MEASURING GDP IN A DIGITALISED ECONOMY

Nadim Ahmad,
Head of Trade and Competitiveness Statistics Division,
nadim.ahmad@oecd.org

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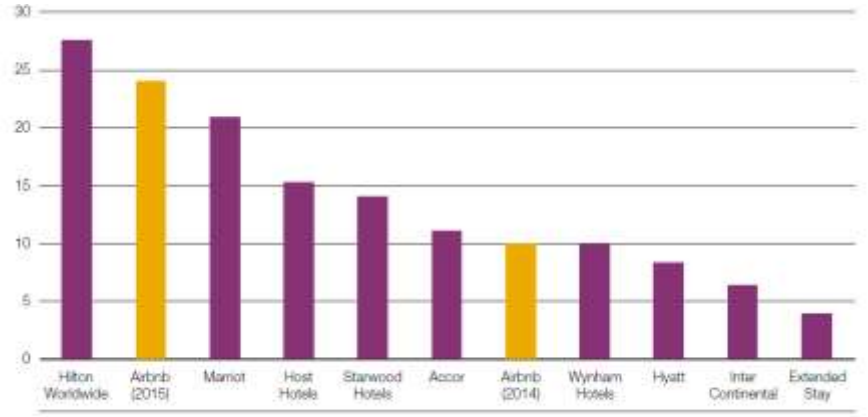
Background

Increased prevalence of 'new' transformative (digital) technologies

But....

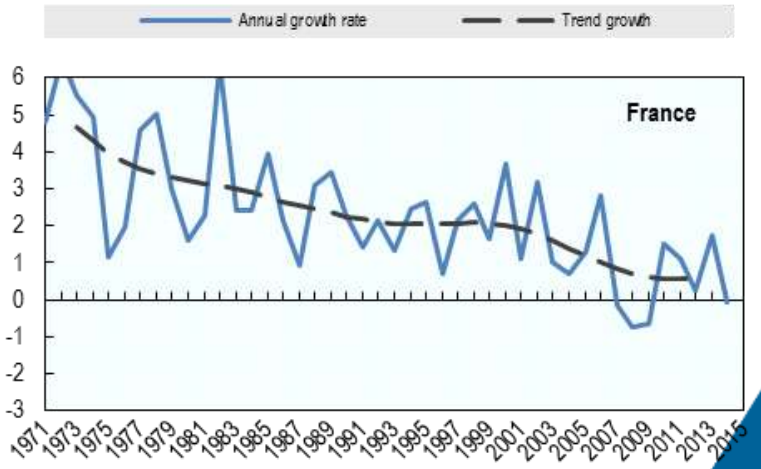
.... Declining productivity

Market capitalisation of AirBnB (£ Billions)

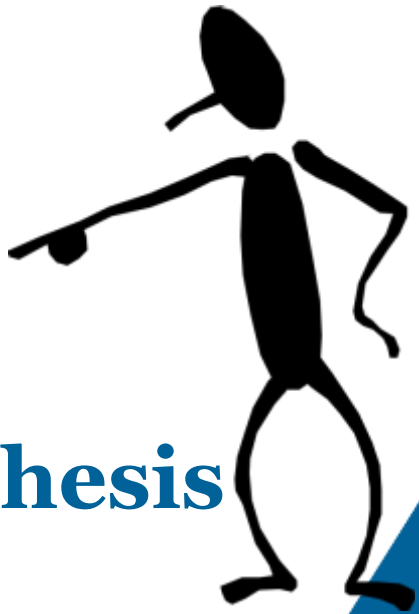


Source: Davidson, L., (2015). 'Airbnb boss calls the UK the "centre of the sharing economy",' The Telegraph.

Trend labour productivity growth



- Shortage of ideas (Gordon)
- Break-down of the diffusion machine and inequality (OECD)
- A business cycle effect



➢ The Mis-measurement Hypothesis

?

Charles Hulten: Valuing the Net and the wide range of applications… is challenging…. and their omission or undervaluation surely affects GDP."

Charlie Bean: "statistics have failed to keep pace with the impact of digital technology"

Diane Coyle: The pace of change in OECD countries is making the existing statistical framework decreasingly appropriate for measuring the economy

THE WALL STREET JOURNAL.

Silicon Valley Doesn't Believe U.S. Productivity

The U.S. Underestimates Growth

FINANCIAL TIMES

The internet and the productivity slump

ComputerWeekly.com

Why we're measuring the digital economy in the wrong way

The Economist

Some optimists argue instead that the problem is one of measurement. Technological progress often raises productivity in ways that statistical agencies struggle to detect

But our collective response has (until lately) been less visible

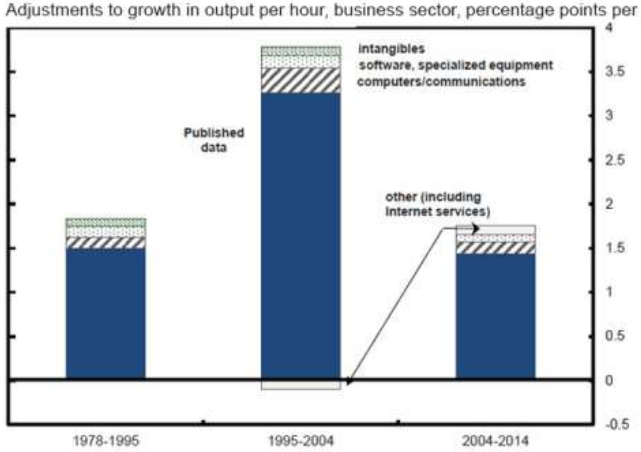
..and despite some notable responses..

- *Challenges to Mismeasurement Explanations for the U.S. Productivity Slowdown, Chad Syverson:* NBER Working Paper No. 21974, February 2016
- *Does the United States have a productivity slowdown or a measurement problem? Byrne, D., J.Fernald and M. Reinsdorf*; Brookings Papers on Economic Activity, Spring 2016.

The current rate of productivity is similar to earlier periods

The fast-growth period from1995-2004 was an anomaly, thanks to the Internet, reorganization of distribution sectors, etc.

Adjustments to growth in output per hour, business sector, percentage points per year



...there remain more questions than answers..

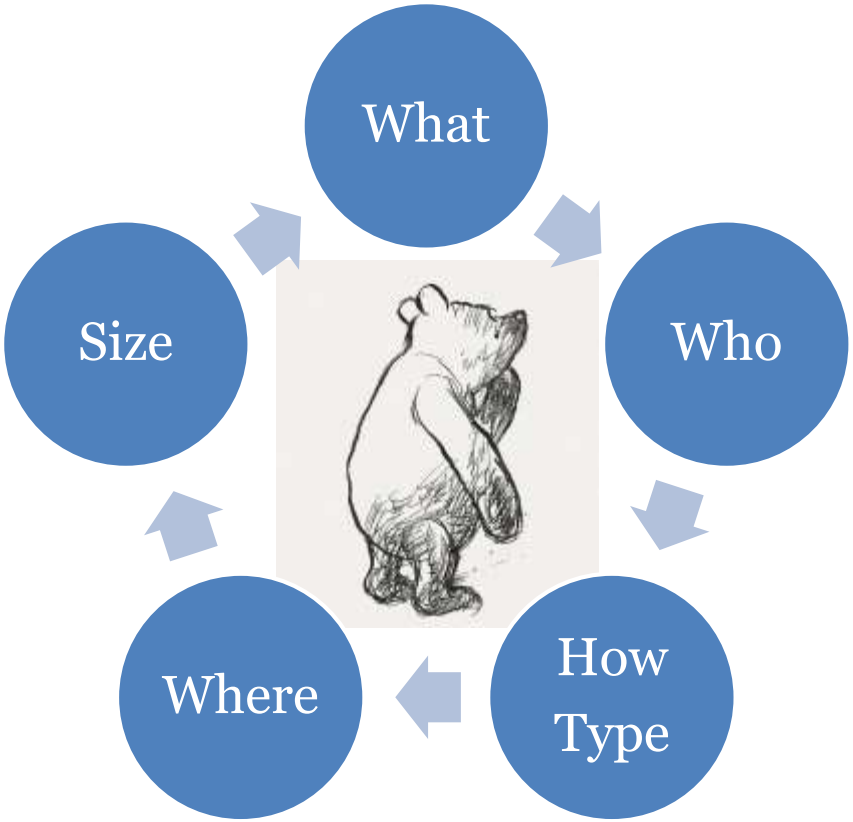
...and calls for action:

Independent Review of UK Economic Statistics

Professor Sir Charles Bean

Partly reflecting the ill defined nature

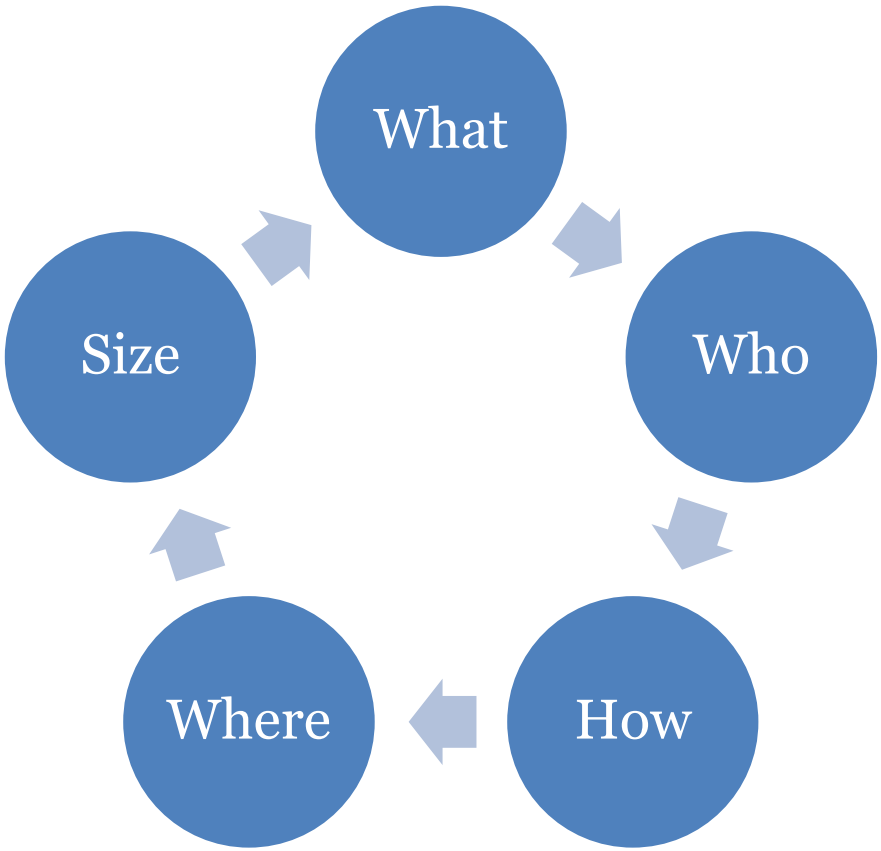
…of the 'digital', 'sharing', 'uberised', 'knowledge based' economy



OECD response

- 2016
  - *OECD Working Paper: Measuring GDP in a digitalised economy*
- 2017
  - Advisory Expert Group of NSOs (members of OECD WPNA), Eurostat, IMF, UN, and members of OECD WPMADE
  - OECD-IMF Working Paper: *Can potential mismeasurement of the digital economy explain the post-crisis slowdown in GDP and productivity growth*
  - OECD-IMF: *Measuring Consumer Inflation in a Digital Economy*
  - OECD-WTO *Task Force on International Trade in Services expert group*
  - *OECD-UPU-WTO-UNCTAD* initiative on de minimis trade

Survey on measurement of GDP and productivity in a digitalised economy



Stocktaking of current and best practices of OECD countries and key partners

29 country responses

Our take on the MMH in 5 domains

1: New forms of intermediation services

Digital intermediaries

Digital intermediaries

Dwelling services

Business& Transport

Distribution (e-Bay)

Conclusions:

Underling activities not new >Conceptual framework robust – (VA=fees, commissions, margins)

But rise in 'informal' (*occasionally employed*) activities may require reviews of estimation methods

Impact of mismeasurement not expected to be large:

- **Dwelling services vs Imputed rent**
- **Distribution services provided by households– margin not expected be large**

Dual Use of Uber vehicles has no impact on GDP and only marginal impact on GFCF if recorded as investment – between 0.01% (France) and 0.05% (UK) in 2015

2: Consumers as producers – ‘participative and displacing production’

'Participative' & 'displacing' production

Households engaging in the intermediation process

Household production of services for own-consumption:

- Hotels and flight bookings
- Supermarket self-service
- On-line check-in
- Cash-machines

Not a new phenomena

- Accounting framework excludes many other 'non-market' transactions

- **Current price GDP unaffected**
- **But volume measures may not adequately capture quality changes**

3:Free and subsidised consumer products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Free assets

Households as 'producers' of free assets

Production of freely available 'public' goods:

Wikipedia, Software

Not a new phenomena

Covered in the Handbook on Deriving Capital Measures of IPPs

Wikipedia: Page views and estimated advertising revenue

		2010	2012	2013	2015	2016
Number of page views (millions)		*143 397*	*152 096*	*160 685*	*153 330*	*183 796*
World GDP (GDP USD, current prices, constant		*65 058 816*	*73 355 559*	*76 787 466*	*83 300 939*	*86 905 866*
Revenue (USD millions)	Display network CTR = 0.35% CPC = 0.58	291.1	308.8	326.2	311.3	373.1
Value/ World GDP Ratio		0.0004%	0.0004%	0.0004%	0.0004%	0.0004%
Revenue (USD millions)	Search network CTR = 1.91% CPC = 2.32	6 354	6 740	7 120	6 794	8 144
Value/ World GDP Ratio		0.0098%	0.0092%	0.0093%	0.0082%	0.0094%

Adjusted for PPPs

		2010	2012	2013	2015	% change between 2010 and 2015
Revenue (USD millions)	Display network CTR = 0.35% CPC = 0.58	266.9	274.5	280	240.4	-9.90%
Revenue (USD millions)	Search network CTR = 1.91% CPC = 2.32	5 826.8	5 992.9	6 111.5	5 247.9	-9.90%

4: Cross-border flows of intellectual property products

Knowledge based capital and globalisation

'Investment' outside of the SNA asset boundary and cross-border flows

Many 'intangible' assets already in the SNA but many are not:

Human capital,

Knowledge in databases,

Organisational capital ,

Brands

And for those assets in the boundary, difficulties with cross-border transactions remain

Not a new phenomena

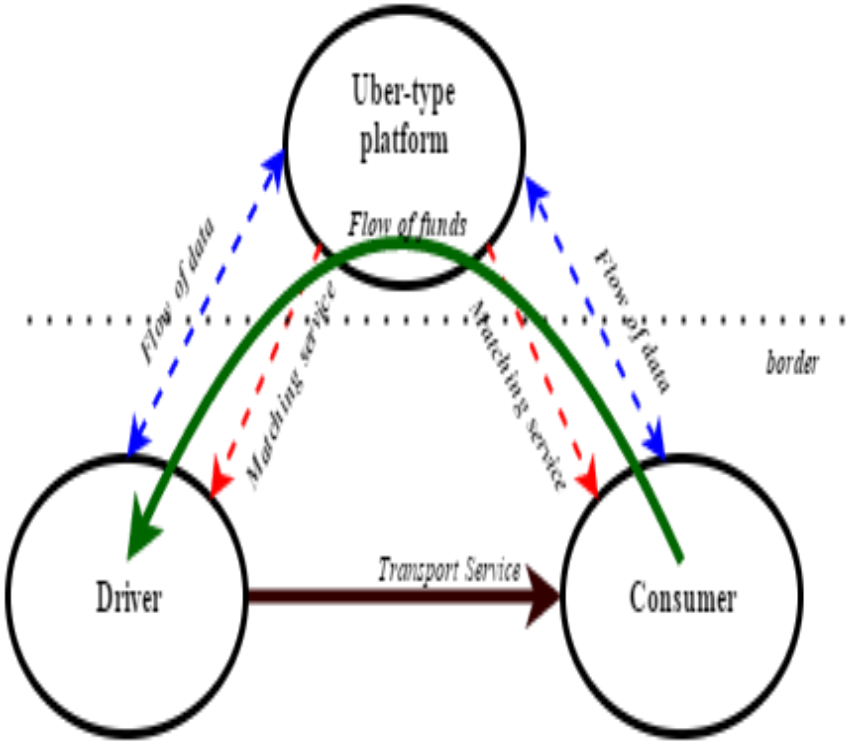
Considered in the 2008 SNA revision process but ruled out on practical grounds.

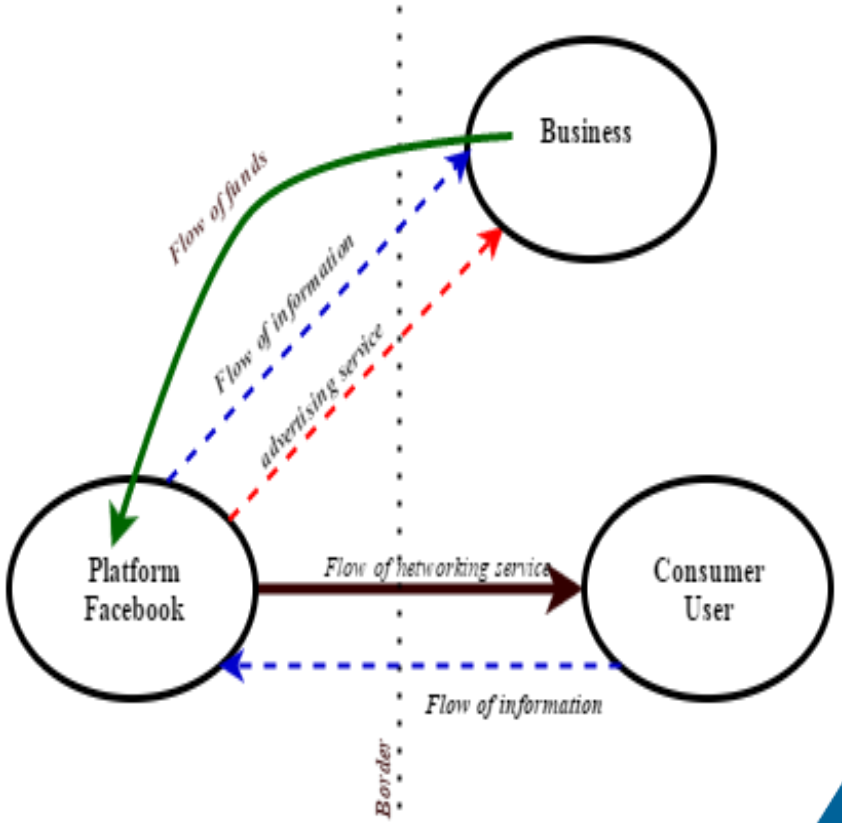
Guidance developed in various Task Forces but further work needed as the scale of the problem remains unknown

Case in point: Ireland's GDP growth

Digital trade

Not always clear whether flows are cross-border – Mode 1 vs Mode 3 – nor indeed the nature of the service – e.g. transportation or business services





De minimis trade

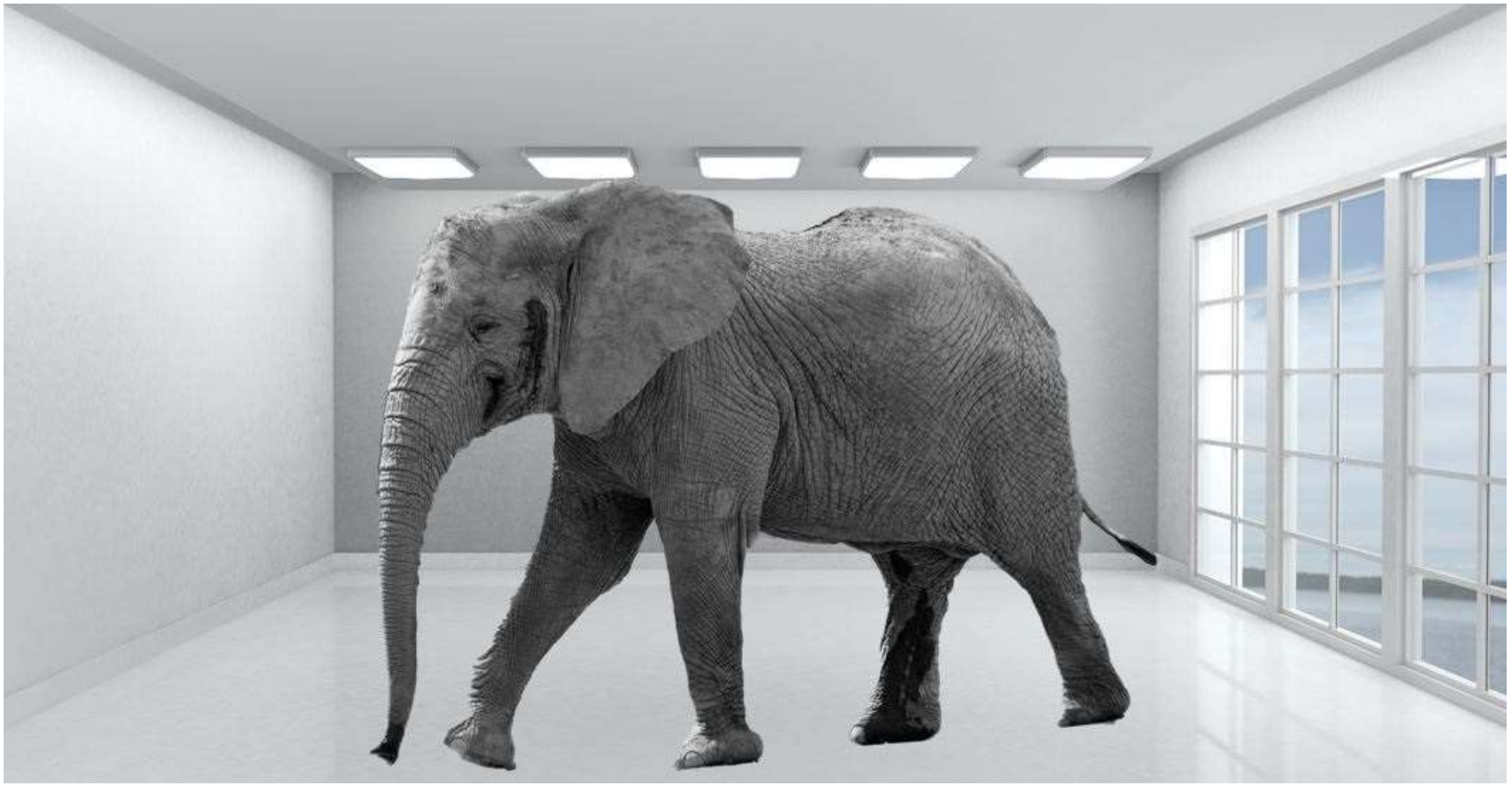
Possible that larger sums are falling below the radar screen

Information is patchy :

Where evidence is available it points to relatively small sums but likelihood is that these are growing.

Working with UPU, UNCTAD and WTO

DATA



5: Prices and volumes

Prices and volumes

A significant challenge

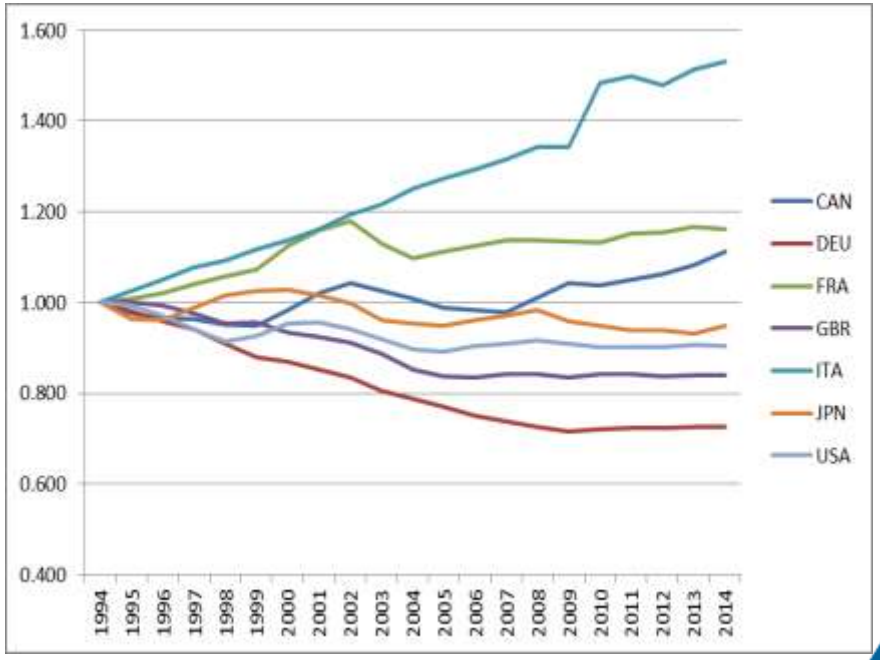
Customisation

Outlet bias

Quality change

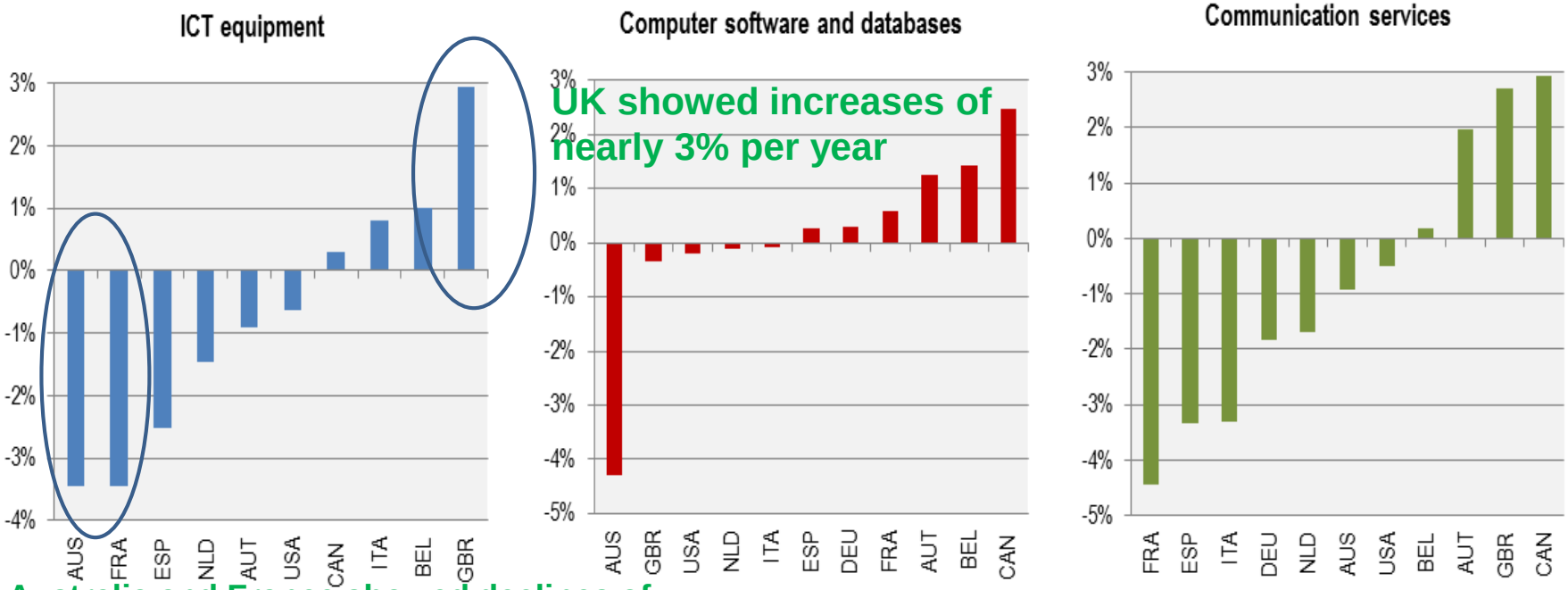
Not a new phenomena
but challenges remain

Price indices for software investment



Price indices for ICT assets and communication services

Average annual growth rate in percentage, 2010-2015 (or latest available year)

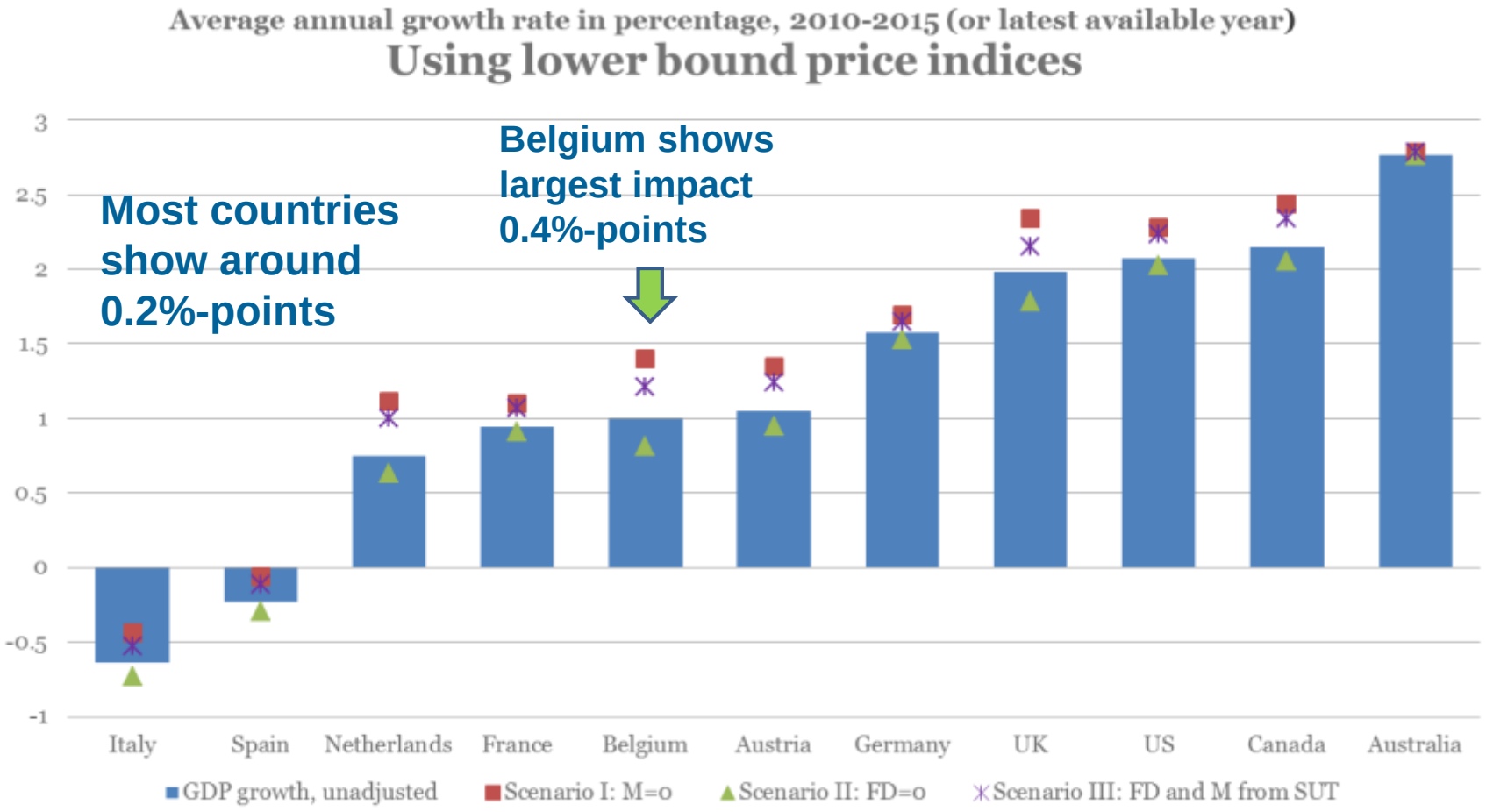


UK showed increases of nearly 3% per year

Australia and France showed declines of more than 3% per year

Notes: Data reported for Spain for ICT equipment and Computer software and database correspond to the period 2010-2014. Data reported for Austria for Communication services correspond to the period 2011-2015.
Source: OECD National Accounts Statistics, OECD Productivity Database, OECD Prices and Purchasing Power Parities database, Australian Bureau of Statistics, U.S. Bureau of Economic Analyses and Statistics Canada, February 2017

Impact on GDP growth, using alternative ICT & communication prices



Prices and volumes: results from survey of national practices

Issue	Response
• Price differences in distribution margins from buying products on-line versus in a store:	• **change in price; (16) change in quality. (9)**
• If producer prices of goods that appear identical differ:	• **Difference in price (18), in quality (5)**
• Participative production	• One country (self-service checkouts

8 countries using or exploring **new data sources**, such as **web-scraping** to deal with **rapid quality changes**. 5 others mention interest for compiling CPI.

Tentative conclusions and on-going actions

Tentative Conclusions

Conceptual framework is robust

Measurement in some areas may require improvement and new approaches for

- The occasionally self-employed
- International transactions in IPPs
- Consistent classification of what is the 'digital' economy

But the impact is not expected to be significant for current price estimates

***Volumes and* Prices**

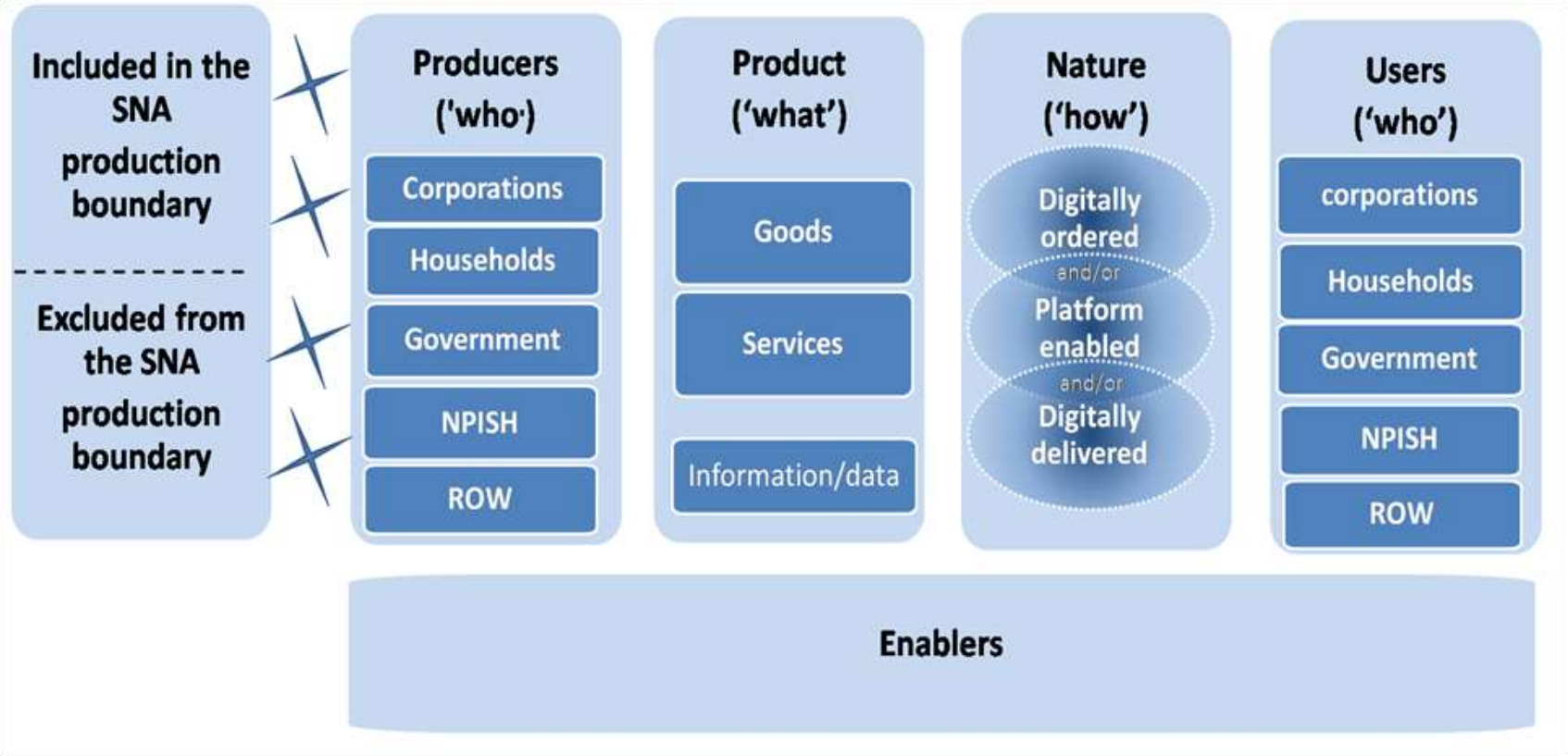
- ***Evidence so far suggests that this will not be able to explain the productivity slowdown (at most adds around 0.2% to growth)***

The problem can be part of the solution

- Digital intermediaries are increasingly asked to disclose turnover
- Big data offers new ways for price measurement and quality adjustments (as in Cavallo and Rigobon 2016

On-going actions

A typology



And satellite accounts

Outline of an Extended Use Table to account for the digital economy (example with 3 industries (1-3) and 5 products (a-e)
The table is reported in both purchasers' and basic prices
Split into domestic and imported supply

			A	B	C	D	E	F	G
			Intermediate use						*Final use*
			Industry type-1		*Industry type-2*	*Industry type-3*	*subtotal: sum of enabler producing industries and platforms (e.g. ind*	total intermediate use	HHFC
	This column would contain a detailed breakdown of agreed products		unincor-porated households	incor-porated	Enabler industries	digital platforms			
1	***product a (non-digital good)***								
2		***Digitally ordered***							
3		directly from counterparty							
4		via a resident digital intermediary platforms							
5		via a non-resident digital intermediary platforms							
6	***product b (digital good)***								
7		***Direct from counter party***							
8		digitally ordered, physically delivered							
9		digitally ordered and digitally delivered (e.g. 3D printing)							
10		digitally delivered not digitally ordered (3D printing-unlikely to be entry)							
11		other (non-digital)							
12		***Via resident digital intermediary platforms***							
13		digitally ordered, physically delivered							
14		digitally ordered and digitally delivered							
15		***Via non-resident digital intermediary platforms***							
16		digitally ordered, physically delivered							
17		digitally ordered and digitally delivered							
18	***product d (non-digital service, paid)***								
19		***Digitally ordered***							
20		directly from counterparty and other digital platforms							
21		***Via resident digital intermediary platforms***							
22		value of the service							
23		intermediation fee (both implicit and explicit)							
24		***Via non-resident digital intermediary platforms***							
25		value of the service							
26		intermediation fee (both implicit and explicit)							
27	***product e (digital service, paid)***								
28		***Direct from counter party and other digital platforms***							
29		digitally ordered							
30		digitally ordered and digitally delivered							
31		digitally delivered but not digitally ordered (may include transactions such as data services,Website design, software)							
32		***Via resident digital intermediary platforms***							
33		digitally ordered, physically delivered							
34		value of the service							
35		intermediation fee (both implicit and explicit)							
36		digitally ordered and digitally delivered							
37		value of the service							
38		intermediation fee (both implicit and explicit)							
39		***Via non-resident digital intermediary platforms***							
40		digitally ordered, physically delivered							
41		value of the service							
42		intermediation fee (both implicit and explicit)							
43		digitally ordered and digitally delivered							
44		value of the service							
45		intermediation fee (both implicit and explicit)							
46	***product f (digital service, free)***	*(outside the current SNA framework)*							
47		Digital data services							
48		of which intra-firm provision of data/ and or use of databases							
49		Other digital services (e.g., free search services, social media, etc.)							

Thank you