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PRELUDE TO A RECONSTRUCTION OF ECONOMIC THEORY. A CRITIQUE OF SRAFFA

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It is too soon to make a firm assessment of Sraffa in the long development of economic analysis. That he launched a damaging attack on neoclassicism is clear, at least to We Happy Few of admirers. Never again should one write $Q = f(L,K)$ and discuss the subtleties of $\partial Q/\partial K$ as determining profit or interest. What is less clear to me is the positive aspect, i.e. where do we go from here? In accomplishing his announced, destructive task (in his one slim volume), he defined, described and constructed a unique invariant measure of value, his standard commodity, thus resolving a problem basic to any exact science, but hitherto unresolved in economics. This standard commodity is, I belive, the denominant eigenvector of his linear formulation of a given economy: with it is associated the dominant eigenvalue of the system. My contention is that if one is going to use one eigenvalue, one could and should use all n along with the 2n associated value and output eigenvectors. Had he done so he would have opened an alluring analytic path through the impenetrable obscurities of our complex problems. In this way he might have offered a reconstruction of economic theory instead of his negative, destructive result, one which shows a crucial emptiness in current theories, but which exhibits no substantive, alternative procedure.

I shall attempt to explain briefly how and why Sraffa restricted himself so severly to prelude to a critique. He begins by considering the real wage and the profit rate as free variables, so that given the real wage, the profit rate is determined inversely. But when he gets down to the more precise analysis, he drops the real wage and takes, wisely, the profit rate as his single independent variable: it then determines relative shares. But the relative share of wages is by no means the same of the real wage: one has only to think of any measure of real wages over the past century in comparison with the share of wages over the same period. The profit rate sets profits and profit share as well. Since in his simplified system, wages and profits add to net product, the share of wages is also determined, since the two shares are identically equal to unity by definition. He relates profit rate to wage share, w, thus comparing two rather different things. Had he related share of profits, v, to share of wages, he would have written

$v = 1 - w$. He goes on to show, with great skill, that, even with a given output and technology, profit rate can be anything from a maximum, at a subsistence minimum wage, to zero where wages take all. Relative prices can vary in such a way as to make this possible. What he does not go on to do is to develop an analysis of how to explain the determination of the level at which the profit rate gets established. There is only the astonishingly unfortunate statement that "It is accordingly susceptible of being determined outside the system of production, in particular by the level of money rates of interest".

In my wiew this is a fundamental mis-specification of the problem. Surely profits are a surplus, as Marx, Sraffa and many others have said: it is what remains after meeting the necessary costs of goods and labour (ignoring, of course, rents). Either from a Marxist or an orthodox point of wiew, one cannot start with a profit rate and then pay labour what is left, which may be high, low or even negative! Both Marx and the non-Marxist, von Neumann, take, along with technology, the real wage as a given, well defined quantity, and *then* determine profits and the profit rate. Starting from a logically sound but unrealistically superficial procedure Sraffa provides no useful theory of how either the real wage or distributive shares may actually be determined. I suggest that at least one reason for this remarkable evasion of deeper problem is that the same type of difficulty arises with the determination of the real wage as he has shown exists with that of the real quantity of capital. I find this confirmed by his remarks on p.33. "The last steps of the preceding argument have led us to reverse the practice followed from the outset, of treating the wage rather than the rate of profit as the independent variable or 'given' quantity.....And when the wage is to be regarded as 'given' in terms of a more or less abstract standard, and does not acquire a definite meaning until the prices of commodities are determined, the position is reversed. The rate of profit, as a ratio, has a significance which is independent of any prices, and can well be 'given' before the prices are fixed." Both profits and the wage arise in monetary form and both profit and wage require valuation in terms of prices. The variation of either one requires a variation in prices, which

in turn alters the real quantity to be measured. Sraffa devised and defined the standard commodity to give an invariant measure for the profit rate, and that is higly successful, since all economists agree that in pure theory, there should be only one common profit rate. It does not work well with the real wage, for a variety of reasons: Sraffa may have sensed, without formulating, this difficulty. He correctly states that the rate of profit is independent of prices, whereas the real wage is not: it is for this reason that the rate of profit uniquely determines relative shares. By contrast the money wage rate does not and the real wage, which does, is only measurable, like the quantity of real capital, *after* the determination of prices. But also by contrast, the rate of profit applied to the real quantity of capital determines real profits and hence accumulation, whereas the rate of money wages applied to the quantity of employment does not determine utility but rather only effective demand and, together with accumulation, real growth, which Sraffa chose to ignore.

With Ricardo's corn economy, all is in order: goods cost is in corn, wages are paid in corn, product is corn and the difference is profit in corn, so that the rate of profit arises from quantities all with the same dimensions, guaranteeing invariant measurement. In such a case, logically, one can either say given the corn rate of profit the real wage is determined, or that given the real wage, profit and profit rate are determined. What one wants to know however, is not only how to measure the real wage but, more importantly, how it is determined. The purpose of an invariant measure is to provide a standard unaffected by, and unaffecting any variations in the thing to be measured: then, and only then, one may be able to explain and predict behaviour. From Sraffa all one can say is that, with any given technology and any given real wage, there must arise a measurable surplus, which is not a cost but which yields a well defined profit rate. The difficulty is that the real wage is not well defined because of the interdependence of the n goods and n prices. Ricardo solved the problem by taking the real wage as equal to subsistence (in the long run): Marx, following him, took the real wage as given, but not by subsistence.

To analyze the problem, one needs the duality of output as well as value, in order to formulate the demand for and supply of labour in general. It also means that one has to pass from static to dynamic analysis to see how the real wage evolves. Marx has been exorcized by orthodox economists, but it was he who first saw certain essential features of the problem. Though he built on a Ricardian foundation, with a tendency to give primacy to value theory, he never made the mistake of ignoring output and its dynamics. Thus it seems he is a little known forerunner of Keynes: he discovered effective demand in the form of the realization problem; he treated unemployment as the industrial reserve army, not as an equilibrium but as cyclical, and endemic in capitalism.

To analyze the real problem, I shall assume n single product sectors, with, in principle, an empirical technology matrix which is indecomposable (or else we take separately indecomposable sub-sets). The structure can then be completely specified by n distinct eingenvalues with n associated eigenprices and n eingenoutputs. There is one dominant eingenvalue which is real, positive and larger than all the others: it, with its associated output eingenvector, defines Sraffa's standard commodity. By transforming to this appropriate coordinate system, we have n standard commodities, or n types of corn, each corn is produced with inputs measured in own corn, wages are measured in the same corn and corn profits accrue as the surplus after deduction of corn inputs and corn wages. The problem of defining and measuring the *real* wage simply disappears. All the homogeneous human labour is paid the same money wage, w, and faces the same set of actual prices, and are deemed to have the same real wage, undefined in a psychological or welfare sense, but precisely specified in terms of economic consequences. The real complexities of interdependence of prices are not denied but are split into two separate steps. When one transforms back, after having solved either the static or the dynamic problem, the fundamental interdependence is taken full account of. We have not only separated variables, so that each depends only on itself, but we have also separated distribution from the troublesome accounting problem posed by interdependence. To see Sraffa's problem, we need to follow

his example and treat labour inputs separately from the others. Labour input per unit of output a_l , can be transformed similarly, the money wage and profit rate, π , being scalars are unaffected: by measuring in deviations from equilibrium, government outlay, fixed costs, etc. may be ignored. Therefore in equilibrium, with wages paid in advance,

$$p_i = (1 + \pi)(\lambda_i p_i + w a_{li}), \ i = 1,2,...,n,$$

were the λ_i are the eingenvalues, so that distributive shares in gross product are

$$1 = \lambda_i + (w/p_i) a_{li} + \pi \left[\lambda_i + (w/p_i) a_{li} \right].$$

The real wage is unambiguosly defined and measured. It is evident that one can say, logically, if the real wage increases, profit rate decreases, or equally that if the profit rate increases the real wage must decrease. It is also immediately evident that a change in either one will require a change in all eingenprices. There are, however, two differences between the two rates. In generalized coordinates the share of capital is the same for all sectors, whereas the wage share is different in every sector. The second difference arises from the fact that wage contract is for a money wage, w, not w/p_i.

A change in π, a single number, alters profits and the share of profits (and consequently the share of wages inversely). By contrast, a change in w is more complicated: if prices change less, then it is a change in real wage, causing an inverse change in profits and rate of profit. Usually a change in w means some sympathetic change in prices, so that the real wage changes by less, and also rate and level of profits. Or, in the extreme case, prices may change in proportion, i.e. p_i changes so as to keep w/p_i constant, with no effect on profit rate. Because firms use mark-up on variable cost, the usual result is that prices rise but by less than w, so that initially there is a smaller rise in the real wage. Then, for a single rise in w, as the cost of goods rise, there is a sequential rise in p.

The turbolent history of capitalism exhibits behaviour quite different from the simplicities of Sraffian analysis. There are two aspects, interdependent but distinct, the one relating more to value and the other to output. The dominant driving force of capitalism, the search for profit, generates a rate of growth which reduces unemployment towards zero, forcing an eventual deceleration of growth and creating an increasing scarcity of available, trained and disciplined labour force. The former reduces investment leading to falling demand and output: the latter brings a real wage rising faster than productivity and, subsequently, a rising share of labour. This latter is further accentuated by the rapid fall in profits due to excess capacity. The depressed phase is characterized by substantially constant wage rates and prices along with low output and profits. This puts heavy pressure on producers to search for labour saving innovations, thus further adding to unemployment and weakening the bargaining power of labour. Low profits and excess capacity do not inhibit,. rather they encourage, innovational investment, lowering costs, raising profits, and stimulating demand. The ensuing expansion of output encourages the further adoption of innovations, thus permitting the real wage rate and the real profit rate to rise together. The structure of production is slowly altered: all eigenvalues, prices and outputs change: the standard commodity has lost its invariance. Consequently the search for an invariant measure of value is, in pratice, illusory.

Though there is in principle a tendency to a single market rate of interest, there is no such thing for growth rates. This creates formidable complications, which are avoided by treating only the profit rate. However, if Schumpeter was right, as I think he was, in contending that in the stationary state the rate of profit/interest would be zero, then one cannot determine any positive level without consideration of the dynamics of output. This also helps in explaining an endemic tendency to inflation in periods of expansion: those sectors experiencing the most rapid growth of productivity can raise wage rates without raising price, and need to do so to attract a growing labour force. This in turn put pressure on all other less progressive sectors to raise wages in order to safeguard labour supply, with,

however, the consequence of varying rates of price inflation.

Since the bulk of commercial investment is financed out of profits, one arrives at the conclusion that the share of wages cannot remain too low because it allows a rate of growth of output which cannot continue. On the other hand, it cannot remain too high because it engenders excess labour through too low a growth rate, thus destroying the conditions which created the high wage share. In this way one can see why dynamically the share of wages cannot be too high and why it cannot be too low, and yet why it is first the one and then the other. In this fashion capitalism's auto control is faulty in that it tends to produce alternating states of excess capacity and excess labour followed by shortage of capacity and shortage of labour. Therefore the longrun average share of labour with its associated growth rate must match the growth of available labour force. Proceding in this way one can see the costituent elements in determining a specific share of wages for each economy. This distribution may be quite different for each individual economy, depending on the rate of technological advance in saving labour per unit of output and on the achieved growth rate of available labour force. The difference between countries of these two elements helps to explain some of the differences in growth rates.

How then are we to assess Sraffa's single, slim volume? By a meticulously elaborate reformulation of Classical economics he managed to damage a central point in the Neoclassical theory of the distribution between wages and profits. By the way in which he phrased his reformulation, I long thought he was also aiming to put marx, the last of the Classicals, on a firmer footing, but he resolutely refused to accept my view, and I now recognize that this formed no part of his aim. Considering his theory on its own merits, I finf it too negative: neoclassical distribution theory can be attacked on broader grounds as capitalist apologetics. Surely what we want is positive guidance as to the forces which *do* determine the distribution of income and wealth.

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