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## *General Comment*

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Like its predecessor, this volume presents important additions to our stock of statistical time series and throws new light on old problems in the interpretation of nineteenth century development. This general comment draws together the parts of the papers which bear on the comparative study of American and British economic growth and on the mechanism of long swings.

I shall take first the interesting section of Lebergott's paper dealing with the role of agriculture in the process of growth in the United States. "Occupying nearly 75 per cent of our labor force in 1800, farming occupied over half the labor force until some time between 1880 and 1890 . . . . The Kuznets and Gallman estimates of national income are consistent with this conclusion." Lebergott goes on to say that "an industry that used from 50 to 90 per cent of the nation's labor input over the first century of our national existence was surely more likely to make greater demands on most supplying industries than one that merely accounted for 5 or 10 per cent."

Before the above figures are discussed, it will be instructive to look at the corresponding data for the United Kingdom. Agriculture occupied 36 per cent of the British labor force in 1801, 22 per cent in 1851, and 11 per cent in 1891. By 1871 there were more persons in domestic service than in farming. Phyllis Deane and W. A. Cole have concluded that in the eighteenth century in the United Kingdom ". . . the growth of the home market for industrial goods was closely bound up with the fortunes of the agricultural community, in much the same way as the growth of the export trade depended on the prosperity of the primary producers overseas."<sup>1</sup> The part which agriculture played in the United States during the nineteenth century (which has been underestimated) was very different from the increasingly passive and subsidiary role that British agriculture played in that century. Lebergott cites Leontieff's estimates which show that a dollar's worth of agricultural output requires far more iron and

<sup>1</sup> *British Economic Growth, 1688-1959*, Cambridge, Eng., 1962, p. 92.

steel output and machinery production than does a dollar's worth of output generated by textiles or miscellaneous manufacturing or even by the iron and steel industry itself; and he rightly emphasizes the part of agricultural investment devoted to land clearing, which entailed copious demands for breaking plows, axes, scythes, and hoes. Added to this were the innovations which made farming more capital-intensive and the system of land ownership which gave owner-occupiers an incentive to invest liberally in the land.

To make sense of the differing roles of agriculture in the economic growth of the United States and the United Kingdom in the nineteenth century, it is essential to contrast the status of the two countries in the international economy. Instead of seeking an interpretation along these lines, Lebergott jumped to the conclusion that his data "... indicate only one thing: U.S. experience reveals no higher law at work forcing a decline of the share of the labor force in agriculture during economic growth." This assertion is unwarranted. It can be shown to be wrong both theoretically and empirically.

The deeper questions raised by these data could have been more fruitfully dealt with if the time series had been handled according to a different chronology. This criticism applies to other papers as well. Instead of presenting the data mechanically for periods such as 1840-60, 1860-80, 1880-1910, etc., would it not have been more instructive to arrange them according to the chronology of the long swing? Several papers in this volume, e.g., those by Gallman, Lebergott, and Gottlieb, have confirmed the statistical findings of Kuznets, Abramovitz, and others in this field. It would have been an advantage to relate these to similar findings for the United Kingdom and other countries.

For example, Gallman shows that during periods of rising or peak long-swing rates of advance for construction, the share of construction in gross domestic capital formation remained roughly constant, whereas during periods of declining or trough rates of advance, the share of construction fell sharply (Tables 4 and 6). Lebergott, in his comparative analysis of the United States and the United Kingdom in the period 1880-1910, makes the point that the "... contrasting migration flows plus variations in the rate of natural increase generated differing manpower requirements in residential construction. The induced effects on highway and public building construction, on plant for making steel, brick, and lumber can be surmised, although not measured at present." Gottlieb demonstrates an oscillation in the ratios of residential to total building—a rise in residential booms and a fall in residential contractions. This confirms Kuznets' results for the years 1870-1920, but Gottlieb shows that the process was at work over a longer period.

I would like to suggest that an approach centering on the interaction between the United States and the United Kingdom would give a more satisfactory explanation of some of the phenomena. Let me summarize some of the statistical findings on this process of interaction between 1870 to 1913.

1. There were long swings in additions to population and internal migration in the United States which were inverse to those in the United Kingdom.

2. In the United States there was an inverse relation between long swings in population-sensitive capital formation (i.e., nonfarm residential construction and durable capital expenditure by railroads) and long swings in other capital formation (i.e., net changes in inventories, producer durable equipment, and foreign claims) and in the flow of goods to consumers.

3. The long swings in British domestic capital formation were positively related to those in British additions to population and inverse to those in population-sensitive capital formation in the United States.

4. Long swings in British domestic capital formation were synchronized with long swings in American "other" capital formation and exports.

5. The long swings in British and European emigration and British capital exports were synchronized with the long swings in population-sensitive capital formation and internal migration in the United States.

6. There were long swings in American imports at constant prices.

7. The gross volume of population-sensitive capital formation in the United States was over 40 per cent of total capital formation in the 1870's and even in the first decade of the twentieth century it was still 25 per cent of the total.

There is a strong disposition among American economists to seek an explanation of every feature of American long swings exclusively in terms of forces operating within the United States itself.<sup>2</sup> The essence of the causal sequence suggested by Kuznets can be put as follows. Starting with long swings in the flow of goods to consumers in the United States, we have—after some lag—swings in immigration, additions to population, and population-sensitive capital formation; this causes inverted swings in other capital formation and additions to flow of goods to consumers, and the latter then induces a new inflow of population.<sup>3</sup> The weakness of

<sup>2</sup> Richard A. Easterlin's attempt to show that the inverse relation between long swings in the United States and the United Kingdom in the period 1870-1913 does not exist can hardly be said to succeed ("Influences in European Overseas Emigration before World War I," *Economic Development and Cultural Change*, April 1961, pp. 347-348). He himself admits that "... to speak of conclusions on the basis of this preliminary reconnaissance would be presumptuous" (p. 348).

<sup>3</sup> Kuznets, *Capital in the American Economy: Its Formation and Financing*, Princeton for NBER, 1961, pp. 346-349.

this model is that the whole thing turns on a suspiciously long "lag" between additions to the flow of goods to consumers and additions to population. Kuznets has to ask us "... to allow for a long lag that would, in a sense, turn negative into positive association."<sup>4</sup> Surely this is going too far. We are dealing here with *long* swings with a span of about twenty years. There is something arbitrary about singling out one case of negative association among many and treating it as a long lag. If it is right to do this in one case, why not in others too?

Much needs to be done before the mechanism of long swings can be satisfactorily explained. I am still convinced that these problems can best be resolved on the basis of a two-country model.<sup>5</sup> This kind of analysis may be briefly summarized as follows.

Let there be two countries: *A*, an industrialized creditor, and *B*, a country underpopulated but rich in natural resources. Each country is divided into two sectors—domestic capital construction and export. There is free mobility of factors between the sectors and between the countries. Let the word "period" refer to either the upswing or the downswing phase of the construction cycle, i.e., half the span of a long swing. The following relationships are assumed:

a. The level of activity in the export sector of one country depends on the marginal efficiency of capital in the capital construction sector of the other country in the same period.

b. The export capacity of each country is a function of the rate of expansion achieved in the capital construction sector of that country in the previous period.

c. A major fraction of total capital formation is population-sensitive.

d. Changes in population growth are dominated by changes in the net external migration balance.

Let us suppose that an outflow of population takes place from *A* to *B*. This stimulates activity in population-sensitive capital formation in *B* and retards it in *A*. The upswing in *B* attracts a flow of capital funds from *A* and this in turn stimulates *A*'s export sector. Thus in *A* there is a downswing in population-sensitive capital formation and an upswing in exports. Meanwhile in *B* the construction boom triggered off by the inflowing population gives rise to an internal suction of factors. There are two phases in this upswing in *B*. First, there is a rapid build-up of population-sensitive capital formation as an *effect* of population increase; in this phase, the boom is supply-determined and there is a widening of the capital structure. In the second phase, limitational factors become

<sup>4</sup> *Ibid.*, p. 347.

<sup>5</sup> See my *Migration and Economic Growth*, Cambridge, Eng., 1954, p. 189.

important and the wage-price spiral starts. The rise in wages will now lead to renewed immigration of labor, and the inflow is now demand-determined.

Through the interaction of the multiplier and the accelerator (with lags), the construction boom in *B* reaches its downturn. It is a crucial matter whether the timing of this downturn in *B* is dependent on what is simultaneously happening in *A*. Statistical analysis of British long swings suggests that upturns in home construction preceded downturns in the export sector, and upturns in the export sector preceded downturns in home construction.<sup>6</sup> If this is so, the downturn of the boom in *B* is determined by the revival in population-sensitive capital formation in *A*. Factors and loanable funds in *A* now move into the reviving construction sector; migration into towns in *A* takes the place of emigration from *A* to *B*. The upswing in construction in *A* is accompanied by a downswing in population-sensitive capital formation and a revival in the export sector in *B*. This goes on until the upturn of the construction cycle is reached in *B*, which is a signal for a revival in exports and then a downturn in home construction in *A*. Space does not allow an account of the price and balance-of-payments implications of these inverse cycles. The model can demonstrate that international migration, through its influence on changes in population growth and population-sensitive capital formation, is the most plausible explanation of inverse long swings.

Within such a framework one can see more clearly the external determinants of the components and sources of output growth in the United States. Let me now return to the role of agriculture which I mentioned earlier. I would interpret the evolution as follows. Each upswing phase of the long cycle in the United States saw a great extension of railways, construction, roads, land clearing, etc.; the capacity thus built up fulfilled itself in large additions to agricultural output in the next period, i.e., the downswing phase of the long cycle. It was in these latter phases, coinciding with the capital formation booms in the United Kingdom, that the United States had its upswings in additions to the flow of goods to consumers and to net claims on foreign countries. In this connection, it is significant that crude and manufactured foodstuffs and crude materials comprised as much as 80 per cent of total United States exports even as late as 1890; the corresponding figures for 1856 and 1875 were 84 and 80 per cent, respectively. The major market was the United Kingdom. There was a very high industrial input (drawing heavily on the metal industries) into agriculture and new settlement; the United States was meeting not only the rapidly increasing demand of her fast-growing

<sup>6</sup> See *ibid.*, p. 186.

population but was also undermining the obsolete agrarian economies of Europe. In the 1880's European agriculture felt the boomerang effects of earlier railroad and steamship investment; although wages on the wheat farms of northwestern United States in 1887 were four times as high as in Rhenish Prussia, nevertheless the cost of production in Prussia was double the American (80 cents a bushel against 40 cents). William N. Parker's illuminating paper on the increase in productivity in the production of small grains is very relevant in this context.

The economic interplay between the New World and the Old entailed a vast expansion of remarkably efficient agriculture in the United States, and its upsurges of output and exports were most prominent during the downswings of the long cycle. The impact on the rural economies of Europe meant an intensification of population pressure and renewed outflows of migrants across the Atlantic. The mass rural exodus of "new" immigrants from southern and eastern Europe between 1900 and 1913 must be attributed partly to the delayed force of New World innovations reaching back to the Old World with disruptive power. In Schumpeter's words, ". . . the story of the way in which civilized humanity got and fought cheap bread . . . is the story of American railroads and American machinery."<sup>7</sup>

In seeking to explain the complex process of output growth over the last century, we must as economists and economic historians pay due attention to the complex interaction between major economies from one period to the next. Analysis which tends to be inward-looking is apt to miss the interesting clues.

<sup>7</sup> Joseph A. Schumpeter, *Business Cycles*, Vol. 1, New York, 1939, p. 319.

## *Output of Final Products*

