

BOOK REVIEWS

Japanese Economic Growth: Trend Acceleration in the Twentieth Century by Kazushi Ohkawa and Henry Rosovsky, Stanford, California, Stanford University Press, 1973, xvi+327pp.

Ohkawa and Rosovsky are a formidable pair who have been doing joint research for the last fifteen years. This research has been comprised of a number of memorable papers on various aspects of Japanese economic development. This book, a synthesis of their joint research, is highly welcome particularly in view of the lack of an up-to-date quantitative analysis of Japan's economic growth as a whole in this century.

As authors of the first volume in a series on the economic development of industrialized countries in the post-World War II period, Ohkawa and Rosovsky apparently were required to place major emphasis on the relevance of prewar development to the postwar period. This is somewhat unfortunate, the resultant strains revealing themselves here and there. Nevertheless, the authors have successfully come up with a set of stylized facts and preliminary interpretations which are pathbreaking in many ways. Though some of the estimates have still to be deemed provisional, these estimates are the best ones currently available and the interpretations are superbly organized in general. The credit for the organization obviously goes to Ohkawa and Rosovsky but the ingenuity and toils applied in estimation and fact finding by Ohkawa, Shinohara, Umemura, and their associates should not be forgotten.¹

What are the stylized facts and preliminary interpretations? The trend rate of output growth was quite high compared with most countries of the world despite the sharp drop in output during World War II. Moreover, acceleration is discernible in the growth trend, culminating in the "miraculous growth" of the postwar period.

Three—or almost three—"long swings" of differing duration (1901-17-31, 1931-37-56, 1956-62-?) are identified which reveal themselves most clearly in the rate of growth of private capital formation. The authors did not tell us whether the swings were generated endogenously or not. Instead, they simply chose to mention the fact that certain other variables behaved with considerable regularity in different phases of the swings.

For example, "when the rate of growth of capital formation spurted, the investment proportion went up sharply." This is rather obvious but what is not obvious is the relative stability of investment proportion in a downswing. The latter was made possible by complementary behavior of public investment. The saving ratio moved, essentially, in the same pattern as the investment ratio, reflecting the relatively insignificant role played by capital movement. This investment and saving ratio behavior caused a secular rise in the ratio over the entire period. The capital-output ratio in the private non-agricultural sector tended to decline in the upswing and increase in the downswing. Secularly, however, it moved upward in the early years, stayed more or less stationary

¹ I feel that a little more credit should have been given to Professor Ohkawa's colleagues at Hitotsubashi University. Their books and articles are cited only sparingly and it is difficult to tell who was responsible for a particular series of estimates, even if the reader takes the trouble of going through the appendix.

in the middle period, and declined in the postwar years. The relative share of capital as a part of national product increased in the upswing and decreased in the downswing. These cyclical behaviors of the capital-output ratio and of the relative share are what is to be expected from our knowledge of business fluctuations.

The capital-labor ratio in the private nonagricultural sector increased steadily and uninterruptedly, negating the Ranis-Fei thesis of "capital shallowing." However, it is not easy to interpret this "finding," since we know that the estimates of the stock of producer's durables in this sector are at best provisional.² I am also curious to know whether or not the estimates of capital stock are sensitive to changes in assumption on the life of capital. There is reason to suspect the sensitivity, since it is known that the perpetual inventory estimate of the stock of ships for the years around 1885 was less than one-tenth (!) of the stock figure directly available.³

According to Ohkawa and Rosovsky, "Japan in this century was a classic example of industrialization based on increasingly capital-intensive borrowed technology" (p. 135). Yet, they also acknowledge that many of efforts to mitigate "the incongruity between required factor proportions and domestic factor prices" (p. 90) were made with considerable success. Apparently, they are saying that Japan basically imported advanced capital-intensive technology with a fixed coefficient but tried hard to mitigate the incongruity. There is considerable difference between this statement and another statement to the effect that Japan successfully adapted and acclimatized foreign technology even though it did not hesitate to use capital-intensive borrowed technology where it was technically inevitable and strategically essential. I can think of many sectors where the latter statement fits better. Hence, I am most anxious to get more reliable macro-economic data as well as qualitative information on the industrial level.

The authors have found a "differential structure," a special type of dualistic structure, closely related to the idea of borrowed technology for the period after 1909. According to Ohkawa and Rosovsky, there was a significant productivity gap between the modern sector which borrowed foreign technology and the traditional sector. Moreover, as technology borrowing progressed, the productivity gap became wider. Presumably, this finding of differential rates of growth prompted the authors to adopt the name, "differential structure." There was also a wage gap and it too became wider until about 1960. Except for the sixties, wages in the modern sector increased less rapidly than labor productivity in an upswing and vice versa in a downswing. Closely tied with this phenomenon was the narrowing of the wage gap in an upswing and its widening in a downswing, again except for the sixties. Apparently something happened in the sixties to the supply of labor to the modern sector. Ohkawa and Rosovsky do not take a definite stand on the issue of the "turning-point." Perhaps they are wise in their refusal. The elastic supply of labor before 1960 came mainly from increased population, and it is not at all clear whether the Japanese economy was transformed from a dualistic to a neo-classical one at that time.

² See my "General Comment" on "Session A" papers in Kazushi Ohkawa and Yūjiro Hayami, eds., *Economic Growth: The Japanese Experience since the Meiji Era* (Tokyo, 1973). For a detailed account, the reader is referred to Yasukichi Yasuba, "On the Reliability of Industrial Statistics in Prewar Japan," (in Japanese) *Osaka-daigaku keizaigaku*, Vol. 17, Nos. 2-3 (December 1967).

³ See footnote 9 in Yasukichi Yasuba, "Modern Economists' Views on Japanese Economy—A Survey," *Japanese Economic Studies*, Vol. 1, No. 2 (Winter 1972-73). Despite the gap, the perpetual inventory estimate was adopted for ships and a number of other components of capital.

With respect to trade, the authors claim that "during all the designated time intervals the average annual rate of growth of exports (in constant prices) exceeded that of GNP." The "designated time intervals" exclude the period 1937-56 in which exports in real terms shrank at an annual rate exceeding 5 per cent in the face of a positive growth in output. Despite this rather arbitrary exclusion, the findings are still noteworthy. What happened was a rapid rise in productivity in the export industries and a steady decline in the relative prices of exports, relative to domestic prices. The analysis in Chapter 7 on the performance of exports is exemplary.

The proportion of imported manufactured goods declined almost throughout the period. The proportion of imports in the total consumption of materials and fuels increased steadily and has recently reached very high levels. The analysis of the latter is straightforward but that of the former, while interesting, is rather incomplete. Import substitution may take place as a result of policy changes, of changes in market conditions abroad, or of changes in internal supply conditions, to mention only a few major factors. Of these, Ohkawa and Rosovsky mainly take the last one into account and claim that the investment spurt was associated with import substitution, apparently implying that the reduced cost of domestic production made import substitution possible. Unlike the detailed analysis of the export expansion, the analysis here is rather sketchy. As a result, a lot of room for alternative hypotheses still remains. For example, a raised barrier to imports may be a cause of import substitution and the cause of an investment boom supported by foreign direct investment eventually reducing the costs of domestic production. Particularly, it should be noted that import substitution during World War II was almost entirely caused by policy changes justifiable, if at all, only in the very long long run.

Finally, sources of economic growth were identified. During the early years, the rate of capital growth was high and its contribution to growth was much larger than that of labor, reaching 60 to 70 per cent of the total. Over the years capital's relative contribution decreased—to around 40 per cent—partially as a result of decrease in its share of national income which was used as the weight. Labor's percentage contribution remained rather constant at around one-third of total growth. Both capital and labor grew more rapidly in the postwar years and various adjustments—for utilization and quality, for example—considerably improved the explanatory powers of changes in inputs. Nevertheless, sizable unexplained residuals, on the order of 33 to 35 per cent of growth, remain for the postwar years, whereas the extent of unexplained growth was at most 17 per cent before the war.

These then, are the major stylized facts and their preliminary analyses. From a casual observation of these stylized facts, one may get an impression that the present century differs in many ways from the nineteenth century. For one thing, the traditional sector played a major role in the nineteenth century while the modern sector led growth in the present century. Another, is that the "differential structure" presumably appeared only after the turn of the century. Thirdly, a rise in the investment proportion, we were told, occurred only in this century. These differences have led Ohkawa and Rosovsky to conclude that the nineteenth century Meiji and the 1901-66 period belong to two distinct "growth phases." The division of phases at 1900 or thereabout can easily be accepted. However, the conclusion that the long period between 1901 and 1966 constitutes one "growth phase" is subject to criticism, and this issue will be touched upon later.

Ohkawa and Rosovsky maintain that there was a "trend acceleration" in economic growth during the latter "growth phase" and, then, they explain the accelerated growth of

residuals (technological progress) rather than acceleration itself which is easier to explain. The analysis here is a little awkward, particularly when it comes to graphic exposition where nonconstant variables are assumed to be constant. In any event, Ohkawa and Rosovsky manage to carry on a formal analysis in which the growth rate of residuals is presented as the sum of the rate of change in the output-capital ratio and the rate of change in capital intensity multiplied by labor's share of income. For the private non-agricultural sector, the first term changed from negative to zero to positive. The change in capital intensity was always positive and became larger overtime. The weight, or labor's share of income, decreased somewhat at first, stayed the same in the middle period, and greatly increased in the postwar years. Thus, trend acceleration for this sector can be explained formally in these terms.

The change in the output-capital ratio, then, is explained mainly by the changing composition of investment, namely concentration in "facilitating industry" (infrastructure) in the early period and a shift to manufacturing and other more "productive" industries later. The gradually improving social capability and, particularly, the extensive application of "improvement engineering" in the postwar years is also mentioned. The accelerated rise in capital intensity is explained in terms of borrowed technology, and the rise in the saving ratio is mentioned as an endogenous (growth-induced) and supportive factor. To the reviewer, it appears that the rigidity in consumption, if more fully documented and compared with foreign experience, is the most original empirical finding by the authors.

Throughout the book little reference is made to institutional factors. To partially compensate for this intended negligence, a casual survey of these factors and an informal projection for the future are given in the last chapter. As institutional factors relevant to social capability, the *zaibatsu*, permanent employment, the expansion of military industries, and the development of colonial economies before World War II, and the purge, new capital, new values, aid and MITI in the postwar years are mentioned. A few developments on the darker side of economic growth are succinctly described and a "trend deceleration" for the future is forecast.

I have only one serious criticism of the book. Namely, the rather confused treatment of "military investment" which may have distorted the authors' interpretation of the process of Japanese development. It appears that the stock of capital is presented exclusive of "military capital" throughout the period. This is straightforward but here we have a data problem as pointed out before. "Military investment" appears to have received different treatment; in the prewar period it is included as a part of public investment except in Table 6.10, while it is always included in government consumption in the postwar period.

In view of the fact that Rosovsky included "military investment" as a part of public investment in his book on capital formation in the prewar years,⁴ the authors may have wanted to include it always as public investment but neglected the postwar "military investment" simply because of the lack of readily available data and also because of its relatively small magnitude. The reason cited in Rosovsky's previous book for the inclusion of "military investment" was that it represented abstinence and could have been used for productive purposes.⁵ However, it is difficult to accept such a line of reasoning. For if "military investment" represents abstinence, current military expenditure must also be interpreted to represent abstinence and, hence, there is no reason why the latter should

⁴ Henry Rosovsky, *Capital Formation in Japan* (New York: Free Press, 1961).

⁵ *Ibid.*, pp. 15-16.

not be included in public investment, if the former is to be included. Then, the actual uses of resources for productive purposes obviously differs from its potential uses.

If we subtract military expenditure from government fixed investment (I_g) and add it to government consumption (C_g) in Table 6.1 in the book,⁶ the government consumption ratio and the domestic fixed investment ratio will look quite different. Table I below shows the results of computation. On one hand, the corrected government consumption ratio (C'_g) was quite high before World War II and relatively low after the war. On the other hand, the corrected investment ratio (I') was rather moderate in prewar years and one can find only a slight upward trend if he is determined to discover it. The upward shift of the investment ratio in the postwar years, in contrast, was quite drastic. Furthermore, the acceleration of growth in the prewar period was modest and does not seem to have been directly connected with the "miraculous" jump in the postwar years. In short, at least so far as these ratios and growth rates are concerned, the prewar years and the postwar years do not appear to belong to one "growth phase," as the authors maintain, but to two rather distinct "growth phases."

TABLE I
GOVERNMENT CONSUMPTION (C_g) AND GROSS DOMESTIC FIXED INVESTMENT (I)
AS PROPORTIONS OF GROSS NATIONAL EXPENDITURE
(%, five-year average, constant prices)

	C_g	C'_g	I	I'
1907	12.3	13.8	11.3	9.8
(1912)	8.0	9.5	13.4	11.9
1917	7.4	8.6	15.0	13.8
1931	9.9	12.2	13.6	11.3
1937	10.1	16.2	19.3	13.2
1955	10.2	10.2	25.0	25.0
1962	7.2	7.2	34.0	34.0
1965	6.6	6.6	33.5	33.5

Note: C_g excludes and C'_g includes "military investment." I includes and I' excludes "military investment."

To be sure there was continuity between the two but, then, there was also continuity, a much more important one at that, between the Meiji era and the early years of the twentieth century. A lot of historians would also insist that the continuity between the Tokugawa period and the Meiji era has been grossly underestimated. Further discussion would certainly be useful but the theme of "trend acceleration within one growth phase" seems to be an oversimplification.

Despite this point, the book ought to be considered a major landmark in research on Japan's economic development. It definitely presents a well-balanced quantitative picture of Japanese growth in broad historical perspective. The writing is done with the lucidity and style one would expect from Ohkawa and Rosovsky. As such, the book is likely to be included in the list of required readings in most courses—upper-level undergraduate and graduate—on Japan's economic development. (Yasukichi Yasuba)

⁶ The figures on "military investment" were taken from Basic Statistical Table 8 and those on GNE from Basic Statistical Table 5. Five-year average ratios were computed centering on each year mentioned and the results were subtracted from I_g and added to C_g in Table 6.1. Incidentally, the explanation about the notation for C_g in Table 6.1 gives an erroneous impression that "military investment" may be included in C_g .