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INTRODUCTION

The origin of seasonal variations in the forces of nature has led to their acceptance as inevitable, if expensive, irregularities and recently the acute cyclical depression has pushed into the background these less intensive disturbances. But neither consideration should obscure the need for a better understanding of the human and controllable element in seasonal variations and for a better appreciation of the urgency of reducing their cost to society as a whole or to the various social groups.

Seasonal variations in the rate of industrial activity imply a volume of equipment, stocks of raw materials and a supply of labor in excess of what would be required were activity to proceed at an even rate throughout the year. The waste thus involved is considerable for society as a whole. The establishment of the incidence of its cost to the various social groups is indispensable to an analysis of the forces involved and to the formulation of policies directed towards stabilization of economic activity.

The need for a more thorough study of seasonal changes is accentuated by their growing intensity in many industries since the World War. The production of most semi-durable and durable consumers' goods has been especially affected, for the spread of hand-to-mouth buying by those engaged in their merchandising has made for a seasonally more variable demand for such goods from manufacturers, and has therefore imposed a larger share of the seasonal burden upon them. The seasonality of demand for these goods by final consumers has, in its turn, become greater with the increasing prominence of elements of style and fashion, originating partly in a rising standard of living and partly in the attempt by manufacturers to enhance the appeal and perishability of their products.

The intensification of seasonal variations in productive activity has resulted in increasing the instability of employment and payrolls and has in some degree stimulated additions to equipment beyond any ordinary requirements. Plans for economic control and stabilization that derive their impetus from the acute disturbances of recent years will even-

tually have to face a seasonal problem which will be more considerable than that of the past. Furthermore, although business cycles may be abolished by the introduction of complete economic planning, even Soviet Russia, whose economic system is organized upon a principle differing from ours, has to contend with grave problems arising from seasonality.

Quantitative measurements are essential to an appraisal and comparison of seasonal swings in various branches of industry and trade. The knowledge that the business man gains in carrying on his business may sometimes be sufficient as a guide for his individual policy, but the general experience in any industry and those industries related to it can be properly studied and evaluated only with a set of scales of adequate precision.

Exact data may be of some practical use to those engaged in a particular industry or pursuit. They contribute chiefly, however, towards an understanding of the mechanism by which the economic system solves the seasonal problem in its various manifestations. While statistical description by itself does not explain *why* seasonal variations have been met in this or that particular fashion, it indicates *how* and thus constitutes a basic point of departure for any intelligent consideration of the way in which seasonal disturbances work themselves out in the complex economic system.

Moreover, the increased precision of observation made possible by detailed statistical analysis reveals the diversity of form that seasonal variations may assume. Knowledge of fluctuations in the size of seasonal swings from year to year and of the character of industrial and regional differences will arm us against misleading interpretations which are likely to be offered when the phenomena are viewed superficially. The familiarity with the measurable aspects of seasonal variations thus gained seems a necessary prerequisite also for any evaluation of social policies undertaken to mitigate variations or to offset their undesirable consequences.

Therefore, the various aspects of seasonal variations in the trade and industry of the United States are measured in this study. Seasonal disturbances are traced in the productive process—from the production of raw materials to the sale of their finished products. Tests are made to determine the persistence of the variations from industry to industry, from

region to region and from period to period. The purposes of the study may, then, be described as follows: to throw more light upon seasonality and its various manifestations as a contribution to a fuller comprehension of the manner in which the economic system responds to the fluctuations that periodically disturb economic processes; to serve as a basis for any policy directed toward lessening the burden of the variations; and finally, to yield a set of measurements for the guidance of individual enterprises and business analysts in their estimates of the seasonal swings typical of specific branches of business.

Every economic problem is at bottom a conflict of aims, and its solution a compromise between or a sacrifice of one or more aims. Similarly, the economic problem created by seasonal variations necessitates a solution that is dependent upon some reconciliation of conflicting purposes. This conclusion is indicated in Chapter I and serves as a unifying thread in the detailed discussion throughout the volume.

The statistical task of measuring quantitatively the disturbances which seasonal influences introduce into the rate of flow of commodities in industry and trade raised many questions of technique which had to be answered before the investigation could be carried through. The technique adopted is explained in Chapter II to enable the reader to pass upon the validity of the measures presented.

Part II is devoted mainly to an analysis of the seasonal movement of commodities in four groups of industries. An examination of all fields of industry and trade for which appropriate data are available was, because of the immensity of the task, quite impossible. Detailed discussion is therefore confined to industries in which seasonal disturbances are conspicuous at any stage between the production of raw materials and the sale of finished goods, and which illustrate an adjustment to different types of seasonal problem. Food products are chosen for detailed discussion as typical of industries the supply of whose raw materials is seasonally affected but whose finished products are subject to a relatively even final demand. Cotton textiles are selected as representative of industries in which both the supply of raw materials and the demand for finished products are seasonally variable. Automobiles and related products are discussed as characteristic of industries

in which the demand for finished products but not the supply of raw materials is seasonally affected. And the construction industry is analyzed as the group in which the process of productive activity itself is the link most affected by climatic factors. For each of these four industrial groups and in some groups, notably the first, for several subgroups, the variations in the flow and stocks of the commodity at all the stages from the derivation of the raw material to the final demand are studied.

In addition, since employment, payrolls, prices, the flow of money and credit, indeed all the measurable facets of economic life, are subject to seasonal influence, a brief description is given in Part II also of typical seasonal variations in economic processes other than production and trade.

Seasonal variations, however, are not constant, either in space or in time. Part III, accordingly, attempts to measure their variability. Up to this point the volume deals with seasonal swings in individual industries for the country as a whole; and while more than one period is often studied, the emphasis is on the swing typical of the total period. Part III segregates for study the regions within the country, compares seasonal swings from one industry to the next and measures temporal changes in seasonality.

In Chapter VIII those activities for which the available data admit of treatment by regions are analyzed to indicate how our interpretation of seasonal measures for the country as a whole should be qualified in the light of their validity for smaller geographic units.

The economic problem raised in the discussion of regional differences, that of mobility of productive factors, leads also to the consideration in Chapter IX of seasonal similarities and differences among industries. Although to a certain degree industries are independent, they all utilize, to a varying extent, the same group of productive factors. A synchronism of seasonal swings means greater stresses and strains for such common factors than would be the case if the peaks and troughs in the various industries occurred in different months.

The next two chapters are concerned with temporal differences, Chapter X with differences in seasonal pattern (that is, the relative position of months within the year) and Chapter XI with those in amplitude (that is, the extent of departure

from an even rate of change throughout the year). For the purpose of measuring the persistence of seasonal variations in time, two types of comparison are made: the average indexes computed for successive periods in the series are compared with each other and also with the seasonal movements traced in each year of the period.

The Concluding Notes consist chiefly of some observations suggested by the survey as a whole and some of its implications for a stabilization policy. An attempt is made to estimate approximately the burden imposed upon the economic system by seasonal variations and to sketch briefly the influence of its adjustment to them upon cyclical fluctuations.

The discussion in Part II and in the first two chapters of Part III centers about charts that present the seasonal indexes. The actual measures are used in the text to support or illustrate a statement, but it was considered advisable to assemble all the indexes themselves into one appendix. The latter contains seasonal indexes not only for the series discussed in the text but also for others which, while computed in the preparation of the study, were not used directly in the discussion. In addition to the indexes, the appendix supplies the sources from which the series were taken, indicates which of the methods of computation was used and offers interpretative comments.