Volume Title: Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856

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CHAPTER I

INTRODUCTION

THE theoretical and statistical studies contained in this book are an outgrowth of an investigation of the course of interest rates and bond yields in the United States since 1856 and of the statistical relations of those rates and yields to one another, to stock and commodity prices, to the physical and monetary volume of trade, and to credit and banking conditions.[1] Directly or indirectly, the questions discussed are nearly all concerned with the relations of interest rates and security prices to the problem of explaining why we have those recurring periods of prosperity and depression which are commonly termed 'business cycles'.

Throughout the studies, we have emphasized the essentially numerical nature of the interest concept. Instead of stopping with the statement that a rate of interest is a measure of an exchange relation between present money and promised future money payments, we have devoted considerable space to the elucidation of some of the mathematical implications inherent in this particular 'measure'. The usefulness of this procedure is strikingly apparent in the discussion of the relations between long and short term interest rates. The conclusions arrived at with respect to what those relations would be, if men's actions could be and were based on complete knowledge of the pertinent facts and logical use of such knowledge, follow simply and directly from the mere mathematical nature of long and short term rates. Statistical examination reveals that the relations as they actually occur show a definite tendency to run *counter* to these theoretical rationalistic expectations. Now the suggestiveness of such an opposition can hardly be overemphasized. The reflections to which it gives rise inevitably lead to the realization that

[1] The tables and charts concerned with the relations of the rates and yields to credit and banking conditions, with the theoretical and statistical discussion of those aspects of the subject, are to appear in another volume.

the type of economic relationship which it so clearly illustrates must *necessarily* be extremely common. A recognition of this fact is, as we shall see later, of fundamental importance not only to the student of interest rates and the business cycle but also to all who are concerned with the more general subject of the nature and significance of the springs and origins of economic conduct.

Persistent emphasis on the distinction between what actually does occur and what would occur if men knew all that was relevant and acted logically has tended to make many of the answers suggested in this book primarily answers to new questions rather than new answers to old questions. No attempt has been made to solve formally any of the age-old philosophic puzzles which, in economic theory, have been grouped under the general title of 'the interest problem'.

Historically, discussions concerning interest began with queries as to its justification. Was it equitable or was it merely legalized robbery? Whether it should be permitted at all was long one of the most debated subjects in the entire field of economic thought. The question was considered by Aristotle. It engaged the Schoolmen of the Middle Ages in endless wordy argument. With the emergence and development of economics as a separate discipline in the 18th and 19th centuries, the controversy was taken over by the economists. Their treatment of the subject early showed a distinct advance over that of the Schoolmen. They soon sidetracked the *ethical* question of whether interest should be received and given for the more purely *economic* questions of why it is demanded and how it can be paid. The answers to these two related problems, as given by the earlier economists, carried with them an atmosphere of reality which had been totally lacking in the dialectics of the Schoolmen. However, the solutions were in general extremely naive. Indeed, it is impossible to deny that some of the air of reality they possessed was the air of reality that so often resides in that brand of 'common sense' which is eventually discredited by careful scientific analysis. With the gradual development of economic theory the solutions proposed tended to become less and less naive, but not to a corresponding extent more and more scientific. The metaphysical poison of the Middle Ages continued to work in the system of economic thought. Once again, as in the days of the Schoolmen, there arose a tendency to treat the problem as one of logically explaining a set of recognized and simple facts. Seldom was any effort made to enlarge

the horizon of facts to be explained. Usually the struggle was for a neat and internally consistent explanation of the few facts (or assumed facts) that were accepted by all as the counters in the game. Under such circumstances, it is hardly surprising that, even as late as the closing years of the nineteenth century, occasional pauses in the heated discussions between economists, not only as to why interest is and can be paid but even as to how it should be defined, were usually traceable to exhaustion or death rather than to any progress towards agreement.

Within recent years fewer books and articles of a primarily controversial nature have been written on the general problem of why interest exists. No longer is each full-fledged economist supposed to have his own individual and unique 'theory of interest'. Eclectic theories have become popular. It is being stressed that there is truth in most of the theories. Their differences are being explained as the result of concentrating attention too exclusively on particular aspects of the problem. The seeming tendency towards agreement which is thus arising carries with it, however, a strong suggestion of that toleration which commonly appears in the discussion of a problem when either its importance or the possibility of any ultimate solution is no longer considered great. Underlying the collection and attempted welding together of various elements from different interest theories lies the suggestion that immediate further progress is believed improbable if not impossible. The incentive to thresh the old straw over again is waning.

When grappling with the question why interest is paid at all, economists have too generally neglected to ask themselves what use they expected to make of the answer. Like the man who has lightheartedly tackled a picture puzzle, they have too often been primarily interested in solving the problem rather than in using the solution. He looks forward to the moment of triumph when the picture will be completed and he can throw the pieces back into the box. When the economist applies his solution to the actual facts of the market place, he generally does so, not to explain those facts but to prove that they can be explained, not to throw light on them but to show that, when 'properly considered', they do not conflict with his solution. The solution becomes a hobby. When facts clash with it, the facts inevitably give way. A bludgeon that is continually used to overcome any difficulties encountered in applying the theory to specific cases is to deny

that the specific cases are interest rates at all or to 'explain them away' by stating that they involve an interest element and elements of essentially different nature.

Most interest theories attempt to explain 'pure' interest only. However, the nature of 'pure' interest is invariably left quite obscure. It is, of course, almost always that interest for which the theory proposes an explanation, but never do the attempts to define it as 'riskless' interest or in any other direct manner bear up well under critical scrutiny. It is of little use to have an answer to the question 'why interest is paid at all' if the answer does not help us to solve or at least understand those less ultimate but more immediate and direct problems that are concerned with the levels and movements of actual rates.

Economists have gradually come to recognize that the interest problem is essentially a numerical problem and should be approached as such. It is fundamentally a problem of interest *rates*. Any discussion that neglects or under-emphasizes this consideration can hardly be expected to be very fruitful. At best, answers to the question 'why interest is paid at all' tend to be inadequate and incomplete because the question is inadequate and incomplete. It is a non-quantitative, non-numerical question and it consequently leads to non-quantitative, non-numerical answers. Such statements as that interest exists because men naturally value present purchasing power more highly than future purchasing power or that it can be paid because money capital can be used productively by entrepreneurs may or may not be open to the criticism that they beg the question. They certainly require mathematical development before they can be used to handle the quantitative, numerical puzzles that the actual data present. Without such development, they are mere truncated explanations which, even if true, are hardly more than unattached items in the system of economic thought. Of course, one must not expect the rigid exactness of a physical law in a mere economic generalization, but to stop with any such non-numerical explanations as the preceding is almost as if the Newtonian formulation of the theory of gravitation—bodies attract one another with a force that is directly proportional to the product of their masses and inversely proportional to the squares of their distances—were to stop with the words 'bodies attract one another.' Even if perfectly true—which modern astronomers would deny—the 'law', in such an incomplete form and without further development, would be less useful as a key

to the movements of the solar system than the earlier but numerical generalizations of Kepler.

However, any mathematical development of an hypothesis that has inherent weaknesses inevitably brings them to the surface and makes them more apparent. Most theories of why interest is paid at all fail to explain the facts of the actual market not primarily because the theories are non-quantitative but for a more fundamental reason. They commonly assume a degree of rationality and capacity in the conduct of human affairs that does not and cannot exist. Jeremy Bentham's 'pleasure calculus' gave a false picture of the activities of men not merely because their lives are not controlled by the search for happiness but also because they are unable to solve the problems of the pleasure calculus. Too much effort has been expended on trying to 'adjust' the actual phenomena of interest rates to some theory that involves assumptions that are not applicable to the actions of human beings in a real economic environment. Too little effort has been made to discover all relevant facts about actual rates and their behavior, and from those facts to find out, among other things, how human beings really do function.

The interest problem has been prematurely attacked. Too much attention has been paid to solving it, too little attention to formulating it. What do we mean by a rate of interest? What are the essential mathematical characteristics involved in the very concept? What are the quantitative facts about actual rates and why are the facts as they are? How and why do rates vary among themselves at the same time, and how and why do they vary from time to time? How, and with what regularity, are interest rates statistically related to other economic phenomena? What are the most important factors that logically should influence rates? And what are the factors that do influence them? To what extent and under what circumstances do the movements of rates seem consistent with rational human conduct, and to what extent and under what circumstances is explanation hindered rather than helped by assumptions of rigid rationality?

It is a hopeful sign that studies of *rates* have, for some time, been appropriating much of the attention that formerly was given to discussions concerned with the nature of interest as such. Measurement, and reasoning that does not attempt immediately to reach back into ultimates, normally precedes consideration of the nature of the thing itself. It is an old saying that the last thing to be discovered in a

science is what it is all about. However, in the welter of historical records and 'statistical studies', the student of interest rates must not forget that truth does not grow like Topsy. While attempting to avoid the Scylla of fruitless dialectics, he must beware that he is not drawn into the Charybdis of meaningless empiricism. A statistical study that presents nothing but raw facts may sometimes be extremely valuable while one that presents 'correlations', or other evidences of empirical relationships, as though they were explanations, may easily become a delusion and a snare. Something more than the mere presentation of an index number of bond yields, an index number of commodity prices, and a correlation diagram such as that seen in Chart 17 is necessary to disclose the character of the causal relations (if any) that exist between the two series. Such charts and diagrams are, of course, suggestive and important. But, if much progress is to be made, examination of facts must be followed by a serious attempt to understand them, to think the matter through. Mere empiricism will not do. Real explanations come by way of shrewd conjecture followed by adequate testing—the old-fashion road of intelligent hypothesis and rigid verification. However, the road of hypothesis and verification is, in economics, almost necessarily a different and more difficult road to travel than it is in such sciences as astronomy, physics or even biology.

The generalizations of the physical sciences are concerned with the world outside man. The sequence of the seasons, the alternation of day and night, the speed of light, and the relations of oxygen, hydrogen, nitrogen and carbon to animal and vegetable life were as they are before man appeared on the earth. On the other hand, the very essence of economics is that it is a study of human behavior, of the life of man and basically of the *mental* life of man. It takes cognizance of facts in the external world, not for their own sake, but only because of their relations to the mind of man. It is a study of some of the causes and effects of those conscious or unconscious decisions that men inevitably make in their rational or instinctive struggle to 'earn a living' and to satisfy at least some of their desires by adjusting the external world to themselves and—perhaps—thereby securing happiness and well-being. Conditions in the external world of course influence such decisions and are influenced by them but, fundamentally, economics is concerned with mental rather than with physical phenomena, with 'desires' and 'decisions', 'happiness' and 'well-being', rather than with bread and butter

or bricks and mortar. Physical facts or generalizations, even though they be of the greatest economic importance, cannot by themselves constitute economic facts or laws.[2] Only indirectly is economics interested in the facts of agricultural chemistry or the laws of mechanical engineering, the constitution of bread and butter or the strength of bricks and mortar. It is primarily a study of decisions and not of actions, of how men mentally *compare and measure* the significance for themselves of various actual and possible conditions in the external world and not of how they physically obtain or alter those conditions. It is primarily concerned with the rationale of how men *value* things and not with the technique of how they produce them.

Because economics is a study of the behavior of men, economists will probably never be able to make much use of the concept of *necessity* (or *invariable* sequence) which permeates the physical sciences. Economic 'laws' in the strict sense of the word will probably always be merely statements of more or less pronounced 'tendencies'. Economics is one of the social sciences, and the chain of causation in all the social sciences is necessarily indirect rather than direct, mediate rather than immediate. The mind of man is always the connecting link—and the disturbing element. Large crops do not lead to low prices in the same direct manner in which great distance from the sun is associated with low orbital velocity. Even if it were true that high interest rates were inevitably associated with rising commodity prices, the high rates could hardly be considered a result of the rising prices in the same direct manner that the movements of a dynamo result in an electric current. The manner in which overexpansion of credit may lead to economic convulsions in a community is fundamentally different from the manner in which a large dose of strychnine leads to physical convulsions in an individual.

Furthermore, the peculiar characteristics of the indirect causation

[2] Though the expression of physical generalizations in economic rather than physical terms may sometimes be highly desirable in order to make their economic importance obvious, it does not alter their essential nature. Economics as such is concerned with how men tend to react to certain physical facts (when known) and not with what those physical facts are. The 'law of diminishing returns in agriculture' may be used as an illustration. That, after a certain stage is reached, successive applications of 'labor and capital' (cultivating and fertilizing, for example) give rise to successively *declining* increments of agricultural produce is primarily a biological and not an economic fact; though, of course, an extremely important biological fact to consider when attempting to understand why men carry on agriculture as they do.

that is seen in economic phenomena do not result from the mere fact that life with its struggle is an essential part of the picture. It is true that life always introduces the element of struggle, the struggle to exist, to 'make a living'. But the struggle with which economics is concerned is always *man's* struggle. It is imaginable that one might work out a system of economics for the beavers or the bees but it would not be the economics we are discussing. It is almost impossible to imagine a system of economics for the oysters or the trees and the flowers. Yet they are all just as much engaged in 'making a living' as is man. It would not be helpful to attempt to define economics in such a manner that the reaching down after water by the roots of a tree could be considered an economic phenomenon. Strictly speaking there is no economic life without man. Man, with the particular type of brain and nervous system that he possesses, is always *the* essential element in the problem.

And right here we encounter the obstacle that will always block the attainment of any such exactitude in economics as is possible in the physical sciences. The minds of men do not admit of the same definite analysis as do the events of the external world. Paradoxical as it may sound, one of the chief differences between the world of matter and the world of mind is that the world of matter is essentially reasonable and the world of mind is not. Reason arose because of its relation to the world of matter. It helps man to conquer his environment. The possibilities of understanding and coping with the external world that the use of reason offers man are almost boundless; its possibilities in the way of understanding and forecasting his own activities are strictly limited. Those activities are partially, though only partially, rational. The presence of a modicum of reason is the disturbing element in the problem which stands in the way of any complete solution by reason.

If men's activities were purely instinctive—a mere matter of tropisms —they could be handled (though of course not by man!) in the way that such facts are handled by the biologist. On the other hand, the implications of the opposite assumption of *complete* knowledge and *absolute* rationality are much more difficult to discuss. Such an assumption must, from its very nature, be so far removed from reality as to make convincing analysis almost impossible. It amounts to assigning to man metaphysical attributes of the same incomprehensible nature as

those that the more philosophic religions commonly assign to deity. On the other hand, one might wonder whether the difficulties involved in analyzing the implications of any such assumption were not primarily the result of its absoluteness rather than of its nature. It might well seem reasonable to think that, *in so far* as men's activities *approached* a condition of complete rationality, *in so far* as they were based on complete knowledge of all that was relevant and rigidly logical use of such knowledge, they might be studied and their significance brought to light and understood by using the methods of the purely dialectic sciences of logic and mathematics—even if the limiting case, in which *absolute* rationality is assumed, presented insuperable philosophic difficulties. It might be thought that, *to the extent* that all men had knowledge of all facts and conditions that had any appreciable bearing on the solution of their economic problems, and *to the extent* that their reactions to those facts were logical rather than emotional, reasoned rather than erratic, economic adjustments by individuals to their environment would occur in the same methodical and mathematically predictable manner as do physical adjustments in the external world.

However, as things are, even those individual adjustments that are deliberately and consciously made show little tendency to be well adapted to the ends in view unless the facts on which action should be based are relatively easily obtainable and the required logical processes fairly simple. Even in the absence of emotion, serious individual maladjustments tend to occur whenever the relevant facts are difficult or impossible to discover or the necessary logical processes are complicated and involved. And only if the factual and logical bases for the individual's economic activities were almost unimaginably perfect, could even *social* economic forecasts be made with anything like the warranted assurance with which astronomical forecasts are now made.

Of course, the disturbing effects that such factors as presence of emotion, lack of logic and insufficiency of knowledge have on the economic behavior of *individuals* would not merit the attention we are giving them if *socially* they always 'canceled out'. If the vagaries of individual conduct were always 'normally' distributed round a strictly rational 'mode', in other words, if the 'deviations' were of the nature of 'accidental' rather than, for example, 'systematic' or 'constant' *errors,* their curbing effects on the development of economics as a strictly logical social science might be small or negligible—unless the 'scatter'

were excessively great. The strictly rational 'mode' could always be discovered by taking a large number of individual observations, and the importance of the 'deviations' of these observations could be expressed in terms of 'probable errors' or other measures of variability. Not merely the 'law', but also the degree of assurance with which the science could be extended by unveiling the logical and mathematical implications of the 'law', could be definitely formulated. The science of statistics has been designed to handle problems of precisely this kind.

It is, however, not worth while attempting to develop in detail the possibilities of such a purely hypothetical condition. It is and always will be thoroughly unreal. *The disturbing social effects of the inadequate solutions that individuals obtain of their particular economic problems result from the fact that many of the inadequate individual solutions do not and never will 'cancel out'.* The reason for this condition lies in a fundamental characteristic of almost all those adjustments that constitute economic behavior. Normally they are adjustments of the present to the future. 'Planning' is the essence of rational economic life and planning looks to the future and not to the past or present. Knowledge of the past or present is normally useful to the 'entrepreneur' or typical 'planner' only in so far as it helps him to forecast and handle the problems of the future. Adequacy of economic adjustments to present conditions is almost always essentially dependent on how adequate is the adjustment to the future. And the existence of such violent social disturbances as are commonly discussed under the general title of 'business cycles' strongly suggests that society at large may well be little, if any, more capable of foreseeing and adjusting to the future than are the individuals of which it is composed. If the existence of business cycles demonstrates anything, it demonstrates that the economic maladjustments of individuals do not always 'cancel out' socially.

Social, as well as purely individual, economic maladjustments tend to increase in severity with an increase in the complexity of an economic system. With the development of large-scale production for the market, the importance of 'planning' becomes increasingly great. With an increasing use of credit, the punishments meted out for inadequate planning (resulting from incorrect forecasting) become increasingly severe. The most elementary form of production is consumer-production—production for one's own consumption. The most important distinction between consumer-production and production for

the market is that, while the consumer-producer needs to forecast only his own desires (and such physical factors as weather) the producer for the market must forecast not merely the desires of other persons but also their (future) ability and willingness to pay a price sufficiently high to give him a satisfactory surplus over his cost of production. He must forecast *demand* and not merely *desire*.

Furthermore, if the consumer-producer, when he comes to the stage of consumption, has changed his mind and wishes that he had applied his work to other ends, there is unlikely to be any serious maladjustment for him or any maladjustment whatever for the community at large. The economic disturbances in a frontier agricultural society in which each farmer is practically self-sustaining are primarily traceable to physical rather than strictly economic origins, to plant or cattle pests or to drought, rather than to price fluctuations. When economic distress occurs in such a community it results from *deficient* and never from *excessive* crops. When Robinson Crusoe planted his corn, the only forecasts he had to make were physical forecasts—that the seeds would germinate and the plants mature. He did not need to consider whether the price per bushel of the resulting corn would be high enough to pay his total costs and still leave him a living surplus. He was free from the dangers of strictly economic disturbances. He did not need to fear that, if the dollars received for the total crop were insufficient to pay the interest on the mortgage on the island, the cannibals would come and throw him into the sea.

Social maladjustments would not tend to increase in severity if the possibilities of adequate forecasting increased rapidly enough to offset the effects of the increasing complexity and intricacy of economic life.[3] Such a condition is, however, extremely unlikely to occur sponta-

[3] Though the complexity is essentially an economic complexity, its origins are technological as well as purely economic. The fact that in a rural community the construction by the farmers themselves of a system of roads to be communally owned contains no such potentialities of economic disturbance as result from the building of a railroad is explainable by economic and not by technical differences between the system of roads and the railroad. The railroad is producing 'for the market'; the roads are not. The railroad has been financed by means of stocks and bonds whose owners, unless their affairs are to be to a greater or less extent disorganized, must receive their return in cash and not 'in kind'. But it was the technical magnitude and complexity of the railroad that led to its being financed so differently from the roads and producing 'for the market' rather than for its stock and bond holders. In one European country after another, economic crises began to appear sporadically

neously under any economic system containing as large an element of 'laissez-faire' as still exists in the economic systems of such countries as England and the United States.[4] It is easier to ask questions than to answer them. Under a regime of relatively uncontrolled freedom for individual economic initiative, it is easier to build up a system in which knowledge of the future is of paramount importance than it is to forecast that future. The fundamental problem is one of social control.[5] It should not be allowed to remain one of mere individual forecasting. However, diagnosis comes before treatment. Before we consider what might be done to reduce the social ill effects of errors in individual forecasting, it is highly desirable that we understand something about the sources of those individual errors that have the most serious social effects—in other words, those errors that socially neither 'cancel out' nor have any other constant relation to a rational norm.

Individual errors in economic forecasting do not usually cause economic disturbances if socially they 'cancel out' or even if the deviation of their social *average* from the rational norm tends to be always of approximately the same *algebraic* magnitude. It is violent fluctuations of the *average*—especially when such fluctuations involve a change of *sign*—that are usually the essentially disturbing elements. So long as men continue to place an extremely high value on diamonds that absurdity introduces no appreciable economic strain. But, if they suddenly came to their senses, the diamond market would collapse. The effects of mass enthusiasm or mass depression are usually of importance to the student of economic fluctuations only because the community is at one time abnormally enthusiastic and at another time abnormally depressed. Even panic is economically destructive primarily because of its unusual and erratic occurrence. If the community at large had, year in and year out, a rather critical and even somewhat

(Footnote [3] concluded)

soon after the introduction of banking, but they did not begin to take on their modern characteristics until the advent of the industrial revolution.

[4] Director's Note: "This, while true, does not imply the contrary contention that economic stability would be more certain under rigid forms of social regimentation. The recurring unbalances under complete 'laissez faire' may be less serious than the economic unwisdom of a dictatorship. The path to stability should lie between the two extremes." M. C. Rorty.

[5] Of course, the control must be both intelligent and stable. The possibilities of accurate long term forecasting are decreased rather than increased by a steady stream of unsound economic legislation, enacted on the theory that the best way to find out whether the effects of passing a bill will be good or bad is to pass it and see.

sceptical attitude towards banks, we should almost certainly have a much better banking system than we have. We must remember that, at the time it occurs, panic may be more logical than not. A general run on the banks may be the result of a belated public realization of the prevalence of grossly incorrect economic forecasting by the bankers, borrowers, depositors, and the community at large. Its explosive and destructive character may be traceable largely to the fact that it did not come sooner.

But erratic emotion is a less fundamentally disturbing influence than either insufficient knowledge or the inability to draw warranted and useful conclusions from what is known. Ignorance is the mother of panic. And, because the most necessary knowledge is knowledge of the future, we must remain largely ignorant. Even such a product of man's own thought as an invention of radical economic importance may burst on an industry like a bombshell.

The future is never certain. But, in all too many instances, thoroughly warranted conclusions as to future *probabilities* are not drawn. The possession of the necessary knowledge of the present, even when such knowledge is easily obtainable, is rare; and the ability to predict, with any great degree of assurance, even the *probable* future from that knowledge is still rarer. The logic we lack, and the logic necessary to handle adequately the more difficult problems of economic life, is more than a mere ability to distinguish the valid from the invalid moods of the syllogism. It is the ability to distinguish the relevant from the irrelevant facts around us and to reason assuredly from such data. However, such reasoning, like the reasoning in all scientific prediction, must obtain its major premises from the particular science involved. But economics, in its present stage of development, may not be prepared to supply the necessary premises. And how few of us have any profound and penetrating understanding of the theoretical and empirical conclusions it *is* prepared to supply. Lack of knowledge of the future is a fundamentally disturbing factor but the effects of inability to handle logically the facts of the present must not be underestimated. Indeed, if that inability were less, our knowledge of the future would be greater.

The unwise economic conduct of individuals that shows itself in poor forecasting is the major source of social economic disturbances. But it is not the only source. Paradoxically, there is another source in

individually *wise* economic conduct. There is a type of shrewd individual conduct that takes no cognizance of the social repercussions of its actions and that may be almost as socially disturbing in its own field as illogical conduct or conduct based on inadequate knowledge. And we here exclude 'criminal' conduct. When bankers lend increasingly huge sums on stock and bond collateral because, as in 1928 and 1929, rates are high and they feel that such loans are extremely safe, they may be acting, even if unconsciously, not merely in a fundamentally anti-social manner but also in a fundamentally unintelligent manner—in spite of the fact that, from a narrowly individualistic standpoint, any single bank may be economically justified in so increasing its collateral loans. This is an excellent illustration of the specious nature of the doctrine of 'the invisible hand'.

But the difficulties of foresight as compared with 'hindsight' become apparent when we notice the present differences of opinion, among even professional economists of the highest standing, as to the ultimate effects of the purchases of huge amounts of long term Federal bonds by the banks of the country during the past few years.

The effects of the social maladjustments that result from inaccurate forecasting or anti-social behavior on the part of individuals are commonly cumulative. A pressure-momentum develops on the down-side just as an opportunity-momentum had developed on the up-side. Not merely those individuals and institutions that have been guilty of the grossest and most inexcusable miscalculations but also multitudes whose economic activities have been relatively sane and rational are overwhelmed when the unprepared-for future becomes the inescapable present. While the up-momentum has its origin in increased purchasing power, the down-momentum has its origin in decreased purchasing power. The one necessarily involves an element of decision; the other does not. While the up-momentum attains its volume through its hypnotic effects on social behavior, the down-momentum introduces the element of necessity. Few are forced to buy during an upward movement of security prices, many are compelled to sell during a pronounced downward movement. Aesop's fable of the contention between the sun and the wind as to which was the more powerful is not especially enlightening as to what happens when the wind is of tornado force.

What light does this long discussion of some of the essential characteristics of economic life throw on the problems of economic 'hy-

pothesis and verification'? Let us review some of our conclusions. We have seen that economic activities are activities of men in their struggle with their environment. We have seen that the mental characteristics of men are quite as important as the physical characteristics of their environment. We have seen indeed that the physical environment is only one aspect of the total economic environment; that men build up through law and custom an extraphysical environment that, in many ways, affects their economic activities as directly and powerfully as does the purely physical environment. We have seen that most economic activities are peculiarly concerned with the future; that forecasting is of the essence of such activities. But we have seen that the economic future cannot be accurately known and that, though it is conceivable that it could be forecast with a fairly high degree of probability, successful forecasting is now rare. Few men have either the necessary knowledge of the present or the technical equipment and ability to deduce the future from such knowledge.

Because of these facts, we hinted at the possibility of two almost independent systems of economics. The one system would be philosophic, logical, mathematical, *and hypothetical;* the other system would be empirical, statistical, *and actual.* In their most extreme forms, the hypothetical system would be concerned with what would occur if economic activities were logically adjusted to one another and to a real though unknown future, while the empirical system would degenerate into a compilation of unexplained historical and statistical 'precedents'.

There are in existence virtually no illustrations of the extreme form of the first system. But the reason is not that the mathematical economists have felt this presentation of the problem to be too unreal, but that they have not sufficiently appreciated the importance of the fact that economic adjustments to be satisfactory must be adjustments to the future. Illustrations of the second system in its most extreme and absurd form are very common. The 'forecasting' woods are full of them.

In slightly less extreme forms, examples of these two systems have existed side by side since the beginnings of economic thought. But there has been no clear recognition of the extent to which their differences are traceable to the fact that so often they are investigating different things. It has almost always been tacitly assumed that they were investigating the same thing, though in different ways. Strange

consequences have inevitably followed. When methods of investigation that are peculiarly applicable to one of the systems have been applied to the other, more or less uninterpretable results or even complete failures have sometimes appeared; the extent of the failure depending, of course, on the degree to which, in the particular economic phenomena under discussion, what men actually do differs from what they would do if their knowledge were adequate and their actions were rational. The mathematical economist, when he really has been investigating the actions of a non-existent 'economic man', has defended a failure to reproduce the facts of the market place by suggesting that his solution was that to which conditions *tended* and that deviations were merely the result of 'disturbing factors'. The statistician has struggled to formulate a rigidly logical foundation for the 'behavior pattern' that his correlations seemed to suggest. Each has always assumed that there is only one possible economics.

In virtually all discussions of 'method' in economics it has been tacitly assumed that the value of studying what would occur if men acted rationally depends on how closely an analysis of hypothetical rational behavior explains how, in fact, they do act. No one has seriously suggested that one of the chief reasons for studying the economics of a 'rational' society might be because it would, in some respects, be so *unlike* the economics of real life. Yet we have in this chapter come to the conclusion that *erratic social irrationality* constitutes one of the chief reasons for the major economic disturbances of society.

The commendation attached to economic analyses that are primarily based on how men would act if their knowledge were adequate and their reasoning good has been declining for decades. On the other hand, the commendation attached to any study of how men actually do function in economic life has been steadily increasing until a stage has now been reached at which the discovery of statistical 'relations' is almost assumed to be of the greatest possible value whether or not they seem to admit of any significant explanation. One of the chief uses of such studies is naturally in the field of empirical forecasting; if the crop be so large, the most probable price per bushel will be such and such; if a country enters a period of monetary inflation the effects will probably be similar to what they were in such and such a similar instance (if a *really* similar instance can be found); if such and such an economic series has 'turned up' such and such another series will prob-

ably promptly follow, etc., etc. However, we must remember that purely empirical study of how men *seem to have* acted in the past will not *necessarily* solve the problem of how they *will* act in the future. Though it present empirical relationships that may seem as worthy of confidence as did 'Bode's Law' to the astronomers of one hundred years ago, in actual application such relationships and generalizations may, at any time, fail as signally as did that 'law' with the discovery of the planet Neptune. If the variables are related in a clearly causal manner, as for example size of crop and price per bushel, the statistical study of the relationship may be useful not only to the business man and the speculator but also to the economist. It may advance his understanding of both how and why things occur as they do. But if no explanation of why a functional relationship should exist can be supplied by other than a grossly *ad hoc* hypothesis, the 'generalization' may 'work' for years and then fail forever. And, of course, be theoretically quite unfruitful.

While, as we have noted, the 'laws' of a *completely* 'rational' economy cannot be formulated, the relations that would exist under specific instances of accurate forecasting of *particular aspects* of the future are, as illustrated in Chapter II, often easily uncovered. The natural line of approach to such problems is the logical and mathematical. If writers on 'deductive' economics—whether 'mathematical' or non-mathematical—formulated more definitely their underlying assumptions and pointed out more carefully how closely or distantly those assumptions corresponded to conditions as they actually exist, we should almost immediately see a distinct cleavage between studies that are primarily concerned with what *would* occur under specific hypothetical conditions and those that are primarily concerned with what usually does occur. In many problems two distinct 'solutions' would be substituted for an ambiguous single solution. For example, it is inevitable that any reasoning based on the assumption that present conduct tends to be accurately adjusted even to merely particular aspects of the future would often lead to results and solutions far from 'fact'. However, though such results would be recognized as solutions of different problems from those which economists have, in the past, believed they were setting themselves, they would hold their own important position in the scheme of economic thought.

Both types of investigation are desirable. They attack two distinct

aspects of the economic problem. In the effort to reach a complete understanding of the economic activities of mankind, they support each other; but not always in the manner in which they are usually supposed to do. In attacking a particular problem the usefulness of neither is dependent on both giving the same solution. The dual approach to a problem in which the two solutions are different may be as enlightening as in the case of a problem in which the two solutions are approximately the same.

The study of what would occur in a 'rational' economy has, of course, relatively more importance for him who would understand in order that he might change and improve 'the rules of the game' than for him who merely desires to win under the existing rules. Its importance is primarily theoretical and social rather than practical and individualistic. Its appeal is to the legislator and reformer rather than to the entrepreneur and speculator.[6] In those fields in which forecasting of socially erratic data is attempted, even understandable generalizations will derive their *social* value not merely from the degree of regularity with which they have 'worked' in the past but also from the opportunity which they present to study the effects of the *deviations* of the actual from the strictly rational and to consider the theoretical and actual extent of the economic disturbances to which such deviations may lead.

Though it may well be that, for many problems concerned with economic reform, it is not necessary to know exactly what would occur under specified conditions of 'rationality', it will always be extremely helpful to keep clearly in mind the possible import of that hypothetical question. That the actual is only by accident ever the strictly 'rational' should never be forgotten. That the chief reason for the deviations of the actual from the 'rational' is the inability of human beings to foresee the future, let alone adjust the present to it, immediately suggests a whole group of possible economic reforms. The first has long been recognized. It involves a study of the problem of how to forecast

[6] However, even the entrepreneur or speculator, if he be well advised, is careful not to stake too much on a generalization whose rationale neither he nor professional economists understands, unless it so regularly and obstinately gives an adequate description of the facts as to compel belief that it must be more than a mere empirical curiosity. Though he may not be interested in how men would act if their knowledge were superhuman and their logic absolute, he may well be somewhat chary of basing actual operations upon an *inductio per enumerationem simplicem* that is anything but free from exceptions.

the future. To the extent that the future can be foreseen it can be prepared for.

It is, of course, highly desirable to learn how things actually have occurred—and particularly how closely or distantly they have followed a 'rational' pattern; to study the problems of economic prediction even into the fields of 'irrational' sequences; to investigate not only the empirical relations between crop sizes and crop prices but also the empirical relations between long and short term interest rates. However, the mere fact that so much effort has already been expended on attempts to improve the quality of empirical forecasting strongly suggests the possibility that no such forecasting will ever be adequate to prevent even such gigantic world-wide economic disturbances as that from which we have but recently emerged.

A more hopeful approach is that of *control.* Instead of attempting to improve the quality of forecasting, we might attempt to make forecasting less necessary. Any economic system functions within a legal pale. Much can be done by mere legal elimination of conditions that make forecasting peculiarly important. However, mere legal restrictions will probably never usher in an economic millennium. If an economic society is to be a highly successful society it should function as a society. We must break away from the mysticism of 'laissez-faire'. Times without number 'the invisible hand' has led mankind into the economic ditch. Positive social action is absolutely necessary. In spite of the inevitable difficulties, the hope of the world lies in truly social, as opposed to merely individualistic, economic *planning.* To the extent that the future can be made, instead of awaited, the disturbing social effects of erroneous and inadequate individual forecasting may become a thing of the past. Of course, adequate public planning is extremely difficult. No system of 'trial and error' will take the place of brains. Without brains, public planning may be extremely dangerous. *We must always remember that the essential objective of public planning should be to make legitimate and desirable private planning easier and not more difficult*—unless we are willing to 'go the whole hog' and lapse into a communist state.

The succeeding chapters of this book suggest a number of ways in which the necessity and importance of particular types of individual forecasting could be reduced by mere prohibitory edict.

Perhaps the most conspicuous is suggested by the light that the irra-

tional relations found to exist between present long and future short term interest rates throws on the indefensible business custom of deliberately using long term bonds as short term investments. It is surely 'looking for trouble' to allow commercial banks to invest any large percentage of their deposits in long term bonds.

Probably the most important element of social economic *control* that the topics discussed in this book will inevitably bring into the reader's mind is the control of the general level of commodity prices. Though it be foreign to our present purposes to delve deeply into the various proposals that have been presented as solutions of that controversial problem, it is certainly not foreign to our purposes to emphasize the social benefits that would accrue from any reduction in the violence of price fluctuations.[7]

One of the most lamentable results of human inability to foresee the economic future is the 'anti-social' forecasting to which it gives rise. In his efforts to foresee what will occur, the individual tends to lose sight of what *logically* would occur. If he is to be personally successful in the speculative aspects of his business life, he must strive to forecast not only those occurrences of the external world that will influence his competitors but also how those competitors will react to such influences—and to their forecasts of how he and others will act. Inevitably he tends to forecast their future actions by means of their immediately preceding actions. In all his speculations he tends to 'follow the trend'. He hesitates to buy on a falling market or sell on a rising one. There is little more limit to his optimism than to his pessimism. When sugar, some years ago, went to twenty-five cents a pound

[7] Director's Note: "It may be in order to suggest that the only 'control' of commodity prices which is economically sound is indirect control through elimination of the *causes* of violent price fluctuations. Such causes are, in the main, non-monetary in character—in spite of current beliefs to the contrary. Furthermore, even from the standpoint of the believer in monetary control of price levels, it is possible to demonstrate that such control is impracticable and wholly dangerous, if not absolutely impossible, with respect to the *wholesale* prices of basic commodities. Such prices *must* fluctuate individually and in a group, as part of the mechanism of economic balance and adjustment, even though 'costs of living' or other more general price indices are stabilized. The problem of avoiding long term secular changes in price levels must be clearly separated from that of control of short term fluctuations. It is desirable that the latter variations should not be accentuated (as by a vicious circle of credit contraction), but, within the limits required for ordinary economic adjustments, they are desirable rather than undesirable." M. C. Rorty.

at retail, housewives who had never speculated and never owned more than ten or twenty pounds of sugar began to buy it by the barrel.

But let us not end this introductory chapter on such a pessimistic note. Social consciousness and social conscience are growing. It is primarily the intellectual difficulties of the problem that keep us out of the promised land. And with the slowly spreading recognition of this fact a will to conquer these difficulties is arising. Can we not believe, with H. G. Wells, that "a time will come when men will sit with a volume of history or some old newspaper before them, and ask incredulously, 'was there ever such a world?' "