CHAPTER FOUR

CYCLICAL MOVEMENTS

CYCLICAL movements are movements of a periodic character, superimposed on the general long-run tendencies of the economy. We shall now proceed to a more detailed analysis of such movements. To begin with, a distinction should be made between general cycles and specific cycles. General cycles refer to movements of the entire economy of a country or even of the world as a whole; specific cycles refer to individual markets or commodities. We shall give examples of the latter in chapter viii. In this chapter we shall deal only with general cyclical movements.

PERIOD

One very important characteristic of general cyclical movements is that they are periodic or at least quasi-periodic. As Figures 20 and 21 show, they are far from regular. It is possible, therefore, to question their periodic character, and one might maintain that the figures show nothing but an accidental succession of increases and decreases. We shall refer to this question later. To the extent that a periodic movement can be observed, the length of the period shows great differences. Distinctions have been made on the following basis: (*a*) long cyclical waves with a period of about forty years, (*b*) the normal wave with a period of from seven to eleven years, and (*c*) the short American cycle with a period of from three to four years.

These various cycles have not always been uniformly named. Cycles under (*b*), in particular, have sometimes been called short cycles to distinguish them from those under (*a*) and sometimes long cycles to distinguish them from those under (*c*). To end this confusion, Schumpeter[1] has proposed to name the three

1. *Business Cycles* (New York: McGraw-Hill Book Co., 1939).

types of waves after their discoverers, viz., (*a*) Kondratieffs,[2] (*b*) Juglars, and (*c*) Kitchins.

The best-known long cycles, in particular the long cycle in prices, do indeed show a period of about forty years, at least between the troughs in 1850, 1896, and 1933; the peaks around 1810, 1873, and 1920 are further apart (Fig. 20). But Professor Wagemann, who has made further studies in this field, has also discovered long waves with a period of about twenty years and a few with a much longer period of perhaps a hundred years or more. The latter type of wave could be observed, with any

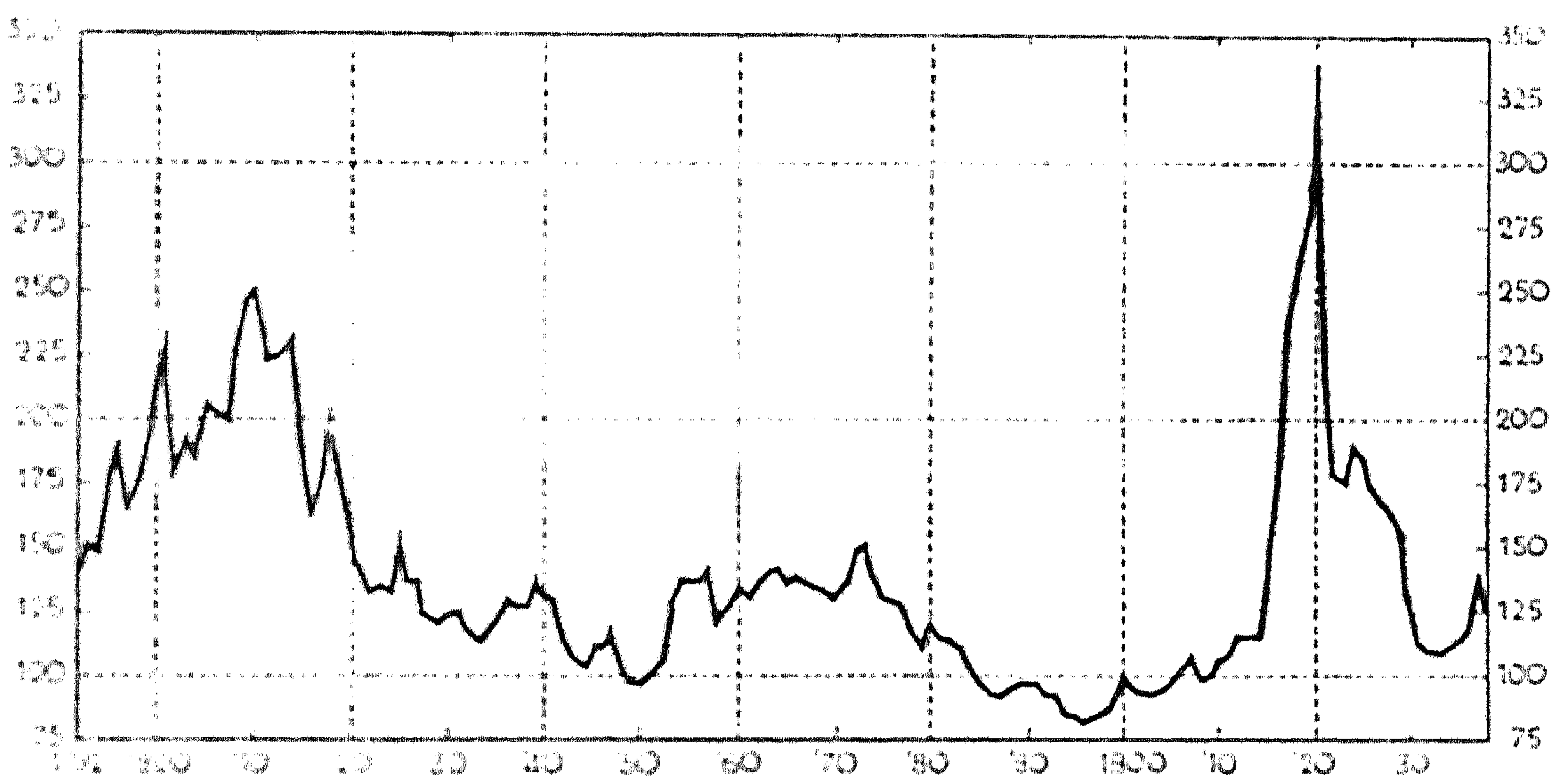

Fig. 20.—Movement of wholesale prices in the United Kingdom (index numbers, 1901–10 = 100).

degree of certainty, on only very few phenomena. Therefore we shall not concern ourselves with them.

A further difficulty in distinguishing between cycles of different periods is due to the fact that their length is often not easy to determine on account of the irregularity of the movements (see, for instance, Fig. 21). The numbers of seven and eleven years, therefore, are not at all intended to mean the extremes for the periods of individual cycles in individual time series but

2. The Dutch may perhaps put in some reservations with respect to the name given by Schumpeter to the long waves; these waves were described by two Dutch authors (Van Gelderen and De Wolff) before they were discovered by the Russian economist Kondratieff.

rather the extremes for the average periods that can be observed in a large number of series.

The shortest cycles occur especially in the United States. In some series, however, particularly in the rate of interest for short-term credits, such cycles can also be observed in European countries.

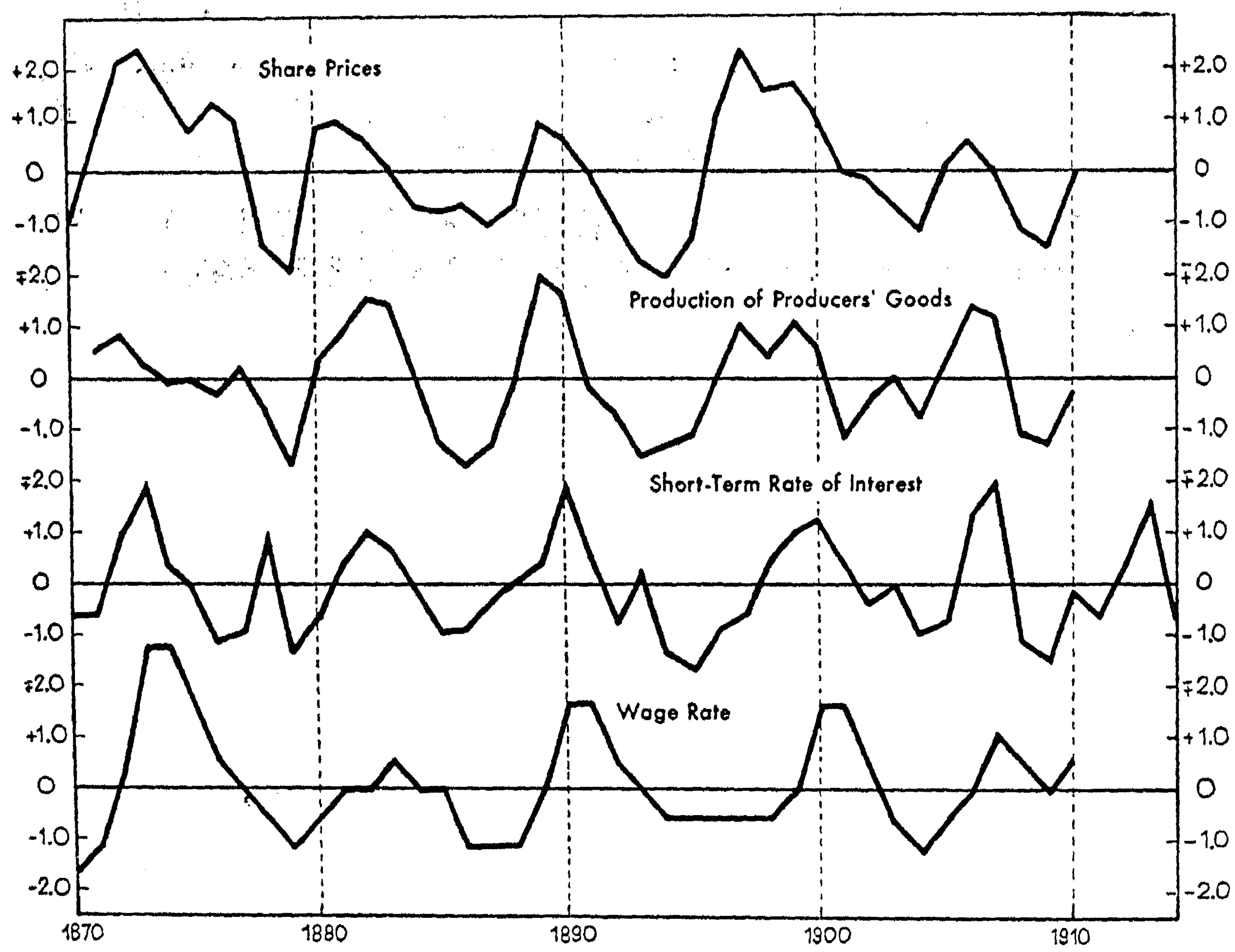

FIG. 21.—Cyclical components of various economic series for the United Kingdom. The curves represent deviations from nine-year moving averages expressed in units of their own standard deviation.

DAMPING

Since most cycles are irregular, it is difficult to measure their degree of damping. Since, roughly speaking, cycles repeat themselves with approximately the same amplitude, no "gross" damping can be observed, that is to say, there is no damping in the observed cycles. It is very well possible, however, that the cycles do have a natural tendency toward damping but are continually kept going by new disturbing factors. Again, it is difficult to state with certainty that the amplitude has remained approximately the same. The crisis of 1929 showed a very large amplitude, and from it a certain tendency toward antidamping might be inferred. Against this, however, it should be borne in mind that sharp and less pronounced crises have alternated over the past century.

TIMING

Cycles in the most important economic series are on the whole if not exactly at least approximately simultaneous. This applies in particular to cycles in the general level of prices and in the general level of activity. In this connection, the price level may refer to the prices of commodities at different stages of production, such as raw materials, semimanufactured products, finished products, either at wholesale or retail, and also to the wage rate and the rate of interest. Activity may be measured either as the volume of production in the broadest sense of the word or as the volume of employment. The simultaneous movement of prices and quantities implies that their product, the value of production in terms of money, must also move approximately simultaneously. Among the value series of importance in this connection are the total value of output and the total value of labor, that is to say, total national income and total labor income (with certain qualifications which are not of great consequence in this connection).

It is always possible by mathematical operations to devise certain other series whose cyclical movements are not simultaneous with those of the series mentioned. Thus, the increase from year to year of any of the above series will usually lead the cycle by about one-quarter of its period; any series which by its nature indicates the opposite of some of the series mentioned, such as an unemployment series, may be considered as one that either leads or lags by half a period; but these are self-evident and entirely artificial statements. It is much more important to see whether there are certain series that have an economic significance of their own and show a cyclical movement with a pronounced lag from that of most other series. Some of these can be found. Thus it will be found that productive capacity will normally lag by about one-quarter of a period, compared to the standard business-cycle series. This is due to the fact that capacity is by its nature a cumulation of series of net investments, the latter being net additions per unit of time to that capacity. As said above,[3] a series resulting from the cumulation of another series normally shows a lag of about one-quarter of a period compared to that series (Fig. 22).

Although most of the important economic series show cyclical movements approximately simultaneously, certain minor differ-

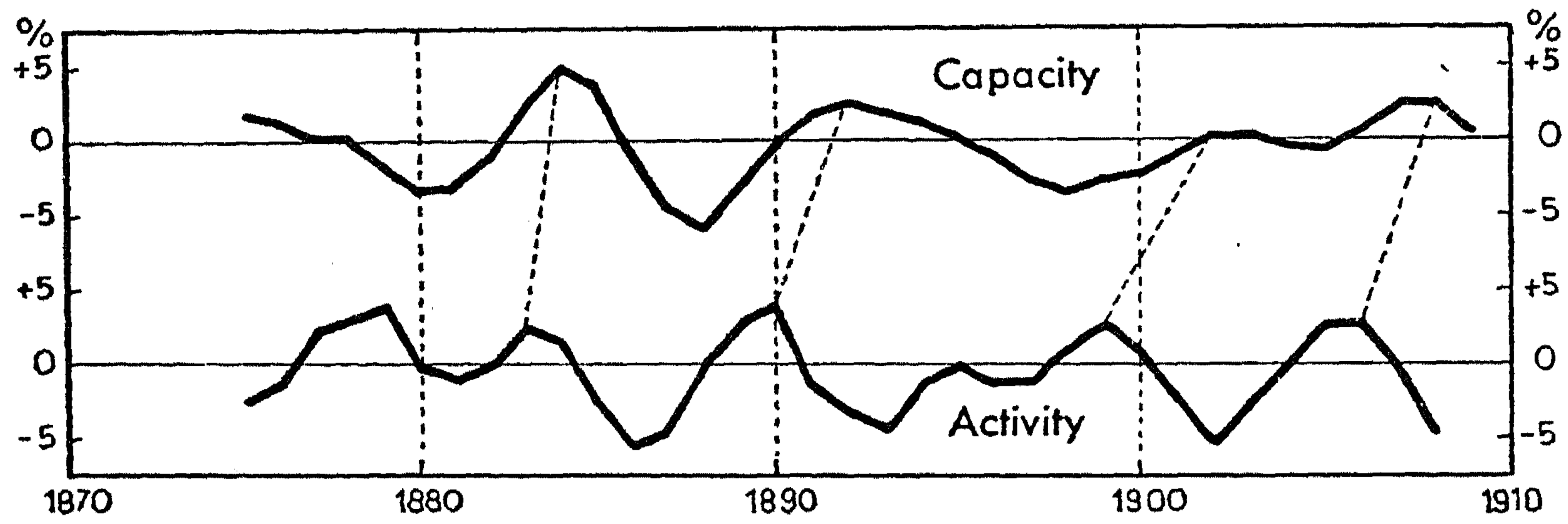

FIG. 22.—Cyclical movements in productive capacity and activity as shown for shipping. The capacity series represents the tonnage of the commercial fleets of the most important countries. The activity series is a transportation index for the most important commodities. Both series are shown as three-year moving averages (in order to eliminate random fluctuations) of deviations from nine-year moving averages.

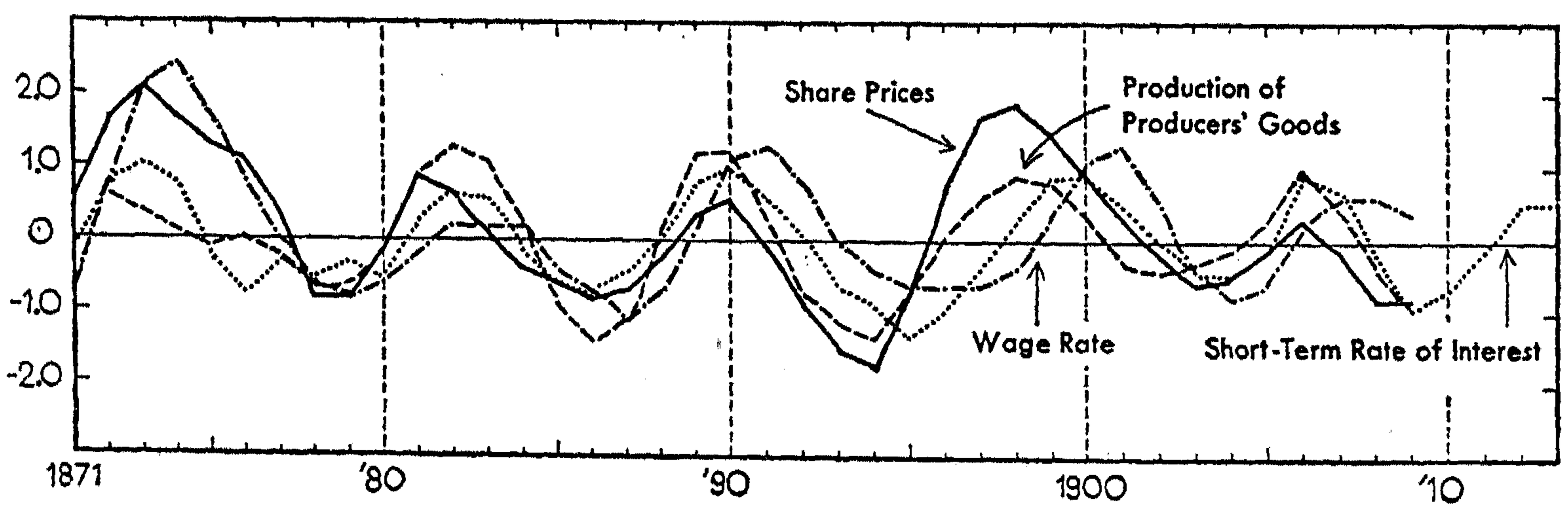

FIG. 23.—Lags between the cyclical component of certain important economic series for the United Kingdom. Deviations from nine-year moving averages expressed in units of their own standard deviation.

ences in timing may, nonetheless, be observed. These differences are not always systematic, but sometimes they are. Figure 23 indicates some of them. Normally, share prices slightly lead the series of production and the general price level; and these, in turn, slightly lead the wage rate and the rate of interest. There are also small differences in phase be-

3. Cf. p. 19, *supra*.

tween the prices of commodities at different stages of production. Prices of raw materials subject to active competition show cycles on the whole somewhat earlier than prices of other commodities. Retail prices lag somewhat behind wholesale prices.

It is often not easy to determine the lag between two series each of which has its own irregular movements. A more reliable way to determine lags or leads is to construct one series on the basis of one or more others with which it is causally connected, along the lines indicated in chapter i. It is obviously easier to determine lags for series for which monthly data are available than for those for which only annual data exist. Except for the United States, unfortunately, only annual figures are available for those economic variables that are most important to business-cycle analysis, such as national income, total consumption expenditure, and total investment; even these annual figures embrace only a relatively short period.

Some of the empirical statements that have sometimes been made about lags and leads have, on closer analysis, only a very limited validity and do not indicate any fundamental economic relationship. On the basis of purely empirical material it is impossible to determine whether any observed regularity indicates a permanent relationship between the variables involved. In anticipation of our theoretical analysis we may at this stage refer to one example. It has often been held that residential construction shows a cyclical movement having a systematic connection with the general business cycle. This relation has been made the basis for observations concerning the significance of the building cycle for the general business cycle and for business-cycle policy. It appears, however, that the various authors on this subject insist on quite different relations between the two cycles. Some hold that the building cycle runs counter to the cycle of the general economy, others that the building cycle leads, and still others, again, that it lags behind the general cycle. This in itself throws some doubt on the existence of any clear and simple relation. Analysis of the data for the United States shows that building has a cycle of its own with a period entirely different from that of the general business cycle. In the case of Germany, too, a building cycle following its own immanent development can be observed at least for certain periods; during these periods, therefore, no regular relationship between residential construction and the general business cycle can be observed. In all countries residential construction appears to be strongly influenced by abrupt changes in confidence; this is a further reason why its fluctuations may show a pattern quite different from that of the general business cycle.

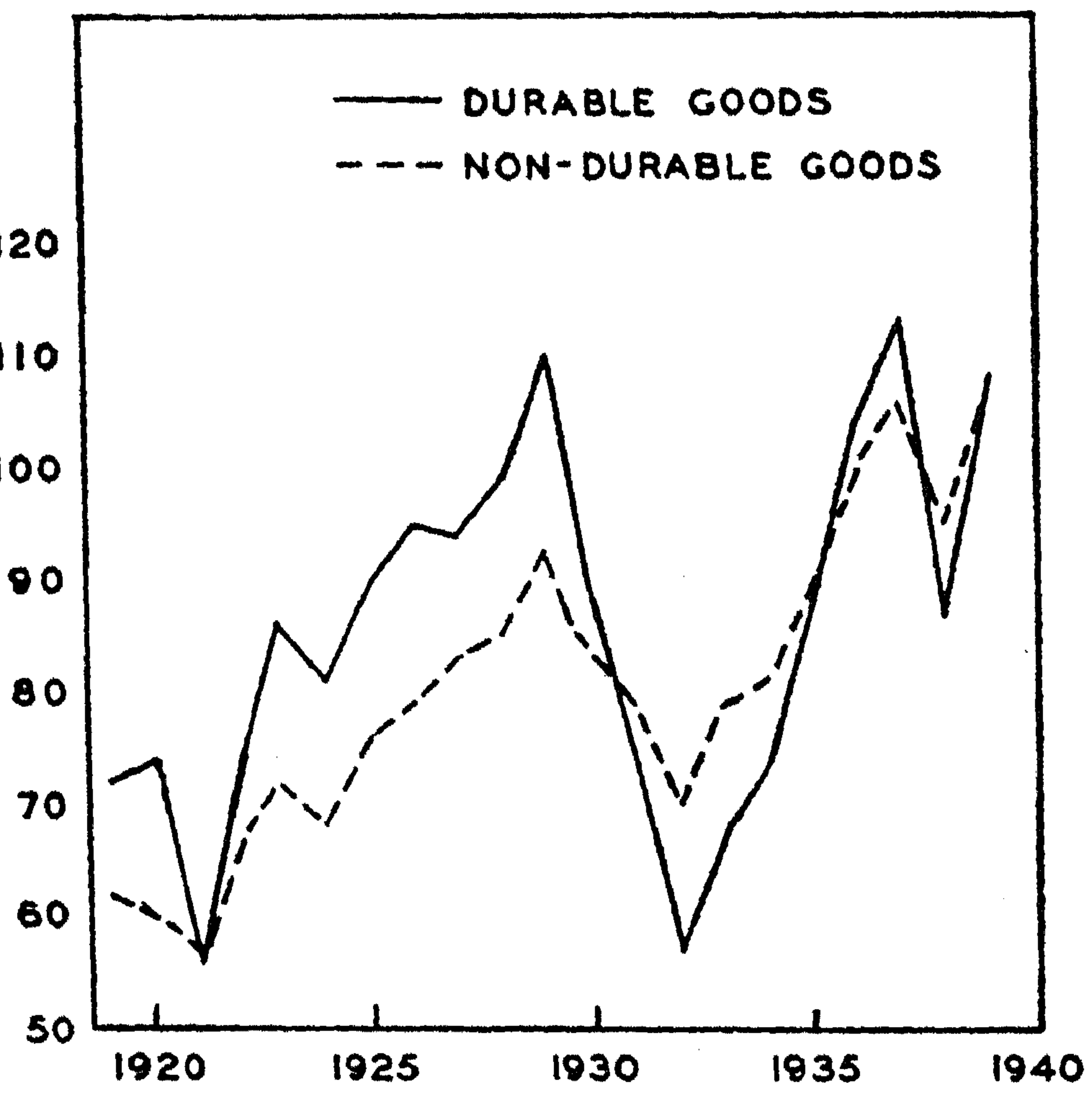

FIG. 24.—Production series with different relative amplitudes in the United States. Durable goods and nondurable goods (index numbers, 1935–39 = 100).

AMPLITUDE

The regularities of business cycles appear clearest in their amplitude, particularly in the ratio of the amplitudes of different phenomena. The relative amplitude of various series, that is to say, the ratio of their amplitudes to their average height, varies considerably. To mention only a few of the most important economic series, the production of durable goods has a much larger relative amplitude than has the production of nondurable goods (see Fig. 24). The relative amplitude of the production of raw materials, also, is somewhat larger than that of finished products, and the relative amplitude of the production of luxury commodities is larger than that of commodities of first necessity.

The differences in amplitude of the production series are matched by corresponding differences in amplitude of the employment series in different branches of industry, but each employment series tends to show a slightly smaller relative amplitude than the corresponding production series.

Among the price series, raw materials show the greatest relative amplitude, and the cost-of-living index and the wage rate

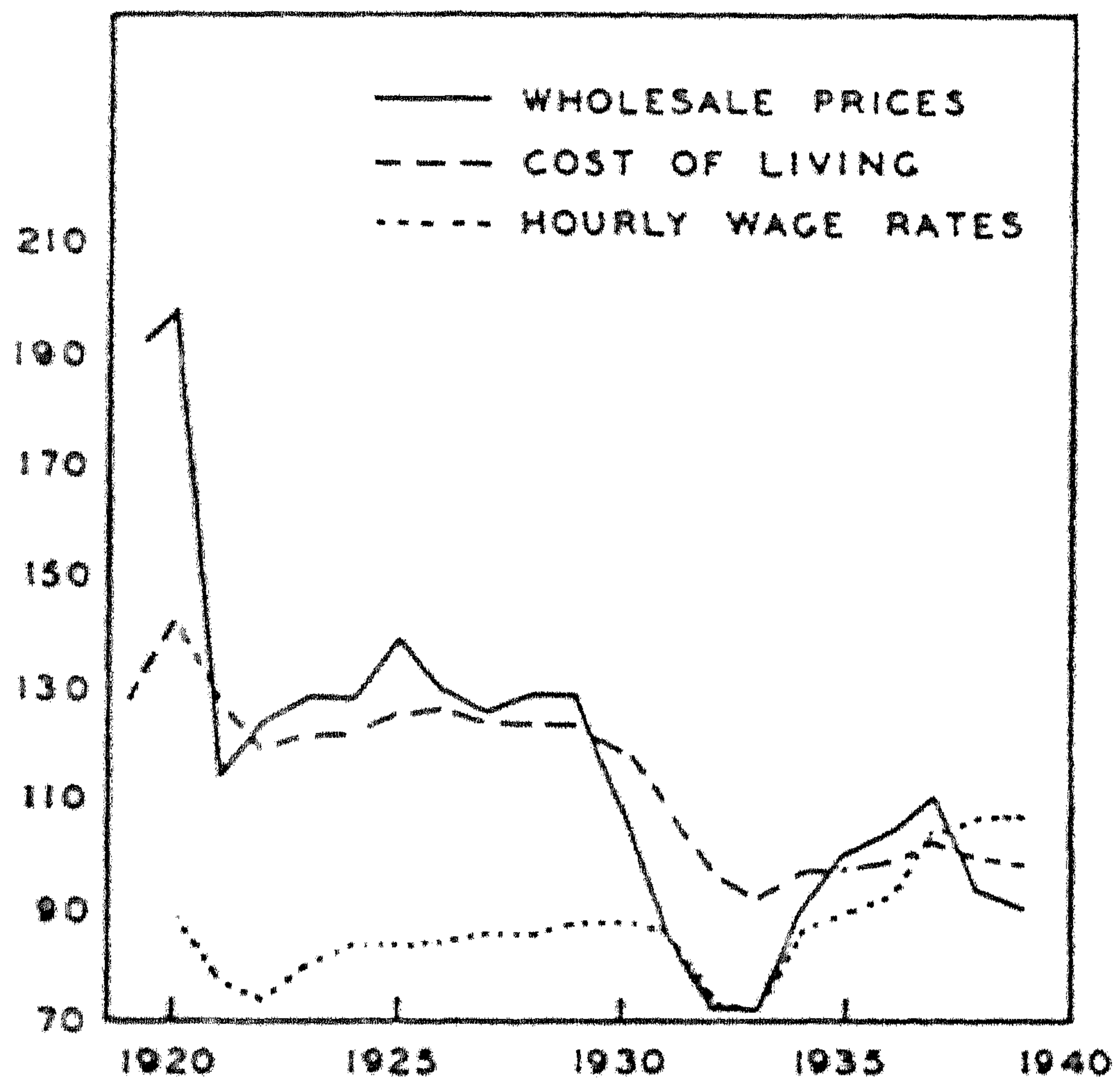

FIG. 25.—Price series with different amplitudes in the United States (index numbers, 1935–39 = 100).

the smallest (Fig. 25). There is also a pronounced difference between corresponding or nearly corresponding prices for contracts of different terms, the longer contracts showing a much smaller relative amplitude. One of the clearest examples of this is in the rate of interest. The rate for short-term credits shows a sharp relative amplitude, whereas that for long-term credits, for instance, yield on irredeemable bonds, shows a very moderate relative amplitude.

Figure 26 indicates that among the income series in the United States the greatest relative amplitude is shown by the figures for profits and the smallest for interest-and-rent income and salaries, whereas wages occupy an intermediate position. It has been found, for the Netherlands at least, that,

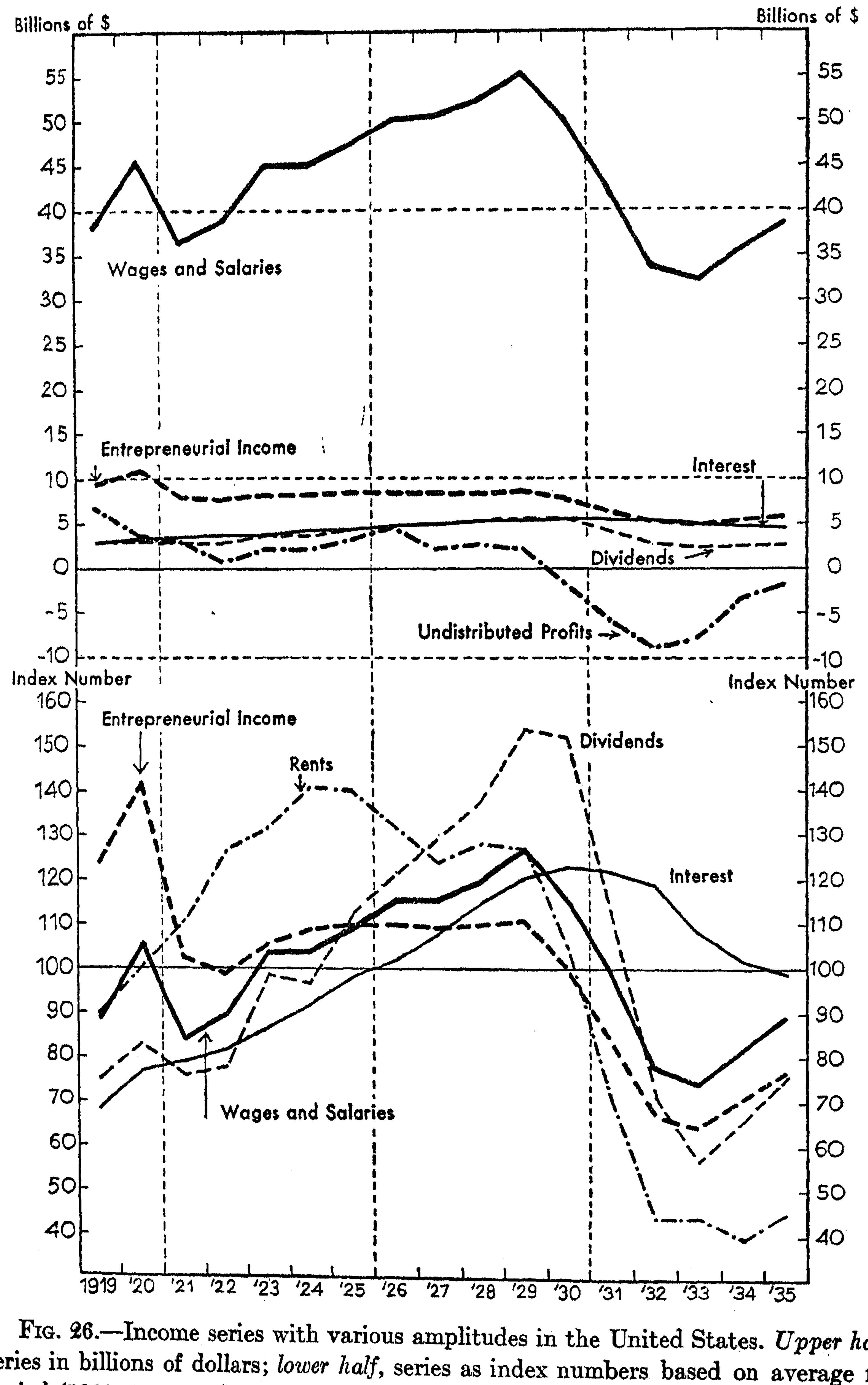

FIG. 26.—Income series with various amplitudes in the United States. *Upper half,* series in billions of dollars; *lower half,* series as index numbers based on average for period (1919–35 = 100).

if incomes are arranged according to size, the highest and lowest incomes fluctuate more strongly than those in the middle of the scale.

SHAPE

As has been indicated, the shape of the fluctuations is often quite irregular. Random influences produce sometimes an acceleration, sometimes a retardation, of the movement. Random fluctuations are particularly important in series that are directly or indirectly connected with agriculture, since all these series are at least partially determined by crop fluctuations which, from an economic point of view, have an almost en-

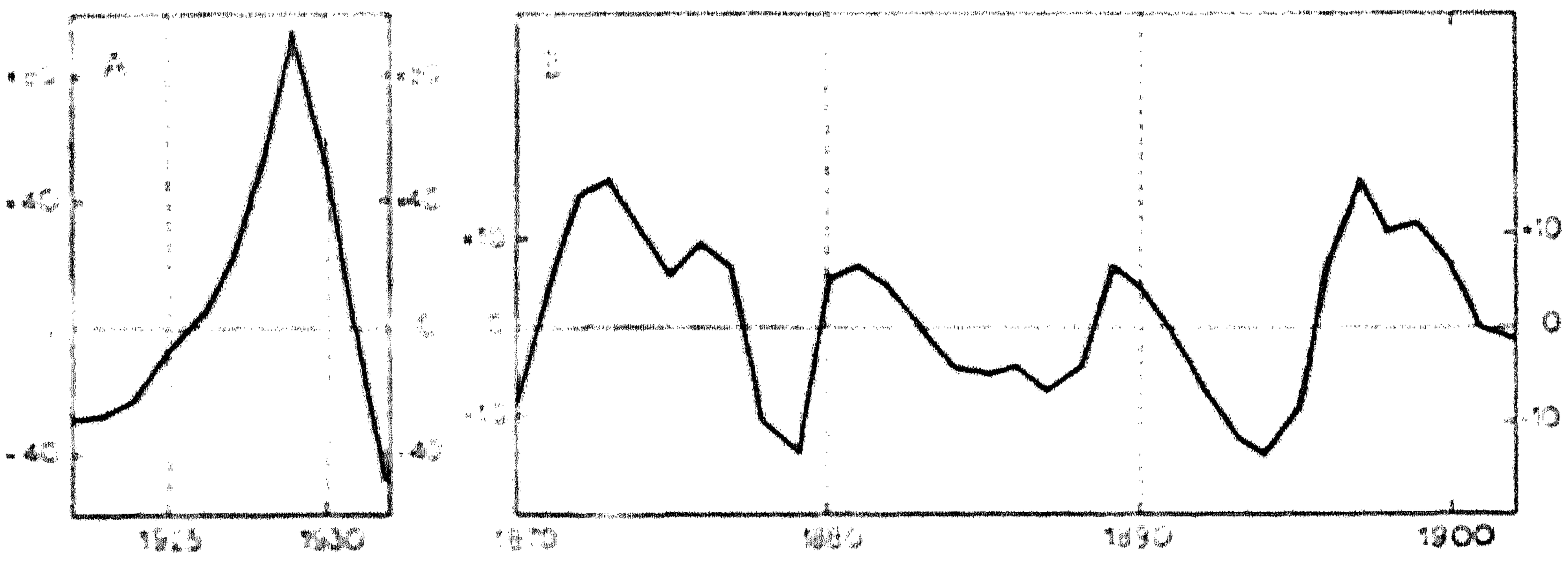

FIG. 27.—Examples of asymmetrical business-cycle components. *Left:* Slow increase and rapid decline as shown by share prices in the United States, 1919–32 (index numbers, 1926 = 100; deviations from average). *Right:* Rapid increase and slow decline as shown by share prices in the United Kingdom, 1870–1905 (index numbers, June, 1890 = 100; deviations from nine-year moving average).

tirely random pattern. Even freight rates that are partially affected by grain shipments show the indirect effect of crop fluctuations.

Other irregularities are of a more systematic character. Thus, there appears to be a tendency to a certain asymmetry in cycles, in the sense that they increase slowly and decline rapidly, particularly when the decline takes the form of a crisis leading into a severe depression. This tendency, however, is much less general than is sometimes believed. There are some clear examples of the opposite tendency; the prices of shares in the United Kingdom during the period from 1870 to 1914 tended to increase rather rapidly during short recovery periods and then to decline slowly during the longer depression periods (see Fig. 27). De Wolff has ascribed these asymmetries to the influence of long waves on the business cycle; in the downswing of the long waves there would, according to him, be short recoveries and long depressions; and in the upswing of a long wave, long recoveries and short depressions. With respect to series such as the price level, which show clearly the influence of long waves, this statement might be proved generally if one might assume an entirely symmetrical normal business cycle.

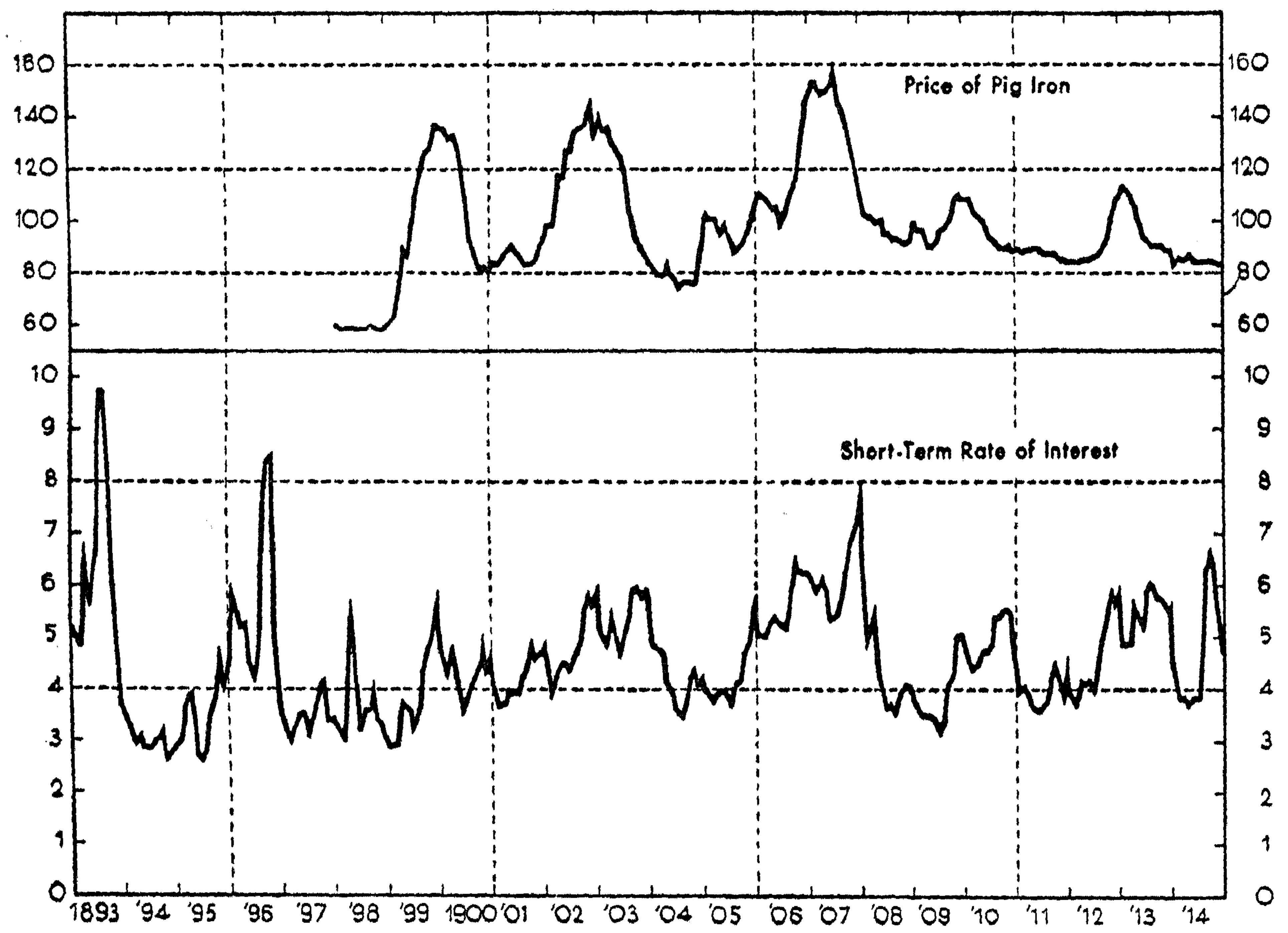

FIG. 28.—Example of cyclical movements with sharp peaks. Pig-iron price and short-term rate of interest in the United States.

In the downswing of the long wave the total movement of such a series would then be represented by the sum of a falling line and a symmetrical wave movement, in the upswing by the sum of an ascending line and a symmetrical wave movement. For most types of symmetrical waves this sum would yield relatively long depressions and relatively short recoveries during the downswing of the long wave and rather shorter depressions and longer recoveries during the upswing. This, however, would not be the case for all symmetrical movements. It would, for instance, not hold for a zigzag movement, which is characterized by very sudden changes of direction. Most cyclical series, though, do not show such sudden reversals.

There are a number of other asymmetries. Somes series show sharp peaks and flat troughs; other series show flat peaks and sharp troughs. A flat peak or a flat bottom will occur in the case of phenomena which have an upper or lower limit. Thus, employment cannot increase above the total labor supply. Owing to this upper limit, this series will normally show flat peaks. The rate of interest, on the other hand, cannot fall below 0; this series will therefore show flat bottoms. Sharp increases and sharp decreases will be found for series which are particularly sensitive. Before the first World War the rate of discount of the central bank used to respond quite sharply to reductions in the gold stock. In boom periods with tight credit the discount rate showed quite sharp peaks (see Fig. 28).

Similar peaks can be observed for the prices of mineral raw materials. In some boom periods the demand for these materials increased tremendously, while the limited capacity of production did not permit any great increase in the quantity supplied. Prices (if they were free, as they usually were at the time) increased rapidly under such conditions and fell again rapidly as soon as the tension eased. The sharp price peaks indicated certain spots in the economy, certain bottlenecks, where the tension between demand and supply was most pronounced. Sometimes these spots are of decisive influence for the amplitude of the cycle in the entire economy, since they provide a brake to further expansion. Not every cycle, however, shows bottlenecks. Various upper turning points show rather flat tops for the prices of investment goods.