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PROFESSOR PIGOU'S *THEORY OF UNEMPLOYMENT*[1]

ECONOMISTS do not need to be told that anything by Professor Pigou merits their most serious and careful attention. *The Theory of Unemployment* is no exception. But the prospective reader should be warned that he might as well not tackle this work unless he is prepared to read it through at least twice and spend a great deal of time digesting what he has read. The book is frankly addressed to experts (cf. Preface); its argument is very compact, and the reader is left to supply for himself as clear an idea as he can of the methods and fundamental concepts which the author employs. Finally, Professor Pigou has made free use of symbols; and while the mathematical principles involved are essentially simple, still he has exercised much ingenuity in transforming his formulas so that they can be subjected to economic interpretation. In many cases it is necessary to verify the results with pencil and paper or to accept them on faith. Unfortunately there are a great many misprints and slips in the book and the reader should be on his guard against these. A partial list of corrigenda can be obtained from the publishers; and I have made suggestions for further corrections at the end of this review.

It is seldom practicable in a review to take up everything which might repay discussion, and in the case of so original and suggestive a book as *The Theory of Unemployment* it is quite impossible. In what follows, therefore, I shall confine my attention to a very few problems.

I

I take it that the object of economic theory is to frame a set of logically co-ordinated questions, the answers to which are to be sought by consulting the facts. (It goes without saying that unless you ask sensible questions you won't get sensible answers.)[2] The questions themselves can never be a source of knowledge about the real world; but their formulation, the task of pure theory, is not less important on that account. Above all, good theory must be in its primary aspects clear

[1] A. C. Pigou, *The Theory of Unemployment.* London: Macmillan & Co., Ltd., 1933. Pp. xxv+319.

[2] This, it seems to me, is the essence of the reply to all those who would do without theory and go "directly" to the facts.

and consistent. Vagueness, confusion, and inconsistency[3] are fatal. Now important parts of *The Theory of Unemployment* are, in my opinion, open to criticism from this general standpoint. This is particularly the case where Professor Pigou deals with the demand for labor as a whole (chiefly in Parts II and III), and hence I propose to examine very briefly a few of the fundamental concepts which he utilizes in this part of the analysis. First, however, let me set out in bare outline Professor Pigou's scheme for attacking the demand for labor as a whole.

The approach is via a modified wage-fund doctrine. The economy is conceived of as divided into industries which produce wage-goods and those which produce non-wage-goods. Export industries are generally regarded as wage-good industries, since (for England) they "produce" wage-goods by way of exchange. The wage-goods fund—i.e., the amount of wage-goods available for payment as wages—is not rigid; it can be augmented in "the very short period" by subtractions from stocks, and by curtailment of wage-goods consumption by non-wage-earners. In the "short period"[4] it can be augmented by these methods as well as by additional output from the wage-good industries. (I am neglecting the complications introduced by the existence of systems of unemployment benefit.) This scheme seems to reduce the real demand for labor in the periods distinguished to dependence upon a relatively small and easily manageable set of factors. With a given real wage rate (in terms of wage-goods units) and a given supply of labor, it is possible to determine within narrow limits the quantity of labor which will be demanded and likewise the elasticity of demand, for (small) changes in the real wage rate.

This is essentially the schematic background of the treatment of demand for labor in the aggregate. It involves no fewer than four fundamental concepts, all of which seem to me to be open to serious criticism. They are: (1) wage and non-wage-goods; (2) wage and non-wage-good

[3] Apart from minor inconsistencies which do not affect the main theoretical structure. Such, e.g., was Wicksell's doctrine that monetary equilibrium necessarily implies a stable price level. Cf. Myrdal in *Beitrage züir Geldtheorie*, ed. Hayek.

[4] The "short period" is here defined as a period "greater than the period of production of the generality of wage-goods" (p. 89) while the "very short period" refers to periods shorter than this. The period of production in Pigou's terminology is not to be confused with the Böhm-Bawerkian period of production. Pigou means the average period elapsing between the application of labor to material and the sale of the commodity; whereas Böhm-Bawerk defines the average period of production as the average time elapsing between the application of original factors of production and the enjoyment of the result. The two concepts are quite different.

industries; (3) the short period; and (4) the period of production of the generality of wage-goods (on which depends the definition of the "very short period").

Let us first consider No. 3. Professor Pigou's definition of the short period is taken straight from Marshall; it is "the period such that over the field of any particular investigation, industrial equipment both in form and quantity may be regarded as more or less fixed" (p. 39). Marshall, as is well known, used the short-period concept, in the analysis of partial (dis)equilibrium situations, to elucidate the path of adjustment of individual firms or industries (small relative to the economy as a whole) to changed conditions of demand, for example (as in the famous example of the fishing industry [Book V, chap. v, § 4]). Professor Pigou now applies the concept to the economy as a whole. The legitimacy of this procedure is by no means self-evident. Fixity of industrial equipment over the whole of the economic system implies that no industries produce industrial equipment, for the duration of the period under consideration. There are two ways of avoiding this apparent inconsistency. The first is to define the short period as a disappearingly small time interval, i.e., as no period at all. This would be unobjectionable for some purposes but does not really touch the present difficulty. The second is to interpret Professor Pigou's definition less strictly; industrial equipment, we might say, is produced in the short period (both for new investment and for replacement) but in quantities small relative to the existing mass of capital goods. In other words, industrial equipment remains "more or less" fixed. I am doubtful as to the value of this interpretation, however. It seems to me to be a more palatable form of defining the short period as "six months or perhaps a year." There is a further reason for questioning the value of this definition. For the whole economy, "more or less" fixity in form and quantity is compatible with considerable movements of "non-specific" industrial equipment which is already in existence. In other words, so long as existing capital is relatively mobile, very small additions and replacements may be associated with shifts in productivity functions out of all proportion.[5] Such movements are, to be sure, in one sense changes in form of industrial equipment, but they are of a differ-

[5] E.g., the result might be a relative shift in the productivity function for wage-good industries within the short period. This would render the demand function for labor as a whole indeterminate within certain limits, since in Pigou's scheme this function is made to depend in a direct way on the productivity function of labor in wage-good industries.

ent order from the more usual changes in form (i.e., through wearing out and new construction) and must be treated separately.

The short period as applied to the economy as a whole may yet prove to be a fruitful concept; it cannot be accepted uncritically, however, and the problems which it conceals deserve more attention than they have so far received.

Let us now turn to wage and non-wage-good industries. Professor Pigou nowhere attempts to define these terms. The difficulties are largely unconnected with those involved in the definition of wage and non-wage-goods themselves. Wage-goods are what laborers buy, but what is a wage-good industry? The things that laborers buy are turned out by a long chain of processes. The mining of ore, for example, plays a part, just as does the retailing of the finished consumption good; the former is certainly not a wage-good industry, and it is difficult to interpret retailing as an industry consistently with much of what Professor Pigou says. But where are we to draw the line? Take a concrete example of what everyone would agree upon as a wage-good—bread. The wheat is sown, reaped, transported, stored, milled, baked, and finally sold to the consumer. Is all this one wage-good industry, or three, or four? Or is the process perhaps divisible into several industries some of which are wage-good and some non-wage-good? And even after we have made this decision, how do we know that increased production can be initiated at the point where the material enters the wage-good industry? Perhaps the supply of the material must first be increased, and so on "backward."

It was suggested above that wage-goods are what laborers buy. This is, of course, by no means the end of the problem, however. In the first place, if we include in laborers all who work for contractual pay, then it is very little exaggeration to say that all goods are wage-goods. This seems perfectly logical, but naturally it does not help any and it is not what Professor Pigou means. He means by laborers roughly what a Marxist means; the Marxist does not include the salaried manager of the United States Steel Corporation. For the Marxist's purposes the vagueness is rather an advantage than otherwise, and certainly he would be wasting his time over precise definitions. But for purposes of scientific analysis the situation is different. Even if, however, this difficulty could be met, the problem is by no means solved, as Mr. Hawtrey has pointed out.[6] The proportion of different commodities bought by laborers (however defined) varies from 0 to nearly 100

[6] R. G. Hawtrey, "The Theory of Unemployment by Professor A. C. Pigou," *Economica*, May, 1934, p. 157.

per cent.[7] The line might be drawn at 10 per cent or at 90 per cent, but it is very difficult to attach much significance to it no matter where it is drawn.[8]

We now turn to consider the period of production of the generality of wage-goods, assuming for the moment that it has been possible to find a satisfactory definition of wage-goods.[9] After the passage of an interval of time equal to this period, new wage-goods are supposedly available to "finance" additional employment or to be used in any other way which those who can claim them may choose. We have here to do with one of those "representative" concepts of which Professor Pigou is so fond. But the fact is that the separate periods of production are widely divergent, and any kind of an average of them means nothing at all so far as the time which must elapse before new wage-goods come into the market is concerned. New wage-goods of some sorts start coming onto the market almost at once, while other kinds may take a long time. The average of the periods is a figure and nothing more.[10] From this I think we can safely conclude that the "very short period" is a mythical member of the doubtful branch of the short-period family.

The foregoing criticisms are specific to *The Theory of Unemployment*, but the attitude which prompted them has a much wider bearing. One of the basic requirements of economic science, in its present stage of maturity, is a widespread agreement on fundamental issues. The only method of reaching agreement is through discussion among the "competent." But discussion is bound to be futile so long as the issues are not clearly stated—so long, that is, as there is confusion and vague-

[7] This, of course, includes capital goods. Laborers save and invest, though this is a possibility which Professor Pigou nowhere even mentions.

[8] These considerations are separate from and in addition to those relevant to the attempt to define a unit of real wages. Professor Pigou recognizes that in view of (1) differences in income, (2) differences in taste, and (3) variations in tastes and prices from one time to another, a unit of real wages can have no exact meaning. This seems to me to be putting it very mildly. In any case he is not deterred from making extensive use of the concept.

[9] The period of production in Pigou's sense, it will be remembered, is the average period elapsing between the application of labor to the production of a commodity and its sale.

[10] It is my personal opinion that "representative" concepts always cover up but never solve difficulties. It should perhaps be added that representative does not always mean average in the mathematical sense, as Marshall was careful to point out (Book IV, chap. viii, § 2). But in this instance I cannot see that Marshallian caution can really save the day.

ness as to what is being talked about. I am far from suggesting that nothing has been accomplished in this direction in the past century and a half. But the fact that much has been done should not blind us to the fact that much more still remains to be done. If I am right in regarding this as one of the most important tasks which economists have to face, then surely it seems a pity that a man of Professor Pigou's tremendous intellectual powers has not more to offer to its solution than can be found in *The Theory of Unemployment.*

II

I pass on now to consider a problem where the issues appear to be well enough defined so that at least a provisional conclusion should be possible.

In chapter x of Part II Professor Pigou investigates for the first time the relationship between money and real wage rates. He arrives at the conclusion that under most sets of reasonable assumptions an all-round reduction in money wage rates will involve a somewhat smaller reduction in real rates. This proposition would, I believe, receive the assent of most economists, and it would be unnecessary to discuss it here had it not been recently challenged with great vigor and on high authority. Mr. Harrod maintains, as against Professor Pigou, that there is nothing in a reduction of money wages as such which would tend to reduce real wages.[11] The implications of such a conclusion are obviously far-reaching. But I believe that it cannot be sustained and that Professor Pigou, in upholding the contrary view, has, if anything, understated his case.

The crux of the difficulty may be stated very briefly. Suppose that in a closed system the money rate of wages is reduced from W to $W-K$ where wages form the whole of prime costs. Now the controversy turns essentially on what happens in the first instance to non-wage-earners' money income. Professor Pigou says it remains the same; Mr. Harrod says we cannot tell until we make further assumptions; and I should like to suggest, with some hesitation in view of the weight of authority to the contrary, that it goes up. Professor Pigou apparently regards his position as self-evident. He says simply (p. 102):

Let us suppose that initially the money income of non-wage-earners is Q, and of wage-earners WX. The money wage rate is reduced from W to $(W-K)$

[11] R. F. Harrod, "Professor Pigou's Theory of Unemployment," *Economic Journal*, March, 1934. Harrod's view is shared by other members of the "Cambridge" school, but the arguments (unpublished to date) by which it is reached are, I believe, on a different footing. I am concerned here solely with the problem as stated by Pigou and Harrod; that it may have to be opened up again from another point of view seems very likely.

and, we suppose, the quantity of employment is not affected. At the outset nothing has happened to non-wage-earners' money income: so that total income for expenditure on an unchanged real income is reduced from $(Q+WX)$ to $(Q+(W-K)X)$.

Cost being reduced proportionately more than price, of course there is an inducement to expansion; more labor is brought into employment. Mr. Harrod objects that it is not so simple. "The crucial proposition," he says, "is that 'at the outset nothing has happened to non-wage-earners' money income.' In that the question is really begged." He then goes on to explain why.

> It must be remembered that payments to supplementary factors are residual. It cannot be known what happens to these even "at the outset," until it is known what happens at the outset to the general level of prices. Yet what happens to the general level of prices depends on what happens to the volume of non-wage-earners' money expenditure. This in turn depends on what happens to their incomes. No solution, therefore, can be reached on these lines.

But surely we are entitled to ask Mr. Harrod whether he regards the sequence of economic events and the time they take to work out their effects as utterly irrelevant. If not, the difficulty disappears. To make this plain let us take a hypothetical example. The community, we suppose, is divided into employers and wage-earners; wages are the only costs. Wages are paid out every Saturday evening and everyone makes his purchases Monday morning. Let us suppose that on a certain Saturday wages are reduced from W to $W-K$, there being X men employed. Obviously after wages have been paid out Saturday evening, wage-earners as a class find their weekly income reduced from WX to $(W-K)X$ and employers find theirs increased from, say, Q to $Q+KX$.[12] This is what happens in the first instance. Now of course it is possible that the banking system may sell KX worth of bonds to the employers the first thing Monday morning, in which case the consequences deduced by Professor Pigou will follow.[13] Or maybe the employers will pay off loans or hoard, maintaining, as Mr. Harrod supposes, their real expend-

[12] This really means that their balances are reduced by less than they otherwise would have been.

[13] Pigou says (cf. above) that after the wage-cut total money expenditure on an unchanged real income will be reduced from $Q+WX$ to $Q+(W-K)X$ per unit of time. But this implies the disappearance of an amount of money equal to KX, and this must be accounted for. Money does not disappear automatically; it requires action on the part of someone. There are various ways by which Pigou's result might be brought about, only one of which is mentioned in the text.

iture constant.[14] But it seems to me far more likely that, having a larger money income, they will increase their money expenditures.[15] If they spend all the KX extra, prices need not fall at all, and real wages may be reduced by as much as money wages. In any case, Professor Pigou's conclusion that a reduction in money wages is likely to lead to a reduction in real wages seems to be established *a fortiori*. It is Mr. Harrod's failure to see that a reduction in money wages does, in fact, in the first instance increase non-wage-earners' money income and thereby act as a stimulus for them to expand purchases which leads him to a contrary view.

III

Professor Pigou has very little to say about the broader influences governing the demand for labor. The reason for this is, as he points out in the Preface, that what he has to say on the subject is largely contained in his *Industrial Fluctuations*. "In some degree this book and that are complementary to one another" (p. vii). This is obviously so and should be borne in mind in judging the present work as a complete theory of unemployment.

The implication throughout *The Theory of Unemployment* is that, apart from frictional obstructions, unemployment would be nonexistent if it were not for the fact that wage-earners habitually stipulate for a rate of wages higher than the "equilibrium" level. In a theoretical study this is doubtless the correct way to approach the problem. In any case it centers attention on what Professor Pigou has to say about "wage policy." It would be difficult to praise too highly these sections

[14] Let us suppose for a moment that they do maintain their real expenditure constant and that all goods are perishable (to avoid the possibility of addition to stocks). What does this imply? That employers reduce their money expenditure in exactly the same proportion as the wages bill has fallen. This at first sight may not seem unreasonable, but consider where exactly the same reasoning leads in an extreme case. One man receives £2 on Saturday evening; he loses half of it on the way home. If everyone is to maintain real expenditure constant on Monday morning, everyone must reduce his money expenditure by exactly half. This is really the meaning of Mr. Harrod's algebra on p. 23.

[15] What they will do depends essentially on their anticipations. To argue that a cut in wages affects the anticipations of non-wage-earners in an unfavorable sense appears to me to be in flat contradiction to the facts. If they are affected favorably enough, they may well reduce their balances below the previous level, in which case real wages will be reduced more than money wages—a result which seems not unlikely. Mr. Harrod argues quite rightly that non-wage-earners could have reduced their balances without the wage cut, and thus have benefited at the expense of the wage-earning class. But he appears to be in error in neglecting the initiating impulse which a reduction in wages may provide.

of the book. They are an outstanding example of what can be accomplished by the method of "informed common sense" in the economic field. Every student of labor problems should certainly read chapters ii and iii of Part V.

Part IV, "Monetary Factors Affecting Variations in the Level of the Real Demand Function for Labor," is easier going than Parts II and III and will repay careful study. It is in effect an interesting variation on the Cambridge theory of money by one who did much more than is commonly supposed to develop the "Cambridge" viewpoint. Considerations of space unfortunately make it impossible to discuss this part here.

Professor Pigou has prepared a list of corrigenda which rectifies many of the most serious errors and misprints, but there remains a distressingly large number uncorrected. Some of these are obvious, and the reader will have no difficulty correcting these as he goes along, as e.g., on page 158, line 20,

$$\left\{\frac{x}{x}\div\frac{w}{w}\right\}$$

should, of course, read

$$\left\{\frac{dx}{x}\div\frac{dw}{w}\right\}.$$

Others, however, are more difficult to trace, and may cause considerable trouble. It is with the hope of clearing up some of these cases that the following suggestions are appended.

On page 42 Professor Pigou obtains an expression for the rate of wages in a single industry as follows: Let $\psi'(y)$ be the demand price for y units of new output at works, $f'(y)$ the supply price of y units of raw material; then the demand price of y units of "processing" is $\psi'(y)-f'(y)$. If x is the number of units of labor that yield y units of processing, i.e., $y=\phi(x)$, then the demand price per unit of labor is obviously the demand price per unit of processing multiplied by the number of units of processing yielded by one unit of labor. Symbolically, the demand price for labor

$$w=(\psi'-f')\frac{dy}{dx}=\frac{d\psi}{dx}-\frac{df}{dx}.$$

Later on Professor Pigou calls the function ψ a demand function and f a supply function. Both of these functions are indeterminate to the ex-

tent of an arbitrary additive constant (so far as any data introduced by Professor Pigou are concerned), and neither is a supply or demand function in any recognized sense of the terms. The latter—namely, f—can of course be interpreted as the total cost function; but I am at a loss to attach any economic significance to ψ, which is, of course, the integral of an ordinary price-quantity demand function.[16] As a matter of fact, Professor Pigou himself never really uses anything but the derivatives of these functions, and it would have been much more consistent and less confusing if he had never introduced ψ and f at all.[17]

On page 55 there is an obvious contradiction. Near the top we read: ". . . . If ϕ'' is positive (i.e. with increasing returns)" and several lines from the bottom ". . . . If ϕ'' is positive, i.e., under condition of diminishing return." ϕ is the productivity function of labor in respect of processing; ϕ' is therefore the corresponding marginal productivity function. The condition for increasing returns is therefore given by $\phi''>0$, and the second of the foregoing quotations must be altered accordingly.

On page 82 the following passage occurs: "Whether that increases or not depends upon whether dx/dw, namely $(Ed+1)$, namely

$$\frac{\frac{1}{Er}+1}{\frac{1}{Er}+\frac{k}{e}}$$

is positive or negative; which in turn depends on whether Er is (numerically) greater or less than unity." Now on page 81 it is established that

$$\frac{dx}{dw}=\frac{x}{w}\,(Ed+1)\,,$$

[16] Consumer's surplus has no relevance in this particular context. It should be noted that ψ has nothing to do with total revenue from the commodity. It is only true for a single competing firm that the first derivative of total revenue is equal to demand price.

[17] On p. 110 he says, "From this equation [i.e., that given above for the rate of wages in a single industry] it is apparent that the quantity of labor demanded in respect of any given real rate of wage will be altered if alterations take place in ψ, ϕ and f." But, as noted above, both ψ and f can be altered by adding an arbitrary constant without changing w or x at all.

Again in the discussion of the effects of monopoly on the demand for labor, Professor Pigou gets confused by his failure to be consistent. He assumes (pp. 54 and 55) that "ψ'' and f'' are both constant, that is to say the functions ψ and f are linear." This is obviously wrong; the way to correct it consistently with the rest of the argument is to read ψ' and f' for ψ and f.

and the general formula for Ed is given as

$$\frac{1-\frac{k}{e}}{\frac{1}{Er}+\frac{k}{e}}.$$

From this we get

$$\frac{dx}{dw}=\frac{x}{w}\left(\frac{\frac{1}{Er}+1}{\frac{1}{Er}+\frac{k}{e}}\right).$$

Of the terms making up this expression, $1/Er$ is always negative, k is always positive, and e is assumed to be negative. Hence the denominator is always negative and the whole expression only positive when Er is (numerically) less than 1. Hence it would seem that the sentence quoted should read as follows: "Whether that increases or not depends upon whether dx/dw, namely,

$$\frac{x}{w}(Ed+1),$$

namely

$$\frac{x}{w}\left(\frac{\frac{1}{Er}+1}{\frac{1}{Er}+\frac{k}{e}}\right)$$

is positive or negative; which in turn depends on whether Er is (numerically) less or greater than unity."

On page 100 we read:

> A little reflection shows that the fraction
>
> $$\frac{\text{percentage change in real rate}}{\text{percentage change in money rate}}$$
>
> in any given set of conditions is not an absolute quantity, but is, in general, different for one size of percentage change from what it is for others. If we write, as heretofore, Er for the elasticity of the real demand for labor and Em for the elasticity of money demand, in respect of any given quantity of labor demanded, the above fraction is given by Er/Em for very small, but not for large, percentage changes in this quantity. For, in general, with a given per-

centage change in the quantity of labor demanded, Er times this and Em times this only gives the associated percentage changes in real and money demand prices if the given percentage change in quantity is very small.

Let us write Wr, Wm, and x for real rate, money rate, and quantity demanded, respectively. Then Pigou's fraction is given by

$$\frac{\frac{dWr}{Wr}}{\frac{dWm}{Wm}}.$$

Now

$$Er=\frac{\frac{dx}{x}}{\frac{dWr}{Wr}},$$

and

$$Em=\frac{\frac{dx}{x}}{\frac{dWm}{Wm}},$$

and hence this same fraction in terms of Er and Em is given by

$$\frac{Em}{Er}\left(\text{not } \frac{Er}{Em}\right).$$

In a similar way it can be shown that a given percentage change in the quantity of labor demanded must be divided by Er and Em to get the associated percentage changes in real and money demand prices.

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