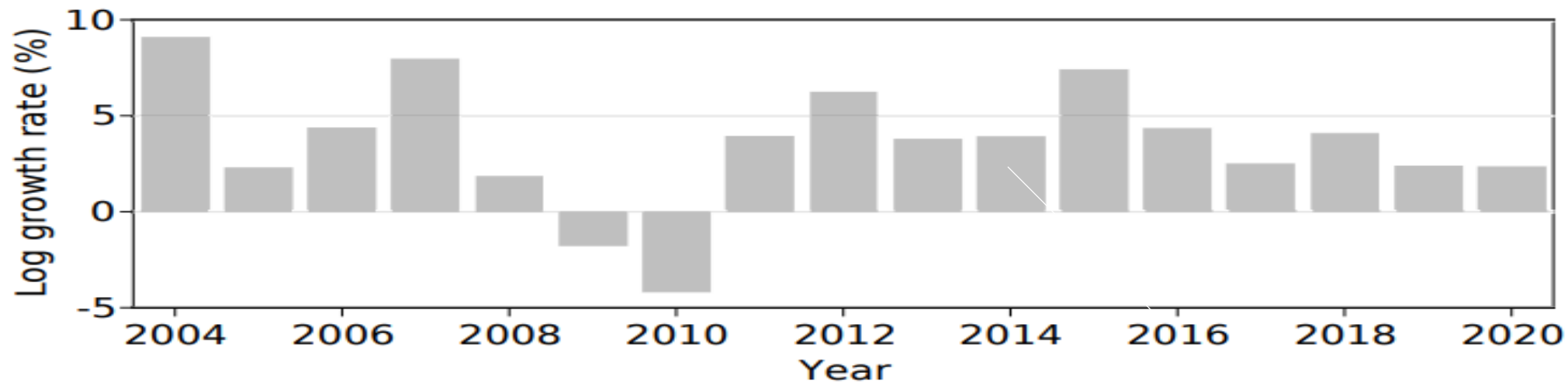
## Example: Own-Account Data Valuation, United States (BEA)

- Focus on U.S. business sector
- Sum of costs = labor + capital + intermediate inputs
  - Consistent with other U.S. own-account IPPs and DZTT
  - Data-related activities: collect, store, analyze, manage
  - R&P and OP-P costs not separately estimated in practice
- Methodology sequence
  - Estimate time use for data-related activities by occupation
  - Estimate wages by occupation and industry
  - Apply a markup to estimate the full sum of costs
  - Adjust for multiple counting and capital formation

# Current-Dollar Investment in Data

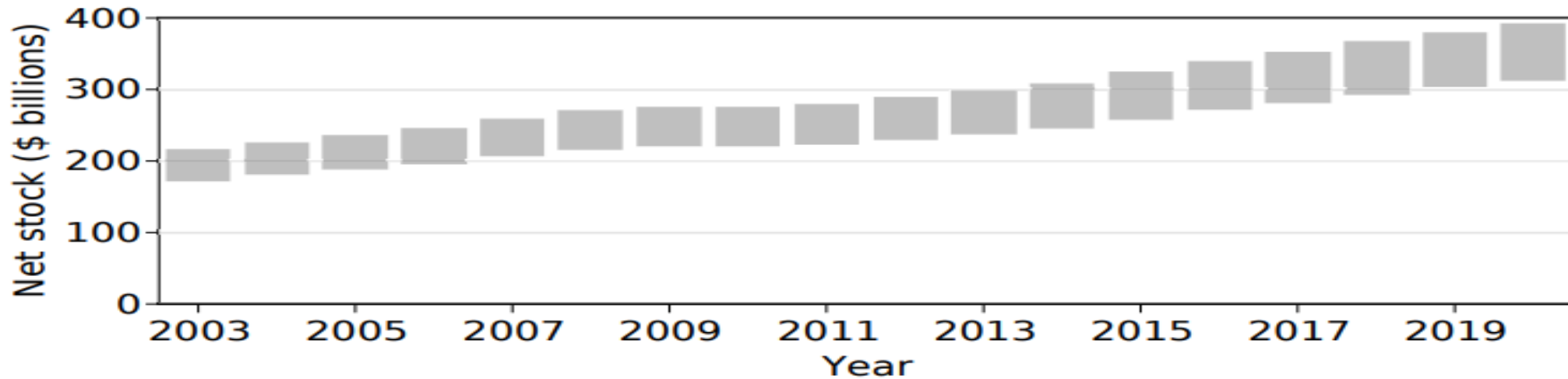


2003 = \$72 B  
2020 = \$131 B

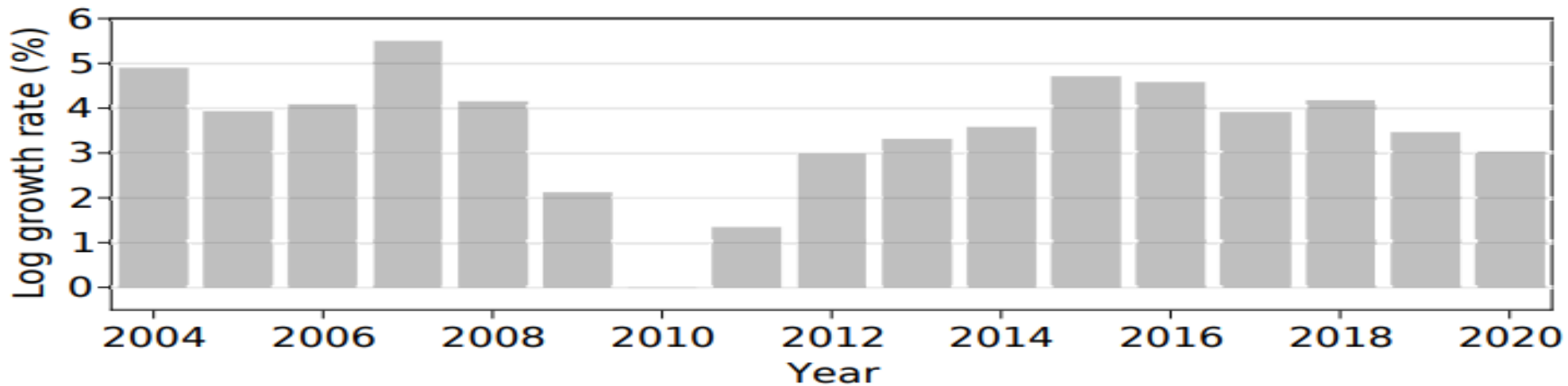


Average =  
3.6%

# Historical-Cost Net Stocks of Data



2003 = \$174 B  
2020 = \$313 B



Average = 3.4%

# Estimates of data assets have been created in a range of countries...

Investment in total data assets as a percentage of total gross value added

Country	upper bound	Lower bound
Australia	2.9%	2.2%
Canada	1.9%	1.4%
Netherlands*	3.0%	2.4%
United States*		0.8%

\*USA & NLD cover private data investment only.

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## Next Steps

- The DZTT has drafted separate guidance notes for data as an asset and “free” digital products
  - Global consultation is complete and the DZTT is considering responses to the survey questionnaires
  - General support for DZTT recommendations
  - Data as a produced asset will be included in the next SNA update, with work beginning on early implementation
- Measurement of R&P costs for data valuation has been demonstrated to be feasible by countries
  - Measurement of OP-P costs (i.e., “free” digital products and user-generated content) requires more research



# THANK YOU!



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