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CHAPTER I

THE INTERNATIONAL SPREAD OF BUSINESS CYCLES

Section 1. The Problem

As long as economists have studied economic fluctuations they have recognized that the disturbances of economic life often have a tendency to spread from one country to another. Businessmen have been aware of this tendency and have had reason sometimes to welcome the impulses received from prosperity elsewhere, sometimes to complain about the bad effects of distress abroad. Politicians and statesmen have variously tried to intervene in these processes by opening up new foreign markets, obtaining or lending capital abroad, or shielding the economy behind tariff walls and even more restrictive measures. Indeed most such measures date back far into the mercantilistic period and not only preceded systematic economic thought but also helped to initiate it.

Currently the world is very conscious of the problem of business cycle transmission. This expresses itself in the establishment of the International Monetary Fund and the International Bank, modeled after other institutions such as the Bank for International Settlements and looser arrangements for financial cooperation. Discussion of them lies outside the scope of this work, which is chiefly concerned with the periods from 1870 to 1914 and 1925 to 1938. Aside from these institutional arrangements there is often a strong conviction that now even more than in the years since World War I the fluctuations of the American economy are chiefly responsible for international disturbances, that the great weight of American foreign transactions determines the course of the world economy. At the same time there is a tendency, so it is argued, for the American economy to pay far greater attention to its domestic affairs because these outweigh American foreign transactions by a factor of more than ten to one. This argument, found not only in popular and political accounts, though oversimplified, nevertheless points to a real difficulty.

Another source of discussion lies in the fact that now there are simultaneously several economic systems distinguished by the extent to which they are centrally directed. The adherents of planned

economies accuse the free economies of being unstable and upsetting the former (although they are planned!) and every movement in the direction of one or the other type of economy is viewed with alarm by some country. There is a growing conviction of the need for international cooperation in schemes to attain "stability." There is, however, a lamentable lack of scientific studies upon which practical measures could be built. The present specialized work, while not concerned directly with problems of future policy, may contribute to policy making through its examination of past policies and the free interaction of financial spheres of several countries.

The study of national cycles has progressed chiefly because abstract, general speculations, based on scanty material or even without any definite empirical background, have been re-examined and gradually replaced by more cautious, limited hypotheses derived from factual investigations and better data. Gradually statistical methods have been evolved to satisfy the special needs arising from these studies. Knowledge about the behavior of business cycles differs considerably from country to country and is for most of them better for the more recent fluctuations, because information is fuller. However, during these later periods many important external disturbances occurred, beginning with World War I, so that the interpretation of this better statistical material is difficult.

In this chapter we shall discuss the problem of the international transmission of business cycles in its broadest aspects, in order to set up a general conceptual and methodological frame of reference. It will be neither complete nor in all respects quite definite. We are entering upon a study for which there are unfortunately few examples, either in the theoretical or in the empirical domain. Thus we shall have to be guided by the experience gained in the analysis of domestic economic fluctuations and try to obtain as much help as possible from related sections of economic theory, chiefly the theory of international trade.

It is not surprising that the few explanations of the international transmission of cycles offered currently are very tentative and appear more or less as mere appendixes to, or extensions of, particular cycle theories. Often they make use of some theorems relating to international trade, although the present essentially static theory of international trade deals with dynamic phenomena only in a very rudimentary manner. Consequently a survey of these explanations reveals their strongly hypothetical and frequently contra-

dictory character. It is easy to see that the contradictions derive quite naturally from the fact that the theories to which the statements about the international aspects of business cycles are appended are themselves often mutually exclusive or, at best, place a widely different emphasis upon some of the different characteristics of the cycles. Furthermore the uncertain factual background of these theories accounts for some of their contradictions.

Similarly there is a great dearth of factual, empirico-statistical investigations relating to international cycles and their transmission. But these have only recently been begun even in the domestic field; the methods for the treatment and analysis of the statistics are in flux; the checking of theories is still only an incidental matter. Thus it is too early to expect international economic analyses of prices, production, money, etc. of a caliber equal to those that exist for some domestic economies. There is even a great dearth of accounts of a historical nature, as distinguished from technico-statistical investigations. What exists in that respect is mostly scattered in innumerable periodicals, newspapers, and occasional writings by current observers.

The present book cannot fill these many gaps, i.e., to give a historical account, to present and analyze (with appropriately new methods) a wealth of new, specially collected statistics, and to abstract a theory of the international transmission of economic fluctuations. This would indeed be a superhuman task. Many research workers in many countries, employing freely their own tested methods, will be necessary to further our understanding of these complicated matters. In the meantime we shall choose international financial transactions as a restricted field of high coherence and great significance. We can at least canvass the field and make stabs in several directions, knowing very well that completeness is out of the question.

Anticipating more detailed discussion (cf. section 3) there is one point where it may seem a priori that we are going too far: we wish to *describe*—in a financial field still to be delimited—the *spread* of fluctuations (possibly cycles), i.e., an interaction among economies, rather than a mere parallelism in their behavior, which may or may not be distorted by leads or lags or other differences. It is true that thereby we set our aims higher than might at first seem necessary. But by trying to obtain some idea of interaction we can make use of notions about a mechanism of transmission of fluctuations that has been thought over by a long line of economists ever since

Cantillon. Although this is more complicated than a mere description of simultaneous behavior, it is more satisfactory on general scientific grounds. That is to say—and we shall return to this thought repeatedly—a problem must not be simplified too much lest it lose all meaning and access to its very heart remain blocked indefinitely.

It is imperative to comprehend from the outset how involved a problem is, so that the necessary simplifications may be made in the light of that knowledge, in the proper direction, and may not be carried too far. Or putting it differently: a certain degree of complexity is necessary even for the simplest and most modest beginning. Whether the limits set for the present undertaking were right, or too narrow, or too wide is something that in the absence of more definite, guiding theories can be judged only when we have finished.[1] And even then there may be differences of opinion.

We deal in our statistico-historical, and to a modest extent theoretical, analysis with *financial operations* or *transactions*. Even this is a wide field and it cannot be sharply separated from others. The transactions consist in the shifts of short-term and long-term funds as a consequence of international trade, in response to interest rates, to attractions of stock markets in various parts of the world, loans in foreign countries for their development, central bank operations in the gold markets, etc. This indicates that relative movements of interest rates, stock market prices, balances of trade, balances of payments, flotations of foreign loans, gold movements, etc., would all have to be investigated, first for parallelism in their behavior and second for disclosure of a transmission of disturbances and cycles.

The limitation of the study does not mean that we believe that other factors do not act upon the financial transactions or vice versa or that a compartmentalization is desirable. It is merely *a matter of expediency*. In particular we desire to get away from wide, over-all statements involving equally global, inclusive figures which at best allow some rough correlations that can be interpreted in dozens of ways. The thinking in unanalyzed global aggregates has become a characteristic of contemporary economics which in that respect has lapsed back to the so-called classical school. Our thought and pro-

[1] We refer to this important principle repeatedly throughout the whole book [cf. in particular page 30]. This principle is of high significance in science; it is directly applicable to economic theory at any level of abstraction.

cedure are diametrically opposed to this tendency, as the sequel will show.[2]

The degree of detail is largely imposed upon us by the assertions made in theories that will guide our statistical investigations. In other words when the existence of very definite, fine interrelations is asserted and we wish to examine them statistically, we have no other choice than to use data that are at least as detailed as the theories involved. Only in this way can it be discovered whether the guiding theoretical principles are reasonable and the limitations of greater generalizations are shown.

One might ask whether it is sound to start with these theories at all. Is it not like voluntarily putting on a strait jacket, then trying hard to get out of it and claiming success if this succeeds while one is really only where he started? This view would be impractical and unjust. The various theories may have many faults, but they were thought out carefully, over many generations, with reference to manifold experiences. It would be unwise to brush this accumulated store of belief and knowledge aside, because there is no other guide for the first steps into the maze of concrete material. We would probably fumble unnecessarily if we dispensed with them from the outset. Of course once we have some orientation in the new territory we may proceed on our own with confidence.

Section 2. Statistical Methods and Materials

The level of our investigation must be decided on from the outset. For example, it is possible to limit ourselves to pure description by studying the background of each series, visually inspecting and interpreting charts, and drawing economic conclusions from both background and charts. Or the series might be subjected to the most formidable modern statistical methods so that the economic interpretation reduces to an arrangement in equations of numerical results giving number, amplitudes of cycles, their energies, their

[2] This does not exclude the desirability of a *description* of the behavior of global aggregates. Their phenomenology needs to be carefully explored; but a satisfactory *theory* involving these aggregates can be constructed only if their compositions and changes in these latter are thoroughly understood. Often this is not the case even in regard to the simplest and apparently perfectly well established concepts such as aggregate demand and supply. Cf. O. Morgenstern, "Demand Theory Reconsidered," *Quarterly Journal of Economics*, Vol. LXII, February 1948, pp. 165–201.

interconnection, autocorrelations, their hidden cycles, etc., leaving correspondingly less to intuitive evaluation.

Neither is entirely satisfactory at present. The first is not, because in the study of national cycles we have passed slightly beyond this stage; the second is not, because it should not be undertaken before the factual, institutional background is well understood, as is not the case. We shall endeavor to remain as closely as possible at the strictly phenomenological level. This refers then both to the intention to keep theoretical interpretation to a minimum and to engage only in very simple statistical operations.

The great progress of statistics over the last twenty-five years naturally produces the desire to apply the new methods and concepts over wide fields. Yet there has been no change in the fundamental relations that must exist between accuracy of observation and understanding of its background on the one hand, and fineness of statistical operations on the other. We need not even ask what these new techniques are, before the first condition is satisfied. And it is precisely the task of this work to explore some of this background. Even more basically, the elementary statistics hardly exist at all, so that the task reduces to the still more primitive one of collecting, sifting, and presenting the data. This takes up the best part of our effort. Only when all this is finished can the question be raised whether more advanced statistical procedures (Fourier analysis, spectral analysis, etc.) should not be used in further work.[3]

The basic ideas of cycle analysis developed by A. F. Burns and W. C. Mitchell[4] will be used to some extent in this work. We shall in particular make free use of the notions of specific cycles and reference cycles; when they are applied to our time series they are used according to the procedure of these two authors. We shall also make some simple measurements of the durations of cycles, etc. and apply these in a natural extension of the basic ideas to international comparisons. On the other hand there arise situations in the last connection where a still simpler approach is indicated. There are also series where an application does not seem possible either because they are of a disturbing type foreseen in Burns-Mitchell[5] or because the series are too arbitrary in the sense of the identification

[3] For more, cf. my paper "Experiment and Large Scale Computation in Economics," in *Economic Activity Analysis*, O. Morgenstern, editor, Wiley, 1954.

[4] Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles*, National Bureau of Economic Research, 1946.

[5] Cf. *ibid.*, Chapter vii, section 3.

of peaks and troughs or because a cycle cannot be interpreted even when found.[6] Since this entire study is in a far more preliminary stage than some of those dealing with domestic cycles, the more complex measurements of the National Bureau method are not systematically incorporated in the body of the text.

The Burns-Mitchell procedure may be included among the simple (elementary) methods referred to above. The division into elementary and nonelementary procedures is of course highly arbitrary. But since the Burns-Mitchell method contains basically qualitative elements upon which the quantitative measures rest, its inclusion in the former group is natural.[7]

Since in this work a large amount of economic statistics is gathered and analyzed by various simple techniques, it may seem useful to make these general comments:[8]

(1) Economic statistics are—in the overwhelming majority of cases—*not scientific observations*. This is a point of primary significance. They are at best historical accounts; mostly they are by-products of business operations or of administrative acts. They are, as a rule, badly collected by scientifically untrained minor officials at the customhouses, warehouses, on street markets, etc. In other words they are not the results of carefully set experiments, or of strictly controlled measurements as are astronomical observations. Examples of the extraordinary crudeness of data will be given later (especially in section 4 of Chapter V).

(2) The *stochastic character* of most economic statistics is thus perhaps more obvious than that of other statistics and it is even more obvious with many we shall be forced to use. Deductions abstracted from them can hardly be very accurate, sharp, and definite.[9]

[6] Cf. *ibid.*, p. 57. Cf. also M. G. Kendall, *Contributions to the Study of Oscillatory Time-Series*, National Institute of Economic and Social Research, Occasional Paper IX, 1946, and the reviews by T. W. Anderson and O. Morgenstern, *Journal of the American Statistical Association*, Vol. 42, March 1947, pp. 187 ff.

[7] The (definitely non-elementary) methods for finding cycles referred to in note 3 above are free from such qualitative factors.

[8] For a more detailed examination, cf. O. Morgenstern, *On the Accuracy of Economic Observations*, Princeton University Press, 1950, 2nd ed., 1959.

[9] For a discussion of these matters cf. especially T. Haavelmo, "The Probability Approach in Econometrics," *Econometrica*, Vol. 12, Supplement, 1944, and various papers by T. Koopmans, especially, "The Logic of Econometric Business-Cycle Research," *Journal of Political Economy*, Vol. 49, 1941, and "Statistical Estimation of Simultaneous Economic Relations," *Journal of the American Statistical Association*, Vol. 40, 1945. Cf. also the review of

When activities are only imperfectly reported, it is without meaning to show figures giving great detail, into many decimals, or when estimates are involved that can be wide of the mark (quite aside from the expense that each additional digit represents). Detail, however, is needed when the relations are of fine structure; a good example is offered by Table 35 showing New York gold points where every abbreviation would have been a loss and where good reasons exist to assume a degree of accuracy of information in the *operations* corresponding to the needs of the analytical statements involved. But it would of course be absurd to report turnovers of foreign exchange transactions in units smaller than hundreds of millions of dollars, etc.

(3) To the "fuzziness" of our data is added a similar fuzziness in some theories. This is true only of some, because others go uncommonly far for economics in making precise statements. An outstanding example of unusual precision that will occupy us much is the assertion that under a gold standard regime exchange rates cannot go beyond (sharply defined) gold points. Such a statement can be tested if gold points and exchange rates may be independently observed, even if each observation has its own probabilistic quality. But there are the more inclusive theories of the transmission of economic fluctuations operating with huge aggregates and very inclusive concepts. These are difficult to test because it is almost impossible to construct counterexamples,[10] not because none can be found but because trivial modifications in the theory can still save the latter's inclusiveness.

It might be added that fuzziness, i.e., lack of sharp definition and reaction, may prevail in a physical mechanism and that in spite of this it need not be inefficient. Organisms function in this manner

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Haavelmo's brochure by E. B. Wilson, *Review of Economic Statistics*, Vol. XXVIII, pp. 173–174, August 1946, in which the advisability of using high-powered new statistical methods is questioned. Our own position was indicated in the text above.

[10] It is not accidental that the technique of using counterexamples is not more consciously employed in economics. It is of course of utmost value in mathematics, physics, etc. where precise statements about relations, facts, etc. are involved. But in economics it seems always possible to think of plausible "exceptions" when a counterexample is found, or much worse, to demand that the "real meaning" of the author be discovered rather than that his words be taken literally. When real exceptions are found something has been contributed. When a theory has to allow for many exceptions it lacks coherence and inclusiveness and is ripe to be discarded. The development of value theory from labor value theory, with many exceptions, to marginal utility theory, with fewer exceptions, is a good illustration from economics.

in many respects; they safeguard themselves thus against undue excitement, but when they respond it is done sharply and precisely. It is not impossible that this behavior may find some analogy in our field, but it is too early to say.

(4) *The amount of statistical data* needed depends on the state of the theory that can be used in the exploration of a field. The better the theory, i.e., the fewer the principles it uses, the fewer additional statistics are needed to test or advance it. The problem of the international propagation of business cycles is so unexplored and vast that very great masses of statistics are needed, many of which later turn out to be irrelevant; but we know already that they are almost impossible to obtain and shall see that their value is not always statisfactory. In the present case even primary data had to be collected. This task should not have been expected in a study of this type.

The *statistical material* used in the following chapters can be briefly characterized here. A detailed description of the sources, methods of computations, analysis of the represented activities, and their comparability for the four countries, United States, Great Britain, France, and Germany are given whenever a series is newly introduced.

As in other business cycle studies, monthly data are preferred; it might have been desirable, but seldom possible, to go over to data referring to weekly or still shorter intervals. Quarterly or yearly data were taken only when monthly data were not available, or when they related to a minor argument, or when they were estimates, or otherwise of such doubtful origin that a monthly series would merely suggest a degree of accuracy that does not really exist.

The *comparability of the statistics* of different countries is one of the most difficult matters. One is familiar with the difficulty of regarding as homogeneous a long series even for one and the same country. Even when staples are involved and the quality has not changed much there are changes in diets or technical knowledge and uses. In the financial field comparability is hard to achieve: the activities are exceedingly sensitive to changes in custom, law, or circumvention of law, and they react sharply even to changes in activities that are represented by other time series, possibly not considered in our study. The degree of interdependence is high but cannot be described or measured in advance; it may often not have been stable over time.

We should like to cover as long a period as possible. It is difficult to obtain data for several hundred months even for single countries, let alone for comparable time series for four countries. We have chosen roughly the periods 1870–1914 and 1925–1938 or at least tried to approximate these as far as possible. Some series start later than 1870; others might have been extended further back, but the disparities in coverage with other countries would have become too great. There is a very good material reason for starting in 1870: from then on (or soon thereafter) the gold standard was universal in all four countries and Germany came into being a year later as an economic and political unit.

The break in our series for 1914–1925 (except, occasionally, in truly international series, such as world gold production or the gold-silver price ratio) is obviously required, at least for the actual period of war. The confusion of the years immediately following affected especially financial activities, and exchange rates in particular. From 1925 on greater order reigns again, though that of the years before World War I had not been regained. Indeed it is one of our results that the kind of international relations and interactions described by our series had been greatly upset and that the old structures did not reestablish themselves. It is clear from the outset what complications this will bring to any effort to build a coherent and uniform theory of the international spread of cycles.

The limitation to four large countries has no other meaning than that of convenience, and in a few instances reference to others, large or small, is also made (for example, Russia, Japan, South Africa, Argentina, Holland). The four countries were—at least before 1914—undoubtedly the kernel of world economic relations. After World War I others began to loom larger in financial affairs (especially Japan and some smaller states such as Switzerland and Holland) while still others removed themselves to a high degree (such as Russia, and those countries which practiced exchange control).

It is important to point out that the choice of only four *similar countries* (of comparable size!) is *not* a simplification of the problem before us. Contacts between a highly developed country, say Great Britain, and a less developed one, say Argentina, in the nineteenth century, were much simpler, because more one-sided, than between, say, Great Britain and France. This is true in particular for commercial relations and holds often also for financial transactions. These are largely one-sided flows of long-term lending from the developed country and an import surplus from the capital-

receiving country. When countries are nearly of the same degree of development, flows of short-term and long-term funds frequently change direction and sometimes even move simultaneously in opposite directions. It is far more difficult to describe and interpret such conditions.

For long periods similarity among the countries can be taken only *cum grano salis.* Indeed the claim of similarity can be made mainly regarding the fundamental attitude toward financial affairs and institutional setups that express it. The differences in the quantities involved in the financial transactions of our four countries are probably much larger and their distribution is less stable than their institutions. There has been, all along, the enormous increase in the economic weight of the United States. There was also the important reversal of the main direction of the flows of capital: first from Europe to the United States, then—after the turn of the century but especially after World War I—from the United States to Europe.

In spite of difficulties to estimate the economic size, weight, or impact of various countries, there is no doubt that our four were more nearly of the same than any other four would have been. It is now—in spite of the preoccupation with aggregate quantities—not customary in economics to attribute special significance to size.[11] But it will be seen at least once (in regard to the gold standard) that size is a very important, though tacit, assumption of some economic laws.

Besides the time series describing activities for the respective countries, there are others showing relative changes and interconnections between several countries. Finally there are truly "international" series.

[11] Quantitative implications are of fundamental importance when judging the success or failure of some economic policies. For example, a "beggar my neighbor" policy of currency devaluation is possible for a small country in regard to a large but not vice versa, nor among countries of the same size. The problems of size in the theory of international trade were specifically treated by F. D. Graham, *The Theory of International Values,* Princeton University Press, 1948, and earlier. See also the important paper by T. M. Whitin, "Classical Theory, Graham's Theory and Linear Programming in International Trade," *Quarterly Journal of Economics,* Vol. LXVII, 1953, pp. 520–544.

Section 3. Theoretical Discussions of Business Cycle Transmissions

This section contains a brief discussion of the most important *types* of theories or views as to how cycles and other fluctuations are transmitted from one country to another. In section 6 some types of the formal ways in which the contact between countries may come about are distinguished. There is a simple relation between the two: the theories try to give explanations which may fit the formal types that should be distinguished.

The bibliography at the end of this section (page 16) includes all *specific* theoretical writing that has come to our knowledge. The line is difficult to draw because there are comparatively few investigations dealing specifically with the international spread of cycles or even with their international aspects. On the other hand many studies exist, principally in the field of international trade, that have a bearing on the topic without being specifically concerned with it.

The existing theories of the international transmission of business cycles reflect, of course, the great diversities of the basic theories for closed economies. There several dichotomies exist. These two are probably the most important: (1) monetary and nonmonetary theories; (2) theories which attribute contraction and expansion either to changes in investment activity or to changes in consumption levels. Obviously either of (2) can be monetary or nonmonetary. The first dichotomy is not perfect since the division of monetary and nonmonetary theories is essentially a matter of emphasis or convention. But there are wide enough divergencies between the monetary and nonmonetary view so that they can be roughly distinguished. The second dichotomy is at least as old as the conflict between Ricardo and Malthus and keeps on reappearing in various forms throughout the generations.

Whatever the worth of these distinctions may be, it is almost certain that monetary phenomena in the international aspects of business cycles by far overshadow everything else. Nonmonetary theories would be much more handicapped here than they are in the domestic field. The restriction of this study to financial transactions is therefore not a very serious limitation.

Theoretical attempts in this field are greatly hampered by the

following serious difficulty: the fluctuations of economic activity connecting several countries, which must even a priori be thought of as being chiefly responsible for a transmission of cycles, vary in size enormously. It would be easier to describe the *large* fluctuations, involving notably such things as devaluations, free exchange rates, capital flights, going off gold, import prohibitions, quotas, etc. But such descriptions would suffer from these disadvantages: the period of observation for modern times when business cycles under such conditions have been studied is short (essentially 1931–1939) and a statistical analysis could therefore not go deep. Some of these events cannot now even be expressed and assessed quantitatively. Finally by omitting the smaller fluctuation we should deprive ourselves of the help that the current theories of business cycles as a whole, reaching into many parts of economics, are likely to offer[12] (see the end of section 7, below). Furthermore descriptions of this period exist, a period which is also still fresh in our minds; much of contemporary economics was shaped on that rudimentatry experience and put to application in economic policy.

The period 1870–1914 is much milder; the disturbances, though at that time often felt as severe, protracted, and desperate, appear in the light of the events of the 1930's as moderate. As a rule it is easier, and would perhaps be preferable, to theorize about larger, more extreme events, but the above-mentioned circumstances force us to a consideration of the quieter period.

Here is a brief bibliography; it deals only with writings specifically devoted to the problem of transmission of economic cycles. It excludes all works dealing with special aspects, such as the influence of currency depreciations, import restrictions, tariffs, etc. It also does not mention those numerous books that contain only incidental discussions of the international aspects of business cycles. More specialized literature is quoted in subsequent chapters.

[12] It would be possible, instead of studying either theoretically or statistically the interaction among *entire* cycles, to investigate those large, irregular events that are more nearly in the nature of catastrophes. This would, for example, mean a comparative investigation of the international crises of 1893, 1907, and 1929–1931. Economic systems, like physical systems, will reveal very important traits when they are subject to *extreme pressure* of various sorts. Therefore one might discover hitherto hidden phenomena of transmission under such conditions. During the years of study such a plan was indeed partly carried out, but it was ultimately decided that it was better to provide first the over-all picture dealing more often with milder fluctuations. We may return to the other studies elsewhere.

BOOKS:

Clément Juglar, *Des Crises Commerciales et de leur Retour Périodique en France, Angleterre et aux Etats Unis* (Paris, 1862; 2nd enl. ed., Paris, 1889), English translation by De Courcy W. Thom, New York and London, 1893.

Jean Lescure, *Des Crises Générales et Périodiques de Surproduction* (Paris, 1907), 5th enl. ed., Paris, 1928.

Wesley C. Mitchell, *Business Cycles*, Berkeley, 1913.

W. L. Thorp, *Business Annals*, New York, 1926.

Wesley C. Mitchell, *Business Cycles: The Problem and Its Setting*, National Bureau of Economic Research, 1927.

Dag Hammarskjöld, *Konjunkturspridningen: En teoretisk och historisk undersökning*, Stockholm, 1933.

Hans Neisser, *Some International Aspects of the Business Cycle*, Philadelphia, 1936.

Gottfried Haberler, *Prosperity and Depression* (Geneva, 1937), latest ed., New York, 1941, Chapter V.

Tse-Chun Chang, *Cyclical Movements in the Balance of Payments*, Cambridge, 1951.

Hans Neisser and F. Modigliani, *National Incomes and International Trade; a Quantitative Analysis*, Urbana, 1953.

François Visine, *La Transmission des Fluctuations Economiques par le Commerce Extérieur* (Paris, 1953).

Edward Marcus, *Canada and the International Business Cycle, 1927–1939*, New York, 1954.

ARTICLES:

Oskar Morgenstern, "International vergleichende Konjunkturforschung," *Zeitschrift für die gesamte Staatswissenschaft*, Vol. LXXXIII, 1927, pp. 261–290.

Albert von Mühlenfels, "Internationale Konjunkturzusammenhänge," *Jahrbücher für Nationalökonomie und Statistik*, Vol. CXXX, 1929, pp. 801–828.

Albert Aftalion, "Les Variations cycliques irrégulières dans les relations internationales," *Revue d'économie politique*, Vol. XLVII, 1933, pp. 273–291.

Wesley C. Mitchell, "The International Pattern in Business Cycles," *Bulletin de l'Institut International de Statistique*, Vol. XXVIII, No. 2, 1935, pp. 397–403.

Colin Clark, "Die internationale Verflechtung volkswirtschaftlicher Bewegungsvorgänge," *Weltwirtschaftliches Archiv*, Vol. XLII, 1935, pp. 400–442.

J. J. Polak, "The International Propagation of Business Cycles," *Review of Economic Studies*, Vol. VI, 1939, pp. 79–99.

Oskar Morgenstern, "On the International Spread of Business Cycles," *Journal of Political Economy*, Vol. LI, No. 4, 1943, pp. 287–309.

———: "La Propagation Internationale des Cycles Economiques," *Economie Appliqueé*, Vol. II, No. 3–4, 1949, pp. 593–611.

There exist, at least, two unpublished Ph.D. theses: Shan-Kwei Fong, "Business Cycles and the International Balance of Payments: An Application of Period Analysis to the Theory of International Money Mechanism" (Harvard University, 1941): Svend Laursen, "International Propagation of Business Cycles" (Harvard University, 1941).

Section 4. The Institutional Background and Its Changes

The financial operations among the United States, United Kingdom, France, and Germany must be seen against their general background and its shifting character.

The great differences between economic life in the period 1870–1914 and that between the two world wars make it easier to obtain an appreciation of conditions of the earlier period. The outstanding feature then was a unity of the economic world, largely lost after 1929; before 1914 there was freedom of travel without passports, freedom of migration, and freedom from exchange control and other monetary restrictions. Citizenship was freely granted to immigrants. Short-term or long-term capital could move unsupervised in any direction, and these movements could take any form. Direct foreign investments were common and welcome; securities of other countries were freely traded on most stock exchanges. Transfer of profits was unhampered and foreign investments were not confiscated after they had begun to show yield.

Monetary standards in most countries were firmly established on gold and no economic crisis occurred that would have given rise to the belief that a country might be "pushed off gold" by badly functioning price systems. Doubts about the gold standard came only from the political propaganda for bimetalism fiat money but not from a belief that the gold standard mechanism could not cope with whatever difficulties one was accustomed to foresee. Neither was there the notion—at least not in Europe—that this monetary system imposed restraints or hardships upon the various economies such that they would be unable to shake off depressions.

Indeed the monetary systems of some countries were tied together even more firmly by international monetary unions—e.g. the Latin Union—organized so that the money of each member state could circulate freely at par in all other member states. Gold coins of all countries found their way easily in all directions. Some countries, e.g. in South America, for simplicity's sake used British gold Sovereigns in lieu of their own currency.[13]

This must be contrasted with the state of monetary affairs after

[13] This had great but little recognized significance for British monetary policy and, of course, for relating fluctuations of those countries with British cycles. For want of space our material on these matters remains unpublished.

World War I.[14] Immediately after the end of the war confusion reigned, great inflations occurred, some of a hitherto unimagined magnitude (Germany, Russia, Austria, Poland, etc.) but an effort to return to earlier conditions was made and proved fairly successful from about 1925 to 1931. The gold standard was partly restablished but, though many of its operations were seemingly the same, a subtle change had occurred through the introduction of gold exchange standards (mostly in other countries) which caused a dangerous pyramid of credits and a new interlocking of economies thus far unknown on so large a scale. It became apparent only when in 1931 the system of international credits broke down and disrupted the exchange of goods and currencies so that the level of world trade fell—as far as can be ascertained—below the level it had reached before World War I.[15]

In addition the situation was further complicated by the problem of German reparations. Large amounts had originally been fixed; they were later scaled downward repeatedly, and payments were essentially made through large loans floated in Great Britain and the United States. The size of these operations overshadowed anything that had happened within comparable time intervals before 1914. This kind of international borrowing coupled with payments of tribute falls outside the operations that the international mechanism had supported earlier. The flows of capital were now more often than before World War I political and sometimes under tacit or open control of governments or at least central banks.

Earlier, capital movements had been large too, but they followed essentially routes that seemed to secure steady and unhampered international trade. The trade routes provided for ever-increasing exchanges of the products of the whole world, thereby tying nations closer together. Indeed ideas of economic self-sufficiency hardly played any practical role, and certainly were not policy-forming. International trade had to overcome tariffs, but in the

[14] An excellent account of the period may be found in "International Currency Experience, Lessons of the Inter-War Period," *League of Nations*, 1944. The major part of this work is by R. Nurkse.

Studies of a more specialized character are: E. L. Dulles, *The French Franc*, New York, 1929; F. D. Graham, *Prices and Production in Hyper-Inflation*, Princeton University Press, 1934; C. Bresciani-Turroni, *The Economics of Inflation*, London, 1937; W. A. Brown, Jr., *The International Gold Standard Reinterpreted*, National Bureau of Economic Research, 1940.

[15] In spite of the increase in the number of countries which transported former domestic into foreign trade! Such countries were, in Europe alone, Finland, the three Baltic States, Poland, Czechoslovakia, and Hungary.

light of those of more recent years or decades they were exceedingly low. There were hardly any quantitative restrictions on international trade (quotas, import prohibitions, etc.).[16] In short it was a world widely different from the one between the two world wars; it was a world of which recently many, and now perhaps more, would have been inclined to assert that it could not be created because it could never work.[17]

It is also noteworthy that international financial and commercial transactions before 1914 were among individuals (and corporations) and rarely among countries dealing as a whole. This is a corollary to the absence of quotas and the like and the prevalence of tariffs, if any. These operate merely like freight rates and therefore goods could be moved whenever price differentials were favorable. National boundaries were thus of small importance, as was the fact that most countries had different currencies. Indeed the theory of international trade encountered great difficulties when it tried to show precisely where the peculiarities of international trade separated it from domestic. This similarity went so far that some authors considered both to be special cases of the problem of regional trade. On the other hand the theory of international trade not only remained largely within the domain of the antiquated theory of labor value but also persisted in treating the relations of two and more countries as if they were trading as units rather than through their individuals.[18] However in the special case of financial

[16] There were beginnings of political quarrels. A good example were the squabbles over Serbian hogs between Austria-Hungary and Serbia, where all sorts of tricks were resorted to. What was then an anomaly became a standard after World War I. In both cases wars followed.

[17] It should be borne in mind that czarist Russia and the Ottoman Empire, both autocratic states, could not be included in this picture of freedom of movement for men, goods, and money as far as Europe is concerned. The same applies to Japan and to the interior of China.

Travel without passports, immigration, and settlement otherwise were possible all over the world—certainly a different world compared with anything known since 1914! Some countries, like Canada, even paid the fare of immigrants from distant continents. This one illustration alone, if properly thought over, and, for example, compared with the current immigration rules of the United States, should serve more than any further elaboration can do to demonstrate the profound difference in world economic relations and in the economic ideologies even of countries purporting to adhere to free enterprise and nonintervention.

[18] In that respect the theory is even today inadequate inasmuch as these situations are described—like all exchanges between 2, 3, 4, . . . individuals—as if simple maximum problems were given. However they are not maximum problems at all but complicated mixtures of such; they can therefore not be treated in the conventional manner. Cf. John von Neumann and O. Morgenstern,

relations the analyst is largely independent of the labor value assumption as well as of the notion that nations deal with each other as units. Instead the underlying picture does conform with the assumption of individual contacts carried out through the medium of large open markets.

Control of varying degree was exercised over financial operations, speaking now only of the period before 1914 (cf. pages 364 ff.). Its existence is often very difficult to determine. For example it is common knowledge that the Bank of England repeatedly intimidated the commercial banks by showing displeasure at some acts;[19] such warnings were heeded lest direct sanctions and squeezes might be applied. The other central banks were not better in that respect, though all of them denied the existence of nonmarket practices. In the United States some of the central bank functions were assumed by the Treasury but the market control was always weak and uncertain. The beginnings of attempts to control the business cycles—or at least special phases or parts and appearances of it—were present in the different countries. Some, like the far more ancient open market policy, easily fitted into the monetary mechanism.

But in general, governments, while interfering increasingly in economic matters (perhaps most in Germany, least in the United States), did not conduct a real and deliberate business cycle policy in the modern theoretical sense. They interfered in particular crises only to withdraw again swiftly. Individual instances of the advocacy and sometimes even application of policies of more advanced nature are, however, found in the forty-odd years preceding World War I, such as the idea of compensatory budgets, public works, buffer stocks, etc. Some of these even go back to the old Egyptians and are described in the Bible.

Another characteristic of the period that has at least to be mentioned is the large increase in population in the chief industrial countries. There was both a natural increase and in some states an

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Theory of Games and Economic Behavior, Princeton University Press, 1944, 3rd ed., 1957, Chap. I.

It is interesting to note that the theory has preserved its original state—monopolistic-mercantilistic outlook (though the subject matter has temporarily changed profoundly)—without developing techniques adequate for the analysis of monopoly.

[19] Such behavior of the Bank of England is really in violation of the rules of the game as generally understood; they mark a wide divergence from the quantitative credit control that was—allegedly—exclusively practiced during the gold standard period.

increase by immigration also, notably in the United States. The increase supported many rising trends—in production, consumption of food, etc.—the migrations linked countries previously in loose contact. New flows of money were initiated through huge immigrants' remittances (e.g. from the United States to Italy) so that the balances of payments of the receiving countries were greatly affected. It was notorious that shipping profited from emigrants perhaps more even than from the ever-expanding world trade.

The general competitive economic expansion was accompanied by the increase or creation of colonial empires with the natural consequences of political tension among the colonizing powers. There were colonial wars but they did not leave deep scars. There were also other wars such as the Spanish-American, the Russo-Japanese, and the Balkan war, but they were localized and occurred at the periphery of economic centers. In some European countries standing armies did call for great armament industries and the race for naval superiority between Great Britain and Germany had great influence upon some industries. In the United States these factors played a negligible role.

The aforementioned countries were institutionally the most *similar* in the world (of the *larger* countries) during the period 1870–1914 and probably still so after World War I. Others may have been in much more intimate relationships, but this would not be typical and would create an additional, different problem (such as the relationship between, say, Great Britain and Denmark). In these latter cases we speak of a complementarity relation based on division of labor. These relations are important and interesting, but the case of the similar countries (cf. page 22) offers greater inducements. If complementarity exists and the size of the two countries is as widely different as that of Great Britain and Denmark, then this case becomes more akin to a regional relationship.

If the (weaker) relationships of similarity between countries of more nearly the same size exist, then the problems with which we are dealing arise in full force. If it should turn out, however, that the closeness of relationship in this field is not so great as is commonly assumed, a significant fact would be established. Similarity need not imply close contacts, but these are quickly established among freely trading countries. If it were a similarity among state monopolies and autocratic countries, then we might have similarity with few and minor contacts. But such conditions did not prevail before 1914—at least not among our four countries—although after

1925 they began to develop. The Soviet Union was so organized from the beginning and in spite of its immense size played only a negligible role in the trade of all other nations (approximately two to three per cent or less in world trade).

Lack of contact among nations where contact is to be expected would lead one to carry the investigation further into the field of those (possibly also institutional) factors which would account for the difference in closeness. These might sometimes be of a less tangible but nonetheless powerful nature. They might, for example, lie in deliberate policies, in variations in the spirit of enterprise, in differences of population growth. These would then be factors that would have to be added to the other institutional ones which were similar. In other words, aside from the objective, physical differences, the same formal institutions can be made use of in widely different ways.

It is a common source of misinterpretation of historical evidence to consider only the structural, static side of institutions as laid down in formal rules, charters, etc. What really matters is how they are handled and enforced. This becomes the more important the greater the latitude which the rules may, even expressly, leave to the functioning organs.

In the field of finance this point of view becomes particularly significant. It is likely that the customs (usances) of financial markets differed more widely than their objective (physical) institutions. We shall encounter several instances of this. It is impossible, however, to take them fully into account because too little is known. Here is a very important field for economic research.

"Similar countries" imply, of course, that they are essentially comparable, also as far as their general economic development is concerned. This enables us to assume, e.g., that certain short-term and long-term interest rates really perform as nearly the same function as is technically possible (although their names may be quite different). If a complementarity relationship obtains, then there need be no similarity among the organizations and the development of the respective countries.

A colony is both undeveloped and dissimilar; it need not be complementary either. In the relation between Great Britain and Denmark, on the other hand, we have two highly developed economies, but also great dissimilarity, insofar as the first country is large and chiefly industrial, the latter small and predominantly agricultural.

The same degree of development is thus a necessary but not a sufficient condition for similarity.

Section 5. Transmission of Shocks and Cycles

We are interested primarily in first describing and then interpreting the *transmission* of economic fluctuations from one country to another. This is evidently a much more complicated enterprise than merely to *compare* the cyclical behavior of various important economies. The comparison is, however, the first step[20] and may help us to formulate hypotheses about the discovery and the nature of transmissions.

Obviously fluctuations need not be transmitted from one country to another. The countries—although open—may have such weak links that whatever stimulus is received by one is easily and entirely swallowed up by the much stronger domestic forces. Or the size of the countries and the magnitude of a fluctuation may be so different that transmissions become wholly one-sided. Yet for other reasons, there may be a great similarity in the nature and timing of their cycles, and even a more than superficial inspection of the statistical materials might support any number of hypotheses. Comparison of the similarity of unconnected, different cycles in various suitably chosen countries has at any rate the great merit of greatly increasing the number of cases upon which generalizations about economic fluctuations can be based. We study successive cycles within one country and try to generalize about them, although we have to bear in mind ultimately that they are probably interrelated and that structural changes affecting them have occurred. These same factors have, naturally, also to be considered when comparing cycles of different countries in which the differences in the institutional setups probably weigh more than their (unknown or only partly known) interrelatedness. And finally, consecutive institutional changes have happened in all countries, sometimes in the same general direction (e.g., greater development of the money and credit economy everywhere).

If it is at all true that every business economy with extensive use

[20] A science that has to make extensive use of comparative analysis is in an early state of its development. It is an indication that its proper method of research has not yet been found. An illustration is offered by biology, which until recently was in this condition.

of money and credit necessarily exhibits rhythmic fluctuations, then, given a sufficiently large number of countries, it is not surprising to find several countries in the same phase of the cycle. This is indeed what the "conspectus of business cycles"[21] shows. It constitutes valuable information because it tends to corroborate the thesis of the necessity of fluctuations. But it does not allow us to determine which cycles of these countries, being in the same phase,[22] are caused by separate forces, or by the same forces affecting them together, or are transmitted by some to others, that may or may not belong to the same group, i.e., which are in the same phase.

It is convenient to distinguish three types of transmission of economic fluctuations in the order of rising difficulties of assumptions:

(1) *Inducement of shocks.* The most natural idea is to think of an erratic shock (e.g., panic, war, inflation) that is imparted by one country to another. The first country is thus itself exposed to a random disturbance which it transmits as such to others. There is undoubtedly evidence in economic history for this type. Indeed it is one that has attracted the interest of economic historians, just as the theory of economic fluctuations originated in the study of individual crises and disturbances the successive interrelations of which were seen only after a long time.

In order to be able to speak of a "shock," a minimal *intensity* of the disturbance must be postulated. That may differ for the various countries widely, depending on their size and the momentary state of business. A shock may, for the receiving country, merely be a certain minimum size or amplitude of a disturbance abroad which, if milder, would not cause any difficulty.

It will make a big difference whether this shock, producing expansionary or contractionary results, comes during an upturn or a downturn of the domestic economy, which of its parts is directly affected, and what the magnitude and duration of the shock is.[23] Evidently these variables can assume a great number of values, and many significant combinations are possible. Their analysis would consist essentially in a breaking down of aggregates and in dis-

[21] Cf. W. L. Thorp and Wesley C. Mitchell, *Business Annals*, National Bureau of Economic Research, New York, 1926. See also Chapter X below, where an attempt is made to obtain a conspectus of international crises and tensions that do not all show up in the comparison of the first kind.

[22] That is, their economies are simultaneously either in expansion or in contraction; or, if not for the whole of these phases, at least for certain parts of it, etc. See Chapter II for further details and the first applications.

[23] Sometimes it will be of an "extreme" nature. See also note 13.

tinguishing many channels through which influences become active, precisely as was done in the beginning, and still incomplete, application of Cantillon's theorem in monetary theory.

(2) *Shock-Induced Cycles.* An isolated shock of sufficient strength could give rise to a full cycle in the receiving country if it came at an opportune moment. This may, for example, be quite typical if the origin of the disturbance is a war abroad. One might be inclined to speak of the transmission of a cycle in this case, while in fact a cycle was merely induced by a much shorter movement, itself noncyclical. This is certainly a more complex form of relationship between the two countries than if the shock causes only internal disturbances in the second country, as random in nature as the initial occurrence in the first country. In many ways it is a very natural assumption, especially if the shock is large,[24] as for example, in wartime. Neutral countries are exposed to this kind of influence and as a rule they go through an inflationary expansion during, and a contraction after, the war though in a milder form than the warring nations. Other cases, not related to war, could probably be found. The empirical verification of this assumption is difficult, especially if all countries, or at least the receiving country, experience cycles anyway so that only a modification of their basic, underlying cycle occurs.

(3) *Transmission of Complete Cycles.* The complete cycles of two or more countries are dependent upon each other. This would entail dependency phase by phase, with perhaps some constant or varying shift in timing and with effects running from almost complete parallelism to almost complete inversion of phases in the two countries.

Under this assumption very much more is implied than in the preceding two cases. The elements whose variations have to be studied have multiplied enormously. A very close form of contact between the respective countries must exist, and the nature of the contact should be made fully explicit by empirical investigations.

The idea of *continuous influence* throughout the two cycles, which necessarily must be made, while strong, is weaker than the assumption that this influence is itself *variable*, i.e., the closeness of this (continuous) influence can itself be subject to (possibly even

[24] A precise and complete definition of a shock would have to contain quantitative statements about the minimum and maximum strength, duration of the impulse, etc. But we need not concern ourselves with this here. In economics this formal possibility seems to have been mentioned first by K. Wicksell. It is of course common in physics, from where the idea was taken.

cyclical) variations. Whether cyclical or not, this important possibility is in the nature of an extension of the remark at the end of (1). It is likely that the mutual influences exercised by the economies of two countries are stronger when both are high in cyclical expansion than when they are both around the lower turning point. For example, an economy is far more susceptible to disturbances when it is late in a boom, and soon afterward, than when expectations are low but not deteriorating, prices and interest rates have stopped falling, and there are good possibilities for expansion with a large supply of labor on hand.

Similarly when one country is still contracting and the other already expanding, the first may receive a stimulus from the second or it may pull down the second's expansion. The conjunction of a food harvest in one country with a bad one in another may accomplish a turn, as is well known from European-American experience, e.g., in the 1890's.

One of the reasons why variations in the speed, direction, and extent of a transmission of fluctuations may occur lies in the fact—also observed for national cycles—that some forces begin to operate perceptibly only at certain stages of the cycle. For example, when credit facilities at home become less ample, many turn abroad for additional capital; the same is true for the demand for raw materials, etc. So it is only after definite stages have been reached that the activity in one country springs over to another—depending, of course, upon the simultaneous condition of business activity there. The number of possibilities, especially when several countries are involved, is very large indeed.

Finally two other forms of possible transmission may fit one or the other of cases (1) to (3).

(a) There is the possibility of transmission by *imitation*. Difficult to establish statistically, it is of importance, especially in the financial field. Various attempts to build a psychological theory of national business cycles have been made. They have in common the stimulus exercised by one successful development upon other possibilities, so that one cumulative process tends to set another, parallel one into motion. In the international field, too, there is wide room for a similar play of psychological factors. A brisk upward movement of stock market prices in one great financial center has often caused similar price rises elsewhere, though there may have been little direct, physical connection through intermarket sales

between the movement on the leading market and the others.[25] The psychological infection can proceed very rapidly. Simultaneous (or almost simultaneous) turning points (especially upper turning points) in different countries might sometimes be accounted for in this manner when there were no visible signs of a transmission through more familiar physical channels, such as foreign trade.

(b) *Summation of Foreign Influences.* An economy is exposed to influences emanating simultaneously from several other countries. Each single stimulus may be comparatively weak, some may cancel out, but the others may add up to great strength. The various single movements may fall in any one of the three types distinguished on pages 24 ff. so that a still wider variety of types of influence has to be accounted for.[26] These would all be more realistic than those earlier simplified types and, as in every approach to fuller reality, the difficulties increase at a tremendous rate.

This may be likened to the determination of the common effects in a given area of a pond into which at various distances from that area stones of different size, from different heights, and at various intervals are thrown. The task would be to determine the interference of the different waves and to describe the upheaval in the original zone. No physicist, even having access to electronic computers, would enjoy this computation.[27]

If these impulses are continuous or at least regular, though intermittent, they may—perhaps even periodically—cumulate in an internationally induced cycle of the country in question, or in an "international business fluctuation" within one and the same country.[28] That is why a deepening of the studies of this problem might

[25] The New York Stock Exchange opens during the closing minutes of the London Stock Exchange and for long periods generally took its lead from the closing prices there. The London Stock Exchange, in turn, starts with the information of the previous closing prices in New York, etc. See Chapter X for the phenomenon of "imitation." Internationally traded securities, woefully neglected in studies on international finance (cf. Chapter X, section 2), are a powerful link between the various national stock markets.

[26] We shall entirely neglect the question whether the summation of influences emanating from different countries is additive or not, in which latter case still further, very serious difficulties arise. They are of the same type as those encountered in the composition of individual time series from their individual components. The problems of the generation of cycles from random disturbances and their summation have been investigated mathematically.

[27] Although hydrodynamics is enviably far advanced, compared with anything in economics!

[28] About *regional* studies and their relation to the theory of business cycles, cf. especially various papers by R. Vining. But the concept of a geographical

contribute to our understanding of the international relationships. To give an example, there can be little doubt, despite permanent differences in interest rates between the east and the west, that the money markets of New York and San Francisco are more closely related to each other than the New York money market is to the New York clothing industry or building trade. The same applies, *mutatis mutandis*, to San Francisco and the respective industries of that city. And the connections between the New York and San Francisco construction trades are at the same time practically nil (with present technology).

The better developed are two national economies that come into contact with each other, the more numerous will these special channels be. But they will not all have the same significance. Especially will they be of different importance, depending upon the direction in which the influence flows. If country A imports from country B a given raw material (which may be B's chief export,[29] or at least its chief export to A) it will certainly be susceptible to the fluctuations in the output of that raw material. But this raw material is only one of many and perhaps, besides having substitutes, enters into many different uses and industries in A. Hence there is widespread diffusion of these fluctuations in raw material output.

The explanation of the contact between two or more countries is of course given by the supposed mechanism that constitutes the object of the theory; this was discussed in section 3. Assume then that we had found several such mechanisms. There arise among others these questions, (a) to what sort of stress they can be subjected, and (b) whether the number of these mechanisms is necessarily stable.

Regarding (a): each mechanism will operate by variation of the factors through which it functions. For example, if exchange rates are for long periods near one of the gold points, the response to *changes* of the rate may be different than when the rate is near parity, etc. Some economic mechanisms will work properly only if the various component economies are of some acceptable relative size to each other.[30]

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region differs considerably from our present notion, which aims at overcoming the restrictions of that nature. There is a relationship in the two attempts and it is better to stress that rather than the differences.

[29] The Philippines are a case in point: copra is its main export but the country does not control its price.

[30] This is particularly true of the gold standard. It seems to be a question that was largely neglected.

Regarding (b): it is likely that each mechanism of transmission will stand only a certain maximum variation of factors without breaking down and causing another one to be put in its place. These maxima are not easily determined, if known at all, though their existence is almost certain. The strains to which the different gold standard mechanisms (as forms on which the transmission depends) can be exposed are definitely limited. There are, for example, the amounts of gold reserves, the limits of the compressibility of prices (especially wage rates and wage incomes), etc. If these stresses are exceeded, other monetary systems, such as managed currencies, take the place of the gold standard. Gold exchange standards have different limits. One may assume the number of possible mechanisms to be large.

The contacts between cycles in different countries can therefore change (1) because of the more or less intensive use of the facilities offered by a given mechanism, or (2) by transition to another technique, where again the variations of type (1) may occur.[31]

The *speed of the transmission* of fluctuations for each mechanism is an exceedingly important issue that influences especially the choice and treatment of the statistics and the character of the time series (see the discussion of arbitrage exchange series in Chapter V). These speeds (which often, but not necessarily, are the speeds of reactions to stimuli differ greatly with the various spheres. They are great in the major parts of the financial field, possibly also in the area of some foreign-trade transactions (e.g. raw material markets), slower as far as emigrants' remittances are concerned, and in the case of direct investments (though these latter two are financial operations!), etc. In each case many observations must be made that have a direct bearing upon the statistical requirements. We mention one that supplements what was said on page 10: Clearly the data should be for a time unit shorter than the reaction period. This will be difficult, nay impossible, in those important cases where arbitrage plays an effective part; this is true of exchange rates, interest rates, gold prices, and gold movements, etc.; in short, in almost all fields which we shall have to touch. Instead we have to use data of vastly longer intervals. This has an important bearing upon the interpretation of our series.[32] Without consideration of the speeds of reaction, simple

[31] It would be wrong, however, to assume that the transition from one mechanism to another could (or would normally) only happen under stress, i.e., after a given one has proved to be inadequate.

[32] For example, the successive observations can, with some further restrictions,

criteria as to what constitutes satisfactory data in respect to the time intervals are apt to fail. A speed of reaction on the other hand is a concept that cannot be well formulated without some model showing interaction.

Unfortunately the entire field is little explored. The traditional equilibrium theory has not incorporated investigations into varying speeds of reactions to economic changes[33] and it probably is not able to do so systematically. These are all quantitative questions of great complexity, because it is likely that the reaction speeds are not constants but vary (in the same direction) with the magnitudes of the changes observed. Thus a transmission from country to country may be greatly speeded up if at the beginning the events suddenly assume great magnitude.

The types of contact among national economies are apt to become fewer, if *aggregates* are formed of economic quantities. Which degree of simplification to choose and at what price is a question that can be answered only in practical experience and it will largely depend on the nature of the statistical material.

As one result of the formation of aggregates, one is led to expect at given times a clear-cut flow of influences in one direction only. But one must not exclude the fact that at the same time, even within the same financial aggregate, movements go in the opposite direction. Long-term capital, for example, moving from country A to country B, and immigrants' remittances may both be transferred in the direction opposite to the flow of capital from B destined to be invested in an active stock exchange of A. This situation is likely to prevail in the financial sphere, where the various channels, though they communicate quite well with each other, often relate to widely different activities (even within one and the same country). Immigrants send their remittances at times when they have saved up, or when needs abroad develop, and not just when a short-term flow is also proper in the same direction. All this would be buried under changes of "net" positions. Price level changes may have more to do with the time when proceeds of long-term

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be considered as *independent* of each other; this should be remembered when studying our frequency distributions.

[33] The problem, which is one of great importance, seems to have been noted first by M. Pantaleoni, "Di Alcuni Fenomeni di Dinamica Economica," 1909, in *Erotemi di Economia*, Bari, 1925. See also O. Morgenstern, *Wirtschaftsprognose*, Vienna, 1928, p. 61 ff. It has appeared in a series of later writings and is mostly discussed in the framework of the Lausanne equilibrium theory.

loans are used than with the level of long-term interest rates at that moment, etc.

Thus we ask: how, for any separate field (as, for example, the credit volume), can one isolate *quantitatively* the *autonomous* (national) from the *internationally induced* changes? The statistics show the *total* phenomenon which is a composite of these two groups of influences. Is the composition *additive* or does it obey a more complicated principle?

Their separation would be analogous to the disentanglement of various components working upon a given single series within one country alone. If the separation of these components had been achieved fully and if powerful methods were available, could one be expected to take the additional, and perhaps bigger, step? This is therefore the inverse process of aggregation, a problem already encountered above.

With all due regard for the work so far done, these aids are not available. Even where such familiar questions as the unique separation of seasonal, random, and trend fluctuations from cyclical for a single time series are dealt with, much uncertainty still prevails. The reason is, of course, that these questions are not simple at all.[34]

[34] Perhaps the clearest and most penetrating treatment of the chief logical difficulties involved in the decomposition of time series is to be found in the first chapter of A. Wald, "Berechnung und Ausschaltung von Saisonschwankungen," in *Beiträge zur Konjunkturforschung*, Vol. IX, Vienna, 1936.

Wald distinguishes between the "external" and "internal" definitions of the various components. The first give our general, intuitive, and descriptive knowledge, the second are mathematical expressions approaching the former as well as possible. Ideally the two should coincide, which is another way of saying that our external definitions should be of a quantitative nature and should enable us to state also quantitatively what is meant by the "influence" or "effect" of each component upon the entire series. Of course we are far from being able to do this completely in economic statistics even in the much studied field of seasonal variations. Therefore we must by further descriptions try to make our external definitions ever more complete, hoping that thus better and better suited (i.e., very narrowly delimited) corresponding mathematical expressions can be substituted for them. These are chosen from a naturally infinite number of available mathematical functions.

In the analogous case in the text requiring segregation of the international component in the variations of our time series we must first supply external descriptions, possibly even external definitions, and show that a strong case for their plausibility can be made.

A discussion of the logic of decomposition of time series, together with a more detailed study of the nature of cumulative processes (e.g., "feedbacks") and their implications for statistical work cannot be given here. The author hopes to be able to publish his studies of these matters at another occasion.

When factors are isolated as those through which foreign influences pass, it will be observed that some of the time series thus formed show frequent and perhaps extensive variations while others may run a more even course. The first are thereafter called *sensitive* and the second insensitive (or rigid). This is customary, for example, in price analysis. It is advisable, however, not to use this terminology freely, because it is beset with many difficulties and a great deal of vagueness that seems to have escaped attention so far. In order to classify phenomena as more or less "sensitive," the *strength and continuity (or frequency) of the force* operating upon the elements, about whose sensitivity statements are made, must be described and measured.

If, of two economic quantities, one moves in wider amplitude than the other or more frequently within a given unit of time, we still have to give meaning to the statement that the first is more sensitive or elastic. We must observe more. It may be that the forces operating upon the latter have been incomparably weaker or occurred less frequently and that it responded exceedingly well to them.

Movements of one quantity may *precede* those of another and then we use the word sensitivity in regard to this lead-lag relationship. Such observations can be valuable, but if not fitted in a body of thoroughly understood interdependencies, they can prove to be quite misleading. They are only of symptomatic nature, signaling the arrival of change elsewhere; therefore these leading series may be of minor importance taken by themselves.

But we hope that a contribution can be made toward giving some of these notions of sensitivity to international influences better empirical foundation as we go along. We shall find that the "effort series," measuring the stress upon international money markets, comes nearest to the desired sensitive series (cf. Chapter VII).

Section 6. World Economy and World Business Cycles

In scientific and popular literature one encounters often the notion of a *world economy* and statements about the "world economic situation," the "world crisis," "world business cycle," etc. The attempt was even made to establish a separate discipline of "world economics." Statistical yearbooks list "world prices," figures on world production, and the like. Production figures offer no difficulties, since they are obviously only the summations of the

outputs in different nations or regions. But what some of the other notions mean is not so clear. For example, what are world prices and world markets? And where does the world business cycle occur? What is its relation to all the domestic cycles over the whole world?

Consider first *world markets* and the *world economy:* of these two notions the first one is least objectionable and indeed offers no particular difficulties. World markets exist for cotton, copper, wheat, sugar, coffee, etc. but not for labor, buildings, railroads, etc. The former are markets within specific countries that are directly open to the business of other countries. The transactions at these markets may move goods that are already in the country where the market is located, but more often the trade may concern shipments from second to third countries. Then these markets are more truly markets of the world. The respective domestic markets in other countries (and sometimes that of still others not involved directly in the transactions) orient themselves to the events at these dominating places. The interrelationship of these dominating markets for different commodities is difficult to describe, if only because they also communicate intimately with the domestic economy of which they form an integral part.

The usually highly competitive world markets are situated in different countries, although Great Britain did, before 1914, have a majority of them. There must be free interaction among the different countries. Sometimes the centers shift from one country to another, as, e.g., sugar from Liverpool to Bremen. Such shifts are usually the expression of deep-lying changes in production, or transportation, or in the financial setup of a country. World markets exist mostly for staples, like grain, wool, cotton, sugar, coffee, etc.; but also such objects as diamonds must be mentioned where, however, there is a world cartel. As soon as diversification of products or a decrease in their mobility (often identical) is noted it becomes impossible to speak of world markets. This is notably the case for labor. The prices of these factors may nevertheless exercise influence upon each other, but only in the very indirect way of affecting price levels, prices of export and import goods, etc.

From the point of view of the individual economy not everything that occurs outside it is part of that "world economy" to which the daily parlance refers; it is true merely of a few of these outside events. *The "world economy" may therefore simultaneously*

represent something quite different for different economies and even for different parts of the same economy. The money market of country A may be linked to those of countries B and C, but its raw material market with those of countries D and E, the market for finished export goods with still another set of countries, etc. For countries B,C, . . . the arrangements may be different again. Hence the interrelationship of even a few countries can conform to a rather complicated structure, the question being, in a more appropriate terminology, to determine which national markets intersect—i.e., have elements in common—with which other national markets in the sense of actual trading, arbitrage, imitation and orientation.

To specify further: influences exercised upon a given community from, say, the "world money market" always originate ultimately in particular national money markets; sales for export to the world market mean ultimately exports to specific countries, etc. It is always possible in principle to identify these various national markets and as a rule it will be desirable to do so.

An exception must be made, however, for a few international series which describe economic activities that cannot be uniquely attributed to any particular country. Such a case is offered by the tramp freighters that roam the seas and take any business that comes their way. Norwegian shipping, for example, largely performed such functions. The profits enter the Norwegian balance of payments, the transactions themselves those of many other countries. One might therefore expect figures of this type (shipping, cargoes, line and tramp shipping volume, freight rates, marine insurance rates and volume, traffic through international canals, and—last but not least—receipts and profits of international gambling casinos) to give an excellent description of "world conditions." Such series are exceedingly difficult to collect. They do not always show international turning points and the like very clearly but have nevertheless great value in that direction. It turns out that in many instances their turning points seem to be governed more by wars and trend-factors than by the cyclical changes in the countries to which they refer.[35]

If it is difficult or even impossible at present to speak unambiguously of a world business cycle, what then shall be done about

[35] The author has collected such series, but for want of space they are not published in this work as is some other material pertaining to gold, gold points, etc.

dating the events so that a simultaneous occurrence or a transmission of fluctuations can be discovered, measured, and interpreted? If there were a world business cycle, then we should be able to determine its properties by a thorough statistical analysis. These could then be compared with the national reference cycles. In this manner the national cycles could be analyzed in respect to leads, lags, and amplitudes[36] in a comparison with these convenient international cycles.

As a first step this would be exactly analogous to the analysis of a (national) time series with respect to its reference cycle. The various national reference cycles would stand in the same relationship to the international that the specific cycles enjoy with respect to the national reference cycle. This would give far more information than a mere conspectus of reference cycles in various countries, in which these are simply and directly compared with another.

Extending this approach further, let us consider some possibilities that can easily be tested and will seem intuitively plausible. They are natural applications and extensions of what was said in section 6 about the specific forms of contacts among different national economies and of specific spheres belonging to several ones.

Thus the reference cycle of country A may serve as the "international" reference cycle for countries B,C,D, etc. if the changes in the economic conditions in country A constitute those "world" influences that matter for the others, in comparison with which the influences from E,F, . . . can be neglected. This is evidently the case when the economy of country B is essentially "dominated" by that of country A. It might have occurred some time in the past between, say, Great Britain and Argentina. Then Argentina's exports of a few staples, its chief products, did not depend only on specific British markets but (as in the case of Argentina's meat and wheat) chiefly on the variations of the vast aggregate income of British consumers. Fluctuations in British consumers' income, in turn, can be explained only in terms of the entire, complex machinery of the forces that generate a British business cycle (which in its turn will also be highly influenced from abroad). In this case British *reference* dates will have to be used when measuring the significance of fluctuations in Argentina's exports and deter-

[36] Theoretically only; present reference cycles do not yield information about amplitudes, but another method might, e.g., when national incomes can be used.

mining the main "international" influences for the Argentinian economy.

The situation is fundamentally the same when the countries are complementary only in a few specific lines of production or other markets. Then the movements of a particular times series of country A—describing the changes, say, in a single industry—as represented by that industry's *specific* cycle would show the chief "international" influence for country B. For that reason the characteristics of that specific cycle—and not those of A's reference cycle—provide the reference-date measuring rod required to measure the international timing relation of country B to country A, on which it depends in this particular line. In such a situation one could trace an international spread of business cycles, as far as timing is concerned. Rubber growing in Malaya and the United States rubber industry are a good illustration. Another example would be to take the specific cycles of the London open market discount rate as the reference dates for the specific cycles of other countries' open market rates on the assumption that these depended on the former as an expression of the leading role of the London money market.

But in this case, as in the majority of others, no simple complementarity relationship of the stated kind prevails between these countries. Therefore the findings of reference date analysis become much more difficult to interpret. These are also the most typical cases, e.g., it cannot be denied that (before 1914) the short-term and long-term interest rates of France and Germany influenced each other[37] and that both stood in a peculiar relationship to those in London, which probably "dominated" them. But the questions are: precisely how did this relationship manifest itself? Was it continuous? Was it stable under pressure? How do we measure "pressure"? Did it undergo changes that can be expressed as functions of the general business cycle in each particular country? All this should of course be answered quantitatively.

Summarizing, we can say that the notion of a world business cycle may assume a more concrete meaning when one has delved deeper into the study of the related phenomena. But that knowledge must be built up from individual elements and the cycle cannot simply be postulated. It was also seen that the underlying idea of a "world economy" is not very tangible and does not open up

[37] That is, between these countries! There is of course also the dependency of short-term and long-term rates within each country. About all this cf. Chapter IX, section 5.

any particularly attractive avenues for the study of the international transmission of business cycles—either as a whole or along specific lines.

Finally we shall raise the question, already alluded to, whether the cyclical approach is such as to be recommended even when no vague notions of world business cycles are involved. In other words one might form the notion of *world disturbances* without maintaining the complicated hypothesis of their cyclical character. It is indeed easier to locate and identify isolated perturbations of major character. They manifest themselves in a change of the *relations* of the activities of the various countries, which, though difficult to describe, are more easily accessible than a world business cycle.

As can be seen for national reference dates (cf. Table 1) certain dates that we know to have been very great world crises do not even occur there. This does not mean that the determination of national turning points (especially upper turning points) is at fault; it does mean that mostly during contractions phenomena of crises occur which are far more spectacular than the turning points and possibly even more important. In the minds of the people October 1929 in the United States and the summer and fall of 1931 in Europe weigh far more heavily and led to far more important business *decisions* than any upper turning point nearby (in fact preceding these dates). These dates are also, without any question, of major international significance. They can indeed be discovered more easily than cycles with which they may, but need not, be associated. It would therefore be quite satisfactory if such a list could be established, the individual crises studied and taken as the basis for further generalizations.

Such a procedure might influence the techniques and the kind of material to be collected. Instead of long time series, their analysis and correlations, particular historical instances would be studied. This may seem to be an inferior method, but it need not be so. The selection of special periods for almost microscopic analysis is a very useful procedure, particularly when the guidance of an already established theory through the mazes of data is still lacking. If such a critical period is one of sharp and even violent movement, it may contain and therefore reveal, in accentuated form, elements of crises that are prevalent in all.

For example, we probably know more today about financial crises, connected with (if not even produced by) exchange precisely

because these controls were applied to the very limit (e.g., death penalty for violations) in the 1930's. This was not the first time they had been used, but never before had they been pushed to such extremes. Very likely our knowledge has gained much more from the examination of this one occurrence than if there had been a dozen minor ones. Now we also understand the earlier events far better (those after World War I, South American policies before that war, etc.). The same is notably true of inflations. The study of the excessive inflations of the period after 1918 has no doubt greatly contributed toward our understanding of the much milder inflationary processes that occur during most business expansions.

Studies in a similar vein recommend themselves in the field of the international spread of economic fluctuations. There were the great international crises of 1873, 1893, 1907, etc. and it is possible to study them and the period preceding and following in the hope that this may lead to the discovery of the mechanism at work.

The selection of particular, extreme cases for more minute investigation is nothing new in economics. Aside from the work of Juglar and Jevons—who were concerned with entire cycles—for the most part individual crises that stood out from among the minor and therefore less interesting fluctuations were investigated. It was not until in 1913 Wesley C. Mitchell's *Business Cycles* appeared that the two approaches were merged.

At present it is impossible to make a definite choice. In this work long time series are analyzed, but we leave the way open for a conspectus that does not primarily depend on cycles and their turning points but assembles what information can be obtained about crises that may or may not coincide with turning points,[38] or may even have nothing to do with cycles.

[38] In the course of the preparation of the present work a serious effort was made in the direction of the study of individual crises. The selection of the two periods 1907–1908 and 1929–1931 recommended itself. World War I separated them, yet they were truly international, had essential financial features, and material could be collected for both. Extensive chronologies were established for the four countries and special data, not available in the time series used in the following chapters, were collected. Though this was a very promising undertaking I returned to the long series because the detail required in the other approach—should it lead to more than a repetition of known facts —was too time consuming and without promise of reward while one was limited to only two crises. The greatest obstacle was, however, the lack of a real theory of transmission of fluctuations which would have given the necessary background. It is greatly to be hoped that individual analyses of the type discussed in the text above will be carried out—preferably together with the writing of those additional business cycle histories that are so sadly lacking.

Section 7. Plan of the Following Chapters

This book is essentially concerned with financial operations; thus we shall have to investigate in the main short-term and long-term financial transactions, interest rates, foreign investments, exchange rates, gold and security movements, and stock markets. National incomes and balances of payments would loom large in the picture if useful data for long-term periods were available; that is of course not the case.

Our procedure will essentially be descriptive, but we shall connect the description with as much analysis and interpretation as is feasible. Instead of theory illuminating the facts or leading to new ones, the facts will more often be found to be very uncomfortable for the theories. We do not aim at a general theory of the field covered nor would a theory suggest itself readily. However we hope that the reader will accept the general, fundamental attitude even if he should regret to see the facts not as complete as he wished, the statistical techniques and methods not as powerful as they should be, and the theories somewhat damaged without adequate replacement.