OECD I:
The Golden Age of Economic Growth

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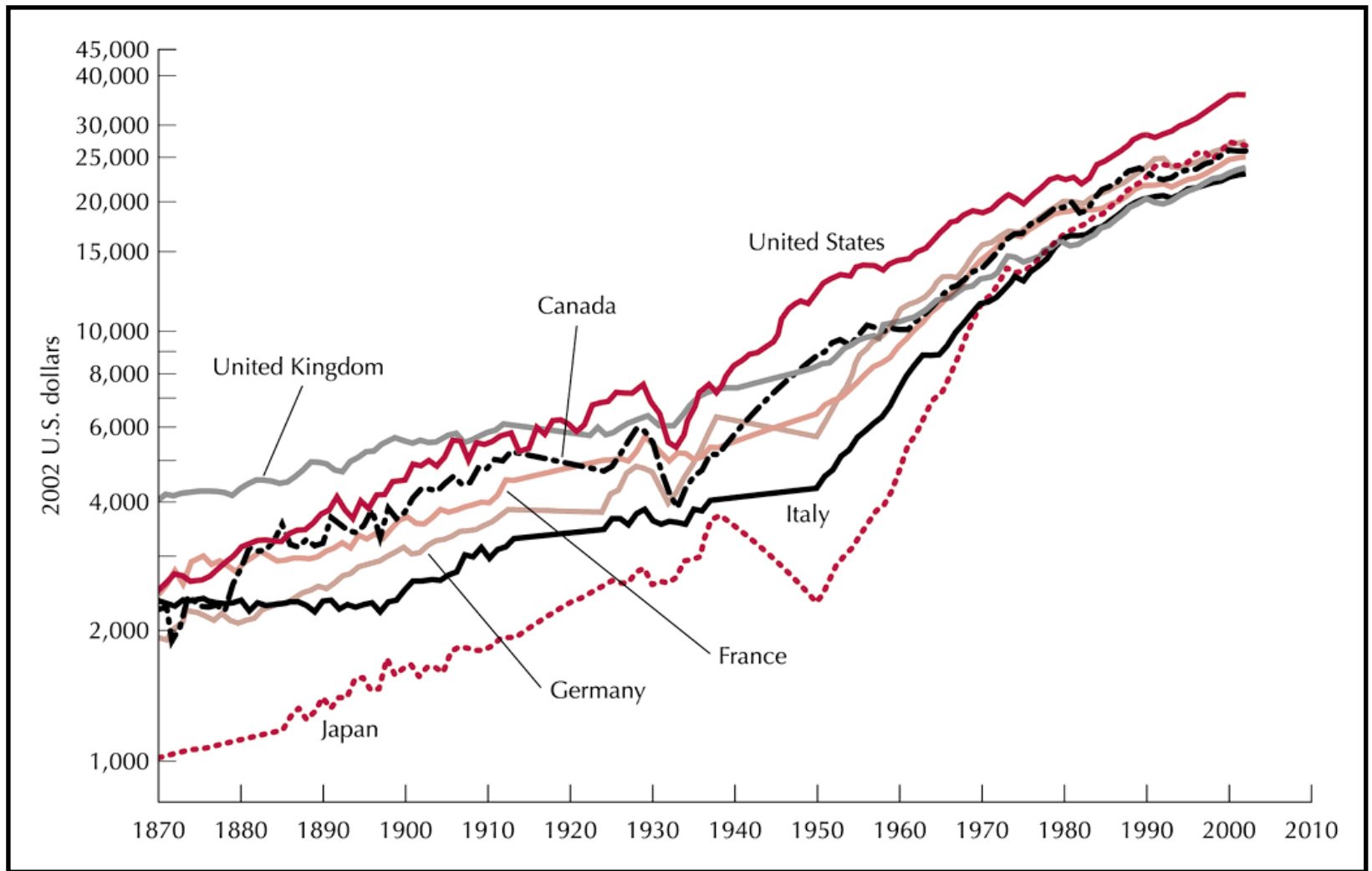
Hilary Term 2007

international labour productivity

	UK=100			USA=100							
	1820	1870	1890	1913	1929	1938	1950	1960	1973	1987	1998
USA	83	96	99	100	100	100	100	100	100	100	100
Japan	31	18	20	18	22	23	15	20	45	60	68
Germany	62	48	53	50	42	46	34	52	73	91	106
France	80	54	53	48	48	54	42	51	74	99	102
Italy	58	39	35	37	35	40	38	46	78	96	100
UK	100	100	100	78	67	64	58	57	68	81	82
Canada	..	62	63	75	66	58	68	72	75	83	80

Source: Robert J Gordon (2005)

economic growth in Western Europe

	GDP	GDP per capita
1890-1913	2.2	1.4
1913-1950	1.4	0.9
1950-1973	4.8	4.0
1973-1994	2.1	1.7
Source:	*Temin (2002)*	

stories about Europe in the golden age

- The return to liberal policies in international trade
  - Churchill: Franco-British Union (1940), Zurich Speech (1946), Council of Europe (1948);
  - The Schuman Plan (1950), the ECSC (1952), the EPU (1950-58);
  - The Treaty of Rome and the EEC (1958);
  - The Stockholm Convention and the EFTA (1960);
  - The GATT, IMF, and IBRD.
- Buoyant domestic demand; export-led growth
- Low inflation rates despite high demand
- A backlog of growth possibilities which made supply very responsive to demand
  - The Marshall Plan ($12.4bn between 1948 and 1951).

Maddison's identifiable forces 1950-1973

	France	Germany	Japan	Netherlands	UK	USA
GDP	5.04	5.92	9.27	4.74	3.03	3.65
Augmented factor input	2.02	2.42	5.44	2.32	1.76	2.54
TFP	3.02	3.50	3.83	2.42	1.27	1.11
Structural Effect	0.46	0.36	1.22	-0.07	0.10	0.12
Technology Diffusion	0.25	0.34	0.50	0.23	0.07	0.00
Foreign Trade	0.28	0.36	0.38	0.98	0.25	0.07
Scale Effect	0.15	0.18	0.28	0.14	0.09	0.11
Energy Effect	0.00	0.00	0.00	0.06	-0.01	0.01
Natural Resources	0.00	0.00	0.00	0.19	0.00	0.00
Total explained	1.14	1.24	2.38	1.53	0.50	0.31
Residual TFP	1.88	2.26	1.45	0.89	0.77	0.80

Note: *Data are annual compound growth rates.*
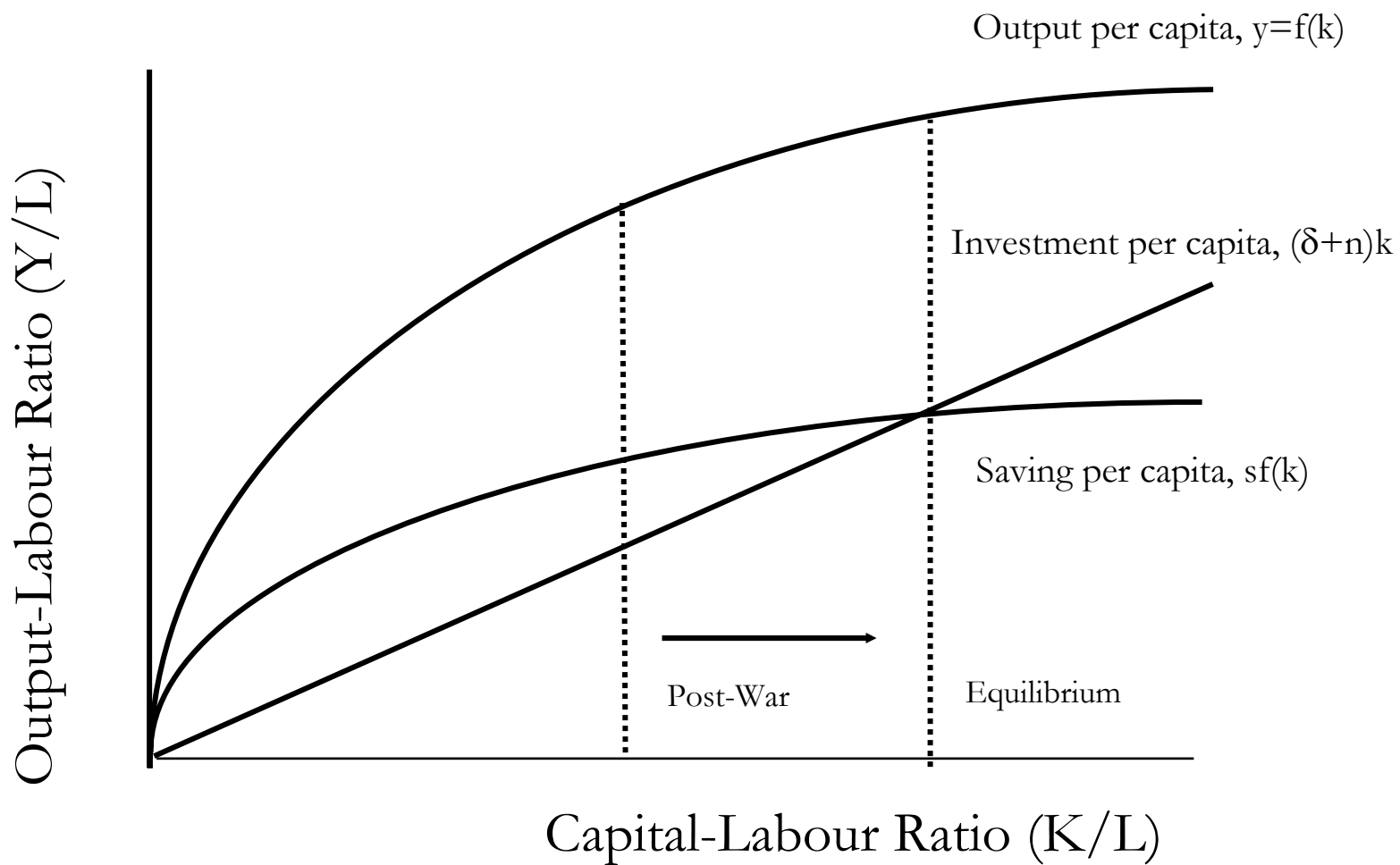*Source:* *Maddison (1991) table 5.19.*

the devil in Maddison's details

- Labour and capital are quality-adjusted and given weights of 0.7 and 0.3, respectively.

- Structural effect allows for the shift in inputs from agriculture into industry and services.

- Technology Diffusion assumes that 10% of the convergence with the US is due to technology.

- Foreign Trade effect assumes a 15% productivity gain from increases in the share of trade in GDP.

- Scale Effect is assumed to be 3% of the annual increase in GDP.

- Energy Effect uses the share of energy in GDP to calculate effect.

- Natural resources effect assumes that only 50% of UK oil output and 80% of Dutch output is a genuine windfall (i.e. not requiring offsetting capital investment).

causality and correlation

- One problem with the growth-accounting framework is that is does not explain, only accounts; i.e. there is no causality implied, only correlation.

- Therefore we cannot say what caused the high investment rates in Europe.

- What was it about the Golden Age that enabled such high rates of investment and such a transfer of labour out of agriculture?

- Some possible causal stories:

  - Investment backlogs and reconstruction;

  - Demand stabilisation;

  - Openness and export-led growth;

  - Technology catch-up;

  - 'High investment; wage restraint' social contract.

reconstruction

Output per capita, y=f(k)

Investment per capita, $(\delta+n)k$

Saving per capita, sf(k)

Output-Labour Ratio (Y/L)

Post-War

Equilibrium

Capital-Labour Ratio (K/L)

investment backlogs and reconstruction

- The war provided a big shock to capital: in Japan 81% of shipping, 34% of industrial machinery and 25% of dwellings were destroyed. USSR lost 25% of capital, West Germany 12%, France 8%, Italy 7%, UK 2%.

- In Holland during the 'Hongerwinter' of 1944-5, 66,000 cars (of 100,000), 3800 buses (of 4500), 2m bicycles (of 4m) were removed to Germany; 300,000 (of 4.5m) Dutch civilians were deported.

- With a Cobb-Douglas production function (with a labour share of 0.7), a loss of a quarter of the capital stock reduces output by 8%.

- In addition, much of the capital that withstood the war was unusable for some time due to lack of fuel, parts, labour and transport. Or because it needed to be converted from wartime to civilian uses. If we say that a quarter of the workforce was temporarily displaced and only a quarter of the capital stock could be used immediately, output would be reduced to 54% of its pre-War level.

- Therefore we might think of the rapid rises back to pre-War levels as largely due to capital and labour being redeployed and brought back into use.

- Of course, that still leaves the actual loss of capital and the 'missed years' to be replaced.

war damage and reconstruction

	Setback Year	Recovery Year	Reconstruction growth rate	Implied 1945 level
Austria	1886	1951	15.2	0.52
Belgium	1924	1948	6.0	0.85
Denmark	1936	1946	13.5	0.88
Finland	1938	1945		
France	1891	1949	19.0	0.57
Germany	1908	1951	13.5	0.55
Italy	1909	1950	11.2	0.64
Netherlands	1912	1947	39.8	0.56
Norway	1937	1946	9.7	0.91
Sweden	never			
Switzerland	never			
United Kingdom	never			

Notes: *Setback year is the pre-War year when GDP was the same as in 1945.*
               Recovery year is the year when GDP recovered its highest pre-War level.
               Reconstruction growth rate is the annual rate of growth of GDP
               during the period between 1945 and the recovery year.
               Implied 1945 level is relative GDP in 1945 compared to highest pre-War level.
Source: *Crafts and Toniolo (1996) chapter 1.*

demand stabilisation

- "If cheap technology and abundant labour and raw materials were not novel features of industrial Europe, something else must still explain why in the 1950s and 1960s they led to 'supergrowth'… Such an explanation would seem to have come from the demand side" Boltho (1982).

- Kormendi and Meguire (1985) found that greater variation in unanticipated money demand was negatively correlated with growth but that a higher variance of output growth between 1950 and 1977 was positively correlated with growth.

- Mills (2002) found positive correlation between volatility and growth in 22 countries between 1870 and 1994. Altman (1995) found no significant correlation.

- There is some evidence that uncertainty reduces the sensitivity of investment to demand shocks (Bloom, Bond, Van Reenan, 2001), and that uncertainty reduces investment in concentrated industries. However, the theoretical relationship is ambiguous (profit convexity vs irreversibility) and the empirical magnitude is small.

openness

- Ben-David (1993) finds that European income dispersion fairly stable until mid-1950s. Only after onset of trade- liberalisation did the dispersion fall.

- Ben-David argues that tariff reduction was very important in explaining European growth and that (a) UK, Denmark and Ireland did not experience convergence until they joined the EEC and (b) EFTA countries experienced convergence with EU as they liberalised.

- In a large cross-country study, Sachs and Warner (1995) define openness as when tariff rates are lower than 40%; non-tariff barriers cover less than 40% of imports, the economic system is not socialist; there is no state monopoly of major exports; and a black market currency premium of less than 20%.

- Sachs and Warner find that countries that pass all five requirements grow 2½% faster each year.

rate of growth of foreign trade, 1913-87

	1913-1950	1950-1973	1973-1987
France	0.7	8.8	4.1
Germany	-2.4	12.0	3.8
Japan	1.1	15.5	6.6
Netherlands	1.0	9.3	3.0
UK	0.2	4.5	3.5
USA	2.4	6.5	4.1
Arithmetic Average	0.5	9.4	4.2

Note: Data are annual compound growth rates.
Source: Maddison (1991) table 5.11.

openness II

- Rodriguez and Rodrik (2000) suggest a thought experiment – does a small economy grow faster in response to a reduction in tariffs holding everything else constant?

- Rodriguez and Rodrik conclude that there too many different openness indices, and that it is better to look at firms than countries, or to compare high barrier with low barrier countries. At the country level they conclude there is no robust positive effect of openness on growth, but definitely no sign of a negative relationship.

- Bernard and Jensen (1998) find that causality can run from productivity to exporting: high productivity US firms are more likely to become exporters.

- Cameron, Proudman and Redding (1998) find that increases in openness in UK industries lead to increased technological catch-up with the USA.

income elasticities and growth

Income Elasticities and Growth Rates, 1955-1965

| | Income Elasticity | | | Growth |
	Imports	Exports	Ratio	Rate
UK	1.66	0.86	0.52	2.82
USA	1.51	0.99	0.66	3.46
Belgium	1.94	1.83	0.94	3.77
Sweden	1.42	1.76	1.24	4.18
Norway	1.40	1.59	1.36	4.41
Switzerland	1.81	1.47	0.81	4.66
Canada	1.20	1.41	1.18	4.66
Netherlands	1.89	1.88	0.99	4.67
Denmark	1.31	1.69	1.29	4.74
Italy	2.19	2.95	1.35	5.40
France	1.66	1.53	0.92	5.62
Germany	1.80	2.08	1.56	6.21
Japan	1.23	3.55	2.89	9.40

Source: *Krugman (1989) and Houthakker and Magee (1969).*

export led growth?

- In general, fast-growing countries seem to face a high income elasticity of demand for their exports, and a low income elasticity for their imports (Houthakker and Magee, 1969). This leads to a stable real exchange rate.

- But it would be wrong to think that it is the income elasticity that is driving fast-growth (i.e. that countries with unfavourable elasticities keep running into balance of payments crises and therefore have low growth), see Krugman, 1989.

- Instead, causation may run from fast growth to favourable elasticities.

- For example, as European countries grew in the 1950s and 1960s they were actually becoming *more similar* to their trading partners, and therefore growth was actually biased against the kinds of goods that Europe was originally producing.

- Europe expanded its share of world markets not by reducing the relative prices of its goods but by expanding its range of goods. Therefore growth in the scale of the economy led to rising trade.

employment shares

	France	Germany	Japan	UK	USA
1950					
Agriculture	27.4	23.2	41.0	4.9	11.9
Industry	37.0	44.4	24.2	49.4	35.9
Services	35.6	32.4	34.8	45.7	52.2
1970					
Agriculture	13.9	8.6	17.4	3.2	4.5
Industry	39.7	48.5	35.7	44.8	34.4
Services	46.4	42.9	46.9	52.0	61.1
1990					
Agriculture	6.1	3.4	7.2	2.1	2.8
Industry	30.0	39.7	34.1	28.8	26.2
Services	63.9	56.9	58.7	69.1	70.9

Source: *Crafts (1991) OXREP table 3.*

technological transfer and catch-up

	1960	1973	1987
France	207	448	761
Germany	179	475	848
Japan	89	342	757
Netherlands	291	514	687
UK	343	480	650
USA	809	814	1074

Note: **R&D expenditure per person employed.**
$ in 1987 US relative prices.
Source: **Maddison (1991) table 5.17**

summary

- Extremely rapid European growth between 1945 and 1950 was largely due to redeployment of misplaced labour and temporarily unusable capital.

- But this still left a large investment backlog and productivity gap with the United States, significantly due to the lack of international trade in the previous twenty years.

- The favourable international trade environment and strong demand conditions played a role in supporting high levels of capital accumulation and the movement of workers from agriculture into industry. But the most important cause of the rapid growth was the initially backward position of Europe.

- Human capital and institutional arrangements were also important, as we shall see next week.