THE KEYNESIAN REVOLUTION

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PREFACE

Chronologically, the origin of this volume goes back to that period in 1940 when two generous scholars, Fred Marer and Dr. Dewey C. Duncan became personally interested in my education. They first put me on the right track. It was my dear friend, the late Struan T. Robertson, who first got me excited about Keynes. The combined influences of Robertson, Professor William Fellner and Professor Norman S. Buchanan first exposed clearly to me the problems of economics. But the following pages could never have appeared in their present form were it not for the stimulation afforded by Professor Paul A. Samuelson, at whose feet I have sat for two years. For those arguments which are faulty or ill-conceived, I bear the full burden of responsibility, and for those arguments which represent real contributions, Professor Samuelson deserves much of the credit. Oftentimes I feel that I have in many cases done nothing more than paraphrase what I have learned in classes and innumerable discussions with Professor Samuelson.

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Abstract

By tracing, chronologically, the various threads of development in Keynes' own writings since his first publications, we can better acquire an idea of the real significance of his important contributions of more recent years. Being schooled in the classical tradition of Cambridge, his early writings adhered closely to orthodox doctrines. Interspersed with the writings of his period of extreme classicism, we find ideas, both from his theory and policy, which later became an essential part of great innovations. A very important characteristic of Keynes' early writings is his great intuitive insight in spite of a hazy, undeveloped theory. His writings were largely on important issues of the day, and his intuitive solution of these contemporary problems led to the development of a formal theory. Specifically, Keynes has always been in favor of inflation as opposed to deflation, although desiring price stability as the best of both worlds. He has consistently developed policies with a view to the avoidance of the spectre of deflation and its consequent unemployment. His unfavorable attitude toward the rentier, as an unproductive element of society, has also consistently fitted in with his views on inflation vs. deflation. Also he developed, at an early stage, fruitful ideas about the processes of saving and investing. He has long supported the theories that have taken investment fluctuations to be the prime mover of the capitalist economy. A Treatise on Money sums up his ideas on these problems just at the opening of a new period in his thought.

In the transition period between the public appearances of the Treatise and The General Theory of Employment, Interest, and Money, a Revolution occurred in economic theory. As a consequence of the various arguments on public works policies and Kahn's brilliant paper on the formalization of the multiplier notion (long a vague concept among supporters of public works programs, including Keynes), the true relation between savings and investment was discovered. It is when Keynes realized that out of the savings-investment process, the level of effective demand is determined that the Keynesian Revolution occurred. The Revolution, then, is simply the replacement of the accepted, classical savings-investment theory of interest by the Keynesian savings-investment theory of effective demand or employment. A consideration of Keynes' own writings during this transitional period and those of his known disciples enables us to place roughly the date of the conception of the new theory in the middle of 1933.

It is very interesting to compare the writings of Keynes in this period with those of the various theories that were then popularly accepted, namely the theories of Hayek, Schumpeter, Myrdal, Pigou, Hawtrey, Hobson, etc. Such a comparison brings out clearly the strongest sense of the Revolution, i.e., the theories against which Keynes was actually revolting.

Mathematical models of the skeleton system of the General Theory are very useful in bringing out certain important structural aspects of Keynesian economics, in disproving certain false conceptions about the new theory, and in contrasting the Keynesian and classical systems. The models show the building blocks on which the complete, interrelated system rests. The false notions which are pointed out and considered are the following: (1) that Keynes'

results follow only from drastic assumptions, (2) that these same assumptions applied to classical economics would produce the same results, thus proving that Keynes has said nothing new, (3) that rigid wages and a supply curve of labor in terms of money wages are necessary conditions for the Keynesian results, (4) that there can be no unemployment in a perfect system with no frictions, (5) that the most important Keynesian innovation is the development of the liquidity preference theory of interest, (6) that the Keynesian results hold only for the short run.

In order to demonstrate the possibility of the existence of unemployment, it is necessary to deviate from classical assumptions, but it is not necessary to introduce all the frictions and rigidities that many ascribe to every Keynesian system. In a system of real economics with no frictions, it is necessary only to assume that certain schedules have different shapes from those assumed classically. If the savings and investment schedules are both interest-inelastic, as we now believe, then it is easy to see why there is no perfect equilibrium of perfect competition possible. This is merely a restatement of the Keynesian Revolution because it can be derived that savings do not in general flow into investment at the going rate of interest with income at the full employment level. It means that the classical interest theory does not hold under the Keynesian assumptions about the shape of the savings and investment schedules. Because a perfect equilibrium solution is not possible, unemployment exists. Furthermore, the prevalence of flexible wages in this system will not insure a return to full employment under the Keynesian conditions on the shapes of the functions, although the reverse is true in the classical case. In the Keynesian case,

flexible wages lead only to hyper-deflation, a phenomenon not observed in the real world. Hence we conclude that there must be rigid wages which prevent hyper-deflation and make the unemployment situation one of persistent equilibrium. Similar results are obtained for the long run situation in which the stock of capital is allowed to vary and in which savings and investment reach their long run zero levels.

An examination of many of the more important reviews of the General Theory reveals how little the book was at first understood. Few of the first reviewers attached significance to the major problems. An attempt is made to clear up some of the controversies which grew up immediately after the reviews. The argument over the effects of money wages upon employment is best treated in the light of the Keynesian conditions on the shapes of the schedules in the system. Conditions can be stated in terms of the various elasticities of the savings function, of the marginal efficiency schedule, and of the liquidity-preference schedule which show why money wage cuts do not lead to increased employment under the conditions of Keynesian economics. The savings-investment controversy is immediately clarified when we distinguish between defined relationships among observables and schedule relations. Finally, it is shown that the liquidity-preference theory of interest and the loanable-funds theory of interest do not lead to the same results, contrary to common opinion. Using an accepted definition of loanable funds, we see that the insertion of a building block based on this definition into the Keynesian system produces a different result from that obtained with the liquidity-preference building block.

That Keynes was anticipated in earlier literature, there is no doubt. But none of his forerunners anticipated the complete theory. The earlier writers can be conveniently divided into two groups according as they anticipated considerations of the savings-investment building block or the liquidity-preference building block. The first group includes the theories of Malthus, Marx, Hobson, Foster and Catchings, Douglas, and Johannsen. Aside from Marx and Johannsen, these writers are usually grouped as underconsumptionists. The second group consists of Proudhon and Gesell. A comparison is made between the writing of each author of the two groups and the relevant ideas of Keynes.

Finally, we make the argument that Keynesian economics is not merely depression economics. We can analyze any phase of the business cycle with this system. As an example of the use of Keynesian economics in non-depression periods, we can analyze very well the problem of the inflationary gap with the new tools.

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CHAPTER I

KEYNES AS A CLASSICAL ECONOMIST

One thing that must be kept in mind throughout the reading of these pages is that Keynes was and still is a classical economist. Much space will be devoted below to the manner in which a significant break was made with classical doctrine, but as all economists know, it is almost impossible to get rid of early impressions, especially after they have stuck for two decades or more. It was not until Keynes had lived through some years of the economic system's greatest catastrophe that he was able to divorce himself from/of the standard doctrines. In this chapter, we shall look carefully at the body of economic theory and policy (always so important with Keynes) which was being espoused by Keynes in order to get a clear picture of the development which must have been going on in his own mind up to the early part of the thirties.

Keynes of the Pre-War World

It was not until the Treaty of Versailles that Keynes achieved his great fame and began to make public the theoretical system on which he based his original contributions to economic policy. But he, himself, pointed out in 1911 in a review of Professor Irving Fisher's The Purchasing Power of Money[1] that English monetary theory was principally a matter of oral tradition -- the Cambridge oral tradition -- and that the theory supported by the British economists had not been widely set down in publi-

[1]See The Economic Journal, Sept., 1911, vol. 21, p. 393.

cations. However, he did at this time remark upon what he considered to be the best work in monetary theory since Ricardo, namely, Marshall's testimony before the Gold and Silver Commission and before the Indian Currency Committee. These comments by Keynes mark him definitely as one steeped in classical tradition. Many years elapsed before he began to question these first theoretical impressions.

Keynes began his professional career with a solid, substantial book, Indian Currency and Finance (1913), which was favorably accepted by his professional colleagues, but which was by no means an indication of his later brilliance and cleverness. Some economists today would like to make much of the fact that Keynes, from the outset, departed from orthodoxy, since here we had a plea for a managed currency. Actually, this policy recommendation that India have a gold exchange standard was reached on the basis of straightforward, classical analysis, not seriously challenged by his contemporary, orthodox colleagues. Briefly, this book asked for a central bank to be set up in India which would centralize the gold reserves so that extraordinary monetary drains could be met in times of crisis. He thought that this plan would lend greater stability to the Indian currency system than would be obtained through the use of a strict gold standard. It was a commonplace that the Western countries had made India the sink for the world's excess gold supply, giving these nations a very good cushion against inflationary price movements. This led directly to price fluctuations and undesirable currency speculation in India. Such conclusions as the above are certainly evident to the classically trained economist working along the lines of the quantity theory of money. Primarily, Keynes was interested in achieving price stability for India and supported his program for stability by quite orthodox analysis. Whether the policy

recommendation was the most orthodox plan or not, it cannot be doubted that Keynes's economic analysis was derived entirely from classical theory.

Surprisingly enough, our prolific hero was very quiet during the War years. His publications during this period were of a very conservative nature with a complete absence of innovation. He reviewed some German publications on that country's war economy and wrote some articles on the behavior of the money markets and banking system during the critical period, but there seems to be no indication of any important contribution on his part to the discussions of inflation or of the real costs of the War that were so prominent then.

The Treaty

From a freely flowing pen, economists and the public in general were entertained with a best-selling analysis of the Treaty of Versailles. As was to be increasingly the case, Keynes was dealing in a spectacular way with important issues of the day, and in this instance the question was: Are the provisions of the Treaty economically justified, and more specifically what is the extent of Germany's ability to pay? With most of this book and its sequel we should not be primarily interested because they give us little evidence of the author's theoretical system, the point at issue in this chapter. However, in The Economic Consequences of the Peace, Keynes did devote a chapter to a discussion of the economic process as it led up to the World War. In this chapter, Keynes looked with pangs of nostalgia at the pre-war economic system in which there were no barriers to trade, unlimited investment opportunities, capital accumulation, and growing population. This period, to any classical economist, was a time of

capitalism at its best, and the growing possibilities of post-war restrictions and monopolistic practices did not present a happy outlook. A few quotations will show the perspective into which the pre-war period was put.

> "What an extraordinary episode in the economic progress of man that age was which came to an end in August 1914!"[1]

> "Europe was so organized socially and economically as to secure the maximum accumulation of capital."[2]

> "The interference of frontiers and tariffs was reduced ~~to~~ to a minimum . . ."[3]

The analysis of this economic millenium is quite interesting, especially so when compared with the later views of the General Theory. He saw the high level of investment and consequent growth of capital stock made possible through the inequalities inherent in the capitalistic income distribution. In fact this inequality was Keynes' justification of the capitalist system. The rich had excess income which they had saved and were able to invest profitably. It was only because the rich were wise enough to abstain from consumption that capital accumulation was able to achieve its great size. But the important part of this analysis is that Keynes saw only two possible obstacles for this progressive economic growth: population might grow too rapidly and outrun accumulation, and war might consume the stock of capital. He was never worried at this time about a lack of offsets to the savings generated out of the capitalistic income distribution and a possible high level of unemployment. Although Keynes is famous for many predictions, he was not able to predict the economic stagnation of England during the twenties, and precisely because

[1] The Economic Consequences of the Peace, p. 11.
[2] Ibid., p. 18.
[3] Ibid., p. 15.

he was too classical in his analysis.

Post-War Maladjustments

The post-war economic ills provided the stimulus to much of Keynes' writings for several years. The issues which he was trying to clear up were inflation vs. deflation; the gold standard vs. a managed currency (sometimes phrased as stability of prices vs. stability of exchange). The first problem is very important to us because of the following reason: Although Keynes was consistently in favor of price stability,[1] if economic maladjustments had to be corrected by price manipulation, he was invariably on the side of inflation as opposed to deflation. This preference for inflation is quite important in understanding much of the argument of the General Theory. His statement on this issue is

> ". . . . it is worse, in an impoverished world, to provoke unemployment than to disappoint the rentier."[2]

This notion was a part of his more important conception that a high level of investment activity is necessary for economic progress under capitalism. Though investors would prefer the certainty of price stability, rising prices were considered to be a stimulus to business activity, while deflation was looked upon as an obstacle to investment and enterprise. Rising prices bring windfall profits to business and in this way enhance the expectations of potential investors, a necessary stimulus to promote a high level of income and employment. But it must be admitted that the level of investment depends upon much more than price expectations, and

[1]This favoritism goes back at least as far as his Indian Currency and Finance.

[2]Monetary Reform, 1924, Harcourt Brace, pp. 44-45.

in this respect the early Keynesian analysis was weak. It was not until investment opportunities had sunk to a much lower level that Keynes recognized their complicated character and the necessity for vigorous measures in order to send the economic system into a revival. However, we must keep in mind the fact that Keynes was always for a little inflation, and his reasons were not unrelated to the promotion of investment. Another reason why Keynes always favored inflation as opposed to deflation was that inflation is carried on at the expense of the rentier class, an inactive class in the economy which Keynes has always wanted to eliminate. He regarded deflation as a transference of wealth from the active to the inactive (i.e. rentier) class. This attitude accounts for his interest and activity in the problem of determining the level of the franc. In an Open Letter to the French Minister of Finance,[1] Keynes argued that the level of the franc would be determined by the proportion of income which the taxpayers would allow to be transferred to the rentiers. He argued that it would be more desirable to diminish the claims of the rentier rather than increase the tax burden. Of three alternatives open to the Minister of Finance -- capital levy, reduced interest rates, or price rises -- Keynes recommended the inflationary method of price rises as the most expedient method of solving France's monetary problem.

The desire for price stability is quite in line with Marshallian teachings. Marshall, too, desired stability because he saw the possible evils of price fluctuations upon the various classes of society. He pointed out the effects of rising and falling prices on producers' expectations and hence the level of output. Marshall very specifically noted the fact

[1]Essays in Persuasion, p. 105.

that wages were sticky relative to prices so that workers lost where employers gained. His observations on the movements of wages relative to prices have some bearing on the more recent Keynesian writings. On the whole, Marshall feared the results of extreme and frequent fluctuations and favored consistently moderation in price movements.

The question of devaluation vs. deflation of the monetary unit was a considerable part of the above matter of inflation vs. deflation, and was being considered in the light of the gold standard issue. The matter can be phrased thusly: Should England fix the value of its currency, no matter on what standard, at the existing, post-war exchange rates, or should she return to the pre-war level by a process of deflation? Secondly, should the monetary system be constituted so as to achieve a stable internal price level or a stable foreign exchange rate? Once the second question had been answered, it would have been possible to decide whether or not to return to the strict gold standard, and the answer to the first question would have indicated the exchange rate to be chosen no matter what standard was used. Keynes was certainly unequivocal in his preference for domestic price stability over exchange stability in order that the monetary authorities could maintain control over the domestic economy. Whether Keynes' specific proposal was what we call a gold standard or not is unimportant; the point to be made, rather, is that he definitely did not want to return to the old-fashioned gold standard system that existed before the War, and he did not want to restore the pound to its pre-war parity under any system. His specific proposal was for the Bank of England to quote a weekly buying and selling price for gold (spot and future) not at the level of pre-war prices. Some economists may define a gold standard

to be in existence when there is a fixed buying and selling price for gold, and it can be seen that Keynes' scheme did not even fall under this liberal definition of a gold standard, for he was very much against a pegged price for gold. The bank's weekly price for gold was not proposed to remain fixed, but was to fluctuate as conditions warranted. Of course, Keynes felt that stability of exchanges, as long as it was not incompatible with stability of prices, was a desirable thing, and if possible, that the Bank of England should keep the buying and selling prices of gold stable.

As in the previous problem of the Indian monetary situation, in order to recommend a policy of price stability, it was necessary to base the recommendation on a theory of the determination of the price level. In both cases, we see that the theoretical apparatus employed was the quantity theory of money, along the most orthodox lines. For the entire period of the twenties we find this incessant insistence upon price stability with the policy measures formulated on the basis of an orthodox quantity theory of money, or something closely related to it. One almost gets the impression that Keynes was viewing the business cycle as the "dance of the dollar" and that price stability, in itself, would cure our economic ills. It was not until the true nature of the saving-investment process became evident to Keynes that he was able to get rid of some of his classical and neo-classical ideas in order to develop a more satisfactory theory of economic behavior.

Returning once more to the theory of the determination of the price level, let us consider the quantity theory as held by Keynes in A Tract on Monetary Reform. There he worked with the well known equation:

$$n = p (k + r k')$$

where n is the cash in circulation; p is the price level; k' is the number of consumption units which the public decides to hold in checking accounts; k is the number of consumption units which the public decides to hold in cash; and r is the banks' ratio for checking accounts. Keynes regarded n and r as institutionally given. He considered k and k' to fluctuate over the course of the cycle but also to be institutionally given by public spending habits at any point of time. Hence the only variable in the equation is p, which can always be determined in terms of institutionally given parameters. The proper manipulation of n and r by the banking system was proposed in order to counteract the fluctuations over time of k and k', thus giving the desired price stability. This theory of the determination of p was admittedly based on the theory of Marshall in Money, Credit and Commerce, except for the fact that the Cambridge "k" was broken up into k + rk'.

As we shall see below, the main difference between Keynes of the Tract and Keynes of A Treatise on Money is linked up with the treatment of the quantity theory of money. For in the Tract, the motives of the public for holding money were inadequately analyzed. Money was regarded as having only one function, as a medium of exchange, and the function of money as a store of value was not considered. This is evident since k and k' were both defined as the equivalents of numbers of consumption units which the public elects to hold in the form of cash or deposits. Alternatively, people have only one motive for holding money, the transactions motive. Keynes actually did go on to qualify this slightly and introduce the precautionary motive, but the important thing that was omitted was the speculative motive which is linked to the function of money as a store of wealth, an idea entirely absent from the Tract. However, we will see later that the major theoretical innovation of the Treatise was the analysis of the functions of money and the motives for which people hold cash balances. The more extensive analysis

of the Treatise along these lines actually led us to just a very short step from the whole theory of liquidity preference.

Again the Marshallian influence is evident. We find in Chapter I of Money, Credit and Commerce, a discussion of the function of money in which Marshall mentioned money only as a medium of exchange and as a standard of deferred payments. He and his pupil both overlooked the influence of money as a store of value.

The modern reader will undoubtedly raise high hopes in anticipation of something quite revealing in the economic process after a reading of the preface of A Tract on Monetary Reform. There the first words read:

> "We leave Saving to the private investor, and we encourage him to place his savings mainly in titles to money. We leave the responsibility for setting Production in motion to the business man, who is mainly influenced by the profits which he expects to accrue to himself in terms of money."[1]

In vain, does one look for some early insight in the body of the book into the saving-investment problem and its influence on the level of output and employment. This passage is one of the first indications that Keynes recognized the problem of offsets to savings and the nature of the decision to save as opposed to the decision to invest. Herein lies the great Keynesian contribution, but we are to hear little more of it in the Tract, except for the discussion of inflation and deflation which examined the effect of price fluctuations on investment and business decisions.

In the transition period between the appearances of the Tract and the Treatise there was one problem which troubled England greatly and which Keynes was constantly attempting to solve. This was the problem of prolonged unemployment and depressed economic conditions in general. Up to 1929 there was a steady rate of unemployment of about one million or more persons (a large figure for Britain), and depressed conditions existed

[1] Monetary Reform, P. V.

in many industries. All this was going on while other countries were quite prosperous, a point which led Keynes to attribute the faults entirely to policies of the British government rather than to world conditions in general. The unemployment was largely concentrated in basic industries such as iron and steel, shipbuilding, and coal, while light industries fared much better. The unemployment was not great in such industries as electrical engineering, printing, distributive trades, or banking. This concentration of unemployment in heavy industries is quite important in understanding some of the remedies later proposed by Keynes.

The main characteristic of the Keynesian policies for the improvement of the level of employment is that they almost all involved some sort of monetary control and manipulation. Unemployment was looked upon as one of the most serious of our economic problems, yet Keynes confidently believed that it could be fully solved within the framework of the capitalist system by employing the proper monetary policy. While the bulk of the policy measures proposed were justified by strict classical analysis, it is true that there was one fundamental point of view which was quite unorthodox, namely, the contention that the system was not perfectly self-adjusting and that laissez faire policies were not the ones to bring about revival. However, this departure from classical reasoning might be more apparent than real, if one recognizes that many of Keynes' reasons as to the lack of self-adjustment related to frictions, maladjustments, and political conditions of the day, which could not have been foreseen by the founders of classical doctrine. In fact, he characterized this state of prolonged depression during the twenties as one of pseudo equilibrium[1] and not a smooth working

[1] Essays in Persuasion, p. 241.

economic adjustment. Also in answering Beveridge's thesis that overpopulation had little effect upon the level of employment, Keynes stated what he believed to be the real cause of unemployment -- a phenomenon of maladjustment. The maladjustments, he remarked, may have arisen from such causes as transitions from lower to higher price levels, a changeover from supplying one type of external market to supplying another, attempts of organized labor to obtain higher real wages than the existing economic conditions would permit. This latter maladjustment was considered quite closely related to overpopulation,and he concluded that perhaps Malthus was correct about a terrible devil.[1]

The classical influence is no more strongly represented anywhere in Keynes' writings than in his earlier views on free trade.[2] He stated that the case for free trade was based on two propositions which he accepted with certain obvious exceptions: (1) It is better for each country to produce those goods in which it has the comparative advantage and trade for those in which it has comparative disadvantages. (2) There can be no disadvantage in importing useful goods. The exceptions had to do with trade restrictions for such purposes as influencing the trade in goods which are particularly desirable or undesirable for non-economic reasons, building up industries for national defense, supporting infant industries, and dealing with dumping. He argued that protection would lead either to interference with commodity exports or to an increase in capital exports. The latter event, he wanted to avoid because he was using the old argument of unlimited investment opportunities -- exported capital merely diverts capital from use at home; i.e. capital will always be employed, either at home or abroad. In Keynes' own words we have the following statements:

[1]"Is Britain Overpopulated?" The New Republic, Oct. 31, 1923, p. 247.

[2]See "Free Trade for England", The New Republic, Dec. 19, 1923, p. 86.

> "For if there is one thing that protection cannot do, it is to cure unemployment."[1]
>
> "But the claim to cure unemployment involves the Protectionist fallacy in its grossest and also in its crudest form."[2]

We shall see later how much these views were modified.

Britain's return to gold in 1925 at the pre-war parity brought forth a huge stream of critical articles by Keynes, for this was a deflationary measure which he had opposed since the close of the War. Moreover, this step was opposed not only on grounds of the preference for inflation over deflation, but also because it represented an attempt to restore an automatic mechanism of currency adjustments, directly in opposition with Keynes' views on monetary management. In the Economic Consequences of Mr. Churchill, he argued that the whole source of difficulty in the British economic scene could be traced to the fact that relative prices at home and abroad were completely out of line, to the disadvantage of England. The prices of British export goods abroad were considered to be too high, thus working a hardship on the export trade in maintaining a balance of payments. But it is quite significant that Keynes agreed at this stage to change one of his views regarding the cause of unemployment and excessively high export prices. An orthodox conclusion to be drawn might have been that the workers were being remunerated too handsomely for what they produced. Keynes objected to this view and said that the real cause of troubles in the export industries was that sterling was overvalued; the return to gold at the pre-war parity raised the value of sterling by 12 per cent abroad, thus making British goods more expensive in foreign markets. If the average

[1] Ibid., p. 87.

[2] Ibid., p. 87.

money wages prevailing at that time in the various countries be converted into a common monetary unit at the then going exchange rates, one would find the British wages far above those of the rest of the world, but this seeming, competitive advantage for British workers was a purely monetary phenomenon. The real wages of British workers were much nearer the level of these in other countries than was true of the gold wages. Keynes thus argued that the difficulty could not have been due to high real wages in the export industries. The possible lines of action that were open to Britain, according to Keynes, were to let the sterling exchange depreciate abroad with constant prices at home or to force home prices and wages down into adjustment with the sterling exchange. Of course, he ruled out the latter alternative because of his constant fear of deflationary complications. He also recognized the institutional rigidities which would stand in the way of wage cuts because he foresaw the possibility of strike action on the part of the workers in order to prevent wage reductions. Another element in the return to gold which drew criticism from his sharp pen was the fact that the Bank of England was forced to raise its discount rate and restrict credit, precisely at a time when the level of investment activity was low.

A long controversy between Keynes and Ohlin took place in the latter part of the 1920's on the transfer problem; however, since the issues involved here have been so extensively reviewed in books on international trade and since the questions involved do not illustrate much about Keynes' monetary theories which we cannot find elsewhere, there is not much point in discussing the matter further. But in passing, we should note that this argument on the transfer problem is quite in line with classical thought,

the theme of this chapter.

It is with the election of 1929 that interesting points arise again, for here is the first inkling of the later and more famous Keynesian doctrines which will be examined at some length below. The occasion of the new Keynesian policy was a political pledge by Lloyd George to reduce the volume of unemployment through spending on public works. Keynes in collaboration with H. D. Henderson[1] examined the commonsense reasoning behind this pledge and argued that it followed from economic analysis. Keynes had by no means deviated as yet from classical thought, and for this reason the argument is weak at certain crucial points. But the most significant enlightenment to draw from this piece of writing is that we can see clearly the sense in which the Keynesian doctrines represent a true innovation. In later chapters we will show clearly that all the important parts of the General Theory can be found in the works of various predecessors, but in spite of this fact no one was thinking seriously along these lines at the time of the great depression. The Keynesian theory was essentially new as compared with the existing body of doctrine held in the late 1920's and the 1930's. The arguments against Lloyd George's Liberal Pledge clearly show the status of some of the non-Keynesian thought.

As always, Keynes was very optimistic about the success of his policy recommendations -- this time a public works program -- in bringing about full employment, especially since he predicted induced as well as direct effects. In fact, he even suggested that Lloyd George wanted to spend too much and that the plan could be successful even if based on smaller outlays. He was rather näive in accounting for the frictions, leakages, and effects

[1]Can Lloyd George Do It? An Examination of the Liberal Pledge, 1929, Nation and Athenaeum, London.

on business confidence, about which we learned so much in our depression experience. The fact that men (economically productive factors) were idle and being supported by costly unemployment benefits when they could have been set to work on useful tasks which would have increased the stock of wealth was an outright contradiction for Keynes. The contradiction was especially flagrant since this state of unemployment had been going on for eight years (excepting 1924) with at least one million persons constantly out of work. He considered, and rightly so, the cost of the Lloyd George program to be trivial as compared with the wastes of unemployment.

Keynes' recognition of the great possibilities of induced effects presents us with the germ of his later developments, for the opponents always considered the costs of the plan in relation to the volume of primary, direct employment that would result. But one must not get the idea that Keynes had yet come to the strategic doctrine of the multiplier. It is an exceedingly big step for a formal economic theory[1] to go from the vague concept of repeated expenditures by successive income recipients to the theory of the multiplier in which one does not get lost in explaining the successive rounds. Keynes always got lost in successive spendings after the first two or three rounds. But he did point out very clearly that there would be cumulative effects of induced purchasing power, although he remarked that it would not be possible to measure the accumulation with any precision.[2] Also he emphasized very much the spread of employment from the immediate site of the public works to the indirect employment in comple-

[1] though not for economic policy.

[2] Compare this with the optimistic attitude about the precision of the measurements in the Means to Prosperity in 1933.

mentary industries -- the notion of investment induced by a given autonomous impulse. However, since he had not examined thoroughly a formal multiplier theory, he did appear to be falling into one pitfall. He imagined that by this spending, the government would be able to lift itself by its own bootstraps. He concluded that there would be such an increase in income as a result of the spending that with fixed tax rates the government would get large increases in its tax revenue in order to offset the budget deficit. Other sources of relief to the budget, he stated, would be reduced armament expenditures and reduced unemployment benefit payments. The reduction of spending on these latter two items by the government would merely mean that spending would be transferred out of these lines into public works if full employment was to be achieved. There would be no net relief to the budget.

There are also indications in this article that the stagnant economic position of Britain had at last impressed upon Keynes' mind the problem of offsets to savings. His opponents contended that employment on public works schemes would merely divert employment from jobs in private industry. They were clearly operating with the classical assumption of full employment -- sending workers into one job merely takes workers from another job. It is amazing that people could argue this way in the light of British experience. That Keynes saw the problem is evident, but he was far from having developed a satisfactory theory. He claimed that the savings which would flow into the investment undertaken by the Lloyd George scheme would not come from funds that would otherwise be used to finance other capital equipment; instead that the resources would be furnished from savings which were then disbursed to the unemployed, from savings which would run to

waste through lack of credit, or from reduced foreign lending. The recommendation that the government offset otherwise redundant savings brings us to the core of the later Keynesian policy.

A Theoretical Model

A period of swift intellectual growth was concluded with the appearance in 1930 of the famous Treatise on Money. Economists eagerly awaited this long publicized work which Keynes had been writing over a period of many years. We are told in the preface that many of the author's ideas underwent great change during the process of writing this Treatise and one reviewer has characterized the book as a transitory phase of rapid development. The most striking characteristic of the Treatise is its loosely knit theory with so many lines of thought incomplete. But we can accept this book as the summation of all the lines of thought covered in the several debates of the 1920's, as discussed above, with the possible exception of the question of public works schemes brought up in the elections of 1929. We will take the Treatise and some of the review articles built upon it as the status of Keynesian theory at the start of the Great Depression. In the next chapter, we can then go on to consider the extremely important transition from the Treatise to the General Theory, with the important steps exposed.

We can characterize the Treatise as a book in classical economics based on two important and well-known theories. These two theories are the business-cycle theory which makes investment fluctuations the prime mover of the capitalistic system as supported by Tougan Baranovski, Spiethoff, Schumpeter, Robertson and the savings-investment theory of interest. With

these two theories superimposed upon a classical model, it is possible to develop the important arguments of the Treatise, with the exception of one significant new contribution to economic theory, the foundations of the liquidity preference theory of interest. It may seem odd that the liquidity preference doctrines should come out of a work based on the interest theory of the Treatise; however, this only illustrates the confused state of Keynes' ideas at the time. The seeming contradiction is easily resolved since the liquidity preference theory of interest grew from the seeds of the bearishness theory of the determination of the price level of investment-goods (or non-liquid assets), as it was presented in the Treatise, rather than the determination of the rate of interest.

Briefly, the argument of the Treatise ran as follows: The business cycle is caused by fluctuations in the rate of investment relative to the rate of savings. This notion is based on the theories of Tougan Baranovski, Spiethoff, Schumpeter, and Robertson. In fact Schumpeter's theory of innovations was unreservedly accepted by Keynes as the moving force of the capitalist fluctuations.[1] According, however, to the interest theory, fluctuations in the market rate of interest about the natural rate are uniquely related to fluctuations in the discrepancy between savings and investment which in turn are related to fluctuations in the price level. Now Keynes argued that investment is the really dynamic factor which fluctuates when the market and natural rates of interest diverge, and that the fluctuations in prices

[1]Although Professor Schumpeter would have us believe that his views are 100 per cent non (anti (?)) - Keynesian, he must admit that there are great similarities between their cycle theories.

are a result of the discrepancies generated between savings and investment. The whole aim of the Treatise was then to tell us how to keep prices stable, or what is the same, to keep savings and investment equal, or what is the same, to keep the market rate of interest equal to the natural rate. Thus his concrete proposals were schemes of monetary control; the banks by manipulation of the rate of interest would influence the level of investment until equilibrium could be achieved with the more stable rate of savings. This would give us the desired end of price stability. If interest rate manipulations proved unsuccessful, then open market operations were suggested as the control measure. In many respects this part of the Treatise does not differ much from the Tract on Monetary Reform. In that latter book he also wanted price stability in order to stimulate a satisfactory level of investment activity. But the Treatise was certainly a step forward in that the investment-savings process was much better analyzed and the influence of the rate of interest, although perhaps exaggerated, was incorporated into the economic model. The analysis of the factors that determine the level of investment in fixed, working, and liquid capital and the distinctions between the process of saving and the process of investment were great contributions of the Treatise, in spite of the fact that these notions were not wholly original with Keynes but were drawn from other theories.

Keynes apparently thought that he was bringing out the heart of his theory in the exposition of his pretentious "fundamental equations", but the "fundamental equations" were not the essential contribution of the book, and it is quite unfortunate that the reviews and discussions of the book always centered on these equations, instead of on more useful material. Of course, Keynes' attitude and his label of "fundamental equations" did not help to promote the discussion of the Treatise to a higher level of scien-

tific achievement. The "fundamental" equations were merely definitions which did not rest upon refutable hypotheses and were on a level with other famous equations in economics such as $MV = PT$, $Y_t = C_t + I_t$, or $c + s + v = V$, which are important to statisticians at times but which do not tell us much about fundamental economic behavior.

Essentially, the fundamental equations represented an attempt to improve upon the classical quantity equations and link the interest rate, as well as the stock of cash balances, to the determination of the various price levels, particularly the price level of output as a whole and the price level of consumption - goods. Keynes wanted to show with these equations how variations in the market rate of interest relative to the natural rate would cause discrepancies between the level of savings and investment, which in turn would cause the price level to oscillate. It must be pointed out that Keynes did not regard his equations as formally incompatible with the quantity theory; rather he thought that they brought to light certain processes obscured by the traditional doctrine.

This exposition may seem to be nothing more than a statement of the Wicksellian theory, from which the terminology was certainly borrowed. But Wicksell was not ready to substitute an alternative for the quantity theory. His theory held that equality between the two rates of interest implies stability of the price level as well as equality between the levels of savings and investment, but he did not look upon these conclusions as flagrant contradictions of the quantity theory and took the attitude in Interest and Prices that the quantity theory, although not a perfect explanation of price movements, was the best theory to use until a better formulation could be provided. Wicksell openly admitted that his ideas about interest rates

and the price level were so imperfectly thought out in his own mind that he did not dare formalize them in mathematical equations. Keynes thought that Wicksell's theory and that of the Treatise came to the same thing but was never quite certain of what Wicksell wanted to say.

Keynes' bone of contention at this time with the classical writers was that the price level is affected by variations in magnitudes other than the stock of money or velocities of circulation, namely by variations in the interest rate. According to the classicists, though, interest fluctuations could influence the price level only through induced fluctuations in the stock of cash balances. That is to say, they thought that changes in the market rate of interest make bank credit easier or more restricted according as the interest rate is lowered or raised. The change in bank deposits when added algebraically to the existing stock of cash was their mainspring behind price movements.

Let us consider now the "fundamental equation" for the determination of the price level of output as a whole in relation to the quantity equation, to see what were the points at issue.

Keynes defined what we now call net national income produced, Y , as the sum of incomes paid out to the factors of production plus windfall profits. The income paid out, E , was defined as salaries and wages, unemployment benefits, interest on capital, regular monopoly gains, rents, and the normal remuneration of entrepreneurs. Normal remuneration of entrepreneurs was defined as that rate which would leave entrepreneurs under no motive to alter the scale of their operations if they were free to make new bargains with the factors of production at the going rates of return. Thus, net returns, over and above the normal rate, became windfall profits. Windfalls were also defined as the difference between the market value of

new investment and savings. The second definition came to the same thing as the first since savings was defined as the difference between income paid out, net of windfalls, and consumption, while the market value of investment was defined as total income produced, inclusive of windfalls, minus consumption.

If we denote output as O, the price level as π, and windfalls as Q then we get

$$Y = \pi O = E + Q$$

Keynes wrote the right hand equation as

$$\pi = \frac{E}{O} + \frac{Q}{O} = \frac{E}{O} + \frac{I-S}{O}$$

where I and S represent investment and savings respectively. Perhaps it was unfair to say above that this equation was a definition and not based on any refutable hypothesis. The mere formal existence of the equation, Keynes thought, depended on the truism that income could be conveniently broken up into two parts. Insofar as this was his theory, it was not based on any refutable hypothesis. But he implicitly attached certain hypothesis to some of these variables in order to study the mechanism of price change. As is true of all these definitional equations, variations in one variable may always counteract variations in another, so that conclusions with regard to the movements of yet other variables may be obscure. In the quantity equations, if movements of the velocity of circulation and/or of the physical volume of output counteract movements of the stock of money, then we cannot be certain about movements of the price level. The classical theorists solved this problem by taking the velocity as an institutionally given constant and output as given at the full employment level. They justified the first assumption by claiming that velocity or, if you like,

the Marshallian "k" depends upon consumer spending habits, practices with regard to the frequency of income disbursements, banking practices, and the general psychology. Thus at any point of time, the general social and economic setting would give them the hypothesis, $k = \overline{k}$. The other assumption of full employment output followed from their theory of the structure of the real sphere of the economy. They thought that the marginal productivity theory of wages defines a demand curve for labor in terms of real wages. This demand curve, according to them, interacts with a supply curve of labor (also in terms of real wages) to determine the level of employment and the level of real wages. They also envisaged a production function relation between output, employment, and the stock of capital. Taking the stock of capital as given in the short run, a unique relation exists between the level of output and employment such that they could determine the former from their knowledge of the latter. Keynes, being a good classical economist, implicitly accepted the above theory of the level of output. Hence, in his fundamental equation we can assume the relation $O = \overline{O}$. That this is a correct interpretation, is substantiated by a statement in the preface of the General Theory which said, "My so-called 'fundamental equations' were an instantaneous picture taken on the assumption of a given output."[1]

The variable E which represents income paid out to the factors of production was never adequately accounted for by Keynes, this being the principal fault of the Treatise. This variable represents effective demand, and the lack of any theory of effective demand was precisely the fault which prevented

[1]The General Theory of Employment, Interest, and Money, p. VII.

Keynes from producing a satisfactory result at this time. He dodged the issue of the determination of effective demand by assuming the ratio $\frac{E}{O}$, which he called the rate of efficiency earnings of the productive factors, as a stable term which changed only gradually with a trend path. Thus the only other determinant of the price level which remains unaccounted for is the strategic variable Q or (I-S). The behavior of this variable was formulated from the main hypothesis of the book. Keynes posited that Q depends upon the difference between the market and natural rates of interest, such that Q is greater than zero when the latter rate exceeds the former, equal to zero when the two rates are equal, and less than zero when the former rate exceeds the latter.

From these hypotheses, Keynes derived the result that the price level fluctuates about a rather stable equilibrium value, $\frac{E}{O}$, according as the market rate fluctuates about the natural rate and induces fluctuations in the profit variable, Q. The theory of price fluctuations could, of course, be stated in terms of the relative behavior of savings and investment flows since Q was defined as (I - S). The explanation in these terms is perhaps more illuminating since it tells us more about the economic mechanism. For example, if there is an increase in the quantity of money, in the first instance there should be an upward pressure on the price level via the term $\frac{E}{O}$ of the equation. More money will be spent in the payments to the factors of production, which accounts for the increased ratio $\frac{E}{O}$. But in the next step, we find that the increased cash will tend to increase the reserve position of banks and make them willing to lend on easier credit conditions; i.e., the bank rate will be lowered. The change in the rate of interest will, according to this theory, stimulate investment and discourage savings so that there is a discrepancy generated be-

tween these two flows. This discrepancy, which was called Q, will further increase the price level; hence there is a stimulus to prices in addition to that caused by increased income payments. The process does not end here because the increased demand for investment reacts upon the demand for workers to produce investment goods and thus exerts a further upward pressure on prices.

Insofar as the quantity equation is written in the Cambridge form

$$\overline{M} = \overline{k}\, p\, \overline{y}$$

in which the stock of money, $\overline{M}$; the fractions of income which people choose to hold in the form of cash, $\overline{k}$; and full employment output, $\overline{y}$, are all given, the classical theory does not agree with the theory of the Treatise. Keynes agreed with the assumption that $\overline{M}$ and $\overline{y}$ are given but objected to the assumption $k = \overline{k}$, which he had previously accepted in A Tract on Monetary Reform. Keynes was really trying to say that k is influenced by the rate of interest. This can be shown in the following way. One of the great innovations of the Treatise was to analyze the motives for which people hold cash balances. Total cash balances were split into income deposits, savings deposits, and business deposits which can be linked very easily to his now, well-known classification of funds held for the transactions, business, precautionary and speculative motives. He said that the incomes paid out are equal to the income deposits multiplied by their velocity of circulation, or $E = M_1 V_1$. Hence the "fundamental equation" can be written as

$$\Pi O = M_1 V_1 + Q$$

Just as the classical writers assumed $\bar{k}$, given, so did Keynes assume V, given. He wrote, "Generally speaking, one would expect the average value of k, [the inverse of V,] in a given economic society to be a fairly stable quantity from year to year."[1] He accounted for the stability of k, by pointing out the same habits, customs, and business practices to which earlier economists had referred. In this relation he thought that interest fluctuations would cause movements in Q, independently of M, and V, which would, in turn cause the price level to oscillate. We may conclude that the classical theory took a fraction of $E + Q = Y$ as a stable, given value, while Keynes took a fraction of merely E as a stable, given value. The monetary flow directed at that part of the value of output denoted by Q was really taken to depend upon the rate of interest and was not given institutionally. The quantity equation can be written as

$$(M_1 + M_2)\ V = E + Q = Y$$

in which M_2 is the stock of business-deposits. Keynes asserted that the sum of income deposits plus business deposits constituted cash-deposits and represented the total sum available for spending. The other element of the money supply, savings-deposits, was assigned a zero velocity of circulation and treated only as a store of value. The equation with $M_1 + M_2$ as the stock of money agrees also with the classical treatment of money exclusively as a medium of exchange. Furthermore, since Keynes wrote

[1] A Treatise on Money, p. 44, vol. I.

$M_1 V_1 = E$, we can legitimately write $M_2 V_2 = Q$, where V_2 is the velocity of circulation of business deposits, defined as the ratio of Q to M_2. If Q is a function of the interest rate, then V_2 is also defined as a function of the interest rate.[1] Now the "fundamental equation" can be written as

$$\Pi = \frac{(M_1 + M_2)V}{O} = \frac{M_1 \bar{V}_1}{O} + \frac{M_2 V_2}{O}$$

The classical V is merely a weighted sum

$$V = \left(\frac{M_1}{M_1 + M_2}\right)\bar{V}_1 + \left(\frac{M_2}{M_1 + M_2}\right)V_2$$

and must also depend upon the rate of interest because it is made up of an autonomous element and a function of the rate of interest.

It is very important to see here that Keynes' divergence from the quantity theory was not related to his treatment of money as a store of value because he excluded the influence of savings-deposits from his "fundamental equation." His present position, however, is to include in his money equation the sum of money used for transactions and for idle hoards. His present divergence from the quantity equation is due directly to the treatment of money as a store of value. In the Treatise, savings-deposits, as we shall see below, were treated in a relation, entirely separate from the "fundamental equations."

The theory behind the determination of the price level of consumption-goods was quite similar to that of the case of the general price level. To determine P, the price of current consumption-goods, Keynes developed

[1]Except for the exceptional case in which M_2 is a particular function of the interest rate such that the rate cancels out of the numerator and denominator of $\frac{Q}{M_2}$.

another "fundamental equation." He first wrote

$$P = \frac{E}{O} + \frac{I' - S}{R}$$

where I' is the cost of production of new investment, and R is the physical volume of consumption. It was soon pointed out by Professor Hansen that this equation involved an unwarranted assumption about the relative rates of change of the costs of investment-goods and consumption-goods. But it will be shown later that this invalid equation in no way affected the argument. It did not influence the determination of the price level, P.

The theory of the determination of the other price level, P', for investment goods introduced a far more interesting theory. D. H. Robertson, in commenting on the Treatise[1], remarked that Keynes' exposition was not complete because he never stated explicitly how P' is determined. Keynes replied[2] that in his discussion of bearishness and bullishness, he had implicitly given enough factors to determine this price level. His theory was that the price level of non-liquid assets is determined by the equation of the quantity of hoards which people want to hold with the quantity of savings deposits which the banks are willing to create. The variable P' was conceived as the allocating mechanism between the holding of idle

[1] "Mr. Keynes' Theory of Money" The Economic Journal, 1931, vol. 41, p. 395.

[2] "A Rejoinder" The Economic Journal, 1931, vol. 41, p. 421.

balances on the part of the public and the creation of idle balances on the part of the banks.[1] Formally he was assuming an equation of the form

$$M_3 = B(P')$$

M_3 is the stock of savings deposits supplied by the banks and $B(P')$ is the bearishness function which shows the demand for idle balances as a function of the price level of investment goods.

The bearishness function is very interesting and we can profitably examine it more closely. When P' is high the expected returns from investment must be high relative to the costs of obtaining funds so that the demand for savings-deposits should be low. Conversely, when P' is low, the demand for idle deposits should be high. Keynes reasoned that the price level of investment goods must be equal to discounted value of the future returns anticipated from the ownership of these goods. If the future returns from the investment in period i of the future are Q_i[2] and the market rate of interest is $\bar{r}$, then we get

$$P' = \sum_i \frac{Q_i}{(1+\bar{r})^i}$$

The series $\{Q_i\}$ and the interest rate $\bar{r}$ are the determinants that lie behind the bearishness function. When expected returns, $\{Q_i\}$, are high, there is an upward stimulus to P' and a high demand for investment assets, accompanied by a low demand for idle balances. On the other hand, a high market rate of interest makes for a low value of P'

[1] For a brilliant anticipation of the theory of liquidity preference based upon this argument of the Treatise, see J.R. Hicks, "A Suggestion for Simplifying the Theory of Money", Economica N.S. vol. 2, 1935, p. 1.

[2] In the discussion at this point, the expected returns, Q_i, are not to be confused with Keynes' windfall profits, Q.

and a low demand for investment assets, accompanied by a high demand for deposits. It is obvious that, in this case, a high rate of interest makes the holding of savings deposits relatively desirable. These two determinants, the expected returns and the market rates of interest, determine the shape and position of the bearishness function at each point of time.

On the supply side, Keynes believed that the banking system had control over M_3, the volume of savings deposits. He said, "We have claimed, further, that the banking system can control the supply of savings deposits, . . ."[1] This assumption certainly makes P' determinate, for if the supply curve is controlled by the banks, and the bearishness function is known, we can get an intersection of the demand and supply curves. The assumption that the banks can control the supply of savings-deposits seems somewhat tenuous. At best, we now assume that they control the supply of the total stock of money and not the various kinds of deposits separately. Keynes was assuming that a particular discount policy determines the size of the various cash balances. But it hardly seems possible that their control over the discount rate could be independent of their control over the stock of cash balances. If the two are not independent, perhaps the classical economists were not so wrong in tracing fluctuations in the interest rate, to fluctuations in the stock of money, and to fluctuations in the price level. At any rate, it must be admitted that the control over the bank rate of interest is highly interrelated with the control over the stock of money supply.

On the demand side, there are expectations always existent in the minds of investors. We cannot treat these expectations as independent economic

[1] A Treatise on Money, p. 346, vol. II.

variables, but must take them as institutionally given at each period of time. Once these expectations and the market rate of interest are given, then the demand curve for liquid as opposed to non-liquid assets is determined. There was some discussion in the literature, however, concerning the definition of the non-liquid assets. At times, Keynes seemed to think that these assets were all securities and at other times as real investment goods. If they are treated as securities with fixed coupons, then a theory of determination of P' gives the market rate of interest immediately from

$$P' = \frac{1}{r}$$

But if P' is to represent the price level of all investment goods, then we cannot identify non-liquid assets with securities.

Now that we have analyzed Keynes' theories of the determination of prices, we can see immediately how his policy control scheme fits into the theoretical framework. He tried desperately to answer the question: Does the central bank have enough power to control the price level? Granted that this control is possible, he believed that cyclical fluctuations would be eliminated. The central bank would have to exercise control over the volume of savings-deposits and the market rate of interest so that P', P, and π would be kept stable. By means of the bearishness function, control over savings-deposits would result in control over P', and by means of the "fundamental equations", control over the market rate would result in control over P and π. He did not claim that the monetary authorities could always produce these results simultaneously; or that non-monetary disturbances might not arise unforeseen; or that it would be possible to avoid relative price movements; or that a country could carry out domestic

monetary policy regardless of international considerations. In general, he had a very optimistic outlook as to the possibility of regulating a capitalist economy and thought that interest rate and credit manipulations carry great weight in economic decisions.

The principal defect of the theoretical side of the Treatise was, as we have seen, the failure to explain how the level of effective demand gets determined. He wanted to explain an equilibrium situation in which prices would be stable. The main criterion of this equilibrium situation was pictured by Keynes as the equality of the flows of savings and investment. Herein lay a great mistake, for savings and investment can be in equilibrium at various levels of employment. For Keynes, an equilibrium between savings and investment at low levels had exactly the same influence on price stability in the "fundamental equation" as an equilibrium at high levels. It is only when the level of savings-investment is related to the level of employment that we get significant results. The theory of the Treatise is entirely independent, in equilibrium, of the size of offsets to savings. Keynes, however, was not the only one to fail to associate his equilibria to the volume of employment. Wicksell's theory had the same defect. He was interested only in the equality of the market rate and the natural rate of interest, or in other words, in the equality between savings and investment.

This defect of the theory could become quite serious. Since Keynes believed that many of the troubles of the early 1930's were due to a failure of savings to get invested, on the basis of his theoretical model he could have proposed two essentially different types of remedies. He could have proposed, as he did, measures which he thought would stimulate investment

to an extent that it would offset, at a high figure, the savings that people wanted to make. But his goal of price stability would have supposedly followed equally well if he had instead proposed measures to discourage savings and bring them to an amount small enough to provide only the meager investment outlets available. One solution would represent a high level of capital accumulation and one a low level. Obviously, our prosperity would differ in the two cases, but the effects on the Keynesian criteria would not be apparent. That is not to say that the effects would not exist. There would be different reactions in each case on the term, E, in the equations, but these reactions would not follow from Keynes' theoretical viewpoint.

Not only was the theoretical model exposed to much criticism, but the applied theory of money also received many attacks. Keynes was exceedingly optimistic about the number of significant economic variables which the banks could control as well as about the results of such control. The principal lever in the whole scheme was the rate of interest. He recognized that the important rate for his theory was the long term rate, for this is the rate which would influence the fluctuations in fixed capital. But since he knew that the banking system had no direct control over the long term rate he had to appeal to the statistical facts to show that there was a close correlation between the long and short rates so that control of the latter by the banks would lead to effective influence over the former. Later, when all the relevant data were brought up to date, it was found that this close correlation did not always persist, and Keynes was forced to back down on his statement about influencing investment through control over the bank rate.[1]

[1]See Edward C. Simons "Mr. Keynes's Control Scheme," The American Economic Review, 1933, vol. 23, p. 264 and J. M. Keynes "Mr. Keynes's Control Scheme," The American Economic Review, 1933, vol. 23, p. 675.

In the event of the banks' failure to gain effective control over the market rate of interest, Keynes was forced to resort to proposals for the stimulation of investment by more direct methods.

A criticism of the Treatise which has also been levied against the General Theory is that the model was entirely static. This criticism is all the more serious since Keynes claimed dynamical virtues for his innovations. In a formal sense, the "fundamental equations" written, as they were, appear to be entirely static. In order for a model to represent a determinate, dynamical system it must be able to tell us the behavior of each determined variable throughout time; i.e. it must be able to give us the value of each variable at any instant of its time path. The solutions of the equations must all be functions of time or constant over time. It certainly seems that we cannot get such formal dynamical solutions in the Treatise. But the case is not yet lost for Keynes. While he did not formalize a dynamical system, all of the reactions which he traced from the behavior of his statical variables were dynamic in character. In the "fundamental equation"

$$\Pi = \frac{E}{O} + \frac{I-S}{O}$$

he did not say that a discrepancy between I and S changes the price level, Π, to a new figure. Instead he said that a discrepancy between I and S causes Π to oscillate about its equilibrium level. He was implicitly working with the equation

$$\frac{d\Pi_t}{dt} = const.(I_t - S_t)$$

which is really a dynamical relation. It was only a formal aspect of his "fundamental equation" that was static. His analysis and conclusions were quite dynamical.

A point which should be mentioned is that in our entire discussion of the Treatise, we have been using the terms savings and investment exactly according to Keynes' definition of these terms. It is well agreed by now that arguments over definitions or terminology are fruitless; since, if definitions are precisely made and consistently followed, perfectly valid results can be obtained. While it is true that one will probably not make any great blunders in formulating economic policy as a result of misconceptions concerning the savings-investment equation, the discussion of the equation is vital to the understanding of Keynesian economics. As a matter of fact, the discussion surrounding the Treatise shows clearly the inability of Keynes, himself, to understand such a simple process of how two economic quantities can be equal at each instant of time and yet not be identical for virtual levels at a given instant of time. Robertson[1] had suggested that Keynes might define income as earnings plus windfall profits and savings as the difference between this income and consumption expenditure. Keynes rejected such a definition as absurd because then savings would always equal investment. If we define Y as income then we would have:

$$Y = E + Q$$
$$S = Y - PR = E + Q - PR$$
$$I = E + Q - PR$$
$$\therefore \quad S = I$$

Keynes, like most of his contemporaries was dealing with these flows as definitions of observable quantities and failed to treat them properly as schedules.

An aspect of the classical side of Keynes which we have not yet discussed but which is very interesting is his final disposition of the quantity theory. In the most general case, with the market rate of interest moving relative to the natural rate, the Keynesian theory differs from the quantity theory, but what happens in equilibrium? If the market rate equals the

[1]"Mr. Keynes' Theory of Money" The Economic Journal, Vol. 4, 1931, p. 395.

natural rate, then the windfall profits become zero and the "fundamental equation" becomes, according to Keynes

$$\Pi O = M.V.$$

This relation looks very much like the quantity theory because we know from the above discussion that the restrictions, $O = \overline{O}$ and $V_1 = \overline{V}_1$, were imposed by Keynes. In the conditions of full equilibrium, the theory of the Treatise becomes strictly classical. As a matter of fact Keynes wrote,

> "This means, indeed, that in equilibrium -- i.e. when the factors of production are fully employed, when the public is neither bullish nor bearish of securities and is maintaining in the form of savings-deposits neither more nor less than the 'normal' proportion of its total wealth, and when the volume of savings is equal both to the cost and to the value of new investments -- there is a unique relationship between the quantity of money and the price levels of consumption-goods and of output as a whole, of such a character that if the quantity of money were double the price-levels would be double also."[1]

There can be no doubt that he accepted the classical theory for the case of equilibrium.

Let us investigate now the complete system of the Treatise to get an over-all picture of the then current conception of the working of the capitalist system.

Wicksell defined the natural rate of interest as either that rate which achieves price stability or which equates savings and investment. Keynes applied this idea to his definitions of savings and investment to get the equation

$$S(r) = I(r)$$

[1] A Treatise on Money, p. 147, vol. I.

whose solution in r determines the natural rate of interest. Actual or observable savings-investment which occurs in the market may be quite different from that calculated by substituting the natural rate in the savings or the investment function. Observable investment would be

$$S(\bar{r}) + Q(\bar{r}) = I(\bar{r})$$

where $\bar{r}$ is the market rate, of course. Wicksell considered $\bar{r}$ as given by the banking system within limits; i.e. he stated that the banks were free to determine $\bar{r}$ as long as their reserve position enabled them always to supply the proper amount of credit corresponding to the rate set.

Keynes also assumed that the banks could determine the market rate of interest at $\bar{r}$. Furthermore he thought that they could control the volume of savings-deposits, $\bar{M}_2$. These controls are certainly questionable, but let us follow the mechanical procedure of going where his assumptions lead us.

We are now in a position to bring together all the loose ends and formulate a complete picture of the Treatise. For easy reference, we define again all the relevant variables.

I is the market value of investment

S is the value of savings

Q is the windfall profits

r is the interest variable

$\bar{r}$ is the market rate of interest

O is the physical volume of output

R is the physical volume of consumption

C is the physical volume of investment

Π is the price level of output as a whole

P is the price level of consumption-goods

P' is the price level of investment-goods

M_3 is the stock of savings-deposits

M_2 is the stock of business-deposits

M_1 is the stock of income-deposits

V_1 is the income velocity of circulation

The equations can then be written as follows:

$$I(r) = S(r) \qquad M_3 = \overline{M}_3$$
$$Q = Q(r) \qquad O = \overline{O}$$
$$r = \overline{r} \qquad M_1 V_1 = E$$
$$\pi O = E + Q(r) \qquad V_1 = \overline{V}_1$$
$$PR = E - S(r) \qquad M_1 = \overline{M}_1$$
$$M_3 = B(P') \qquad C + R = O$$
$$P'C = I(\overline{r})$$

In order, we have the savings investment equation, the profit function, the autonomously set market rate, the "fundamental equation" for the determination of π, the definition of savings (or, alternatively, our version of the "fundamental equation" for the determination of P), the bearishness function, the given stock of savings-deposits, the given output, the definition of income velocity, the given velocity, the given stock of income deposits, the division of output into consumption-goods plus investment-goods, and finally a definition of the market value of investment. We now find ourselves with as many equations as variables when we distinguish between the natural and market rates as distinct variables.

We can solve the first equation for the natural rate of interest, say, r_o. Substituting the market rate in Q (r), we next calculate the windfall profits. Adding the observable savings and the windfall profits, we get the actual level of investment, $S(\overline{r}) + Q(\overline{r})$ or $I(\overline{r})$. The equation of bearishness yields a solution $P' = P'_o$; furthermore the ratio $I(\overline{r}) / P'_o$ gives us C_o , the volume of real investment. From the equation

$$C_o + R = \overline{O}$$

we can calculate R_o , the volume of consumption.

We are now left with three equations

$$\pi \overline{O} = E + Q(\overline{r})$$

$$PR_o = E - S(\overline{r})$$

$$\overline{M}_1 \overline{V}_1 = E$$

to get the three variables π, P, E. The weak point in this system is the most important element of later-Keynesian economics, namely, a theory of effective demand. A quantity equation is his sole theory of the determination of E,and the validity of this theory depends upon the assumption that the banking system can determine the stock of income deposits $\overline{M}_1$, as well as the total stock of money. Elsewhere, Keynes also put forth the "theory of effective demand" that $E/\overline{O}$ is institutionally given as efficiency earnings.

It is very interesting to see that even if the "fundamental equation" for the price level of consumption-goods be left as Keynes wrote it in the Treatise, the system does not become more or less determinate. This equation can be written, with the unwarranted assumption, as

$$P = \frac{E}{O} + \frac{I' - S}{R}$$

The assumption

$$I' = E\left(\frac{c}{O}\right)$$

merely adds another equation and another variable so that the theory of the determination of P is, in a sense, unaffected.

Keynes did not recognize $Q \neq 0$ as an equilibrium situation, and for the case $Q = 0$ we do get a more consistent, although strictly classical, theory. For the equilibrium position he did support the quantity theory as the quotation on page 37 shows. The model would now become

$$I(\bar{r}) = S(\bar{r}) \qquad \pi\bar{O} = RP + S(\bar{r})$$

$$\bar{M}_1 = \left(\frac{1}{\bar{V}_1}\right)\pi\bar{O} \qquad C + R = \bar{O}$$

$$\bar{M}_3 = B(P') \qquad P'C = I(\bar{r})$$

In this case we have enough equations to determine all the free variables.

If we consider only the following self-determined part of the system,

$$I(\bar{r}) = S(\bar{r})$$

$$\bar{M}_1 = \left(\frac{1}{\bar{V}_1}\right)\pi\,\bar{O}$$

we see that Keynes was as classical as he could possibly be. At the going rate of interest, all savings flow unobstructed into investment and the amount of money determines the price level. Full employment output is taken as given because it comes from the background equations of the complete system.

CHAPTER II

THE BIRTH OF THE GENERAL THEORY

With the preceding chapter as background, we shall trace the very important steps that were taken prior to the great publication of 1936. The procedure will be twofold; first we will trace chronologically the developments in the Keynesian literature, and secondly we will compare the Keynesian developments with the status of thought of the non-Keynesian writers. It is hoped that, by this method of tracing chronologically the Keynesian development, it will be possible to put a finger approximately on the date of the conception of the new theory. In the next chapter we shall then be able to make comparisons between the formal, theoretical models of the General Theory and the conventional theory held by economists outside the Keynesian camp.

The Keynesian Development

Economists can sometimes go very far in the advocacy of proper, sound policy measures based on an inadequate formal theory. That such things are possible only proves that practical economics is simply common sense -- "common sense made difficult". Keynes had a good idea as to what the troubles were in the economic system in the early years after the crash, in fact, even before the crash, in 1929 -- and he supported policy quite similar to that built up around the General Theory, but he was not able to formalize his arguments into a satisfactory theoretical mold. His early analysis in the beginning of the depression was based entirely on

the classical model of the Treatise. It was not his theory which led him to practical policies, but practical policies devised to cure honest-to-goodness economic ills which finally led him to his theory. Keynes was in much the same position as have been many of our colorful monetary cranks. These amateur-economists have usually sensed what is wrong, and have often proposed workable corrective policies, but they have usually been far wide of the mark in the formulation of their fantastic, theoretical systems. A consideration of Keynes' popular writings in the interim between the Treatise and the General Theory will show quite well this relation between policy and theory.

In the first months of the slump Keynes was telling us that the fundamental cause of the difficulty was that there was a lack of new enterprise due to the poor outlook for capital investment. He advocated action to stimulate profit margins and hence to give rise to new investment. But he did not want to attempt to restore profits to a higher level through the cutting of costs, for he regarded such a move as deflationary. He argued that there were two ways of restoring profits: either by inducing the public to spend a larger fraction of their incomes or by inducing entrepreneurs to turn a larger fraction of their output into the form of investment. The reasoning behind these proposals shows what intellectual confusion existed. It was obvious to Keynes that increased consumer spending would be a net inflationary stimulus to the system, yet his advocacy of a higher rate of spending was based on the classical theory of the Treatise - saving would fall and be in equilibrium with investment at the new low level thus giving us the desired end of price stability. He had not yet dropped the equation $O = \overline{O}$ so that he could imagine a case in which both consump-

tion and investment could be raised simultaneously. He was still working under the assumption that, since output is given, increased consumption must be at the expense of investment and vice versa. A typical Keynesian characterization of the slump maladjustment was that producers were not dividing their output between consumption and investment in proportions which corresponded to the way in which consumers were dividing their income between savings and consumption. This argument was another way of saying that there were discrepancies between the terms I, S and I', S in the fundamental equations.

We must admit that Keynes advocated certain policies in the early thirties in spite of, rather than because of, his theoretical background. He made a radio address in England in 1931 which was an excellent plea for increased spending to counteract the depression -- intuition was far more powerful than a theory. In this address he attacked thrift, the classical virtue, because he saw the fallacy of providing large savings to be offset when there were no available offsets in sight.[1] The housewife was urged to spend, and a plug was made for government public works expenditures. These proposals sound very much like those of the modern Keynesians arguing on the basis of the General Theory.

In addition to the attack on thrift, Keynes soon changed some of his previous views on another classical doctrine. He suddenly decided that perhaps free trade does not pay in a period of serious unemployment, and made strong "buy British" arguments. He suggested that the Chancellor of the Exchequer choose a protective tariff for Great Britain in order sim-

[1]Recall the discussion of Chapter I on the Economic Consequences of the Peace concerning Keynes' appraisal of saving and the capitalist growth of the pre-World War I era.

ultaneously to relieve the budget and restore confidence. It hardly seems possible that the Keynes, who in 1923 claimed that protection could never help increase employment, could later advance such anti-classical policies. But a great change must have been developing in Keynes' thoughts because of the failure of his former theories to solve problems of under-employment situations.

In June, 1931, at the time when Keynes was advocating the various measures mentioned above in this section, there appeared the famous Macmillan Report.[1] Since the latter part of 1929 a committee on which Keynes was a member had been preparing this report. The most interesting conclusions from our point of view are those of Addendum I relating to domestic monetary policy. This addendum, which was unreservedly supported only by Keynes and three other committee members, stated that there were three alternatives in domestic monetary policy which could be used to meet the emergency: 1. a reduction of salaries and wages 2. controls over imports and aids to exports 3. state assistance to private enterprise and to investment.

True to the Keynesian traditions, the first alternative of wage cuts was rejected as deflationary. The Report argued that false analogies as to the advantages of wage cuts to the single employer were often drawn to apply to the economy as a whole. The committee members realized that output as a whole might suffer if purchasing power of wage earners should be reduced. This is precisely the argument which Keynes used in all of his own writings. It is quite significant that the Report concluded that it

[1]Committee on Finance and Industry, Report, Presented to Parliament by the Financial Secretary to the Treasury by Command of his Majesty, June, 1931.

would be better to leave money incomes fixed and change the monetary standard by lowering the gold parity of sterling in order to adjust the level of wages and salaries to a long run equilibrium position. It is possible to see here the germ of the early arguments of the General Theory as regards real and money wage rates. Since it would have been very difficult to lower money wages all round, a better solution was thought to be the inflationary measure of causing prices to rise and real wages to fall.

The discussion of the second alternative made the point very emphatically that the free trade arguments do not apply to a system in which there is unemployment, since tariffs could in this event bring about a net increase instead of a mere diversion of resources. On similar grounds, aids to exports were recommended also.

In the case of the third alternative -- schemes of capital development -- the argument was on about the level of Keynes' discussion of Lloyd George's Liberal Pledge, considered in the previous chapter. Again the theory of the multiplier was implied roughly in the argument, but as in every other case the analysis never got beyond the first few rounds of expenditure. As opposed to what many other economists thought at the time, the writers of the Report were quite emphatic in pointing out that public spending on investment would not divert resources from private investment since there was a high level of unemployment. From a practical point of view, one improvement was made over Keynes' previous analysis of public works spending. This improvement was the recognition that such programs might have a harmful effect upon business confidence, another reason why protection was considered to be advantageous. However, the Report thought that on balance such spending schemes would be helpful and desirable.

When we compare the recommendations of the main body of the Report with those of Addendum I we see some striking contrasts. The former recommendations were much more conservative and orthodox. They comprised proposals for adherence to the gold standard at the existing parity, for a lower international value of gold in terms of wholesale goods, for price stability at higher levels, for bank regulation of interest and credit in order to stabilize the level of investment. When contrasted with the more radical proposals of the Keynesian Addendum I, we see that Keynes was forced to depart widely from the more conventional lines of thought of his colleagues. This point will be brought out even more strongly later in this chapter when we consider the testimony of Hawtrey and Pigou before the Macmillan Committee.

From Keynes' lecture[1] delivered under the auspices of the Harris Memorial Foundation at Chicago in the summer of 1931, we see the continued influence of his old theoretical model. Though he made a rather good analysis of the current economic situation and suggested meaningful remedies, his theoretical views were basically unchanged and not entirely in accord with his common sense judgments. One very accurate prediction that he did make at this time was that the catastrophe in which the world then found itself would not be quickly overcome; instead he predicted that the slump might last much longer than people thought. He foresaw a long period of semi-slump conditions -- an underemployment equilibrium, if you like. He continued at this time to emphasize the influence of the rate of investment on ecohomic prosperity and suggested remedies entirely in the light of attempting to stimulate investment. It seems that his principal tool for curing the depression was still the manipulation of the interest rate. He was very optimistic as to the influence of the rate of interest in investment decis-

[1] Unemployment as a World Problem, Quincy Wright, Editor, Chicago, 1931.

ions -- a practical issue -- and he was still working with the theory of the Treatise in which the interest rate was the main factor in bringing about an equilibrium between savings and investment -- a theoretical issue. His goal at this time may be characterized as a situation in which investment would be driven up to a level of savings which would signify prosperity. Savings was taken as the stable element and investment as the volatile element of the economic process. However, the Keynes of this period saw unlimited investment opportunities at sufficiently low interest rates, while the later Keynes saw limitations in investment opportunities due to a lack of effective demand. As a result of this theoretical system, Keynes proposed a program of reduction of the long term interest rates and of restoration of confidence to borrowers and lenders. In spite of his restrictive theoretical system, Keynes also proposed a program of government construction.

An important scientific contribution was made at this time, that was to develop a completely revolutionary mode of economic thought. While Hayek, Robertson and others were discussing such questions as: Are Mr. Keynes' "fundamental equations" really different from the ordinary quantity equations; or is Mr. Keynes' E, the cost of production of current output, the same as his E', the factor earnings during the period in which the output comes on the market; Mr. R. F. Kahn was formulating the theory of the multiplier[1], the missing link between what Keynes was saying in policy and what he wanted to say in theory. The theory as Kahn formulated it was just the step needed to show that savings and investment determine

[1]"The Relation of Home Investment to Unemployment" The Economic Journal, June 1931, p. 173.

the level of output as a whole and not the rate of interest. But let us not be misled and think that Kahn, Keynes, or anybody else could see the issues involved at this time and incorporate the contribution into a new theory of the determination of the level of employment. Kahn quite unambiguously stated that he had worked out his theory of the multiplier in an attempt to solve a practical problem of the day -- to get a more precise evaluation of the beneficial repercussions of public works projects. Furthermore Kahn has told us that he wrote this article with the theory of the Treatise before him. He obviously did not see the great theoretical implications of his work.

Many other economists had thought about and written about the multiplicative effects of government deficit spendings due to induced relationships, but they were never able to formalize their thoughts into a theory of definite economic behavior. Why should we lay such great stress on the multiplier theory, as formulated by Kahn? The answer is that this formulation of aggregative consumer behavior changed entirely our views about the structure of a model economic system. As a result of his paper, we were able to see the important point that consumption depends, in a definite way, upon income and not upon the rate of interest. Such a functional relationship between consumption and income is necessary in order to generate the successive rounds of the multiplier sequences. Once we have recognized the relation between consumption and income, we can pass by means of a mathematical identity to the savings-income function, and if income is taken to be the important variable in the consumption function, it must also be the important variable in the savings function. We would then be practically ready to discard the classical notion of a savings-investment equilibrium via the rate of interest. All that was needed was a few more months of stubborn,

depression facts, and Keynes was able to see that investment opportunities are not unlimited at low interest rates. Rather, investment also depends upon the level of income, or it is quasi-autonomous. At any rate the standard functional relation between interest and investment did not fit the facts, and a theory of the determination of the level of income was needed to replace the theory of the determination of the rate of interest. Once this point was seen, a Revolution occurred in economic theory. Let us observe that it was not a new theory of the rate of interest that was needed to replace the classical savings-investment theory, as some economists seem to think; instead it was a theory of output that was needed to replace the old theory of the interest rate. When the latter step was carried out, a new interest theory followed as a residual which had to be accounted for.

We must repeat here that although Kahn furnished us with the necessary step in 1931, the Revolution did not occur then. Economists continued to think along the old lines while using this innovation in their formulation of policy. It required some two years before we can find evidence that Keynes made great use of the multiplier concept in his theoretical system. Although the egg was developing, the conception of the new theory did not occur until about 1933.

Keynes' own writings continued along the old lines for some time after Kahn's article was made available. In 1932, Keynes was worried about a financial crisis more than anything else. But he thought that the critical situation could be improved if only cheap money would become available. He seemed to feel that an abundance of credit would probably lead to a high level of investment and initiate a recovery, thus avoiding a financial crisis.

He did qualify his cheap money policy with more vigorous state intervention in the stimulation of investment in the event of a failure of a purely monetary policy. But a short article written in 1932 shows that he still had great faith in manipulation of the interest rate.[1] The conversion of the War Loan to an interest rate of $3\frac{1}{2}$ per cent was looked upon by Keynes as one of the most promising of all the anti-depression measures. He had always before regarded his program for the manipulation of the short-term bank rate as somewhat inadequate because this control need not influence the more important long-term rate. But now he had an instance in which an important long-term interest rate was directly lowered, an event which he thought might hold great promise for the future. The continued insistence upon credit controls shows how little Kahn's arguments had yet convinced him.

Professor Samuelson has pointed out to me a very interesting development in the economic literature of 1933. We can never be quite sure what goes on behind the political scenes in Cantabrigian economics, but we do know that there is a good deal of exchange of information among individuals within certain groups. If we take Joan Robinson as a reliable sounding board of opinion within the Keynesian group, we find a great change in ideas during 1933. In Economica of February, 1933 Mrs. Robinson wrote an article entitled "A Parable on Savings and Investment" in which she attempted to explain some of the more subtle difficulties of the Treatise to the simple-minded reader. It was an attempt to clear up the differences of opinion which existed between Keynes and his reviewer, Hayek. In this article we find a perfectly clear exposition of Keynes of the Treatise, which leads

[1] "A Note on the Long-term Rate of Interest in Relation to the Conversion Scheme" The Economic Journal, Vol. 42, Sept. 1932, p. 415.

one to suspect that the ideas of the Treatise were still being talked about within the Keynesian group. However, in the autumn of that year, 1933, Mrs. Robinson felt called upon to write another article for Volume I, number 1 of the Review of Economic Studies, called "The Theory of Money and the Analysis of Output". In this later article Mrs. Robinson again claimed to be giving an exposition of the Treatise, but such was not the case. Any reader of the Treatise or of the discussion given in Chapter I of this book (if it has been accurate) knows that a theory which used the equation $O = \overline{O}$ is not a theory of the analysis of output. Mrs. Robinson was over-generous to the master and was actually writing one of the first expositions, in which she is so lucid, of the really essential parts of the General Theory of Employment, Interest, and Money.

In the Economica article, Mrs. Robinson was attempting to demonstrate the working of the theories of the determination of P, π , P' which had caused so much confusion because simple-minded people, like herself, had to be shown clearly how a fall in P, for example, need not lead to a rise in P' . In other words she was trying to explain the relations behind the two "fundamental equations" and the equation of bearishness.

$$\pi = \frac{E}{O} + \frac{I-S}{O}$$

$$P = \frac{E}{O} + \frac{I'-S}{R}$$

$$M_3 = B(P')$$

Her exposition followed that of the Treatise without a break. But when we come to the second article, which appeared in the Review of Economic Studies, we get material which is infinitely more interesting and powerful. She was quite a prophet in her own right when she said, " . . . the Theory of Money has recently undergone a violent revolution." The beautiful thing

about this article is that the analysis of the General Theory was so clearly stated, and that such an important element as the savings-investment equation was presented in terms of the real issues involved instead of in terms of trivial, terminological controversy. The pre-General Theory Keynesians were much clearer than their successors! In this discussion, Mrs. Robinson told explicitly how savings and investment can be equal at all points of time and yet not be identical. She assumed first a disequilibrium and then showed one process by which the level of real income would adjust to bring savings and investment into equality. She also demonstrated the working of another very important process in the maintenance of the equation, namely the operation of "forced" investment. She assumed an increased rate of savings and a consequent fall in consumption so that the equation could not be maintained. Her explanation of the adjustment then was that inventories would pile up due to the decreased rate of consumption thus forcing investment up to meet the increased level of savings. This is an argument commonly used by present-day Keynesians. The whole argument was summed up by the statement that there may be an equilibrium output at any number of different levels -- levels of full or less than full employment. It is also interesting that she did not need, at this stage, to appeal to lower limits to the interest rate, or rigid money wages, or imperfections in competition to explain the phenomenon of unemployment.

The differences in theoretical structure between these two articles of Mrs. Robinson are quite amazing and should lead us to suspect the occurrence of the Revolution in Cambridge during 1933.

One of the first articles by Keynes which shows the influence of Kahn was published in 1933.[1] In this work Keynes made a new argument for public works expenditures which was in many respects similar to that made in 1929, except for the fact that this time he made very extensive use of a new tool, the multiplier theory. The arguments which were being put forth against government spending programs were very similar to those used against the Lloyd George Pledge, but this time Keynes was able to counter with more explicit statements as to the ultimate level of employment created out of a given expenditure and as to the net cost to the budget. Recall that in 1929, Keynes had said that there would be induced and indirect effects which the opponents always neglected but that these effects could not be measured with any precision. The important thing for the reader to keep in mind is that in order to get precision, it is necessary to know a definite functional relationship between consumption and income given certain other variables in the system as parameters; in other words, applications of the multiplier theory must be based on a theory of the consumption or savings function.

At this time Keynes estimated the multiplier to be about 2, but in order to be conservative calculated with a value of $1\frac{1}{2}$. He used the same argument as before concerning the strain upon the budget. He calculated the transfer saving on the dole and the increased taxes out of the increased income generated as covering half the costs involved. Thus he concluded that there was no dilemma between spending programs and the balancing of the budget. However, one is not quite sure whether or not he has fallen into the mistake of believing that the exchequer can lift itself by its own bootstraps.

[1] The Means to Prosperity, Macmillan, London, 1933.

There is no doubt that he then saw clearly the relationship between consumption and income although this discussion was not intended to produce a theoretical system. He encouraged spending on the part of the population but realized that it would be impossible to spend much more out of an already reduced income. He also began to see more clearly the working of economic systems as wholes. Only a few years before The Means to Prosperity, he had announced a distinct favoritism for a protectionist policy in Great Britain. Now he was willing to give up this idea since he realized that successful attempts by England to improve her foreign balance would only be at the expense of other countries. Furthermore he realized that competitive protection applied by all countries simultaneously would only be harmful to all. What he now proposed was world-wide inflationary loan expenditure to stimulate the world as a whole, especially in order to raise the world price level. He was now ready to advocate that all countries expand trade simultaneously through the abolition of exchange restrictions and tariffs. Keynes made a complete turn-about on the question of free trade.

As in the case of the Treatise, the appearance of the General Theory was well advertised in advance. We know that, for some time, Keynes was lecturing at Cambridge on the theory of employment and output according to the doctrine later written down in the General Theory.[1] Also some ten months prior to the signing of the preface of the General Theory, the New Republic carried an article by Keynes,[2] in which he brought out the main points of

[1] A copy of some unpublished notes by R. B. Bryce, who was then at Cambridge, has been provided me.

[2] "A Self-Adjusting Economic System?" , The New Republic, Feb. 20, 1935, p. 35.

his new doctrines which he compared with those of the heretics and cranks. Now he had come to believe that in the absence of frictions the system was not self-adjusting as the classical economists had felt and as many economists feel today. If we can find a theory which describes a non-self-adjusting capitalistic, frictionless, perfectly competitive system, have we not found a revolutionary theory?

Keynes did not present at this time a complete outline of his theory, but he did say enough to indicate the core of the analysis. I have found that some people have misinterpreted the essential innovations of the Keynesian Revolution, and there is a statement by Keynes in this article which may add to this misinterpretation. He claimed that the inability of the classical system to determine the level of effective demand and of employment was due to an unsatisfactory interest theory. Are we to take this to mean that the Keynesian Revolution lies in the interest theory -- liquidity preference? We can admit that the theory of liquidity preference is an ingenious solution to the problem of the determination of the rate of interest, which is <u>essentially</u> different from the classical, neo-classical, or modern Swedish theories, but we need not regard the liquidity preference theory as an essential element of the Keynesian system. It merely rounds out the theory and makes it complete. The way to interpret Keynes' above claim about the inadequacies of the classical interest theory is to point out that this theory used, as determinants of the rate of interest, flows which actually determine the rate of output; hence we were prevented from having a satisfactory theory of output as a whole because classically-inclined economists were using the strategic determinants of output to determine something else. Keynes later remarked that, as it actually happened, he first conceived of the savings-investment equation as the determinant

of the level of output. This left him without a theory of interest; so he then developed the liquidity preference theory of interest. At this point we should like to anticipate an argument which may arise in the reader's mind; at least it arose in the mind of D. H. Robertson. This argument would state that savings and investment should not be isolated out as merely determinants of the level of output, for they can determine something else simultaneously, namely the rate of interest. We admit that in a mutually interdependent system, cause and effect cannot be isolated, but at this stage of the analysis we are working with building blocks out of which a mutually determined system has been constructed. We are now solely interested in the strategic variables in each of the interrelated equations. However this point will be discussed more fully below.

Non-Keynesian Theories Prior to 1936

If we are to see the full significance of the Revolution, we must have a rather thorough idea of the theory against which Keynes revolted. It is true that Keynes directed his attack against what he called classical economics with the implication that most economists of the day were thinking according to the classical system. This implication has caused some disagreement with the result that many economists maintain that Keynes was knocking over straw men since hardly anyone held these so-called classical notions, anyway. We can avoid this issue by simply going to the pre-General Theory writings and finding out just what other economists were thinking before the light was revealed to them. We shall attempt to present a cross section of opinion in order to bring out the prevailing doctrines.

Just as Malthus engaged in a long controversy with the orthodox, classical school, over the question of Say's Law, Keynes pictured himself

as arguing the same issue with his orthodox contemporaries. While we will probably never know how much stimulation Keynes received from many of his anticipators, we can be quite sure that he drew much from Malthus whom he openly admired. The controversy between the Keynesians and the non-Keynesians in many respects was similar to the Ricard-Say-Sismondi-Malthus controversies of the nineteenth century.

A beautiful exposition of Say's Law which brings out the major issues of the discussion of the 1930's can be found in a book from which many well-known economists were undoubtedly taught, namely, Fred M. Taylor's Principles of Economics. This book was written in 1921 and was used as a textbook in American universities for several years. Let us examine more carefully the arguments on Say's Law in this book, which is, on the whole, an excellent piece of work. First Taylor attempted to demonstrate the fallacy in the argument that disastrous acts of God can stimulate the level of economic activity. He took the example of a householder whose roof was blown off by a tornado. He observed that the spending by the householder in replacing the roof would react in successive rounds and increase the prosperity of the entire community. But, he argued, is this a net increase in demand? True to Say's Law and other classical traditions he answered, "The money which on account of the tornado our householder was compelled to spend putting on a new roof would ultimately have been spent anyhow, though in some other direction; and thus being spent, it would have created just the same demand for commodities or services."[1] Here we have the strictest sort of classical argument; with the assumption of given output, expenditures on one sort of activity are merely diversion from spending elsewhere. Taylor

[1]Principles of Economics, Ronald, N. Y., 1923, p. 197.

could see that there was plainly no reason why funds spent on a roof would always otherwise be spent on consumption, especially if the householder should be sufficiently wealthy; so he assumed that the householder would otherwise have spent the money on investment activity, say the excavation of a cellar. This brings us to the crux of the matter. The exponents of Say's Law have always assumed unlimited investment opportunities. Householders could never have any savings which would not be invested somewhere in this perfect system. "Hence the tornado does not increase demand in the least, it merely substitutes one chain of purchases for another."[1] "The contribution made by any one person to the total demand for goods is, in the long run, bound to be just equal to his income, no more no less."[2]

In a sense, Taylor in 1921 was not quite so bad as were some other economists in the early thirties, for he recognized that in short run depression periods when there is unemployment, Say's Law may not hold; i.e. government spending on public works projects may not divert funds from the private investment market. But he was not one to say that this condition could persist for any length of time, for he stated unequivocally that Say's Law would hold in the long run. As a long run optimist, he saw unlimited investment opportunities.

Hawtrey's monetary theory of the trade cycle is relevant in connection with getting a picture of the status of the prevailing economic thought of the depression period, but we shall review this theory toward the end of this chapter in connection with other groups of theories. However, Hawtrey

[1] Ibid., p. 198.

[2] Ibid., p. 198.

has expressed some ideas which are not unrelated to a discussion of Say's Law and which can be conveniently considered at this point. Hawtrey was called upon to give testimony as an expert economist before the Macmillan Committee of which Keynes was a member.[1] The problem of the Committee being to suggest policies which would bring England out of her stagnation, Hawtrey commented on possible methods of securing the desired ends. On the matter of government spending, Hawtrey stated that whether the spending comes out of taxes or loans from savings, the increased governmental expenditures would merely replace private expenditures. He even considered the "radical" idea of government spending out of new bank credit, but predicted that the result of such a policy would be inflationary and a threat to the gold standard, thus forcing up the bank rate of interest and credit contraction. Such a plan, for him, would only defeat itself since government expenditures out of bank credit would mean the end of cheap money for private enterprise. Arguments like these would be much more understandable coming from Taylor of 1921 than Hawtrey of, say, 1930. How could economists worry about the inflationary gap when there was such a high level of unemployment? The only answer that we can give to this question is that they must have been working with assumptions of Say's Law and/or full employment. It was with similar arguments by British political lights that Keynes had to contend in his articles supporting public works projects.

Whatever labor leaders or leftist economists have to say (often in a sneering way) about Keynes' bourgeois emphasis, they must be brought to realize that he consistently worked against those theories which wanted to blame the depression on labor. There was a large body of doctrine which

[1]Reprinted in The Art of Central Banking, Longmans Green, London, 1933.

traced the cause of the unemployment to rigidities which prevented the free working of the capitalist system, the major rigidity being obstructions to the downward movement of wages. How can people find employment if they ask a king's ransom for their work! Professor Pigou, like Hawtrey, was called upon to give testimony before the Macmillan Committee. He said that the current difficulties could be traced to two obstructions to the free working of economic forces, namely, the improper allocation of people among jobs, and the existence of wage rates above the level called for by the general demand conditions. He supported a policy of wage cuts. Even today, Professor Pigou argues that unemployment is not possible if we admit flexible wages into our theoretical system. This issue will be considered more fully in a later chapter.

Another exponent of wage cuts was Professor Cannan[1] who wanted to explain general unemployment in exactly the same way as one explains particular unemployment. He argued that in particular employment, more workers can be employed at lower wages if the demand for the product is elastic. In total employment, demand for the product is indefinitely elastic; therefore any number of workers, up to full employment, can be hired if they do not ask for too high wages. Consequently he regarded general unemployment as the result of asking too much. He also included attempts at profit maintenance as part of the phenomenon of asking too much. If this point of view is representative of the theories of very many economists of this period, can there be any doubt that the Keynesian system is revolutionary?

In Professor Schumpeter we have an economist who is quite outspoken in his belief that there can be no persistent unemployment in a perfect,

[1]See "The Demand for Labor", The Economic Journal, Sept. 1932, Vol. 42, p. 357.

frictionless system. Aside from his theory of innovations which would explain relatively short period movements, we should expect him to incorporate a theory of frictions and obstructions to explain unemployment. He provided us with such an explanation very early in the depression.[1] The forces which he claimed were at work in the early period of depression were the agrarian crisis, protection, high taxes, high interest rates, high wages, and the lack of free price movements.

The examples of Pigou, Cannan, and Schumpeter are not atypical. Many economists felt that our capitalist system was self-adjusting in the absence of frictions and obstacles. They argued that we always recovered before from crises and that we would again if only the imperfections could be removed from the system. As a matter of fact, Keynes thought along exactly these lines just after World War I, and his great change of view perfectly delineates the Revolution.

While we see clearly the great changes which Keynes had to make in his own ideas, an indication of the striking character of the innovations is also provided by the examination of what some of Keynes' more recent followers were thinking during the formative years. Professor Hansen is a perfect example of a Keynesian disciple who argued strongly, in the days of confusion, against the very things which he now so vigorously supports in the light of modern Keynesian economics. Hansen's remarks at this time appear to be almost unbelievable in the light of his policy recommendations of a few years later. For those who were not too stubborn and set in their ways of thought, the Revolution meant a complete turn-about in economic thought and policy. For example, Hansen in 1933 was very skeptical of the acceptance

[1]See "The Present World Depression: A Tentative Diagnosis", Supplement to the American Economic Review, March 1931, p. 179.

of Keynes' policy measures, especially those having to do with the stimulation of investment by governmental devices.[1] He feared "absurd" results as a consequence of the support of measures which try to increase investment and decrease the rate of saving by the use of such measures as governmental deficits, tariff policies, buy-now campaigns, unemployment doles, and public works programs. Hansen worried very much about adverse effects of the Keynesian policies upon business confidence, and one gets the impression that he was using the classical argument, then so popular among economists, that a dollar spent by the state meant a dollar not spent by private enterprise. He agreed with Hayek that it was wrong to assume that the government could buy its way out of depression because of the burden which would be placed on the capital market. Hansen retained these conservative notions until the last minute, i.e. until the appearance of the General Theory. In 1936[2] he was still in doubt about the usefulness of public works programs in the stimulation of employment. He sided with those who looked upon public works as a mere stop-gap, and, curiously enough, he was not impressed with the multiplier approach. Hansen's attitude shows how necessary it is to write down a complete, formal, elegant theory in order to convince professional economists of the validity of new ideas. Apparently all the Keynesian writings of the period 1930 to 1936 were not accepted until Keynes gave them his theoretical justification.

One of the most popular business-cycle theories of the early thirties was what is often called the neo-Wicksellian theory. The basis for this

[1]A. H. Hansen and Herbert Tout, "Annual Survey of Business Cycle Theory: Investment and Saving in Business Cycle Theory" Econometrica, Vol. 1, April, 1933, p. 119.

[2]Alvin Hansen, Francis M. Boddy, John K. Langum, "Recent Trends in Business Cycle Literature", The Review of Economic Statistics, May, 1936, Vol. 18, p. 53.

theory rests on Wicksell's interest theory of the natural rate and the market rate. Swedish economists have been true to the "favorite son" and worked closely along Wicksellian lines, one of their best expositions being Myrdal's Monetary Equilibrium. But the Swedish economists were not the only ones who dressed up and elaborated upon Wicksell's theory; Mises and then Hayek developed a popular business-cycle theory, known also as the monetary over-investment theory, which started out its analysis from the relation between the market rate and the natural rate.

Although Keynes of the Treatise also made use of the Wicksellian interest theory (or something close to it) his analysis was quite different from that of Myrdal, Mises and Hayek. Myrdal has presented a very clear picture of the theory of the interest rate used by this school of writers. He considered the natural rate of interest to be given by either one of two relations, 1. The natural rate is that rate at which savings, in the schedule sense, is equal to investment, or what is the same, to free capital disposal, also in the schedule sense. Thus the natural rate, r, is the root of the equation $I(r) = S(r)$. 2. The natural rate is the ratio between the expected net return on new investments and their costs of production. Myrdal does not make it quite clear, however, whether the natural rate should be the anticipated returns over cost on new investment or on total capital, but, at any rate, we can see how closely this concept is related to that of the marginal efficiency of capital in the Keynesian system of the General Theory. One question which comes up, with regard to these two conditions, is that of their consistency. If expectations of future returns on investment are given and if the supply price level of investment goods is determined from other equations of a complete system, then is the natural rate obtained from these conditions the same as the natural rate obtained

from the equation I (r) = S (r)? The answer to this question depends upon the saving-investment theory used. The revolutionary development of Keynes was to formulate a savings-investment theory which made the answer to this question no, for the general case.

The monetary overinvestment theorists argued from Wicksell's interest theory to a complete explanation of the cyclical process. They maintained that when the market rate of interest is pushed below the natural rate, a cumulative expansion process begins. Investment will be undertaken at this profitable relationship between the market and natural rates, and the structure of production will be elongated. The important part of their theory was however an explanation of why the expansionary process cannot continue indefinitely and must eventually come to an end. The explanation of the downturn into the depression is quite different from the theory of the Keynesian system. The reason why the expansion has to end, i.e. why there has to be a shrinkage in the structure of production, was stated by Hayek to be that an insufficient supply of credit will always be forthcoming to fill the ever abundant investment outlets, or in their words, to complete the structure of production. Hayek claimed that the banking system will always fail to supply enough credit and people will not be willing to forego consumption in order to supply the necessary savings funds for the partially completed structure of production. According to this theory, if people will only save voluntarily, then the elongation of the production structure can remain intact, and depression will not occur. Hayek considered it impossible to complete the elongation of the production structure via forced savings. He also argued that excessive government expenditure and taxation or changes in the money supply will aggravate the shortening of the structure of produc-

tion. Finally, he did not approve of the combatting of depression through inflation of the money supply. In short, he was an ardent supporter of do-nothing economic policy. The business-cycle is an immutable law of nature which cannot be defied, and the system, if left alone, will always recover to full employment.

The overinvestment writers were clearly dealing with short run cyclical phenomena and did not attempt to deal with the theory of prolonged depression. This follows from the notion that monetary factors can always be relied upon to bring about recovery from a depression. If only the market rate of interest be pushed below the natural rate, the cumulative expansion process will begin. Obviously they overlooked some of the major points about the theory of the natural rate. If we accept the formulation of the natural rate as the ratio of the anticipated net returns on new investment to the cost of the investment, then we should naturally attempt to develop a theory of what determines the size of this rate. However, it never occurred to Hayek, Mises, or other writers of this school that the numerator of this ratio may get so low that no fluctuations of the market rate of interest will stimulate investment. They believed that the natural rate is always so high, that it will be possible to find market rates of interest low enough to stimulate investment.

It is very important to consider this theory of Hayek in the light of the Keynesian Revolution, for the central notions of the Hayek school are directly opposite to those which have made the Keynesian theory so important. Recall that their central thesis of the collapse of prosperity was that there is a lack of savings available to finance ever-present, unlimited investment opportunities. For Hayek, the boom never fails, due to a failure to find investment outlets, but always due to a failure of abundant investment out-

lets to be financed by scarce savings. He insisted on working with a theory of full employment; hence one must spend either on consumption or investment, and funds spent on consumption represent funds not available for investment. In fact Hayek has claimed in his review of the Treatise,[1] that the only point of view which could have led Keynes to a true explanation of the cycle is the view of the alternative character of increased output of consumption goods or of investment goods. How can this mean anything but an assumption of constant full employment? An important contribution of Keynes has been his stress on the limitation of finding increased investment outlets on the part of capitalistic, private enterprise. One cannot fail to see the differences which make the Keynesian theory entirely unlike Hayek's theory of abundant investment opportunities, full employment, alternative production of either consumption goods or investment goods, and a lack of voluntary savings. Hayek's description of the economic process just does not fit the facts. This is not altogether surprising, however, when one considers his sterile and reactionary attitude toward statistics, explained in Monetary Theory and the Trade Cycle. He is apparently completely unconcerned if the available statistical data do not bear out his "logical" theory.

The first seven chapters of Haberler's famous book, Prosperity and Depression, give a very good summary of the status of all the various business cycle theories that were being espoused before economists started talking about consumption or savings functions, the multiplier, the marginal efficiency of the capital, and liquidity preference. Our job will be to examine each of the classes of theories presented there and to see how Keynes departed from their doctrines.

First there is the purely monetary theory of Hawtrey which said that

[1]"Reflections on the Pure Theory of Money of Mr. J. M. Keynes" Economica, Aug., 1931 and Feb., 1932.

changes in "the flow of money" are the only causes of business fluctuations. The sensitivity of the merchant class to interest changes is the strategic element in this theory, for Hawtrey believed that an easy money policy could stimulate any revival by inducing the merchants to invest in liquid and working capital. With such a theory, economic stagnation is practically impossible. It is hard to see how an economist who lived in England through the 1920's could support such a theory.

In a sense, Hawtrey's theory has some likeness to that of the Treatise in terms of the influence of the interest rate upon investment. But while Keynes thought that low interest rates would stimulate investment, he did say that a cheap money policy could only hope to have a great influence on fixed capital and not on working or liquid capital. Keynes thought that fluctuations in working and liquid capital are extremely important in the cyclical process, but he did not think that their fluctuations are sensitive to changes in interest rates. However, more relevant than a comparison of Hawtrey's theory with the theory of the Treatise is a comparison with the theory involved in the Keynesian Revolution. A major point of the new theory is that investment does not depend upon interest rates alone and that investment is not indefinitely expansible. It is impossible with any realistic formulation of the revolutionary Keynesian system to maintain that an easy money policy will always stimulate revival. Hawtrey was supporting an extremely optimistic point of view which included little of the essential elements of the new Keynesian doctrines.

The theories with one of the largest followings are those which Haberler calls the overinvestment theories. The monetary overinvestment theories, we have already considered above, for this is just another name for the theory of Hayek. Other supporters of this theory were Machlup, Mises,

Robbins, Röpke, Strigl. The differences between this and the Keynesian school are very great and have already been stated. But the non-monetary branch of overinvestment theorists covers a slightly more interesting group of writers who are somewhat more closely related to Keynes although they may not like to admit it. The truth of the matter is that Keynes has really drawn heavily upon some of their ideas. The authors in the non-monetary school include Spiethoff, Tougan-Baranovski, Cassel and possibly Schumpeter.

The sense in which the non-monetary overinvestment theorists are similar to Keynes of the General Theory is the same sense in which they were previously similar to Keynes of the Treatise. In the latter work he admitted having favored their idea that the moving force behind the cyclical movements is the violent fluctuations in the level of investment. For Keynes, the mischief maker has for a long time been the everchanging rate of investment, a quasi-autonomous variable which depends very much on probability judgments and expectations as to the future level of other variables. But we have followed the two theories as far as they go together. The non-monetary overinvestment theorists just do not explain satisfactorily the incidence of a crisis after a period of expansion. For them, a capital shortage brings about the catastrophe. They never consider the possibility that investment opportunities might be lacking. They fail to make use of their own theory of the uncertainty and expectational behavior behind the fluctuating level of investment! They would argue that the prosperity could continue if people would only refrain from consuming too much -- an activity which prevents investment goods from being available to complete the structure of production. On the other hand, Keynes has shown us that spending on consumption can be just as much a stimulus to the level of in-

come and employment as can spending on investment. Theories which argue that the depression is caused by too much consumption are quite anti-Keynesian.

Haberler characterizes the theories based on the acceleration principle as mere features of the more general overinvestment theories. Similarly the acceleration principle can be quite easily incorporated into the Keynesian system; so we need not consider it further at this stage.

The other important group of theories considered by Haberler is the underconsumption school of business cycle theories. It is very interesting, indeed, to read that Haberler considers the scientific standard of these theories on a lower level than that of the overinvestment or monetary theories. It is difficult to agree that this is an accurate statement, for many of these writers were nearer the truth than the so-called scientific theories. Fortunately orthodoxy is not the only criterion of scientific standardization. The writers of this school; Malthus, Sismondi, Hobson, Foster, and Catchings; include some not unimportant anticipators of the General Theory.

There are two senses in which oversaving or underconsumption can be harmful. There may be oversaving relative to the level of investment opportunities; i.e. there may be more savings than can be offset by investment outlets. Secondly, there may be oversaving in the sense that too much saving gets invested and hence more goods are produced than can be consumed. For the Keynesian theory, it has been saving which does not get offset which represents over saving, but for many of the other underconsumptionists such as Hobson, Foster, and Catchings, it was often saving that does get offset, over and above a certain level, which constituted oversaving. Thus the Keynesian theory is a distinct improvement over the underconsumption theories existing in the early depression period. But in spite of the fact that the underconsumptionists had a faulty theoretical structure, their policy

measures are quite in accord with the arguments of Keynesian economics. Policies to stimulate the level of consumption such as income redistribution would in the Keynesian models help to raise the level of income. Many of the underconsumptionists, like other economists, thought that there were sufficient investment outlets for any level of savings, this being their principal error.

CHAPTER III. THE NEW AND THE OLD

This chapter will not be a conventional expository description of each of the elements of the Keynesian system, for these are well known already. First, in this chapter, we must examine the significance of the Keynesian system and its revolutionary character, and then it will be the function of the next chapter to try to resolve certain problems which have arisen in connection with the various building blocks of the General Theory.

What has been Keynes' revolutionary contribution? The Revolution was solely the development of a theory of effective demand; i.e., a theory of the determination of the level of output as a whole. There are two major economic problems -- the problem of achieving full employment and the problem of allocating resources in a full employment economy. Keynes has shown us how the level of employment gets determined and thus has provided us with a theory with which to attack the first problem. He did not presume to advance the solution of the second problem, except insofar as the first must necessarily be cleared away before we can start thinking about the second.

A Simple Model

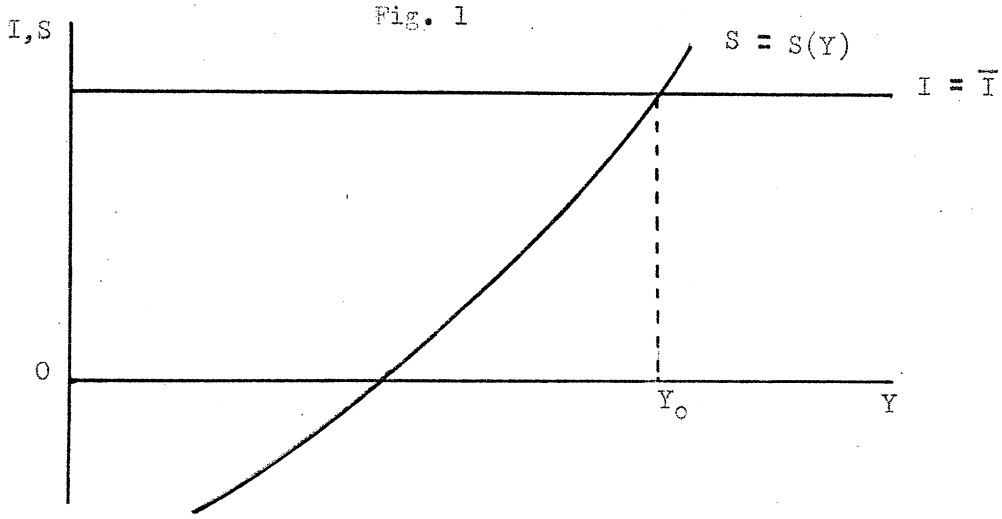
We know that Keynes' procedure was first to do away with the savings-investment theory of interest and replace it with a savings-investment theory of output. When this step had been done, the Revolution was a fait accompli, for a full understanding of this new model shows us the essential

factors involved in the determination of the level of output -- our central problem now. Thus the simplest Keynesian model becomes $I = \overline{I} = S(Y)$ where I = investment, S = savings, and Y = money national income. In this model we use the formula $I = \overline{I}$ to show that investment is completely autonomous and must be taken as a datum for the economic system. The reason we choose such a model is that we know Keynes was working along these lines in the early thirties, for this equation is the basis for the multiplier theory which appeared in the Means to Prosperity. The most important features of Keynesian economics are included in this equation.[1] The function $S = S(Y)$ tells us that savings or consumption depends in a definite way on the level of income. When the multiplier theory is applied, we can immediately see that some conditions are placed on this function if we require that the economic system to which it applies be stable, in a dynamical sense. Furthermore, the equation $I = \overline{I}$ tells us that investment is something highly unpredictable which does not depend upon any economic quantities. In fact, Keynes of the Treatise accepted unreservedly Schumpeter's theory of the moving force behind the cyclical process. Are Professor Schumpeter's innovations something that can be predicted from other economic quantities? What do innovations depend upon? They depend upon scientific and technological contributions, population growth, political events, economic institutions such as laws and regulations, and psychological anticipations of a very hazy future. While Keynes has usually made I depend upon interest rates and national income, it is quite obvious that a strong case can be made for the equation $I = \overline{I}$.

[1] It should be evident that this model is due to Kahn.

Graphically, our system can be shown very easily

Fig. 1



In this case, $\bar{I}$ gives the investment which offsets enough savings to generate a level of national income, Y_o. This is the clearest picture of the theory of effective demand. Then a theory of the business cycle (or fluctuations in the level of income) follows from the autonomous shifts of $I = \bar{I}$ about what we have reason to believe is a stable function, $S = S(Y)$. For every different level of investment, there is determined a level of income. Fluctuations in investment therefore determine fluctuations in income -- or the business cycle.

If we define $C = C(Y)$ as the consumption function, then we get the following identity:

$$Y - C(Y) \equiv S(Y) \text{ identically in } Y$$

This identity says that once a decision is made not to consume, then automatically a decision is made to save. It should be emphasized at this point that consumption means the consumption schedule, $C(Y)$, and that savings means the savings schedule, or $S(Y)$. In the schedule sense, there is one and only one mathematical identity in this Keynesian system. The other relationships,

$$S(Y) = \bar{I}$$

or, what is the same,

$$\bar{I} + C(Y) = Y$$

are equations which represent determined equilibria. From the latter equation we get

$$dY = dC + d\bar{I}$$

$$dC = C'(Y)dY \text{ when } dY \text{ is small.}$$

Thus the familiar multiplier equation comes out of this simple system as

$$dY = \frac{1}{1 - C'(Y)} d\bar{I}$$

In this equation $\frac{1}{1 - C'(Y)}$ is the multiplier, and $d\bar{I}$ is the multiplicand.

The important points which Keynes has stressed are that psycho-economic behavior gives us the multiplier and that in a free enterprise economy there are definite limitations on the multiplicand. With a given multiplier and a limited multiplicand, the progressive expansion in the variable Y is seriously limited. This is why we have unemployment. By appealing to the condition that a dynamical model of this system be stable, we can derive the restriction that $|C'(Y)| < 1$. Keynes has postulated that $0 < C'(Y) < 1$ follows from a psychological law, but it seems preferable to say that this result follows from the condition that a model of the economic process be stable, plus the common sense argument that income and consumption are positively correlated. The dynamical model of this theory which gives us the stability condition is none other than the model which makes consumption depend upon income previously earned -- income of the previous period, if you like.

This system is

$$Y_t = C(Y_{t-1}) + \bar{I}$$

We have here a simple difference equation of the first order in Y_t, which when solved provides us with the well known stability condition.

There is good reason to believe that our simplest Keynesian model is very important. Keynes has been quite outspoken in his distaste for socialism, especially the Russian brand. In fact, while Keynes has been an accurate predictor of many economic events, he has made very poor predictions in the case of Russia. For example, he predicted," . . . if Communism achieves a certain success, it will achieve it, not as an improved economic technique, but as a religion."[1] This statement shows a complete lack of understanding of the political, technological, and economic basis of the Soviet system. Keynes, the glorifier of the bourgeois life, little knows that the Russians acted precisely, knowingly or unknowingly, according to his simplest model. In this way, their economic technique enabled them to solve the first of the economic problems and concentrate on the second.

It is no accident that Russia has had full employment, and it will be no accident if she is able to achieve a long-run boom level of employment. The central planning board merely has to keep in mind the equation

$$\bar{I} = S(Y)$$

For Russia, investment is completely autonomous and the equation $I = \bar{I}$ holds without exception. The role of the interest rate becomes trivial in this system. The other equation,

$$S = S(Y)$$

[1] Essays in Persuasion, p. 305.

holds also. People save in a socialist economy for the same reasons that they save in our system, except for the fact that some of the savings motives are less powerful for them. There should be less savings for precautionary purposes, for example. Also the more equalized income distribution makes for a low propensity to save. In the Russian example investment has been decreed to be at a high level. The savings function is pushed far to the right; hence out of the equation,

$$\bar{I} = S(Y)$$

there is generated a high level of output, $Y = Y_o$.[1] In actual practice, the propensity to save was made so small and the level of investment so high that there was an inflationary pressure on prices. This pressure called for the turnover tax and some price control in order to prevent inflation. So we see how important the understanding of this simplest Keynesian model becomes in understanding the working of the Soviet economy. Proper policy by a socialist planning board can always lead to full employment -- this is the superior economic organization which Keynes failed to see in the years before the General Theory was conceived.

The General System of Interdependence

While the simple model of the previous section tells us most of the important features of the Keynesian system, it can hardly be taken as complete because we know that there are economic variables which are unaccounted for. In

[1] As will be seen in the last chapter, this simple model also describes the determination of effective demand in a war economy, where autonomous war expenditure replaces autonomous investment.

the first place, Keynes has always been convinced that the interest rate is an important variable and once he had discarded the classical interest theory, he needed a new interest theory. He had only to recall the developments of the Treatise to find this theory. In that volume he had considered at some length the various reasons for which people hold money. His classification of deposits into income deposits and business deposits gave him two reasons why people hold money. Income deposits were considered to be held for the purpose of synchronizing the activities of receipt and disbursement of income. Similarly business deposits were considered to be held for the purpose of bridging the gap between costs and receipts of business enterprises. The last classification of deposits in the Treatise was that of savings deposits. These deposits he now took to be held for precautionary and speculative motives. Furthermore, the theory of the Treatise had posited that this third class of deposits must get allocated between hoards and earnings assets. Keynes saw,after some time, that the earnings of these assets are in the form of interest; therefore he reasoned that the economic variable which allocates resources between speculative hoards and earning assets must be the interest rate. He now had a new theory of interest, and the determinacy of the system was complete. As a first approximation he could write the equation

$$M_2 = L(r)$$

where M_2 is the stock of money held as idle balances, L is the liquidity preference function and r is the rate of interest. But we must not be misled into thinking that the system

$$\overline{I} = S(Y)$$

$$M_2 = L(r)$$

is a special Keynesian theory. These are the building blocks of the most general Keynesian system.

Keynes has never been quite willing to admit that interest rates do not have a significant influence on investment. This reluctance to part with the influence of interest rates will make a modification of the building blocks of the form

$$I = I(r)$$

However, Keynes had not given up all the notions about the natural rate of interest. He still claimed that fluctuations of the market rate are important only in relation to some underlying subjective valuation. Enter marginal efficiency of capital. If, according to certain subjective probability judgments, we anticipate a series of future net returns on an earning asset, then there must be some relation between these probability judgments and the supply price of the assets. Let P_I be the supply price of new investment goods, and Q_i be the expected net return from this good in period i of the future. Then we have the equation

$$P_I = \sum_i \frac{Q_i}{(1+\rho)^i}$$

where ρ is called the marginal efficiency of capital. We can see immediately the relation between the marginal efficiency of capital and the natural rate of interest when the natural rate is formulated as the ratio between expected returns and costs.[1] Behind the Keynesian system, there are always background equations which determine prices, wage rates, real output, etc. From these equations, in a determinate system, P_I will always be known. Also the series

[1]Actually, Keynes said that he was inspired by Professor Fisher's rate of return over cost rather than the theory of the natural rate. We have used the latter concept merely to attempt to link up more closely the Treatise and the General Theory.

$\{Q_i\}$ will be institutionally given as speculative expectations. Hence at any point of time, there will exist a value ρ which satisfies the above equation. This value of ρ will enter into the equation

$$I = I(r)$$

as a parameter, i.e., fluctuations of r will affect the level of investment only insofar as the values of r fluctuate about a given value of ρ. Since we assume ρ as given at each point of time, we can neglect it from the investment equation.

Let us come back again to the other building block,

$$M_2 = L(r)$$

In Chapter I it has been shown that Keynes was weaned on the quantity theory model of the classical system. In the Tract he related the quantity theory to the transaction and precautionary motives for holding money. There he regarded all monetary units as being held for purposes of consumption or precaution. Once he had introduced new motives for holding money and related them to the rate of interest, he saw that the quantity theory no longer holds. But he could not abandon this theory entirely. He still linked the funds held for purposes other than speculation to the level of money income. Thus the building block had to be modified to the form

$$M = L(r, Y)$$

It is entirely possible to be more specific as Keynes has explicitly done and write

$$M = L_1(Y) + L_2(r) = \frac{1}{V_i} Y + L_2(r)$$

with the subscript 1 denoting the function for transactions, business, and precautionary hoards and with the subscript 2 denoting the function for speculative hoards. However, the first form is perfectly general and will be used in the further developments of this work.

It is certainly obvious that investment will be somewhat influenced by the level of income. The total stock of capital, which we shall denote by K, will also influence investment, but for a short-run theory we can take the stock of capital as given, $K = \overline{K}$. However, a long-run model will be discussed below in which K is introduced as a variable. It is not so obvious, though, that the rate of savings will be influenced by interest rates, but there will probably be some effect, and no harm is done by including r as a variable in the savings function. Now, we can write the most general form of the Keynesian system as

$$S(r,Y) = I(r,Y)$$
$$M = L(r,Y)$$

With M taken as a datum of the system, there are two equations to determine r and Y. When r and Y are determined, the levels of savings and investment can be calculated from the savings and investment functions. Then, knowing the level of income, we can subtract investment from it to get the level of consumption. Now that we have the Keynesian system with which to work, it is very important to keep in mind the relation to it of the basic, building block theories.

The economists' job is far from done. Much has to be studied about this skeleton in order to place some meat on the bones. The most important meat must be provided from the real world. What are, in fact, the shapes and properties of these functions in the economic system in which we live?

Many studies have been made of the consumption or savings function. The results have been in good agreement. They show that the marginal propensity to

save is less than unity and positive. They find also that consumption is related to previous income as well as current income which is important to know in formulating a dynamical system. In no cases has the interest rate been found to be a significant variable in the savings process. On a priori grounds we do not know whether we should logically expect a positive or negative correlation between interest rates and savings, but it is generally conceded that if interest rates are at all related to savings, the relation will be a weak direct relation. Thus from the functions

$$S = S(r, Y)$$

$$C = C(r, Y)$$

we can expect the following conditions:

$$0 < \frac{\partial S}{\partial Y} < 1$$

$$0 < \frac{\partial C}{\partial Y} < 1$$

$$\frac{\partial C}{\partial r} \leq 0 \qquad \text{and small in absolute value}$$

$$\frac{\partial S}{\partial r} \geq 0 \qquad \text{and small in absolute value}$$

Keynes has been consistently in favor of low interest rates in order to stimulate investment activity to a high level. But the real world as we know it has shown his hopes to be over-optimistic and the facts are that investment has not responded to fluctuations in the rate of interest. By the time he came

to write the General Theory, however, Keynes began to have less confidence in monetary policies designed to influence the interest rate. This was evidently just a temporary lapse in his theoretical development, for a few years later he changed his mind again, and returned to his former optimistic faiths. Compare, for example, the two following statements by him.

> "For my own part, I am now somewhat sceptical of the success of a purely monetary policy directed towards influencing the rate of interest. I expect to see the State, which is in a position to calculate the marginal efficiency of capital-goods on long views and on the basis of the general social advantage, taking an ever greater responsibility for directly organizing investment; since it seems likely that the fluctuations in the market estimation of the marginal efficiency of different types of capital, calculated on the principles I have described above, will be too great to be offset by any practicable changes in the rate of interest."[1]

> "'I am far from fully convinced by the recent thesis that interest rates play a small part in determining the volume of investment. It may be that other influences, such as an increase in demand, often dominate it in starting a movement. But I am quite unconvinced that low interest rates cannot play an enormous part in sustaining investment at a given figure, and when there is a movement from a higher rate to a lower rate in allowing a greater scale of investment to proceed over a very much longer period than would otherwise be possible.'"[2]

The main reason for this failure of the stimulative influence of interest rates has been a very small series of anticipated net returns $\{Q_i\}$ from projected new investment. If the series $\{Q_i\}$ is small, then the value of ρ determined from

$$P_I = \sum_i \frac{Q_i}{(1+\rho)^i}$$

will be so small that fluctuations in r relative to ρ will be quite unimpor-

[1] The General Theory of Employment, Interest, and Money, p. 164.

[2] See the article by Mordecai Ezekiel, "Statistical Investigation of Saving, Consumption, and Investment," The American Economic Review, 1942, vol. 32, note 10, p. 283.

tant. Conditions like these form a very important part of the modern world. The subjective series $\{Q_i\}$ is just not very large. There are, of course, many other important reasons why investment is insensitive to interest fluctuations. It is a known fact that many of the modern, large corporations who do a very significant portion of the investing have huge sums of working capital. They do not have to borrow funds to undertake investment and are not greatly concerned about market interest rates. They are more interested in the series $\{Q_i\}$ and do not have to consider the costs of obtaining investment funds.[1] Furthermore, even when funds do have to be borrowed to fill up the investment outlets, the costs of borrowing are usually quite insignificant in comparison to the engineering and other costs of the projected investments. Business men do not need to worry about interest costs when there are other tremendously more important costs involved. So many investors require that the total costs must be written off in a very short time, say less than ten years, that interest costs are not given a chance to be important. The allowances for depreciation and amortization will be much greater than any interest costs. Two studies[2] have recently been made to consider the practical attitudes of businessmen toward the influence of interest in investment decisions. While these studies do not <u>prove</u> the point that interest fluctuations are unimportant, they certainly confirm a very strong supposition. Furthermore, Tinbergen's statistical results have shown that there do not exist any known significant correlations between investment and interest rates in the models which he has constructed. At any rate, the burden of the proof is clearly placed upon those who still maintain that interest rates are

[1] It is irrelevant to argue that businessmen do not act rationally in failing to charge themselves for imputed interest because models which are to describe the real world should consider only the way people actually behave and not the way they should behave according to some theoretical principle.

[2] J. Franklin Ebersole, "The Influence of Interest Rates upon Entrepreneurial Decisions in Business -- a Case Study," <u>The Harvard Business Review</u>, Autumn, 1938, p. 35; H. D. Henderson, "The Significance of the Rate of Interest," <u>Oxford Economic Papers</u>, No. 1, Oct., 1938, p. 1, J. E. Meade and P.W.S. Andrews, "Summary of Replies to Questions on Effects of Interest Rates," <u>Oxford Economic Papers</u>, No. 1, Oct., 1938, p. 14.

important economic variables.

These practical results lead us to believe that the properties of the investment function are as follows:

$$\frac{\partial I}{\partial r} \leq 0$$ and small in absolute value

$$\frac{\partial I}{\partial Y} > 0$$

We do not have much practical information about the latter condition except that we do know that its magnitude is seriously limited when there is very much autonomous investment.

About the liquidity function we do not have many actual facts. We do, however, recognize that Keynes' a priori judgments concerning this function make sense. He has stated that in the neighborhood of a certain low interest rate the function should have infinite elasticity. His point here is well-known that there are certain minimum risks and costs of making loans which give rise to a bottom for the interest rate. We also know that interest rates have been pushed to a rather low level in recent years, leading us to suspect that we are in the neighborhood of this infinite elasticity. The variable Y enters into the liquidity function through the modified quantity theory of money. From that theory we borrow the notion of the positive relation between Y and M. On this basis we would expect the liquidity preference function to have the following shape:

$$\frac{\partial L}{\partial r} < 0$$ and large in absolute value

$$\frac{\partial L}{\partial Y} > 0$$

The magnitude of the latter derivative may be taken to be the reciprocal of the income velocity of circulation. According to statistical estimates of velocities, the reciprocal must be substantially less than unity. The income velocity has

been estimated at approximately two or three for the United States.

The shapes of the functions of the Keynesian system are not, by any means, solely determined by a few partial derivatives. It is necessary to inquire further into what lies behind some of these schedules. There are certainly a whole host of institutional and psychological factors which determine the shape and position of the consumption-savings pattern. Keynes has pointed out very often to us that the relations of consumption or savings to income are very stable, predictable relationships, but he has not brought out so strongly, as has Hansen,[1] the institutional setting which gives rise to this relation. Hansen has investigated the facts of our economy to show what determines the shape and position of the consumption function. He has shown that large amounts of savings are undertaken to meet fixed contractual obligations of insurance policies and pension funds. Consumer habits as to the disposal of their incomes are made to conform to personal tastes which are likely to be influenced mainly by the trends of our times. This is where Keynes' psychological attitudes fit into the picture. Thus the consumption-savings side of the Keynesian model can be taken to be quite stable.

On the other hand, Keynes has recognized the volatility of investment for many years. He stressed this point very much in the Treatise, and approved of the theories of Tougan-Baranovski, Spiethoff, and Schumpeter. If the level of investment is completely autonomous, then the shape and position of the investment function is that given in the simplest Keynesian model above, a horizontal straight line. In the more general case where investment is both induced and autonomous, we are not sure about the properties of this function but we do know that the institutional factors behind the schedule involve unsure,

[1] Fiscal Policy and Business Cycles, Chapter XI.

probability judgments of the future.

Professor Samuelson has provided us with another type of tool with which to analyze the properties of certain interrelationships among the various Keynesian functions. His methods involve the use of the "Correspondence principle." The statical model which we have of the Keynesian system is very useful in analyzing the level of the economic system at any point of time, but when we impose shifts upon one or more of these functions we cannot, from this statical system, predict exactly the new position of the system. However, Samuelson has shown that by considering the dynamic model for which the statical system provides the stationary solution, it is possible to develop certain relationships within the system. The reason why the dynamical model leads to useful theorems in comparative statical systems is that we make the dynamical models satisfy stability conditions which seem to conform to the real world. We know that our system undergoes changes, but it seems to be reasonably capable of resisting great stress, indicating the fulfillment of stability conditions.

If by considering the facts of the real world and the stability of dynamic equilibrium we can derive many properties of the generalized Keynesian model, then we shall be better equipped to tackle such problems as underemployment equilibria and comparisons of Keynes with the Classicists.

The Background Equations

The Keynesian system as presented above is a completely determined system in the monetary sphere of the economy. But there is lacking a model of what is behind these equations in the real sphere. In other words we must link monetary theory with traditional value and distribution theory.

In the short run, we can take the stock of capital as fixed; i.e. as $K = \bar{K}$. This means that the production of real output, which we shall denote by y, is uniquely related to employment, N, through a production function with $\bar{K}$ as a parameter.

$$y = y\ (N, \bar{K})$$

From the theory of production and cost, there is the result that wages, w, are made equal to the marginal value productivity of labor. Thus we get another equation

$$w = p\left(1 - \frac{1}{\eta(p,y)}\right)\frac{\partial y}{\partial N}$$

where p is the price level of aggregate output and $\eta = \eta(p,y)$ is the price elasticity of demand for final output. Since this condition is a maximizing condition for the employers of labor it can be considered as the demand function for labor. Of course, in perfect competition

$$w = p\frac{\partial y}{\partial N}$$

From the supply side, we must get a schedule showing how much of labor's services will be offered at each level of wages. Now we are at an impasse. Do we take real or money wages in the supply curve of labor? The classical system would have the equation

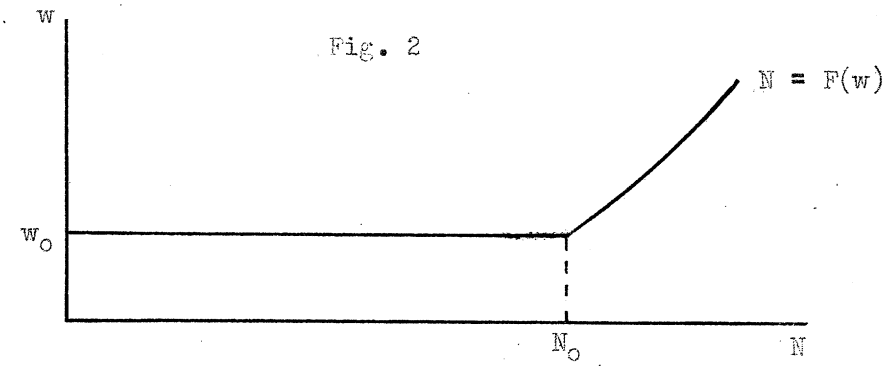
$$N = f\left(\frac{w}{p}\right)$$

But Keynes objected to this equation and substituted

$$N = F(w)$$

This is not the only modification which he has made in the supply schedule, for he has also fixed its shape. He has said that the supply of labor is perfectly elastic at the going wage up to a full employment level.

Fig. 2



w_o is the going wage rate and N_o is full employment. This particular supply curve of labor is very important and leads to certain desired results within the Keynesian system which economists thinking along other lines were unable to reach. Realistically, it seems that the Keynesian supply curve is much more accurate and describes the way workers actually behave. But on a different level of abstraction there is another question to be considered. In a perfect Walrasian equilibrium where the classical supply curve is used, can we get the result of underemployment equilibrium with the Keynesian system? We shall attempt below to answer this question and also to show why a classical model must have a full employment equilibrium under such conditions.

By now we have enough results to write down a complete model of the Keynesian economic system which shows the background equations along with the monetary equations.

$$S(r,y) = I(r,y) \qquad y = y(N,\overline{K})$$
$$M = L(r,y) \qquad w = p\left(1-\frac{1}{n}\right)\frac{\partial y}{\partial N}$$
$$Y = p\,y \qquad N = F(w)$$

This is the skeleton of the General Theory. When all the factors determining the characteristics of these functions are considered, the economist has a

powerful analytical tool.

A Comparison with Classical Economics

Before we can discuss the relationship of Keynesian to classical economics, it will be necessary to state on what grounds the two systems are to be compared. By now, it is well agreed that the most pressing economic problem of our present society is the problem of unemployment. As economists in this society, we should operate with theoretical models which are capable of explaining the phenomenon of unemployment. The classical system can explain unemployment which is due to frictions or market imperfections and to unwillingness of workers to be employed. For our tastes, this is clearly insufficient because even a perfect, frictionless system need not always have full employment.

Keynes thought that it was necessary to develop a new definition of unemployment in order to explain the occurrence of an underemployment equilibrium. He defined involuntary unemployment as that unemployment which could be done away with by cuts in real wage rates. This definition is not entirely satisfactory. It does not admit of a negatively sloped supply curve of labor. But more seriously it seems to imply that if workers would offer their services according to real instead of money wage rates, that there would be no problem of unemployment. It hardly seems possible that Keynes could say that his major contribution to economic theory was to point out a money illusion on the part of workers which has always been the cause of unemployment. Keynes' real contribution, to repeat, has been to show that if savings are not offset by legitimate investment outlets, we will fail to generate a high level of employment. Even if the Keynesian supply curve of labor is replaced by the classical supply curve in terms of real wages, we

still have the problem of making savings pass into investment.

A simple definition which would appeal to classical economists would be that employment is full if all who want to work at the going real wage rate are employed. In this case, we have a supply curve of labor

$$N = f\left(\frac{w}{p}\right)$$

and any solution of the classical system for N which falls along this curve is a full employment solution. In classical economics, such a solution always occurs in the conditions of full equilibrium. If we do not accept the classical supply curve as being realistic and use instead

$$N = F(w)$$

then we can call full employment that situation in which anyone who wants to work at the going rate of money wages can find a job.

Other useful definitions of full employment can be formulated in terms of a certain level of output. Full employment, for example, may be looked upon as the long run potential level of output. The short run potential may conveniently be called the bottleneck level as distinguished from the full employment level. We will not have occasion in this chapter to make further use of these concepts. However, they will be helpful at a later stage in the analysis of the inflationary gap.

Just as we have given below, the simplest Keynesian system, we should begin our comparison with the simplest classical system. Savings always flow, unobstructed, into investment, and the stock of money and the velocity of circulation are given constants. We can write

$$S(Y) \equiv I(Y) \quad \text{identically in } Y$$

$$\overline{M} = \overline{k}\ Y$$

In this system savings and investment are not only identical as observables over time, but also for all virtual displacements of the variable Y at a given period of time; i.e. savings and investment are identical in the schedule sense. Since

$$Y = p\,y \qquad \text{then } \overline{M} = \overline{k}\,p\,y$$

Also from the background equations we find

$$W = p\frac{\partial y}{\partial N}$$

$$\text{therefore } \overline{M} = \overline{k}\,w \cdot y \Big/ \frac{\partial y}{\partial N}$$

Suppose that there is not full employment. Their immediate solution would be to lower wages. Since the equation

$$\overline{M} = \overline{k}\,w \cdot y \Big/ \frac{\partial y}{\partial N}$$

always holds, a lowering of w will call for an offsetting rise in something else. They assumed y to be an increasing function of N and $\frac{\partial y}{\partial N}$ to be a decreasing function of N. Therefore with $\overline{M}$ and $\overline{k}$ given, the adjustment must take place with an increased N. Wages can thus be lowered until N reaches what is called the full employment level.

It is easy to see that decreasing wages is just an easy money policy in this system. The same results could be obtained by increasing the amount of money. In the equation

$$\overline{M} = \overline{k}\,Y$$

if $\overline{M}$ is arbitrarily increased by the banking system then income will rise. Whatever part of this income is not consumed will pass over automatically into investment. At these higher levels of income, consumption, and investment, more workers will be employed. By an easy money or flexible wage policy, this system can always avoid unemployment.

Keynes threw over the assumptions of this system. He gave up Say's Law and made savings and investment part of an equation rather than an identity in Y.[1] He also developed a theory which did not make flexible wages such a powerful tool, always insuring full employment. The incompatibility of this system with the simplest Keynesian model

$$\overline{I} = S(Y)$$

shows clearly what is meant by a Revolution.

A more complex version of a classical model would be one in which the interest rate is introduced explicitly as a variable, and in which the complete background equations are given. In this system, the flow of savings into investment determines the rate of interest. The system would be the following:

$$\overline{M} = \overline{k}\, Y$$

$$S(r) = I(r)$$

$$y = y(N, \overline{K})$$

$$w = p\frac{\partial y}{\partial N}$$

$$N = f\left(\frac{w}{p}\right)$$

$$Y = p\, y$$

At first glance, the differences between this system and the Keynesian system above on p. 89 may seem to be quite obvious. Some have said that the principal difference lies in the changing of the quantity equation into the liquidity preference equation; others have said that the distinguishing characteristic of the Keynesian system is the substitution of the "non-homogeneous" supply equation

$$N = F(w)$$

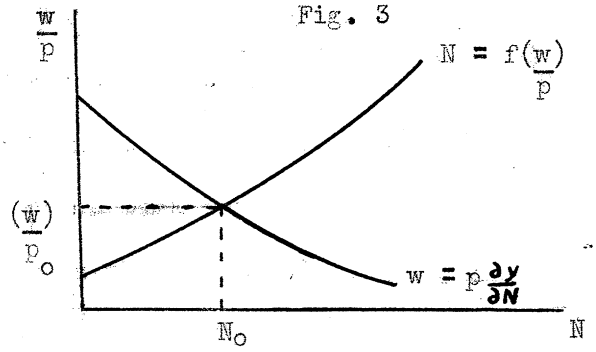
for $N = f\left(\frac{w}{p}\right)$;

[1] Notwithstanding many of the confused interpretations of this point.

and still others have been closer to the truth by pointing out that the main alteration by Keynes occurred in the shape of the savings-investment equation.

That the full equilibrium solution for this system is one of no unemployment, is almost obvious. The demonstration is quite simple. The last two equations can be considered as supply and demand equations for labor as functions of real wages. Thus from these equations, we can find the level of employment and real wages.

Fig. 3



By substitution of $N = N_o$ into the production function, $y = y_o$ can be determined. From the relation

$$Y = py$$

we can substitute into the quantity equation and get the price level

$$\overline{M} = \overline{k}\, py_o$$

The rate of interest, $r = r_o$, follows from the savings-investment relation.

The values of output and employment, y_o and N_o, represent full employment levels since this value of N ($= N_o$) lies on the supply surve of labor. All who want to work at the going real wage are employed. If any maladjustment occurs within this system so that there is not full employment, a wage cut can always restore the economy to its full employment equilibrium. The competitive bargaining among workers will always be remunerative. Since M and k are given in the quantity equation, total spending is given. At lower wages certainly more workers can be hired with total spending constant. Wage cutting

will continue up to the full employment level. In the quantity equation, a wage cut requires the upward adjustment of employment:

$$\overline{M} = \overline{k}\ w.y\ /\frac{\partial y}{\partial N}$$

If w goes down, $y/\frac{\partial y}{\partial N}$ must go up to preserve the equation. Assuming diminishing marginal productivity, this is possible only with increased employment (N).

With the assumption of various frictions, imperfections and rigidities of the real world, an explanation of unemployment is not difficult, either in the classical or the Keynesian system. But assuming away all such defects, can unemployment exist? Many economists will answer this question today in the negative. Those who pick out the essential, distinguishing feature of the Keynesian system as the assumption of rigidities imply also that they would answer no to this question. Unfortunately, Keynes has practically admitted[1] that he, too, would answer no. Again, as in the Treatise, Keynes did not really understand what he had written and chose the wrong thing to publicize as his innovation. The Keynesian supply curve of labor and definition of involuntary unemployment were no more important to the General Theory than the "fundamental equations" were to the Treatise.

Suppose that we live in a Euclidean world in which there exists a perfect Walrasian system of equations. We shall now argue that this Utopia will not automatically solve the economic problem under the conditions of Keynesian economics. However, full employment will always be insured in a classical situation in this world. Now we shall be able to see the fundamental difference

[1]See "The General Theory of Employment" Quarterly Journal of Economics, Feb., 1937, Vol. 51, p. 209, where Keynes said that Leontieff was correct in pointing out that the Keynesian system differs mainly from the classical system in not being homogeneous of order zero in prices.

between Keynesian and classical economics. Let all variables and functions in this system be measured in real terms, say, in wage units. Thus we will have

$$Y = w \cdot Y_w, \quad I = w \cdot I_w, \quad C = w \cdot C_w, \quad S = w \cdot S_w, \quad M = w \cdot M_w$$

There will be perfect competition, homogeneity of order zero in prices and no inflexibilities. The structure of the system can easily be seen from a few equations

$$M_w = L_w (r, Y_w)$$

$$S_w(r, Y_w) = I_w (r, Y_w)$$

$$Y_w = Y_w (N, \overline{K}_w)$$

$$w = p \frac{\partial Y_w}{\partial N}$$

$$N = f \left(\frac{w}{p} \right)$$

It might be argued that this is a perfect classical system which represents a a perfect equilibrium of perfect competition. From the solution of the background equations, we can find $\left(\frac{w}{p} \right)_o$, N_o, and $(Y_w)_o$ which represent full employment. Next we substitute $(Y_w)_o$ into the savings-investment equation and solve for r_o, the interest rate. This gives us everything except the absolute level of wages and prices. But the money equation will produce a solution for these variables. By substituting $(Y_w)_o$ and r_o into the L_w function and by setting the result equal to $M_w = \frac{\overline{M}}{w}$, we can find $w = w_o$. Since $\left(\frac{w}{p} \right)_o$ is known, $p = p_o$ can then be found. In this system

$$M_w = L_w (r_o, (Y_w)_o)$$

or

$$\overline{M} = w L_w (r_o, (Y_w)_o)$$

is the familiar quantity equation; the L_w function can be considered as a given constant in this case analogous to the Marshallian $k = \overline{k}$. The quantity

equation can be considered as an equation to determine either the absolute level of wages or of prices.

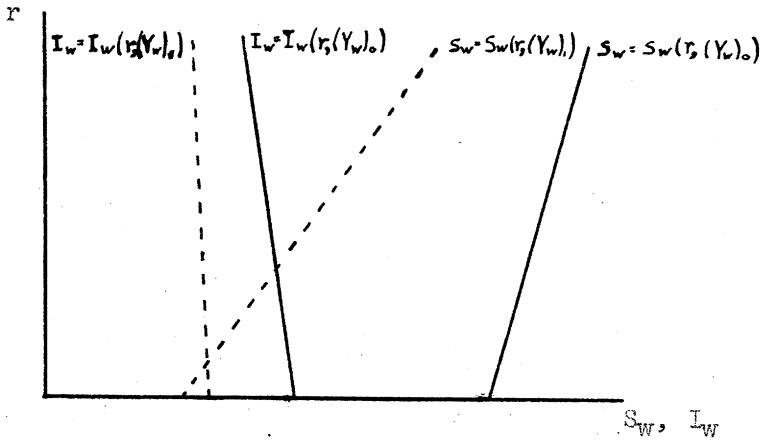
But now, let us become Keynesian and see what happens. As before, solve the background equations for $\left(\frac{w}{p}\right)_o$, N_o, $(Y_w)_o$. Substitute into the savings-investment equation. Is there always a solution for r? We have as many equations as variables, but does that guarantee an economically possible solution? The answer is that it certainly does not! We must do more than merely count equations and variables. We must consider the shapes of our functions. The Keynesian Revolution rejected the classical theory of interest. It denied that the equation

$$S_w\,(r,\ (Y_w)_o) \equiv I_w\,(r,\ (Y_w)_o)$$

need always have a positive solution for r when Y_w is given at the full employment level. When we analyze the saving process, we see that $\frac{\partial S_w}{\partial r}$ might be negative or positive and will probably be small in absolute value. More recently, we have come to believe that $\frac{\partial I_w}{\partial r}$ is also small in absolute value. It is more likely than not that there will be no positive value of r which satisfies this equation. Perfect equilibrium of perfect competition is not in general compatible with the system of Keynesian economics.

A feasible graphic presentation of this situation is the following

Fig. 4

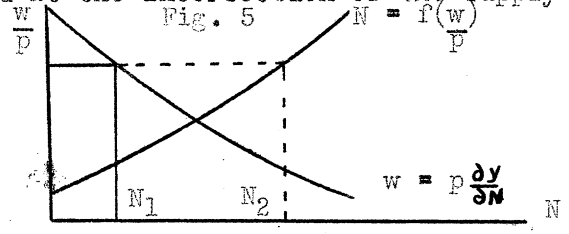


When Y_w is at its full employment value, $(Y_w)_o$, there is no solution for r from the two inelastic schedules, but when Y_w is at a lower value, $(Y_w)_1$, there does exist a solution for r. Only after a theory of the adjustment of output is introduced, can we be always certain to determine the rate of interest for the general case.

The principal difference, then, between Keynes and the classics centers around their theories of savings and investment. The multiplier theory, or the theory of the determination of effective demand, is the Keynesian savings-investment theory. The theory of the determination of the rate of interest is the classical savings-investment theory. The money equation merely serves the purpose of determining the level of wages and prices and does not play an essential part in showing the differences between the new and the old economics.

The principal question which must inevitably arise now is, how do we get any solution from this real, Keynesian system? There can be an equilibrium of perfect competition in this system, but it cannot be a perfect equilibrium. Something must give way in order that the economic variables can assume some determinate values. The obvious thing which gives ground is the level of employment. N falls to a less than full employment level; there will be a different value of Y_w obtained from the production function which if substituted into the savings-investment equation will cause such shifts[1] of the two-dimensional cross-sections in the (S_w, I_w, r)-plane that a positive solution for r will occur. This imperfect equilibrium solution will mean that the level of employment will not be determined at the intersection of the supply and demand for labor schedules

Fig. 5



[1]These shifts are not of a dynamical character, but merely represent statical adjustments in more than two dimensions.

The supply of labor exceeds the demand by (N_2-N_1) and this is a measure of unemployment.

The non-Keynesian economists will argue now that if workers compete for jobs and lower money wage rates, that full employment will be restored. This proposition is correct only under the conditions of classical economics. In our Keynesian system lower wages need not do any good.

An analysis of the true picture of the economic world shows that interest rates have been pushed to very low levels so that the liquidity preference function is, in fact, interest-elastic. Furthermore all statistical information leads us to believe that lower interest rates will have little, if any, influence on the rate of investment. The economics of an interest-inelastic schedule of marginal efficiency of capital is a very important branch of modern analysis. It is easy to show that if the liquidity preference schedule is elastic and/or the marginal efficiency schedule inelastic, wage cuts will not raise the level of output and thus employment via the production function. In the first two equations of this real Keynesian system, it is possible to solve for r and Y_w as functions of M_w. With $\overline{M}$ given by the banking system, it is evident that a fall in w, through competition for jobs, will increase M_w. Thus we should be able to trace the effects of a wage cut if we can calculate $\frac{dY_w}{dM_w}$. We get

$$\frac{dY_w}{dM_w} = \frac{\frac{\partial I_w}{\partial r} - \frac{\partial S_w}{\partial r}}{\frac{\partial L_w}{\partial Y_w}\left(\frac{\partial I_w}{\partial r} - \frac{\partial S_w}{\partial r}\right) - \frac{\partial L_w}{\partial r}\left(\frac{\partial I_w}{\partial Y_w} - \frac{\partial S_w}{\partial Y_w}\right)}.$$

By appealing to Professor Samuelson's "correspondence principle", it is possible to fix a sign to the denominator of the expression on the right. If we construct a dynamical model involving discrete time periods in which consumption depends upon the income of the preceding period and all the other relations between variables are simultaneous, then it follows as a stability condition of this

system that, with the marginal propensity to invest less than unity (an entirely reasonable condition), the denominator is negative. If $\frac{\partial S_w}{\partial r}$ is a small positive value and $\frac{\partial I_w}{\partial r}$ is a small negative value then the fraction will be very small but positive. In addition, if $\frac{\partial L_w}{\partial r}$ has a large negative value, the fraction will be made even smaller in magnitude. Hence, there are serious limitations to the stimulative effects of a wage cut. In the limiting case there are no stimulative effects; i.e.

$$\lim_{\substack{\frac{\partial I_w}{\partial r} \to 0 \\ \frac{\partial L_w}{\partial r} \to -\infty}} \frac{dY_w}{dM_w} = 0$$

But the protagonists will not give up in their argument at this stage. They will say that disregarding the limiting case in which $\frac{d\,Y_W}{d\,M_W} = 0$, consider the situation where $\frac{d\,Y_W}{d\,M_W}$ is some small positive number. Then, since there is no limit to the extent to which M_W can rise with a fall in w there is no limit to the rise in Y_W. They are arguing that in the relation

$$d\,Y_W = \frac{d\,Y_W}{d\,M_W}\, d\,M_W$$

with $\frac{d\,Y_W}{d\,M_W}$ as multiplier and $d\,M_W$ as multiplicand, the smallness of the former is not an obstacle to full employment since the latter factor is limitless in its expansionable characteristics. But they have argued themselves directly into a trap. What will be the effects of unlimited increases in M_W as a result of unlimited decrements in w? The effects will be those of the economics of hyper-deflation and social revolution. If dM_W becomes large through limitless

wage cuts and employment receives only a slight stimulus, adverse expectations must certainly occur. As a result of expectations of further wage cuts, production plans would be postponed. Wages could fall endlessly to zero without any increase in employment, but instead decreases. Undoubtedly, this process would have to stop somewhere before zero. The method of stopping it would be the overthrow of the capitalist system.

Professor Pigou has pointed out that once-and-for all wage cuts without any expectations of further wage cuts will always increase employment. If the Keynesian functions are such that liquidity preference is elastic and/or marginal efficiency is inelastic, the multiplier effect will be small. Also if there are to be no adverse expectations, the multiplicand effect must also be small (otherwise there will be adverse expectations). The product of two small factors will also be small. It is not possible to abstract from expectations in this problem.

There is, perhaps, some possibility that wage cuts will cause shifts of the savings or the investment functions. If we write

$$I_w\,(r, Y_w) - S_w\,(r, Y_w) = -\alpha$$

where α represents a shift of the investment schedule relative to the savings schedule, we can also calculate $\frac{dY_w}{d\alpha}$

$$\frac{dY_w}{d\alpha} = \frac{\frac{\partial L_w}{\partial r}}{\frac{\partial L_w}{\partial Y_w}\left(\frac{\partial I_w}{\partial r} - \frac{\partial S_w}{\partial r}\right) - \frac{\partial L_w}{\partial r}\left(\frac{\partial I_w}{\partial Y_w} - \frac{\partial S_w}{\partial Y_w}\right)}$$

In this case, however, it is not the multiplier which is limited, rather the multiplicand. If $\frac{\partial L_w}{\partial r} \to -\infty$ we get the familiar spending multiplier

$$\frac{dY_w}{d\alpha} = -\frac{1}{\frac{\partial I_w}{\partial Y_w} - \frac{\partial S_w}{\partial Y_w}}$$

There is every reason to believe that $d\alpha$ will be quite small as a result of wage cuts. The reasons for this will be discussed more fully, below on p. 135 .

As a result, we can state that unemployment is possible in a perfect system and that perfect equilibrium of perfect competition is not compatible with the Keynesian conditions; whereas the achievement of full employment in the classical world is automatic. In order to show that full employment is not automatic in a perfect world subject to the Keynesian conditions, we have to assume nothing whatsoever about rigidities in the system. The numerous remarks throughout the recent literature that Keynes relied upon wage inflexibilities to obtain his results are entirely unsubstantiated.

But the assumption of rigidities will become very useful in explaining how an underemployment situation can be one of equilibrium. The essential contribution of Keynes was to show that full employment is not automatically assured. We need only look at the real world to realize why unemployment can be a persistent equilibrium condition. Under classical economics wage flexibility leads always to full employment. Within the framework of Keynesian economics wage flexibility does not correct unemployment and leads merely to hyper-deflation if carried to its logical conclusion. But in the real world we observe neither hyper-deflation nor full employment. The explanation is that wages <u>are</u> sticky; they are not flexible. The solution to the Keynesian system which gives a value of N not on the supply schedule persists when wage cuts do not occur. Because workers do not bid against one another, we do not experience the hopeless downward spiral.

When we introduce imperfections and rigid money wages into our model of the Keynesian system, the results of underemployment equilibrium follow quite easily. We then have a more realistic picture of how the economic system looks.

But it is not true, as many have said, that the Keynesian equations in conjunction with a perfect, frictionless system will always yield a full employment solution. Unemployment is extremely likely even under perfect competition. It shows clearly that the discussion of the new results of Keynesian economics should not be centered in the price-output sphere of the economy; rather in the probability, psychological, and expectational sphere of the economy. We should investigate the determinants of the shapes of the Keynesian functions. These are the strategic economic variables. They tell us whether or not a full employment solution is possible. The long familiar observation about the stickiness of wages supplements the results of Keynesian economics and brings us into contact with actuality.

With respect to methodology some questions may legitimately be raised at this point. Undoubtedly some economists will deny the validity of any results derived from aggregative models. In reply, it is only necessary to note that microstatical, Walrasian models present hopeless confusion. These models make a great contribution in giving us a picture of how the economic system works, but it is highly unlikely that we can ever infer anything about the levels of operation obtained within such a complex system. It does follow that if there is perfection in every market of a Walrasian system that there will also be perfection in the markets of the aggregative system. Thus if we assume a perfect equilibrium of perfect competition, then we can be assured that our background equations will be as we have written them. Professor Samuelson puts the matter another way. Assume a one-good system. Then the aggregative model holds without exception. From this, he argues that if we can prove the possibility of unemployment in this simple system then we have surely proved the possibility a fortiori for the infinitely more complicated multiple-good system. It is

also true that the aggregative model holds without exception for systems of many goods, but in which there are fixed proportions among the various goods.

APPENDIX TO CHAPTER III

The Long Run Equilibrium

At any point of time the economic system can be regarded as tending toward a long run stationary state in which there is no net investment and in which all existing capital equipment is exactly replaced. This idea does not mean to imply that the stationary state will necessarily be reached, but any dynamical system can be considered as approaching a stationary norm which changes at different periods of time but always exists as a useful concept. Outside factors will from time to time introduce shocks within the dynamical system which will make it tend toward a different stationary state. The question to be investigated now, in the light of Keynesian economics, is concerned with the level of employment in the long run. Will the stationary state be one of full employment? The classical economists who first talked about the stationary state certainly assumed full employment for their long run theory. Recently, Professor Hansen[1] has disputed the classical position with the argument that the institutional and psychological makeup behind the determinants of effective demand may be such that the system will settle down to a long run underemployment equilibrium. Professor Pigou[2] was not long in coming to the rescue of the classical writers and attempted to salvage their theory. It will be very useful to consider, in some detail Professor Pigou's case and to trace its full implications.

Reckoning in terms of wage units we can easily write down a system to

[1] Fiscal Policy and Business Cycles, p. 288.

[2] "The Classical Stationary State" The Economic Journal, Vol. LIII, Dec., 1943, p. 343.

represent the long run equilibrium, which is consistent with that of Pigou.

$$M_W = L_W (r, Y_W)$$

$$S_W (r, Y_W, K_W) = 0$$

$$I_W (r, K_W) = 0$$

$$Y_W = Y_W (N, K_W)$$

$$w = p \frac{\partial Y_W}{\partial N}$$

$$w' = p \frac{\partial Y_W}{\partial K_W}$$

$$N = f \left(\frac{w}{p}\right)$$

where w' is the price level of capital goods.

If an economically meaningful solution to these equations should exist, then full employment would follow, and the stationary state would represent perfect equilibrium of perfect competition. But Pigou has agreed that the added condition, $r > 0$ may make the system over-determined. That is to say, there may be no solution for r which has economic meaning when all other variables are at a full employment level. There must be some least value of $r > 0$, and if this value will not bring savings and investment into equilibrium at their zero levels then something must give way in the system. In reality employment is the thing that will give way, such that a solution for r exists consistent with less-than-full employment values of the other variables. However, Pigou represented this system of equations as an impasse, implying that the classicals were wrong in saying that there would be full employment and that Hansen was wrong for saying that there would be unemployment. Pigou refused to admit the existence of an imperfect equilibrium condition. For Keynesians this system represents a situation of unemployment due to the overthrow of

the classical interest theory. The market phenomenon of sticky wages will explain why the unemployment position is one of equilibrium.

The ace in the hole for Pigou was a slight modification of the savings schedule to the form

$$S_w \quad (r, Y_w, K_w, M_w) = 0$$

The substitution of this function for the other savings function in conjunction with the other equations of the system, Pigou thought, enabled him to save the classical doctrine. His argument was that since it is reasonable to assume $\frac{\partial S_w}{\partial M_w} < 0$, a flexible wage policy will always push savings to the required zero level, even after r has been lowered to its minimum value. It is obvious from the relation, $M_w = \frac{\overline{M}}{w}$, that wage cuts serve to increase the real stock of money, M_w. If increases in M_w diminish the desire to save, then a flexible wage policy can always insure the zero-level of savings at full employment because unemployed workers will always bid w to such a low value that just the correct amount of savings are forthcoming. In this case the added condition on the interest rate does not make the system overdetermined.

Pigou's argument, however, is not quite convincing, and the classical point of view has not yet been saved. The assumption of unlimited wage cuts, as has been pointed out above, is a very dangerous tool when we take into account any realistic considerations of anticipations in the economic process. Professor Pigou must rest his argument on the fact that a very small wage cut will immediately restore high levels of employment so that a deflationary spiral is to be avoided. In particular, he must show that in his system the relation

$$d Y_w = \frac{d Y_w}{d M_w} d M_w$$

yields a large positive multiplier, $\frac{d Y_w}{d M_w}$, so that a small multiplicand, $d M_w$ can induce a large increment to income, dY_w. We must consider, then, the

conditions which make for large or small values of $\frac{d\,Y_w}{d\,M_w}$.

The system

$$M_w = L_w(r, Y_w)$$
$$S(r, Y_w, K_w, M_w) = 0$$
$$I(r, K_w) = 0$$
$$w = \overline{w}$$

is equivalent to the larger system with the background equations because with $\overline{M}$, given by the banking system, the first three equations in conjunction with the background equations are sufficient in number to solve for all variables. Thus we can consider the first three equations as solved for r, Y_w, K_w in terms of w (or M_w) and w as determined along with w', p,N from the background equations. Whatever this value of w turns out to be, we shall call it $\overline{w}$. Pigou, in his paper, actually assumed $Y_w = \overline{Y}_w$ instead of $w = \overline{w}$, but the difference is not essential. As a matter of fact, in his Employment and Equilibrium, he pointed out that either $w = \overline{w}$ or $Y_w = \overline{Y}_w$ was implicitly assumed by the classical economists.

Suppose now that the solution to the abbreviated system is one of less than full employment with $w = \overline{w}$; in other words, forces are imposed upon the system so that the relations hold only imperfectly. Pigou's process is then to lower/in the equations as a result of the competition for jobs. The stimulus to employment from this lowering of w can be seen from

$$\frac{dY_w}{dM_w} = \frac{\frac{\partial S_w}{\partial K_w}\frac{\partial I_w}{\partial r} - \frac{\partial I_w}{\partial K_w}\left(\frac{\partial S_w}{\partial r} + \frac{\partial S_w}{\partial M_w}\frac{\partial L_w}{\partial r}\right)}{\frac{\partial S_w}{\partial K_w}\frac{\partial I_w}{\partial r}\frac{\partial L_w}{\partial Y_w} - \frac{\partial I_w}{\partial K_w}\left(\frac{\partial S_w}{\partial r}\frac{\partial L_w}{\partial Y_w} - \frac{\partial L_w}{\partial r}\frac{\partial S_w}{\partial Y_w}\right)}$$

With Pigou's assumptions

$$\frac{\partial S_w}{\partial K_w} \leq 0\,,\ \frac{\partial S_w}{\partial r} \geq 0,\ \frac{\partial S_w}{\partial Y_w} > 0\,,\ \frac{\partial S_w}{\partial M_w} < 0\,,\ \frac{\partial I_w}{\partial r} < 0\,,\ \frac{\partial I_w}{\partial K_w} < 0,\ \frac{\partial L_w}{\partial r} < 0,\ \frac{\partial L_w}{\partial Y_w} > 0$$

it follows that

$$\frac{d\ Yw}{d\ Mw} > 0$$

But the size of the multiplier will depend, as in the short run models, on the structure of the entire system.

In the long run, it is reasonable to expect that the rate of interest will be pushed towards its least possible value. If the stationary state is one of such foresight that there are no minimum risks connected with borrowing, then the interest rate can fall to the minimum costs of making loans on the part of the banks. This will undoubtedly bring the rate near zero. In the case of the presence of borrowing risks, the bottom to the interest rate may be somewhat higher, but no matter which point of view is adopted, the rate should be in a range in which the liquidity preference schedule has great interest-elasticity. While the condition of interest-elasticity seems to follow directly from the Keynesian assumptions about the bottom to the interest rate, it can easily be shown that this condition follows also from Pigou's system.

Instead of the liquidity function, as we have written it, he used the relation

$$r = g\left(\frac{Mw}{Yw}\right)$$

in which $\frac{Mw}{Yw}$ represents the Marshallian "k". He assumed

$$g\left(\frac{Mw}{Yw}\right) > 0$$

and $$\frac{dr}{d\left(\frac{Mw}{Yw}\right)} < 0$$

$$\text{for all } \frac{Mw}{Yw} > 0$$

In addition he stated that the function g falls asymptotically towards zero for large values of $\frac{Mw}{Yw}$. Thus when the interest rate is small and near zero, as it will be in the stationary state, we get

$$\frac{d\,r}{d\left(\frac{Mw}{Yw}\right)} < 0$$

and small in absolute value. From the inverse relation

$$\frac{Mw}{Yw} = g^{-1}(r)$$

we can calculate

$$\frac{\partial Mw}{\partial r} = Y_w \frac{d[g^{-1}(r)]}{dr} = Y_w \frac{d\left(\frac{Mw}{Yw}\right)}{dr} < 0$$

Where r is small, Pigou's assumptions imply that $\frac{d\left(\frac{Mw}{Yw}\right)}{dr}$ is large in absolute value, so that $\frac{\partial Mw}{\partial r}$ will also be numerically large, although negative.

The consequences of an elastic liquidity preference schedule are that the stimulative effects of wage cuts will be very slight. In the multiplier expression, all terms not involving $\frac{\partial Lw}{\partial r}$, do involve either $\frac{\partial Sw}{\partial r}$ or $\frac{\partial Sw}{\partial Kw}$ as factors. Pigou admitted that the magnitude of both these slopes of the savings function would be extremely small, numerically. In the limiting case where these terms tend to zero and the liquidity preference function tends toward infinite interest-elasticity we get

$$\lim_{\substack{\frac{\partial Sw}{\partial r}\to 0 \\ \frac{\partial Sw}{\partial Kw}\to 0 \\ \frac{\partial Lw}{\partial r}\to -\infty}} \frac{dYw}{dMw} = -\frac{\frac{\partial Sw}{\partial Mw}}{\frac{\partial Sw}{\partial Yw}} > 0$$

At best there would be very slight increases in employment as a result of wage cuts because any reasonable estimate of the magnitude of $\frac{\partial Sw}{\partial Mw}$ relative to $\frac{\partial Sw}{\partial Yw}$ must leave the ratio of the two substantially less than unity.

A strong case can be made for the proposition that $\frac{\partial S_w}{\partial M_w}$ is small. This term should be of the same order of magnitude as $\frac{\partial S_w}{\partial K_w}$. The real stock of capital, Kw, is merely the sum of various stocks of different types of real capital. The term, Mw, can reasonably be included with the sum of these various stocks so that Kw + Mw becomes the proper independent variable in the savings function. There is no a priori reason to believe that the variable, Kw + Mw has a very different effect on the level of savings from that of Kw. Hence it is very probable that $\frac{\partial S_w}{\partial M_w}$ is also quite small numerically and is of a much smaller order of magnitude than is $\frac{\partial S_w}{\partial Y_w}$. When this is the case, the multiplier becomes negligible. The modification of the savings function has really done very little to enable Pigou to abstract from the deflationary aspects of expectations. In this case, even if we admit flexible wages, full employment will not be readily achieved. With the existence of unemployment, workers will continue to cut wages in their competitive struggle for jobs, but there will be little stimulus to increased employment, and expectations of further wage cuts must certainly develop. Producers will postpone action in anticipation of further wage cuts; prices will be depressed; and the economy will travel downward in a hopeless spiral. As before, we introduce the condition of rigid wages to show why the system will stay in the imperfect equilibrium condition and not collapse as a result of the deflationary spiral.

However, there is one case which may be labeled as an extremely classical situation in which Pigou's results can be obtained but which does not follow from his assumptions. One of the important aspects of this situation is contained within the following statement by Keynes,

> "In a static society or in a society in which for any other reason no one feels any uncertainty about the future rates of interest, the

> Liquidity Function L_2, or the propensity to hoard (as we might term it) will always be zero in equilibrium . . . . Thus if it is practicable to measure the quantity, O, and the price, P, of current output, we have $Y = O P$, and, therefore, $MV = OP$; which is much the same as the Quantity Theory of Money in its traditional form."[1]

If we assume as a characteristic of the stationary state, that there is no uncertainty as to the future rate of interest, then the liquidity preference equation can be replaced by the quantity equation, and the effects of wage cuts should be very favorable to employment. In fact for this case it follows that

$$\frac{d Y_w}{d M_w} = \frac{1}{\frac{\partial L_w}{\partial Y_w}}$$

The multiplier is the income velocity of circulation of cash balances (or the reciprocal of the Marshallian "k"). This value has been estimated at two or three for the United States; consequently we should expect, in this case, a favorable result from wage cuts which could quickly restore full employment and avoid the disastrous results of hyper-deflation. If this model is what the classical economists had in mind for their stationary state, then perhaps they were correctly following their assumptions.

[1] General Theory, pp. 208-209.

CHAPTER IV. A POLEMICAL DIGRESSION

For those who feel that the controversies, in the literature, on Keynesian economics have been carried on ad nauseam, this chapter will be of little interest. However, economists should be absolutely clear about their theoretical foundations. It is true that some rare individuals have great intuitive insight into economic problems and do not find it necessary to rely on rigorous theoretical analysis, but there is nothing more tragic than an economist floundering in the field of economic policy because his theory is confused. This chapter is designed as an attempt to clear away some confusions in theoretical economics and should be of interest to those who take economics as a serious affair.

Reviews of Reviews

Neither Keynes nor his immediate reviewers understood the full implications of the theoretical model of the General Theory. Much of the later polemical literature represented wasted paper, but all the discussions were by no means worthless. To those making a survey of the battlefield after most of the shots have been fired, it seems impossible that this theory could have been so little understood, but such a lack of comprehension merely serves to emphasize the revolutionary character of the work. Keynes was quite unkind to the mathematical economists in the General Theory, but it is hoped that this book along with basic works of Lange, Smithies, Hicks, Samuelson, Kaldor will show that only by laying bare the mathematical skeleton models of the theory can all its implications be traced. My perusal

of the literature has revealed that those who really understood the Keynesian theory were the mathematically and the empirically minded economists.

Two of the well-known reviews of the General Theory were made by disciples, Lerner[1] and Reddaway[2]. Lerner's review was generally cited as an approved, condensed version of Keynes' book. From the outset of Lerner's career as a Keynesian, though, we must feel forced to accuse him of being a mischief maker. Lerner accepted the Keynesian views without much exception, and he often presented the bad side of Keynes. For example, there are two Keynes on the matter of the savings-investment equation. One Keynes maintained the equality of savings and investment in terms of definitions of observable economic quantities, with no refutable hypothesis behind the equation. The better side of Keynes' dual personality stated the savings investment relation in terms of intersecting schedules of economic behavior, which determine an equilibrium position. Lerner in his review chose the former exposition and has, apparently, never parted with it. He looked upon savings and investment as identically equal and not brought into equilibrium by any economic variable. Here we have the beginnings of a controversy which will be discussed at greater length later in this chapter.

The other issue on which Lerner supported the bad side of Keynes is the question of wage cuts. Lerner attempted to show that whenever there is a uniform money wage cut, prices will fall by exactly the same proportion as wages thus leading to no change in real wage rates. He then followed Keynes with the proposition that since real wages have not fallen, employment

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[1]"Mr. Keynes' 'General Theory of Employment, Interest and Money'", International Labor Review, Vol. 34, 1936, p. 435.

[2]"The General Theory of Employment, Interest, and Money," The Economic Record, June 1936, Vol. 12, p. 28.

cannot be increased. The insistence on this doctrine of equiproportional wage and price declines has evidently incurred the ridicule of the more classical theorists. These latter economists invariably employ close reasoning, and any attempt to convert them to unorthodox views by such arguments must certainly fail. With regard to this problem of wage cuts, there was also another Keynes. The second personality considered the effects of wage cuts on the structure of the determinate system; i.e. upon the shifts induced upon the schedules of the system. It is a much more fruitful line of attack to inquire as to the possible effects of a wage policy on investment, saving, and liquidity preference.

With the rest of Lerner's article, there is little to contend, since it was a straightforward story of the General Theory.

Reddaway's article, on the other hand, was one of the best reviews of the book. This writer saw quite clearly the fundamental contributions of the new economics and was one of the first to be able to formulate a mathematical model of the skeleton system. According to Reddaway, Keynes was primarily attacking one of Ricardo's basic assumptions — Say's Law, or the proposition that supply creates its own demand. The incompatibility of Say's Law with the determinate Keynesian theory is great and it would be hopeless to try to derive the Keynesian results with a theory based on such principles. Furthermore, Reddaway recognized the fault of the Treatise, namely, the study of stability or lack of stability of various price levels rather than the study of the determination of the level of output.

He wrote down the model of the Keynesian system as follows:

$$S = f(Y)$$
$$I = g(r)$$
$$I = S$$
$$M = L_1 (Y) + L_2 (r)$$

This skeleton is basically the same as the more general model of the preceding chapter, especially when account is taken of the probable values of certain derivatives of these functions. Reddaway went all the way with Keynes in eliminating entirely the influence of interest rates upon savings. The current fashion is to include interest as a minor variable in this function. He also omitted income as a determinant of the level of investment. However, today we recognize that some investment may be passively related to income. Such a proposition is, by no means, anti-Keynesian and merely makes use of the principle of derived demand familiarly accepted in economic theory. The treatment of the liquidity function as the sum of two separate functions is quite all right and is merely a special case of the more general relations $M = L (r,Y)$. The split of this function into two parts is an attempt to bring out more strongly the dichotomy in the functions of money; i.e., money as a medium of exchange and money as a store of value. Reddaway's (and Keynes') formulation attempted to maintain the last vestiges of the quantity theory of money.

Personalities were not spared in Keynes' sarcastic attack upon the classical economists in the General Theory. Professor Pigou was cited as a particular example of the theory which Keynes was attacking since he had formulated most explicitly and elegantly the classical model. Pigou returned the blow with a bitter argument against the General Theory.[1] It is not

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[1] "Mr. J. M. Keynes' General Theory of Employment, Interest and Money", Economica, N. S. Vol. 3, 1936, p. 115.

difficult to see that Keynes was the winning economist but the losing gentlemen; he hardly observed the rules of the academic game. Nevertheless Pigou's review shows quite plainly the breach between classical and Keynesian beliefs; when we compare Pigou's later writings on this subject, we find a partial conversion to the new ideas.[1]

Pigou stated that the fundamental charge against the Classics was that of the assumption of an equilibrium position built up around an intersection of a real demand and a real supply schedule for labor. He repeated the classical view that unemployment is not an equilibrium position in the classical system because money wage cuts would always lead to declines in real wages and hence to more employment. What Pigou objected to in Keynes' argument was that a cut in money wages would entail a fall in prices exactly by an amount which would leave real wages unchanged. Pigou may have been correct in disputing this Keynesian view, but he did not consider adequately the effect of money wage cuts on other variables of the system such as interest rates, investment and savings. An interesting point to be noted is that in the world of concrete policy, Keynes and Pigou were not entirely at opposite ends since the latter agreed that there would be many practical difficulties in carrying out a wage cut. But on the whole, Pigou firmly believed that with the proper banking policy, wage cuts, in practice, could be relied upon to raise the level of employment.

With regard to the developments which have been stressed in the preceding chapters, Pigou remained quite conservative and refused to give up

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[1] See especially Employment and Equilibrium, Macmillan, London, 1941 and "The Classical Stationary State," The Economic Journal, Vol. 53, Dec., 1943, p. 343.

his older views. He did not regard saving decisions as complete in themselves; i.e., there has to be a corresponding act of investment to round out the saving process. According to him, the motives behind saving are investment opportunities or possibilities of future consumption. Pigou did firmly believe that a smooth running saving process which changed only steadily would always be exactly offset by a similar smooth running investment process. Only when sudden increases occur in the saving process could there be a lag of investment opportunities. But even this lag was considered temporary and of an entirely different order of magnitude from that which existed in Keynes' mind. Thus Pigou could not see the maintenance of the savings-investment equation as an important economic problem. Like other economists of the day, he was not able to envisage a lack of investment outlets. He made an argument similar to that attributed to Hawtrey in Chapter II[1] when he criticized the use of the multiplier theory on the grounds that governmental expenditure for public works would exert an upward pressure on interest rates and thus cut private borrowing for purposes of investment. For the non-Keynesians, private and public investment are always compensating alternatives; any governmental investment will somehow be at the expense of private investment.

Keynes' day of judgment was not a worry for Pigou. If we should ever approach a situation in which people attempt to maintain savings on a high level with a failure of investment offsets (due to a previous exceedingly high rate of capital accumulation), then Pigou predicted that money wages would be forced down by competition to keep people fully employed.

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[1] See p. 60.

Finally Pigou criticized Keynes on minor technicalities some of which are well taken and some of which represent confusion. For example, Pigou did not understand how Keynes could take the stock of capital as given for the short run and then speak of a non-zero rate of investment. He had in mind the fallacious argument that if capital is regarded as a given constant, then it can have no rate of change other than zero. However, those acquainted with the simplest concepts of the differential calculus know quite well that a variable can be given for each point of time and yet have a positive or negative rate of change over time. Pigou also objected to the breaking of the liquidity preference function into two parts, one depending upon income and the other upon interest. His argument here was that the Marshallian "k", which Keynes had not yet dropped entirely from L_1 (Y), already is a function of interest and includes the notions of liquidity preference. However, it is very questionable as to whether the classical economists did regard k as a function of interest in their discussions of the quantity theory. It is wrong also to think that the liquidity preference theory does nothing more than make velocity depend upon the interest rate. We saw, at an earlier stage, that the argument of the Treatise was based to some extent on the proposition that velocity is a function of the rate of interest. But the two "fundamental equations", which did relate the classical concept of velocity to the interest rate, were not related to the liquidity preference theory. It was only the theory of bearishness coupled with an analysis behind the various motives for holding cash balances that was related to the doctrine of liquidity preference. The classical treatment which viewed money only as a medium of exchange does not come to the same thing as the modern theory of Keynes even if the Marshallian "k" is made a function

of the interest rate. At any rate, this whole problem has no effect whatsoever on the Keynesian system since we can write in full generality $M = L(r,Y)$ and get all the important economic results. But there was one minor criticism by Pigou which does seem to be a well aimed blow. He did not like Keynes' verbiage on the own rates and the money rate of interest, including the involved explanation of the strategic importance of the money rate. Pigou concluded, and correctly we believe, that it makes no difference what standard of value is chosen. Numéraire problems are never essential problems in economic theory. We should be able to dismiss the own rate analysis as one of the "red herrings" of the General Theory.

Pigou was not the only follower of classical tradition who felt injured by Keynes' assault. The General Theory, more so than any other modern work on economics, warranted a formidable array of reviewers. Professors Knight and Cassel joined the mob in the stoning of the revolutionary dissenter.

Knight[1], in the first place, denied that Keynes actually refuted anything that can be called classical doctrine, in the modern sense. He looked upon the General Theory, then, as an attack upon straw men. However, it would be very strange to consider Ricardo, Marshall, Pigou, Wicksell, Hawtrey, Hayek, Mises, Robbins, etc. as straw men! Keynes was revolting against all those theories which did not explain the phenomenon of effective demand. Knight refused to open his eyes to any possible Keynesian contribution. For example, in his consideration of the proposition that savings

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[1] "Unemployment: and Mr. Keynes' Revolution in Economic Theory" The Canadian Journal of Economics and Political Science, Vol. 3, 1937, p. 100.

depends upon income in a definite way, Knight concluded that there is nothing new in this result, since it is a familiar point in classical writings that saving is an institutional matter, dependent on social psychology. But he did not bother to mention that whenever classical economists were thinking seriously about the savings-investment process, they worked with the interest theory,

$$S(r) = I(r).$$

An appeal to side remarks of classical writers cannot eradicate the major differences between their and Keynes' ideas of the savings-investment process.

Another point made by Knight, which is very similar to a remark of D. H. Robertson, was that the rate of interest can equate more than one set of desires simultaneously; i.e., that it can equate the desires for holding cash and non-monetary wealth, and that it can equate the desires for lending and not consuming. He criticized Keynes for not leaving more than one alternative open. But what Knight failed to do, is to distinguish between a complete, interdependent system and a building block theory. In working with the building block theory from which any final construction must be built, we have to pick out the strategic variables in each relation and hold the others constant. Keynes took Y to be the important variable in the savings-investment equation, and took r to be the important variable in the liquidity preference equation. In the end result of the most general Keynesian system

$$\begin{aligned} S(r,Y) &= I(r,Y) \\ M &= L(r,Y) \end{aligned}$$

we cannot pick out cause and effect. The interest theory of this system is the solution to the set of equations (r_o, Y_o) which is based on the liquidity preference building block.

There is further a methodological issue to be settled with Knight. He implied that there was something asymetrical in Keynes' analysis due to the assumption first of unemployment and then of the presence of obstacles to a return to full employment. Knight was aware that, historically, full employment has been the most usual state of affairs; therefore he argued that we should not assume unemployment, but instead full employment and then explain how such a happy situation could end. Does not the multiplier theory work in reverse? If investment opportunities wear out due to a high level of capital accumulation, while saving habits persist, the equation

$$dY = \frac{1}{1-C'(Y)}\, dI$$

will be in operation with the multiplicand, d I, negative. Income will fall and employment will decrease. It is as convenient to explain the upper turning point of the cycle with the Keynesian analysis as it is to explain the stagnant trough. One of the major differences pointed out in Chapter II between the overinvestment theorists and Keynes was in the analysis of why the boom comes to an end.

Knight claimed that all the Keynesian results follow only from his assumptions of unemployment and rigidities. While we do not deny that the rigidities exist and make the Keynesian analysis simpler, we do deny that they are at all essential to the theory. In particular, we have demonstrated in Chapter III that Keynes' results are still powerful in a frictionless system. It would be much more fruitful to shift the discussion from the assumptions of rigidities to realistic assumptions about the shapes of the important schedules of the Keynesian system.

The General Theory received another spanking at the hands of Cassel.[1] This bitter review is full of loopholes but brings out very well the fact that the Keynesian notions are not those of classical economics. Cassel began his review with the support of a linear trend extrapolation, so frequent and so disrespected among economists. Past trends showed clearly to Cassel that wealth doubled every 25 years, and he firmly expected this trend to continue into the future. Hence he argued that since Keynes' book was primarily an attack on saving, it was plainly wrong in both fact and theory because savers would have a big job on their hands in supplying funds to meet the doubling of wealth of the next 25 years. Cassel could not possibly imagine an exhaustion of investment opportunities and even imagined potential investment outlets as standing in line awaiting satisfaction. He thought that every new amount saved would give rise to new investment, but he saw the savings-investment equation as being maintained solely by the rate of interest. He flatly declared that Keynes was wrong to substitute

$$I(Y) = S(Y) \quad \text{for} \quad I(r) = S(r).$$

Also he was ready to throw out the whole concept of marginal efficiency of capital. For him, nothing but the interest rate could have any relation to investment.

Naturally, Cassel could not put up with the liquidity preference theory of interest. Interest, according to him, is determined in the savings-investment equation, and the price level comes out of the quantity equation. He envisaged a general equilibrium system in which all relative prices are determined, and then allowed the introduction of a theory of

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[1] "Mr. Keynes' 'General Theory'" International Labor Review, Vol. 36, 1937, p. 437.

money to determine the absolute level of prices. This system is in equilibrium when the supply of money is so regulated as to stabilize purchasing power. In the light of this background, he regarded Keynes attempt to revive the Mercantilist ideas of a monetary theory of interest as a complete failure.

Finally Cassel concluded that there always exists a solution to the general equilibrium equations which gives full employment and that there is no such thing as a general theory of unemployment. The following proof from Cassel is offered as entertainment for the bored reader: Ideas such as the propensities to save or consume cannot possibly explain unemployment. Suppose the existence of a propensity to save such that there is unemployment. Now if all the unemployed die, there will be full employment and the same propensity to save; ergo Keynes is wrong.

The reader should not get the opinion at this stage that all the reviews, other than those by disciples, were made up entirely of destructive criticism. Hicks is an example of a non-Keynesian who gave the General Theory a more favorable review,[1] although he was unable to pick out the essential Keynesian development. He remarked that the casual reader may take the equality S = I to be the innovation of the book. Then he went on to say that this equality depends only upon definitions. Many of us who claim to be more than casual readers of all Keynes' more important works must side with these simple-minded folk and say that the innovation is S = I but that is is not a matter of definition alone. When we speak of the equation S = I, we are speaking about savings and investment in the schedule sense and not as observable flows. However, we can agree with Hicks that the

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[1] "Mr. Keynes' Theory of Employment", The Economic Journal, Vol. 46, June, 1936, p. 238.

theory of expectations as put forth by Keynes was a real contribution, although not necessarily the major innovation as Hicks has put it.[1]

In his Value and Capital Hicks emphasized strongly the point that Keynes' interest theory and the loanable funds interest theory come to exactly the same thing. The argument behind this demonstration, which is very unsatisfactory, was already formulated in his earlier review article. There he said that there was nothing revolutionary about the liquidity preference theory. It will be better to drop further discussion of this point now and to take it up in a later section on the interest controversy in this chapter.

In his evaluation of the connection between the Keynesian analysis and the real world, I think that Hicks was not entirely an accurate observer. He accepted Keynes' ideas about fluctuations of the marginal efficiency of capital as being the important cyclical element, but he doubted the implied, longer run prophesies that the marginal efficiency of capital would decline secularly. He considered Keynes' greatest card to be that of a declining population becuase of all the things which maintained the marginal efficiency during the nineteenth century such as population growth, inventions, new lands, confidence, wars; it appeared to Hicks that population was most likely to fail. We find today among the stagnationists that, while declining population growth is important, many other things are more important in depressing the level of the marginal efficiency of capital. Even if population were growing at an increasing

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[1] See also "Mr. Keynes and the 'Classics'; a Suggested Interpretation", Econometrica, Vol. 5, 1937, where Hicks singled out the liquidity preference theory of interest as the feature which distinguishes Keynesian from classical economics.

rate, we would undoubtedly not feel assured of full employment.

Professor Viner is by no means of the Keynesian persuasion, yet he was not at all hostile in his review of the General Theory.[1] Viner concluded that the only difference between Keynes and the classical economists, with regard to such matters as the supply of labor and wage rates, was the former's denial that a cut in money wages will reduce unemployment. This conclusion was quite true, although the proper understanding of the difference depends upon our view of the modus operandi of the wage cut as well as the final effect. The discussion built up around the models of the previous chapter was precisely an attempt to show why wage cuts do not assure us of full employment. The different assumptions about the supply curves of labor are not essential to the argument. Viner was one of the first critics to question Keynes' readiness to follow the classical correlation between real wage cuts and unemployment. He pointed out that this resulted from a too unqualified application of the principle of diminishing returns. However, Keynes would counter with the argument that somewhere before full employment is reached, diminishing returns must set in, and then there will be the positive correlation between real wage cuts and increments in employment. Viner also pointed out at this time a pitfall in Keynes' definition of unemployment. He said that this definition implies a monotonically increasing supply curve of labor, something we can doubt empirically and theoretically.

In general Viner claimed that he accepted the broad outlines of the Keynesian system but doubted Keynes' description of the working and quantitative structure of the system. Particularly Viner did not agree with the theory of liquidity preference because he thought that the transaction

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[1] "Mr. Keynes on the Causes of Unemployment," The Quarterly Journal of Economics, Vol. 51, Nov., 1936, p. 147.

motive has as much influence on the rate of interest as the speculative motive. He was not able to give up the quantity equation and divorce the concept of hoarding from the theory of velocity, being an expert in the relative manipulations of M, V, P, and T. But to show how far Viner was from the Keynesian analysis, he remarked that savers with high hoarding propensities are not the source of trouble because they ". . . have investment habits, and abhor idle cash as nature abhors a vacuum." He also said, "It would at least be interesting to know whether these are facts or fancies." The events of recent years urge us to bet heavily on "fancy".

Viner believed that Keynes did not actually refute the classical economists but merely pointed out that money wage cuts might lead to adverse expectations and stifle investment. Actually Keynes has enabled us to demonstrate more than this, namely, that the classical mechanism is not the automatic lever which they thought it to be. Pigou, at least, has admitted that there may be practical difficulties in obtaining wage cuts, and that adverse expectations may set in, but on a higher level of abstraction he has argued that, in the absence of these obstacles, money wage cuts will always lead theoretically to full employment. One who really understands the working of Keynesian economics must dispute the classical point of view.

This country's most famous Keynesian disciple is undoubtedly Professor Hansen. As we saw above, though, Hansen held many views before 1936 which were not in agreement with the General Theory, and when he came to review this great work, he was not quite a confirmed Keynesian. In his review[1] Hansen attempted to link up the new theory with Keynes' development. According

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[1] "Mr. Keynes on Underemployment Equilibrium" The Journal of Political Economy, 1936, Vol. 44, p. 667.

to Hansen, the theoretical structure of the Treatise toppled because of his own and other criticisms. This was certainly claiming too much for himself. It is true that Hansen pointed out an error in one of Keynes' "fundamental equations," but the Treatise by no means stood upon so flimsy a foundation. The pretentious "fundamental equations" were not an essential part of the Treatise, and the most that we can say about Hansen's points is that they were criticisms of trivial equations. The theory of the Treatise stands or falls on the skeleton model written down in Chapter I, above. What actually knocked over the theory of the Treatise was the replacement of the savings-investment interest theory with a theory of output as a whole, and Mr. R. F. Kahn is responsible for this!

But Hansen did recognize immediately the important contribution of the General Theory and saw especially the divergence from the classical system. He pointed out that Keynes' criticism of the classics was not connected with the theory of price or distribution, but with the notion that there is an unique equilibrium point for output — at full employment. He recognized that the classical economists had no theory of output and employment as a whole. He went along entirely with Keynes on the view that the causal forces are found outside the price system in the psychology, expectations, habits and institutions of the population.

Hansen also claimed that it would have been better if Keynes had adopted the Robertsonian definitions of savings and investment because they give a clearer picture of the causal process. With this point of view, we cannot agree at all. The choice between the different definitions depends upon the type of system with which one wants to work — comparative statical or dynamical. This issue will be taken up at greater length in a later section.

The final review which we shall consider is that of Hawtrey,[1] Keynes' contemporary and rival for the leadership of British monetary policy. On the whole, Hawtrey's review was critical but not overly unfavorable. It does seem, though, that he was too preoccupied with a discussion of interest rates. In fact, Hawtrey considered the Keynesian thesis as primarily a revision of the classical interest theory. While this consideration is quite true, its meaningfulness depends upon what Hawtrey thinks Keynes used to replace the classical interest theory. The fact that Hawtrey centered so much of his review around the Keynesian interest theory seems to imply that he looked upon the Keynesian innovation as the substitution of the theory of liquidity preference for the classical interest equation. If this is what Hawtrey meant, then we are not in agreement, but it is difficult to tell from his writing exactly what he did mean.

Hawtrey had some interesting and some confused things to say about the rate of interest. He was of the opinion that in many schemes of new investment, the interest rate would play a subordinate role. He did not think that unfavorable interest rates would be an obstacle for promoters of new investment projects where there is competition in the carrying out of new ideas. Furthermore, he considered possibilities of the expansion of demand as a more powerful incentive than interest rates in stimulating investment. Hawtrey's opinions are all in agreement with what we have lately taken to be the structural characteristics of the Keynesian system. But there are two points of confusion with respect to interest rates. He accepted Keynes' idea that in equilibrium the rate of interest would be driven to equality with the marginal efficiency of capital, but his acceptance was too naïve. He thought that lower interest rates would be ×

[1] Capital and Employment, Longmans Green and Co., London, 1937, Ch. 7.

desirable during a depression; hence he concluded that we should attempt to lower the marginal efficiency in order to lower the interest rate. The Keynesians really want to raise the marginall efficiency of capital far above the interest rate or to lower the interest rate far below the marginal efficiency of capital. They never want to lower the marginal efficiency of capital! Another source of confusion was in the interpretation of the equation

$$M_2 = L_2(r)$$

According to Hawtrey the theory behind this equation involves circular reasoning. He said that the monetary authority regulates r through its control over M_2 and that $L_2(r)$ is based on what the public expects the monetary authority to do about M_2, but that the authority only determines r via the equation above. This argument he believed to be circular. However, we cannot agree with him on this point. The function $L_2(r)$ is a demand function of the people and its shape depends upon the expected future course of interest rates just as an ordinary demand function depends upon the expected future price pattern. Once all expectations and psychological behavior are given, the demand function $L_2(r)$ is completely specified. On the other hand, the monetary authorities make a certain decision as to the supply function M_2 which is to interact with $L_2(r)$. This supply function is an independent function and depends upon the discount policy of the banking system. The banks autonomously set the rate of discount which, in turn, determines the money supply. The discount rate and the market rate of interest are quite different variables, and the banks' control over the former does not involve circular reasoning in the theory of the determination of the latter. The

monetary authorities, in their attempt to influence r, may try to guess what is in the public's mind; i.e. what is the form of $L_2(r)$ and create M_2 accordingly, but this is not circular. It is true, of course, that expectations and monetary policy interact, but it is precisely this interaction which gives us a single equation in the single variable r.

In his criticism of the savings investment relationship, Hawtrey concentrated entirely on Keynes' concepts of observables rather than of schedules. However, his substitute definitions practically amount to a use of the terms as schedules. A description of Hawtrey's designed (active) and undesigned (passive) investment can be easily related to the process of schedule intersections.

A minor point on the matter of policy should be considered. Hawtrey declared that in times of depression it is not the government expenditure which gives rise to employment, but instead the government borrowing. He thought that this borrowing would have the same effect if the deficit were created by a remission of taxation. In the first place, it is the net injection of more purchasing power into the depressed system that gives rise to increased income. Hawtrey's plan of remission of taxes would mean borrowing without increased spending on the part of the government. If the former taxpayers spend their funds which otherwise would have gone into taxes and if the government does not cut down on its spending, then there will be a net injection of purchasing power to raise the level of income. But we can also get beneficial effects of spending without borrowing, for by balancing the budget at a high level, the government can also create a net stimulus for the economy. In any case, either the government or private individuals

must increase their spending if we are to do away with unemployment.

The Wage Controversy

Keynes plunged immediately into the classical theory of wages in the early pages of the General Theory. The discussion between the Keynesians and non-Keynesians, resulting from this attack, has actually been on two different issues. First there is the issue of the relation between the time paths of money and real wages, and secondly there is the much more important issue of the effects of money wage cuts upon employment.

The spark for the first question was set off by Keynes' conjecture that historical time series would show a negative correlation between first differences in money wage rates and in real wage rates. In a later article Keynes revealed the reasoning that lay behind this conjecture of the General Theory.[1] The conjecture was in conformity with the general propositions that marginal costs are increasing in the short run; that for a closed system, short run marginal costs are not very different from short run marginal wage costs; and that prices are governed roughly by marginal costs. Later results have indicated that the short run marginal cost curve is probably horizontal in the neighborhood of the existing levels of output and that there is so much imperfection in the system that prices are not at all equal to marginal costs. At any rate, Keynes' conjecture has not been found to be correct in the statistical investigations that have been

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[1] See "Relative Moments of Real Wages and Output," The Economic Journal, 1939, Vol. 49, p. 34.

made. John T. Dunlop[1] and Lorie Tarshis[2] both investigated the behavior of the time series of real and money wage rates. Dunlop found that in England increased money wage rates have been usually associated with incresed real wage rates, but decreased money wage rates have been associated with both increased and decreased real wage rates. Tarshis' results were for the United States, where he found a high positive correlation between percentage changes in money wage rates and in real wage rates for the period 1932-1938. While these statistical investigations are not of the nature of "rigorous proofs" it appears that Keynes was backing the wrong horse.

Our main concern however is not with the empirical problem but with the theoretical relation of wage cuts to unemployment. In the classical models of the preceding chapter, unemployment is not possible as long as there exist wage flexibilities. Time and again in the anti-Keynesian literature we find the claim that if Keynes would have allowed money wages to be flexible downward in his system, an underemployment equilibrium would not be possible. Then these writers have concluded that Keynes' results follow only from his assumptions of rigidities. In addition to the results of Chapter III, above, we should examine more carefully what has come out of the literature on this subject in recent years.

Pigou[3] and Kaldor[4] engaged in the first serious discussion of this question soon after the ideas of the Keynesian system began to take hold. Pigou admitted then that he was abstracting from institutional obstacles and

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[1]"The Movement of Real and Money Wage Rates" The Economic Journal, 1938, Vol. 48, p. 413.

[2]"Changes in Real and Money Wages" The Economic Journal, 1939, Vol. 49, p. 150.

[3]"Real and Money Wage Rates in Relation to Unemployment" The Economic Journal, 1937, Vol. 47, p. 405, and "Money Wages in Relation to Unemployment" The Economic Journal, 1938, Vol. 48, p. 135.

[4]"Prof. Pigou on Money Wages in Relation to Unemployment" The Economic Journal, 1937, Vol. 47, p. 745.

from the possibility of adverse expectations. He then, of course, took the position that money wage cuts would lead to more employment. But in order to prove his point he made use of the proposition that the main influence of the wage cut would be on the interest rates. Thus far the Keynesians and the orthodox economists are not at odds. But when we stop to consider the end result of the reduced rate of interest, the significance of the Keynesian Revolution is quite apparent. Pigou was, according to tradition, using the classical assumptions about the saving schedule; i.e. that interest is an important variable in this function. Kaldor was very ready to point out that the Keynesian innovation was to change this function. If in the function $S = S(r,Y)$, $\frac{\partial S}{\partial r}$ has a large positive value, then the classical results becomes more plausible. If, in addition, we do <u>not</u> assume $\frac{\partial I}{\partial r}$ to be numerically small or $\frac{\partial L}{\partial r}$ to be numerically large, then the classical view is undoubtedly correct. It is easily seen from the formula for $\frac{dY_w}{dM_w}$ on p.99 above, that $\frac{\partial S_w}{\partial r}$ enters in the numerator, and that the larger this value becomes, the more effective is an easy money policy. This result agrees entirely with the remarks of the Pigou-Kaldor controversy. Similarly if appropriate magnitudes are given to $\frac{\partial I_w}{\partial r}$ and $\frac{\partial L_w}{\partial r}$, Pigou's method of cutting wages can be even more powerful in eliminating unemployment.

One of the most important points to recall from this debate is that Pigou has admitted that money wage cuts will not increase employment unless interest rates are reduced as a result of the cut. Furthermore, he admitted that wage cuts and banking policies are merely alternative ways of inducing a change in the interest rate. These admissions show clearly where we should concentrate attention when studying wage cuts within the framework of

the Keynesian system. It very definitely removes the arguments from the misconceptions of rigidities and perfection of competition to the behaviour outside the price and production system as such, i.e. to the behavior of the psychological and anticipational attitudes of the population.

While there is mutual agreement as to the effect of wage cuts upon interest rates, there is not so much accord with respect to the effects upon saving and investing. Most writers have assumed that a wage cut will transfer income from the wage earners to the non-wage earners of the population. If this transfer does take place, then the effect will certainly mean an upward shift of the savings function. But it may happen that the elasticity of demand for workers is much greater than unity. In this event, the total wage bill will rise (along with rising profits, of course), and the effect on the saving schedule is somewhat uncertain. Since the demand for labor is a derived demand, its elasticity will depend upon the elasticity of output. If the demand for output as a whole is very elastic, then the demand for labor is more likely to be elastic. If we assume perfect competition, then it does follow that demand for the aggregate product is elastic. But even in this case it is still possible that income will be transferred relatively to the non wage earning sector and that the propensity to save will remain very high.

Since investment depends on so many things other than current demand and costs, it is difficult to see what effect wage cuts will have on the investment schedule. But insofar as wage cuts set up unfavorable expectations of the future, investment will receive a very adverse shock. The economics of hyper-deflationary situations are very important and should not be ruled out. From the calculations on p. 101 , we see that there must

be a net upward shift of the investment function relative to the savings function in order for the influence on income of the multiplicand, $d\alpha$, to be significant. The depressing effects of a deflation upon investment will largely counteract any conceivable stimulative influence arising from the redistribution of income. Moreover, it is very questionable whether or not a redistribution of income will cause the savings schedule to shift noticeably.

In summary, most people agree, in the matter of wage cuts, that there will be a depressing effect on interest rates, or what it the same, an easy money policy. The discussion of whether or not an easy money policy will be effective should be independent of the competitive characteristics of the system and should concentrate upon the shapes of the functions of the Keynesian system.

The Savings Investment Controversy

The famous arguments over the Keynesian proposition S = I are usually laughingly referred to as wasted hours spent on matters of definition. This attitude misses much of the point. The peculiar thing about this controversy, though, is that its settlement is much more important to theory than to policy. It is undoubtedly true that some of our most distinguished leaders in economic policy are not entirely clear about the savings-investment equation. In contrast, the preceding discussion of the wage question involves a very different situation. It makes a good deal of difference whether one advocates wage cuts or some inflationary measure during periods of unemployment. The theoretical analysis of the effect of wage cuts may have profound influence on the governmental economic policy actually followed.

The entire confusion linked up with the savings-investment controversy can be traced to a failure to distinguish between schedules and observables. When we speak of savings and investment as observables in the Keynesian system, then we have an identity:

$$S_t \equiv I_t \text{ identically in } t.$$

But when we speak of savings and investment as schedules (and this is, by far, the most important case) we get a genuine equation:

$$S(r,Y) = I(r,Y)$$

Keynes is somewhat to blame for not making the proper distinction himself. Thus he said,

> "Income = value of output = consumption + investment
>
> Saving = income - consumption
>
> Therefore saving = investment"[1]

Here he was talking about savings and investment as observables; i.e. of the relation $S_t \equiv I_t$. But elsewhere he said, "The traditional analysis has been aware that saving depends upon income but it has overlooked the fact that income depends on investment, in such fashion that, when investment changes, income must necessarily change in just that degree which is necessary to make the change in saving equal to the change in investment."[2] This latter statement referred to a process of adjustment which achieves an equilibrium. This notion involves a building block equation

$$I(Y) = S(Y)$$

We have the same situation in the familiar theory of supply and demand. As

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[1] General Theory, p. 63.

[2] Ibid, p. 184.

observables over time, supply and demand are always equal and just represent opposite sides of the same transaction. But as static schedules supply and demand are related in a genuine equation and are not identical.
In the first case we get

$$s_t \equiv d_t \text{ identically in } t,$$

and in the second case we get

$$s(p) = d(p)$$

In the latter instance we can talk about divergences between supply and demand at virtual, unobserved prices. Similarly we can talk about divergences of savings and investment at virtual, unobserved levels of income.

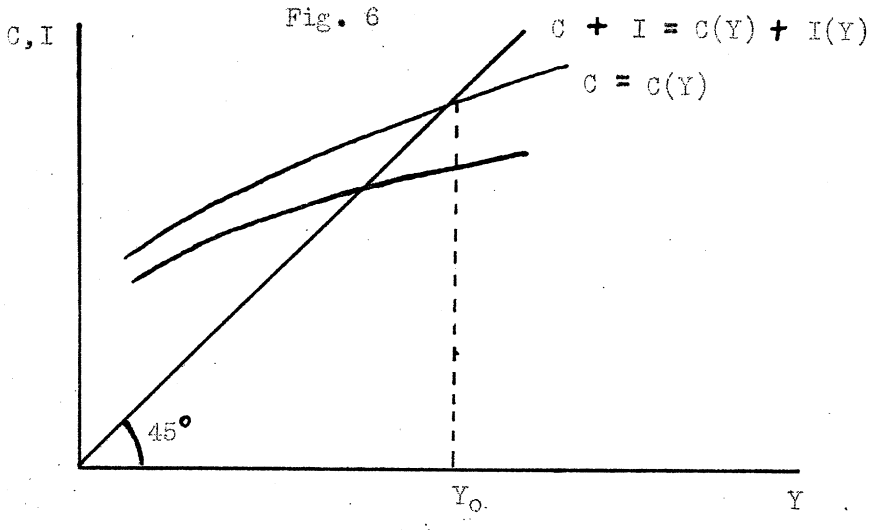
It is correct but uninteresting to say that supply and demand or savings and investment represent in each case opposite sides of the same transaction. It follows from definitions and not from economic theory that all demanded goods or invested funds come from somewhere. If we designate "somewhere" by supply in the first case and by savings in the second, nothing has been added to our understanding of the working of the economic system. But if we construct the theories that supply and demand are equal, at the going market price, and that savings and investment are equal, at the going level of national income, then we have some real, analytical tools.

By starting out with the familiar proposition that consumption plus investment add up to income, we can show quite easily a meaningful savings-investment equation. Since Keynes has taught us that consumption is related to income by a functional relation, when we speak of consumption we mean the consumption schedule. For the moment, let us assume the interest rates are given (or that they have no influence on savings or investment). Hence we are now studying a building block theory. Write now the following equation:

$$C(Y) + I(Y) = Y$$

This is a single equation in the single variable Y. On the familiar 45-degree line graph the relation can be neatly pictured.

Fig. 6



In this graph there is one and only one level of income such that the amount consumed and the amount invested out of the same level of income exactly add up to this income, say, Y_o. But there is one identity in the Keynesian system, namely the relation between savings and consumption. Income that is not consumed is automatically saved. When a consumer decides not to consume some of his income, then he has automatically decided to save. Thus we have the identity

$$Y-C(Y) \equiv S(Y) \text{ identically in } Y.$$

In the equation

$$Y-C(Y) = I(Y)$$

We can substitute S(Y) for the left side because one function can be substituted for another function when the two functions are identically equal. Thus we get

$$S(Y) \equiv Y-C(Y) = I(Y)$$

$$S(Y) = I(Y)$$

and a building block of the Keynesian system is laid in place. In fact, this building block is the cornerstone of the system.

When Keynes answered his critics on the savings-investment equation, he had in mind the schedule relation.[1] We know this for two reasons. First, he explained the equation by citing the analogy of supply and demand equations in ordinary markets. He was thinking of savings and investment schedules exactly as we think of supply and demand schedules. Secondly, he claimed that he was old-fashioned in postulating the equality of savings and investment. He actually meant that he was old-fashioned in the sense that he postulated their equality as a result of schedule intersections. He emphasized the point that his real contribution was to change the equilibrating variable from the interest rate to the level of income.

Practically all the polemical articles on this question dealt with observed aggregates and did not get to a discussion in terms of the proper concept of schedules. It seems, though, that the terms ex-ante and ex-post have finally been boiled down to mean nothing but schedules and observables. If we take ex-ante quantities to be schedules of economic behavior and ex-post quantities to be observed aggregates, then an exposition in these terms agrees exactly with that given above. However, a confusion in the literature exists in connection with the definitions of Robertson. Many writers seem to think that there is some mystical, superior power of these definitions. It is often claimed that these definitions are better because they are dynamic and because they allow one to speak of differences between savings and investment. Both claims are confused. Robertson's definitions are dynamic only in the most trivial sense. They define observed aggregates at different points of time, but they give us no functional relations of economic behavior so that we can solve for each variable in the system as a function of time alone. Robertson has set up a few lagged definitions but has given us no truly dynamical rela-

[1]See "Alternative Theories of the Rate of Interest," The Economic Journal, June 1937, Vol. 47, p. 241.

tions. Although, if we insert Robertson's lagged definitions into the Keynesian functions, then we can get a dynamical system. This can be done as follows:

$$C\ (r_t,\ Y_{t-1}) + I_t = Y_t$$

$$I_t = I\ (Y_t,\ r_t)$$

$$M = L\ (Y_t,\ r_t)$$

This is a truly dynamical, Keynesian system, in which we can solve for each variable as a function of time once the exact form of the equations is known. To make the system dynamical, we have to postulate that expenditure on consumption is made out of the income of the previous period. Robertson has supplied us with this idea, but he did not supply us with a theory of the consumption function which gives a definite functional relation between consumption and income. As for the other alleged superiority of the Robertsonian definitions, it is not the only formulation which admits divergences between savings and investment. Such divergences are also permitted in the Keynesian definitions but not at observable levels of income, only at virtual levels. In a statical, Keynesian system, there can be differences between savings and investment only when the system is not in equilibrium. Similarly, in the static theory of supply and demand, there can be differences between supply and demand only at virtual prices which are not equilibria.

Lerner, an ardent Keynesian, has been largely responsible for misstating the Keynesian position. He has always dealt with savings and investment in identities instead of equations. If we accepted Lerner's position (the bad side of Keynes), we would find that we are working with an indeterminate system.

It would be

$$S(r,Y) \equiv (r,Y) \text{identically in } r \text{ and } Y$$

$$M = L\ (r,Y)$$

Now, there is only one genuine equation and two variables; the result is indeterminate. Lerner would undoubtedly deny any affiliation with Say's Law, but this system can easily be interpreted in those terms. Lerner is a perfect example of an economist who can think quite correctly on policy matters while operating with a confused theory of the savings-investment process.

The Interest Controversy

The phenomenon of interest presents one of the most difficult problems of economic theory. We are now, however, coming to the view that the rate of interest is not a very important variable in the modern economic world, but theories of the rate of interest are in a most unsatisfactory state. Of the functions of the Keynesian system, the liquidity preference function needs more careful study. Keynes has opened the road for us, and we must in the future study more carefully the motives behind the holding of money as against earning assets.

The controversy with which we are concerned is that between the liquidity preference theorists and the loanable funds theorists. There are two questions essentially: (1) Are the two theories the same? (2) If they are not the same, which theory is the better? The answer to the first question would be a simple and straightforward economic analysis if the loanable funds theorists would only define precisely what is meant by loanable funds. We shall see below that it is quite simple to answer question (1) when we assume certain specific definitions that have been used by loanable funds theorists. The other ques-

tion is less easy to handle, but we shall argue that the liquidity preference theory is preferable under those definitions where the two theories are not the same.

There have been at least three attempts in the literature to prove that the two theories give identical results, but we must reject all three proofs as very unsatisfactory. The attempt of Hicks was mentioned previously.[1] He argued that interest like all other prices is determined as a solution of a general equilibrium system of n equations. He made the old argument that one equation follows from all the rest and that it can be eliminated. As far as Hicks was concerned, this was all the apparatus that he needed to prove his point, since he then had the choice of eliminating either the equation of supply and demand for money or the equation of supply and demand for credit. Depending upon which equation he eliminated, he could be either a loanable funds theorist or a liquidity preference theorist. What if he had eliminated, as Mr. Lerner has publicly remarked, the supply and demand for peanuts, what then?

In this case he cannot claim to be either a loanable funds theorist or a liquidity preference theorist, and yet the rate of interest gets determined. Hicks was quite correct in stating that the same rate of interest is obtained as a solution to the system of equations no matter what single equation is eliminated, but nothing has been proved by this argument. It does not tell us whether the rate of interest is the mechanism which allocates funds into idle hoards as opposed to earning assets or which brings the supply and demand for loans into equilibrium. It does not tell us which building block should be fitted into a determinate system.

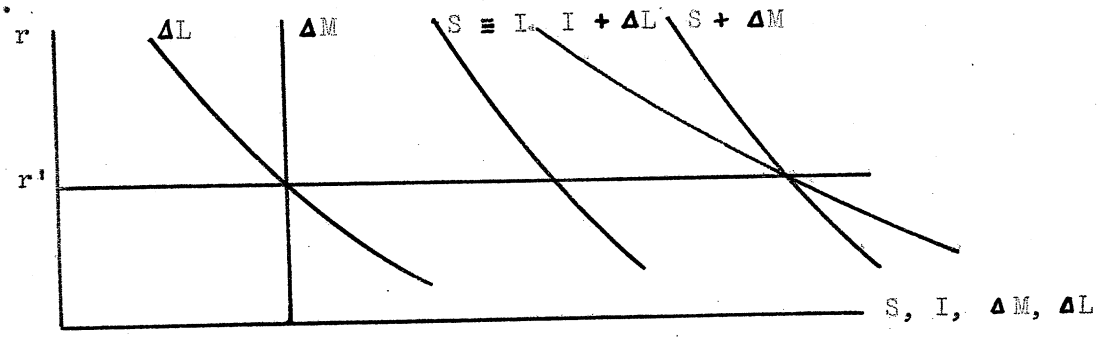
The mere enumeration of equations and variables is very misleading. It is necessary to the Keynesian theory that the shapes as well as the number of schedules be taken into account. The liquidity preference theory, being a

[1]See Value and Capital, London, Oxford, 1939, Chapter XII.

genuine part of the completely determined Keynesian system, is always consistent with the conditions imposed upon the shapes of the schedules. Since the loanable funds theory has never been made part of a completely determined system, we cannot be sure that it will be consistent with the conditions of the Keynesian system. In fact, for the particular case in which net hoarding does not occur, the supply and demand for loanable funds reduces to the savings-investment equation. It was shown in the previous chapter that the savings-investment theory of interest does not satisfy the Keynesian conditions.

Another reconciliation of liquidity preference with loanable funds was attempted, unsuccessfully, by Lerner.[1] He defined the supply of credit as savings plus the net increase in the amount of money during a period, and the demand for credit as investment plus the net hoarding during the period. These are precise definitions of the supply and demand for loanable funds, and, moreover, have been approved by an eminent loanable funds theorist, Professor Haberler.[2] We shall find use for these definitions. Denote the net increase in the amount of money by ΔM and the net hoarding by ΔL; Lerner's version of the reconciliation has been graphically illustrated as in the following figure.

Fig. 7



[1] "Alternative Formulations of the Theory of Interest", The Economic Journal, June, 1938, Vol. 48, p. 211. In a very recent article, Lerner has restated his views on interest theory, but there seems to be no change of his position on the consistency of the loanable funds and liquidity preference theories. See "Interest Theory: Supply and Demand for Loans or Supply and Demand for Cash", The Review of Economic Statistics, Vol. XXVI, May 1944, p. 88.

[2] See Prosperity and Depression, League of Nations, Geneva, 1939, p. 184.

Lerner argued that the supply of loanable funds ($S + \Delta M$) is brought into equilibrium with the demand for loanable funds ($I + \Delta L$) at the rate, r'. He then went on to say that this same rate will equate the demand and supply for money, thus giving us consistency with the liquidity preference theory. This latter result was achieved by adding a constant, M_o, the amount of money held at the beginning of the period to both the ΔM and ΔL curves. There are two errors in his procedure. The grossest error was to make the savings and investment schedules coincident. If this were the correct presentation of the saving-investment process, then we might not have a determinate system, and the theoretical base might rest upon Say's Law. The other error was to add a constant to the ΔL schedule. If and only if the total liquidity function, $L_o(r)$ and the amount of money, M_o, both measured at the beginning of the period, were in equality at the same rate of interest, r', would $M_o + \Delta M$ and $L_o(r) + \Delta L(r)$ also intersect at r'. The key to the distinction between this formulation of the loanable funds theory and the liquidity preference theory is that the former theory employs equations which involve both current and past interest rates. This is not true of the static liquidity preference theory.

Let us take this representation to its logical conclusion; do away with the period analysis; and derive instantaneous relationships. We shall call the loanable funds theory inconsistent with the liquidity preference theory if it is not generally possible to substitute the former theory into the Keynesian system and get the same solution as with the latter theory. If instantaneous relations are used, then the net increase in the amount of money is $\frac{dM}{dt}$. It is true that we take $M = \overline{M}$ at each point of time, but this does not preclude

us from working with a non-zero $\frac{dM}{dt}$.[1] Similarly the instantaneous net hoarding is $\frac{dL}{dt}$ where L is a function of r and Y. Then the loanable funds equation as formulated by Lerner and approved by Haberler is

$$S(r,Y) + \frac{dM}{dt} = I(r,Y) + \frac{dL(r,Y)}{dt}$$

or

$$S(r,Y) + \frac{dM}{dt} = I(r,Y) + \frac{\partial L}{\partial r} \cdot \frac{dr}{dt} + \frac{\partial L}{\partial Y} \cdot \frac{dY}{dt}$$

This last equation can be written more generally as

$$\varphi\left(r, Y, \frac{dM}{dt}, \frac{dr}{dt}, \frac{dY}{dt}\right) = 0$$

The liquidity preference equation

$$M = L(r,Y)$$

can be written as

$$\Phi(r,Y,M) = 0$$

It is quite obvious that the savings-investment equation in conjunction with Φ (the complete Keynesian model) will give different results than in conjunction with φ. One system will depend not only on current interest rates and levels of income, but also on their rates of change. The Keynesian system cannot even be regarded as the stationary solution of that dynamical system which includes φ. As we saw above, in Lerner's presentation, it was the interest rate of the beginning of the period which entered into the loanable funds theory along with current interest rates. The lagged interest rate in the period analysis is merely the counterpart of $\frac{dr}{dt}$ in the instantaneous analysis. While no other "economic proofs" may be rigorously made in this book, we can be quite certain that we have made the proof that Lerner's version of the loanable funds theory is not the same as the Keynesian liquidity preference theory.

[1] This is the same thing as assuming $K = \overline{K}$ in the short run, and then using $\frac{dK}{dt} = I$ as non-zero investment.

The above demonstration is certainly in agreement with the intuitive idea that the liquidity preference theory, because it is stated in dimensions of stocks, cannot be identical with the loanable funds theory, which is stated in terms of flows.

A third attempt was made by Fellner and Somers to prove that the two theories amount to the same thing.[1] Perhaps this attempt was successful, but if it was, then definitions of supply and demand for loanable funds take on some new connotations. Working with a building block theory and assuming income as given, these writers broke up the liquidity preference function into three parts: (1) L_a, the demand for goods other than claims; (2) L_b (r) the demand by people for their own money; (3) L_c (r) the demand for claims. The entire problem revolves around the definition of claims, for L_c (r) defines the demand for loanable funds in their analysis. They evaded the problem with the following footnote:

> "The definition of claims is admittedly arbitrary and must depend on what we want to call 'the rate of interest' (i.e. on what we want to include, by definition, in the interest structure). But once we have decided on any definition of 'claims' we must, of course, be consistent in what we regard as 'the rate of interest,' since the latter is but a slightly different expression for the price of claims."[2]

Certainly, claims can be defined so as to make the two theories identical. This begs the issue, completely.

On the supply side they defined M_a as the supply of goods other than claims; $M_b(r)$ as the supply by people of their own money; and M_c (r) as the supply of claims. Then they took M_a and L_a as independent of r and equal in any general equilibrium situation. Also they used the identity

[1] "Alternative Monetary Approaches to Interest Theory," The Review of Economic Statistics, Vol. 23, Feb., 1941, p. 43.

[2] Ibid., note 13, p. 45.

$$M_b\ (r) \equiv L_b\ (r) \text{ identically in } r$$

With these two relations, it follows that

$$L_a + L_b\ (r) + L_c\ (r) = M_a + M_b\ (r) + M_c\ (r)$$

gives the same solution for r as

$$L_c\ (r) = M_c\ (r).$$

The last equation they called the loanable funds equation and the preceding equation they called the liquidity preference equation. Their procedure merely amounts to defining that part of the equation of the supply and demand for money which depends upon the interest rate as the supply and demand for loanable funds. If this is what the loanable funds theorists mean, then they do have a theory which is quite consistent with the liquidity preference theory, but they cannot characterize the loanable funds theory in this guise as a theory of flows. Fellner and Somers have defined claims as the stock of earning assets other than that which one supplies and demands of his own earning assets.

If the two theories are stated in terms of stock dimensions rather than flow dimensions, then they will come to the same thing and there is nothing to choose between them. But the more usual treatment of the loanable funds theory is in terms of flows, while the liquidity preference theory is unequivocally one of stocks. In the more usual case there do exist reasons for the superiority of the Keynesian theory. T. de Scitovszky[1] has stated, better than anyone else, the economic reasons why an interest theory should be a theory of stocks rather than of flows.

Scitovszky has pointed out that in ordinary supply and demand analysis, price is the allocating mechanism between two flows, and that this approach is legitimate when dealing with commodities for which there are not large stocks or for which the stocks are independent of the price. But in the case in which

[1]"A Study of Interest and Capital" Economica, N. S., Vol. 7, Aug., 1940, p. 293.

stocks are significant and are dependent upon price, he claimed that the equation of supply-demand flows may not lead to the correct result. His argument amounts to the following: Suppose that current production and consumption flows for some good are in equilibrium at the current market price and that this price is also an equilibrium point for the supply and demand for stocks. If now there is a shift of consumer demand for the good, the establishment of a new price at which the two flows will be in equilibrium will be retarded by the adjustment of stocks to the new price. If the shift of demand represents a decrease in consumers desires for the good, price will tend to fall in order to bring the flow schedules into equilibrium. But then the holders of stocks will want to increase their stockholdings at the lower price. Hence the stockholder behavior will counteract the flow adjustment and can prevent it from taking place.

It is certainly very obvious that money and earning assets, are commodities which do possess very large stocks. We know that interest is earned on existing stocks of assets as well as on the current flows. Interest is not the allocating mechanism between the supply and demand for credit flows, rather the allocating mechanism between the holdings of stocks of earning and non-earning assets.

By a very neat argument based on the theories of consumer behavior and utility, Scitovszky was able to show that the demand for the holding of securities is a decreasing function of price. The argument gives a formal substantiation of Keynes' assumptions about the shape of the function L_2 (r).

In essence, the Keynesian contribution was to point out that people can make two distinct types of decisions. They may decide upon saving or consuming their incomes, and they may decide upon holding idle cash or non-liquid securities. Each decision requires an economic calculation. In the former case, individuals decide on the basis of their incomes how much they want to spend on consumption

and at the same time how much they want to save. In the latter case, they must decide on the basis of alternative rates of return (i.e. interest rates) whether they want to hold cash or securities. The distinction between these two sets of decisions clearly calls for a liquidity preference theory of interest.

CHAPTER V ANTICIPATIONS OF THE GENERAL THEORY

"Those who are strongly wedded to what I shall call 'the classical theory' will fluctuate, I expect, between a belief that I am quite wrong and a belief that I am saying nothing new."[1] Did Keynes actually say something new? He certainly said something quite different as compared with what most other economists were saying at the time, but it is not difficult to find in the literature of economics many of the same ideas earlier expressed. In fact, somewhere in the literature every element of the Keynesian system was at some time discussed. But no single theorist ever worked out a complete and determinate model based on the propensity to consume (save), the marginal efficiency of capital, and liquidity preference. All the predecessors of Keynes to be discussed in this chapter failed to make use of one or more of the Keynesian ideas. Furthermore, many of these forerunners did not have the theoretical formulations clear in their minds, and it is often necessary to read between the lines in order to reconcile their views with those of today. We shall make no attempt to consider every author in history who discussed economic problems along the lines of Keynesian analysis, but will merely select some of the better known cranks, heretics, and respectable economists who have concerned themselves with the problem of unemployment.

Early Ideas on Savings and Investment

We saw above that the generalized model of the Keynesian system can be written as a savings-investment equation and a liquidity preference equation.

[1] General Theory, p. V.

But since there has never appeared evidence of any previous writer's working with this determinate system, we must confine the present study to one of building blocks, for these did appear throughout much of the literature. Nobody, apparently, anticipated both building blocks, and the writers who are included in this chapter can be conveniently classified according to which building block they did anticipate. In this section, then, are included those economists who have at some time worried about the problems of saving and investing -- the underconsumptionists.

In many cases it is impossible to say whether or not any earlier writers could have had any direct influence on the development of Keynes' ideas. It may be that he always developed his ideas independently, and then pointed out others who had previously expressed similar ideas. But in one instance, we can be reasonably sure that Keynes derived a profound inspiration. T. R. Malthus, a respectable and highly competent economist, was openly admired by Keynes, and, at a time when the Revolution was about to be conceived. In his Essays in Biography, finished by February, 1933, Keynes paid great tribute to Malthus and particularly noted the latter's discussion of effective demand. As was mentioned in a previous chapter, the break between Keynes and his contemporaries can be likened in many ways to the dispute which occurred after the Napoleonic Wars between Malthus and Ricardo. The issues in each case were essentially the same. Malthus and, later, Keynes wanted to replace Say's Law with a theory of effective demand. There can be little doubt that Keynes was aware of this historical similarity and must have profited much from a perusal of the early literature.

Like the Keynesian Revolution, Malthus' contribution to the problem of unemployment was a product of his times. He lived through the prosperous,

developmental period of the industrial revolution and then the later boom of the Napoleonic Wars. But following the Wars was a period of great unemployment and depression without a very rapid recovery. The influence of the socio-economic milieu showed up very much in the Malthusian economics. Malthus was impressed, as were so many economists in the recent interwar period, by the contradictory phenomenon of poverty in the midst of plenty. The prevalent unemployment was all the more a problem since it was unnecessary. The economic resources were available and the population desired the fruits of the employment of these resources. But Malthus saw something that those preoccupied with Say's Law could not possibly see, namely, that while the people desired to consume they did not demand effectually to consume. A theory of effective demand was necessary to explain the then current depression.

As is well-known, Say, Ricardo, and Mill held that a general glut of the market could not occur. They maintained that maladjustments could occur in specific industries to create temporary shortages and gluts. But in general, they postulated that production regulates consumption via Say's Law. At the market rate of interest, they held that all savings go automatically into investment. This is the doctrine which Malthus denied in his Principles of Political Economy, first published in 1820. He, instead, claimed that effective demand determines consumption which in turn determines production.

If Malthus had developed a complete theory of the determination of effective demand he would have been very close to the present Keynesian system. He knew why effective demand is important, and he knew its true meaning, but he did not have an adequate theory of how it gets determined. Such has been the case with most of the underconsumption theorists. They have adequately analyzed

only part of the process. They understood well the savings-consumption side of the picture, but they usually failed to integrate it properly with the investment side.

Malthus knew that saving is a necessary condition for the occurrence of capital accumulation, but he did not want to see saving take place at the expense of consumption; consequently he gave a very clear explanation of a way in which both savings and consumption could increase in a period of unemployment. He said:

> "It [saving] may take place, and practically almost always does take place, in consequence of a previous increase in the value of the national revenue, in which case a saving may be effected, not only without any diminution of demand and consumption, but under an actual increase of demand, consumption and value during every part of the process. And it is in fact this previous increase in the value of the national revenue which both gives the great stimulus to accumulation, and makes that accumulation effective in the continued production of wealth."[1]

Here he recognized that savings depends upon income such that an increase in income leads to an increase of savings. Also since we know that he understood the relationship between consumption and savings as alternative ways of disposing of income, it follows from his statement that the marginal propensity to save is less than unity because the increment to income which he envisaged was made up of an increment to savings and an increment to consumption. He was able to imagine a situation in which both savings and consumption could

[1] Principles of Political Economy, Reprinted 1936, pp. 365-366.

increase only because he did not follow his contemporary classical economists in taking the level of output as given. He spoke over and over of saving habits and attitudes and provided a basis for the theory of the savings schedule.

In addition to a theory of the saving process, Malthus saw how savings interacts with investment, but he never went adequately behind motives for investment. At times he seemed to imply that investment is entirely a function of national income. Consider the following quotation:

> ". . . but the national saving, in reference to the whole mass of producers and consumers, must necessarily be limited by the amount which can be advantageously employed in supplying the demand for produce; and to create this demand, there must be an adequate and effective consumption either among the producers themselves, or other classes of consumers."[1]

The substance of the above two quotations signifies that Malthus might have been working with the proposition that the equation of savings and investment determines the level of effective demand, but the exposition is not clear cut. A better analysis of what determines the shape and position of the schedule, I (Y), would probably have led to a Malthusian Revolution.

Now that we have in mind some of the major points of the Malthusian theory of employment, let us consider some of the more specific points which he made that are relevant to modern economics. In agreement with his views about the savings function, he was aware that income and wealth distribution have some effect upon the level of savings. He realized that savings come out of larger incomes or land holdings and that a more equitable distribution of income would

[1] Ibid., p. 401.

stimulate consumption. He said unambiguously that

> "Thirty or forty proprietors, with incomes answering to between one thousand and five thousand a year, would create a much more effectual demand for the necessaries, conveniences, and luxuries of life, than a single proprietor possessing a hundred thousand a year."[1]

He had some enlightened views with regard to the public debt and its effect upon the economy. Being a good theorist, he realized that the public debt is not theoretically a problem, provided the interest burden does not exhaust the national income. But also being alive to the practical issues of the real world, he was against the public debt as an unnecessary evil. He objected to the debt on three grounds: 1. He thought that taxation to meet the interest payments might be an obstacle to production. 2. The mass of population considered the debt to be a bad thing and would be relieved by its liquidation. 3. It would accentuate the evils of inflation and deflation, harming some class no matter which event occurred. It is interesting to see that he linked up his theory of employment with the attitudes of the population.

Malthus was disappointing on one question, that of wage cuts in relation to unemployment. We should expect that one who emphasized so strongly the theory of effective demand would not have considered money wage cuts as a stimulus to employment. His argument followed along the strictest classical lines of thought:

> "An extension of foreign commerce, according to the view which Mr. Ricardo takes of it, would, in my opinion, place us frequently in the situation in which this country was in the early part of

[1] Ibid, p. 374.

1816, when a sudden abundance and cheapness of corn and other commodities, from a great supply meeting a deficient demand, so diminished the value of the income of the country, that it could no longer command the same quantity of labour at the same price; the consequence of which was that, in the midst of plenty, thousands were thrown out of employment -- a most painful but almost unavoidable preliminary to a fall in the money wages of labour, which it is obvious could alone enable the general income of the country to employ the same number of labourers as before, and, after a period of severe check to the increase of wealth, to recommence a progressive movement."[1]

Let us state now a summary of Malthus' view of the cyclical pattern and his positive program for reform. His business cycle theory was[2] that in prosperity the wealthy individuals save larger amounts out of their increasing incomes, enabling investment and the hiring of productive laborers to take place. As a result of the passage of savings into investment more goods are put on the market for sale, but since there is a limit to the available number of workers and since it takes time to change consumption habits, the effective demand for consumption does not rise fast enough and there is a glut of the market. The savings of the wealthy thus give rise to a lack of effective demand. The system then goes into a depression and production falls off. With money wage cuts and more favorable opportunities for profit, recovery is initiated. He advocated as an ameliorative measure, the maintenance of unproductive consumption through public works schemes. The concept of unproductive consumption was Malthus' main contribution to a solution of the economic problem. An unprod-

[1] Ibid., p. 393.

[2] See James J. O'Leary "Malthus and Keynes", The Journal of Political Economy, Vol. 50, 1942, p. 901.

uctive consumer was defined as one who sells services without producing concrete goods for the market in return. Factory laborers sell their services to the employer and produce goods in return. They are productive consumers in the Malthusian scheme. But servants who sell their services to their master and produce no concrete goods come under his definition of unproductive consumers. Malthus believed that our salvation lay in unproductive consumers since they have purchasing power to clear the glut from the market and do not add anything to the glut as a result of their economic services. In many respects the ideas of Foster and Catchings, to be explained below in this section, were similar to Malthus' ideas built up around unproductive consumption. However, Keynes would have to disagree with Malthus (and Foster and Catchings) and argue that in periods of unemployment a high level of investment whether it employs productive or unproductive consumers as laborers would be a net stimulus to the level of income and prosperity.

There has been some disagreement among economists on the relationships between Keynes and Marx. Dudley Dillard, who has done some brilliant work on the relations between Proudhon, Gesell, and Keynes,[1] has argued that since Keynes praised the work of Gesell, the anti-Marxian, disciple of Proudhon, there is probably little substance in the Marx-Keynes comparison. Furthermore Keynes has, wrongly we believe, referred to Capital as "an obsolete economic textbook . . . not only scientifically erroneous but without interest or application for the modern world."[2] But the incontrovertible fact stands that the modern Marxists who think seriously about economic affairs have solidly supported Keynesian economics in theory and in practice. What is there in

[1]"Keynes and Proudhon" The Journal of Economic History, May 1942, Vol. 2, p. 63 and Proudhon, Gesell, and Keynes: An Investigation of Some "Anti-Marxian Socialist" Antecedents of Keynes' General Theory of Employment Interest and Money, Aug. 1940, Ph.D. Thesis, Univ. of California.

[2]Essays in Persuasion, p. 300.

Keynesian economics that would appeal to a Marxist?

First we should comment on Dillard's reasoning before we consider the above question. As will be shown below, the main contribution of Gesell and Proudhon to Keynesian economics was through the theory of money and the interest rate. The anti-Marxians had very little, indeed, to say about the more important building block of the system, namely the theory of savings and investment. Say's Law and effective demand were entirely neglected by these two writers, who were purely monetary reformers. On the other hand Marx was very little interested in a theory of the rate of interest. It is very possible for Marx to disagree with Gesell, Proudhon and even Keynes on matters of interest theory or policy and yet be in agreement with other Keynesian doctrines about the movement of a capitalist economy via the process of sending savings into profitable investment.

In general, we can say that Marx analyzed why the capitalist system did not and could not function properly, while Keynes analyzed why the capitalist system did not but could function properly. Keynes wanted to apologize and preserve, while Marx wanted to criticize and destroy.

Both writers looked at the system as an aggregative whole and did not tie themselves up in the hopeless confusion of microstatics, but the methodology of Marx and Keynes was in important respects quite different. Keynes has always been extremely classical in his methods of economic analysis, but Marx was unorthodox. There is an infinite difference between the two equations

$$c + v + s = V$$

$$C(Y) + I = Y$$

If Keynesian economics were couched entirely in terms of observable aggregates such as in the relation $C_t + I_t = Y_t$, where t is time, the two methodologies

would be quite similar. But all the important Keynesian results were derived from schedules of economic behavior and not from defined relations among observables. Keynes did however speak of and make use of certain historical trends within the capitalist system, and this is where his results dovetail with those of Marx.

With these points in mind it would seem that the principal relation between Keynes and Marx would be in their respective conceptions of the historical time paths of the marginal efficiency of capital and the rate of profits. According to Marx, the rising organic composition of capital, $\frac{c}{c+v}$, due to accumulation pushes down the rate of profit, $\frac{s}{c+v}$. A gap will be left which consumption will not fill, thus giving rise to a fundamental contradiction within the capitalist process. The theory of the falling rate of profit rests upon the relation

$$p = s' (1-q)$$

where $p = \frac{s}{c+v}$; $s' = \frac{s}{v}$; $q = \frac{c}{c+v}$.[1] Hence, with s', the rate of surplus value (exploitation), given and stable, p will vary inversely with q and we have the theory of the falling rate of profit.

Keynes went behind the forces determining the marginal efficiency of capital for any given point of time -- he was working with a schedule. Marx went behind the historical forces in a certain social setting which determine $p = \frac{s}{c+v}$. But Keynes and Marx did not reach different conclusions about the

[1]See Paul M. Sweezy, The Theory of Capitalist Development, Oxford Press, N. Y., 1942, p. 68.

time pattern of returns from private enterprise. Both authors predicted a declining trend for this variable due to a high rate of capital accumulation in the past. Keynes gave the basis for the modern stagnation thesis, a thesis not at all unattractive to Marx and the Marxists who have long predicted the falling rate of profit.

With regard to the savings side of the important savings-investment relations, Marx did not give an analysis comparable to that of Keynes. The former did consider the saving as done by the capitalists who had surplus income and then as invested by them. He, of course, was well aware of the influence of the capitalistic shape of the income distribution on the level of savings. But Marx concentrated on the behavior of a particular economic class in connection with the saving procedure rather than the psychological behavior of the population as a whole.

On the subject of business-cycle theory Marx was too eclectic to be pinned down to a particular idea. He did support an underconsumption theory partially, but we will never know what he would have done with the development of this theory had he lived longer. However, practically all the underconsumptionists have germs of the Keynesian system in their theories, and Marx was no exception. As far as the policy reform of Keynes to eliminate the cycle is concerned, it is in line with Marxian teaching. The recommended socialization of investment to fill the gap left by underconsumption would be a net stimulus to output under a Marxian or a Keynesian system.

The group of Keynes' contemporary, underconsumption theorists have handed down an interesting body of economic doctrine. Any one of these writers could have beat Keynes to the North Pole had he possessed the faculty of rigorous formalization of his heuristic propositions about the behavior of the economic

system. They could see clearly that the difficulty lay in the fact that there was not adequate purchasing power to clear the market during depression; in other words they saw the failure of effective demand just as Malthus saw it many years before, after the Napoleonic Wars. However, when they attempted to explain the failure of effective demand, they were not entirely correct because they did not have adequate theories of how the level of effective demand gets determined within our economic system. Usually the underconsumption writers looked at one single feature of the process which seemed outstanding to them, and then based their entire program on a correction of the single, supposed maladjustment. They failed to see the more complicated interrelations within the economic system as a whole.

The principle point of all underconsumption writers was that because a fraction of the national income is saved, the demand for finished consumers' goods becomes inevitably too small to clear the market for these goods and a general glut occurs. Some postulated a periodic appearance of glut and scarcity while others postulated a steady, stagnant glut. The main difference between their theory and the teachings of Keynesian economics is that they looked upon savings as deflationary whether they are offset by investments or not, while Keynes considered only savings which do not get invested as deflationary. Throughout much of the underconsumption literature we find references to the proper balance between saving and consuming. They thought that a happy medium could be found between the position of zero consumption out of income and 100 per cent consumption. Their idea was similar to that, more recently, of Lange -- an optimum propensity to consume. As far as we are concerned, the optimum propensity to consume (in the schedule sense) is that propensity which interacts with the investment schedule to give a full employment level of national income, and there are an infinite number of consumption functions which will do this.

The heretic, J. A. Hobson, was certainly one of the best under-consumption writers and was one of the first to carry on in the tradition of Malthus. Hobson's main point of disagreement with the existing economic order was in the distribution of income. There is very much truth in what Hobson had to say, and it may be that he was correct in choosing the most fundamental flaw in the capitalist system as the unequal distribution of income although this may not be a strategic factor in the determination of output as a whole. A rough presentation of his argument is the following: The common experience of the real world is a tendency for production to outrun consumption. This situation is caused by the fact that the rich are able to save part of their excessively large incomes and to invest this savings in the construction of capital goods to produce even more consumption goods. In this way, we accumulate more than enough producers' goods to supply the effective demand for consumption. The economic checks of fluctuating interest rates and prices introduce a cyclical pattern sometimes making for a high level of production and employment and sometimes causing depressed levels of production and employment. But no boom can sustain itself because of the chronic failure of consumption which, in turn, can be traced back to the income distribution. The only permanent remedy envisaged by Hobson was redistribution of income.

It is certainly impossible to refute Hobson's contention that the existing income distribution encourages saving, but we are not ready to assume that over-saving would be impossible in a capitalist society with a perfectly equal income distribution. If an economy were organized according to the principles of theoretical socialism, it is quite conceivable that there would be a much lessened desire to save with an equalized income distribution. In such an economy there are no financial hardships of old age, disability, unemployment, etc. Furthermore there are no opportunities for capital accumulation. The

problem of oversaving would become minimized. But within the capitalist environment, risks of the future continue, and opportunities for capital accumulation exist. Many individuals would save even under capitalism with an equalized income distribution. In fact there is much empirical evidence to doubt that the principal motives for saving in this country have been due to the existing distribution of income. There are many reasons to believe that saving has been more closely linked to our institutions, particularly our insurance companies. Furthermore, there is not enough curvature in the consumption function fitted to personal income data, to cause great stimulative effects upon employment from the redistribution of income.

The real contribution of Hobson to Keynesian economics was his analysis of savings and its effect on the level of economic activity. While Hobson analyzed, in some detail and very brilliantly, the saving process, he failed to give a good account of investment and its determinants. He considered saving to be done primarily for the purpose of capital accumulation, and never mentioned that the problem of making savings flow into investment is really at the root of the difficulty. A high rate of savings which are actually offset by investments provide a net stimulus to the economic system, but Hobson implied that such offsets in both depression and prosperity cause underconsumption and deflation. Had he analyzed more carefully the reasons for scarcity and abundance of investment opportunities, he would have been closer to the true result.

We find that Hobson had a very clear picture of what determines the savings schedule. In the first place he was not in agreement with the classical economists that savings and the rate of interest are related in any definite way. He wrote,

"The great bulk of what I call automatic saving will scarcely be affected by a fall in the rate of interest except in so far as this reduces the aggregate unearned incomes. Some sort of conscious thrift, aiming to make a definite provision of income for old age or other future contingency, may even be stimulated, instead of depressed, by a falling rate of interest which demands a larger volume of saving to yield the required income."[1]

Hobson in this quotation was making an argument, very familiar today, that the order of magnitude of $\frac{dS}{dr}$ is probably small (positively or negatively) because some saving responses to interest changes counteract others. He recognized, throughout his writings, the institutional and automatic character of savings due to the growth of insurance companies and the desires to provide for old age or children. There can be little doubt that he considered personal savings to be a function of the level of personal income as a result of his discussion of the effects of the current distribution of income. It is not a big step from this concept of the personal savings schedule to the aggregative schedules of the Keynesian system.

His policy recommendations are also related to those of Keynes. He did not favor a wage cut in order to achieve full employment. In fact, his arguments against wage cuts paralleled closely those of the later Keynesians. He pointed out the institutional obstacles due to the resistances of organized labor. But he was aware of the other difficulties even if this resistance could be overcome. He said,

"The history of 'sliding-scales' in wage agreements testifies to the influence of elasticity of wages in aggravating fluctuations

[1] The Economics of Unemployment, 1923, Macmillan, N.Y., p. 52.

of trade by enabling employers to gamble upon future wage reductions."[1] Thus he too was an inflationist and feared the cumulative, downward spiral of deflation. But in line with his main argument, he was mainly interested in the effect of wage cuts on the total wage bill and the distribution of income. The behavior of the total wage bill, he noted, depends upon the elasticity of demand for labor, something which he was not prepared to estimate.

Since Hobson regarded the root cause of the difficulty to be the maldistribution of income, his program for reform was to be an attempt to eliminate this cause. He suggested government spending of public credits such that the spending would go as much as possible into wages and as little as possible into profits, rents, interest, and high salaries. He approved unemployment doles as a step in the right direction. But he did not think temporary corrections of unemployment to be an adequate program. What he really aimed at was a permanent redistribution of income in order to get a "proper" adjustment between spending and saving which could maintain permanent prosperity.

Foster and Catchings[2] found the flaw of our economic system to be in the methods of business saving and financing. They too were trying to give a theoretical explanation of why production periodically runs ahead of consumption. All the underconsumptionists observed the same market phenomenon -- the availability of more goods than consumers could purchase with their money incomes. They tried to explain the deficiency in consumer purchasing power, though, without showing how the level of purchasing power is determined. They were in agreement with Hobson on the proposition of a lack of effective demand, but they did not attach the same significant importance to the income distribution, which they considered to be merely a subsidiary factor.

[1] Ibid., p. 91.

[2] See Profits, Houghton Mifflin, Boston, 1925 and Business Without a Buyer, Houghton Mifflin, Boston, 1927.

The argument of these gentlemen was based on the dilemma of thrift. They saw that savings are necessary for economic progress with a growing stock of capital equipment, yet they considered savings of individuals or corporations to generate deficiencies in effective demand. Savings are necessary but are an evil; this was their dilemma. They imposed two conditions for the continued maintenance of effective demand: (1) Business firms must distribute all their profits to consumers. (2) Consumers must spend all their incomes. If by spending, they meant spending on consumption, then they were saying that the only salvation for society is an economy of zero net investment and 100 per cent consumption. However this result does not follow from the analysis of the Keynesian system. In that system we see that with any given investment schedule, there are infinitely many savings schedules which are consistent with stable full employment.

For them, profits were taken to be the motive behind capitalism. But if the firms who make the profits, save some of their net income in order to purchase investment goods (as opposed to consumers' goods), then they predicted overproduction in the sense that consumers could not possibly buy the output at the going level of prices. They argued that the purchase of investment goods would add to the eventual supply of consumers' goods without adding to the demand, but they overlooked the interrelations of our economic system. If business savings are spent on production goods, these liquid funds must be distributed to the workers who produced the production goods and these workers are in turn consumers. Foster and Catchings concentrated too heavily on the order in which the spendings take place. Their theory stated that funds which are spent more than once in succession on production goods generate overproduction. Instead, money must be spent alternatively on production and consumption. They considered

the investment of individual savings as pernicious as that of business savings, but they concentrated their argument on the latter because they thought it is much more important as an aggregate. But, Foster and Catchings fell into the same trap which caught most of the underconsumptionists; i.e. they thought that oversaving is evidenced by the investment of too much savings instead of the failure to find investments for all that people desire to save.

Since Foster and Catchings did not look upon the system as constantly in a stagnant state of unemployment, rather as periodically deflated and inflated; it must be explained how there could have ever been full employment because some savings have always been present. They explained our past full employment as the result of acts of God, war, waste, permanent inventory accumulation, business losses. We must agree that these negative items will offset savings to give a high level of employment, but there have been also positive contributions from other offsets which have made our society grow and still have kept workers employed. These two authors saw only part of the picture of effective demand.

They had very little to recommend as to what should be done about the inevitable tendency towards less than full output. They were true to the Keynesian spirit in opposing the deflationary adjustment of falling prices. They argued that theoretically the surplus production with given purchasing power would not be a surplus if selling prices were to fall. But they feared the evils of the deflationary spiral which would lower available incomes very rapidly. The only other policy considerations that they discussed were in connection with the relation of the government finances to underconsumption. While they did not consider seriously the effects of deficit spending by the treasury, they did hint that a possible way out of our dilemma would be for the government to spend newly created money on consumption goods. In this respect they have anticipated

the policy measures of Keynesian economics.

Fortunately, the underconsumption writers have had some honest, intelligent, and sincere gentlemen among their ranks. But the colorful, Fascist crank, Major Douglas, has done much to lower the scientific achievement of this school. Hobson, for example, was anxious to dissociate his beliefs from those of Douglas.[1] The latter is one of the best examples of an amateur economist who was supporting a reasonable policy on the basis of a nonsensical theory. It is only by stretching the meaning very much of the Douglas theory that it can be reconciled with the Keynesian system, and let it be made clear that Major Douglas' policy measures are to be considered only in their strictest economic implications. His movement was filled with political dynamite. It was a Fascist movement with all the trappings of green-shirted legions, anti-labor propaganda, and anti-semitism. But the demagogues sometimes have important points to make.

Douglas did not have an underconsumption theory of business cycles. His theory was one of permanent stagnation and more particularly inefficiency. He was interested in poverty in the midst of plenty, with the emphasis on plenty. Being an engineer, he concentrated his attack upon our industrial efficiency in the light of what we were producing as compared with our potential output. Due to the inability of our economic system to distribute enough purchasing power to enable consumers to clear the markets, he claimed that we would always be producing far below the potential capacity.

The entire theoretical basis for the Douglas underconsumption situation was the famous A + B theorem, an all time high in economic unscience. Douglas changed his mind often about the definition of the terms A and B, and we will concern ourselves only with the first and last statements. In 1920,[2]

[1]See The Economics of Unemployment, Ch. VIII.

[2]Credit-Power and Democracy, London, 1920, p. 21.

Douglas conceived the division of total factory payments into two parts, A and B. Group A included all payments made to individuals; i.e. wages, salaries, and dividends. Group B included all payments made to other organizations; i.e. for raw materials, bank charges, and other external costs. A represented purchasing power distributed to consumers and A+B represented the total charges made by entrepreneurs necessary for profitable operation of business. He then argued that A, purchasing power, would never be able to purchase A+B, the market value of output, unless extra purchasing power to the extent of the value B should be distributed. The economists' attack on this crude proposition should be obvious. They, of course, pointed out that group B payments also get distributed to consumers in the form of purchasing power. But Major Douglas did not quit then; he merely modified his definition of the B payments. He finally, in 1931,[1] limited B to allowances made by business firms for reserves, mainly depreciation. This position, of course, was still untenable, but Douglas was not open to conviction. Keynes correctly remarked that if Douglas had limited the B payments to ". . . the financial provisions made by entrepreneurs to which no current expenditure on replacements and renewals corresponds . . ." [2] he would have been more nearly correct. With Keynes' restrictions on the definition of the B-term, he would practically have been saying that the failure of effective demand is due to savings, which are not offset by investment. Hence by the proper twisting of Douglas' remarks, we can find an anticipation of the Keynesian contribution.

As a cure for the chronic illness of our economic system, Major Douglas proposed the corrective of social credit. This was an attempt to make credit freely available and to take it out of the hands of our present financial system, the institution most frequently attacked by Douglas in order to gain

[1] Warning Democracy, London, 1931.

[2] General Theory, p. 371.

a mass following. He proposed that with every purchase, the purchaser be granted a credit of a certain percentage of the retail price. This was just another way of giving a net inflationary stimulus to the economic system. It should have the same effect in stimulating spending and discouraging saving as many other policy measures which are compatible with the Keynesian analysis. Social credit could be made part of a feasible, anti-cyclical, fiscal policy.

Douglas did not give as good an analysis of the savings process as did other underconsumption writers, yet he did see some of the fundamental relations between the volume of savings and effective demand. He had very little to offer, in a constructive way, with regard to investment or interest theory.

Finally in this section on the anticipations of the savings-investment building block of the Keynesian system, we come to a sadly neglected crank. N. Johannsen, in 1908, published[1] a complete anticipation of this part of Keynes' theory. The only recognition of the works of this author that appear to be available in economic literature occurs in brief footnotes in the Treatise, and in W. C. Mitchell's early volume on business cycles. Keynes did not mention Johannsen in the General Theory, but actually his ideas were much more relevant to the latter book than to the Treatise. For those interested in the development of economic thought, the ideas of this brilliant amateur should be studied very carefully.

Johannsen wanted to know why crises occur and more importantly why prolonged depressions follow these crises. He admitted that some of the prevalent theories could explain the upper turning point but never the trough, especially the broad, persistent trough, of the business cycle. He wanted only to analyze why the depression takes place and offered no economic policy as a cure. He began his analysis with the very fruitful notion that prosperity is closely

[1] A Neglected Point in Connection with Crises, Bankers' Publishing Co., N.Y., 1908.

linked with a high level of investment.[1] He was observant enough to notice that in the stagnant countries of the world there was little investment except for replacement of the capital stock. His view of the economic process was that investment funds are supplied by savings, and that so long as the savings are invested in new constructions and enterprises they provide income and employment for workers. The spread of business activity throughout the economic system by the "multiplying principle" generates a high level of prosperity with a high level of investment. But he observed that when savings do not get invested depression will ensue. Thus he directed his attention to an explanation of what happens to savings which are not offset by investment. It should be remarked that Johannsen meant roughly what Keynes meant by savings and investment, but he never defined his terms precisely. The reader of Johannsen must be careful, however, to observe when he meant replacement investment as opposed to net investment or when he did not count dissavings as negative savings which cancel out positive savings. As long as we realize the sense in which he used his terms there is no problem in comparing his propositions with those of Keynes.

A business cycle theory which he rejected as inadequate was the lack-of-funds theory. This theory said that the boom comes to an end because the insatiable demand for new investment exhausts the savings funds of the money market. Johannsen argued that this theory could never explain the continued depression because in the downward phase of the cycle investment opportunities do not press upon the funds of the money market. He was revolting against a theory which is similar to the non-Keynesian theories of the 1930's, namely

[1] He did not speak of investment, rather new construction and the creation of productive capital or wealth.

the so-called overinvestment theories which blame the upper turning point on a shortage of capital. The phenomena which he observed in the real world, of a money market with surplus investible funds during depression and little investment activity in progress, he attempted to explain by the failure of investment opportunities. He thought that during prosperity, investment is carried on to such an extent that the demand for capital accumulation becomes satisfied for some time. With the large growth of the capital stock, returns from investment begin to decline and enterprisers develop very poor expectations as to the future returns from investment. Thus he pointed out that people continue to save,but the savings do not get invested. What happens to these savings?

To answer this question he developed the concept of impair savings. Since capital accumulation ceases or falls off during the depression, the outlet for the continuing savings must be in investments which do not enhance the volume of capital stock. These investments he called impair investments. The impair savings which are offset by impair investments are not included in the Keynesian definitions of net savings and investment. To put Johannsen's argument in Keynesian terms it would run as follows: Investment opportunities begin to fall after a period of rapid capital accumulation. Those who can afford to save, however, continue to do so out of their falling incomes. But since investment outlets fall much faster than these continued savings, the savings do not get invested. Instead they are used to purchase existing assets from others in the economy who want to dissave (live above their income) or are loaned to others who need to supplement their income with added spending power. In essence, Johannsen's impair savings are offset by dissavings (impair investments) on the part of others in the economy. If he had reckoned dissavings

as negative savings he would have ended up with the algebraic result that aggregate savings equal aggregate net investments. The interesting thing about Johannsen's concepts is that they focus attention on the problem of offsets to savings and the relation of the abundance of these offsets to the business cycle. Johannsen was, without a doubt, one of the most unambiguous of the anticipators of the essential points of the Keynesian Revolution.

Let us now examine more carefully some of the specific points made by Johannsen. In the first place, he had a clear idea of the savings schedule. As a matter of fact, he worked with a schedule of the form $S = 1/7 \cdot Y$. This schedule, however, made use of his definition of savings. If we reduce his definition of savings to the Keynesian net savings we will get a smaller propensity to save. He did not link up his savings function directly with the multiplier theory, but the orders of magnitude of his multiplier and his inverse, marginal propensity to save are not out of line. He estimated that a drop in investment of one billion dollars (i.e. impair investments of that amount) would cut income by five billion dollars. From the savings schedule, his multiplier would be greater than seven. But when he worked out the successive rounds of his multiplier he got lost after a few rounds and merely made a rough estimate. He saw only the rough principle of the multiplier and knew nothing of its formalism. At first, he gave the impression that the "multiplying principle" worked only in one direction -- downward, but later in the book pointed out that induced effects worked also on the upswing. He said first

> "One billion dollars of savings, if invested in building up new capital, will augment the country's wealth by . . . $1,000,000,000
>
> One billion dollars of saving, if invested in the 'impairing form', will not augment the country's wealth but will, according to the figuring above, annihilate

the income of the community to the extent of . . . . . $5,000,000,000[1]

The first of the two propositions is inaccurate but was later not employed by Johannsen in the analysis of the upward phase of the cycle.

He criticized those theories which depend upon the assumption of boundless opportunities for expansion of capital. He was ready to predict that whenever the opportunities should turn up, there would be plenty of savings to supply the necessary funds. His prediction of the outlook for our investment opportunities was slightly pre-mature. He thought, in 1908, that the exceptional investment opportunities that had existed in the United States and Germany in the past would not last long. He did not see then the great automobile expansion of the 1920's that was in store for us. However he would have been more nearly correct had he made similar predictions for Great Britain. Of course, there is always the possibility that the prolonged depressions which he wanted to explain were somewhat less than ten years in duration and that he looked upon investment opportunities as in a continuous, oscillatory pattern.

According to Johannsen, China had a higher propensity to save than did France, yet China was a much less prosperous country. He explained this situation by pointing out that the Chinese savings were not of a healthy variety because they did not find investment outlets. This failure of offsets to savings, he said, generated poverty among the masses, unemployment, stagnation in trade, and permanent depression. France on the other hand, had profitable investment opportunities abroad which offset domestic savings. This accounted for the superior economic status of France. He claimed that if China would save less or invest more, the country would be more prosperous.

[1] A Neglected Point, p. 46.

In the Treatise, Keynes lightly brushed off Johannsen's work with the remark that lower interest rates will always make the available savings pass into investment; a process which Johannsen overlooked. This was hardly a fair or accurate commentary on the latter's brilliant treatment of the savings-investment problem.

Monetary Theories of Interest

The other building block of the Keynesian system appears much less obviously in the older literature. The principal link that can be found is that between Keynes and Gesell. The latter received great praise in the General Theory. Gesell, in turn, belauded Proudhon, Marx's contemporary. In the works cited above on p. 158, Dillard traced very carefully the chain of ideas from Proudhon, to Gesell, to Keynes, and we shall make use of Dillard's excellent work in what follows.

As far as theoretical economics is concerned, the main relationship among these three writers lies in the interconnections between their theories of money and interest. These two Keynesian antecedents did not have a theory of the determination of output and employment. They did not see the importance of the savings-investment equation. But all three writers made surprisingly similar value judgments concerning capitalism. Dillard has termed Proudhon and Gesell as socialists in the anti-Marxian tradition. Indeed, Proudhon became very famous as a result of controversy with Marx. The theme of anti-Marxian socialism has been an attack on rentier income mainly as interest on money and as rent on land. Proudhon and Gesell praised the creative entrepreneur and condemned the rentier. They did not want a collectivist society without private property rights over the means of production, but they wanted

purely monetary and land reforms within the framework of capitalism. These value judgments about the socio-economic environment are not far different from those of Keynes. He, too, has opposed the rentier; in fact this opposition has led him to favor inflation over deflation consistently in his writings. Also Keynes has always looked upon the entrepreneur who stimulates capital growth as the prime mover of our economy. The doctrine of the euthanasia of the rentier can be integrated into the writings of all three authors.

Proudhon lived in France during the period before and after the Revolution of 1848. In the years before the Revolution, the Bank of France was the most important financial institution of the country. Small scale entrepreneurs, who predominated, found it difficult to get bank credit, and this financial situation prompted Proudhon into making his proposals for a cure of the economic ills of the day. He thought that by replacing the Bank of France with his reformed bank of exchange and by reducing the rate of interest to zero (or near to zero), demand would always clear the market of all that could be produced. The purpose of the bank of exchange was to introduce bills of exchange into popular circulation. Producers would make out a bill to consumers; the latter would accept it; and then the producers would take the bill to the bank for discount at negligible rates of interest.[1] The bank would then substitute its own bill, which was to circulate at face value and be irredeemable in specie, for the producer's bill. Proudhon's bank was to insure full employment by making money and credit plentiful. His program was one of purely monetary reform and left many important considerations in the savings-investment relations of the economy untouched.

[1]At first the rate would be placed high enough to cover handling charges.

Proudhon regarded interest as a purely monetary phenomenon and considered the level of the rate of interest to be determined largely by the available supply of monetary funds. He had the germ of the idea of a liquidity preference theory of interest, but he had by no means arrived at a complete interest theory. His theory held that interest is a reward that must be paid to the holder of liquid funds so that he will be induced to part with his money in order that it may be used for production. He did not consider all the psychological and institutional factors which act to determine liquidity preference, but he did see the economic alternatives which interest rates have to allocate.

As in the case of so many of the Keynesian antecedents, there are inconsistencies. These inconsistencies are due to the fact that nobody anticipated the complete, interrelated theory, rather only individual building blocks. Proudhon showed his inconsistency with Keynesian economics by his support of a policy of wage cuts to increase the level of employment. It must be remembered that Proudhon had no theory of employment, only the rudiments of a theory of interest. He gave the well-known classical arguments in support of wage reductions. With a given volume of credit, more transactions can take place at a lower level of wages. However, had Proudhon been entirely consistent with his anti-rentier position he would have supported inflationary methods instead of wage cuts in order to alleviate unemployment. Maybe the crucial point in this connection is the fact that Proudhon was not a staunch supporter of organized labor. He was consistently opposed to strikes and unions.

The basis for the Gesellian theory of interest is the physical difference between goods and money. Gesell was quite emotional on this unfair difference. He said,

"The wares which compose supply decay, lose weight and quality, decrease continually in price in comparison with fresh wares. Rust, damp, decay, cold, breakage, mice, moths, flies, spiders, dust, wind, lightning, hail, and earthquakes, epidemics, accidents, floods, and thieves wage war continuously and successfully upon the quantity and quality of wares."[1]

"Demand, on the contrary, as we have already shown, is not subject to this compulsion. It is composed of gold, a precious metal which, as the expression implies, occupies an exceptional position among the products of the earth. Gold may be regarded almost as foreign matter intruded upon the earth successfully withstanding all the destructive forces of nature."[2]

From these two quotations we find the essential element of Gesell's theory of interest -- the characteristic of money as a store of value. Money can be successfully held idle without deteriorating physically; therefore Gesell argued that money holders are able to claim a premium for its use. If borrowers refuse to pay a premium, then hoarders have no reason to lend money because it does not deteriorate on their hands. But goods cannot be held indefinitely (except for the pathological cases like wine) without losing their value. Holders of goods would be only too happy to lend out their goods and in the future to receive in return exactly as much as they had lent out, free of deterioration. Gesell would call the repayment of equal quantities of goods by the borrower, a repayment at a zero interest rate. However, the lender is getting back more than he otherwise would have possessed if he had elected to hold the

[1] The Natural Economic Order, Free Economy, San Antonio, p. 93.

[2] Ibid, p. 95.

goods. It is a real question as to whether or not the premium of non-deterioration is actually interest.

At any rate, Gesell thought that money should be only a medium of exchange and not a store of value. His argument was based on the comparison of the essential differences between a barter and a money economy. He stated that in a barter economy, goods exchange against goods at their face values with no interest charges and that full employment is always achieved. The only reason why money is introduced into the economy is to facilitate the maintenance of efficient division of labor in the economy. He truly looked upon money as a "veil". He was well aware, though, that the world does not behave in this way. Money is not merely a veil. As a result, he attacked the money system insofar as it enables people to earn interest because of the hoardable character of money. He attributed the fluctuations in output and employment to the monetary ills of our economic system.

Gesell's strong points were of course interest theory and money. But he did have some ideas about saving and investing. He missed much of the saving-investment problem, but some of his points are worth considering. He remarked,

> "Interest is, no doubt, a special attraction for the saver. But this special attraction is not necessary, for even without it the impulse of saving is sufficiently strong. . . . It is certainly easier to save 5 dollars from 200 dollars than from 100 dollars. If with 100 dollars wages a man, partly because of the stimulus of interest, deprives his stomach of 10 dollars for his own and his children's benefit, with 200 dollars wages he could probably, from the natural impulse of saving, set aside, if not 110 dollars, at any rate much more than 10 dollars.

> Saving is practised throughout nature without the incentive of interest. Bees and marmots save, although their stores bring them no interest and many enemies. Primitive peoples save although interest among them is unknown. Why should civilized man act otherwise?"[1]

This is a clear indication that he related savings to the level of income and not necessarily to the rate of interest. But investment for him was more closely linked to the rate of interest. He spoke of investment as the disposal of savings. In this connection he wrote,

> "But no one parts with money savings unless promised interest, and the employer can pay no interest if what he constructs does not bring in at least as much interest as is demanded for the use of savings."[2]

Investors must get a return on their investment if they are to part with savings funds, and borrowers must reap a reward from the operation of the investment which yields a return over and above the interest charge. This is the gist of the latter quotation. But Gesell never attributed our economic troubles to a lack of balance between saving and investing, except to that lack introduced by the phenomenon of interest charges. He never got to the heart of the problem, a consideration of the determinants of effective demand.

Although Gesell developed for publication his reform program of economic control long before his theory of interest, his policy scheme can be derived logically from the theory. On the other hand, it is probably true that Gesell, like Keynes, developed his theoretical structure from the observations of the real world of his time and from practical economic policies. His reform

[1] Ibid, pp. 252-253.

[2] Ibid, p. 114.

measures followed quite naturally from his discussion of the characteristics of goods and money. He wanted to reduce money to the status of goods; i.e. to force it to deteriorate also, so that it would not be profitable to hold money and thereby exact interest. His plan was that of stamped money. He proposed a single type of legal tender, irredeemable in specie, and requiring a periodic stamping in order to keep the money at its face value. If every dollar were to require, periodically, stamps which would amount to, say, five or six cents per year, it would be very unprofitable to hold money, and people would prefer to spend in order to hold goods. He thought that he could regulate the price level (at a stable figure) through strict control over the note issue and could speed up the spending of incomes, to prevent hoarding. With this basic reform, he thought that our economic problems would be solved. What Gesell had to say was quite good and contained much truth, but he did not go far enough. He should have analyzed the effect of stamped money on consumption, savings, investment, and income. He was preoccupied with prices and interest rather than employment and income. It is probably true that stamped money would be beneficial to spending, both on consumption and investment, in that way generating higher levels of income, but Gesell omitted much about this problem.

It is hoped that in the future economists will devote more sympathetic study to the works of the "crack-pots."

CHAPTER VI DEPRESSION ECONOMICS?

All too frequently the charge is heard that Keynesian economics is economics of a depression situation. Even Professor Schumpeter is now willing to make the great concession to admit that this system of economics describes a depression rather well. But the catastrophic thirties were neither the beginning nor the end of periods for which the Keynesian methods of analysis produce useful results. Not only the current war period but also the years to come will see fruitful applications of the new methods. It is wrong to think that Keynes' system fails if it cannot predict pessimistic results. The pessimism is not inherent in this system; instead the determinants behind the system make it operate either pessimistically or optimistically depending on the current state of affairs in economic and non-economic life. That is to say, the Keynesian economic system is essentially a machine which grinds out results according to where the several dials controlling the system are set. The dials are the functional relations and the setting of the dials is taken care of by the banking system, the government, the psychology of consumers, the attitudes of investors, the achievements of the technologists, etc. Is it correct to blame the machine if the dials are consistently set at pessimistic levels? If the machine is a true model of the way the system of the real world behaves, then we are not justified in criticizing the machine because other factors set the dials at particular levels. It is just as easy to explain one phase of the business cycle as any other with the Keynesian analysis provided we take into account the correct structure of the relationships involved during each phase. Our experience in the past has been that the re-

lationships have been sufficiently alike over a period of years so that we can take the stationary system for an equilibrium solution. If the conditions of our time are such that this stationary solution is not one of full employment, then we must realize this fact and do something about it. On the other hand, the future may be such that we get a continuously changing structure for the economic model. Without serious modification, this can be incorporated into the theory. There is nothing to make us work with constant, unchanging functional relations. Shifting equilibria and dynamically changing relations can also be ground out of the machine. The principles of the Keynesian Revolution need not be discarded; rather they must receive elaboration and be extended to handle more complex situations.

We must be brought to realize that Keynesian economics will admit full employment as a legitimate solution to the equations as well as the infinite number of underemployment solutions. If human behavior and our institutions are such that full employment is made possible, then the classical and Keynesian systems become one and the same thing. In this case the savings-investment equation can be considered to yield an economically meaningful value for the rate of interest when income is at the full employment level. There is then no difference between the two skeleton models, and the two are equally valid.

The Inflationary Gap

The argument against the classification of Keynesian economics as depression economics seems so obvious that it is difficult to do more than shrug shoulders at the charge, yet the other side is never convinced. However, since

"the proof of a pudding is in the eating", an example from the actual world of affairs should decide the argument definitively. The example to be used is a happy choice since it also brings the analysis of the results of Keynesian economics almost up to date, showing the extension of the achievements since the General Theory.

Today[1] we do not worry about an immediate deflation. We are living in a period of anything but depression economics. Never before have we experienced such high levels of output and employment. Curiously enough, in our current stage of the inflationary gap we have not yet thrown over the Keynesian system. Of what use to us now is this system of depression economics? The purpose of this section will be to analyze the gap problem with those tools which some prominent economists would like to discard during other than deflationary conditions.

The discussion of the inflationary gap, as such, did not attract much attention until the term was introduced in England in the budget speech of the Chancellor of the Exchequer in April, 1941. About one year earlier, Keynes wrote his well-known booklet, How to Pay for the War, in which he dealt with the inflation problem in very much the same manner as did the later "gapists." He stated the inflation problem very clearly in terms of national output, war expenditures, and aggregate consumption.

Using rough figures he put the matter this way. Incomes were being paid out in Great Britain at about £ 6,000 million per annum and the taxation was yielding £ 1,400 million leaving individuals with spending power of £ 4,600 million. The government expenditures inclusive of transfer items were reckoned at £ 2,750 million, leaving a balance of £ 3,250 million for public consumption.

[1]These pages are written during the peak period of war production.

The inflation situation arises out of the fact that persons would have £ 4,600 million in purchasing power to bid for goods valued at £ 3,250 million in pre-inflation prices. Of course, we have learned well enough that people do not spend all their income on consumption goods. At gross income levels of £ 6,000 million there would be according to the existing consumption function a definite amount which people would want to consume and to save. Only if savings should happen to be as much as £ 1,350 million out of an income of £ 6,000 million would there be no inflationary gap. For purposes of illustration Keynes assumed savings of £ 700 million which meant that £ 3900 million would actually bid for goods valued at £ 3,250 million. The difference of £ 650 million can be taken as a particular definition of the inflationary gap. The consumption function and the level of war expenditures by the government interact to determine the level of income. The inflationary gap is then the difference between what the population will try to consume out of this income and the amount available for consumption at pre-inflation prices.

The Chancellor of the Exchequer defined the gap as "the amount of the government's expenditure against which there is no corresponding release of real resources of manpower or material by some other member of the community."[1] An adequate measure of this gap would not be the simple difference between expected governmental expenditures and tax revenues. The lack of balance between expenditures and tax receipts has been filled somewhat by the sale of securities abroad, genuine savings of private individuals or corporations, extra budgetary governmental receipts, etc. But with these corrections there has still been a lack of balance between what the government has wanted to acquire for the prosecution of the War and what the population would give up at current price

[1] "The First War Budget", Economist, Vol. 140, April 12, 1941, p. 475.

levels. The government will get the goods and the population will consume only what remains, but the important problem is to analyze by what methods the government can get the goods which would not be given up at current prices by the public. There are good and bad ways of closing the gap. We particularly want to avoid the closing of the gap through price rises.

In Keynes' example from How to Pay for the War, he demonstrated how the gap might be filled through price rises. A 20 per cent price rise in his case would bring the value of goods available just up to the amount of purchasing power directed at these goods, £ 3,900 million. But this price rise would increase incomes by bringing a windfall gain of £ 650 million to sellers of the goods. In the next year, we would then begin with £ 650 million added to the income stream, and if all other data increased mutatis mutandis we would find ourselves confronted with another gap. But Keynes pointed out that it would be very likely that part of the windfall of £ 650 million would be collected from excess profit taxes by the government. In this event, there will be an anti-inflationary pressure on the system.

Hence with a given tax schedule, price rises and voluntary savings may be considered as alternative methods of closing the gap.

We can conveniently think of two strategic levels of national income, the full employment level and the bottleneck level. We reach the former level, say, when all who want to work at the going wage rates can find a job. The bottleneck point is reached when plant capacity is fully limited and all increases in money national income become price increases. It is not always certain that full employment will precede the bottleneck point; much depends on the state of capital equipment. It is quite conceivable that a serious depression could so depreciate the capital stock of an economy that plant capacity would be limited far before the full employment level of income. Keynes, in the

early years of the War, was worried, lest the bottleneck point be reached too early.[1] As it happened in this country we reached full employment and then continued to expand output by inducing new workers into the labor force. Our wartime increments of money income represented substantially more than price rises.

Although we probably did not reach the bottleneck point, we came very close to it, close enough, so that for purposes of simplification in the analysis it will be legitimate to assume output as no longer expansible. Increases in money national income thus represent price rises. It is actually nearer the truth to say that increases in money national income represent substantial price rises so that a policy of money income stabilization of our present levels of output, which are in the neighborhood of the bottleneck point, is in the public interest as an anti-inflation measure.

With this background, it will be very simple now to go back to our familiar Keynesian model and give an analytical presentation of the problem of the inflationary gap.

During war periods, private investment decisions are practically nullified. In a total war economy, income represents the sum of private consumption plus war expenditures by the government. The latter component is completely autonomous, its size depending entirely upon congressional appropriation bills. In this case, then, we write

$$Y = C + \overline{W}$$

where $W = \overline{W}$ represents autonomous war spending. In order to emphasize the role of fiscal policy and a possible variant of the gap, let us write the consumption function as

$$C = C^{*}\,(Y - T(Y)) \equiv C\,(Y)$$

[1] How to Pay for the War, p. 19.

where $T = T(Y)$ is the tax function. With given tax schedules, for each level of income there will be a certain revenue from taxation. Consumers spend their incomes after the payment of taxes; thus we take account of this fact in the argument of the C^* - function. There are some distributional problems in connection with the tax function as well as with the consumption function, but their importance does not warrant any further complication of the model.

Our basic equation for the determination of the level of income becomes

$$Y = C^* (Y - T(Y)) + \overline{W}$$

which could also be written as

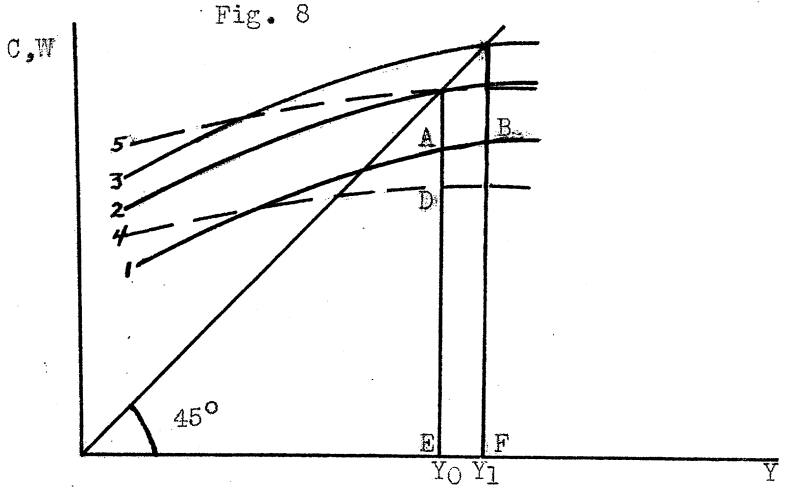
$$S(Y) = \overline{W}$$

Out of this model we find a certain value for income, say Y_o, which will be taken as our base quantity. This money income stream defines a certain price level because output is given at the full capacity of our productive powers. Suppose next, as must inevitably occur in war time, that $\overline{W}$ increases by an amount which we can call α. In this new situation, a different and higher value for Y will be obtained from

$$Y = C^* (Y - T(Y)) + \overline{W} + \alpha$$

which we can denote as Y_1. The task of wartime fiscal policy, however, is to prevent Y_o from rising to Y_1. If under our assumptions, all price increases are to be avoided, then we must somehow operate on the terms of the equation so that a level of income no greater than Y_o is generated. Clearly, we can do nothing to $\overline{W} + \alpha$; so our only hope is to influence the consumption function -- the task of war finance is clearly set out. At the base prices there is an amount $Y_o - \overline{W} - \alpha$ available for consumers. At the income levels that would be generated out of the new conditions, people will try to consume $C^* (Y_1 - T(Y_1))$. Fiscal policies must be devised to wipe out the gap between these two figures. A diagrammatic exposition can make the situation quite clear.

Fig. 8



At the starting position curves 1, 2 represent the consumption function, $C^*(Y-T(Y))$ and the consumption function plus war expenditures, $C^*(Y-T(Y)) + \overline{W}$ respectively. The income determined is Y_0. As war expenditures are added we move up to curve 3 by a constant amount, α. In the first case, consumers want to spend a total equal to AE; in the second case they want to spend the amount BF. If prices are not to rise, the consumption function must be lowered (not necessarily a parallel shift) so that when the spending of the government, $\overline{W} + \alpha$ is added to it, the total will cross the 45° line at $Y = Y_0$. Curves 4 and 5 depict a possible result of the shift of the consumption function. There are infinitely many shifts which would be suitable, but the requirement that must be met is that curve 5 must cross the 45° line at $Y = Y_0$. No matter what shift is imposed upon the consumption schedule, the new amount of goods and services consumed will have to be DE which is the same for any shift which meets our basic requirement. The vertical distance between the points B and D is the inflationary gap which we face in this situation. Consumers' goods available at the old prices, $Y_0 - \overline{W} - \alpha$, add up exactly to DE, while unrestricted consumer activity would make attempted spending equal to BF, which is the same as $C^*(Y_1 - T(Y_1))$.

One variant of the inflationary gap would make it the amount of taxes necessary to wipe out the gap. But this is not an unambiguous concept. We

have written the consumption function as C* (Y-T (Y)). This function is then given as of a certain functional operator T. A particular tax system underlies the consumption function. If taxes are changed so as to get more revenue to finance government spending, a new consumption function will come into existence. The change in the tax system needed to close the gap is that change which will push the consumption function downward so that curve 5 crosses the 45° line at the proper point. There is no limit to the variety of changes in the tax system which would accomplish this result. But it is true that no matter what change is made, it will have to sop up an exact amount of purchasing power at the observable levels of income if price rises are to be avoided.

The useful thing about this whole analysis is that it is entirely operational. All that we must know is the equation of the consumption function and possibly the tax function. War expenditures by the government have been announced in advance so that we can have predictable figures for this strategic term. But in making applications to the practical problems of the War we must be careful statisticians and stick to reality. Output never quite reached its maximum in this country. The gap that we want to avoid when output is still expansible, to a limited extent, will be slightly different.

If we take into account the fact that output is still expansible and that small price increases are to be permitted, the problem is not altered in any essential way. In this new case, certain increases in money national income over the base period becomes permissible, and our policy of shifting the consumption function should still be carried out but to a lesser extent. The increase in money national income to be expected as a result of an increase in governmental war expenditures can be broken into three parts. One part will

be the increase due to the expansion of physical output; a second part will be due to permissible price rises; and the third part, which is to be avoided, will be due to undesired price rises. Given the base year income, the expected expansion of physical output, and the price levels at which stability is desired, we can calculate an exact level of money national income which will lie between the values Y_0 and Y_1 of the preceding graph. Fiscal policy should then be directed toward shifting the consumption function to an extent such that this function plus the stated level of war spending, $\overline{W} + \alpha$, crosses the 45° line at this unique level of national income between Y_0 and Y_1. The gap will be determined by the difference between the ordinate to the old consumption function at Y_1, BF, and the ordinate to the new consumption function at the value of Y which is calculated between Y_0 and Y_1.

There are, however, certain important aspects of the inflationary situation which are not uncovered by the type of analysis of the immediately preceding paragraphs. Inflationary phenomena are highly dynamic and our methods of comparative statics conceal many important aspects of the process. We learn nothing about the speed of inflation from the analysis of shifting static schedules. In a situation where expectations are so important it is not possible to disregard the dynamic influences. The faster price rises occur, the more likely are they to breed anticipations of further increases and develop into an irresistible, cumulative process. Only by dynamizing the Keynesian system can we account for the speed of inflation. The simplest way to dynamize this system is to introduce the important lags that are concerned with the receiving and spending of income, the adjustment of wages to prices, etc. Keynes in How to Pay for the War, was quick to see the influence of lags upon the system. He regarded lags as an ace-in-the-hole which would tend to be a

stabilizing factor. He said,

> "It is these time-lags and other impediments which come to the rescue. Wars do not last forever."[1]

Koopmans[2] and, later, Smithies[3] formalized these ideas about the influence of lags and developed from specific models precise relations between the rate of price increase per unit of time and the significant lags. It is seen from Koopmans' article that for the general case the relative rate of price increase is a fraction whose numerator is the governmental expenditures and whose denominator is made up of terms involving marginal propensities to consume, incomes, and time lags as factors. The larger become his spending lags and wage adjustment lags, the larger becomes the denominator and the smaller becomes the speed of inflation. Koopmans' method is really a generalization of the procedures given above, in the sense that they dynamize the shifting equilibria. Smithies obtained similar results for his models and found that the addition of lags to his system slows the process of inflation.

Another deficiency of the gap analysis is that it has been constructed to deal mainly with current flows of income, war spending, consumption, and savings. However since inflation can spread so rapidly throughout the system by means of expectations of further price rises, we must consider not only the prices of current output but also of the stock of existing output which is still being traded on our markets. There may be dangerous price rises in the system on goods that in no way enter into current output. Also spending in excess of the available quantity of goods valued at base prices may be not only from the current stream of income paid out, but also from idle balances which were a

[1] How to Pay for the War, p. 66.

[2] "The Dynamics of Inflation", The Review of Economic Statistics, May 1942, Vol. XXIV, p. 53.

[3] "The Behavior of Money National Income under Inflationary Conditions", The Quarterly Journal of Economics, No. 1942, Vol. LVII, p. 113.

part of the income of earlier periods. The economists of World War I were not entirely wrong in concentrating their inflation analysis on the growth of the stock of cash balances, for that will have some influence on the volume of spending which can be directed against the limited output. Indeed, even the Keynesians of World War II recognize a potential inflationary danger in the post-war resulting from the large amounts of liquid funds now in the hands of the population. We may save part of the flow of income year after year in just the right amount so that the gap is kept continuously closed, but these savings may also accumulate as liquid funds for future spenders. The maintenance of a closed gap for any number of years does not insure us against the dumping of accumulated funds all at once on the market at a time when output is not sufficiently expansible to prevent inflationary price increases. The gap is related entirely to flow concepts, but we cannot rule out the influence of stock concepts.

It is, of course, quite possible to calculate numbers of gaps within the economy; e.g. the durable consumer goods gap, the steel gap, the butter gap, etc., all in terms of the difference between expected expenditures on these goods and the amount available, measured at stabilized prices. However, most of the treatment has been in terms of broad aggregates because here we have more knowledge about the relation of spending to incomes. It is possible that the method of aggregates may cover up some important price increases. While the general price level may be unchanged there may be such increases in specific bottlenecks of the economy that an inflation may be initiated. It may be said, though, in favor of the aggregative method that workers and employers in this War have followed surprisingly closely general price levels. If bargaining is kept within the methodology of the "Little Steel Formula", then

it will not be incorrect to work with over-all consumption functions, war expenditures, and national income.

A review of the economists' writings during World War I on the subject of inflation is enough to convince one that there has been a Revolution in the subject of inflation economics. It is not possible to find an analysis during that period which really grappled with the problem, as the gap analysis does, in terms of anticipated expenditures and available goods at a given price level.

Most of the literature of that earlier period dealt with the questions of war finance and inflation from the point of view of the stock of currency, the state of the security markets, and the level of interest rates. There seems to have been little objection to the proposition that the price rises which occurred were due to the increases in the amount of money in circulation or perhaps to the changes in the stock of gold. The quantity theory explanation was everywhere in vogue.

The very prominent discussion of taxes vs. loans as a method of war finance, it might be suspected, would have led to some discoveries similar to those of the current discussion. But instead of considering taxes and loans with respect to their separate influences on the rate of private consumption expenditures in relation to available output, the arguments concentrated entirely on the respective burdens which would be left for future generations. The relative efficacies or even possibilities of reaching a solution to the immediate inflationary problem by the two methods was not adequately considered.

A vast difference exists between the current fashions and the more classical methods of 1914-1920, and the principle reason for this difference can be traced to the recognition today, from Keynesian economics, of the interaction between autonomous war expenditures and the consumption function in determining national income.

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