

## Executive summary

Close to real-time analysis of large volumes of data (big data) – generated from a myriad of transactions, production and communication processes – is accelerating knowledge and value creation across society to unforeseen levels. Data-driven innovation (DDI) refers to significant improvement of existing, or the development of new, products, processes, organisational methods and markets emerging from this phenomenon.

DDI has the potential to enhance resource efficiency and productivity, economic competitiveness, and social well-being as it begins to transform all sectors in the economy, including low-tech industries and manufacturing. The exploitation of DDI has already created significant value-added for many businesses and individuals, and more can be expected to follow. Some estimates put the global market for big data related technology and services at USD 17 billion in 2015, with a growth rate of 40% on average every year since 2010. Available evidence also shows that firms using DDI have raised productivity faster than non-users by around 5-10%.

DDI can also help address social and global challenges, including climate change and natural disasters, health and ageing populations, water, food, energy security, and mass urbanisation. Investments in public administration, research and education, and health care will be particularly fruitful in the short term, as these areas rely heavily on the collection and analysis of information, but still face a relatively low level of computerisation in most countries.

The disruptive nature of DDI requires addressing major economic and societal challenges and calls for a whole-of-government and participatory approach to help maximise the benefits and mitigate associated risks and obstacles.

Two clusters of challenges should be met by policy makers in the transition towards a data-driven economy:

1. Governments should consider addressing the negative effects of “creative destruction” while stimulating investments in:
  - *the infrastructure needed for DDI*, particularly in mobile broadband, cloud computing, the Internet of Things, and data, with a strong focus on small and medium-sized enterprises (SMEs) and high value-added services
  - *the public sector, health care, science and education* to pick the “low-hanging fruit” that can boost efficiency, knowledge sharing and well-being in the short term, and help better address global challenges
  - *organisational change and entrepreneurship in the private and public sector* by encouraging a culture of data-driven experimentation and learning
  - *continuous education training and skills development beyond science, technology, engineering and mathematics (STEM) fields* to take advantage of job creation opportunities and smooth structural change while addressing inequality in earnings in labour markets.

2. Governments should aim to understand and strike the right balance between the social benefits of “openness” and individuals’ and organisations’ legitimate concerns of such openness by encouraging:
- *the free flow of data across nations and organisations.* This also includes ensuring that the Internet remains an open platform for innovation; promoting both open access to data and interoperability of data-driven services; and empowering actors to reuse their data across interoperable applications (i.e. data portability).
  - *the responsible usage of personal data and the prevention of harm caused by privacy violations.* This also includes enhancing the participation of individuals; the transparency of data processing; the effectiveness of privacy enforcement; and the adoption of a privacy risk management approach.
  - *a culture of digital risk management across society,* involving all stakeholders of the data ecosystem.
  - *data sharing and the appropriation of returns on investments (ROI)* through a combination of alternative incentive mechanisms such as data citations and intellectual property rights (IPR) licences that enable sharing such as Creative Commons and open source software licences.
  - *coherent assessment of market concentration and competition barriers* through better definitions of the relevant market and the consideration of potential consumer detriments due to privacy violation. This will also require a better dialogue between regulatory authorities (in particular in the area of competition, privacy and consumer protection).
  - *improved measurement* to help better assess the economic value of data assets, prevent base erosion and profit shifting (BEPS), and design better DDI policies.

In addressing these two clusters of challenges, policy makers should acknowledge that DDI may favour concentration and greater information asymmetry and with that, shifts in power: away from individuals to organisations; from traditional businesses to data-driven businesses; and from governments to data-driven businesses (the latter can gain more knowledge about citizens than governments). These shifts could exacerbate existing inequalities and lead to a new digital (data) divide that could undermine social cohesion and economic resilience if not addressed.

Given all of this, governments have an important role to play in promoting DDI and mitigating the associated risks.



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