THE AUSTRALIAN ECONOMY IN
HISTORICAL PERSPECTIVE
— Some Findings in Comparison with Japanese Experiences —

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I Introduction

The economic performance of Australia provides several interesting topics for economic analyses. Furthermore, such analyses can widen our knowledge of growth experiences under different initial conditions. Unfortunately the interest of Australian economists in this field has declined since the publication of the widely celebrated book by N.G. Butlin on Australian national income accounts.[1] However, I would like to assert that the postwar economic performance of Australia can be well understood through analysis from a historical perspective.

Two important concepts are introduced in this paper; that of "modern economic growth" advocated by S. Kuznets and that of "national economy" rediscovered by H. Otsuka.[2] These two concepts are closely interrelated with each other and are quite relevant to the economic issues to be discussed. Thus, they will provide us with a well formed conceptual framework.

Basic statistical data for long-term economic analysis of Australia are rather limited. No systematic estimations like those in the *LTES* of Japan have yet emerged.[3] Overall economic performance will be traced by using Butlin's *revised* GDP series. The Australian Bureau of Statistics' population series well provides the main demographic information. A revised series of capital formation is also used. Information regarding the post war period is more abundant than that on the pre-war period. Furthermore, our discussion is confined to certain aspects of the economy with special reference to comparison with Japanese growth experi-

ences.

II Development of National Economy and Modern Economic Growth

Kuznets' term "modern economic growth" is used to refer to a national economy undergoing process of sustained economic growth characterized by increasing adoption of scientific technology. This concept is relevant, as I asserted above, not only for the advanced economies of Western Europe, but also for the "late comer" economies, such as those in Asia. Since a comparison within such an analytical framework between Bangladesh and Japan has already been conducted elsewhere,[4] with some analytical success, the same concept can be also applied to the Australian economy and greater success expected.

The term, "national economy," was "rediscovered" by Otsuka in his celebrated book.[5] The term itself had been discussed by F. List in the preface of his *Das nationale System der politischen Ökonomie,* 1841, where he defines what national economy is, what the independence of national economy means, and what relationships the term has to political independence of the people.

A. Daniel Defoe and the National Economy

Otsuka's definition of the national economy is "a national system with full autonomy in the division of labor of a society based on a commodity exchange economy."[6] Otsuka has added a new dimension to the term by introducing the "formation of the regional market area" as an addition to the definition.[7] The new term is highly related to the main themes of Defoe's *Calculation of Trade,* 1728, and *A Plan of the English Commerce,* 1728. Otsuka emphasizes a model of industrial structure undergoing *natural* or *normal* growth.[8] In *Calculation of Trade* Defoe describes the development and structure of a new city in South England, a process he calls the ordinary course of things.[9] Defoe also extends the use of this analytical framework to the analysis of the Dutch and British economies. Here it is significant that these two countries controlled international trade in the early part of the eighteenth century, although there was a clear trend towards increased British dominance

and declining Dutch dominance.

The Dutch economy was based on the so-called *trafiek* industry which depends heavily on the overseas supply of raw materials and on the external demand for the commodities manufactured using such raw materials. In other words, the Dutch trade was vulnerable to international surplus of goods resulting from increased foreign production (or falling foreign demand) and it had absolutely no contact with the input-output structure of its national economy. On the contrary, British economic management was based on the support of "independent industries" (a term used by historians). These industries were, on one hand, completely independent of overseas supply and demand conditions and had, on the other hand, firm roots in the input-output structure of the national economy. [10]

B. The Relationship of the Two Concepts: National Economy and Modern Economic Growth

The concept of the modern economic growth can be enriched by adding the concept of the national economy described in the previous part of this section. The past failures of industrialization in developing countries are good examples for our discussion. Excess emphasis on industrial development with no forward or backward linkage development as in the early five-year plans of India and the unintentional neglect of the agricultural or traditional sector of national economies are among a list of many examples here. Recent development of the "bonded areas" could also, I am afraid, be a new addition to the list, because they might become modern versions of the Dutch *trafiek*. [11]

Political independence and the establishment of national economy are closely related as in American history and as discussed in *Das National System*. The formation of national economy was achieved through the efforts for political independence at the same time the process of modern economic growth was initiated in many advanced European nations. The formation of a national economy is, therefore, an indispensable pre-condition for modern economic growth.

C. Problems in Applying the Concept of Modern Economic Growth to Asian Countries

When we try to analyze the economies of developing countries (such as many post-war Asian economies or Australia and Japan of the late nineteenth and early twentieth centuries) using the concept of modern economic growth, the starting point of the process of modern economic growth needs to be clearly identified and distinguished from the formation of the national economy. Many of these countries were colonized before World War II and, as colonies of Western Powers, they were incorporated into the political and economic systems of their suzerains. It is important to consider whether a nation has experienced colonization or not when we discuss the modern economic growth of these countries. Except the United States no advanced Western countries have ever been colonized. Furthermore, the British colonization of the United States was qualitatively quite different from the colonization of Asian countries.

To illustrate effect of Asian colonization, let us, for example, consider human capital. The development of human capital is, I think, slower in most colonial states than in national economies. This is seen in many Asian countries where political power has often been controlled by military government after independence. One of the costs of colonization is the shortage of human capital. Local people who formed the lower ruling class during colonization could not remain in power after independence. However, the rest of population was left uneducated and unskilled[12] resulting in a shortage of human capital in the post-colonial era.

D. The Start of and Transition to Modern Economic Growth

If the chance to obtain knowledge and experience of managing organizations is only possible among a limited number of the military staff, this group can inevitably monopolize political power in turn. How to minimize the cost of this monopolized power structure is a heavy burden imposed on Asian countries during the transition period. The discrepancy between formation of a national economy and the start of

modern economic growth cannot be observed in European countries, but in Asian countries whose independence was achieved after World War II, there is such a discrepancy called a transition period. It has been considerably long, if we assume the national economy was formed when political independence was achieved and transition period was finished.[19]

The start of modern economic growth in Japan and the formation of the national economy are generally thought to have occurred with the Meiji Restoration of 1868 and the end of the Matsukata deflationary policy of 1886, respectively. The latter can be extended to the entire period of 1886-1890. The Meiji Restoration cannot be overemphasized as an important event in the formation of modern Japan. Tokugawa Japan was not colonized as many Asian countries but ruled under the division of more than one hundred feudal clans, the number of which was far larger than the present number of prefectures. The other point is that the process toward the Meiji Restoration should be included as part of the period during which modern Japan was formed. The Meiji Restoration was not built in a day. Our suggestion here is that we focus on the 1858-1868 period as the conclusion of the American-Japan Treaty of Friendship and Commerce in 1858 can be viewed an important turning point. However, more discussion is needed to determine what the first crucial event that led to the Meiji Restoration was.

My knowledge of Modern Australia's history makes it difficult to determine when Australia's modern economic growth started and when its national economy was formed. The Federation in 1900 can be viewed as a tentative formation date for Australia but, as in the Japanese case, more investigation may be required to identify what event was the most crucial in initiating the process which led to the Federation, since it also could not be built in a day.

It is more difficult for me to determine when the start of the Australian modern economic growth took place, for it is exclusively related to the formation of the Australian national economy, and there are some economic historians who insist that the Australian national economy was not fully established until after World War II. Historically, the degree of independence for each state has been so strong that tradition sometimes

results in considerable weakness of national policies. Thus some future research is essential to solve this problem. One possible way is to calculate the degree of inter-state dependence through the compilation of a regional inflow-outflow table of commodities. One could then compare this degree of independence with the degree of foreign dependence by examining the direction of Australian trade.[04]

III The Long-Term Performance of Australian Economy

Quantitative economic analysis depends heavily on the availability of data; long term analysis is often very difficult due to the lack of long-term series for relevant variables. The construction of such long-term series is indeed a painstaking task requiring the cooperation of many scholars from different fields. In Japan Ohkawa, Shinohara, and Umemura coordinated the effort which resulted in *LTES*.[05] Furthermore, previous works by Yuzo Yamada and others were useful in the compilation of *LTES*.[06]

N.G. Butlin's estimates of Australian data used in this paper are a continuation of the research of Clark, Crawford and Arndt.[07] During the 1967-1982 period some further attempts were made to enhance information on the labor force, employment, and price levels. In addition, efforts to link between prewar and postwar national income series were also made.[08] These works were mainly undertaken by economic historians.

A. Growth Rates of GDP, Population and Per Capita GDP

1. Identification of Cycles

In this section we would like to discuss the long-term economic performance of Australia, based on the movement of residential capital formation as shown in Panel A of Table 1. Butlin identifies five complete cycles for the period of 1861-1900: trough years are 1871, 1879, 1882, 1885, 1893 and 1897 and peak years are 1868, 1877, 1881, 1884, 1888 and 1899.[09] The five cycles were identified as a single long swing in my previous paper.[20] For the postwar period of 1953/54-1980/81, one and a half long swings are identified as in Table 1 but more sophisticated research has been carried by Boehm and Defris to determine the

reference cycle for the period of 1950-1980.[20]   There are seven peak
dates, April 1951, August 1954, August 1960, December 1964, January
1970, August 1973 and May 1976 and six trough dates, December 1952,
June 1957, July 1961, February 1972, January 1975 and October 1977,
identified. Cycle durations are between 33-60 months (peak-to-peak)
and 33-72 months (trough-to-trough), respectively. Butlin's cycles are
4-12 years in duration and cannot be classified as long swings.[22]   The
short durations in the last two swings from peak to peak in Table 1 seem
to depend on the observation period and thus identification of these two
cycles may be premature.

2. Growth Rates of GDP and its Industrial Composition

Panel C in Table 1 provides a statistical summary of the long-term
economic performance of Australia. The highest annual growth rate of
4.21% was recorded in the postwar period of 1953/54-1980/81. Overall
economic growth of the latter nineteenth century was considerably
higher than that of the early twentieth century. However, for the prewar
period annual average growth rate of 2.96% in Australia is rather high by
international standards. Yet, one might question the validity of the data
here. The higher growth rate of the 1862-1898 period can be attributed
to the development of primary industry (pastoral and agriculture), which
is hypothesized to have a higher degree of dependence on domestic
demand than the development of raw material production in the early
twentieth century. In the early part of the twentieth century, the degree
of dependence on overseas demand increased as Australian production of
raw materials for the British market became more significant. This was,
in part, a result of British colonial policy.

There have been two hypotheses presented to describe the deter-
minants of these long-term fluctuations.[23]   The first could be called
"endogenous determinants" hypothesis and the other "exogenous deter-
minants" hypothesis. Following the above analysis it seems reasonable
to assert that "endogenous determinants" are more relevant to analysis
of late nineteenth century performance while "exogenous determinants"
are more relevant to analysis of the early twentieth century.[24]

The economic effects of World War I on the Australian and Japanese economies were, as is well known, completely opposite. Excess demand in the world market was met by the Japanese economy as a marginal supplier and its commodity trade balance went from deficit to a large surplus. On the other hand, the rupture of economic contacts with the world economy resulted in insufficient demand for its exports and Australia suffered severely from the rapid rise in the import prices. The rise and decline of shipbuilding industry of Japan during and immediately after World War I is a good example of what happened in the Japanese economy. In other words, the rising world prices adversely affected the economic performance of Australia, but they were, in general, favorable to the Japanese economy whose external equilibrium could not otherwise have been maintained even if domestic equilibrium had been sacrificed.[25]

Table 2 provides us statistical information of what happened to Australian economic structure. Relative high shares (of GDP) for services and mining & manufacturing are noted throughout our observation period. On the other hand, the share of primary industry was surprisingly low, especially in comparison with the Japanese experience. There was no industry in which the share either rose or fell dramatically. Differences in initial conditions of modern economic growth between Australia and Japan are the main reasons for the above fact. The high population density in Japan, for example, resulted in a relatively high share of primary industry in the early phases of modern economic growth and the decline of the share over time. In 1887 this share was 42.5% and it consistently decline to 18.5% in 1938.[26] The share of Japanese mining & manufacturing, although it rose from 2.6% in 1887 to 11.7% in 1930 (the highest level in the prewar period) was less than half the size of the Australian share. The share of Japanese services was lower than that of Australian services, but both were rather stable compared to the experiences of other countries. The sustained high growth rate of GDP and the mature industrial structure dating from well before the era of modern economic growth are, in conclusion, the special characteristics of the Australian economy we have discovered in the above analysis.[27]

B.   Growth Rates of Population and Per Capita GDP

Population growth rates in Australia before World War II declined as seen in Panel A of Table 3. Closer observation, however, reveals that higher growth rates were observed in the trough-to-peak periods than in the peak-to-trough periods if we divide the prewar period into two sub-periods, taking the turn of the century as a breaking point and excluding the 1933-38 period.

There is a close association between growth rates of GDP and population. There seems to be no one way causal relationship between the two variables, although the degree and direction of causality might differ over time. It should also be noted that time lags exist in this relationship. Incorporating this relationship into a long-term econometric model of Australia seems promising if more long-term economic data become available.

Examination of growth rates of per capita GDP clearly illustrates failures of Australian economic development during down swing (peak-to-trough) periods. Negative growth rates were observed even in the 1886-98 period. Over long swings negative growth rates were observed only in the two periods of 1912-18 and 1926-33, as indicated in Section A.2.

C.   Growth Rates of Gross Private Domestic Fixed Capital Formation (GPDFCF)

Capital formation is a driving force in economic growth. It is a crucial element of the discussion of modern economic growth of a national economy as technological progress can only be realized through capital formation activities.[29]   The level of capital formation in the private sector declined in periods of downward swings in comparison to the levels of upwardswing. Negative growth rates were recorded throughout our sample of 1862-1980/81. (See Table 5, Panel A.) The absolute values of the growth rates in the prewar period were larger than those in the postwar period, which means that the fluctuation of GPDFCF in the former period was wider than that in the latter.

Over long swings the period of 1926-38 was the only one that has negative growth rate, and the growth rate between the two troughs was higher than that between the two peaks. GDP growth rates slightly exceeded those of GPDFCF in the periods of 1862-1938 and 1953/54-1980/81. (See Panels C of both Tables 1 and 5.) If you compare the above experience with the Japanese one, then you will find a completely different fact that, in contrast, the growth rate of GPDFCF was much higher than that of GNP during the period of 1887-1938; the rate were 5.44% and 3.13% respectively.[29] This relation was also maintained in each long swing without exception.

IV The Postwar Economic Performance of Australia: Investment and Saving Ratios

In this section our discussion will be confined to three important ratios related to capital formation. They are investment-output ratio, saving-income ratio and capital output ratio.[30]

A. The Investment-Output Ratio (or Investment Ratio)

Table 6 provides the level and movement of investment-output ratio (or to be more exact, the gross domestic capital formation-gross domestic product ratio) of postwar Australia and Japan.

There was no substantial difference between the levels and time trends of the Australian and Japanese ratios through 1955. Time trends have remained similar since but a difference in levels has emerged since 1956. Excluding 1951, there were two peaks of 1964 and 1968 for Australia, while in Japan there were also two peaks of 1961 and 1970. We see a kind of bimodal distribution in both cases.

In the case of Japan the higher investment-output ratio could be attributed to a higher economic growth rate and had close association with the lower net worth ratio of incorporated firms resulting from so called indirect financing. Australian ratio has been far lower than the Japanese one, but, as is well known from international comparisons, it has been considerably higher than international levels. This is one of the basic characteristics of the Australian economy. Thus if we may pay

more attention to this fact, our understanding about the Australian economy can be deepened in the future. Given a rather high net worth ratio the Australian economy, on the contrary, can be said to have had a high level of investment-output ratio in the postwar period. More precise analysis of saving-investment channels such as banking system, capital markets, and money flows between household and business sectors and so on, is needed. Given the two experiences, we can see that there is no direct causal relationship between high investment-output ratio and low net worth ratio.[31]

B.   The Saving-Income Ratio (or Saving Ratio)

Saving behavior of households is selected for discussion here. Unfortunately full household saving and income data are, so far, not available. Our observations start in 1962 for Australia. The level of saving-income ratio was, as is easily seen, lower throughout our observation period than that of the investment-output ratio since, although household sector is important, it accounts for about one third of total domestic saving (based on the Japanese experience).

It is conceivable that the level would be the same in the two countries in the 1950's. From Table 7 the trend of the ratio over time is almost the same as that of the investment-output ratio. This fact indicates that neither firm nor government savings had a counter-cyclical impact on household savings.

Harrod's formula will give a simple explanation of what we have already discussed. It is: G C = s, where G is the growth rate of output, C is the marginal capital-output ratio and s is the saving-income ratio. If the levels of the marginal capital-output ratio, C, of Australia and Japan are lower than those of other advanced countries, growth rate of output is expected to be higher in the two countries than in those countries, since, as mentioned earlier, the saving ratios of the two have been higher than those of other advanced countries.[32]

C.   The Capital-Output Ratio (or Capital Coefficient)

Fig. 1 will offer some statistical evidence to support the previous

assumption that marginal capital-output ratios of Australia and Japan have been rather low. Yet we should note that, first of all, the Australian series are limited to the period of 1966/67-1976/77 and, secondly, C should be *marginal* capital-output ratio but capital-output ratios presented in Fig. 1 are *average* ones. These facts limit our analysis here.

It is very difficult to identify a general trend for the countries identified in Fig. 1. Australia and Japan, however, had rather lower levels of average capital-output ratio than the US, the UK (or Great Britain), and Norway. Lower average capital-output ratio means, other things being equal, higher productivity of new capital formation and a lower marginal capital-output ratio.

V Summary and Conclusion

Analysis of the Australian economy utilizing the concept of modern economic growth has been advocated and pursued in this paper. At the same time, the well known term, national economy, rediscovered by Otsuka, was linked to the former concept. By doing so, a historical perspective of Australian economic performance can be related to the international framework of economic growth.

Lack of long-term series of major economic variables except population and GDP and its components has been a limiting factor in the analysis. Efforts of economic historians in Australia, however, have provided some findings as discussed in the previous sections. Good economic performance in the latter part of the nineteenth century was succeeded by poor performance in the early part of the twentieth century. The best economic performance has been observed in the postwar period. This leads to the problem of determining the date at which modern economic growth started in Australia. Here we tentatively identify the Federation of 1900 as the point at which the national economy was formed.

There are similarities in postwar economic growth in Australia and Japan, though dissimilarities have often been discussed in the view of the fact that the two economies are complementary to each other. The economic development of Australia in the early part of the twentieth

century as well as in the latter part of the nineteenth century was strongly influenced by the British economy through international trade and capital movement. Comparison is often made of the economic development in the United States and other British colonies, where the success in establishing the national economy of the United States of America could not be repeated. This is asserted to be true for non-diversified economies such as the Australian one.

By analyzing industrial structure it can be seen that the Australian economy has not been a non-diversified economy; a little less than a half of GDP has originated in services, about twenty percent in mining & manufacturing and in primary sectors, respectively. This type of industrial structure can not be called a non-diversified economy.

Notes

(1) Butlin, N.G., *Australian Domestic Product, Investment and Foreign Borrowing, 1861-1938/39*, Cambridge Univ. Press, 1962.

(2) Kuznets, Simon, *Modern Economic Growth: Rate, Structure and Spread*, Yale Univ. Press, 1966, and Otsuka, Hisao, *National Economy — Its historical consideration (Kokumin Keizai — Sono rekishiteki kosatsu —)*, *Otsuka Hisao's Collected Works*, vol. 6, 1969, pp. 3-123.

(3) Ohkawa, K., M. Shinohara and M. Umemura (eds.), *Estimates of Long-Term Economic Statistics of Japan*, Toyo Keizai Shinposha, 14 vols.

(4) Ishiwata, S., "A Comparative Study on the 'Modern Economic Growth' — With reference to the experiences of Bangladesh and Japan —," *Asian Cultural Studies*, no. 15, March 1984, pp. 37-48 (Japanese).

(5) Otsuka (1967). Especially see Part III, pp. 79-123. The world 're-discovered' is used here, since the term has been given a new aspect by him.

(6) Otsuka (1967), p. 18.

(7) In Japanese 'kyokuchi shijo ken.' See Otsuka (1967), p. 81. Recent plans of rural development in the present developing countries share a common element with this term.

(8) Otsuka (1967), p. 109.

(9) The basic principle of Defoe's, though implicit, seems to lie in the concept of Natural Law.

(10) As mentioned in the previous section, Otsuka's emphasis is, to be more exact, on the *social* autonomy where a nation is supported by wide rage of classes of people with common interests. The issue is essential in his book, but to be omitted from our discussion.

(11) The Japanese economy in the prewar period, as well as in the postwar period, could also be described as a *trafiek* economy as done by some economists. It is an interesting problem whether the usage of the term 'trafiek' is correct or not.

(12) The possible rise of entrepreneurship in formerly colonized countries is an interesting topic related to the modern economic growth.

(13) This is the most important but neglected point when we apply the term to presently developing countries.

(14) If the inter-state commodity flow catches up with the international commodity flow, then a national economy can be said well formed. Statistical work using this criterion would require a lot of painstaking research.

(15) LTES stands for *Estimates of Long-Term Economic Statistics of Japan* which consists of fourteen volumes published by Toyo Keizai Shinposha.

(16) Yamada, Yuzo, *Sources of Japanese National Income Estimates*, Toyo Keizai Shinposha, 1951 and revised ed., 1956 (Japanese) and Hijikata, Seibi, *Structure of National Income*, Nihon Hyoronsha, 1933.

(17) More detailed explanation of this matter can be found in Arndt, H.W., "A Pioneer of National Income Estimates," *Economic Journal*, vol. 59, December 1949, pp. 616-25.

(18) They are the following articles:

    (a) Haig, B.D., "1938/39 National Income Estimates," *Australian Economic History Review*, vol. VII, 1967, pp. 172-86.

    (b) Keating, M., "Australian Work Force and Employment, 1910-11 to 1960-61," *Australian Economic History Review*, vol. VII, 1967, pp. 150-71.

    (c) Bambrick, Susan, "Indexes of Australian Import Prices, 1900 to 1927-28," *Australian Economic History Review*, vol. VIII, 1968, pp. 62-67.

    (d) Butlin, N.G. and J.A. Dowie, "Estimates of Australian Work Force and Employment, 1861-1961," *Australian Economic History Review*, vol. IX, 1969, pp. 138-55.

    (e) Bambrick, Susan, "Australian Price Levels, 1890-1970," *Australian Economic History Review*, vol. XIII, 1973, pp. 57-69.

    (f) Pope, David, "Price Expectations and the Australian Price

Level: 1901-30," *The Economic Record*, vol. 58, 1982, pp. 328-38.

(19) Butlin, N.G., *Private Capital Formation in Australia, Estimate 1861-1900*, The Australian National Univ., 1955, pp. 7-9.

(20) Ishiwata, S., "Short-run Cycles and Long Swings in Australian Residential Capital Formation, 1861-1939," *The Aoyama Journal of Economics*, Dec. 1977, pp. 157-82.

(21) Boehm, E.A. and L.V. Defris, "The Australian Reference Cycle: 1950 to 1980," *The Australian Economic Review*, 1st Quarter 1982, pp. 63-67.

(22) Butlin was rather skeptical when he said: "but the significance of such a long cycle is rather difficult to see, especially when one turns to consider the course of capital formation of the major components." See, Butlin (1955), p. 12 Addition.

(23) Boehm, E.A., *Prosperity and Depression in Australia, 1887-1897*, The Clarendon Press, 1971, pp. 63-95.

(24) This is a preliminary working hypothesis of this paper and is not based on statistical evidence. Further research is desirable in order to test its validity.

(25) In other words, the inter-war period provides a good topic for international comparison.

(26) Ohkawa, K. and M. Shinohara (eds.), *Patterns of Japanese Economic Development, A Quantitative Appraisal*, Yale Univ. Press, 1979, Table 2.1, p. 35.

(27) It is difficult to reconcile these facts with the discussion of not diversified economy in Australia under the British economic power. The development of domestic service industry might have been neglected in this discussion.

(28) This, of course, does not necessarily mean that all capital formation activities are related to technological progress.

(29) Ohkawa and Shinohara (1979), Table 1.6, p. 20.

(30) The ratios are called the 'Great Ratios.'

(31) Recent discussions on the Australian financial system presented such as in *the Final Report* of the Committee by K. J. Campbell *et al.* (1981) has a close relationship to what we discussed here. Of particular interest is the relationship between industrial development and development of financial institutions.

(32) Due to short-term fluctuations, it is not so easy to identify the trends of the marginal capital-output ratio.

(33) (a) Australia:
Bailey, Cherylee, *Current-Cost and Constant-Cost Depreciation and Net Capital Stock*, Occasional Paper, Studies in National Accounting, Canberra, Australian Bureau of Statistics, July

1981.

For output, see Source of Table 6.

(b) Japan:

Ohkawa, K., S. Ishiwata, S. Yamada and H. Ishi, *Capital Stock*, LTES, vol. 3, Toyo Keizai Shinposha, 1966.

Ohkawa, K., N. Takamatsu and Y. Yamamoto, *National Income*, LTES, vol. 1, Toyo Keizai Shinposha, 1974.

Economic Planning Agency, *Annual Report on National Income Statistics*, Japanese Government Printing Office, 1974.

Department of National Income, *National Economic Accounts Quarterly*, Economic Research Institute of Economic Planning Agency, Statistical Appendix, some issues.

(c) Norway:

Aukrust, D. and Juul Bjerke, "Real Capital in Norway 1900-56," *Income and Wealth*, Series VIII, 1955, pp. 80-118.

(d) UK and GB:

Mitchell, B.R. and Phyllis Dean, *Abstract of British Historical Statistics*, Department of Applied Economics, Monograph No. 17, Cambridge Univ. Press, 1962.

Mitchell, B.R. and H.G. Jones, *Second Abstract on Historical Statistics*, Department of Applied Economics, Monograph No. 18, Cambridge Univ. Press, 1971.

Central Statistical Office, *National Income and Expenditure 1964-74*, London, Her Majesty's Stationary Office, 1975.

(e) US:

Kendrick, John W., *Productivity Trends in the United States*, Princeton Univ. Press, 1961.

————, *Postwar Productivity Trends in the United States, 1948-1969*, New York, National Bureau of Economic Research, 1973.

Table 1. Growth Rates of GDP: Australia 1862—1980/81 (%)

Panel A:

1862 (T)*	− 1866 (P)	4.88 (24)[1]	1953/54 (T)* − 1971/72 (P)	4.63
1886 (P)	− 1898 (T)	1.49 (12)	1971/72 (P) − 1975/76 (T)	3.06
1898 (T)	− 1912 (P)	4.10 (14)	1975/76 (T) − 1980/81 (P)*	2.73
1912 (P)	− 1918 (T)	−0.98 (6)		
1918 (T)	− 1926 (P)	3.31 (8)		
1926 (P)	− 1933 (T)	−0.05 (7)		
1933 (T)	− 1938 (P)*	2.09 (5)		

Panel B:

1862 (T)*	− 1898 (T)	3.74 (36)	1866	(P) − 1912	(P)	2.08 (36)
1898 (T)	− 1918 (T)	2.55 (20)	1912	(P) − 1926	(P)	1.46 (14)
1918 (T)	− 1933 (T)	1.74 (15)	1926	(P) − 1938	(P)*	1.08 (12)
1953/54 (T)* − 1975/76 (T)		4.56 (22)	1971/72 (P) − 1980/81 (P)*	2.87 (9)		

Panel C:

1862 (T)*	− 1898 (T)	3.74 (36)
1898 (T)	− 1938 (P)*	2.26 (40)
1862 (T)*	− 1938 (P)*	2.96 (76)
1953/54 (T)* − 1980/81 (P)*		4.21 (27)

Source: Pre World War II period: N.G. Butlin, *Australian Domestic Product, Investment and Foreign Borrowing 1861-1938/39*, Cambridge Univ. Press, 1955, Table 13, pp. 33, and S. Ishiwata, "Australian Residential Capital Formation and Capital Stock," *Aoyama Keizai Ronshu*, vol. 30, nos. 2-4, February 1972, pp. 127-167 (Japanese) and work sheet.

Post World War II period: See Source of Table 5.

Notes: Abbreviation:

T = trough, P = peak, * preliminary.

1) Length in year.

Table 2. Industrial Composition of GDP, Selected Years (%)

Year	Primary (1)	Mining & Mfg (2)	Construction (3)	Public Utilities (4)	Service (5)
1861	15.2	23.8	10.3	1.1	49.6
1866	15.8	22.8	8.4	1.6	51.4
1871	17.7	24.8	9.2	1.5	46.8
1876	20.4	21.2	12.8	1.8	43.8
1881	20.7	20.8	16.2	2.4	39.9
1886	17.4	19.2	18.4	2.9	42.2
1891	21.0	21.7	15.1	3.2	39.0
1896	18.1	26.1	9.2	4.0	42.7
1901/02	11.7	24.4	11.5	5.5	46.9
06/07	21.3	25.4	7.0	5.2	41.1
1911/12	17.3	25.1	8.5	7.1	42.0
16/17	22.5	21.1	5.7	7.7	43.0
1921/22	18.7	21.0	8.5	6.1	45.6
26/27	16.1	22.4	8.9	6.7	46.0
1931/32	23.7	21.0	4.5	6.4	44.4
36/37	19.7	22.9	5.7	6.3	45.5

Source: N.G. Butlin, *Australian Domestic Product, Investment and Foreign Borrowing 1861-1938/39.* Cambridge Univ. Press, 1955, Table 269, pp. 460-461.

Notes: Primary (Pastoral and Agriculture), Mining & Mfg (Mining, Dairy, etc. and Manufactures), Public Utilities (Water Transport and Public Undertakings) and Services (Public Services, Finance, Distribution, Other Services and Rents less Unallocated). Original figures are at 1910/11 prices.

Table 3. Growth Rates of Population, 1862-1938 (%)

Panel A:

1862 (T)* − 1886 (P)	3.62
1886 (P) − 1898 (T)	2.31
1898 (T) − 1912 (P)	1.86
1912 (P) − 1918 (T)	1.14
1918 (T) − 1926 (P)	2.37
1926 (P) − 1933 (T)	1.20
1933 (T) − 1938 (P)*	0.82

Panel B:

1862 (T)* − 1898 (T)	3.18	1886 (P) − 1912 (P)	1.49
1898 (T) − 1918 (T)	1.65	1912 (P) − 1926 (P)	1.84
1918 (T) − 1933 (T)	1.82	1926 (P) − 1938 (P)*	1.04

Panel C:

1862 (T)* − 1898 (T)	3.18
1898 (T) − 1938 (P)*	1.61
1862 (T)* − 1938 (P)*	2.35

Source: Commonwealth of Australia, *Demography, Bulletins*, some issues.
Notes: Abbreviations, see Notes in Table 1.

Table 4. Growth Rates of Per Capita GDP, 1862-1938 (%)

Panel A:

1862 (T)* − 1886 (P)	1.26
1886 (P) − 1898 (T)	−0.86
1898 (T) − 1912 (P)	2.24
1912 (P) − 1918 (T)	−2.12
1918 (T) − 1926 (P)	0.94
1926 (P) − 1933 (T)	−1.25
1933 (T) − 1938 (P)*	1.27

Panel B:

1862 (T)* − 1898 (T)	0.56	1886 (P) − 1912 (P)	0.59
1898 (T) − 1918 (T)	0.90	1912 (P) − 1926 (P)	−0.36
1918 (T) − 1933 (T)	−0.08	1926 (P) − 1938 (P)*	0.04

Panel C:

1862 (T)* − 1898 (T)	0.56
1898 (T) − 1938 (P)*	0.65
1862 (T)* − 1938 (P)*	0.61

Source: See Sources in Tables 1 and 2.

Table 5. Growth Rates of Gross Private Domestic Fixed
Capital Formation (GPDFCF), 1862-1980/81 (%)

Panel A:

1862 (T)*	− 1886 (P)	7.75	1953/54 (T)* − 1971/72 (P)		5.64
1886 (P)	− 1898 (T)	−4.79	1971/72 (P) − 1975/76 (T)		−1.15
1898 (T)	− 1912 (P)	7.73	1975/76 (T) − 1980/81 (P)*		5.53
1912 (P)	− 1918 (T)	−8.70			
1918 (T)	− 1926 (P)	7.47			
1926 (P)	− 1933 (T)	−6.89			
1933 (T)	− 1938 (P)*	8.90			

Panel B:

1862 (T)*	− 1898 (T)	3.48	1886	(P) − 1912	(P)	1.14
1898 (T)	− 1918 (T)	2.52	1912	(P) − 1926	(P)	0.55
1918 (T)	− 1933 (T)	0.74	1926	(P) − 1938	(P)*	−0.34
1953/54 (T)* − 1975/76 (T)		4.63	1971/72 (P) − 1980/81 (P)*			2.51

Panel C:

1862 (T)*	− 1898 (T)	3.48
1898 (T)	− 1938 (P)*	0.14
1862 (T)	− 1938 (P)*	3.03
1953/54 (T)* − 1980/81 (P)*		4.79

Source: Pre World War II period: See Source of Table 1.

Post World War II period: Australian Bureau of Statistics, *Australian National Accounts*, 1972-1973 and 1980-1981 issues.

Notes: In the postwar series two base years of 1959/60 and 1966/67 are converted to 1979/80 using the overlapping years of the two series, respectively.

* preliminary.

Table 6. Investment-Output Ratio: Postwar Australia and Japan (%)

Year	Australia	Japan
1948	19.2	
1949	22.3	
1950	24.6	
1951	32.0	
1952	20.4	26.8
1953	24.4	23.7
1954	26.3	23.4
1955	26.7	24.9
1956	23.2	28.7
1957	24.8	32.6
1958	26.6	28.1
1959	26.0	30.1
1960	28.5	33.9
1961	23.6	39.8
1962	26.7	35.8
1963	26.1	35.4
1964	29.8	36.1
1965	28.4	32.0
1966	28.2	32.5
1967	27.7	35.5
1968	29.4	36.9
1969	27.3	37.6
1970	27.3	39.0
1971	25.6	35.8
1972	23.0	35.6
1973	25.2	38.1
1974	24.6	37.3
1975	23.5	32.8
1976	24.2	31.9
1977	22.3	31.1
1978	24.0	31.3
1979	22.8	32.9
1980	24.3	32.4

Source: Australia: Australian Bureau of Statistics, *Australian National Accounts, National Income and Expenditure*, 1972/73 and 1980/81.
Japan: Economic Planning Agency, *Annual Report on National Income Statistics*, 1975 and 1981, and *National Economic Accounts Quarterly*, nos. 55 and 61.

Notes: If not specifically mentioned, fiscal year (July-June) for Australia and Calendar year for Japan, and thus no direct year to year comparison between the two is plausible.

Table 7. Household Saving-Income Ratio:
Postwar Australia and Japan (%)

Year	Australia	Japan
1952		9.2
1953		7.0
1954		8.7
1955		12.2
1956		12.4
1957		14.3
1958		13.8
1959		15.4
1960		16.0
1961		17.5
1962	7.4	16.8
1963	8.7	16.2
1964	8.8	14.7
1965	7.3	17.9
1966	9.1	12.3
1967	5.6	12.8
1968	8.2	13.6
1969	7.7	14.0
1970	8.8	14.6
1971	9.6	14.2
1972	11.9	14.4
1973	13.7	16.5
1974	14.0	18.7
1975	12.2	17.2
1976	11.4	17.4
1977	11.1	16.3
1978	11.3	16.0
1979	9.8	13.9
1980	10.0	14.6

Source: See Source in Table 6.

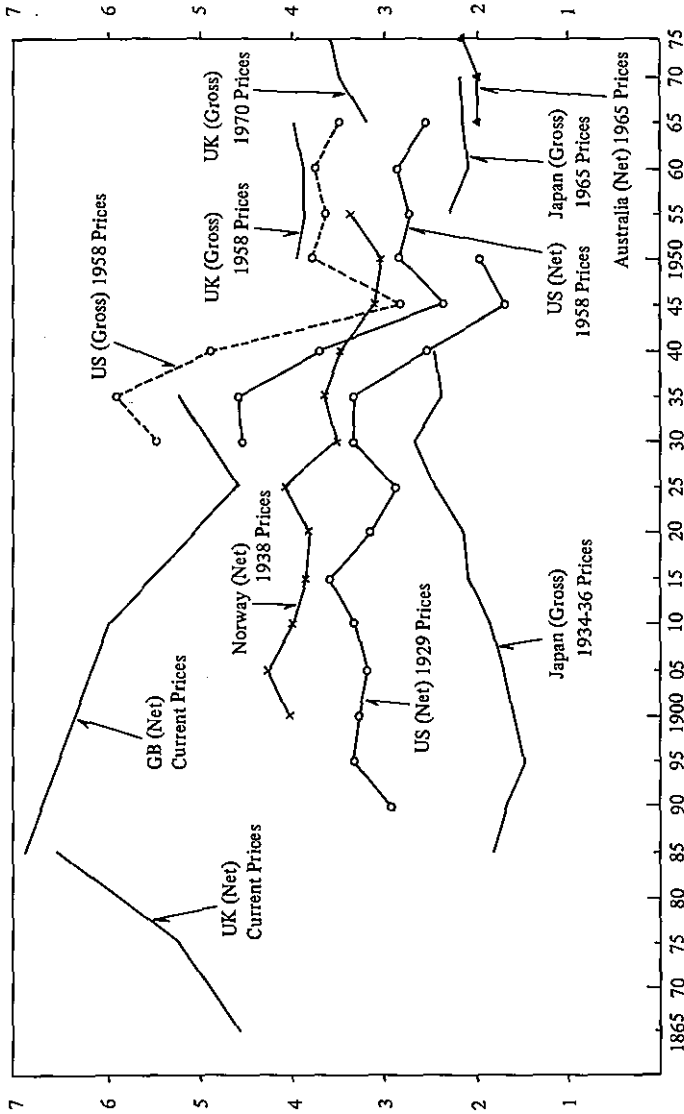**Fig. 1 Capital-Output Ratios: Selected Countries and Years**

Source: See Notes (33) of this section.