

JAPAN'S EXPLOSIVE GROWTH "EXPLAINED"

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In the 1950s and 60s, the Japanese economy has grown faster than that of any other industrial country. From 1950 to 1967 its real G. N. P. rose by 9.5 per cent a year compared with 6.2 per cent in Germany, 5.6 per cent in Italy, 5 per cent in France, 3.9 per cent in the U. S. A. and 2.8 per cent in the U. K.¹⁾

When we compare Japan with the other major capitalist economies, there are two major factors which "explain" why it did so well. The labour supply and the capital stock both grew much faster than in any other country. We will examine the reasons for this, and the extent of the difference between Japan and other countries.

Labour Supply

Postwar population growth was not particularly fast in Japan but employment rose faster than elsewhere for demographic reasons. In Japan there was a drastic reduction in the birth rate encouraged by government policy. The proportion of children dropped enormously from 35 per cent of the population in 1950 to 24 per cent in 1967, and the population of working age increased sharply, whereas in all Western countries the proportion declined. The activity rate rose in some Western countries and was virtually unchanged in Japan, but, nevertheless, the net result was a bigger increase in the proportion of the population employed in Japan.

The Japanese labour supply was also more elastic than in Western countries because there was a much bigger reservoir of agricultural workers who could be shifted to more productive work elsewhere in the economy. In most countries agricultural productivity is relatively low, and the growth of non-agricultural employment is probably a better measure of the effective increase in labour supply than the movement in total employment. In Japan nonagricultural employment grew by 4.3 per cent a year from 1950 to 1967, i. e. six times as fast as in the U. K. and almost twice as fast as in Germany.

Unfortunately, data on working hours are rather poor for the purposes of international comparison, but it is clear that they declined less in Japan than in most Western countries, so that a comparison of labour supply in terms of man hours would show Japan more favourably

1) See *Economic Growth in Japan and the U. S. S. R.*, Allen and Unwin, London, 1969, for an analysis of longer term growth experience since the 1870s. (Japanese translation will be published by Nihon Keizai Shim-bun in 1970).

placed than in terms of employment.

Table 1 Growth of Population and Employment 1950-67

	annual average compound growth rates		
	Population	Total Employment	Non-agricultural Employment
France	1.1	0.3	1.5
Germany	1.3	1.3	2.3
Italy	0.7	0.8	2.5
Japan	1.1	1.9	4.3
U. K.	0.5	0.5	0.7
U. S. A.	1.6	1.5	1.9

Source : O. E. C. D., *Labour Force Statistics*, ; O. E. C. D., *Manpower Statistics*; *Hundred-Year Statistics of the Japanese Economy*, Bank of Japan, 1966; A. Maddison, *Economic Growth in the West*, Allen and Unwin, London, 1964.

Table 2 Demographic Structure and Employment

	Employment as percent of population		Population aged 15-64 as percent of total population		Employment as percent of population aged 15-64	
	1950	1967	1950	1967	1950	1967
France	45.5	40.4	65.8	62.6	69.2	64.6
Germany	42.5	43.9	67.2	64.5	63.3	68.1
Italy	36.5	36.9	67.3	66.9	54.2	55.1
Japan	42.9	49.4	59.7	69.0	71.8	71.6
U. K.	45.9	46.0	66.9	64.1	68.6	71.8
U. S. A.	40.0	39.1	65.0	60.4	61.6	64.7

Source: As for Table 1.

It should also be stressed that the Japanese labour force is much better educated relative to the tasks it has to perform than is the case in Europe. In terms of average years of schooling the Japanese labour force matches European standards and university enrolments are higher. In 1961, I went round the Sony television factory and found that the girls working on the production line were high-school graduates in science and most of the foremen had Ph. D. s in physics. Sony employees may have had better than average Japanese qualifications, but one would not have found workers like that in any European factory. At the managerial, organisational, and technical level we should also remember that Japanese energies were concentrated on economic development, whereas most Western countries had some of this valuable talent locked up in military pursuits and defence research of low economic value. This high level of education, plus Japanese traditions of hard work and discipline, made the labour supply elastic in terms of quality as well as quantity.

Capital Formation

In terms of capital formation, the Japanese effort far surpassed that of the other major economies. Japan devoted almost a quarter of its resources to productive investment, whereas the U. K. and the U. S. A. managed no more than one eighth.

Japanese save more than Westerners partly because consumption habits are still extremely frugal. This is a socio-cultural hangover. Most Western countries have had rising per capita

Table 3 Ratio of Non-Residential Fixed Investment to G. N. P. at Current Prices 1950-1967

		average of annual ratios	
France	15.1	Japan	22.5
Germany	17.5	U. K.	12.4
Italy	14.7	U. S. A.	12.3

Source: O. E. C. D., *National accounts statistics*.

incomes for nearly two centuries, and memories of pre-modern consumption constraints have disappeared. Many Japanese remember that their grandfathers lived in a Malthusian economy, and have had less time to adjust to an affluent society. The Japanese diet remains closer to that in Asia than in Europe. In 1965 Japanese food consumption per head was about half that in Italy, which has a lower per capita income than Japan. The Japanese diet is similar to that in Thailand, where income is only one sixth of that in Japan. Most Japanese houses are still modest wooden structures, with paper walls and little furniture. They have no central heating, fireplaces or chimneys, and are usually heated by portable charcoal braziers. The traditional house has been difficult to modify without changing its character completely, and Japan has saved on housing by the inertia of tradition more than by deliberate policy. There is probably smaller class differentiation in consumption habits in Japan than in Europe. In switching from traditional costume to western clothes the Japanese also jettisoned sartorial class differentiation. The upper and middle class probably spend less on clothes than their Western counterparts.

Table 4 Per Capita Food Consumption and Per Capita G. N. P. in 1965

		\$ at U. S. relative prices			
Western countries		Asian countries			
	Food	G. N. P.			
France	156	1,990	Japan	68	1,466
Germany	126	2,109	Malaya	63	528
Italy	113	1,345	Philippines	41	269
U. K.	137	1,985	Taiwan	58	573
U. S. A.	134	3,179	Thailand	55	254

Source: A. Maddison, *Economic Progress and Policy in Developing Countries*, Allen and Unwin, London, 1970, p. 128.

The other reason for high savings rates in the postwar period is that government current expenditure takes a much lower share of G. N. P. than in Western countries. In Japan the ratio is only half of that in the U. K. and U. S. A. This is due to (a) the virtual absence of military expenditure, (b) a lower proportion of children and old people who need social services.

Table 5 Government Current Expenditure on Goods and Services as Percent of G. N. P. 1967

France	13.5	Japan	9.1
Germany	16.7	U. K.	17.9
Italy	13.9	U. S. A.	20.7

Source: *National Accounts of O. E. C. D. Countries 1958-1967*, O. E. C. D., Paris.

These factors making for a high rate of saving are self-reinforcing. Personal frugality and low government expenditure free resources for investment, and high investment raises the growth of output. The faster output grows, the greater the propensity to save. In Western countries too,

the savings ratio has risen steadily, but in Japan it has grown faster.

The figures in Table 3 on investment as a share of G. N. P. show the financial burden of capital formation, but they do not indicate the contribution of capital to growth. Part of investment goes for replacement, and this portion is smaller in Japan which has a fast growing capital stock than in countries where the capital stock is growing more slowly and has a higher average age. Secondly, the contribution to the capital stock of a given investment rate will depend on how fast G. N. P. is growing (which is influenced, *inter alia*, by differences in the growth of labour supply). For both these reasons we should measure the growth in capital stock, rather than rates of gross investment if we wish to measure the impact of capital on economic growth.

Estimates of capital stock are notoriously difficult to make in comparable form, but the figures in Table 6 give at least a crude approximation of the difference between Japanese experience and that of other leading industrial countries. The Japanese capital stock has risen about three times as fast as in the U. K. and significantly faster than in Germany.

Table 6 Growth of Non-Residential Fixed Capital Stock 1950-67

		Annual average compound growth rates	
France	6.1	Japan	11.3
Germany	8.5	U. K.	3.9
Italy	6.4	U. S. A.	4.2

Source: Gross fixed non-residential capital formation derived from O. E. C. D. statistics for each year 1950 to 1966. It was assumed that the initial stock was equal to 1.5 times the G. N. P. of that year in all cases, and that capital was replaced at a rate of 3.3 per cent a year. In fact, the initial ratios are unlikely to have been identical, but it is probably safer to assume that they were, than to use the estimates which are presently available. The latter are likely to contain errors and conceptual differences bigger than the inter-country variation which they show. The official estimates of capital stock in Japan show a lower initial capital output ratio than in Western countries, and if they were used as the base for our estimates they would show the Japanese capital stock rising even faster. See A. Maddison, *Economic Growth in Japan and the U. S. S. R.*, p. 59 for a discussion of this point.

A country with such a high investment rate as Japan might well be expected to run into difficulties of absorptive capacity, i. e. it would normally be likely to find sharply diminishing returns.²⁾ This did not happen for two reasons: (a) a good deal of investment was capital 'widening'. 'Widening' the capital stock to provide extra workers with equipment does not involve a change in factor proportions. It is only when increased output has to be derived from increased productivity (capital deepening) that we could expect diminishing returns to operate; (b) Japan still has a productivity level significantly below that in Western countries, so that a good deal of its capital 'deepening' has involved exploitation of technologies already known and tested. The large scale on which foreign technology was exploited can be easily demonstrated. In 1963, 210,000 abstracts of foreign scientific papers were made by the Japan Information Centre for Science and Technology, and in 1966, \$ 177 million was spent on foreign patents and royalties.

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2) For an analysis of this problem in Norway, see O. Aukrust, "Investment and Economic Growth", *Productivity Measurement Review*, February 1959, O. E. C. D., Paris, p. 42.

There are other factors which have stimulated postwar Japanese growth which are significant, e. g. rapid growth of international trade has increased productivity because of greater specialisation. Government policy has helped maintain a high level of demand and kept it more stable than in prewar years. However, these influences have also operated in other countries, and it seems likely that the bigger inputs of labour and capital are the main explanation for faster Japanese growth. However, one cannot "explain" growth quantitatively without some kind of production function, which relates the major inputs to the growth of output.

Before doing this, we should recapitulate the two strategic magnitudes which are most important in explaining growth and show their relation to the growth of G. N. P. They can be seen in Table 7.

Table 7 Increase in Real G. N. P., Non-Agricultural Employment and Capital Stock 1950-1967

	Annual average compound growth rates		
	Real G. N. P.	Non-agricultural employment	Fixed non-residential capital stock
France	5.0	1.5	6.1
Germany	6.2	2.3	8.5
Italy	5.6	2.5	6.4
Japan	9.5	4.3	11.3
U. K.	2.8	0.7	3.9
U. S. A.	3.9	1.9	4.2

Source: First column from O. E. C. D., second from Table 1, third from Table 6.

The most sophisticated attempt to "explain" intercountry variations in growth is to be found in Edward Denison's authoritative study.³⁾ Denison makes a composite index of factor inputs, giving each one a weight equivalent to its share in national income in the country concerned. Unfortunately he does not include Japan, and one can not extend his painstaking type of analysis to Japan in a short article. Furthermore I have strong doubts about the appropriateness of Denison's procedure in using factor income shares as a means of measuring the contribution of labour and capital to the growth of output. In Western countries the share of labour is roughly threequarters of output and owners of capital receive about a quarter. But this weighting understates the role of capital. Technical progress is exploited mainly by being embodied in capital but the benefits are shared with workers and consumers and the rewards of capitalists are not an adequate reflection of the contribution of capital to production. For this reason capital should be given a greater weight in explaining economic performance than Denison gives it. If we give labour and capital equal weight in making a joint index of factor input, we arrive at the results shown in Table 3.

The Future

The main purpose of speculation about the past and of international comparison is to get a

3) See E. F. Denison, *Why Growth Rates Differ*, Brookings Institution, Washington D. C., 1967.

Table 8 Growth of Output, Combined Factor Inputs and Unexplained Growth 1950-67

	Output	Joint Factor Input	Unexplained Growth	Percent of Growth Explained
	annual compound growth rate			
France	5.00	3.80	1.20	76.0
Germany	6.20	5.40	0.80	87.0
Italy	5.60	4.45	1.15	79.5
Japan	9.50	7.80	1.70	82.1
U. K.	2.80	2.30	0.50	82.1
U. S. A.	3.90	3.01	0.89	77.2

clearer picture of growth potential and the possibilities offered by economic policy. What then does our analysis suggest for Japan's future growth potential?

The demographic developments in Japan in the postwar period were of a once-for-all character, and in future the labour force is unlikely to grow faster than population. It also seems likely that with increased wealth, Japanese may have a higher preference for leisure and will want to cut their working hours and have longer holidays. However, there is still a large proportion of the population in low productivity jobs in agriculture, and this labour reservoir remains more important than in any Western country except Italy.

Table 9 Percent of Employed Population in Agriculture 1967

France	16.2	Japan	23.1
Germany	10.4	U. K.	3.1
Italy	23.6	U. S. A.	4.9

The propensity to save will probably remain high as long as income grows rapidly, and government claims on resources are likely to remain relatively small unless there is a major policy switch towards rearmament and military spending. Japan's capacity to absorb such large increments of capital productively will probably remain higher than in Western countries (a) because the productivity level is still below that in the West; (b) because technical education and the policy effort to absorb foreign technology are so well developed. Japan seems less likely to be troubled by the chronic foreign payments difficulties that some Western countries have suffered, and external constraints arising from this are unlikely to be as great as elsewhere.

It seems possible therefore that Japan may remain on an 8 to 9 per cent growth path for the next decade. This would put Japanese productivity ahead of most European countries. Thereafter, the constraints on growth would probably grow stronger in terms of absorptive capacity, preferences for leisure or more pessimistically, a desire to convert some this enormous economic strength into military power.