CHAPTER I

INTRODUCTION

§ 1. Purpose of the Study

The purpose of this series of studies is to submit to statistical test some of the theories which have been put forward regarding the character and causes of cyclical fluctuation in business activity. Many of these theories, however, do not exist in a form immediately appropriate for statistical testing while most of them take account of the same body of economic phenomena—viz., the behaviour of investment, consumption, incomes, prices, etc. Accordingly, the method of procedure here adopted is, not to test the various theories one by one (a course which would involve much repetition), but to examine in succession, in the light of the various explanations which have been offered, the relation between certain groups of economic phenomena.

The enquiry is, by its nature, restricted to the examination of measurable phenomena. Non-measurable phenomena may, of course, at times exercise an important influence on the course of events; and the results of the present analysis must be supplemented by such information about the extent of that influence as can be obtained from other sources.

§ 2. Method employed

The method of study here employed, sometimes described as "econometric business cycle research," is a synthesis of *statistical business cycle research* and *quantitative economic theory*. A little may be said about each of these two elements.

(1) In the early phases of *statistical business cycle research*, attention was paid to somewhat superficial phenomena, such as the length of cycles, the degree of simple correlation between series and the relative amplitudes of their movements, the decomposition of series into trend, seasonal components, etc. Certainly all this work had its value, especially for the *negative* evidence it afforded on the validity of certain theories. For the purpose of applying more searching tests, however, it is necessary to dig deeper. An apparently simple relation, such as that between prices and production, is often not a direct causal relation at all, but a more or less complicated chain of many such relations. It is the object of analysis to identify and to test these direct causal relations: production, for instance, may be regarded as determined by the volume of orders; the volume of orders by the income of consumers and by prices; income by employment, wage rates and so on.

The part which the statistician can play in this process of analysis must not be misunderstood. The theories which he submits to examination are handed over to him by the economist, and with the economist the responsibility for them must remain; for no statistical test can prove a theory to be correct. It can, indeed, prove that theory to be incorrect, or at least incomplete, by showing that it does not cover a particular set of facts: but, even if one theory appears to be in accordance with the facts, it is still possible that there is another theory, also in accordance with the facts, which is the " true " one, as may be shown by new facts or further theoretical investigations. Thus the sense in which the statistician can provide " verification " of a theory is a limited one.

On the other hand, the rôle of the statistician is not confined to " verification ". As the above example illustrates, the direct causal relations of which we are in search are generally relations, not between two series only—one cause and one effect—but between one dependent series and several causes. And what we want to discover is, not merely what causes are operative, but also *with what strength each of them operates*: otherwise it is impossible to find out the nature of the combined effect of causes working in opposite directions. On this problem—the problem of " measurement ", as it may be called—the statistician can

throw light by the use of the method called multiple correlation analysis. The details of this method are described in non-technical language in Chapter II, and in mathematical language in Appendix A.[1]

(2) *Economic theory*, to be capable of statistical test, must be expressed in quantitative—*i.e.*, in mathematical—form. What has usually been known, however, as mathematical economics deals chiefly with the conditions of an *equilibrium* which tends to be established in the long run, but is certainly not realised in the course of cyclical fluctuations. To be useful, therefore, for business cycle research, economic theory needs to be made " dynamic ". A " dynamic " theory, in the sense which is here attached to that ambiguous word, is one which deals with the short-term reactions of one variate upon others, but without neglecting the lapse of time between cause and effect. The equations in which it is expressed thus relate to non-simultaneous events, and take a form which Swedish economists have described as " sequence analysis ".

Take, for instance, the static concept of the functional relation between price and quantity supplied.[2] To convert this into a " reaction relation " or " direct causal relation " three things must be done. First, the relation must be exhibited in terms of cause and effect. Secondly, any time difference (lag) found to exist between change in price and change in quantity supplied should be mentioned explicitly—though in some cases, if the lag is very short (*i.e.*, if adaptation is almost instantaneous), it may legitimately be ignored. Thirdly, if quantity supplied varies to an important degree through causes other than changes in price (for instance, through changes in cost or in productive capacity), the influence of these other causes must be shown, and not left concealed in a *ceteris paribus* clause; though here again minor causes — *i.e.*, those whose combined effects are small — may legitimately be

[1] It is only in recent years that this method, developed especially by Mr. G. Udny Yule, and long known to mathematical statisticians, has been systematically applied in economic research, though some scattered applications to economic problems were made as long ago as 1906.

[2] This instance is taken for the sake of illustration only. In the study of cyclical fluctuations other " reaction relations ", such as those determining the movements in total outlay on investment or on consumption, appear to be of greater importance.

ignored, the formulation being confined to exhibiting the influence of major causes only. The necessary additions to static theory have, as a matter of fact, sometimes been found as a result of statistical research; in that sense, the statistician may supply theoretical suggestions to the economist.

Thus we find that the correlation analysis suggested by statistical technique and the sequence analysis dictated by "dynamicised" economic theory converge and are synthesised in the method employed in this study—the method, namely, of econometric business cycle research.

§ 3. Macro-economic Approach

There is one further feature of the method here employed which calls for remark. Economic analysis may be applied to the behaviour of individual persons or firms; or to the behaviour of "industries", defined in some more or less arbitrary manner; or, again, to the behaviour of whole groups of industries, such as those producing consumption and investment goods respectively, and of whole categories of economic persons, such as those engaged in the credit market, or the labour market, as a whole. It is this last type of economic approach (sometimes spoken of as the "macro-economic" approach) which will be employed in this study. For it is this type of approach which seems most relevant to cyclical fluctuation, and which alone makes it possible to limit the number of variates considered to a figure which permits of their being effectively handled. It goes without saying that, in this approach, the coefficients found do not give any indications of the behaviour of individual entrepreneurs, consumers, etc., but only of the average reactions of many individuals.