



# The Next Production Revolution: Implications for Government and Business

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# The Next Production Revolution

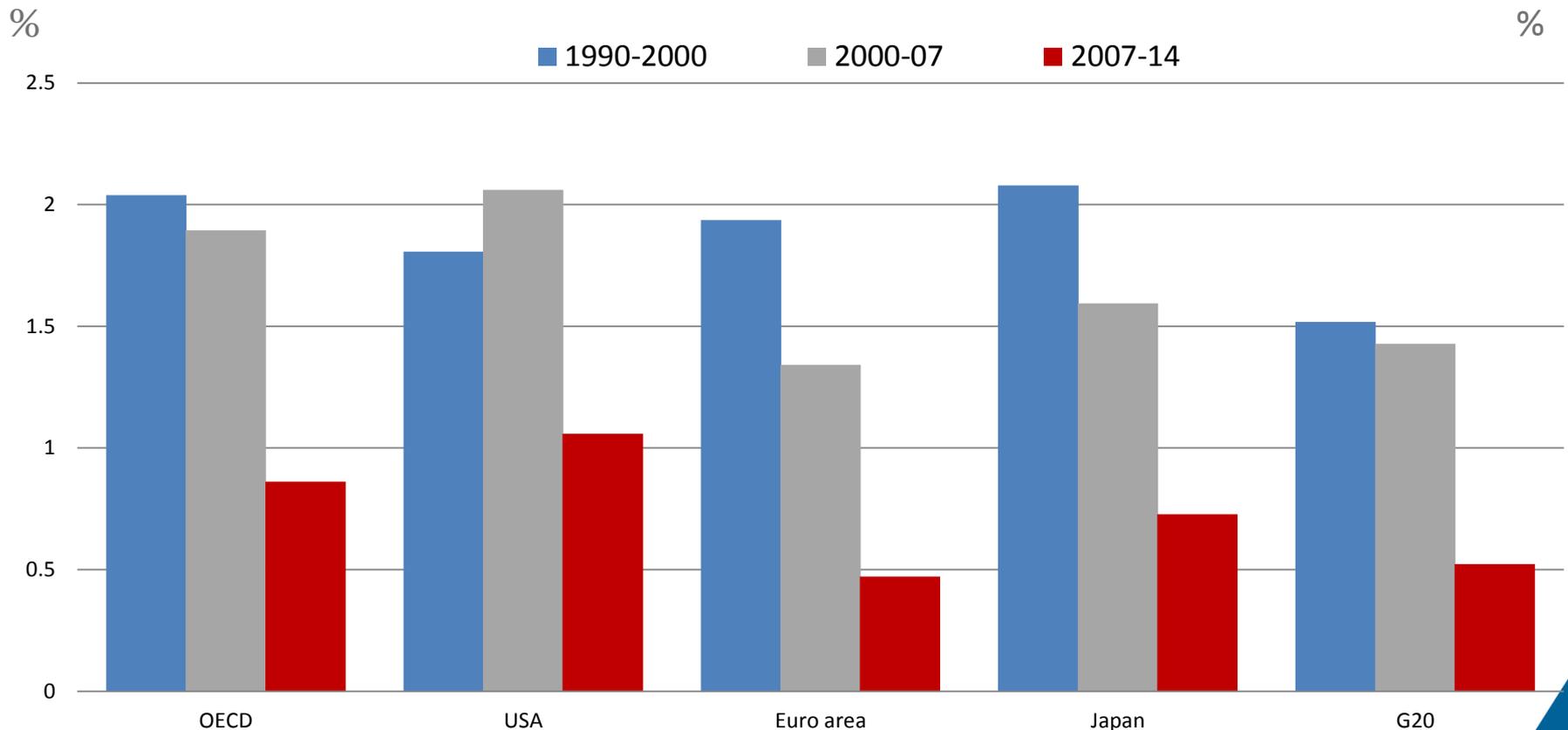
IMPLICATIONS FOR GOVERNMENTS AND BUSINESS





# The potential productivity benefits of new technologies are urgently needed.

**Productivity growth has declined since the 1990s**  
Annualised growth of labour productivity (output per hour worked)



*Source:* OECD estimations using OECD National Accounts database; OECD Productivity database; International Labour Organisation database. Statlink: <http://dx.doi.org/10.1787/888933367500>



# Digital technology and “*servicification*” of manufacturing



has transformed its business into a service with “Power by the Hour”, where customers pay only for the time they use an engine. RR engineers oversee management of customer’s fleet.

- The IoT is used to collect data on real-time engine usage
  - > minimises RR’s operation costs (maintenance costs)
  - > maximises engines’ operation time (service revenues)

Based upon FY 2014 revenues, RR’s savings could range from USD 400 million to USD 600 million and revenues increase could be USD 1 billion annually



# Using big data, cloud computing, and the IoT: the case of John Deere

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**JOHN DEERE**

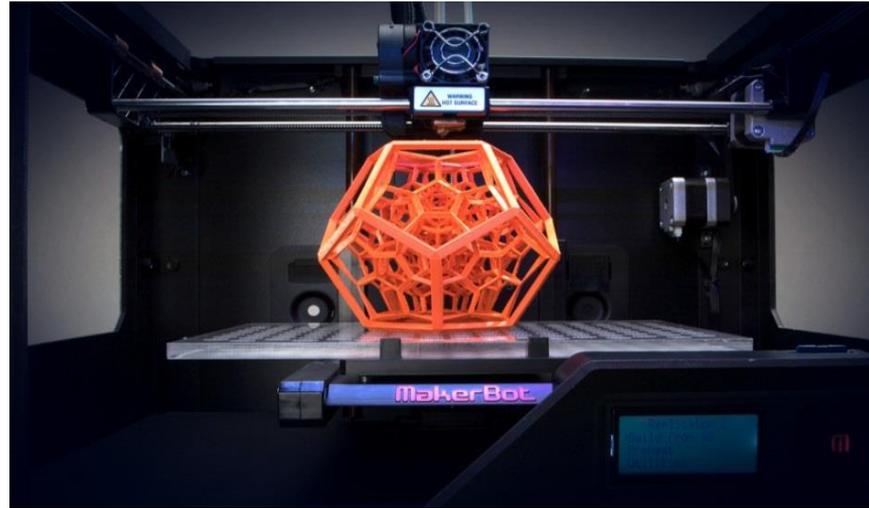
is connecting farm machines to each other and to the cloud (MyJohnDeere) via the IoT to collect and process big data

> autonomous vehicles enable a single farmer to plant and harvest up to 600 acres a day (compared to 150)

Global precision farming market now worth  
~ USD 3 billion and expected to be worth  
~ USD 5 billion by 2020 (CAGR: 12%)



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Enable 3D printing of repair parts for products no longer in production - **remove intellectual property barriers**





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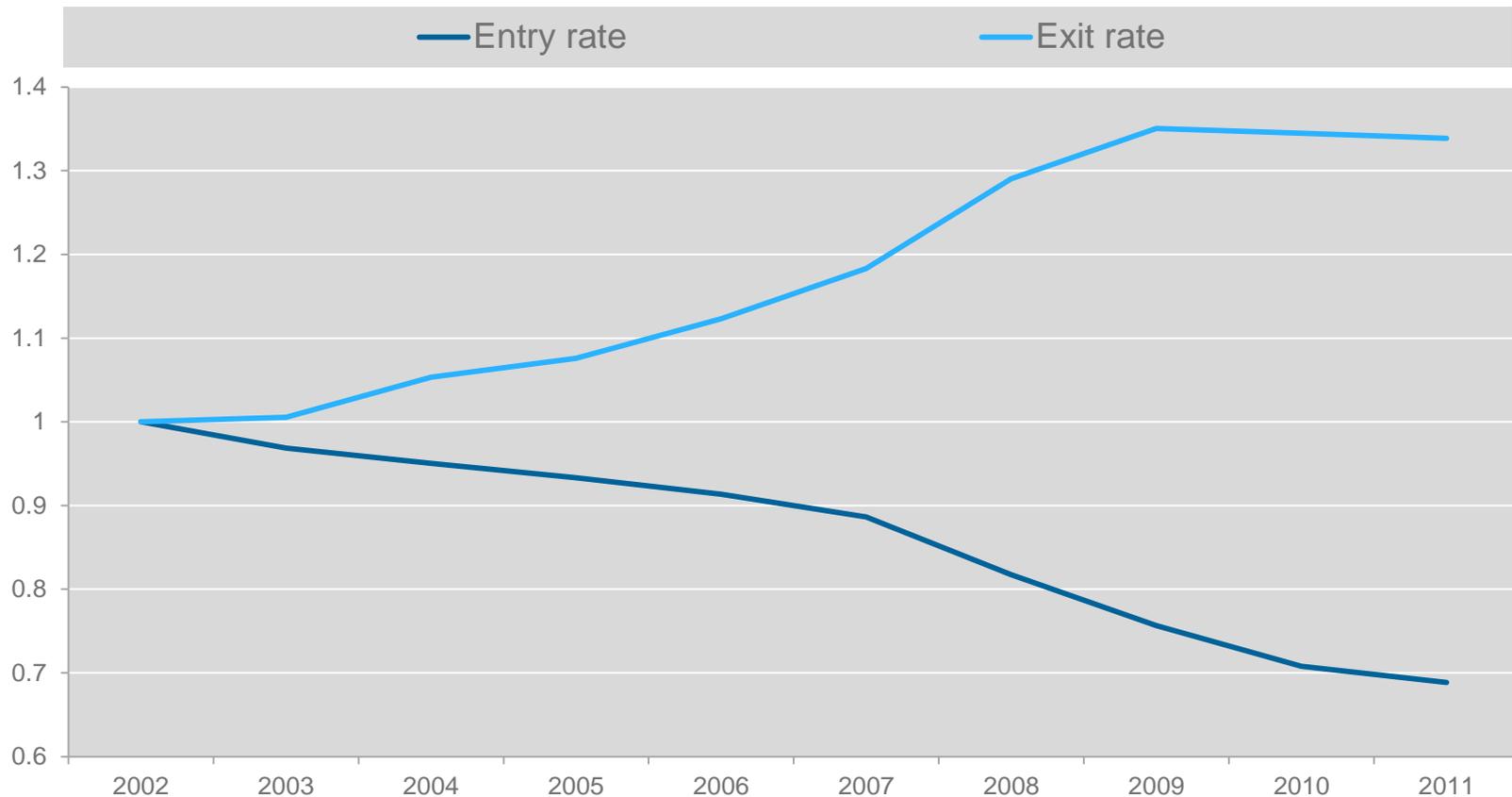
- Marketplace for 3D printable files (like Shutterstock or Fotalia, but 3D).
- Some such markets already exist, but with limitations (Thingiverse, Markerbot's marketplace, does not allow makers to monetize their designs).





# Business Entry and Exit rates

## Cross-country average





# New forms of business organisation : 2<sup>nd</sup> industrial revolution



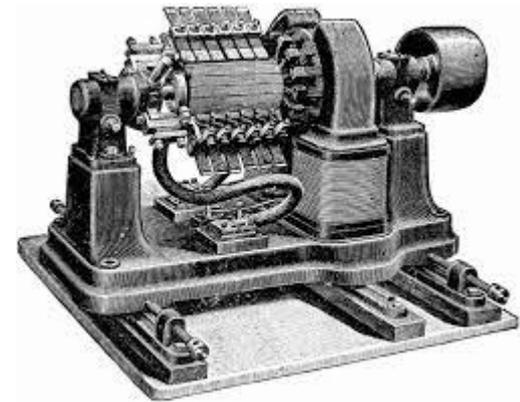
Source: David, P.A. (1990), 'The Dynamo and the Computer: An Historical Perspective on the Modern Productivity Paradox', American Economic Review, Volume 80, Issue 2, pp.355-361.



# New forms of business organisation : 2<sup>nd</sup> industrial revolution



*Introduction begins  
in mid-1890s*



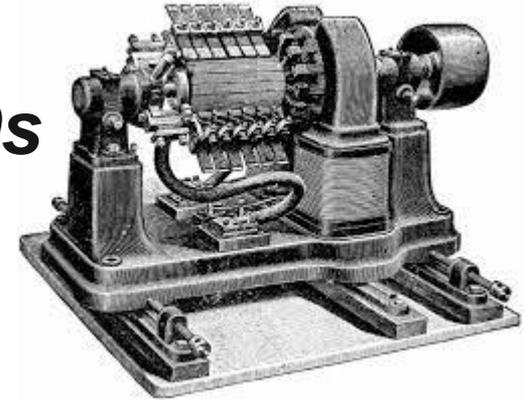
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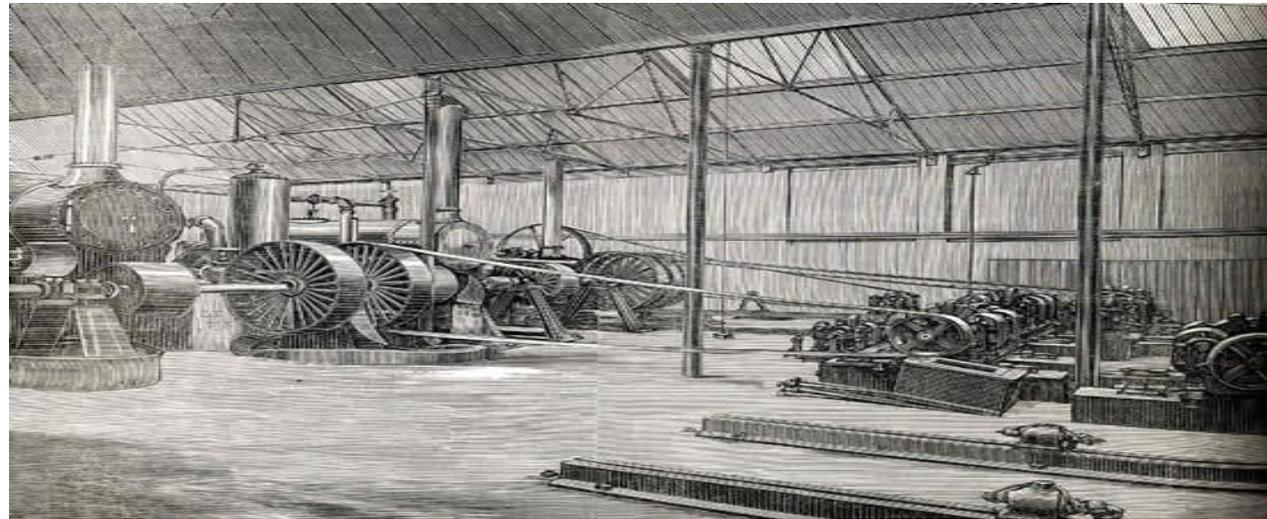
# New forms of business organisation : 2<sup>nd</sup> industrial revolution



*Mid-1890s*



*Industrial  
productivity  
only rises in  
early 1920s*



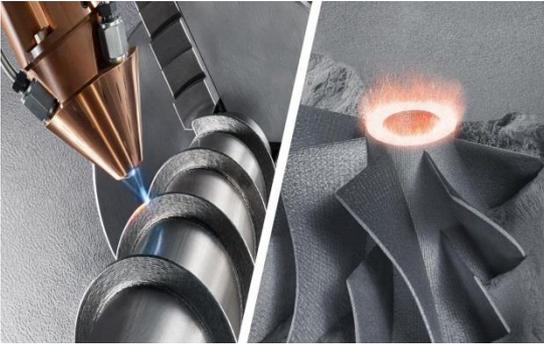


**Thank you**



# 3D printing – another aspect of strategy

Metals Additive Manufacturing (MAM)



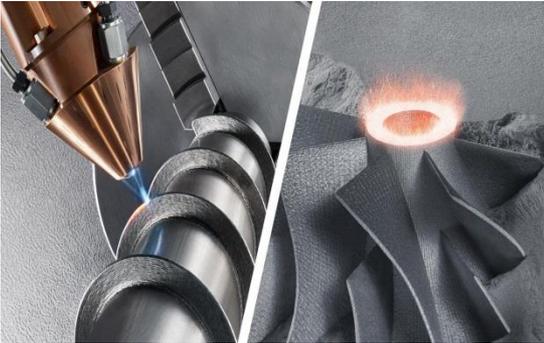
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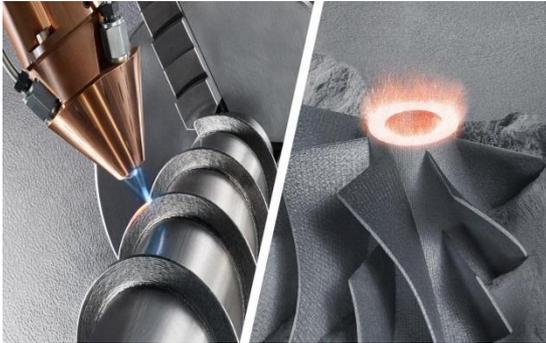


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extraordinary safety  
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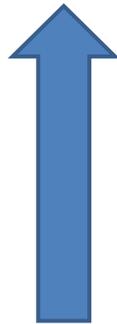
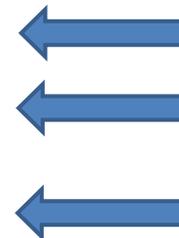
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Government can help



- Technical and institutional infrastructure (e.g. materials databases)
- Promote standards
- Forge data sharing agreements across industry, government labs and academia