Beyond Industry 4.0 & Implications for Industrial Policy (including in Hungary)

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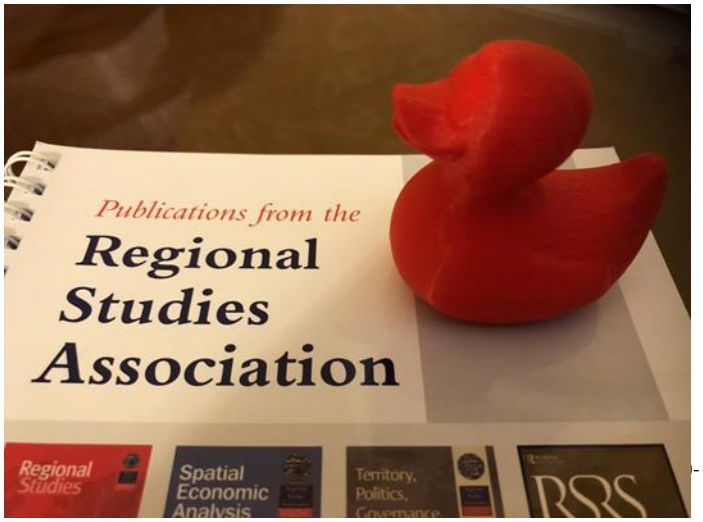
David Bailey
Aston Business School

Lisa De Propris
Bimingham Business School



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Today:

Definitions of I4.0
MAKERS: a broader interpretation (I4.0+)
Auto case: ICE to ACE
Implications for Industrial Policy (including Hungary)
(Brexit: UK case?)

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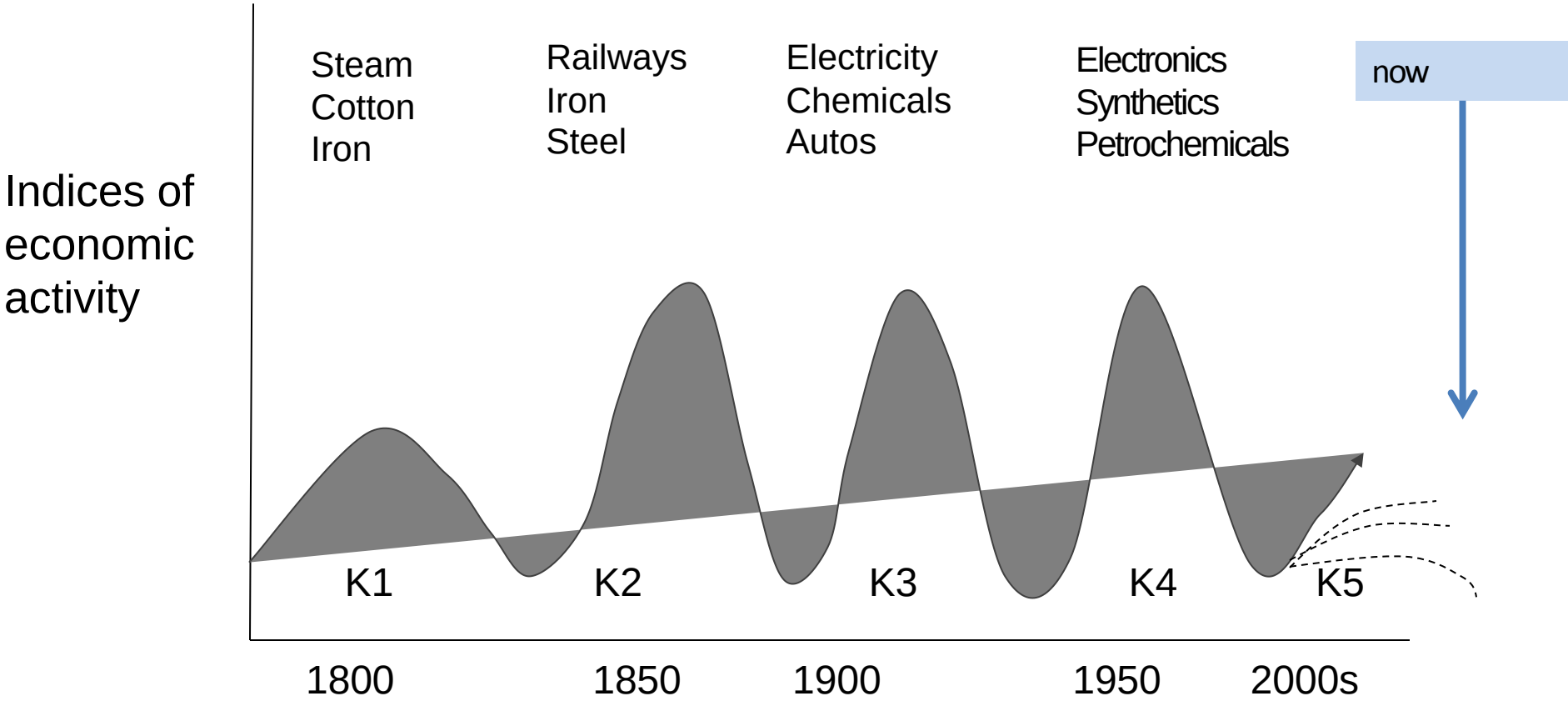
Technological change



Kondratiev's Long Waves

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‘4th Industrial revolution’

Biotech, nanotech, neurotech, green & renewables, ICT & mobile tech, 3D, AI, Robotics, sensoring & space tech, drones

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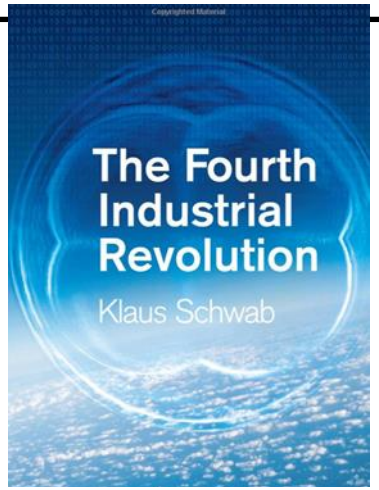
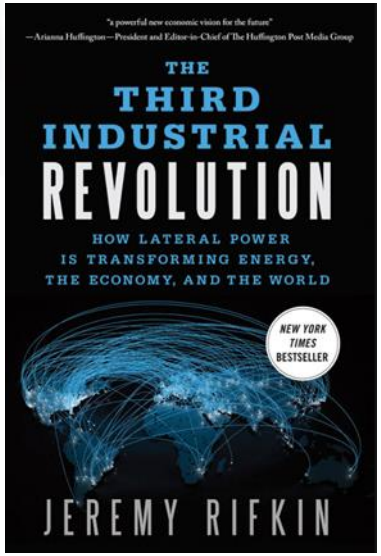
MAKERS

Revolution or evolution?





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EU def of Industry 4.0

Industry 4.0 describes the organisation of production processes based on technology and devices autonomously communicating with each other along the value chain in virtual computer models.

Industry 4.0 involves a series of disruptive innovations in production and leaps in industrial processes resulting in significantly higher productivity.

Efficiency driven arguments→

- **Smart** and **webbed factories**
- Large plants
- Large firms or multi-national firms
- **Mass customisation**

- AI- IoT – robotics- automation
- Cyber-physical systems (smart ordering, scheduling, control and delivery systems, 'big data'.
- New combination capital & labour
- lower inventory upstream, in process and downstream.
- Max productivity

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MAKERS → Broader

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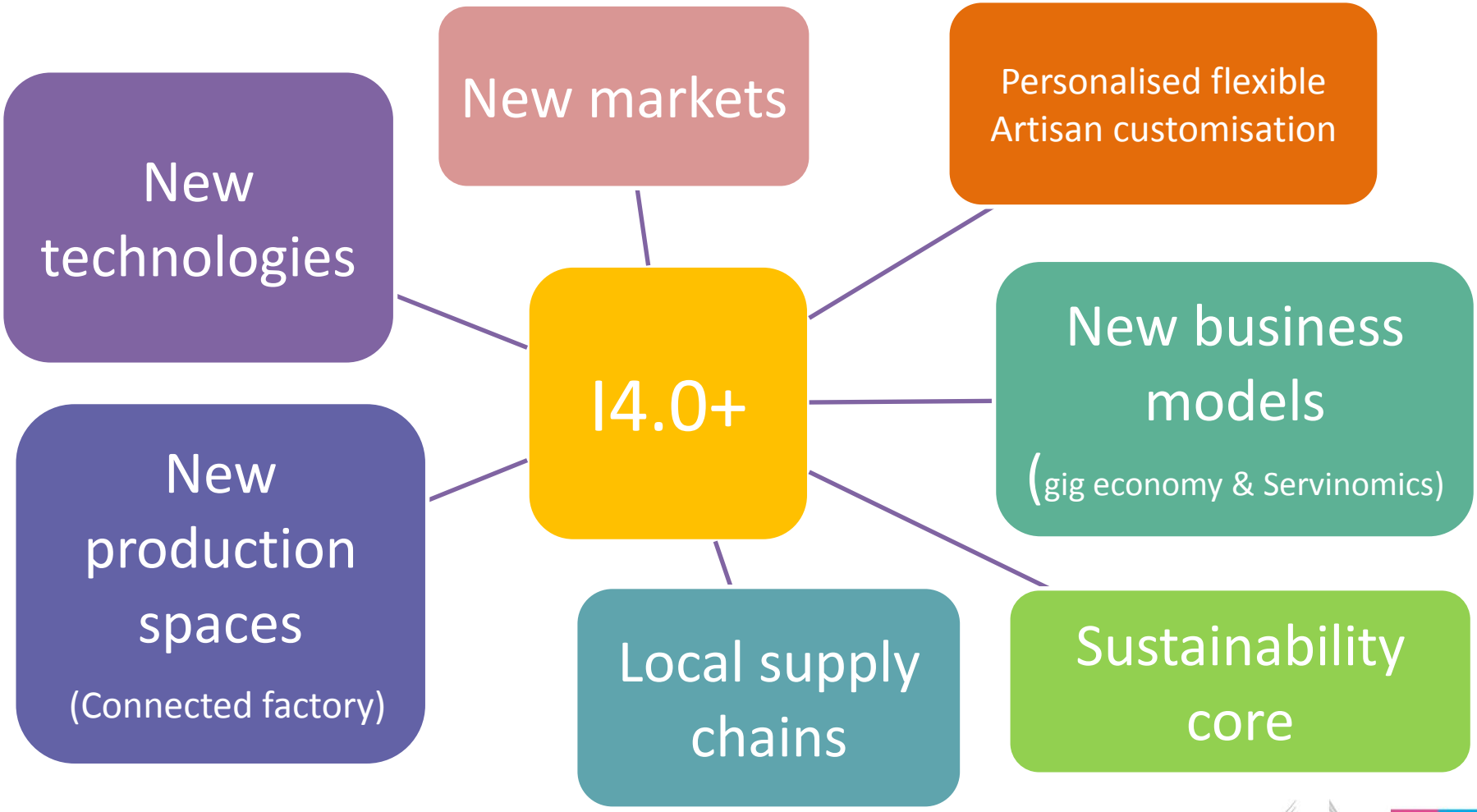
Industry 4.0+



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‘I4.0+’ & Auto:

- Connected devices and sensors;
- Predictive analytics, cognitive computing & AI; decisions and predictions based on real time data
- widespread adoption of mobile, touchscreen and virtual reality;
- new flexible systems of production, technologies such as 3D printing and intelligent robotics;
- connected factories

AND….

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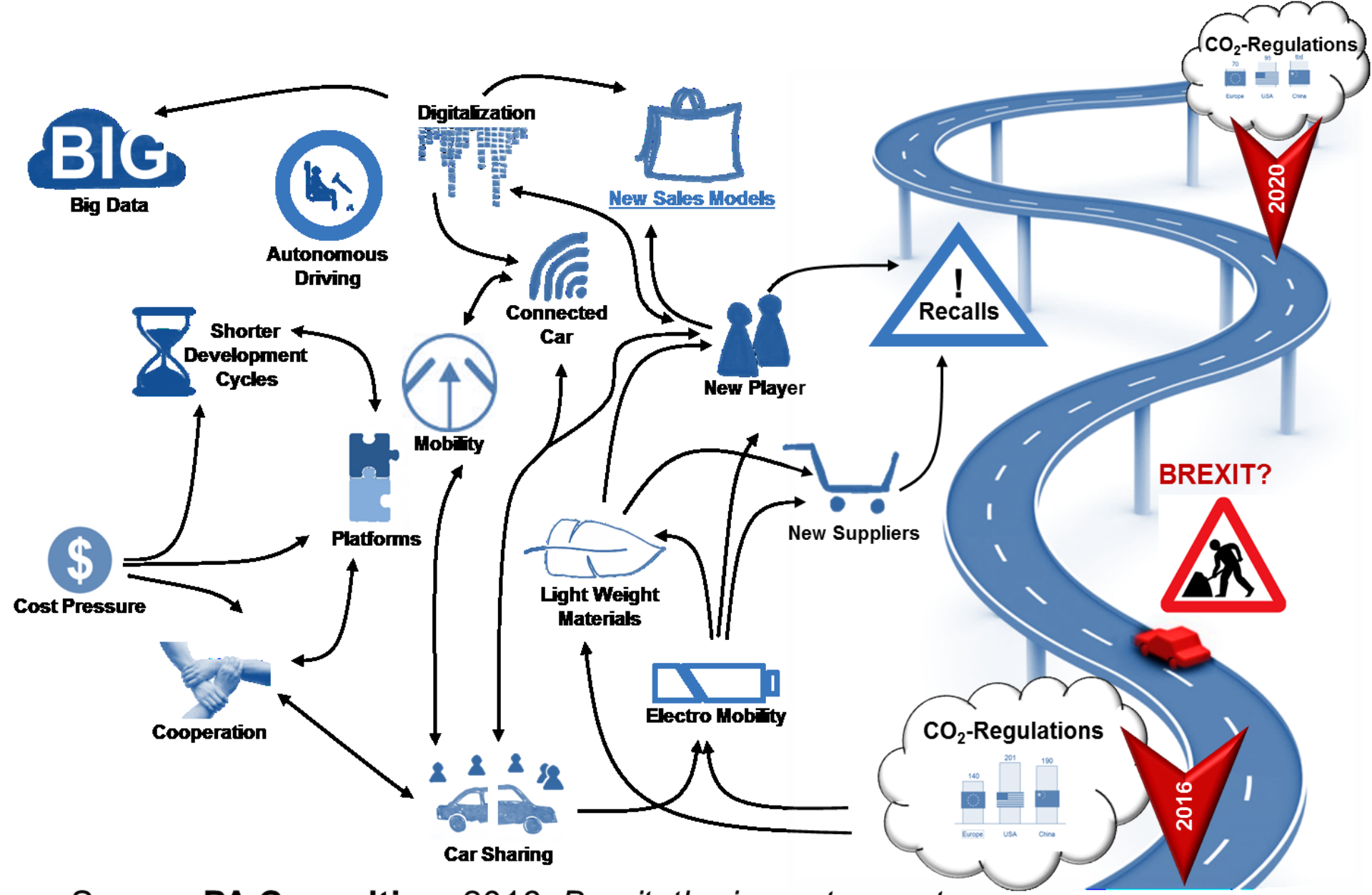
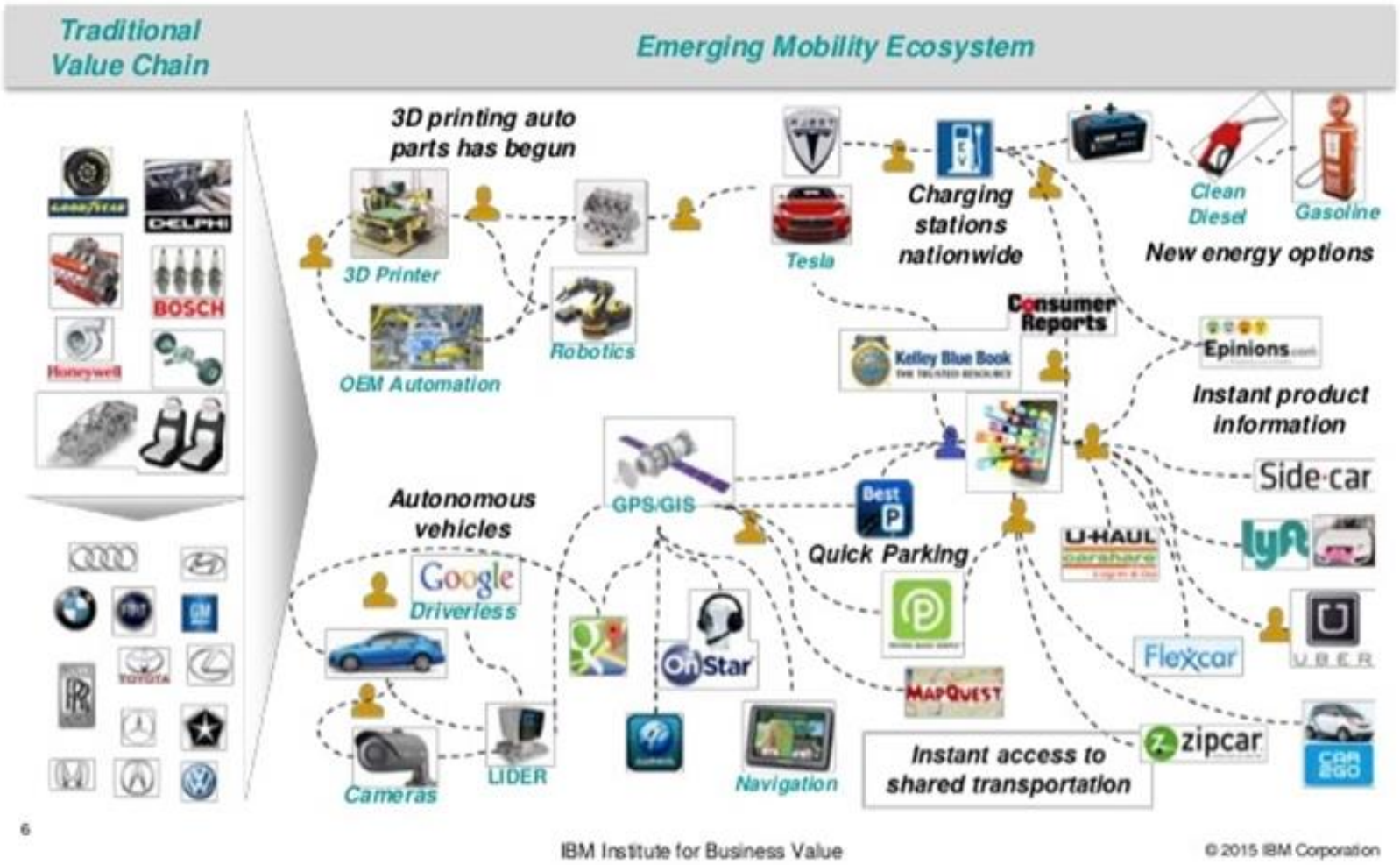


Source: **PA Consulting**, 2016. *Brexit: the impact on auto manufacturing in the UK*


Traditional Value Chain
Emerging Mobility Ecosystem
3D printing auto parts has begun
3D Printer
OEM Automation
Robotics
Tesla
Charging stations nationwide
Clean Diesel
Gasoline
New energy options
Consumer Reports
Kelley Blue Book
Epinions
Instant product information
Side·car
GPS/GIS
Autonomous vehicles
Google
Driverless
Best P
Quick Parking
U-HAUL
lyft
Flexcar
UBER
OnStar
MAPQUEST
zipcar
car2go
Cameras
LIDER
Navigation
Instant access to shared transportation
BOSCH
DELPHI
Honeywell
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6
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‘ICE to ACE’

Implications for the Auto Value Chain 1

→ **'fleet-based on-demand personal mobility' value chain**, comprising components which will share data across the value chain, such as:

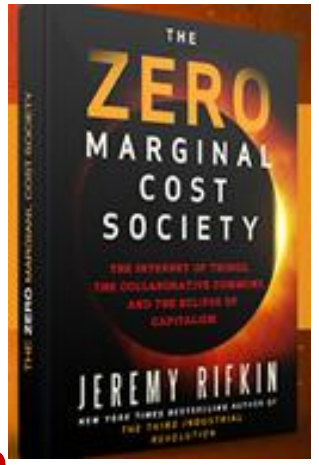
- ***Vehicle design and manufacturing*** (existing automaker, outsourced automotive manufacturer, supplier or fleet operator, operating more on an open innovation model).
- ***Operating Platform*** (existing automaker, tier 1 supplier or new entrant like Waymo, Renovo or Drive.ai)
- ***User Experience Platform provider*** (controlling the passenger's mobility experience, including in-cabin experience, including hardware, software and data.

Implications for the Auto Value Chain 2

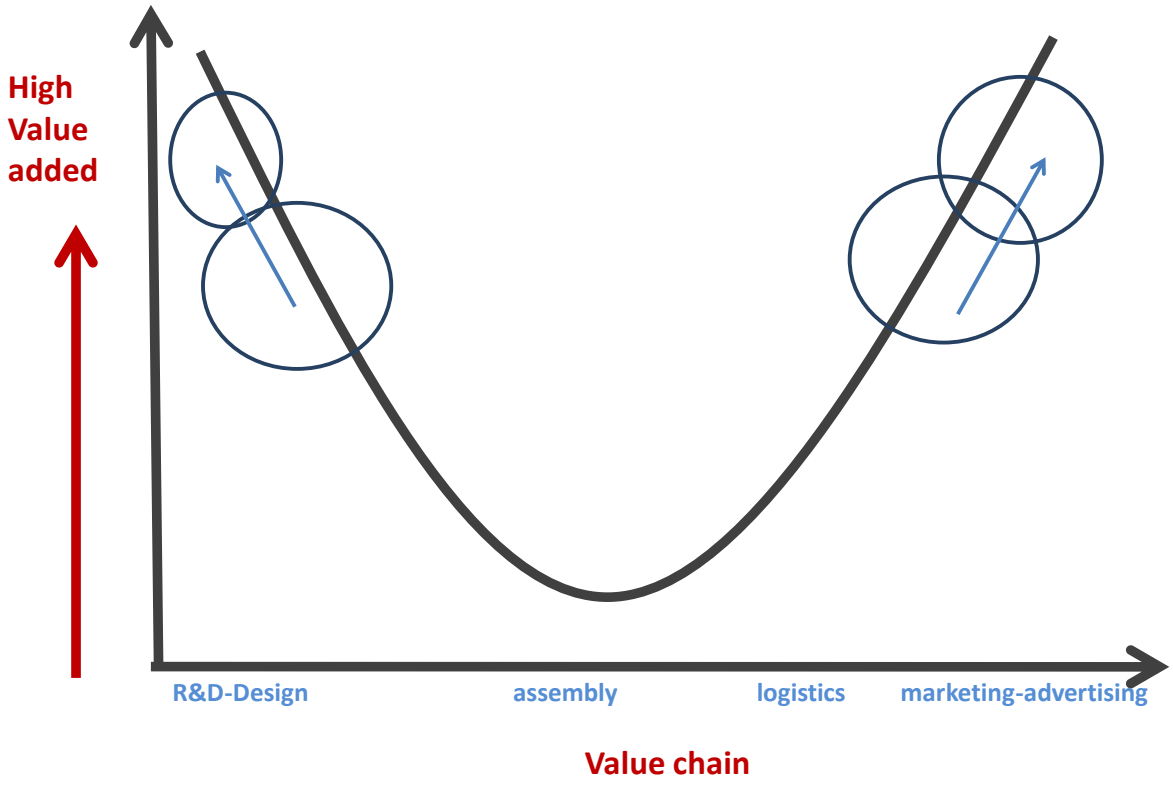
- ***Data services provider***: content - entertainment, traffic, mapping or weather, consumed by ACE platforms or passengers in ACE vehicles.
- ***Fleet creation****:* fleet operators could specify, design and buy/lease from a specific vehicle manufacturer or lease vehicles from a 'fleet creation company', as in the airline industry. Fleet creation involves financing and insurance.
- ***Fleet operator****:* firms operating and managing the fleet of ACE vehicles offering on-demand mobility services - extend to integrating on-demand with public transport and to '*Global Distribution System*' firms (as in the airline industry) offering reservations to on-demand mobility services?
- ***Fleet service and maintenance provider****:* servicing, maintaining and supporting fleets – specialists may provide this service.

Some key issues

- Co-creation
- New ways of consuming, using, accessing…
- Servitising consumption and sourcing
- Downscaling: Q: economies of scale?
- Shorter value chains?
- Rethinking products and processes from an ecological perspective



Manufacturing in the knowledge economy (De Propris, 2016)



Global Value Chain

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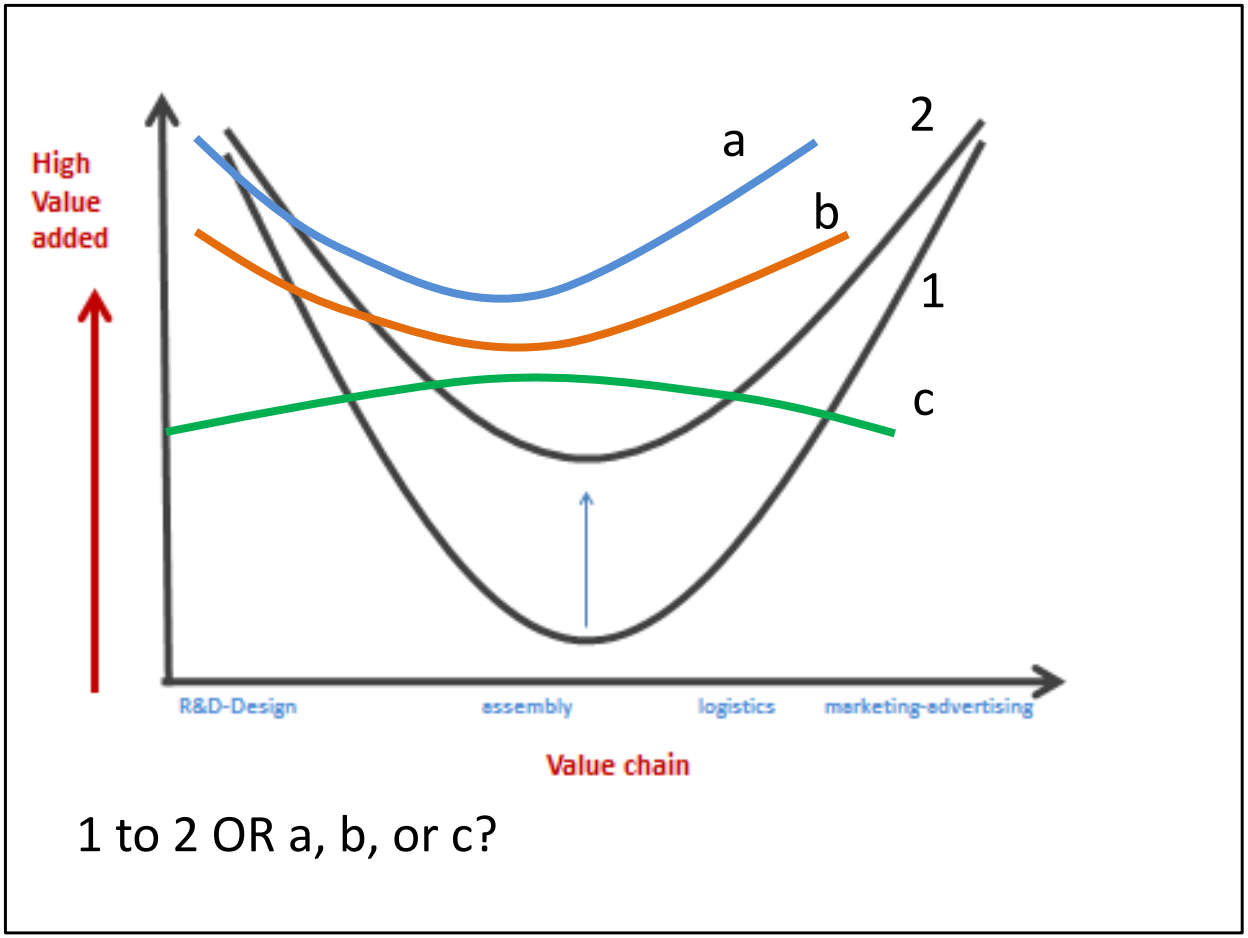
New manufacturing model: possibility for 'reindustrialisation' in 'OIRs'?



1 to 2 OR a, b, or c?

- Focus on high-value added activities
- Re-positioning on Global Value Chain
- Personalisation of offer
- Focus on manufacturing & services (services ('Manuservices' / 'servitisation')
- 'Factories of the future'

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Pinch points?

- **Lack of information**
- **Vested interests**
- **Resistance to change**
- **Risk and uncertainty**
- **Delusion about the inevitable supremacy of services**
- **Belief that businesses & market know better**

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Implications for industrial policy 1

- **Political understanding of scale of change → information and education**
- **Design clear and communicated vision → shared vision, commitment**
- **Promote technology adoption and application→ join technology with sectors**
- **Join national with regional scales →multi-level**

→ regional industrial policy

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Implications for industrial policy 2

- **Skills, training and retraining (UK: devolution?)**
- **Infrastructure; eg 5G, charging infrastructure…**
- **Firm access to I4.0+ technologies (finance, funding, support)**
- **‘Platform sharing’: enabling technologies. join technology, sector, place (e.g. EU’s digital innovation hubs)**
- **Open innovation approaches ? (implications for eg challenge funding)**

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Implications for industrial policy 3

- **GVC Repositioning? *Reshoring*? Recoupling innovation and manufacturing?**
- **New GVCs: 'servitisation' opportunities**
- **Place-based dimension of niche development (transitions lit: MLP): role of place!**
- **Modern forms of IP: *process* of discovery of tacit knowledge, identify opps, challenges and how to overcome → National & regional.**

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Industrial policy in Hungary?

- **Vulnerability? E.g. FDI attractiveness?**
- **Position in GVCs?: Upgrade AND new GVCs?**
- **Smart specialisation: Value *capture* as well as creation? (CJE, 2018); e.g. 'bottleneck' assets.**
- **Financing for SMEs to take up I4.0 technologies**
- **infrastructure**
- **Domestic enterprises and clusters**

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Industrial policy in Hungary?

- **‘Multi-sector’ clusters?**
- **New tech → reg disparities?**
- **Bring together technologies, sectors, places?**
- **Training and retraining?**
- **Modern forms of IP: *process* of discovery of tacit knowledge, identify opps, challenges and how to overcome → National & regional.**

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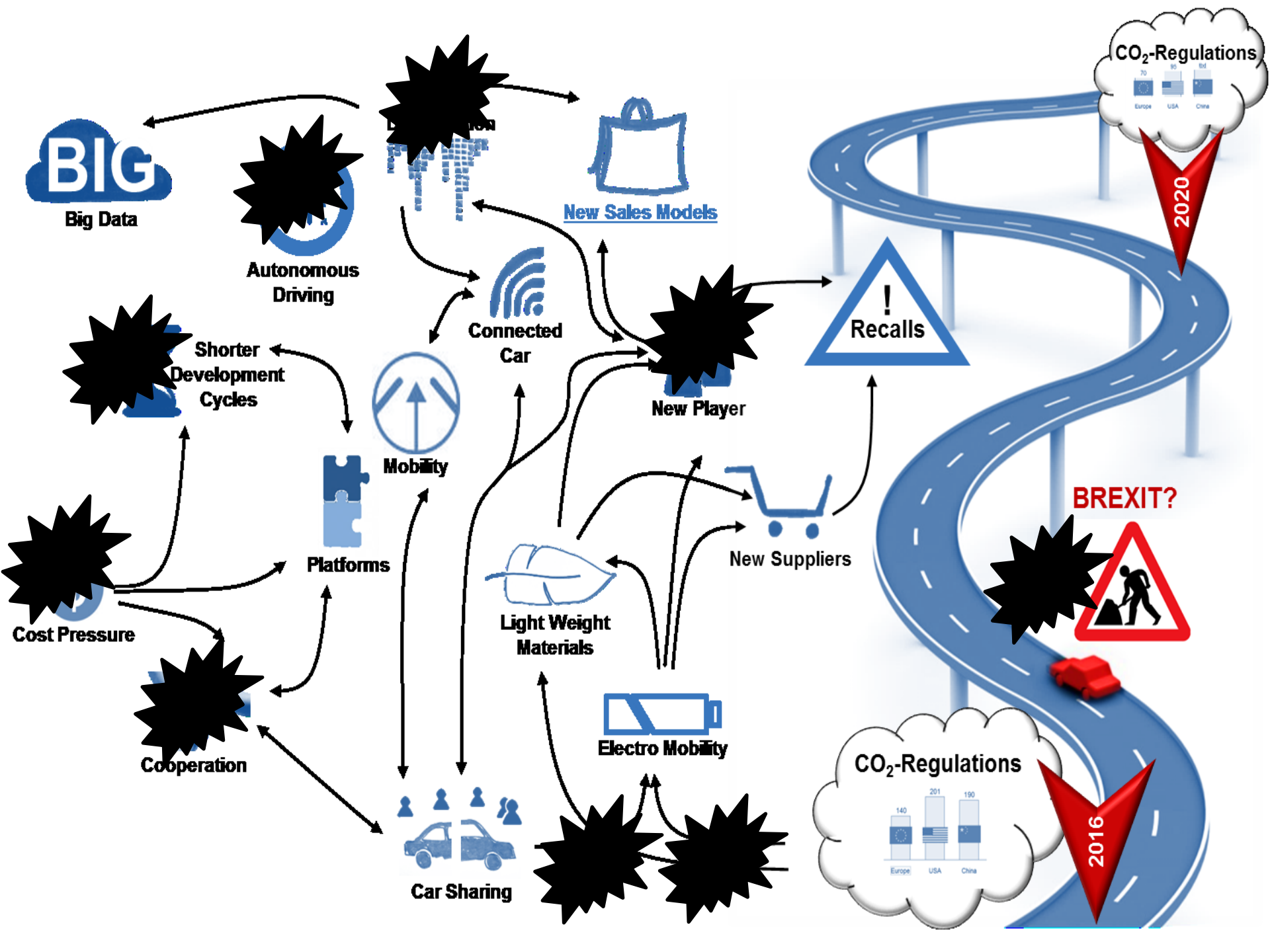

Big Data
Autonomous Driving
New Sales Models
Connected Car
Shorter Development Cycles
Mobility
New Player
Recalls
Platforms
Cost Pressure
Cooperation
Light Weight Materials
New Suppliers
Electro Mobility
Car Sharing
CO_2-Regulations
2020
BREXIT?
CO_2-Regulations
2016

UK - Brexit: some priorities to consider:

- Impact of Brexit on UK industry could be felt via: economic growth, investment delays, shifting cost bases, export disruption (and policy measures).

Need?:

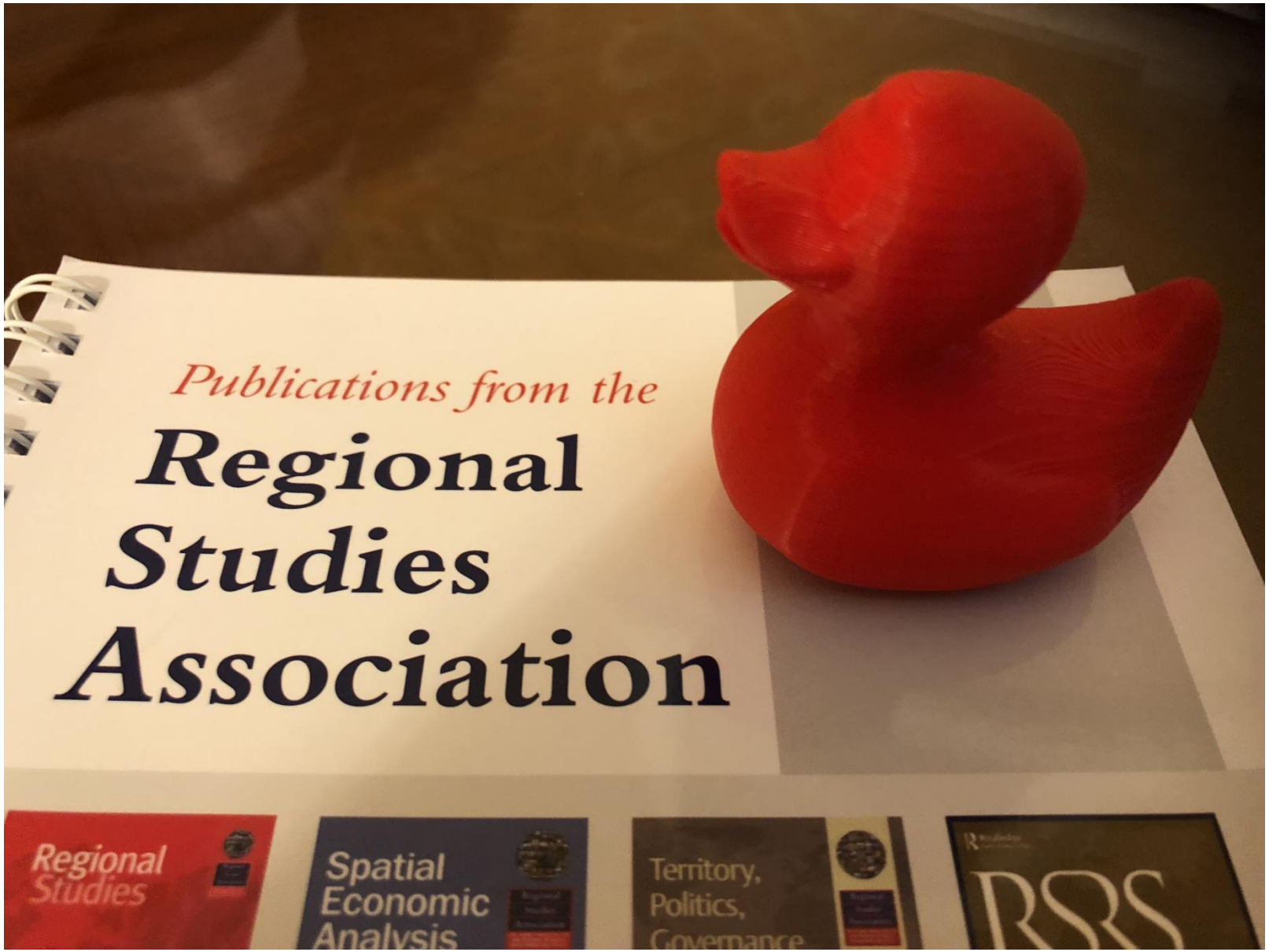
- Prioritise Single Market in negotiating position with the EU or at least Customs Union +;
- Being able to hire skilled workers from EU;
- Exploiting opportunities on reshoring and the technological revolution underway: needs a much stronger industrial policy for auto & manufacturing.

Industrial policy - UK case?

- Eliminate uncertainty over trade position as soon as possible
- Make the most of **opportunities** to export and reshore components supply
- Boost capital allowances rather than general cut to corporation tax?
- 'Re-boot' industrial policy and funding:
    - More to rebuild supply chain – *reverse previous mistakes*
    - Skills and finance – **devolution to regions.**
    - Support for exporters
    - Attracting tier 1 suppliers? Segments of supply chain.
    - Innovation eg 'phoenix industry' linked to open innovation
    - More holistic approach to e.g. encouraging the shift to EVs
    - Energy costs? Proper compensation scheme.

Need to join up sectoral industrial policy and technology policies with place based approaches at regional level. A Federal approach?


Ceci n'est pas une pipe.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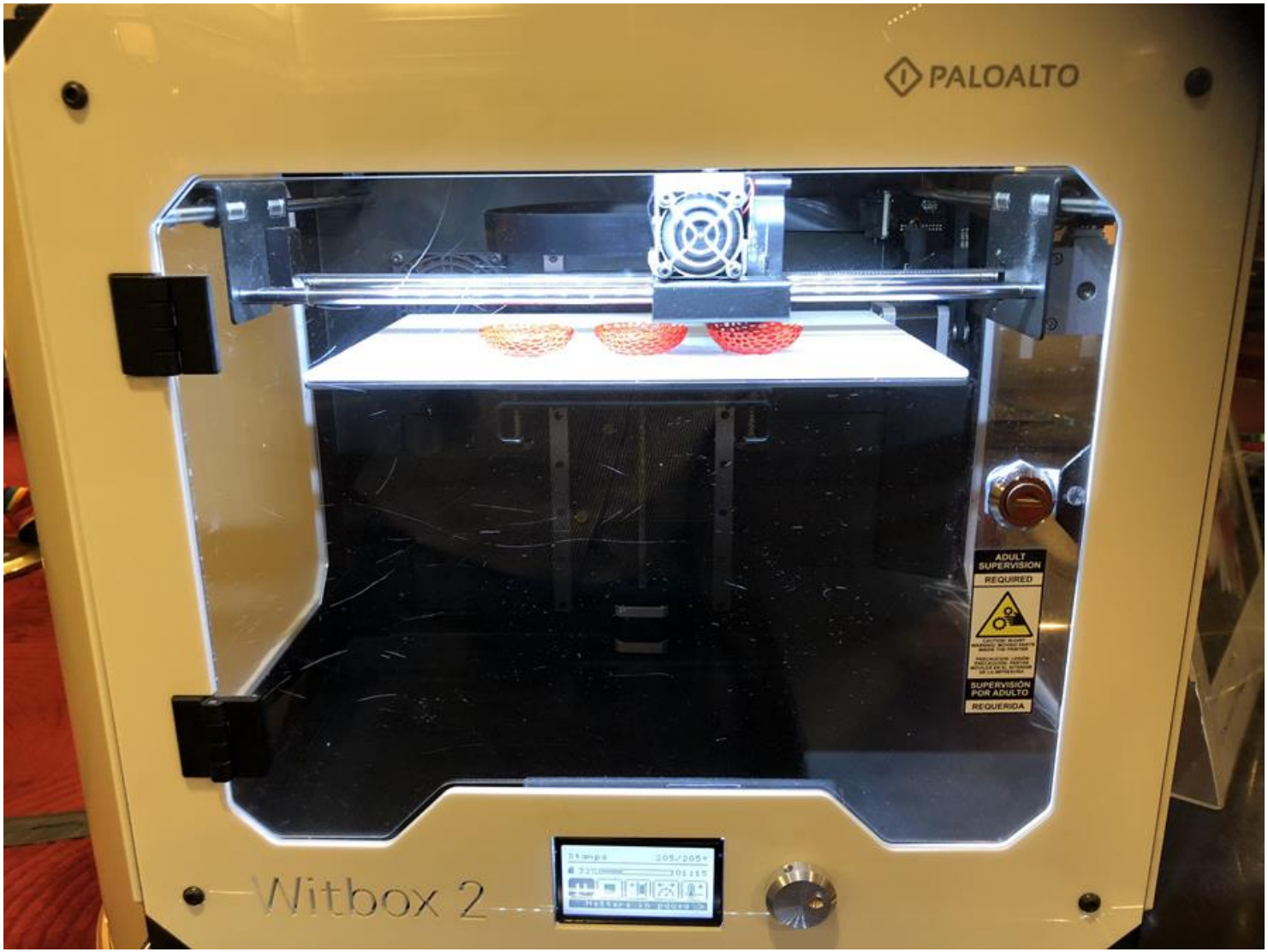
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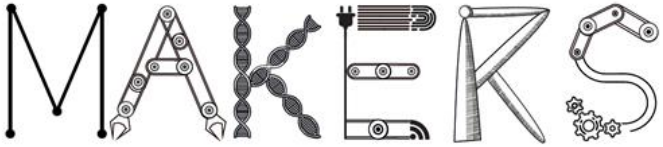

Thank you

d.bailey@aston.ac.uk

l.depropris@bham.ac.uk

www.makers-rise.org

Q&A

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