

		Capital-Product Ratio (years)			
		1 Period	2 Initial Date	3 Terminal Date	4 Percentage Change
Great Britain (current prices, national income)	Total capital	1885-1927	8.2	4.8	-41
	Reproducible	1865-1933	4.6	5.0	9
Belgium (current prices, national income)	Total capital	1846-1950	9.3	5.4	-42
Norway (1938 prices, NDP)	Net fixed assets	1865-1874 to 1947-1956	4.0	3.2	-20
West Germany (1950 prices, GNP)	Gross fixed assets	1913 to 1950-1955	5.4	4.0	-26
United States (1929 prices, GNP)	Total capital	1850-1950	3.5	2.7	-23
	Reproducible	1850-1950	1.9	2.1	11
Australia (current prices, GNP)	Total capital	1903-1956	6.4	4.0	-37
Japan (1928-1932 prices, national income)	Total capital	1905-1953	7.2	5.3	-26
	Reproducible	1905-1935	2.8	3.0	7

Figure 3-15 Capital-output ratios for seven selected countries
Source: Kuznets 1966.

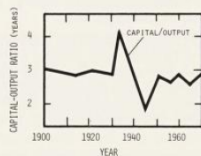


Figure 3-16 Evolution of the U.S. capital-output ratio, 1900-1968
Source: Samuelson 1970, p. 722.

The total industrial capital stock (measured in the dollar units defined in the introduction to this chapter) is the accumulation of all past investments in industry diminished by all past depreciations of that capital stock. Industrial capital IC consists of all manufactured goods used in the production of industrial output and in the extraction of nonrenewable resources. The capital stock includes factory buildings, production equipment, and material inventories but not raw material. It is thus reproducible capital only, excluding land and subsoil resources, which are handled in separate sectors of the global model. Improvements in the labor force are implicit in ICOR and are thus not incorporated in IC.

To summarize the net effect of all industrial capital investment and depreciation before the initial time period of the simulation, we had to specify the initial (1900) value of industrial capital ICI. It was set equal to 210 billion dollars worth of buildings and equipment by estimating the per capita industrial output IOPC in 1900, multiplying that figure by the population POP in 1900 and the capital-output ratio ICOR in 1900, and dividing by (1 - the fraction of capital allocated to obtaining resources FCAOR) in 1900.

$$IC(1900) = \frac{[IOPC(1900)] \times [POP(1900)] \times ICOR}{[1 - FCAOR(1900)]} = [IOPC(1900)] \times 5 \times 10^9,$$

where

IOPC(1900) = industrial output per capita in 1900 (dollars)

POP(1900) = population in 1900 = 1.6×10^9 persons (from Chapter 2)

FCAOR(1900) = fraction of capital allocated to obtaining resources in 1900 = 0.05 (from Chapter 5)

ICOR = industrial capital-output ratio = 3.0 years (from preceding discussion of IO)

The absence of good data forced the use of a crude estimate of industrial output per capita IOPC in 1900. The average GNP per capita in 1968 was first estimated. Then, using an estimate of the average growth rate in GNP per capita during this century, we were able to infer the level of GNP per capita that must have existed globally in 1900. Finally, using the development patterns identified by Chenery and Taylor (1968), it was possible to estimate the fraction of the 1900 GNP per capita that was in the form of industrial output.

For our estimate of the 1968 world average GNP we used the GNP figures reported by the World Bank for 122 countries in 1968 (IBRD 1970). The weighted average of the reported GNP figures is about 660 dollars per person-year. Kuznets (1971) has provided data on some average growth rates of GNP per capita for seventeen countries for time periods between 1864 and 1967, which are summarized in Figure 3-17. The annual growth rates in these countries vary from a low of 0.6 percent per year in India to a high of 2.8 percent per year in Japan. Because such a large fraction of the population of those countries is in India, a reasonable average growth rate for the global GNP per capita is probably not greater than 2.0 percent per

Industrial Capital IC

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IC,N=IC,J*(UT) (ICIR,JK-ICDR,JK)          52, L
IC=ICI                                       52.1, N
IC1=2.1E11                                  52.2, C
IC      = INDUSTRIAL CAPITAL (DOLLARS)
UT      = TIME INTERVAL BETWEEN CONSECUTIVE
          CALCULATIONS (YEARS)
ICIR    = INDUSTRIAL CAPITAL INVESTMENT RATE
          (DOLLARS/YEAR)
ICDR    = INDUSTRIAL CAPITAL DEPRECIATION RATE
          (DOLLARS/YEAR)
ICI     = INDUSTRIAL CAPITAL INITIAL (DOLLARS)

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