

# ECONOMIC AND BUSINESS HISTORY 22/23

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## LECTURE 3 – INNOVATION AND GROWTH

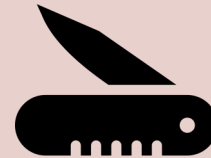


# Innovation and Growth

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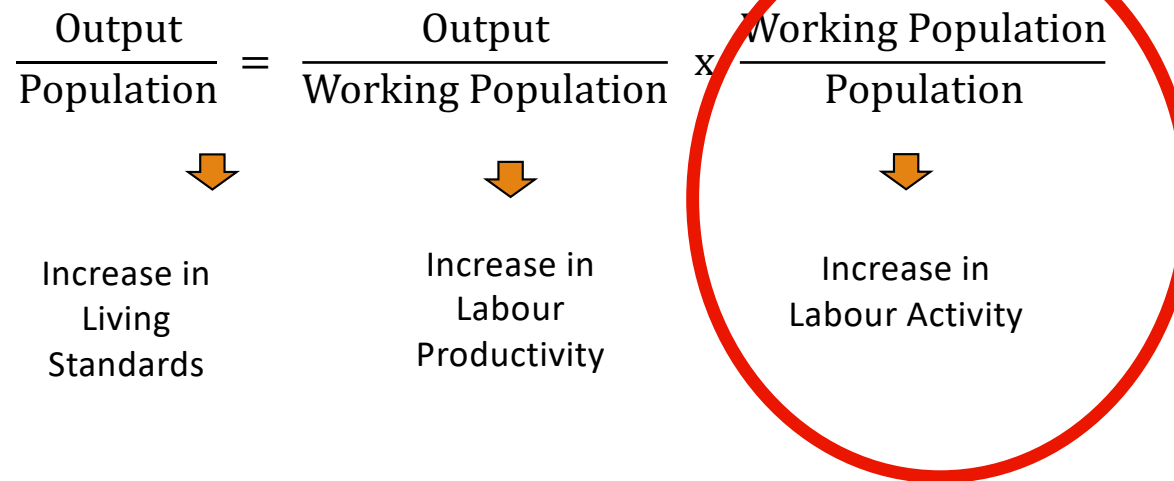
Invention and  
Innovation



Structural Change

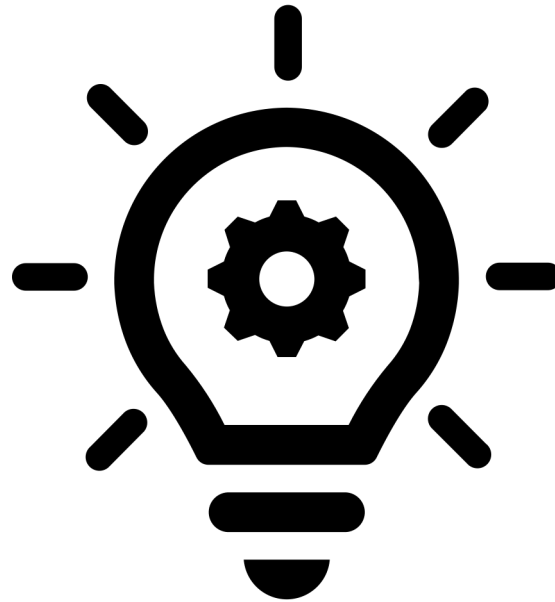
# Modern Economic Growth

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# 1. Invention and Innovation

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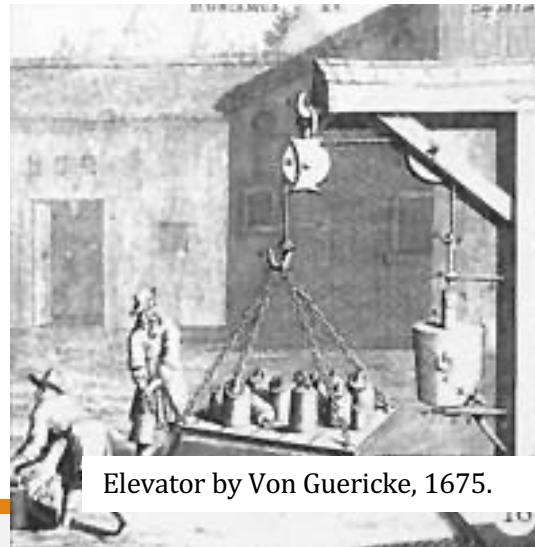
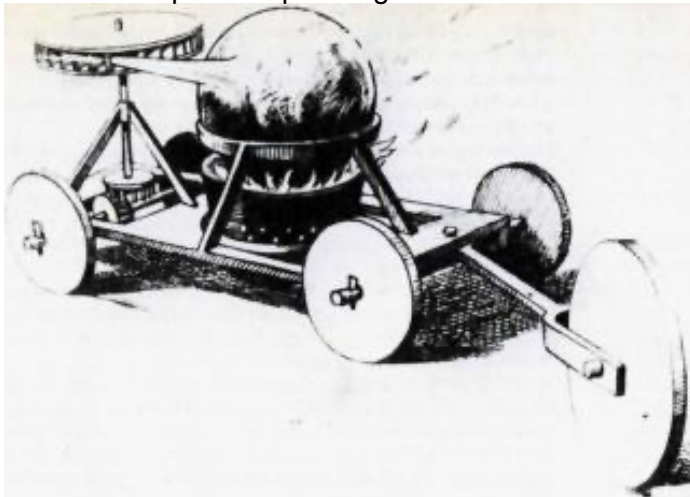


# Invention OR Innovation?

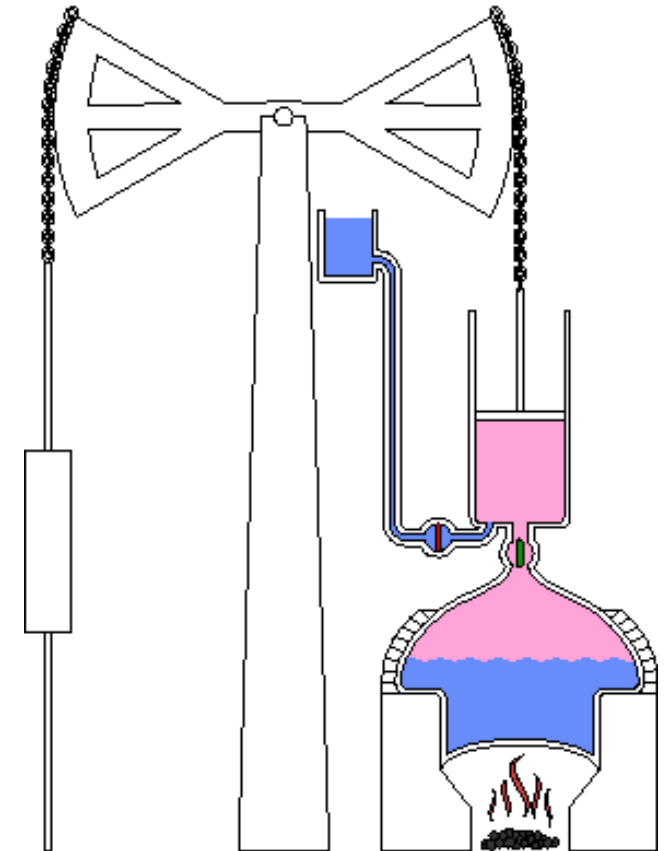
Steam engine by Hero of Alexandria ; 1st cent. AD



Steam car by Father Verbiest, 1678. Presented in the Chinese Court. No space for passengers!



Elevator by Von Guericke, 1675.



Newcomen's Steam Engine, 1712.



# Science and Innovation

- The scientific foundations for steam had been known since the 1660s, thanks to the discovery of vacuum by Von Guericke
- A few functional steam machines were around since then
- Portugal, for instance, was not behind in terms of scientific knowledge
  - There was even a pioneer of steam machinery called Bento Portugal ;D )
  - Vacuum even was part of the curriculum of Portuguese universities (see tiles from the Un. of Évora, depicting the Marburg experiment)
- The difference was not in the SUPPLY of scientific knowledge, but on the DEMAND for innovations.
- In Great Britain, high wages and low interest rates stimulated innovation, something which did not happen in the continent

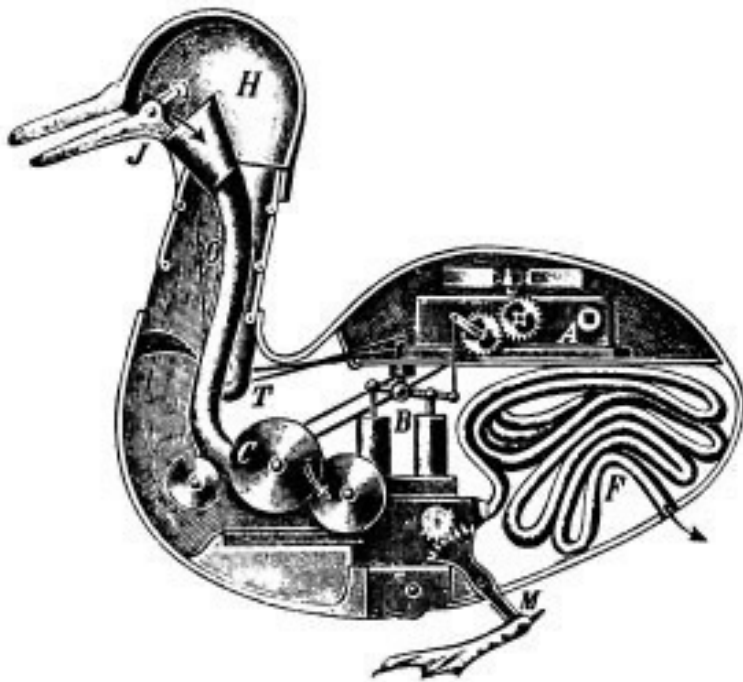
# Invention and Innovation

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- “Inventions” (see Vaucanson’s duck) did not morph into innovations
- The contrast between the continent and England can be seen by the way how the technology behind an impressive mechanical duck by a gifted French inventor (Vaucanson) had no effect on the country’s industry
- Yet, fame of this reached England where an illiterate businessman (Arkwright) tried to adapt the mechanism to perform a far simpler (spinning) movement
- Arkwright’s successful spinning opened the path to successive improvements, which meant increasing profitability, even with lower wages

# Invention

# Innovation



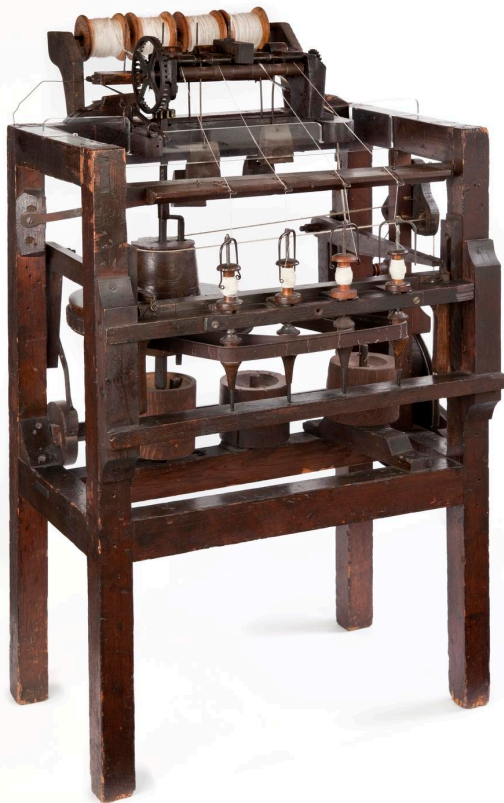
Vaucanson's duck 1740. Walked (M), ate (J), "digested" (B and F) and expelled "food" (F) by means of clockwork mechanism.



Spinning engine by Arkwright. Water powered. Research by Arkwright and his team of clockworkers from 1767 to 1771. Patented.

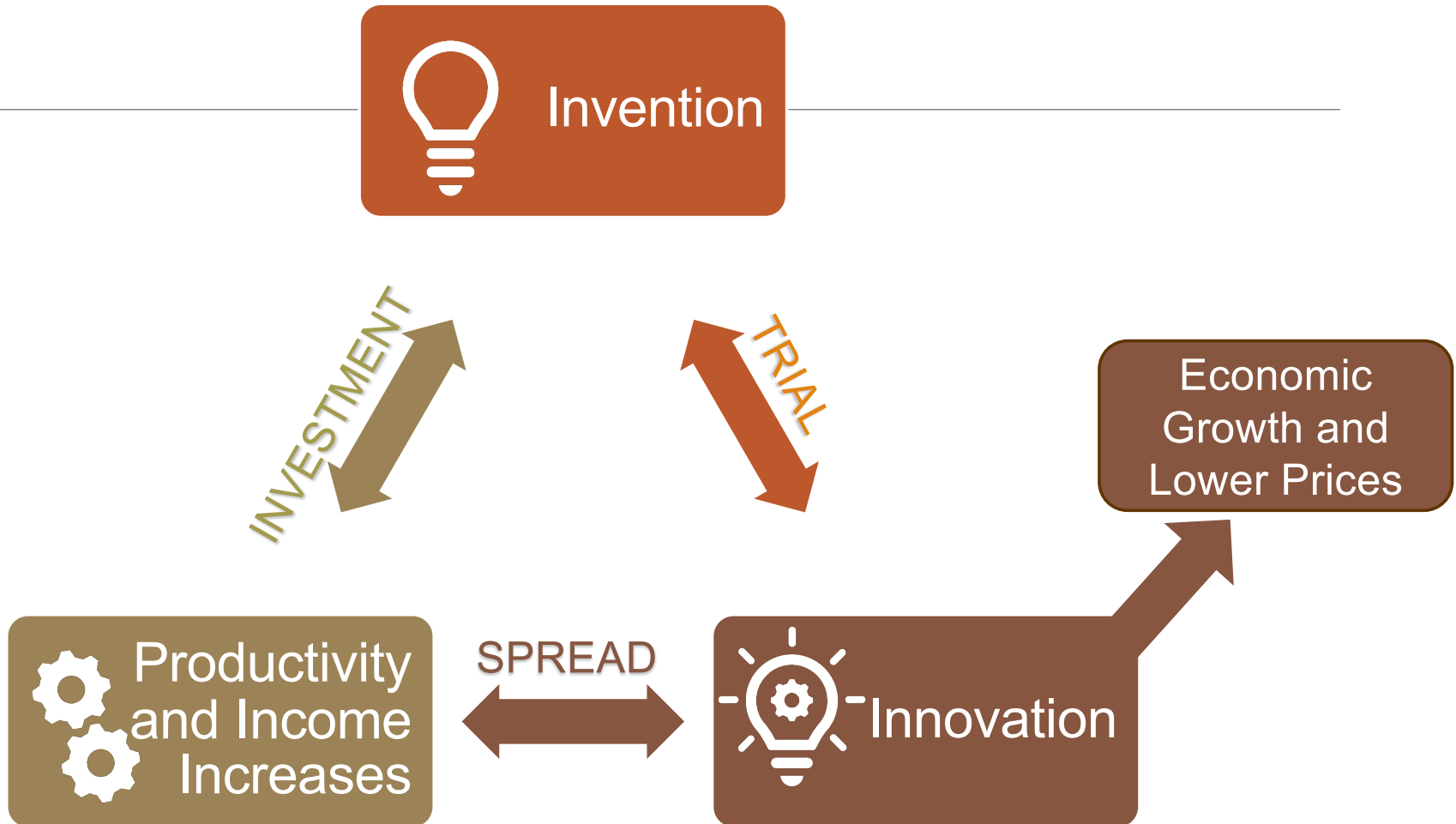


# Productivity Increases in cotton spinning



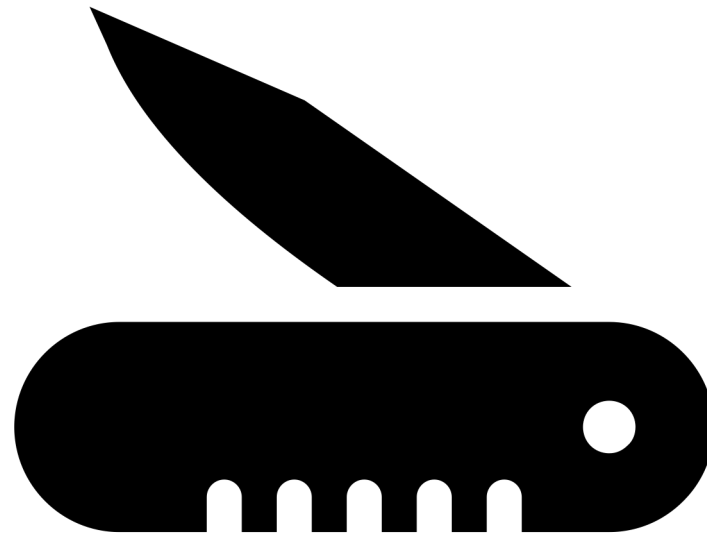
	Cost for spinning 100 lb of cotton in current GB pounds	Cost for spinning 100 lb of cotton INDEX	Hours for spinning 100 lb of cotton
1780	2.10	100	100
1795	0.57	23	15
1830	0.13	4	7

# Invention and Innovation



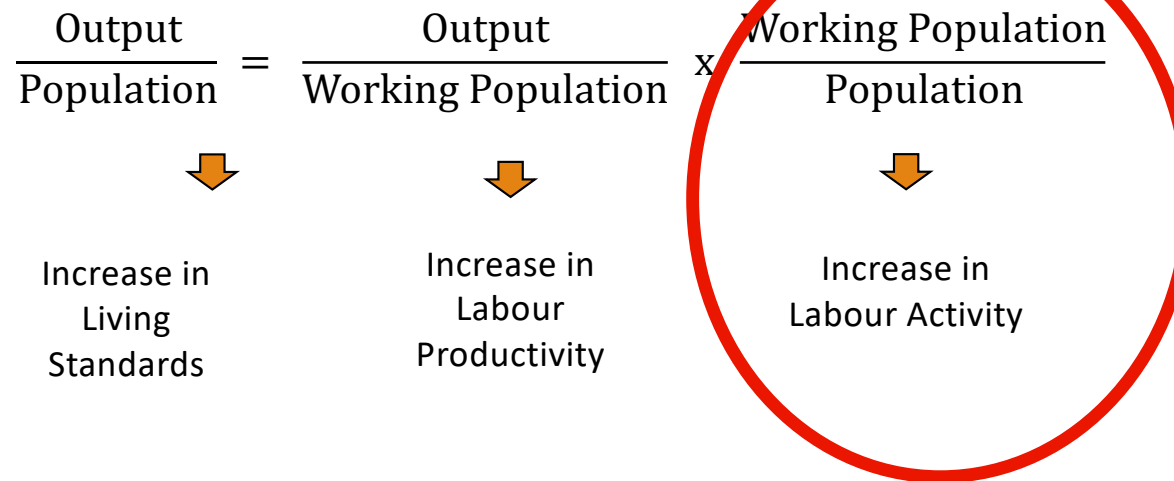
# 2. Structural Change

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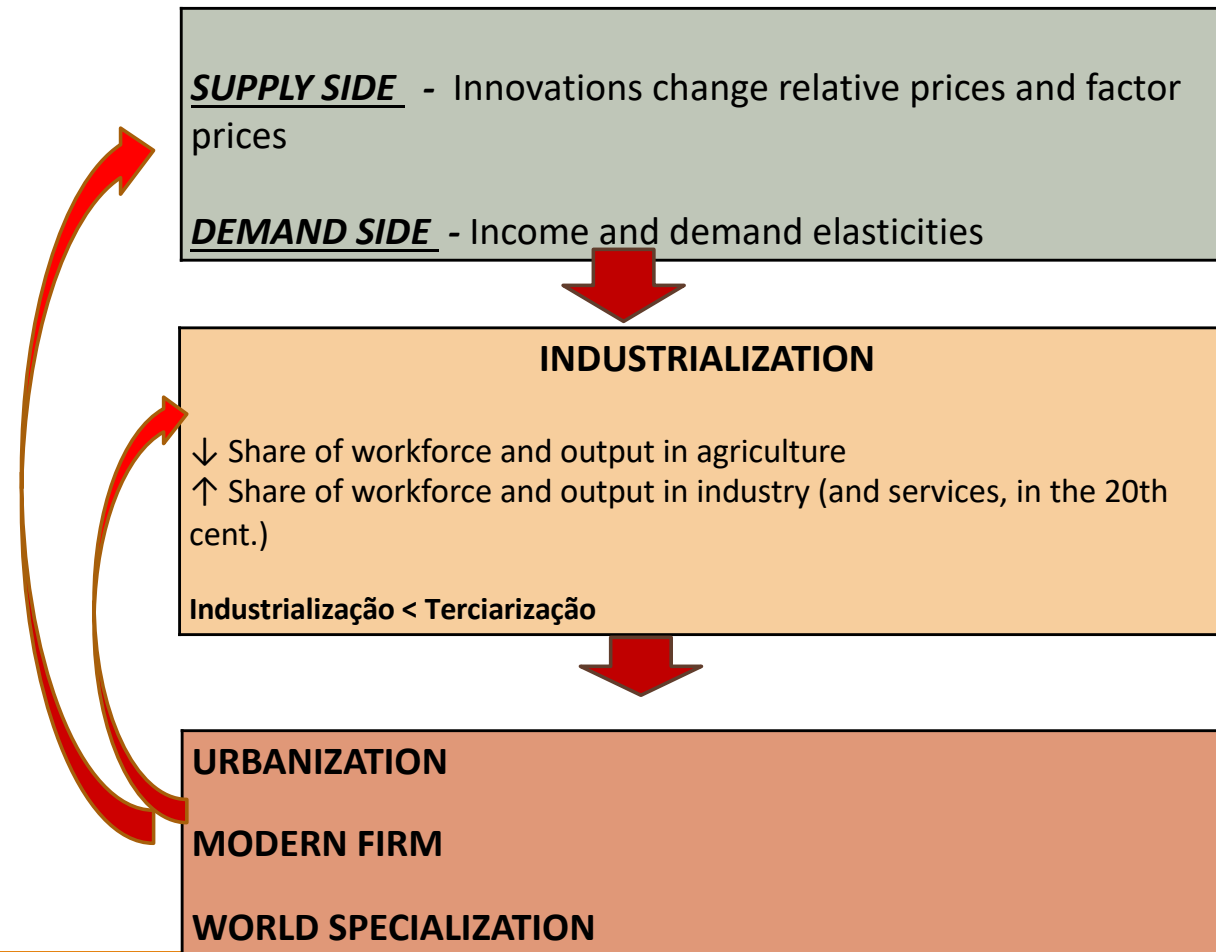


# Modern Economic Growth

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# Structural Characteristics of MEG: SECTORIAL CHANGE



# Division of Labour and Industry

	1705	1775	1845
England	35	29	20
France	70	65	59
Prussia	80	70	60
Spain	71	66	61
Average	60,8	55,6	55

Fonte: Dennison e  
Simpson 2010: 149

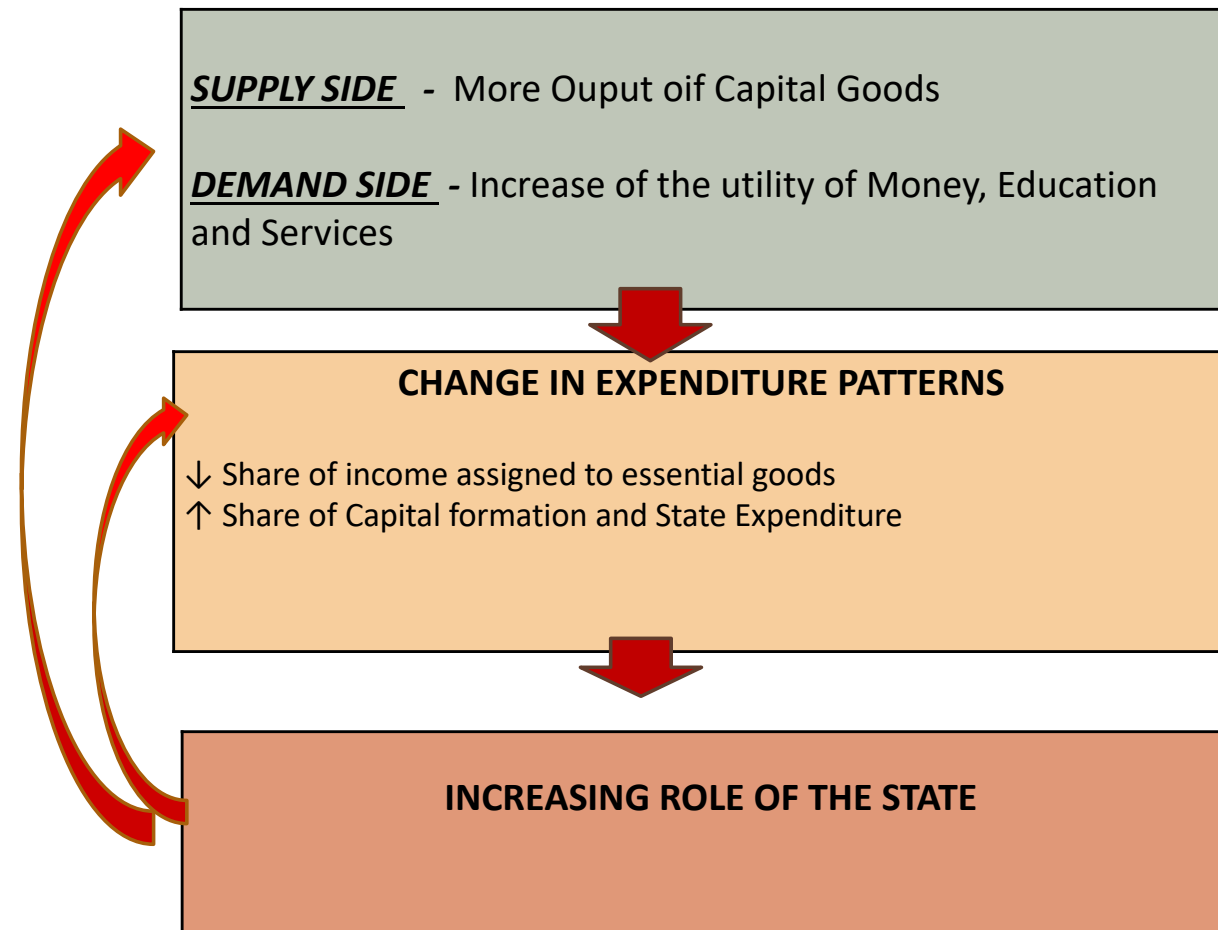
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# Sectorial Output Shares in the UK, 1770-2001

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	1770	1801	1851	1891	1931	1961	2001
Agriculture	45	31,6	19,3	9,0	4,1	4,0	1,0
Industry	24	32,6	31,9	41,0	36,1	49,3	27,5
Serviços	31	35,8	48,8	50,0	59,8	46,7	71,5

# Structural Characteristics of MEG: Expenditure Patterns





# The trajectory of Advanced Economies

Indicator	1820	c.1990	2018
Hours worked per person per year	3000*	1600	1589
Average schooling (in years)	2	11	12.7
Foodstuff and clothing/private consumption	75%	25%	20%**
Private Consumption/GDP	>85%	58%	54%
Farm employment/Total employment	49%*	6,00%	3,6%

Source: Maddison 2003; OCDE 2018