THE THEORY OF WAGES

By

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TO MY FRIENDS AND ASSOCIATES

CHARLES W. COBB

SIDNEY W. WILCOX

ERIKA SCHOENBERG

TO WHOM THIS WORK OWES MUCH

"If we wish to make ourselves acquainted with the economy and arrangements by which the different nations of the earth produce or distribute their revenue, I really know of but one way to attain our object, and that is *to look and see.*"
Richard Jones. *Introductory Lecture on Political Economy.* 1833, p. 31

"In good sooth, my masters, this is no door. Yet it is a little window, that looketh upon a great world."
Quoted in Risley, *The People of India*

FOREWORD

For twenty-seven years the publication of a series of books on economic subjects has been the result of the generosity of Messrs. Hart, Schaffner and Marx. Their aim, as expressed from the beginning, has been by the annual offer of prizes "to draw the attention of American youth to the study of economic and commercial subjects and to encourage the best thinking of the country to investigate the problems which vitally affect the business world of the day." In 1924 the firm sought to discover whether, by increasing the prize and freeing its award from the previous limitations to the United States (and Canada), a larger number of capable contestants would be attracted and work stimulated of even more value than that already published in the series. Messrs. Hart, Schaffner and Marx, therefore, authorized the Committee, already acting on their behalf as judges in their prize contests, to offer a prize of five thousand dollars for a study on a topic of the Committee's selection. The Committee, consisting of Professor J. Laurence Laughlin, chairman, Hon. Theodore E. Burton, and Professors John Bates Clark, Edwin F. Gay, and Wesley C. Mitchell, decided to offer the prize in 1926 for the best original treatise on the theory of wages, and the announcement of prize and topic was widely published both in Europe and the United States. The Committee placed no restriction upon the scope, method, or character of the studies to be submitted beyond the requirement that they make genuine contributions towards an understanding of the problem. "Emphasis," it stated, "may be laid upon analysis of the economic principles underlying the determination of wages, upon the conditions which set maximum and minimum limits to the prices paid for important types of labor, upon quantitative studies of the factors involved, or upon any other aspect of the problems which a writer can show to be significant and upon which he can throw new light. The prize will not be awarded except for a work of high merit." Competitors were to inscribe their manuscripts with assumed names and to give their real names and addresses in sealed envelopes which were not opened until after the judges had given the vote of award.

Among the hundred and thirty essays handed in on the day set, October 1, 1926, the final choice, after careful sifting, narrowed to four, and to one of these, the Committee at its session of March 26, 1927, unanimously awarded first place. The other three contestants, to whom honorable mention was given before the opening of the envelopes containing their names, exemplified both the international character of the contest and the high quality of work, theoretical and historical, which was submitted. These three essays of high distinction were by Professor Jens Warming of Copenhagen, Denmark, Dr. William L. Valk of Scheveningen, Holland, and Sergius N. Prucopovitch of Pratra-Kusive, Czechoslovakia.

The winner of the prize, Professor Paul H. Douglas of the University of Chicago, had satisfied the judges as to the pre-eminence of his work definitely submitted at the time of the contest. But the study was incomplete in some parts and, while clearly of exceptional interest and importance, it needed, before publication, some further development and testing. The manuscript was therefore returned to the author and time was granted for the additional work which in the Committee's opinion was advisable. Both the time taken for this supplementary work, however, and the extent of the remodelling went far beyond any pre-vision of the Committee. The author's previous commitments and intervening engagements do not alone explain the delay. He found, as he says in his preface, that the developments of the theme so promisingly set forth in his original prize essay, entailed long and arduous labor. The results, both of the Committee's extension of time and of the author's toil, must be justified by the scientific value of this volume. The Committee believes that the experiment of the donors, in the furtherance of their chief aim, will be regarded as successful. They had here aided notably the advance of economic analysis in one of its most difficult fields. It is only by successive attacks, such as this, in the realistic spirit of von Thünen, one of the greatest eonomists of the nineteenth century, that the economics of the twentieth century may approach the status of a science.

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The Committee which awarded first prize to Professor Douglas' essay in 1927 cannot sign this foreword. Senator Theodore E. Burton was removed by death in 1929. Professor John Bates Clark asked to be relieved of his duties in 1933 and has been succeeded by his son. Professor James Laurence Laughlin, who had served as chairman for twenty-four years, retired in 1929, but maintained his lively interest in the Committee's work to the end of his days, which came last December. To the disinterested zeal for promoting economic research manifested by these their elder colleagues for a long period of years, the present committee members pay their tribute of gratitude.

Edwin F. Gay, *Chairman*
Harvard University
John Maurice Clark
Columbia University
Wesley C. Mitchell
Columbia University

PREFACE

When this manuscript was submitted for the Hart, Schaffner and Marx international competition in 1926 it really consisted of three parts, namely, (1) a history of past wage theories, (2) a more or less original explanation of general wages drawn in terms of relative elasticities of supply, and (3) the theory of occupational and geographical differences in wage rates. The manuscript thus contained the material for no less than three volumes and was much too long for publication in its existent form.

In 1927, in cooperation with my friend Professor Charles W. Cobb of Amherst College, I began to explore the possibility of measuring inductively the marginal productivities of labor and capital in recent times. This line of approach gradually began to produce results which crystallized in Part Two of the present volume.

In the following year, with the initial aid of Mr. Harold Glasser, I pushed additional inductive investigations into the short-run supply curve of labor and these studies have been continued in more recent years with the assistance of Mrs. Erika Schoenberg. A great deal of additional work was also done on the long-time supply curve of labor and the supply curve of capital.

As the inductive material thus developed over the years, it became apparent that the form of the work would have to be radically altered and compressed. Accordingly the last portion on differences in wages was completely omitted and the first portion on the history of wage theory was confined strictly to the development of the theory of production and the principle of diminishing incremental yields of the factors. The book as a whole, as the result of almost continuous revision during a period of seven years has therefore come to be an attempt at an inductive study of both the productivity and supply curves of labor and capital, and from these, certain tentative results have been obtained which the author at least believes to be important. The book is therefore somewhat less inclusive than its title may indicate but this was necessary if the subjects considered were to be treated with any adequacy within the necessary limitations of space. Even as it is the book is perhaps too bulky.

It has long seemed to me that the inductive, statistical, and quasi-mathematical method must be used if we are ever to make economics a truly fruitful and progressive science. The neo-classical school has constructed a valuable theoretical scaffolding according to which the value of commodities and the rates of return to land, labor and capital are fixed at the intersections of the various supply and the demand curves. This is a beginning but only a beginning. For in order to make the analysis precise, to forecast, and to detect interactions in economic society it is plainly necessary to determine the slopes of the demand and supply curves of the various commodities. An excellent beginning has been made in this direction during the last twenty years by such scholars as Henry L. Moore, Schultz, Ezekiel, Bean, Working and Marschak and in this development the United States has reason to be proud of the part which her investigators have played. The victory of these men is not yet won for there are still those who sneer at all attempts to introduce greater precision and who at times seem to take a perverse pleasure in muddying the waters. But the skill of these pioneers and their followers is growing and they are using ever more powerful techniques with a resultant narrowing of the margin of error and uncertainty. This line of attack has, therefore, more than justified itself in dealing with the problem of the prices and the values of commodities. The younger generation of economists has indeed shown their recognition of this fact in the way they are increasingly turning on the one hand from the sterile shadow-boxing which has characterized so much of dialectical economics and on the other from the theoretical blind alley of the purely historical and institutional methods.

There is need for a similar approach to the problems of distribution. We need to know whether the assumed curves of diminishing incremental productivity are merely imaginative myths or whether they are real, and if the latter, what their slopes are. We need to know more about the supply functions of the factors of production and whether the actual processes of distribution furnish any degree of corroboration to the inductive tendencies discovered. This book is an attempt to do just that. Since it is a pioneering study and since I certainly am not a mathematician, it undoubtedly has many lacunae and defects. But it is hoped that it at least furnishes a fruitful method of attack and that its results have some significance.

Even its weaknesses may perhaps be pardoned if they stimulate others to remedy them and to launch out further upon the trail. As one of the mottoes of the book indicates, the author realizes that it "is no door yet it is a little window that opens out upon a great world."

The passion of Americans for statistics is as a matter of fact accumulating vast quantities of data which almost cry aloud for analysis if they are to be rendered intelligible and significant. The patient accumulation of facts will in itself avail us little unless these facts are subjected to mathematical and statistical analysis to determine their inner relationships. It is however one of the amusing and at times irritating ironies of the present state of economic science that many modern statisticians, or economic arithmeticians, seem resolved to maintain the innocence of their beloved figures by keeping them unsullied from intelligent analysis. They apparently want to cherish these facts as ends in themselves and are commonly ready to give battle to the death against anyone who seeks to use them as a means of obtaining significant and interpretative results. The author is well aware that he will probably arouse the emotional opposition of these devotees by his attempt to use such statistical series as raw material with which to work but he feels that the sooner economists come to use facts as means rather than as ends, the more rapid will be the progress of economic science. It is of course true that there is a certain margin of error in most of our economic data but there are many series which are sufficiently close approximations to the facts to permit of more refined analysis. In short while we should try to improve our existing statistics, we can wring far more meaning than we have from those which are now available.

This is perhaps enough for the general history of the work and for the spirit in which it has been carried out. There are however perhaps further comments which should be made.

1. The inductive evidence of the book, as well as the deductive reasoning, is drawn from modern economies which have been characterized by competitive or quasi-competitive capitalism. Some of the principles developed might, therefore, not apply in an authoritarian or a monopolistic capitalism, in a rationed communism or a liberal socialism. If society is passing out from the stage of competitive capitalism, this study may, therefore, in part become obsolescent. Even then however some of the principles such as diminishing incremental productivity

and the importance of supply functions will still apply. The way in which economic theory may be adapted to a state of partial or complete monopolies has been well illustrated by a recent brilliant book by Mrs. Joan Robinson of Cambridge University on *The Economics of Imperfect Competition* which seems to me to be very illuminating in its treatment of a set of problems which the economists who are accustomed to deal with the problems of pure competition have tended to neglect.

2. The forces connected with the determination of wages are so inter-related with those which determine interest and rent that it is impossible to consider the theory of wages by itself. Wages, interest, and rent are instead determined by mutually interacting forces. This accounts for the fact that the present volume treats the theory of distribution as a whole and considers the productivity and supply curves of capital as well as those of labor. If less attention has been given to land, it is due to the lack of sufficient homogeneous data.

3. It may be objected that instead of trying to find an explanation of the general rate of wages, interest and rent, I should have abandoned this attempt because of the lack of homogeneity in each of the factors. According to this criticism, the lack of transferability between different sections of each factor is such as to compel the abandonment of this attempt. Instead of a basic rate of wages for labor as a whole, it is argued that there should be basic rates for an indefinite series of labor groups and similarly in the case of capital and land. Instead of three factors there would, according to this contention, be an almost infinite number. This criticism is not only considered in the text but a theoretical explanation of how this may be treated from the standpoint of marginal productivity is also given. The difficulty with proceeding inductively upon this hypothesis is however at least three-fold. First, capital funds are sufficiently fluid and ultimately sufficiently homogeneous as to prevent great differences in true yields from cumulating and instead operate towards rather than away from uniformity. Urban land can be shifted from one use to another fairly readily and this is true to a very considerable degree of agricultural land. There is also a very large degree of transferability in the field of labor. Secondly, differences from the basic rate of wages for unskilled labor and the pure rate of interest may be explained by other methods. The theory of wages and of interest may, in fact, also be built up from an analysis of (a) the basic rate and (b) differentials from this basic rate. In the third

place, I have been unable as yet to determine any way by which the various separate sub-groups of labor, capital and land could be segregated and measured. It would be almost impossible to measure the incremental productivities of this infinite series of sub-groups or to determine their supply curves. In view of the present inability to test the validity of this great sub-division of the factors, I can only consider this suggestion to be at present, in the words of Professor Bridgman, a non-operational concept. From the standpoint of scientific progress, we should primarily concern ourselves with problems which we can solve. We have sufficient statistics to permit a beginning at least in the attempt to determine the theory of distribution from three variable factors. We do not have enough material to try to work with from twenty to a hundred. If and when we do, the task should be attempted but the time for this is apparently not yet.

4. It will be noticed that I have treated the marginal productivity and supply curves for labor and capital in society as a whole and not for particular industries and plants. This has been done in part because as Willard Gibbs once remarked "the whole is simpler than its parts" and because it has seemed to me to be the more significant problem. When we deal with separate industries and enterprises we are involved in the whole problem of increasing and decreasing costs, technical factors determining the ratios of labor and capital, the elasticity of substitution of labor for capital and vice-versa. This whole range of problems has been very acutely treated by Mrs. Robinson and there is need for further studies along this line. At the same time, the forces at work in society as a whole need to be analyzed. For surely general results are at once more significant than are those for particular branches of industry and in turn are conditioning forces upon these sub-groups.

5. While most of the logical analysis is carried through on the assumption that men act rationally in economic matters, the statistical material is based on a somewhat broader approach, namely to detect patterns of influence and response whether or not these be logical. There is much in life and even in the economic phases of life which does not spring from a rational pursuit of individual or group ends but which arises instead from passion, prejudice, stupidity and even blind physiological and psychological reaction. There are indeed "more things on heaven and earth than are dreamt of" in the Hedonistic psychology. But statistics takes these other responses into account as well as those which are purely rational and it is consequently

not so circumscribed as is most of deductive reasoning.

May I now turn to the very grateful duty of recording my indebtedness to various friends and co-workers? My greatest obligations are to the three associates to whom I have dedicated this book. Professor Cobb first brought mathematical order out of the relationship between the series for labor, capital, and production and the general theory of production which has been developed would have been impossible without his pioneering work and his unfailing generosity. Mr. Wilcox was of great help in the early stages of the study and I have profited from his advice in the later period as well, while Mrs. Schoenberg has been literally invaluable in the later years. Her patience, accuracy, and ability have greatly improved the whole work. Mr. Aaron Director was responsible for the material for New South Wales and has aided in many other ways while Mr. Harold Glasser also shared in the work. I have also had the faithful and devoted service of a staff of computers among whom should be mentioned Mr. Stanley Posner, Miss Mabel Byrd, Mr. Harold Weber and Mr. A. D. Battey. My friend and former colleague, Professor J. M. Clark, was kind enough to read the manuscript and I have profited greatly from his criticism. Without these associates, I could never have finished this work and I am deeply appreciative of all they have done. From my students and my colleagues I have also received many fruitful suggestions and criticisms which though not always easy for me to identify have been no less real. Professor Henry Schultz has been especially generous in the aid which he has given in the field of statistical method. Some of the devices which he developed after prolonged study for checking and systematizing the computations used in computing the elasticities have been used in this study at the saving of great labor and expense. Mae Shiffman and A. W. Keith have drawn the charts while Agnes Jacques, Janet Murray and Mrs. Helen Parsons have helped with the proof. Erika Schoenberg in addition to all her other aid has read the proofs with great care and with her husband, Walter Schoenberg, has prepared the index.

Finally had it not been for the unfailing support which the administration of the University of Chicago and in particular its President, Robert M. Hutchins, has given to the maintenance of a free and fearless pursuit of truth, I could never have completed this book.

Chapter V originally appeared in much of its present form in the Supplement to the American Economic Review for March, 1928, and Chapter X in the volume of Economic Essays Contributed in Honor of John Bates Clark. The editors of these publications have been good enough to permit the use of these chapters in substantially their original form. A. A. Knopf, Inc., and The Macmillan Company have also kindly permitted me to reproduce certain charts from Raymond Pearl's *The Biology of Population Growth* and J. B. Clark's *The Distribution of Wealth.*

May I add that both Hart, Schaffner and Marx itself and its Committee of Award were extraordinarily patient and understanding during the delay which necessarily occurred. Another group of men would have become disgusted at the seven years of apparent delay during which the manuscript was being revised and re-written on an average of at least once a year while extensive further studies were being constantly carried on. If such were the feelings of these gentlemen, they generously refrained from giving expression to them and I only hope that the result justifies their forbearance.

Every effort has been made to make the statistical work as accurate as possible and all data have been carefully checked. Many millions of computations have however been made and it is possible there may still be some undetected errors. It is not believed however that these can be of any appreciable magnitude.[1]

PAUL H. DOUGLAS

CHICAGO, DECEMBER 9, 1933

Addendum

It may perhaps be added that Professor Pigou's recent book on the *Theory of Unemployment* did not appear until after the galley proofs of this book had been corrected. It is interesting and to my mind significant that he should have estimated by purely deductive methods that the probable elasticity of de-

[1] It may perhaps not be presumptious to indicate how this volume fits into the program for the investigation of wages which I have set myself. In my *Real Wages in the United States, 1890–1926,* and the *Movement of Money and Real Wages 1926–1928,* I studied the movement in this country for nearly forty years of wage rates, earnings, unemployment and the cost of living in order to obtain an index of the material progress of the American wage-earning and salaried classes. In my *Wages and the Family,* I developed a method of wage payment to take account of family responsibilities. In the future I hope, if permitted adequate leisure and resources, (1) to carry down to date and improve my indexes of money and real wages for this country (2) to prepare

mand for labor as a whole during periods of depression is not less than —3.0 (*Ibid.*, p. 97). My own estimates, based upon an inductive study, indicate a "normal" elasticity of between —3.0 and —4.0. Pigou's work therefore lends some corroboration to my "normal" results. It remains to be seen, however, whether Professor Pigou's sharp distinction between the elasticity of demand for labor during periods of prosperity and periods of depression is fundamentally valid. His conclusion, however, that during the periods of boom "it is impossible for the real demand for labour . . . to be other than highly inelastic" (i.e., less than —1.0) seems to me to be incorrect. On the contrary, my results indicate that as a direct consequence of the equation of production, which Pigou apparently does not consider, the elasticity of demand in "normal" times is, as stated, not far from —3.0.

indexes of money and real wages for the more important European countries (3) to investigate the problems of wages and the business cycle (4) to study wage and salary differences between localities, industries and crafts and to offer an analysis of the reasons for these differences (5) to continue the present set of studies and find for other countries and for divergent periods of time the probable marginal productivity curves of labor and capital and the supply curves of these factors in order to work out inductively and with more precision the forces governing the competitive equilibrium of distribution (6) to carry on similar studies for specific industries and plants and to deal more definitively with the problems presented by complete or partial monopoly and (7) finally to prepare a history of wage theories.

CONTENTS