



THE ECONOMICS OF DATA-DRIVEN INNOVATION

Opportunities and challenges for Europe

Christian.Reimsbach-Kounatze@oecd.org



OECD - Organisation for Economic Co-operation and Development



- Like-minded
- Economic and social development
- Policy standard setter
- Inter-governmental
- Multi-stakeholder

Inter-governmental organisation with 34 members

Australia	Korea
Austria	Luxembourg
Belgium	Mexico
Canada	Netherlands
Czech Republic	New Zealand
Chile	Norway
Denmark	Poland
Estonia	Portugal
Finland	Slovak republic
France	Slovenia
Germany	Spain
Greece	Sweden
Hungary	Switzerland
Iceland	Turkey
Ireland	United Kingdom
Israel	United States
Italy	+ European Union
Japan	



Structure*

1. Why do we care about data-driven innovation?
2. What is the current evidence-base?
3. What are the key policy opportunities for Europe?

*Disclaimer: This presentation reflects my expert views and should not be reported as representing the official views of the OECD or of its member countries.



DATA DRIVEN INNOVATION: A NEW SOURCE OF GROWTH?



Data: inexhaustible source for growth across the economy



Public Administration



Health



Retail

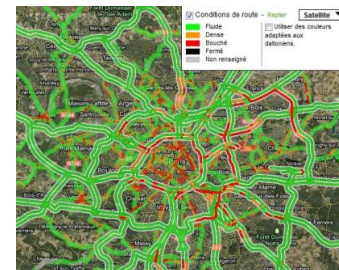
Data



Agriculture



Science and Education

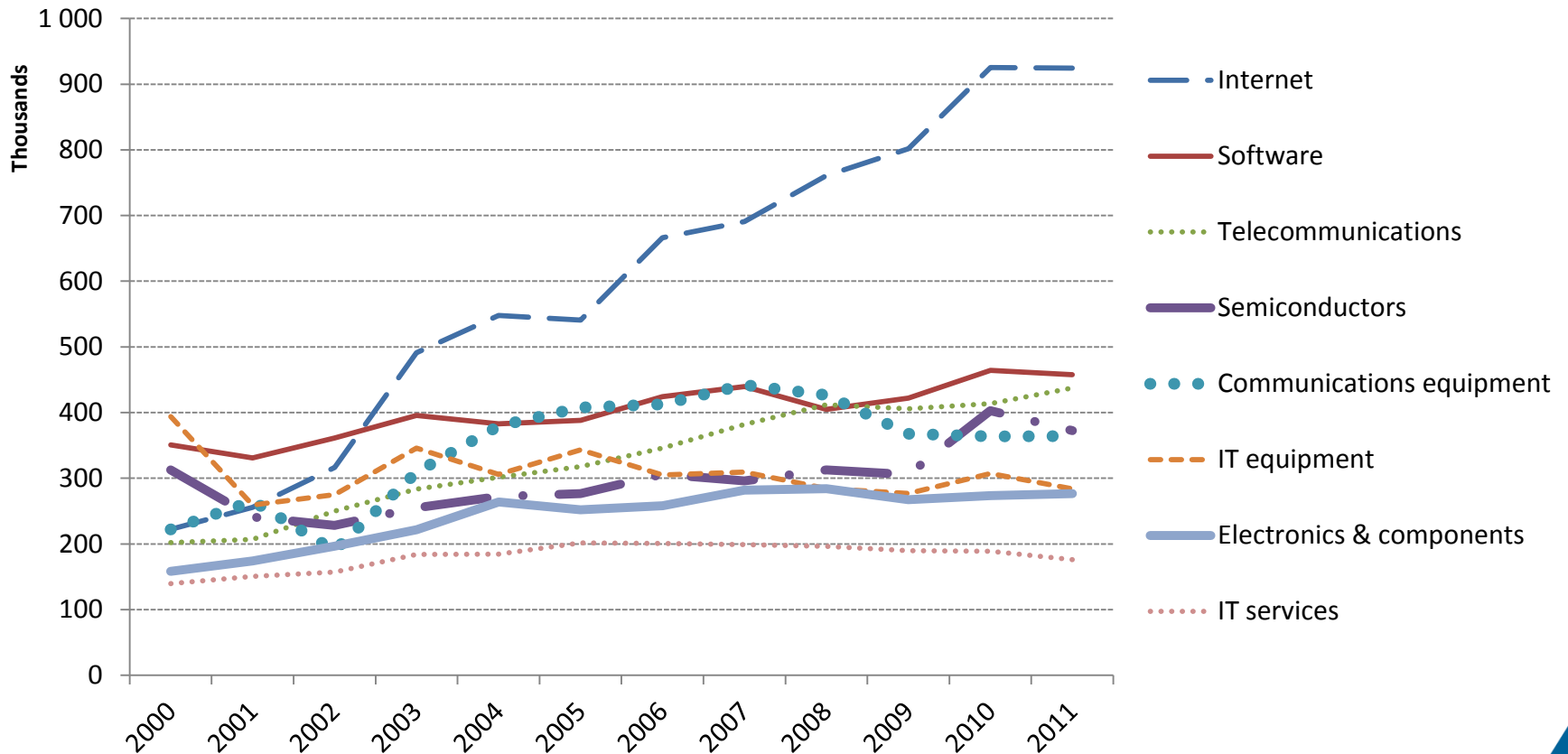


Transportation



Internet firms – pioneers of data-driven innovation

Average revenue per employee of top 250 ICT firms in thousand USD



Source: OECD Internet Economy Outlook 2012



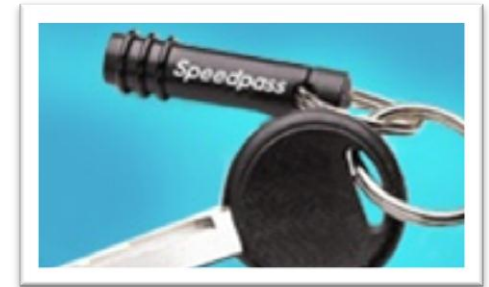
More data is being generated through the Internet of Things (M2M)



Supply Chain Management



Work In Process Tracking



Security & Access Control



Environmental Applications



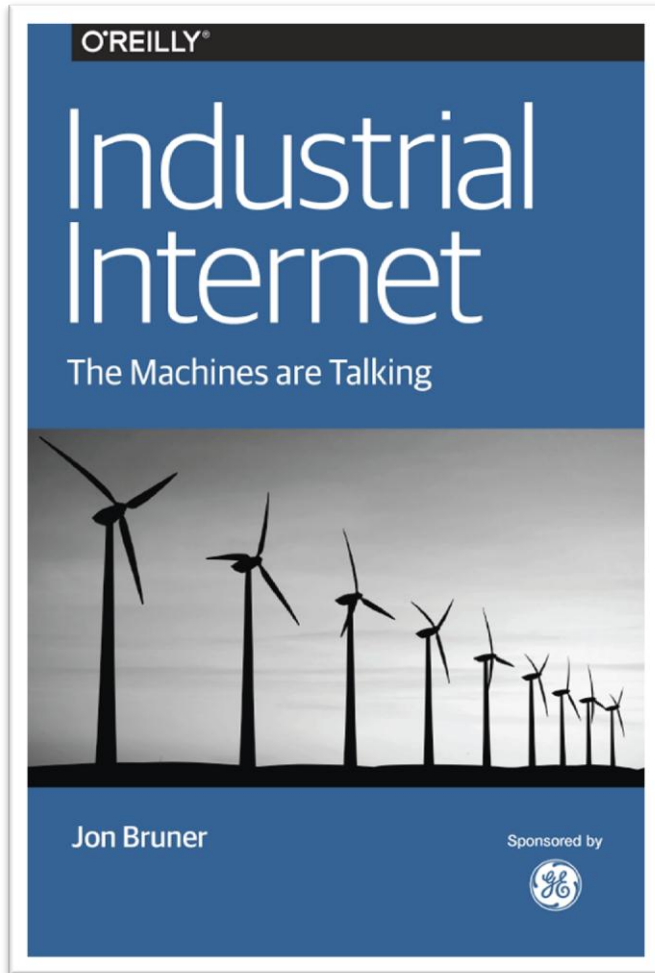
Asset Management



Consumer Applications



Data-driven innovation in 21st century manufacturing





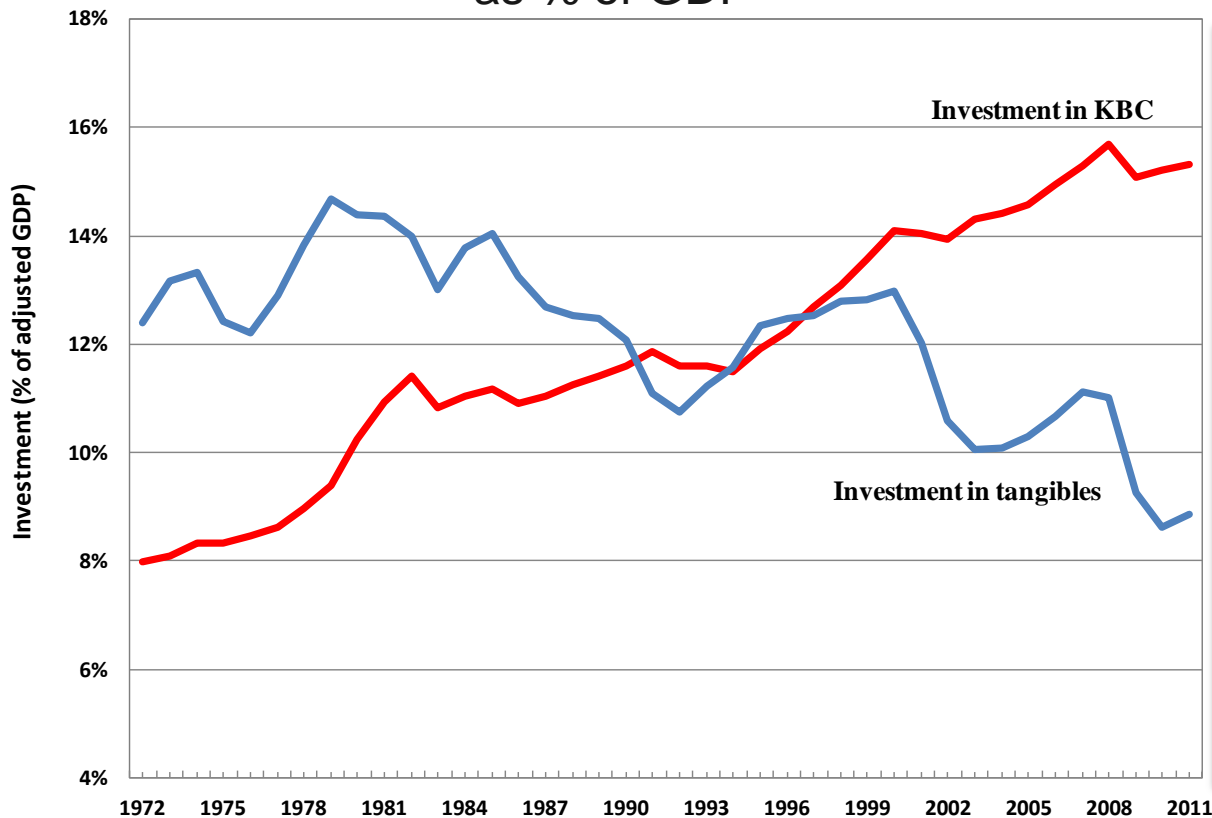
EVIDENCE BASE ON DATA-DRIVEN INNOVATION STILL POOR

BUT IMPROVING !



Improvements in measuring knowledge-based capital ...

Business investment in intangible (knowledge-based) and tangible assets in the United States, as % of GDP

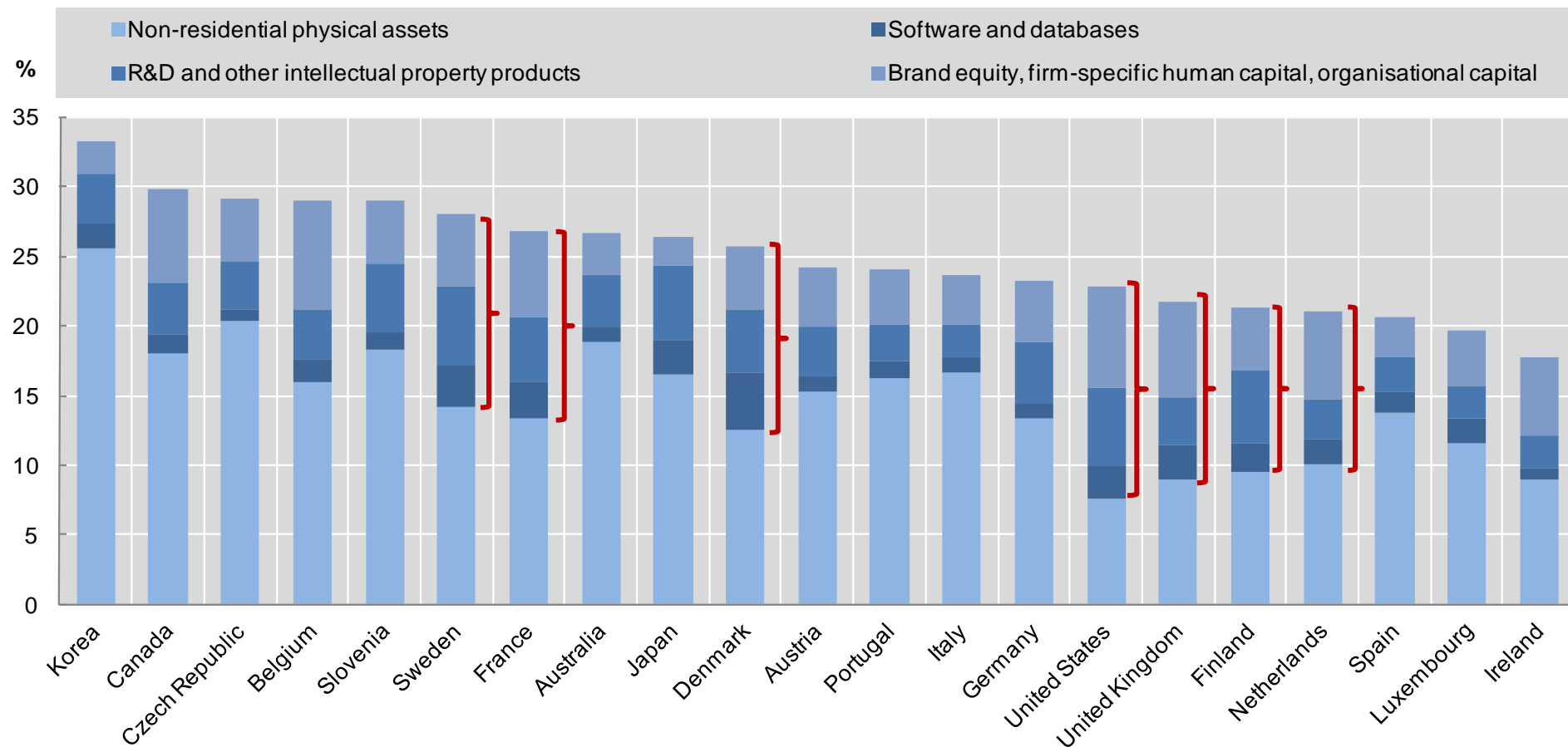


Source: Corrado, Hulten, and Sichel (2012)



... including investments in databases and software

Investment in physical and knowledge-based capital, 2010
(As a percentage of value added of the business sector)



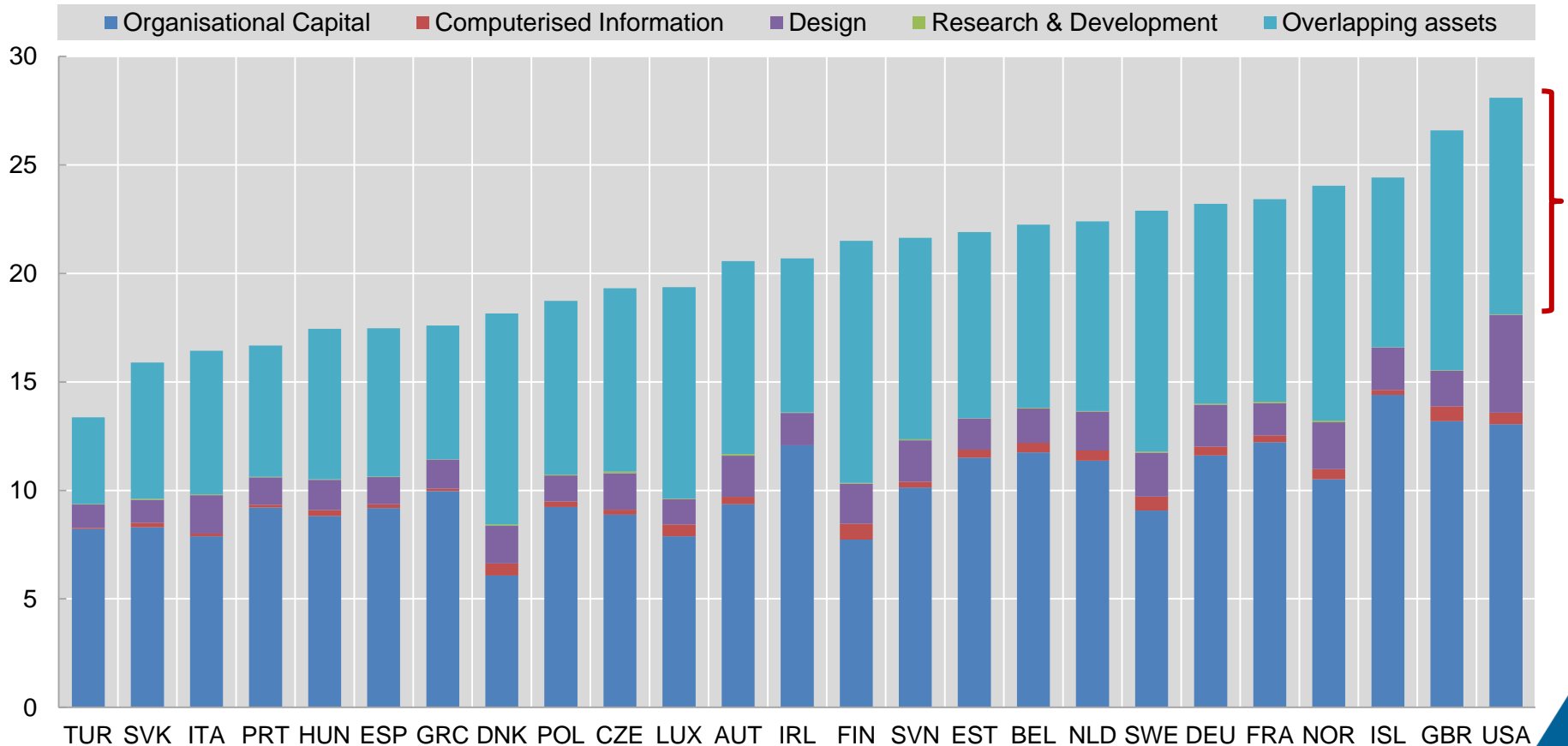
Source: OECD Science, Technology and Industry Scoreboard 2013.

<http://dx.doi.org/10.1787/888932889820>



Effects of complementary investments still need further study

Knowledge-based capital related workers, 2012
(as a percentage of total employed persons)



Source: OECD Science, Technology and Industry Scoreboard 2013.

<http://dx.doi.org/10.1787/888932890618>

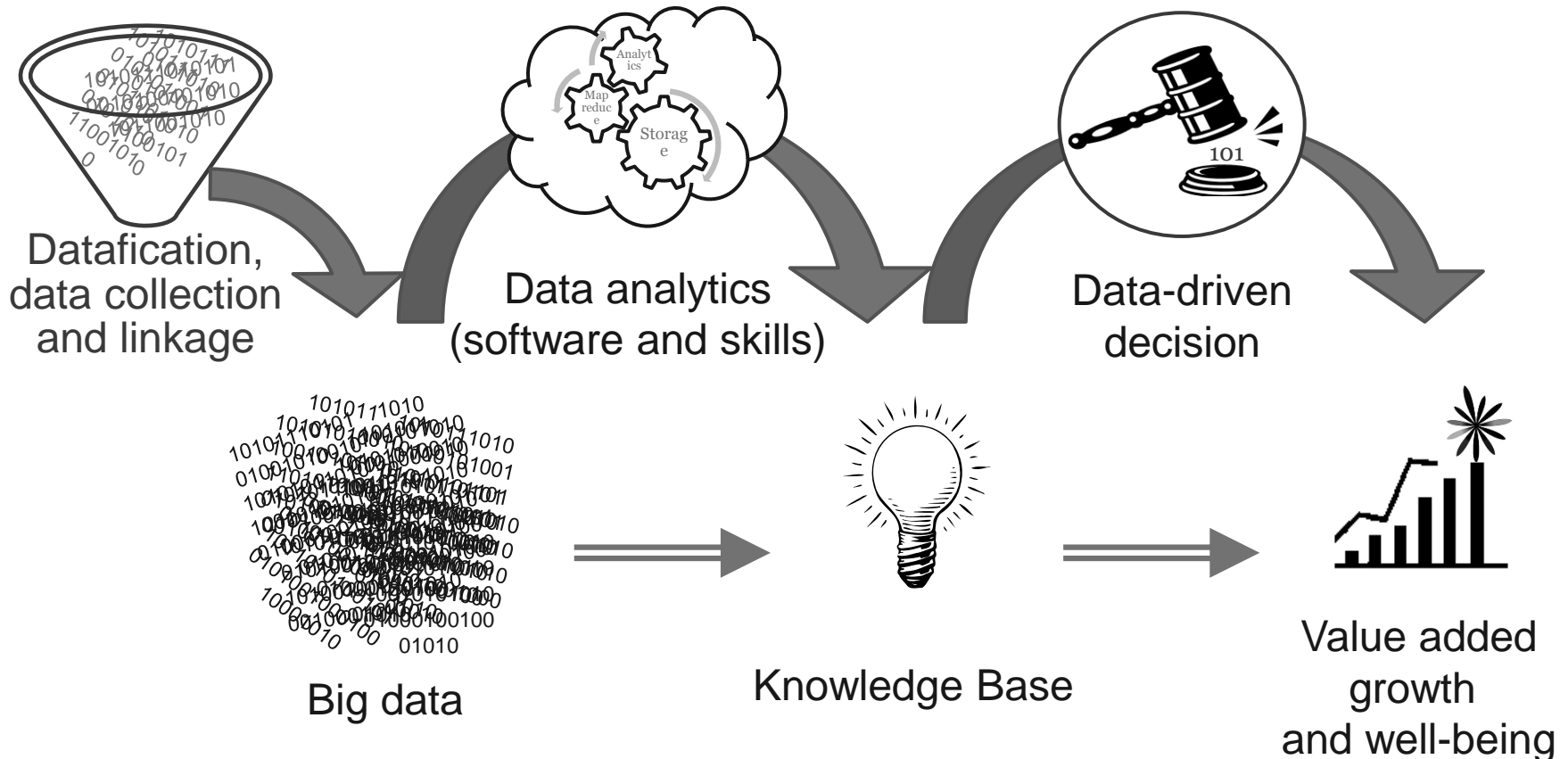


What we know about the fundamental economic properties of data

- **Data is a non-rivalrous good:**
 - Data re-use and non-discriminatory access to data can maximize data-driven value creation
 - Data enables multi-sided markets
- **Data has no intrinsic value:**
 - Value depends on the capacity to extract information and to gain knowledge out of it
- **Data can create super-additive insights:**
 - Data linkage is a key source for the opportunities and challenges of data-driven innovation

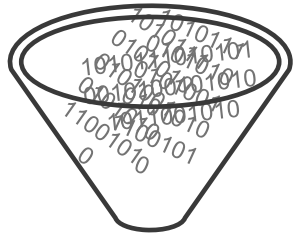


Data-driven innovation is not only about data, but about the data value chain!

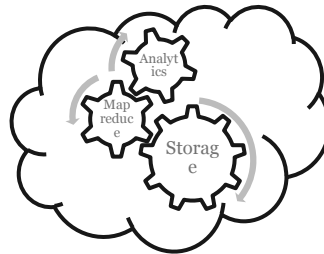




A holistic view is needed to leverage data-driven innovation



Datafication,
data collection
and linkage



Data analytics
(software and skills)



Data-driven
decision

Increasing the pool
of re-useable data

- Open data
- Data portability

Enhancing data
analytic capacities

- Cloud infrastructure
- Data scientist skills

Promoting responsible decision-
making for growth and well being

- Domain-specific competencies
- Entrepreneurship

Cross-cutting policy issues:
Privacy, IPR, competition, tax, trade, ...



KEY POLICY OPPORTUNITIES



1. Promoting trust in data-driven innovation

Forbes

New Posts

Popular

Wu-Tang's Secret Album

Lists

The Midas List

Vide

The Bi

How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did

334 comments, 173 called-out

+ Comment Now + Follow Comments

TECH | 1/01/2014 @ 1:51AM | 30,130 views

4.6 Million Snapchat Usernames And Phone Numbers Captured By API Exploit

+ Comment Now + Follow Comments

SnapchatDB!

Bringing 4.6 million users' information to your fingertips...

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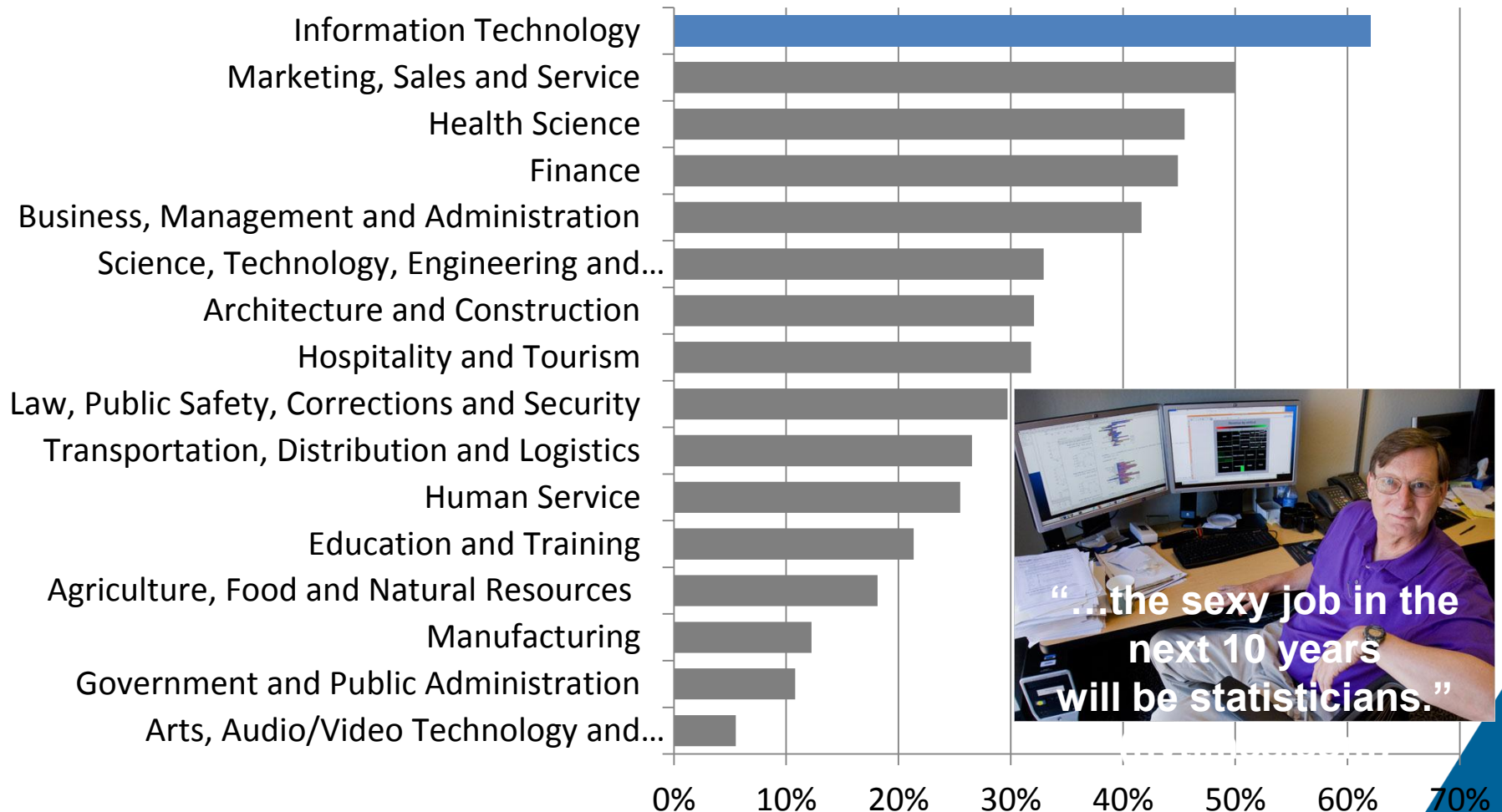
2. Getting data governance frameworks right

- Data silos preventing the re-use of data even within organizational borders;
- Potential opportunity costs through unrealised positive externalities (spill-over effects) of data;
- Better data sharing platforms and common standards could be needed;
- Privacy as well as IPR concerns may better be addressed in a more differentiated manner;



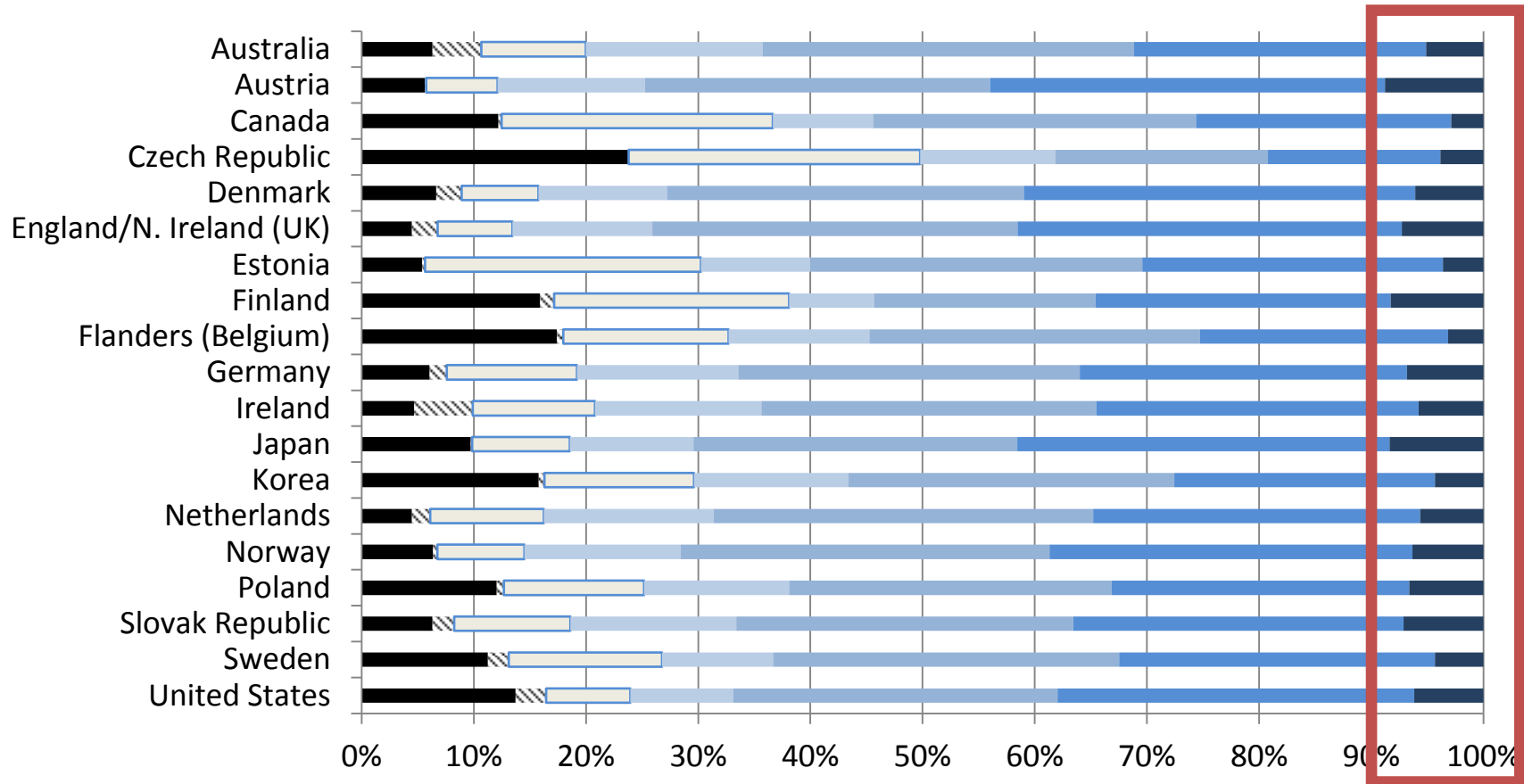
3. Addressing skills shortages and mismatch

Bright outlook occupations (% total)





Only a small percentage with a sufficient level of basic e-skills



Top skills
~ 6%

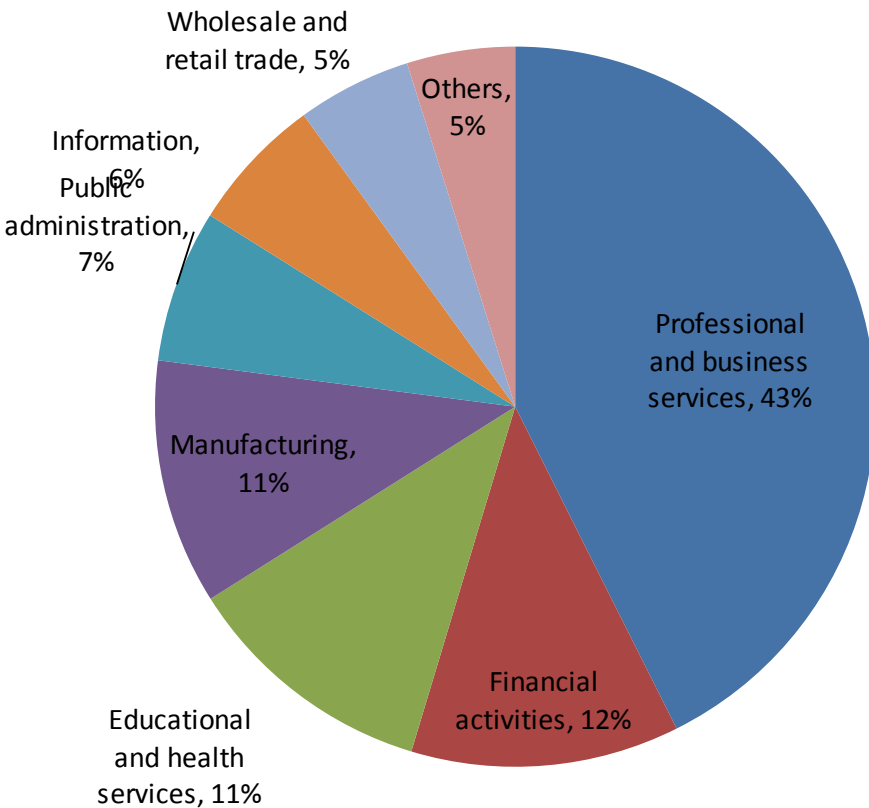
- Opted out of the computer based assessment
- ▨ Missing
- Failed ICT core or had no computer experience
- Below Level 1
- Level 1
- Level 2
- Level 3

Source: OECD PIAAC

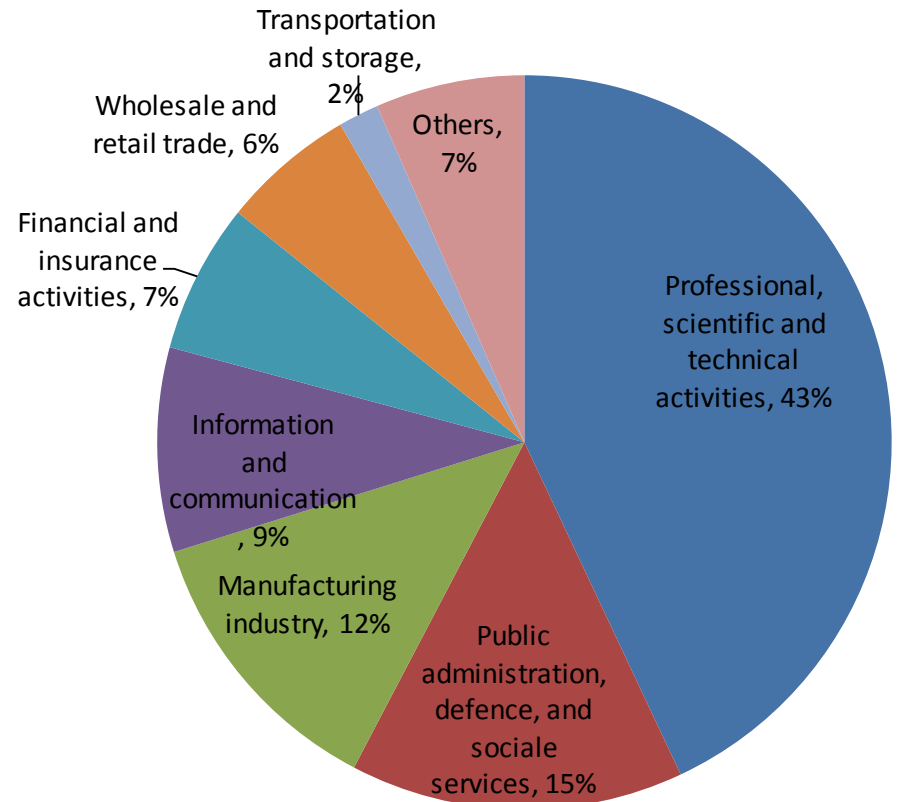


Distribution of data scientists jobs* across the economy in the US and EU

United States, 2013



EU, 2013



* Based on preliminary working definition of “data scientists”; ICT services included in “Professional *”.
Source: OECD based on US CPS (March Supplement 2013) and EU LFS



Thank you for your attention!

- Report “Exploring Data-Driven Innovation as a New Source of Growth: Mapping the Policy Issues Raised by ‘Big Data’”: <http://oe.cd/wr>
- OECD project site on data-driven innovation: <http://oe.cd/bigdata>
- Christian.Reimsbach-Kounatze@oecd.org