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A COMMENT ON HOLLANDER ON SRAFFA AND THE ‘MARXIAN DIMENSION’

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1. Introduction: Hollander’s assessment of Sraffa’s interpretation of Ricardo

The contribution by Professor Hollander (2000) discusses Marx's influence on Sraffa's thought. While enquiries into this matter certainly have a historical and biographical interest, the paper steps beyond this kind of interest. In fact, in this article, Professor Hollander maintains that this influence caused a *bias* in Sraffa's interpretation of Ricardo (pp.192-97).¹ However, such a claim on Professor Hollander’s part requires a demonstration that Sraffa’s conclusions were indeed led astray by the alleged influence.² This is therefore the central question, and will be taken up in the present comment. Only in the conclusion will I touch briefly on the question of whether the claim of a Marxian influence on Sraffa’s interpretation of Ricardo is indeed correct from a biographical and historical point of view.

What exactly is wrong with Sraffa's interpretation of Ricardo according to Professor Hollander? More clearly than in the past, Hollander concedes that Sraffa’s interpretation concerning the determination of the rate of profit is a correct, if only 'truncated' view of Ricardo:

‘The Sraffian perspective on Ricardo – at least the Ricardo of the *Principles* - holds up well as far as it goes. The problem is that it truncates Ricardo by concentrating on the profit rate formula emerging in his chapter 6 and applied in chapter 1 to calculate equilibrium prices’ (p. 197);

According to Hollander,

‘[...] this constrained view neglects a broader body of evidence pointing to the market determination of wages and prices and their interdependence. Though a given wage permits (*ceteris paribus*) a forecast of the average profit rate independently of prices, and thus entails the priority of distribution, the wage is *not* in fact a datum but is determined by the labour market and played upon both by the growth rate of capital (motivated by the return on capital) and the pattern of final demand, the latter itself partly governed by the (variable) income distribution.’ (p. 195).

The above passages indicate that the central point is the determination of the wage rate. The ‘surplus’ interpretation advanced by Sraffa requires that the wage and the outputs be taken as given when proceeding to the determination of the profit rate. On the other hand, according to Hollander

¹ All references to pages alone are to Hollander (2000)

² An example may help clarify the point: in his intellectual endeavours, Newton might have been motivated by his belief in natural laws of divine origin, yet no one would want to claim that his scientific contribution was ‘biased’ or otherwise vitiated by this belief. More generally, any deep commitment to research in any field is most likely to be motivated by some kind of 'passion', be it moral, social or otherwise. However, results must of course be evaluated on their own merit, not on the basis of what motivated the research that created them..

there is interdependence between prices, outputs and wages: that is, Ricardo's economics 'allows for interdependence between, and the simultaneous determination of, prices, output levels, and the distributive variable' (p. 109). Accordingly, Sraffa's interpretation 'neglects [...] that for Ricardo the wage is determined by labour market pressures [...] is an endogenous variable partly dependent on the structure of final demand; distribution is not divorced from the pricing process, except in the context of the formal expository examples of Ricardo's chapters 1 and 6' (p. 203).

Therefore, Hollander's claim here, as in several earlier contributions,³ is that in Ricardo we find a neoclassical general equilibrium type of analysis, assigning an important role to what Hollander calls 'demand and supply analysis' (203). In fact, Hollander's own claim in this respect becomes a little less clear when he stresses that in Ricardo 'the market determination of the wage is elaborated in the context of secular tendencies' (p 208), where such secular tendencies clearly refer to the interdependence between wages and the growth rate of capital as mentioned in one of the passages quoted above. While the reference to the interdependence between patterns of demand and distribution is reminiscent of the indirect substitution mechanisms found in the marginalist approach, secular tendencies refer to a different type of relationship that does not, by itself, imply a similarity with marginalist analysis. This point will be taken up in the following section, while in the subsequent ones the alleged similarity with 'supply and demand analysis' as it is found in neoclassical theory will be discussed.

However, at this stage, it can already be noted that there is a striking conflict between Hollander's claim that in Ricardo wages are determined in a manner similar to that found in marginalist theory and the conclusions Ricardo draws in the chapter on machinery. In that chapter, Ricardo claims that the introduction of machinery can cause unemployment, which may be corrected *only* by further capital accumulation (and hence *not* by changes in labour demand – at a given stage reached by capital accumulation - caused by lower wages).⁴ This is so much at variance with marginal theory to have perplexed, for example, Wicksell ([1924] 1981) and Schumpeter ([1954] 1982, p. 683). As both point out, the workers made redundant by the introduction of machinery, according to 'fundamental economic principles' (*i.e.*, to marginalist theory), would

³ See for example Hollander, 1979

⁴ It should be noted here that the novelty of the conclusions reached in the chapter on machinery consists in the admission that the introduction of machinery can *diminish* employment and not in the admission of the possibility of persistent unemployment as such. The latter was in fact already recognized by Ricardo before his change of views concerning the effects of machinery, as in his parliamentary speech *On Mr Owen's Plan* (V, pp. 31-2; discussed in Stirati, 1994, p. 136 and ff)

compete for employment, cause a fall in wages, and hence render more profitable the adoption of processes with a higher labour intensity, leading to a return to full employment.⁵

More generally, if Hollander were right in claiming that Ricardo regarded wages as determined simultaneously with prices, output and the profit rate, then his suggested interpretation begs the question of what would be the purposes and analytical basis for Ricardo's procedure in determining profit rate and prices in chapter 1 and 6..

In the following sections, we shall more closely examine Hollander's arguments concerning the role of 'supply and demand analysis' in Ricardo's theory of wage determination.

2. 'Secular tendencies' and the determination of the wage rate.

There are two aspects of the problem of wage determination, one of which we can term 'static', and which relates to the role of 'demand and supply' in a given situation, characterized by a given population and a certain stage reached by capital accumulation. The other, which Hollander refers to when he mentions 'secular tendencies', we can term 'dynamic', and addresses the interaction between wage rate and rates of growth of population and capital. The latter interaction seems to be what Hollander as well as many other interpreters of Ricardo often have in mind when referring to the role of 'demand and supply' in the determination of wages.

As indicated by the passage cited in the introduction, Professor Hollander maintains that one of the ways in which the role of demand and supply in determining wages manifests itself is the 'secular' analysis of the interplay between population growth, capital accumulation and wages. He also maintains that this interplay can be understood only by means of simultaneous determination of wage and profit rates by means of the functional relationships between wage, population growth, profit rate and capital accumulation. According to Hollander, this would destroy any possibility of regarding Ricardo's framework of analysis as a 'surplus approach', that is, one in which given the wage rate, profits and the other incomes emerge as a surplus.

It has been argued in earlier contributions that the relations between wages, population and capital growth were not really conceived by Ricardo and other classical economists as functional relations, and that even the direction of the effects were regarded as dependent upon historical circumstances (see Stirati, 1994: 119-20, concerning population, and Hollander, 1979, p.319, n. 39 concerning the 'vagueness' of the connection between rate of profit and accumulation). However, and purely for the sake of argument, let us concede this proposition and imagine that the relations

⁵ In a number of papers, Professor Samuelson had attempted to argue that Ricardo's conclusions can be regarded as consistent with fundamental economic principles as they are understood today by neoclassical economists. His contribution cannot be discussed here in detail (on this,, see Garegnani, 2007); however the number of his contributions along these lines seems to suggest that the author was not fully satisfied with them.

have a definite functional form. Would that, *per se*, justify the conclusions reached by Hollander (and, indeed, suggested by many other scholars)?

Suppose we can write:

$$1) p = bw - a$$

where a and b are given parameters, p is the rate of growth of population, and w is the real wage rate

$$2) k = c - dw$$

where c and d are given parameters and k is the rate of growth of capital. Let's further assume a given proportion between capital and labour, so that k is also the rate of growth of employment.

If we make the usual assumption about the effects of the difference between k and p on the wage level that is: $k > p$ will cause wages to rise and *vice versa*, we can impose an equilibrium condition that will be the one, it is maintained, towards which the system will tend:

$$3) w^* = (c+a)/(b+d)$$

with w^* the 'dynamic' equilibrium wage realizing equilibrium between rate of growth of population and employment. But would we observe full employment in that position? No, not at all, except *by a fluke!*⁶ Without a decreasing demand schedule of the *static* type, there is no endogenous tendency to full employment. Thus, even if we could attribute dynamic mechanisms leading to the equality between rates of growth of population and employment to the classical economists that would not rule out the presence of unemployment. However, if there is some unemployment, there are only two possibilities. Either i) we accept the marginalist notion of competition, and conclude that even if condition 3) holds, wages would *tend to zero* and population would 'die like flies' (see Samuelson, 1978:1423) until it reaches a level adequate to the given demand for labour; this adjustment mechanism was certainly not to be found in the classical economists, and at the same time is hardly suggestive of neoclassical 'market clearing'; or ii) we would have to accept that wages will not tend to zero because, notwithstanding competition, they are regulated by customary and institutional factors (see Levrero, forthcoming). This, of course, leads us back to the 'surplus' interpretation we find in Sraffa: a given wage (determined by historical and socio-economic factors), in any *given period* (that is, with given population size and stage of capital accumulation), and hence, an excess of output beyond reintegration of the means of production and wages.

Thus, 'supply and demand elaborated in the context of secular tendencies', to use Hollander's phrase, do not, by themselves, challenge the 'surplus' interpretation of Ricardo. What would be necessary but, which I would argue has not as yet been found despite much effort in this direction, is the 'static' demand function for labour (on this point, see also Garegnani, 2002, pp.248-49, and

⁶ On this point, see also Stirati (forthcoming).

2007:212-26). Thus, in the following sections, attention will be given to those arguments advanced by Professor Hollander that appear related to the existence of such a 'static' demand function in Ricardo's economic analysis.

3.'Supply and demand analysis' in commodity markets and the 'interdependence' with distribution.

Although Professor Hollander maintains that the core of the problem with Sraffa's interpretation of Ricardo has to do with how wages are determined, the arguments advanced in the paper mostly refer to the role of supply and demand in commodity markets. This seems to suggest that Hollander attributes to Ricardo the existence of indirect substitutability mechanisms as the basis for a 'static' inverse relation between wages and demand for labour in classical theory. Prior to discussing Professor Hollander's specific arguments on this question, for the purpose of clarifying the different nature and treatment of the 'interdependences' in marginalist and classical theories, it may be useful to start by briefly recalling their form in long period general equilibrium marginal theory.

3.1. 'Interdependences' in the traditional marginalist approach

In general equilibrium marginal theory, a change in wage would affect input proportions both directly and indirectly: directly, through the choice of techniques used in each industry; indirectly, through the changes in relative prices and consequently, due to the decreasing marginal utility principle, in the composition of output and hence in labour demand, with the other factors of production taken as given in quantity and fully employed. In turn, any change in tastes or other exogenous change in demand patterns would induce a change in relative prices since it causes a rise (fall) in the returns of the (fully employed) factors used more intensely in the production of the goods the demand for which has increased (decreased).

In this framework, market clearing⁷ is brought about by the mutual adjustment of demand and supply in both good and, crucially, factor markets, via price flexibility. For this adjustment to take place and the equilibrium to be stable it is essential that demand curves for production factors be

⁷ It can be noted here that market clearing in commodity markets in marginalist theory is very different from the process by which the production of a commodity is brought to the level of effectual demand in the classical approach. In the latter, all that is required is that the market price should exceed the natural price when effectual demand exceeds supply and *vice versa*: capital mobility in response to the (transitory) deviation of actual from normal profit rate will then determine the required changes in the levels of production. This does not rely on demand and supply functions, and does not entail a *mutual* adjustment of demand and supply through the price mechanism. It is the supply of the commodity that adjusts to the given effectual demand - it therefore appears quite misleading to use (as Hollander does, p. 190 and ft 7) the term 'market clearing' for this process of adjustment and, in addition to this, claim that Garegnani (1990), in describing it, attributes the idea of 'market clearing' to the classical economists!

decreasing.

Therefore, the question is whether such specific ‘interdependencies’ can be found in Ricardo. In the following paragraphs, I shall discuss Professor Hollander's arguments with the aim of establishing whether they support the existence in Ricardo of relations between variables of *the same nature* as those found in the marginalist approach.

As already mentioned, Hollander’s arguments do not directly address the existence of a decreasing demand curve for labour of the 'static' type, but rather discuss several instances of ‘supply and demand analyses’ in connection with commodity markets. In this regard, it may be useful to recall that in the traditional marginalist general equilibrium framework of analysis, long period equilibrium relative prices of commodities are affected by changes in demand only in so far as these cause a change in income distribution; with given factor prices no change would take place (*i.e.* with given factor prices long run supply curves at industry level are horizontal).⁸ Thus, what is relevant for the present discussion is whether the examples discussed by Professor Hollander can establish the existence in Ricardo of the same approach to the analysis of interdependence between commodity and factor markets as we find in marginalist theory.⁹ In the following paragraphs, I shall only discuss those arguments that appear to point at establishing the existence of such a connection between commodity markets and distribution, and consider whether they can support Hollander’s view that wages in Ricardo were not taken as given when determining the rate of profit and relative prices, and that they were regarded as dependent on demand and supply functions of the *static* type.

3.2 Equalization of the rate of profit across industries and the demand curve

Professor Hollander maintains that Ricardo indicates links between patterns of demand and distribution in two causal directions: from normal wage level to patterns of demand and *vice versa*. The latter, that is the possible influence of the composition of demand on wage levels, which is

⁸ Following the usual assumption of neoclassical theory, technical returns to scale are assumed constant at industry level (Wicksell, 1934, p 126 ff). Of course, constant technical returns to scale may be associated with non-constant costs of production if changes in output cause changes in factor prices.

⁹ Actually, two of the arguments and examples advanced by Professor Hollander do not appear to be relevant in establishing this point; that is, in suggesting a link between commodity and factor markets based on indirect substitutability mechanisms that would lead to a decreasing demand for labour of the static type, and will not be discussed here. The two arguments are: 1) that quantities produced adjust to the quantity demanded (*i.e.* Smith's 'effectual demand': the quantity demanded at the natural price). This is undoubtedly correct, and is the necessary basis for the tendency towards equalization of the rates of profits across industries following a change in the patterns of demand; but it has nothing to do with the existence of demand curves either in commodity or factor markets (see also ft 6 above);. And 2) that cost *may* under specific circumstances (increasingly) depend on the quantity demanded of a given commodity. In this regard the examples provided do not establish a *general* connection between quantity and costs depending on systematic changes in the remuneration of the fully employed factors used more intensively in the production of the commodity, the quantity of which has increased and, hence, a similarity with neoclassical theory.

treated by Ricardo in the machinery chapter, will be dealt with in section 4 below; I shall now discuss the former. Professor Hollander's main argument in this respect is based on 'making sense' of the process of profit rate equalization across industries *after a change in wages* in the manner described by Ricardo.

Ricardo maintains that when changes in the natural wage occur, this will cause, at the natural prices holding before the change, a difference in rates of profits across industries. Competition between capitals will then lead to a change in prices such that the rates of return will tend to become uniform again. This is taken by Professor Hollander as an indication that, underlying Ricardo's analysis, there must be a supply and demand mechanism as it is the only way to 'make sense' of this adjustment. Let us begin by discussing the mechanism suggested by Hollander and then see i) in what ways it contradicts Ricardo's clearly established views and ii) in what other ways sense can be made of Ricardo's statement.

For the purposes of evaluation, Hollander's reconstruction of the mechanism can be re-proposed here in more explicit terms. On the basis of a passage by McCulloch explaining Ricardo's views, it is maintained that, with a given *numeraire*, if wages increase, at the initial natural prices the rate of profit will fall in those industries that use labour in greater proportion relatively to those that use proportionally less labour. This in turn will lead to capitals moving away from labour intensive industries and towards less labour intensive industries.¹⁰ According to Hollander, the process thus described must imply a *permanent* change in the quantities supplied and demanded of the two types of commodities. That is, in the new uniform rate of profit situation, the natural price will be higher than before in labour intensive industries and lower in less labour intensive ones, and the quantities demanded and produced must have fallen in the former set of industries (from which capitals had been withdrawn) and increased in the latter set of industries. Accordingly, it seems to be inferred, though not explicitly stated, that the higher wage would have also induced a diminished demand for labour in the economy as a whole, just as in marginalist long period general equilibrium theory.

The process imagined by Hollander clearly requires that there is an inverse relation between the *natural* price and the corresponding effectual demands.¹¹ If his interpretation is correct, this relationship between the natural price and the quantity demanded of the commodity should be of an absolutely *necessary and general* nature, since Ricardo believed that competition would *always* bring about the uniformity of profit rates across industries. Yet very clear and bold statements that,

¹⁰ Of course, we now know that when there are heterogeneous capital goods the ranking of two or more processes according to their 'labour intensity' cannot be established in general, but only for a specific value of the rate of profit (or wage rate), and that a change in the latter can bring about a reversal of the ranking (see Sraffa, 1960, §48).

¹¹ Note that this is a different proposition than the statement that *transitory deviations* of actual (market) price from the natural price may bring about transitory changes in the quantity demanded.

particularly for items that are part of the wage basket, demand for commodities does not normally vary with changes in their natural prices can be found in the *Principles*:

‘M. Say says, that “the tax added to the price of a commodity, raises its price. Every increase in the price of a commodity, necessarily reduces the number of those who are able to purchase it, or at least the quantity they will consume of it.” *This is by no means a necessary consequence.* I do not believe, that if bread were taxed, the consumption of bread would be diminished, more than if cloth, wine, or soap were taxed’ (I, p. 237, *emphasis added*).¹²

Hollander’s reconstruction contradicts statements found in Ricardo’s *Principles*, and requires attributing severe inconsistencies to Ricardo. Before accepting such an interpretation, one should ask whether a different interpretation is possible, one that is more consistent with Ricardo’s writings as a whole.

In contrast to Hollander’s interpretation, for this purpose let us suppose the quantities demanded of the goods remain unchanged in the face of changes in natural relative prices;¹³ would it really be impossible to ‘make sense’ of the rate of profit equalization under this assumption? First, it may be noted that it can be expected that following a wage rise actual prices will tend to adjust to the new natural prices even without capital mobility *actually* taking place,¹⁴ just as one would expect it to happen as a consequence of the change in the price of any other inputs (similarly, one might add, to what would be the case in the Marshallian framework of analysis).¹⁵ Unlike McCulloch, Ricardo indeed implies that, in these circumstances, relative price adjustment requires the *possibility* of capital mobility across industries, but it is not necessary that the latter occurs:

‘the manufacturer, who, in a general rise of wages, can have recourse to a machine which shall not increase the charge of production on his commodity, would enjoy peculiar advantages if he could continue to charge the same price [...] but he [...] *would be obliged to lower the price of his commodities, or capital would flow* to his trade till his profit had sunk to the general level (I, p. 42, *emphasis added*).

¹² All references to Ricardo are to the volumes of his *Works* edited by Sraffa.

¹³ This is not *necessarily* the case, since such changes *may* take place, but, following Ricardo’s treatment of the matter, it is not possible to say *a priori* whether they will.

¹⁴ The case is different of course when actual (market) prices differ from natural prices because the supply of the commodity differs from its effectual demand: in this case a change in the levels of production is required as part of the process of gravitation of actual prices towards natural prices.

¹⁵ With reference to the familiar Marshallian supply and demand curve for a particular commodity, let us suppose an exogenous price increase for an input specific to the industry. Whatever its shape, the supply curve would shift upwards, generating an increased supply price for any quantity supplied (the opposite would happen in case of a decrease in costs). The assumption of a rigid demand curve, or of a perfectly elastic supply, would not alter this conclusion. This shows that even in the marginalist framework of analysis the process of adjustment in relative prices following an exogenous change in production costs *does not* require the operation of the usual Marshallian decreasing demand/ increasing supply schedules - so why would they be needed to explain adjustment within the classical framework of analysis?

Only in the case in which price adjustment did not occur, would capitals tend to move towards the industries with higher than normal returns and away from those with lower than normal returns (as stated in the passage by McCulloch quoted by Hollander). With given effectual demands, this would cause *a supply in excess of effectual demand*¹⁶ in some industries and *shortage of supply with respect to effectual demand* in others, thereby determining the change in prices that would lead towards the rate of profit equalization. However, the situations of excess/shortage of supply with respect to the given effectual demands could only be transitory. With given effectual demands, at the end of the adjustment process the new natural prices would hold, and the quantities supplied would be the same as in the initial situation. Indeed, that this is what McCulloch has in mind is suggested by his own wording in the passage quoted by Hollander (p. 207) concerning the effects of an increase in wages:

‘[...] the undertakers of those businesses, in which the whole or the greater portion of capital is laid out in paying the wages of labour, in observing that their neighbours, who have laid out the greater portion of their capital on machinery, are less affected by the rise in wages, will immediately begin to withdraw from their own businesses, and to engage in those that are more lucrative. The class of commodities produced by the most durable capitals [...] will therefore *become redundant* [...]’ (McCulloch 1825, pp. 303-4, emphasis added).

Here ‘redundant’ quite clearly means in *excess* of the effectual demand, and there is nothing to indicate, either in McCulloch’s or in Ricardo’s discussion, that the change in relative prices will normally lead to a change in effectual demands (and hence to a persistent change in the composition of output) in the direction suggested by Hollander.

3.3 Changes in distribution and patterns of demand, when consumption baskets differ among social groups

The other argument advanced by Professor Hollander concerning the influence of the wage level on the composition of output in Ricardo’s analysis is the fact that Ricardo refers to the influence that a change in distribution has on the structure of demand because wage and profit earners are social groups that have different consumption patterns. However, this is a relationship that has nothing to do with marginal substitutability principles. To the contrary, a marked differentiation of consumption patterns between income groups may well be a hindrance to the possibility of deriving a decreasing demand for production factors from substitutability in consumption. This point may be illustrated by means of an example based on an extreme case.

¹⁶ Following Smith’s definition, which is fully accepted by Ricardo, effectual demand is the quantity of a given commodity demanded at the natural price.

Suppose we have an economic system in which two goods (corn and rye) are produced by means of land and labour used in an annual production cycle, with given production coefficients. The price equations, with corn chosen as *numeraire*, will be:

$$wl_c + rt_c = l$$

$$wl_r + rt_r = p_r$$

Where w is the wage rate (in corn); l is labour input per unit of output, r is the rate of rent per unit of land and t is the land required per unit of output. Let's further assume that $t_c/l_c > t_r/l_r$ and that the consumption baskets of workers and land-owners are completely different and rigid, so that landowners consume only corn and workers only rye. Finally let us assume, consistently with the marginalist approach, that both land and labour are fully employed. In such circumstances, suppose an exogenous increase in wages (as could be caused by workers' combinations for example). Under the above assumptions, this will cause an increase in p_r ; but since rent has diminished, the composition of demand will change towards a higher proportion of rye with respect to corn. Hence, to satisfy this demand, a greater proportion of the (still fully employed) land would have to be used to produce rye and therefore cultivated by a higher number of workers than previously. The result is a demand for labour that increases with an increase in wages, rather than the opposite. In turn, this would imply that we could not use demand and supply schedules to determine equilibrium wages, since the intersection between the two would be reached only by an accident and not brought about by competition since, in such a situation, an excess demand for labour, which would cause competition among employers to raise wages, would in turn determine a further increase in labour demand. The example is also useful in that it reminds us that consumer choice under the principle of decreasing marginal utility is not principally meant in the marginalist approach to determine *the composition* of demand: the *position* of the demand schedule for each commodity in the usual graphical representation is in fact determined (for given income levels) by exogenously and arbitrarily given 'tastes' of the consumers. Hence, the main role of consumer theory is to determine *variations* in the composition of demand following a change in distribution and relative prices from which the decreasing demand schedules for factors can be derived (Garegnani, 1990).

Even though the influence of distribution on demand patterns owing to social differentiation in consumption baskets has nothing to do with the distinctive features of marginal theories, could it still be argued that it indicates the necessity of simultaneous determination of distribution and outputs? The answer must be no, since there can be no theoretical generalization of the connection. Consumption baskets may differ in various ways and degrees according to circumstances, and there is clearly no *general principle* to establish how consumption patterns will be affected by changes in distribution. Accordingly, attempts at formalizing a 'simultaneous determination' would be devoid

of any economic content.¹⁷ The only sensible procedure appears the one actually followed by the classical economists. That is, to take the wage level and the effectual demands for commodities as given when determining natural prices, while analysing the several aspects of the links between income distribution and effectual demands at separate, case specific, stages of analysis.

4. The 'static' demand for labour

It has been recalled in the introduction that attributing demand and supply functions for labour of the static (neoclassical) type to Ricardo is inconsistent with his conclusions about the possibility of persistent unemployment drawn in his chapter on machinery. Several arguments advanced by Professor Hollander concerning the role of 'supply and demand analysis' in the explanation of distribution have also been discussed in the previous sections. I shall now return to the role of 'static' demand and supply in determining wages, then proceed to comment on whether the influence of output composition on wages, one of the points raised by Professor Hollander is a further indication of the 'interdependence' between distribution, pricing and outputs.

As seen in the introduction, the central claim of the paper by Hollander is that wages are 'determined by labour market pressures' (p.203). The first reaction to this statement might be that, in a sense, it must of course be true that wages are determined by the market - by what else, in a market economy? However, the question is how did Ricardo (and Smith, and the other classical economists) understand the normal functioning of the labour market? And, more specifically, did they conceive of a systematic inverse relation between the wage level and the employment level similar to that found in marginalist theory?

Ricardo often refers to changes in the proportion between labour demanded and population as a factor that can influence the level of wages for fairly long periods of time - but it has been contended in Stirati (forthcoming) and elsewhere¹⁸ that not only the supply, but also the labour demanded are given quantities, and not functions of the wage rate. While all the arguments cannot be repeated here, some points can be briefly restated:

a) There is no reason to believe that in the case of labour, demand and supply should not have the same meaning as in the case of commodities where the 'proportion' between the two is that between the quantity demanded at the natural price and the quantity 'brought to market' (Smith, 1976, I, vii, 7-8). Hence those terms do not refer to functions, but rather to given quantities. In addition, there is some direct textual evidence that Ricardo did not conceive of an inverse relation between wage

¹⁷ Unless of course, one is willing to build not a theory, but a *specific applied model*, relating to a given actual situation in which such relations might be derived, always with some degree of approximation and arbitrariness, from statistical information (e.g. from social accounting matrices)

¹⁸ See Stirati, forthcoming, for further references.

level and labour demand. For example, he criticised Malthus's statement that an increase in the wage caused by 'combinations of artificers and manufacturers' would cause a fall in employment, stating that: 'a combination among the workmen would increase the amount of money to be divided among the labouring class' (Ricardo, VII, pp 202-3; for other passages and further discussion of this point, see Stirati 1994, p. 134).

b) If supply and demand are given quantities of labour, and not functions of the wage rate, they *cannot* possibly determine wages in the manner in which they do in marginalist theory, where supply and demand schedules contain all the information we need in order to determine the full employment equilibrium wage, which cannot be influenced by anything else.

Without a decreasing demand curve, there is no endogenous mechanism tending to ensure full employment, and some unemployment would indeed be a normal feature of the economy. Thus, the proportion (*i.e.*, ratio) between the quantities of labour demanded and supplied describes labour market conditions. This proportion (ratio) influences the worker's bargaining position and hence the wage level - as it does in the case of Smith and other classical economists.

c) There is much indirect evidence to support this interpretation. For instance, it is the only way in which it is possible to explain Ricardo's position on taxation, namely, the fact that he thought taxes on wages or on wage-goods ('corn') would not cause a fall in after-tax real wages (I, p. 166; VIII, p169). This conclusion is not compatible with a Marshallian determination of wages by means of intersecting demand and supply curves, since these would give rise to: i) no increase in the wage with a given (vertical) labour supply curve; or ii) with an elastic supply curve, an increase in wages lower than the one that would leave its after-tax purchasing power unaltered. In that framework of analysis, only a horizontal supply curve would give rise to a full adjustment such as assumed by Ricardo. However, an 'horizontal'¹⁹ supply curve could only be justified by the assumption of a *full population adjustment* in response to changes in wages. This in sharp contrast with Ricardo's statement that: 'no interval which could bear oppressively on the labourer, would elapse between the rise in the price of raw produce,²⁰ and the rise in the wages of the labourer' (I, p. 166).²¹

d) This interpretation is also the only way to make sense of the phenomenon of unemployment caused by the introduction of machinery that is so very puzzling for those who try to read Ricardo along marginalist lines. On this point, Hollander suggests that Ricardo's views are akin to the notion of substitution between capital and labour, since an increase in wages would tend to cause the introduction of machinery in order to reduce usage of labour. Yet there are fundamental differences.

¹⁹ Meaning that any deviation from a given value of the wage would give rise to indefinite fall or growth of supply, bringing the wage back to the given level.

²⁰ 'raw produce' refers here to 'corn' that is, wage-goods.

²¹ On the other hand, this statement by Ricardo is also in sharp contrast with the conclusions about the incidence of taxation derived on the basis of the wage fund theory by JS Mill and McCulloch (Stirati, 1999)

The introduction of machinery appears in Ricardo as an irreversible change in production methods. Of greatest relevance, he argues that the introduction of machinery can cause *permanent unemployment, which may only be corrected through accumulation*: ‘All I wish to prove, is, that the discovery and use of machinery may be attended with a diminution of gross produce; and whenever this is the case, it will be detrimental to the labouring class, as some of their number will be thrown out of employment’ (I, p. 390); the possible remedy to the unemployment thus created may come from the fact that ‘[...] with the same wants he [the capitalist] would have increased means of saving [...] But with every increase of capital he would employ more labourers; and, therefore, a portion of the people thrown out of work in the first instance, would be subsequently employed’ (I, p. 390). Indeed this is perhaps the utmost indication that Ricardo’s analytical framework is radically different from the marginalist one, and as we have recalled in section 1 above, it is precisely for this reason that it has puzzled so many interpreters of Ricardo.

On the basis of the four arguments listed above, once it is established that supply and demand for labour are given quantities, not functions of the wage rate, we can discuss the claim by Professor Hollander concerning the influence of the composition of demand on the wage level that was noted by Ricardo. As Hollander points out, there is no doubt that Ricardo concludes his chapter *On Machinery* by emphasizing the importance for the workers of the structure of final demand and production (I, pp. 395 ff). But, in the light of what we have just argued, this is the natural consequence of the fact that the latter contributes to determining the proportion (that is, the ratio) between the employment level and the working age population. A lower proportion means that there is more ‘redundant population’ (*i.e.*, , unemployment, however, that term was not used at the time). Besides damaging the workers *per se*, this in turn is also likely to have depressing effects on wages (within boundaries set by customary subsistence) by weakening the ability of workers to bargain over wages²². However, as Ricardo’s conclusions on machinery remind us, this is not expected to lead to full employment or, at any rate, to a higher employment level, except through its possible (but not warranted) effect on capital accumulation.

6. Conclusions

The arguments advanced by Hollander do not support his interpretation of Ricardo. This is not because ‘interdependences’ or a ‘role of demand’ are not to be found in Ricardo. Rather, it is because they are not *the same* interdependences we find in marginal theory and were not treated and cannot, in general, be treated by means of simultaneous determination by means of supply and demand *functions*.

²² On this point, see also Levrero (forthcoming)

Indeed, it should be emphasized again that the issue at stake in this discussion is *not* whether Ricardo, or the Classics in general, recognize that there may be several forms of reciprocal influence between income distribution, structure of final demand and prices (Garegnani, 2002, Mongiovi, 1994). Some of these influences - such as the change in composition of demand following a change in distribution owing to the different commodity baskets normally consumed by different social groups (p. 208) - are so obvious, that it would be a caricature to pretend that accepting Sraffa's interpretation of Ricardo involves denying them. At the same time, that kind of relationship between income distribution and composition of demand has absolutely nothing to do with the derivation of the demand functions for commodities and factors found in marginal theory (sect 3.3 above). Thus, the issue at stake is whether in Ricardo (and the other classical economists) the relations and mutual influences between the above mentioned variables had the same form and nature as we find in marginalist theory? That is, whether the causal links were the same, and were conceived as relations having a necessary and general nature: for example, whether an increase in the wage rate would *systematically* tend to cause a fall in labour demand with a given quantity of capital, as along a labour demand curve. An additional issue that is closely linked with the previous question arises, what was the method by which mutual influences between distribution, prices and demand patterns were analyzed? That is, were these influences examined or addressed at separate stages of analysis (Garegnani, 2005, Mongiovi, 1994) or by means of simultaneous determination. If the latter, it requires that the previous question be answered in the affirmative.

Actually, in many instances, Professor Hollander's writings seem to suffer from a 'short circuit' such that any reference to 'demand' or to relations among economic variables in Ricardo is automatically taken as evidence of similarity with general equilibrium marginal theory, even when the nature of the relation described has nothing to do with substitutability in production and consumption, that is, with the distinctive features of marginalist theory. This attitude goes hand in hand with the perspective that the only conceivable way of treating any kind of reciprocal influences of, for example, income distribution and the structure of demands and outputs, is through simultaneous determination by means of supply and demand functions. Yet, it has already been pointed out in earlier discussions that those relations were analyzed by Ricardo in a different way, consistent with the 'surplus approach' interpretation (Garegnani, 2002).

However, at the core of the latter interpretation is the determination of wages prior to prices and the rate of profit. In this connection, it has been argued here that there is no 'static' demand function for labour in Ricardo. Moreover, that the secular relations between wages, population and accumulation, even apart from their tractability as functional relations, are insufficient foundations

for the ‘demand-supply *determination* of the real wage’ (p. 209, emphasis added –see sect. 3 above). However, I fully agree with Professor Hollander in this respect, that this is the central point.

Thus, the ‘Marxian dimension’ is not necessarily important for explaining Sraffa’s interpretation of Ricardo. Indeed, Professor Hollander quite candidly admits that many other scholars, even though they were not Marxist - had seen profound differences between Ricardo and marginal theory, quoting, in particular, Samuelson, Arrow and Hicks (fn 11, p. 195). However, there were many others before these authors that noted the differences between Ricardo and marginalism, for example Cannan (1893, pp.379-83), Knight (1956, p.75), Schumpeter ([1954] 1981, pp 268, 551-61; 566-67).²³ However, before Sraffa, these differences appeared as shortcomings, and elicited surprise at the inability of such minds to grasp the ‘fundamental principles’ of economics. Following Sraffa, these differences began to appear as part and parcel of a distinct and alternative approach to economic theory, that had been developed for over a century by the founders of economics as a science, and which could be revived today. After this, and as a reaction to it, there has been a strong revival of the Marshallian interpretation of the classical economists as forerunners, albeit sometimes rough and incomplete in their analyses, of the Marshallian theory itself. So, in a sense, the question of ‘bias’ in the interpretation of Ricardo could be reversed. On the other hand, while the influence of Marx on the development of Sraffa’s ideas is still being assessed, the material found in the unpublished manuscripts suggests a sharp turning point in Sraffa’s views on economic theory and the history of economic thought, a change that also brought with it a new perspective on Marx’s value theory (Garegnani, 2005). Thus, in fact, it could well be the case not that Sraffa read Ricardo through Marxian spectacles, but rather that he understood and fully appreciated Marx’s contribution to economics only after he had understood Ricardo.

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²³ See also Hutchison (1952) who lists a large number of authorities in the field of economics and history of economics in support of the view that classical economists ‘did not understand’ proper (marginalist) economic principles.

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