



# Regulation, market structure and incentives to innovate in IoT markets

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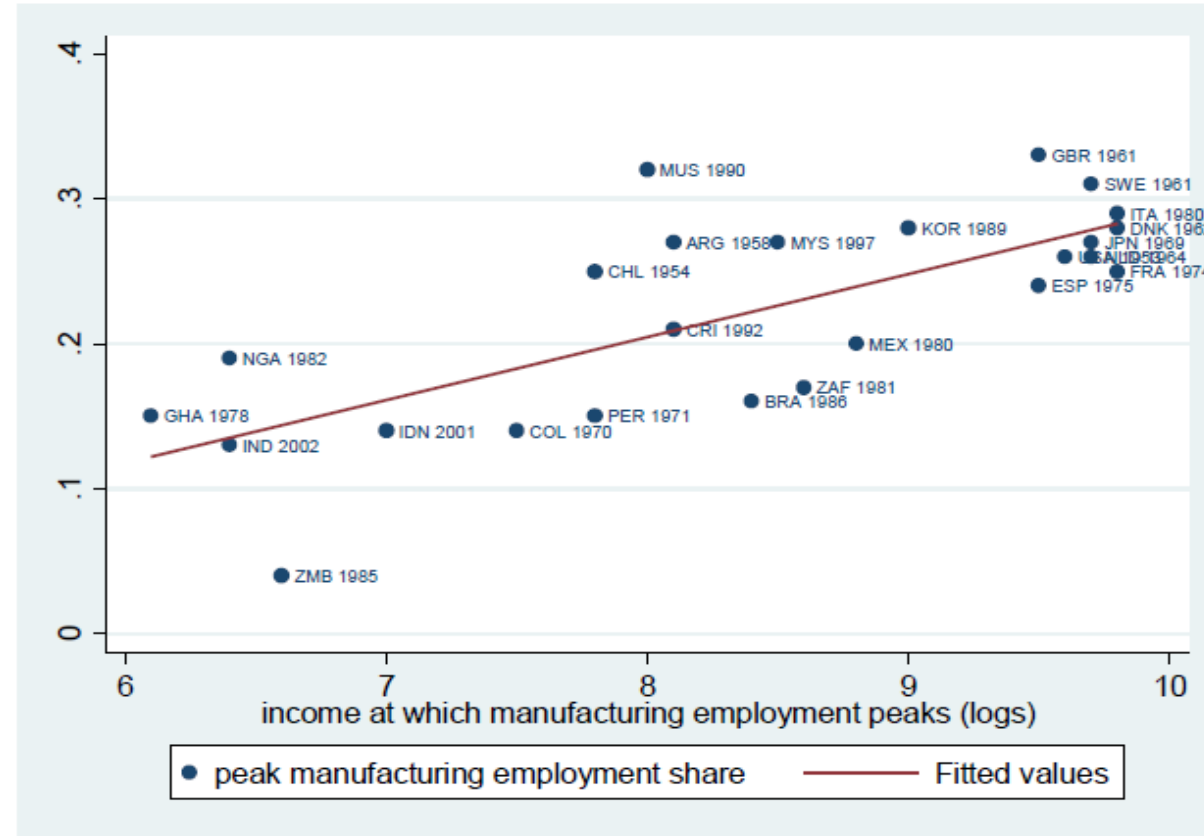
# Outline

- Is ICT innovation "different"?
- Does ICT innovation create "new" challenges for regulators?



# Context

- ICT innovation affecting all sectors of the economy (IoT, AI, digitisation.
- This is happening worldwide
- Premature de-industrialization: sooner and at lower levels of income (D. Rodrik)





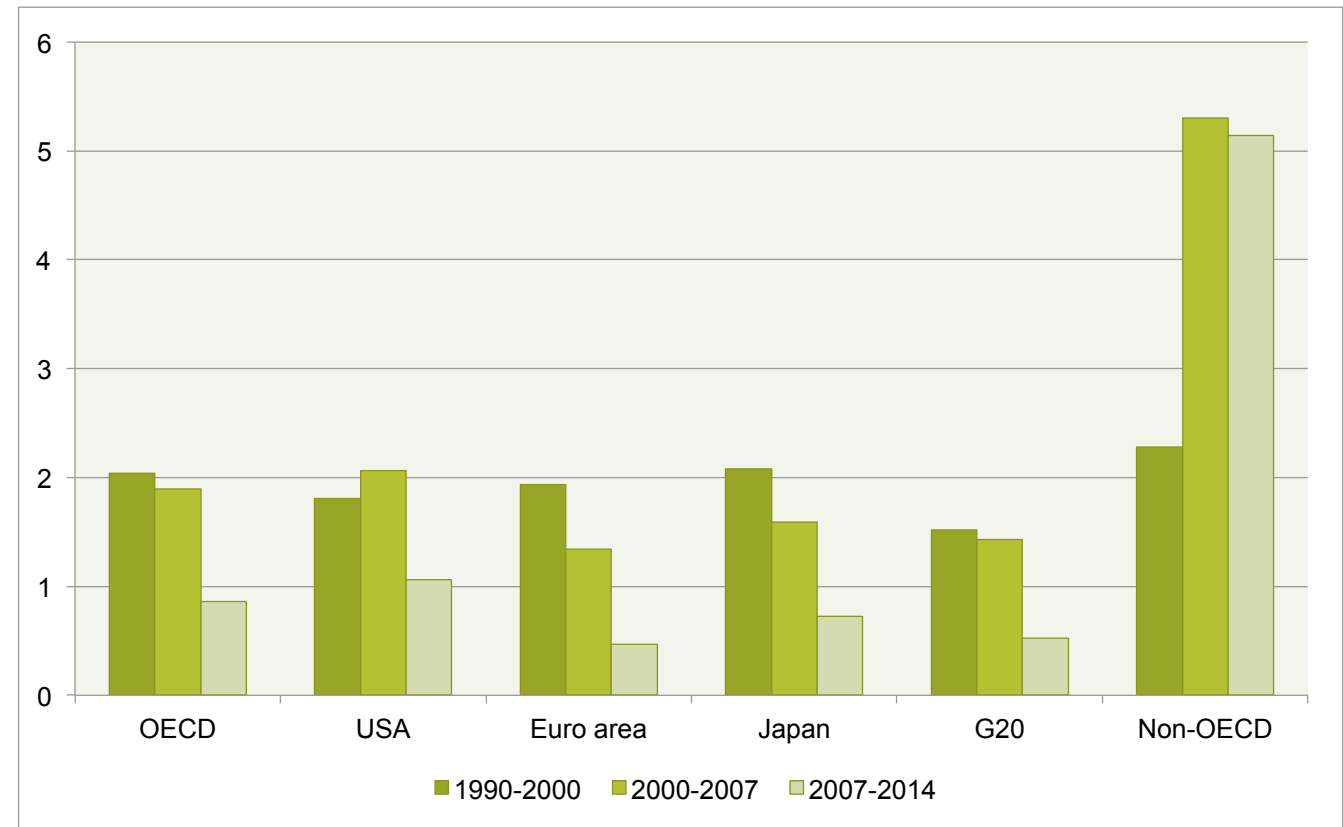
# Is ICT innovation "different"?



# The decline of productivity growth since the 1990s

Annualised growth of labour productivity  
(output per hour worked)

Source: OECD Economic Outlook, Volume 2016 Issue 1 - © OECD 2016, data based on OECD National Accounts database; OECD Productivity database; International Labour Organisation database.





# ICT vs Manufacturing

- **Alphabet:**

Operating revenues: 90,272,000 Th. USD

Employees: 72,053

Ratio: **1253** Th. USD per employee

- **Facebook:**

Operating revenues: 27,638,000 Th. USD

Employees: 17,048

Ratio: **1621** Th. USD per employee

- **Volkswagen:**

Operating revenues: 237,564,000 Th. USD

Employees: 626,715

Ratio: **379** Th. USD per employee

- **Johnson & Johnson**

Operating revenues: 71,890,000 Th. USD

Employees: 126,400

Ratio: **568** Th. USD per employee

*Source: ORBIS, Bureau Van Dijk. Data refers to 2016*

Champions of productivity or simply **Scale without Mass?**



Can current innovation undermine future incentives to



For example: Scale without Mass



**WhatsApp:** 300 M users, 50B message/day, 55 employees



**Netflix:** USD8.8B revenue, 3500 employees



**Dropbox:** 500M users, 1.2B files stored/day, 1200 employees

**Challenges policies that target firms by measure of mass (e.g. employees) as well as competition policy, may contribute to productivity divergence across firms**

Credits: Andrew Wyckoff and Dirk Pilat  
Directorate for Science, Technology and Innovation, presentation at European Political Strategy Centre, 5 May 2017, Brussels



**Does ICT innovation create "new" challenges for regulators?**





# Example: Smart home system

Two different scenarios:

1. **Closed bundles:** Producers sell the whole system, i.e. components are compatible only with other components produced by the same company.
2. **Compatibility:** other producers can sell separate components that enrich the smart home system



Cartoon by Teddy Tietz  
<https://www.teddytietz.com/2015/12/>

## What can determine the prevalent scenario?

Innovation@ITU-D

## The usual suspects

- Competition policy
- Initial market power
- Quality
- Technological constraints
- Patent ownership
- Reputation
- etc...

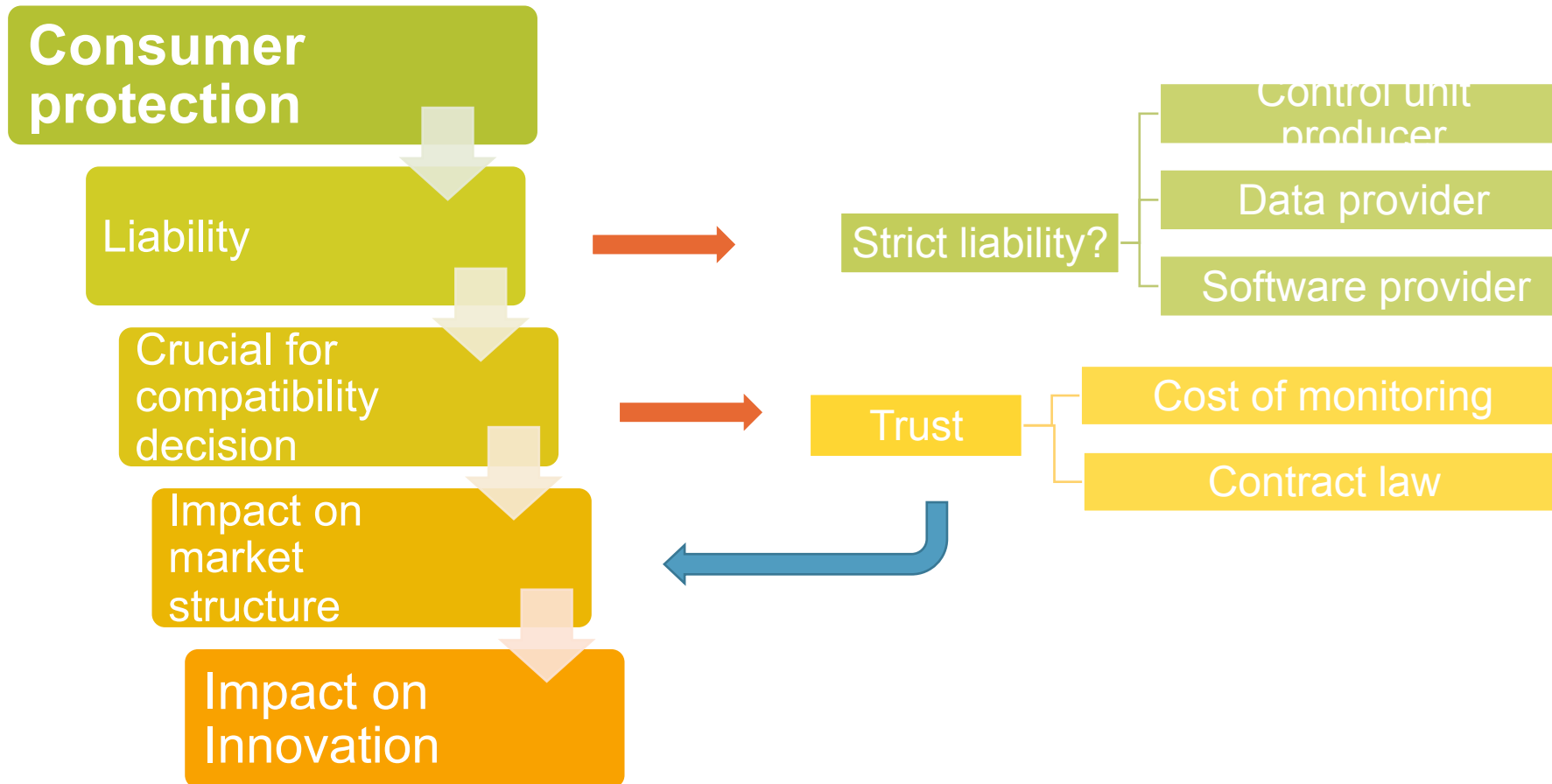


## Vast related literature

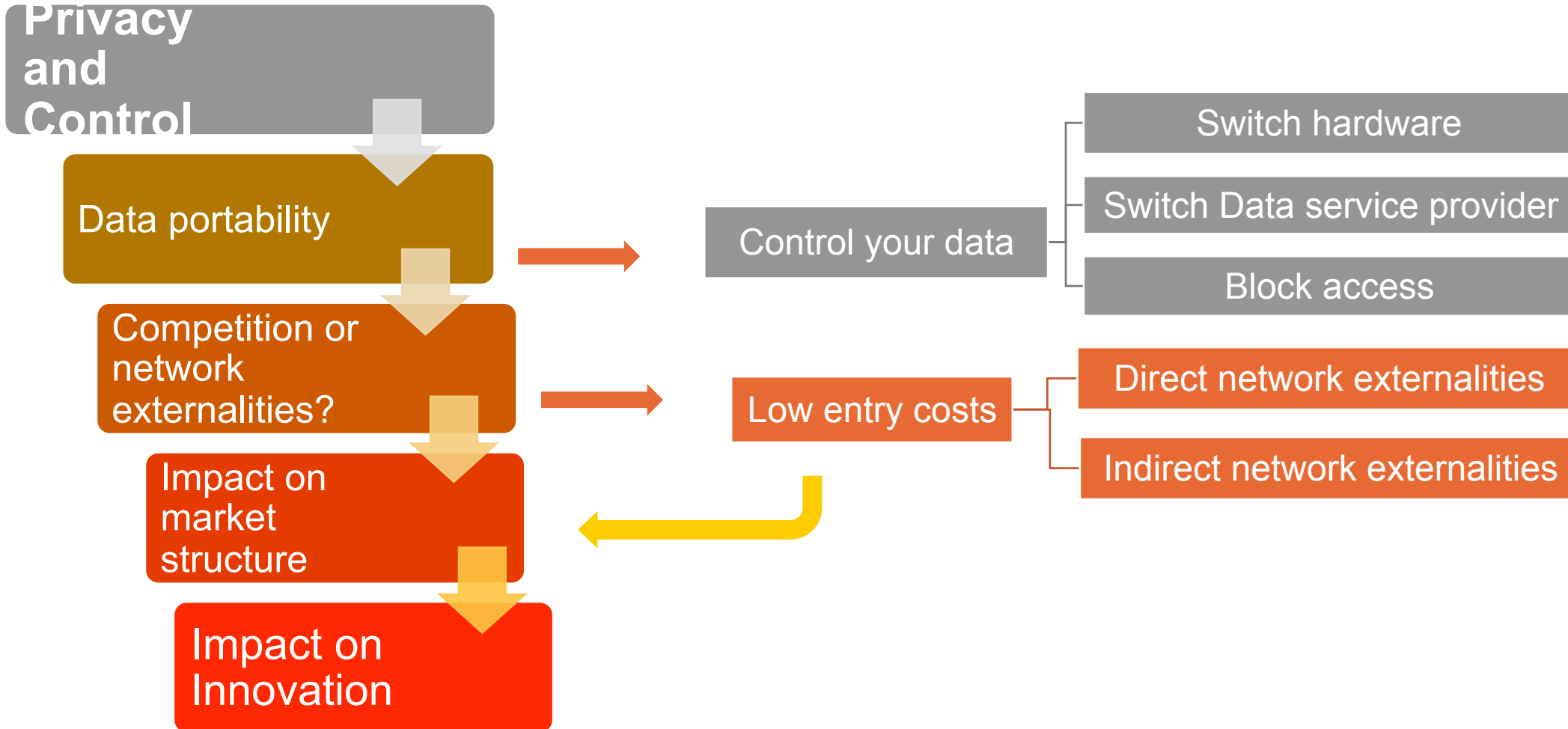


**But regulators may need to protect citizens against "new" threats**

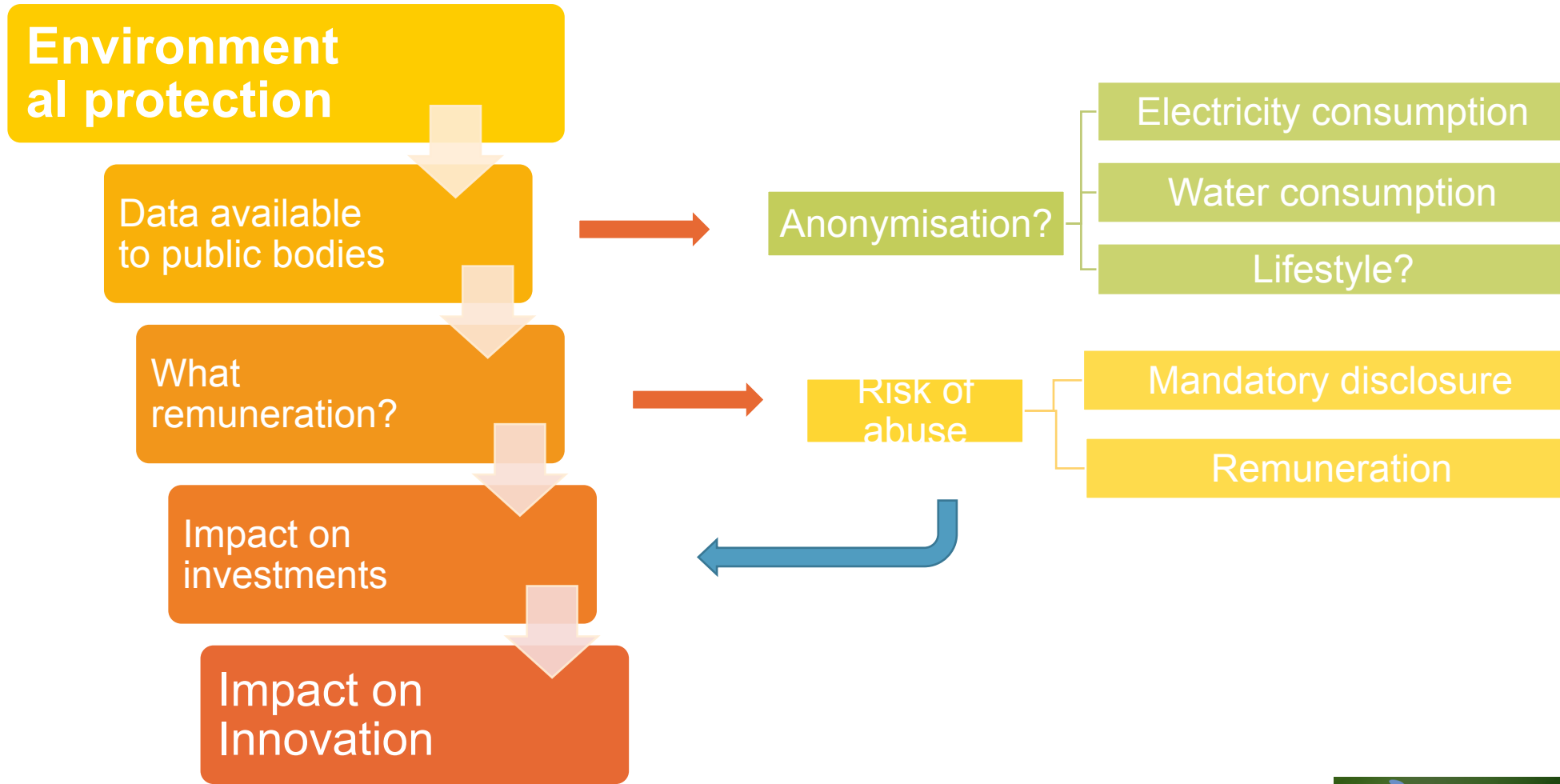
# Ex. 1: Strict Liability



# Ex. 2: Data portability



# Ex. 3: Access to data





# Conclusions

- Balancing public interests and market economy
- Public – Private partnerships
- International harmonisation of regulation

