

# Catching Up and Falling Behind: Lessons from 20<sup>th</sup>-Century Growth

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# Angus Maddison's Legacy

- Evaluating performance in economic growth requires long-run international and inter-temporal comparisons of productivity
- Angus transformed this discourse by allowing the notions of **catching-up, falling behind, and forging ahead** to be **quantified**
- The huge debt that we owe him will be obvious as this lecture proceeds ... in the style of a fellow '**chiffrephile**'

# Modern Economic Growth

- Post industrial revolution era
- Driven by technological progress that has substantial impact on productivity growth
- Need appropriate institutions and policies to take advantage of the opportunity
- Penalty for getting it wrong gets much bigger; **income divergence** is not new but **increases dramatically**

# Real GDP/Person (\$1990GK)

	<b>1870</b>	<b>1913</b>	<b>1950</b>	<b>1973</b>	<b>2010</b>
<b>Asian Tigers</b>	<b>394</b>	<b>603</b>	<b>1010</b>	<b>3631</b>	<b>23313</b>
<b>China</b>	<b>530</b>	<b>552</b>	<b>448</b>	<b>838</b>	<b>8032</b>
<b>India</b>	<b>533</b>	<b>673</b>	<b>619</b>	<b>853</b>	<b>3372</b>
<b>Africa</b>	<b>648</b>	<b>908</b>	<b>889</b>	<b>1387</b>	<b>2034</b>
<b>W. Europe</b>	<b>2006</b>	<b>3488</b>	<b>4517</b>	<b>11346</b>	<b>20889</b>
<b>USA</b>	<b>2445</b>	<b>5301</b>	<b>9561</b>	<b>16689</b>	<b>30491</b>

Source: The Maddison Project (2013)

# Real GDP/Person Growth (% per year)

	<b>West</b>	<b>Rest</b>	<b>World</b>
<b>1500-1820</b>	<b>0.14</b>	<b>0.02</b>	<b>0.05</b>
<b>1820-1870</b>	<b>1.06</b>	<b>0.06</b>	<b>0.54</b>
<b>1870-1913</b>	<b>1.54</b>	<b>0.73</b>	<b>1.30</b>
<b>1913-1950</b>	<b>1.14</b>	<b>0.67</b>	<b>0.87</b>
<b>1950-1973</b>	<b>3.73</b>	<b>2.82</b>	<b>2.92</b>
<b>1973-2007</b>	<b>1.98</b>	<b>2.48</b>	<b>1.81</b>

Source: Maddison (2010)

# Shares of World GDP (%)

	China	India	Western Europe	USA
1820	33	16	23	2
1870	17	12	33	9
1913	9	8	33	19
1950	5	4	26	27
1973	5	3	26	22
2010	16	6	19	23
2030	28	11	13	18
2050	29	16	10	17

Sources: Maddison (2010) and OECD (2012)

# Divergence Big Time

- 20<sup>th</sup> century growth unprecedented; GDP gap much greater than ever before
- Clearly **not unconditional  $\beta$ -convergence** so the pure neoclassical prediction does not work
- Conditional  $\beta$ -convergence may be a viable hypothesis – but what are the key conditions?

# The Solow Model in a Globalized World

- $Y/L = A(K/L)^a$
- Diminishing returns to capital accumulation
- Technology universal
- Factors mobile,  $K/L$  equalized across countries
- Beta and sigma **convergence**



# 20th vs. 21<sup>st</sup> Century

- “*The restoration of inter-society income equality will be one of the major economic events of the century to come*” (Lucas, 2000)
- So divergence will be superseded by convergence and normal (neoclassical) service will be resumed

# Lucas's Underlying Argument

- **Obstacles to growth removed** through imitation of good policies, institutions
- In a globalized world, capital mobility and financial liberalization relax the savings constraint
- **Speed of catch-up growth will increase** markedly and K/L and TFP gaps will be rapidly reduced

# Why Might Lucas/Solow Be Wrong?

- **TFP is not the same** across all countries because either efficiency or technology is not universal
- Obstacles to factor mobility
- Geography, institutions or economic policies differ **persistently**
- Sustaining catch-up growth may need **continual reform; 'too difficult'** so catch-up incomplete

# The North/Acemoglu View

- **Institutions** which affect investment and innovation are the underlying determinants of economic performance
- Institutions are formal and informal constraints that structure behaviour
- **Property rights** are the key to high incomes today and thus to divergence over time
- Institutions are **persistent**

# Rule of Law Scores (-2.5 to +2.5)

Kaufmann et al. (2013)

	<b>1996</b>	<b>2012</b>		<b>1996</b>	<b>2012</b>
Brazil	-0.33	-0.11	Netherlands	1.65	1.84
China	-0.43	-0.49	Nigeria	-1.26	-1.18
India	0.26	-0.10	Singapore	1.28	1.77
Russia	-0.87	-0.82	USA	1.45	1.60

# Early vs. Later Stages of Development

- **Gerschenkron:** institutional design and role of government different in conditions of **'backwardness'**
- **'Substitutes for prerequisites'** ('developmental state'); initially, optimal boundaries of firm wider and coordination problems more serious
- Implies institutional diversity (cf. China)
- May imply difficult transition as development progresses

# Institutions and Growth

- Important but **surely not all that matters**
- Institutional quality may not be well measured but growth regressions do not suggest it dominates recent differences in performance
- Policy plays a part and so too does geography

# Divergence Big Time

- Persistent and widening income gaps characterize modern economic growth era
- Institutional/policy failures matter much more when growth opportunities increase BUT there is a **strong spatial correlation of development outcomes**
- Does this mean that geography undermines the mainstream assumption of a 'level playing field' for development ?



# New Economic Geography: Key Ideas

- Agglomeration Benefits
- Market Potential
- Trade Costs
- **Globalization may imply divergence**

# Transport Costs and the Location of Economic Activity

- **Very High or Very Low:** everything dispersed
- **Intermediate:** centralization of industry based on location in larger market with increasing returns and external economies of scale
- So New Economic Geography says that, even with perfect institutions everywhere, integration of markets may lead to divergence

# Globalization and the Inequality of Nations

(Krugman & Venables, 1995)

- **Manufacturing** goods are subject to increasing returns and are used both as final and as intermediate goods
- As trade costs fall, self-reinforcing advantage of larger market leads to country-specific external economies of scale and lower costs for manufacturing in **core** relative to **periphery**
- Eventually, if trade costs fall enough and/or wages in the core rise enough, manufacturing returns to (parts of) the periphery. **NB:** unconditional convergence only in manufacturing (Rodrik, 2013)

# Market Potential

- Market access matters for industrial location decisions; operationalized by 'market potential' which is distance (transport costs) -weighted GDP

$$MP_i = \sum GDP_j d_{ij}^\gamma$$

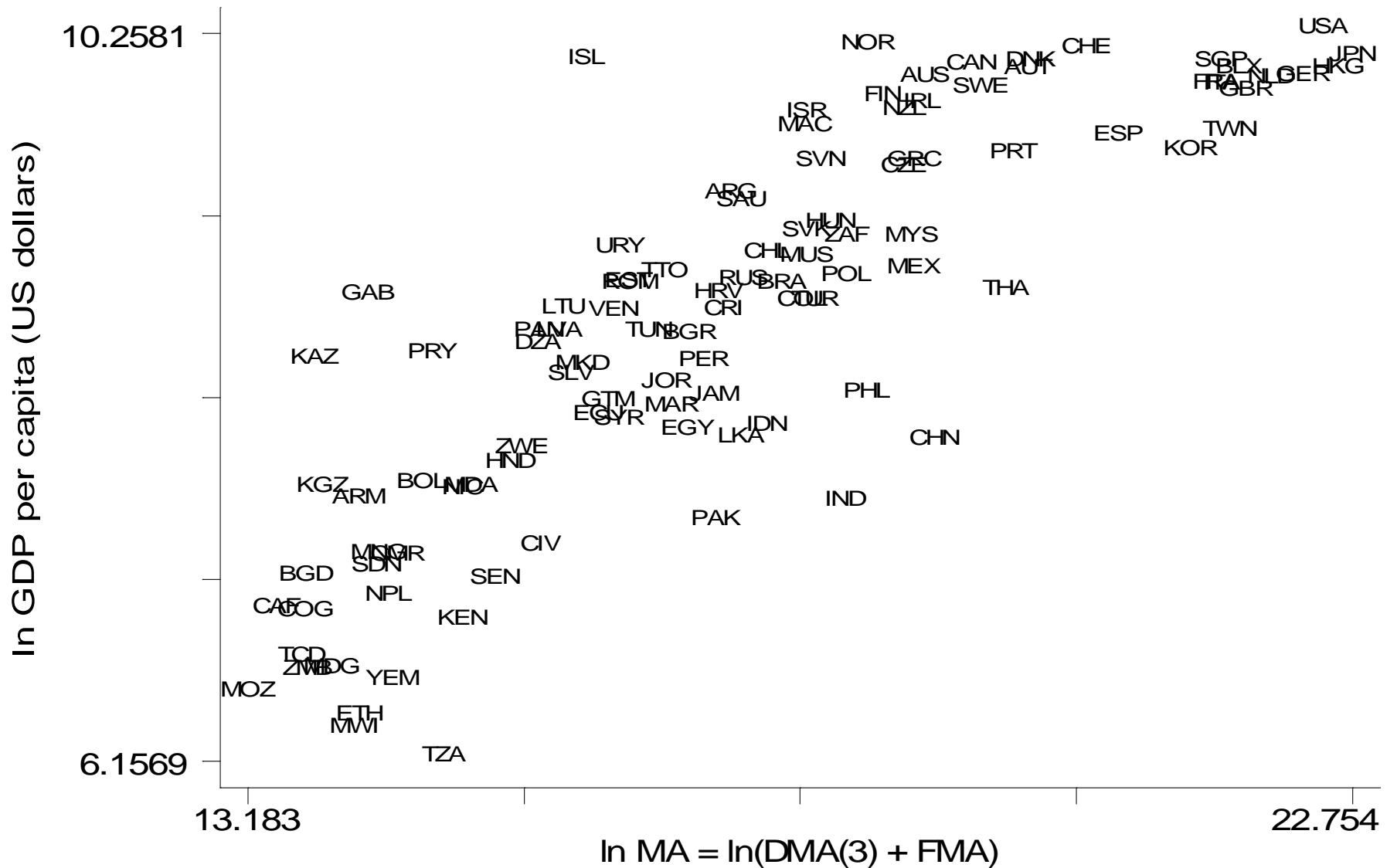
- If data permit, can estimate  $\gamma$  using gravity model; traditionally assumed that  $\gamma = -1$

# Late 20<sup>th</sup> Century Empirics

(Redding & Venables, 2004)

- There is a high **correlation between location and income** so, following Acemoglu's strategy, this also might explain divergence big time
- Market potential elasticity around 0.3
- Location effects largely robust to including institutional quality

Figure 4 : GDP per capita and MA = DMA(3) + FMA



# A Prediction

*If Zimbabwe were re-located to Hungary, real GDP per person would rise by 80 per cent*

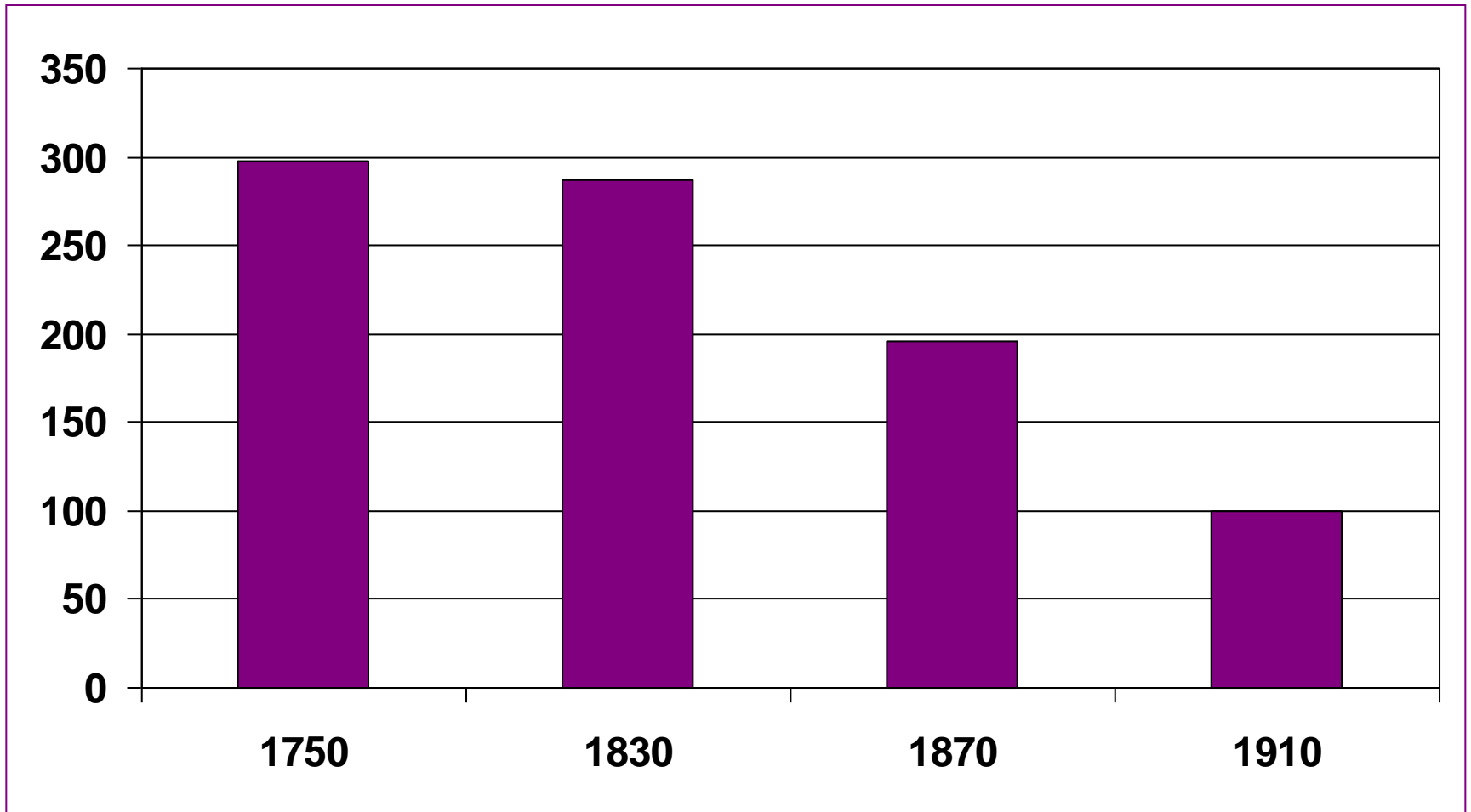
Redding & Venables (2004)

# Changes in 19<sup>th</sup>-Century Economic Geography

- **Industrialization and de-industrialization** in globalizing world
- Concentration of world manufacturing production and, even more so, exports
- Changes in location influenced by transport costs; **manufacturing cities proliferated in Europe and North America**; mass production and mass distribution



# Real Cost of Ocean Shipping (1910=100)



Source: Harley (1988)

# Shares of World Industrial Production (%)

	China	India	Western Europe	USA
<b>1750</b>	<b>33</b>	<b>24</b>	<b>23</b>	<b>0.1</b>
<b>1830</b>	<b>30</b>	<b>18</b>	<b>34</b>	<b>2</b>
<b>1880</b>	<b>12</b>	<b>3</b>	<b>61</b>	<b>15</b>
<b>1913</b>	<b>4</b>	<b>1</b>	<b>57</b>	<b>32</b>
<b>1953</b>	<b>2</b>	<b>2</b>	<b>26</b>	<b>45</b>
<b>2010</b>	<b>15</b>	<b>2</b>	<b>24</b>	<b>25</b>

Sources: Bairoch (1982) and UNIDO (2012)

# Historiography (Rodrik, 2013)

- The explanations for **19<sup>th</sup> century continental divergence are** as follows:

Imperialist exploitation (Mandel, 1975)

Institutions (Acemoglu et al., 2002)

Dutch Disease (Williamson, 2011)

Directed technical change (Allen, 2012)

- But **could NEG core-periphery have anything to do with it?**

# Market Access Then and Now

(Redding & Venables, 2002; Liu & Meissner, 2013)

<b>1910</b>		<b>1995</b>	
USA	100	North America	100
UK	88	Western Europe	92
India	31	South Asia	40
Indonesia	13	Latin America	35
Argentina	7	Africa	34

# Market Potential and GDP 100 Years Ago

- Has similar impact on real GDP/person to late 20<sup>th</sup> century with elasticity of about 0.3 in whole world countries sample (Liu & Meissner, 2013) or in European regions sample (Caruana-Galizia, 2013)
- **Core Europe has much greater market potential** than peripheral Asia (and Southern Europe) by the late 19<sup>th</sup> century
- Liu & Meissner's estimates suggest the following quote may not be entirely accurate

# A Quotation

***“No deus ex machina translates endowments into political outcomes. If that were so, Argentina would be as rich as the United States”***

North et al. (2000)

# Location of Manufacturing

- The **'manufacturing belt'** in the United States is locked into place by market potential which interacts with scale and linkage effects (Klein & Crafts, 2012)
- **Catalonia** industrializes to a much greater extent than the rest of Spain as a result of favourable market size (Roses, 2003)
- **Lancashire** dominated the world cotton textile industry based on second nature geography (Crafts and Wolf, 2014)

# Incomplete Catch-Up

- Historical experience is that even quite successful catch-up may stall well short of complete convergence
- Type of growth changes at different stages of development
- Far-from-frontier and close-to-frontier countries need different institutions and policies (Aghion & Howitt, 2006)
- Continual reform required but this is difficult



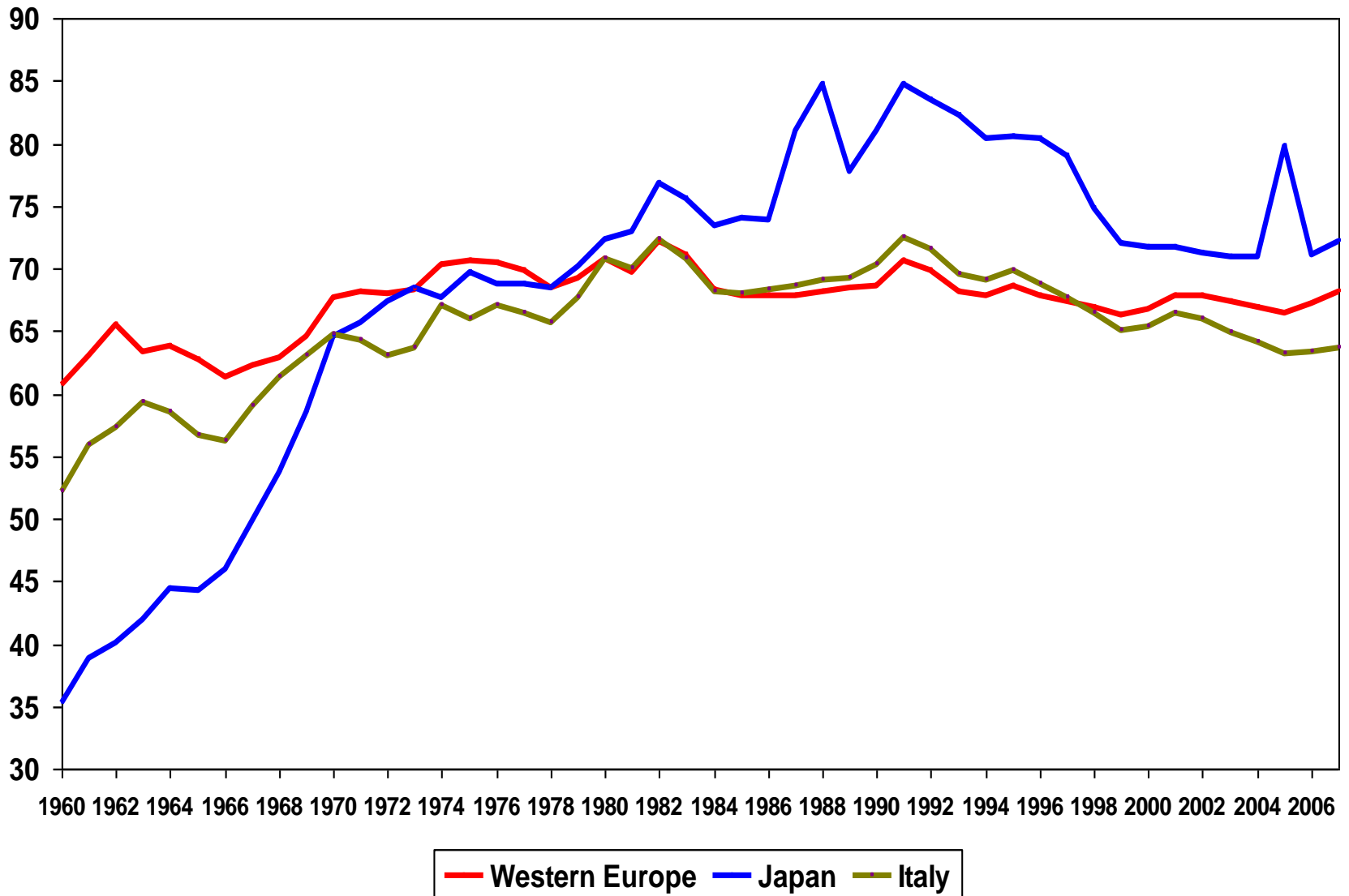
# Phases of West-European Growth

- **1950-1973**: rapid catch-up growth; gaps with USA in  $Y/P$  and  $Y/HW$  falling quickly
- **1973-1995**: catch-up in  $Y/P$  ceases but catch up in  $Y/HW$  continues
- **Post-1995**: Europe no longer catching up but falling behind;  $Y/HW$  grows faster in USA

# Late 20<sup>th</sup> Century Europe

- Now 'close-to-frontier' not 'far-from-frontier'
- Adverse implications of 'post-war settlements'
- **Failed to make necessary reforms** after the end of the 'golden-age'
- Struggled to exploit the ICT opportunity

# Real GDP/person as % of USA level, 1960-2007



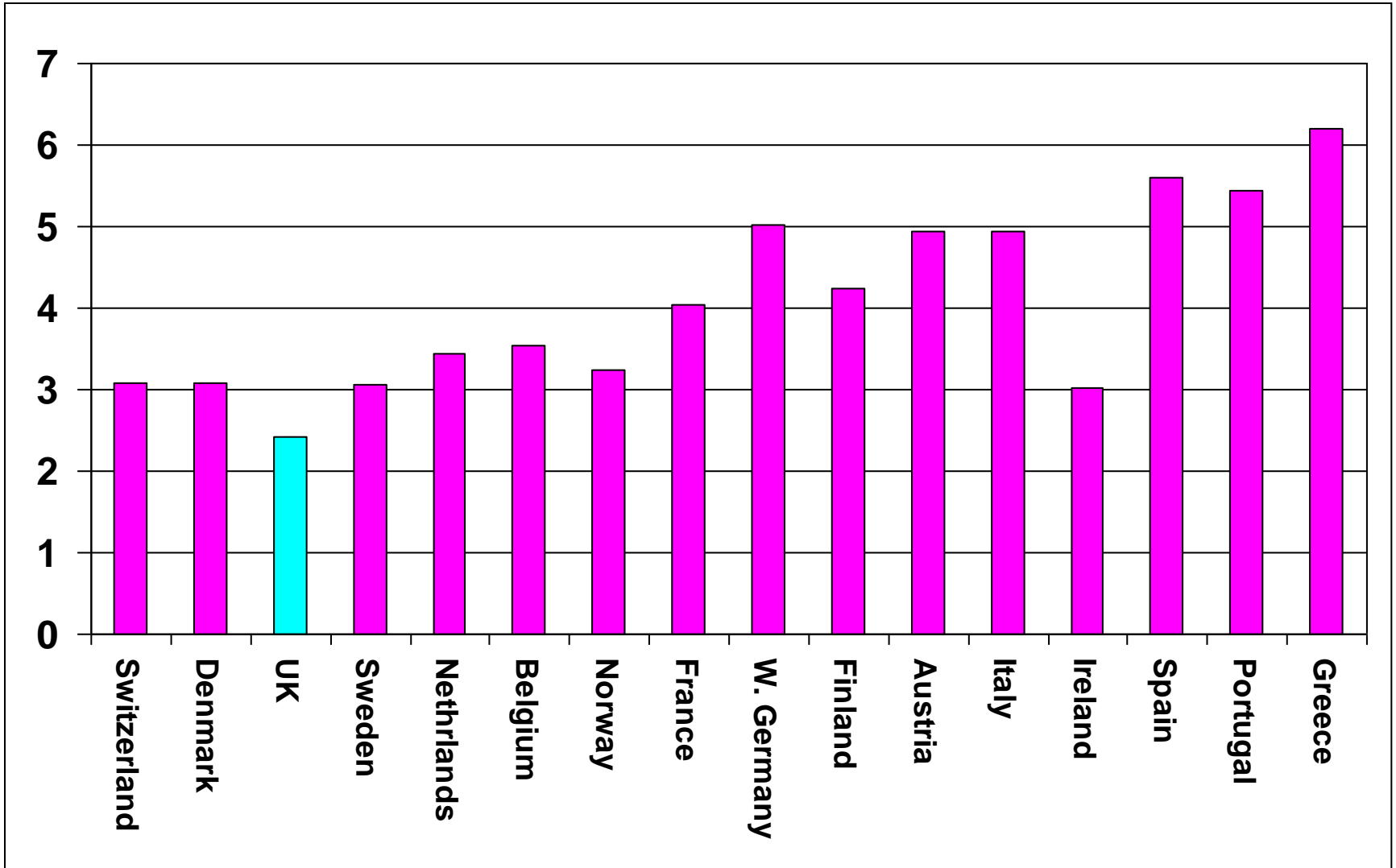
Source: The Maddison Project (2013)

# UK Relative Economic Decline in the Golden Age

- The **UK growth failure in 1950-73** was about 0.75 pp per year; UK was overtaken by European rivals (Crafts & Toniolo, 2008)
- Supply-side policy was badly designed and undermined incentives to invest and to innovate
- Policy was seriously constrained by accepting the 'trade union veto' in seeking to maintain full employment
- Weak competition sustained bad management and low-effort bargains

# Levels and Rates of Growth of Real GDP/Person 1950-1973

(\$1990GK and % per year)



# Real GDP/Person (UK = 100 in each year)

	USA	West Germany	France
<b>1870</b>	<b>76.6</b>		<b>58.8</b>
<b>1913</b>	<b>107.8</b>		<b>70.8</b>
<b>1950</b>	<b>137.7</b>	<b>61.7</b>	<b>74.7</b>
<b>1964</b>	<b>133.5</b>	<b>101.3</b>	<b>92.2</b>
<b>1979</b>	<b>142.7</b>	<b>115.9</b>	<b>111.1</b>
<b>1997</b>	<b>133.7</b>	<b>100.9</b>	<b>95.4</b>
<b>2007</b>	<b>124.9</b>	<b>88.9</b>	<b>86.8</b>

Sources: The Conference Board (2014) and West Germany in 2007 calculated from Statistisches Bundesamt Deutschland.

# An Early Start Hypothesis

- The real penalties of Britain's 'early start' were felt after World War II
- The key **transmission mechanism** was the persistence of institutions *together with* the policy framework resulting from the severe interwar problems to which the early start exposed Britain
- **Retreat from competition interacted with corporate governance and industrial relations legacies** to undermine productivity performance (Crafts, 2012)
- It took roughly 50 years to deal with this problem

# BRICs Hypothesis

- Goldman-Sachs (2003) highlighted change in world economic structure consequent on rapid growth of big developing economies
- **B**razil + **R**ussia + **I**ndia + **C**hina = **BRICs**
- Based on **catch-up and convergence** in these economies
- Does not confront need for continuing reform to prevent catch-up stalling



# The BRICs Model

- Conventional and mechanistic

$$Y = AK^{0.35}L^{0.65}$$

$$\Delta A/A = 1.3 + 1.5[\log(Y/P_{US}) - \log(Y/P_{BRIC})]$$

- Capital stock growth keeps pace with effective labour supply growth and  $Y/L$  growth at about 1.5 times TFP growth: TFP growth slows down gradually as catch-up proceeds
- Takes membership (or not) of the catch-up growth club as a given

# Back to 1974

- It would be nice to believe that this model worked well in the past
- **Starting in 1974**, its predictions of future shares of world GDP would have been way off:

it would have assumed continuing Japanese and European catch-up of USA

it would have had no way to predict the rise of China and India

# OECD (2012) Projections

- **Chinese growth will slow down** as scope for catch-up diminishes and labour force falls
- Normal catch-up trajectory entails China = 55% American Y/P in 2050 and Chinese share of world GDP stable at about 28% post 2030
- This might be too optimistic on China if future reforms are problematic

# OECD (2012) 'Business-as-Usual' Projections for China (% per year)

	<i>Real GDP Growth</i>	<i>Real Labour Productivity Growth</i>
2001-7	<b>10.2</b>	<b>9.2</b>
2012-17	<b>8.9</b>	<b>8.4</b>
2018-30	<b>5.5</b>	<b>5.9</b>
2031-50	<b>2.8</b>	<b>3.6</b>

# The Chinese 'Economic Miracle'

- Fast growth imperative to legitimize CP rule
- Much improved incentive structures but context-specific and politically-contingent institutions; *Doing Business* points to weaknesses
- Wasted investment, weak service sector performance, rapid **TFP growth hard to sustain**
- Still a very inefficient economy (Hsieh & Klenow, 2009)

# The RDA Model of Growth

(Xu, 2011)

- China like M-form firm with internal labour market; central government gives strong incentives for local officials to promote growth
- Incentives high-powered with single-task, effective yardstick competition, and CP in power
- Faster (slower) growth substantially raises probability of promotion (termination) for officials
- Explains rapid **growth despite 'bad institutions'** but will need to be replaced

# Africa's Growth Tragedy

- For 25 years from the 1970s income levels in Africa stagnated
- Neither economic policy nor institutions were conducive to joining the catch-up growth club
- Africa has not been favoured by geography
- But stronger growth recently ... means **an African Tiger is unleashed?**

# Growth of Real GDP/Person, 1960-2000

(% per year)

	<i>Resource -Scarce &amp;Coastal</i>	<i>Resource- Scarce &amp; Landlocked</i>	<i>Resource -Rich</i>
<b>Africa</b>	<b>0.50</b> <b>(33)</b>	<b>-0.36</b> <b>(33)</b>	<b>0.29</b> <b>(33)</b>
<b>Other Developing</b>	<b>3.79</b> <b>(88)</b>	<b>1.40</b> <b>(1)</b>	<b>2.89</b> <b>(11)</b>

Source: Collier (2007); numbers in parentheses refer to percentages of population in each category



# African Tigers?

- The recent growth spurt is based on very strong demand growth for primary exports driven especially by Chinese demand
- Whether this leads to **sustained catch up growth is doubtful:**
  - Productivity growth still quite weak
  - No industrialization surge
  - Weak institutions, moderate CPIA scores, and geographic handicaps have not gone away

# Sub-Saharan Africa: Reality Check

- 1997-2012: Y/L growth = 2.1%, TFP growth = 0.8%
- Manufacturing = 10% GDP in 2010
- Market access relatively low; **is globalization really Africa's long-term friend?**
- *Doing Business* and *Governance Matters* scores generally still quite low
- None of Acemoglu, Krugman or Rodrik would see this as highly promising

# What Does OECD Project for Post-Crisis Europe?

- Crisis affects output levels but not trend growth rate
- Basically, it is **pre-crisis 'business as usual'**
- Catch-up growth resumes and slow convergence towards 'best-practice' supply-side policy continues

# OECD Real GDP/Person Potential Growth Projections (% per year)

	<i>2000-2007</i>	<i>2008-13</i>	<i>2014-30</i>
<b>Euro Area</b>	<b>1.1</b>	<b>0.5</b>	<b>1.5</b>
<b>France</b>	<b>1.1</b>	<b>0.7</b>	<b>1.8</b>
<b>Germany</b>	<b>1.2</b>	<b>1.4</b>	<b>1.3</b>
<b>Netherlands</b>	<b>1.5</b>	<b>0.6</b>	<b>1.8</b>
<b>UK</b>	<b>2.1</b>	<b>0.3</b>	<b>2.0</b>
<b>Greece</b>	<b>2.6</b>	<b>-1.2</b>	<b>2.1</b>
<b>Ireland</b>	<b>3.5</b>	<b>0.8</b>	<b>1.4</b>
<b>Italy</b>	<b>0.7</b>	<b>-0.6</b>	<b>1.2</b>
<b>Portugal</b>	<b>1.2</b>	<b>0.2</b>	<b>1.3</b>
<b>Spain</b>	<b>1.8</b>	<b>-0.2</b>	<b>1.1</b>

Source: OECD, Economic Outlook (2014)

# A More Sceptical View

- Medium-term effect of the crisis is likely to be negative (Crafts, 2013)
- The aftermath of the 1930s crisis is not encouraging nor is the rise of populism; **‘desirable reforms’ less likely?**
- High debt to GDP ratios and lower levels of European economic integration are an unfortunate legacy

# Lessons

- Catch-up is nearly always incomplete; the BRICs and Europe will face big reform challenges to address this problem
- Geography matters and this remains a big problem for Africa
- It is still not a neoclassical world of beta and sigma convergence