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From Arrow-Debreu to Sraffa

Christian Bidard

The neo-Ricardians commonly believe that their theoretical position stands as a critique of the dominant marginalist school: their analysis identifies certain internal contradictions within neoclassical discourse and simultaneously proposes a basis for an alternative conception of prices — which has yet to be crowned by a suitable theory of quantities or activity levels, *e.g.* one inspired by Keynesian theory according to the post-Keynesian programme. The main — though not unique — origin of this idea comes from Sraffa, as indicated by the subtitle, “Prelude to a critique of economic theory”, to his *Production of Commodities by Means of Commodities*. The historical and theoretical importance of this book is the reason why we follow it closely in the first section of this paper. Having explained the economic conditions of the intelligibility of Sraffa’s discourse, we compare its conclusions to the neoclassical results (section II), then come back to the question of the long-run position (section III).

I. SRAFFA’S CRITICISMS AND HIS OWN PRICE THEORY

Sraffa’s criticisms of “economic theory” (*i.e.* the marginalist theory) are written down in a few sentences which the reader has to look for carefully in *Production*. Two of them are expressed in the preface, the most famous in section 48 and the fourth in the last appendix, D. Some presuppositions of the subsequent discussion are that:

- Sraffa’s theory is coherent with the classical notion of prices;
- Sraffa’s equations are economically meaningful and refer to an equilibrium position of a capitalist economy under perfect competition;
- Sraffa’s criticism addresses the core of the marginalist theory of prices, *i.e.* the characteristics of the equilibrium position, and not the practical difficulty of reaching it;

— though the internal contradictions of an “old” theory are of interest for historians of economic thought, a “new variant” which is free of these contradictions cannot be logically discarded on the basis simply of its historical roots. For example, the fact that the labour theory of value is incompatible with the uniformity of profit rates does not mean that the theory of production prices is invalid.

1.1. *The equilibrium position*

“Anyone accustomed to think in terms of the equilibrium of demand and supply [...]” (*Production*, preface). The choice of the equality of demand and supply on all markets as the reference position of an economy is often considered a key characteristic of the marginalist theory. Keynes for instance adopts another concept of equilibrium based on the realization of the entrepreneur’s expectations. Though Sraffa does not explicitly set a definition of equilibrium, his price equations

$$(1 + r) Ap + wl = Bp \quad (1)$$

(B diagonal in single production, non-diagonal for jointly produced commodities) require that the whole product be sold on the market. Otherwise the profit rates should be calculated on the basis of sales and not on the physical product as given by the technological data $(A, l) \rightarrow B$.

This does not mean that Sraffa supports Say’s law, or that he refers to equality of supply and demand of commodities¹ as a natural position. His approach is similar to Marx’s in the second volume of *Das Kapital* where the conditions for a self-reproduction of a capitalist economy are studied. Since any mode of production must be a mode of reproduction, Marx shows that, under certain circumstances, the whole production can be sold, an assertion which does not deny the probability of crisis or even of final collapse. In fact, Sraffa explicitly mentions a self-replacing state in the first chapter, entitled “Production for Subsistence”, but the reference is shaded off when a surplus appears (e.g. he writes in section 36 that the same property “applies as much to a system which is not in a self-replacing state as to one which is”). The existence of a surplus, if “the economy produces more than the minimum necessary for replacement”, is compatible with self-reproduction (when it is totally consumed) but opens the way for capital accumulation when the propensity to save is positive. In any case, its use should be described more precisely: if there are pure consumption and pure production goods, the composition of the net product, which is sold on markets according to equation (1), has precise implications for its use, *i. e.* on the reproduction of the economy (cf. for instance Marx’s condition of self-reproduction $C_2 = V_1 + Pl_1$).

¹ We exclude labour from commodities, since equation (1) does not imply that the labour market be in equilibrium.

Sraffa incidentally mentions the problem in note 2 of section 50, at the beginning of the study of joint production: commodities must be produced in the proportions “for which they are required for use”. Without entering into a detailed discussion of joint production,² one may notice that:

- Sraffa’s main mistakes in this study, for example the squareness postulate of section 96, are directly connected with the omission of the requirements for use which are forgotten as soon as mentioned.
- Sraffa’s commentators have given a specific interpretation to these “requirements for use” by assuming a final demand for consumption goods and a demand for production goods sustaining a regular growth at rate g (whether $g = r$ as in Schefold (1978) or $g < r$ as in Schefold (1988)). This choice suggests that steady growth paths ($g = 0$ or $g \neq 0$) have special connections with the emergence of production prices, as suggested by von Neumann’s (1937) and Morishima’s (1964, 1969) models which are the basic technical tools of many post-Sraffian studies.

A minimal conclusion is that the clearing of markets implicit in equation (1) requires a balance between supply and demand of each commodity, which is achieved for specific activity levels only. The idea of a complete separation between a theory of prices and a theory of quantities has to be rejected.

1.2. *Returns to scale*

“No assumption [of constant returns to scale] is made. No changes in output and [...] no changes in the proportions in which different means of production are used by an industry are considered, so that no question arises as to the variation or constancy of returns” (*Production*, preface). The aim of Sraffa’s emphatic warning is to show that a coherent price theory may be elaborated independently of any consideration of margins: such a theory will therefore be alien to the dominant one.

Nobody denies that a constant return assumption makes calculations easier and is thereby helpful. The question is whether it is a theoretical necessity for the understanding of Sraffa’s equations. Three arguments lead to a positive answer, in contradistinction to Sraffa’s warning:

- If the economy is not in a self-replacing state (which is often the case!), constant returns are required.

Consider two consecutive periods 0 and 1 with three dates 0, 1 and 2. The production conditions within period 0, as represented by (A_0, l_0, B_0) , lead to the determination of the price vector p_0 solution to (1) for these data (for single production industries it is preferable here *not* to normalize

² Cf. CH. BIDARD (1991), Part II.

activity levels or quantities, *i. e.* $B_0 \neq I$). The price vector p_1 within period 1 is similarly determined by the new data (A_1, l_1, B_1) . But equation (1) presumes that the price vectors at the beginning and at the end of the period are identical and, in a circular process of production, two different prices cannot be ascribed to the same good at date $t = 1$, as it is considered an output in period 0 or an input in period 1. If the physical data (A_0, l_0, B_0) and (A_1, l_1, B_1) differ, the uniqueness of the price vector at $t = 1$ requires that their rows be proportional, which is a constant return assumption.

— A multisectoral economy for which equation (1) holds must admit constant returns.

Given an equilibrium position, no force tends to move the system out of it. This general definition must be clearly distinguished from the opinion that, starting from a disequilibrium position, economic forces are able to stabilize the system. When considering equation (1) as a description of an equilibrium, it is assumed that, independently of the balance between supply and demand, the uniformity of the profit rates is satisfactory for capitalists in the sense that they have no incentive to displace their own capital from one industry to another. This idea is wrong: capitalists take care of the marginal conditions of production and if the last ecu yields only six cents in one industry and twelve cents elsewhere it will be disinvested and reallocated in a place with higher prospects, even if the previously invested sums globally get the same percentage in all industries. The absence of capital movements is thus characterized by the uniformity of the *marginal* rates of return, not of the average returns. By specifying a condition in terms of average conditions of production, equation (1) implicitly assumes they are identical to marginal conditions, hence that constant returns prevail.

— Constant prices require steady growth.

According to the classical conception of prices, the price of a commodity is an expression of the difficulty of its (re-)production. If, from one period to the next, the conditions of production are modified, prices should change accordingly. Though the exact meaning of the “difficulty of production” is not easily defined (cf. Ricardo’s search for an invariable standard of value), the only reasonable interpretation of the invariance of prices for *all* commodities in two economic situations is that the states we compare are indeed identical — perhaps up to a scale factor —. A self-reproducing state (*with* constant returns since the above argument still holds: a capitalist will reduce his production if he finds some advantage in the operation, even if the economy is no longer reproducible) or a steady growth path ($g > 0$ instead of $g = 0$, constant returns being obviously required) thus appear as the two conceivable regimes for which the prices obey equation (1). It is not surprising that the results recently obtained in a joint production framework on the existence and behaviour of a solution to equation (1) always refer to this regime and its special type of requirements for use.

It is true that the classical economists have not explicitly linked production prices to regular growth, though they have given some hints to the relationship: the price of corn rises with an extension of its cultivation because the scarcity of high-grade lands limits regular growth (except at rate $g = 0$), and the same for exhaustible resources. Fidelity to the classical ideas requires the scrutiny of the theoretical setting for equation (1) to be meaningful, even if the conclusions of the analysis are much more restrictive than the classical themselves hoped — not to mention Sraffa's ambition to study prices *in vacuo*.

1.3. *Capital theory*

Sraffa has convincingly established that no quantity of capital can be conceived independently of prices and distribution (*Production*, § 48). The debates on capital theory in the sixties have confirmed this view, an implication of which being that the aggregate version *à la* Clark or the Austrian version *à la* Böhm-Bawerk of the marginalist theory are faulty from a logical standpoint — just as the labour theory of value has to be abandoned, being incompatible with the uniformity of profit rates. The main stream of modern economic thought has basically ignored this discussion because it does not affect its core, the Arrow-Debreu version of the general equilibrium theory inherited from Walras, even if Garegnani (1959) has tried to show a contradiction within the Walrasian model of capitalization. More recently Eatwell (1987) exemplifies the contradiction between passion and reason on these topics.³ To their credit, both attacks are addressed to the right target. However, they necessarily fail because a capital theory within the general equilibrium framework, which is immune to contradictions and provides precise answers to some basic questions (such as the “measure of capital”), is conceivable and indeed was elaborated by Malinvaud as early as 1953.⁴

Modernism does not mean superiority. But the neoclassical version of capital theory is no longer in the state it was in the twenties, and criticisms of an older version have only an archeological value — if not, we are still waiting for an explanation of their applicability to the modern construction. A false estimation of the evolution explains why the neo-Ricardians think they have exhibited an internal contradiction of “the” marginalist theory whereas the neoclassicals ignore these criticisms.

³ Cf. BIDARD (1991), Chap. 22, for a discussion of Eatwell's argument.

⁴ Apparently, Malinvaud's remarkable paper was not known by the participants of the debate on capital theory, at least until Bliss's book (1975): it does not appear in Harcourt's extensive references (1972) and, in the opposite camp, Solow was to rediscover some of its conclusions.

1.4. *Circularity of production*

In appendix D, Sraffa contrasts the classical conception of production as a circular process (commodities are reproduced by means of commodities) with the marginalist “one-way avenue from factors of production to consumption goods”. Prices based on the reproduction principle are implicitly opposed to those founded on the scarcity of factors, and the final words of the book come full circle by rejoining the warning in its preface: with no marginal or finite change being considered, the discourse excludes any reference to the dominant economic theory.

Sraffa’s assertion poses at least two questions: is neoclassical theory unable to take reproduction into account, and are the scarcity and reproduction principles incompatible?

The current neoclassical discourse, and indeed that of 1960, when *Production of Commodities* was published, is far from being the same as it was when the first version of the book was written. Sraffa’s criticisms apply to the Austrian or neo-Austrian versions of the marginalist theory, and partly to the Walrasian version, though section V of the *Eléments d’Economie Pure* stands as an interesting essay on reproduction. Nowadays the notion of “dated good” developed by Arrow, Debreu and Malinvaud allows us to develop the question further. Commodities at date t are not produced by themselves, but by means of commodities dated $t-1$, which are of the same physical nature but, since they are available at another date, remain economically distinct.

Those tempted to qualify this device as a pure trick may be losing sight of Sraffa’s original objective, which was to show that the marginalist theory is logically unsound. The working of forward markets for all dates and all commodities is not defensible on the grounds of realism, but is nevertheless a useful tool in the intellectual process of abstraction. Similarly, though no economist has ever claimed that intersectoral profit rates are equal, this does not deprive the concept of production price of interest.

II. SCARCITY, REPRODUCTION AND PRICES

Once it has been admitted that modern marginalist theory allows for the reproduction of commodities, the study of the compatibility of the “scarcity principle” and the “reproduction principle” or, in other words, of Arrow-Debreu’s and Sraffa’s theories of prices, is wide open. The conclusion, however, is far from being immediate.

Let us first reduce the apparent differences between the assumptions required on technology in these theories. As the concept of production prices demands constant returns, the following discussion is concerned with the convexity assumption and the number of processes.

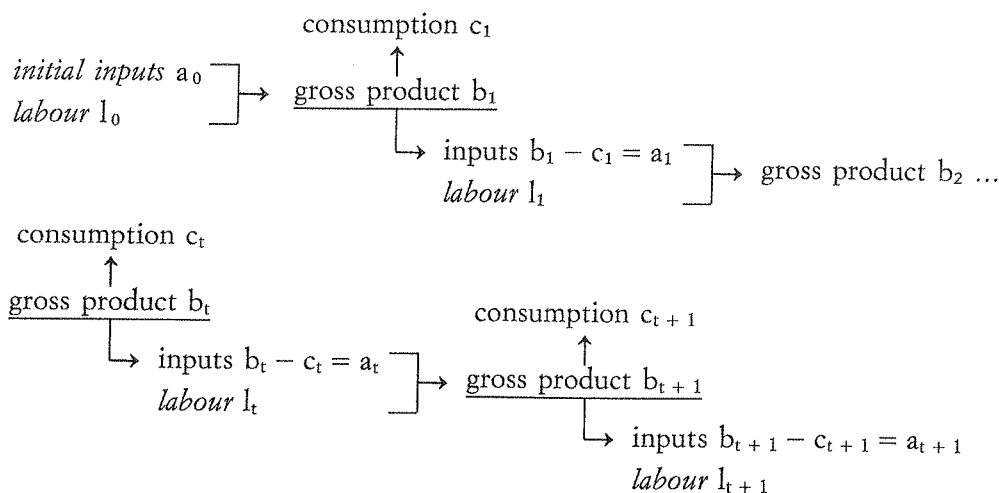
— Convexity means that two production processes can work simultaneously at activity levels λ and $1-\lambda$ with a joint product equal to the corresponding combination. Even if Sraffa tries to maintain some distance with this assumption in his very cautious construction of the standard commodity, which is seen as an imaginary basket of goods, the hypothesis emerges implicitly in the following note: “The existence of two methods [...] will be necessary for obtaining the required proportion of the two products through an appropriate combination of the two methods” (*Production*, § 50, note 2). But the main evidence remains the fact that the rejection of the convexity hypothesis would otherwise render necessary an explicit description of the output generated by several processes working side by side, as always happens in a multisectoral economy.

— It is well-known that modern neoclassical theory does not rely on the “marginalist” assumption of a continuum of processes, and that it is compatible with a finite number of methods (even reduced to one). The only difference is that the equilibrium conditions are expressed in terms of left and right inequalities instead of marginal equalities.

Sraffa begins with a unique process for each industry and, in the third part of the book, extends the results to a finite number in order to build a theory of the choice of technique. He could indeed have adopted the same mathematical assumptions as the marginalists. In any case, Sraffa’s theory is (rightly) based on the search of a cost-minimizing system, a formal problem whose solution is mathematically expressed in terms of inequalities or of marginal equalities according to whether there are finitely many or differentiable technical data. With respect to the number of available processes, the stake is empirical, pedagogical or aesthetic, and not theoretical (as far as marginal equalities are *not* interpreted in terms of causality but as the expression of equilibrium relationships between several variables).

The scarcity principle plays an explicit role in the classical theory of extensive rent, but subsequent debate is often obscured by the strategic aims of the discussants who want either to defend the specificity of classical theory or, on the contrary, seek to annex it as an appendix to marginalist theory. Let us underline that the scarcity of land can be understood in two different ways: at a given date, land (or high-grade land) exists in a given amount (sense 1) and reproduction does not allow its quantity to be enlarged (sense 2). Industrial commodities possess only the first feature. Prudence, however, suggests we abandon this track in favour of an alternative question: how does neoclassical theory deal with the reproduction phenomenon?

The following diagram is adapted from Malinvaud:



A reproduction scheme

The subscripts refer to the date, the horizontal arrow indicates production by means of inputs and labour and the data in italics are what neoclassical theory calls the “endowments” of the economy. The interesting feature of this scheme is that all inputs a_t , except for the very initial ones a_0 , are obtained as the result of previous production. If we admit that the influence of the primitive inputs a_0 vanishes in the long run, we have a pure reproduction process (a mechanical endogenization of labour, identified with a given wage basket, would be useful for a comparison with von Neumann’s theory, but the operation is not necessary here).

The above scheme is purely descriptive as long as intertemporal prices are ignored. Their role is to allocate the commodities between alternative uses. For instance, given the relative prices p_t of inputs and w_t of labour at date t , capitalists will demand more or less of each: for a disaggregated (of course!) differentiable production function, the cost-minimization property leads to the well-known rule of proportionality between prices and the marginal productivities of inputs.

The determination of the intertemporal path of the economy requires that consumption behaviour and production functions be specified. Though neoclassical theorists postulate the existence of an intertemporal utility function, this dubious notion can be dispensed with. It is sufficient to set a consumption function depending on prices and income, with a fixed or flexible propensity to save. A specification in the classical spirit would be that workers’ consumption basket be given and profits be saved, but one might adopt more general assumptions such as specific propensities to save s_w and s_c ($0 \leq s_w < s_c \leq 1$), as in some post-Keynesian models. The production functions admit constant returns to scale. Technical progress is ignored in order to isolate the pure effect of accumulation.

Intertemporal general equilibrium prices associated with a finite or infinite path of consumption and accumulation have no general properties: the reason being that goods called corn at date t , iron at date t , corn at date $t + 1$ and iron at date $t + 1$ are formally considered as four distinct commodities of an atemporal economy.⁵ But on a regular path of growth, the relative prices of commodities are the same at all dates: the property is immediate under the additional assumptions that all goods are basic and that production functions are differentiable, because the marginal productivities of inputs are identical at points a_t and $a_{t+1} = (1 + g)a_t$; the conclusion still holds without these simplifying hypotheses (Malinvaud, 1953). We thus have $p_{t+1} = \lambda p_t$ and, in single production, the nullity of the pure profit is written $A'p_t = p_{t+1}$ (A' being the matrix of the inputs-and-labour coefficients associated with the operated methods). With $\lambda = (1 + r)^{-1}$ — index t may be dropped —, this equality reads⁶

$$(1 + r)A'p = p \quad (2)$$

so that these general equilibrium prices are production prices with advanced wages (the gap with Sraffian prices when wages are paid post factum is not essential (Bidard, chap. 3)). Non-operated methods (a,l,b) satisfy inequality $(1 + r)(ap + wl) > bp$ and are not profitable. Finally, since the neoclassical notion of pure profit has to be compared with the classical notion of rent and not with that of profit, the profit rate r in equation (2) is normally positive even if the pure profits are null: for instance, it is given by the Cambridge formula $r = g/s_c$ under the relevant assumptions.

As far as the examination is limited to the characterization of the equilibrium position on a regular path, the main divergence between the classical and neoclassical conclusions concerns the labour market: for neoclassical economists, there is full employment and the growth rate g is that of the labour force; according to the classical tradition, the profit rate depends on the class struggle, the accumulation rate on capitalists, and full employment is not the rule.

In short, we have first shown, starting from a classical standpoint, that prices of production only appear under constant returns and regular growth. Conversely, under these assumptions, the general equilibrium prices in an intertemporal economy of the Arrow-Debreu-Malinvaud type are indeed production prices, *i.e.* the profit rates are uniform among industries (neoclassical theorists state this property as own interest rates being uniform among commodities). The relationship between the two price theories cannot be thought of in terms of contradiction.

⁵ However, inequality $p_{t+1} < p_t$ (non-negativity of the own rates of interest) holds true under rather weak assumptions as suggested by Böhm-Bowen.

⁶ We assume single production; in general joint production, Sraffa's 'squareness axiom' is wrong (Bidard, chap. 17) except in a few cases which lack of economic generality.

III. LONG RUN AND DYNAMICS

The analysis has so far been restricted to the examination of equilibrium position on a regular growth path, without directly tackling dynamics. In our opinion, this roundabout way is necessary for the understanding of the question of long run dynamics and the possible divergences between different economic schools.

3.1. *Long run dynamics and the neoclassical school*

Modern neoclassical economists agree on the Arrow-Debreu formalization of a pure competitive economy and on existence (and optimality) results. Divergences however appear with respect to stability and dynamics. It is not obvious to state "the" neoclassical position on this issue.

— The dominant tradition, often associated with politically rightist opinions (but not systematically, cf. Walras himself) is that markets in disequilibrium should rapidly reach the equilibrium position if competition acts without hindrance.

Applied to the labour market, the conviction is that the flexibility of wages, and possibly the Pigou effect, are automatic tools for full employment.

— Modern mathematical formulations have led to more cautious conclusions, ranging from the discovery of some cases of convergence to the instability of a unique equilibrium (Scarf) or to a complete indeterminacy of dynamics (Debreu, Mantel, Sonnenschein). Non-tâtonnement processes increase the probability of stabilization, but the position ultimately reached is not an equilibrium of the initial economy.

The question becomes more involved if the time necessary for the equilibration — let us say the Hicksian week —, interferes with "historical" time, when the characteristics of the economy are themselves changing, as in a reproduction scheme. Let us however maintain the dissociation by assuming an instantaneous adjustment at each date. The economy then follows a sequence of equilibria which define its intertemporal trajectory. As shown in section 2, production prices then appear if this trajectory is a regular path, but the initial endowments here matter. For given demand and production functions, regular growth is only reached for specific activity levels (see Morishima, 1964, 1969) which, under the equilibrium assumption, require specific proportions of inputs (a_t, l_t) and, by recursive induction, a specific amount \bar{a}_0 of initial endowments associated with l_0 . If $a_0 = \bar{a}_0$, the economy is on the rails for regular growth from its very beginning; if not, the intuition that the importance of the initial endowments should vanish in the long run leads to the turnpike conjecture: does the sequence of equilibria tend towards the regular growth path, and do prices move towards production prices? Such a (technically involved) property has been

recently established under particular assumptions (see Bewley, Epstein, Yano...). If capital is homogenous (vector a_t is reduced to one component k_t), reference can be made to an earlier study by Solow (1956) who sought to prove, contrary to the post-Keynesians, that, firstly, there is no knife-edge in dynamics and, secondly, that regular growth is reached in the long run whatever the initial endowments. But Solow's conclusion should be reversed when heterogenous capital goods are taken into account (Hahn, 1956), as the regular path becomes repulsive instead of attractive.⁷

3.2. *What can we learn from neo-Ricardian studies?*

Our aim is not to propose a new formalisation or to put forward new results on the gravitation processes, these aspects being intensively discussed in other papers. The following statements seek to analyse the scope of neo-Ricardian studies as we understand them:

a) Since the classical and neoclassical theories both agree on the existence of production prices associated with steady growth, Sraffa's analysis exhibits no internal contradiction to the modern neoclassical theory. Possible divergences can only appear out of this regime. Though classical economists do not systematically associate production prices and steady growth, they are nonetheless aware that economic phenomena generating non regular paths (such as technical innovations, scarcity of land, changes in distribution, crises, etc...) affect the relative prices. However, it remains their conviction that production prices (the "natural prices") remain a useful tool of analysis even when the strict economic conditions of their validity are not fulfilled. Such a belief lies in sharp contrast with the dominant modern school. A typical student today can follow a full course in economics and read a lot of professional journals without encountering the concept of production price. If the suspicion of mere ideological censorship is discarded, the lesson is that the long run (and a steady long run) matters as a constant reference for classical economists whereas the short term influences seem more important to the neoclassicals. The first approach conceives the effective trajectory as a series of transitory deviations from a predominant tendency, while the second basically reduces the long run to a succession of short run steps (in this respect, the neoclassicals are indeed closer to Keynes).

b) Classical economists generally admit that market disequilibria are frequent (this statement might be discussed in relationship with the debates on Say's law, but is admissible as a rough claim in comparison with the marginalist main stream which often assumes an instantaneous adjustment).

⁷ Hahn and Bewley both work with disaggregated models, but use different notions of equilibrium: Bewley refers to an intertemporal general equilibrium (as we did in section 2), which presumes the existence of forward markets for all dates at $t = 0$; Hahn studies a sequence of temporary equilibria, with only one forward market. The non-robustness of the conclusion as regards to this change of concept is another signal against too categorical statements.

The dynamics of the economy are partly due to the reaction of the agents facing the disequilibria but, while the neoclassicals posit a mechanism tending to clear the markets, the neo-Ricardians also underline the uniformization of the profit rates by means of capital movements among industries.

Several conceptual problems are linked to the idea of the uniformization of profit rates:

— As already observed, it is surprising that n prices allow the balance of supply and demand on n markets (let us recall that the effective profit rates are calculated on the basis of sales, not on the book value of products) *and* the equalization of n profit rates. The apparent overdetermination disappears if one reminds oneself that we are considering a very special state, located on the regular growth path.

— The theoretical condition for an equilibrium on the financial market (which is implicitly referred to in connection with the idea of capital movements) is not the equality of the rate of returns, but also needs to take into account the expected gain on the value of the securities.

— The very concept of profit rate is not well-defined when the relative prices are not constant. If relative prices change between dates t and $t + 1$, the calculation of the profit rates depends on the numéraire. Even the ranking is dubious, as shown by a simple example: let us imagine that, in terms of the input basket of industry 1, the profit rate of industry 1 be 10%, while that of industry 2 is 5%. It is conceivable that, in terms of its own input basket, the profit rate of industry 2 is 15%. The direction of the capital movements is not self-evident in this case.

c) The neo-Ricardian programme should provide a faithful formalization of the idea of gravitation, that the classical expressed too imprecisely given our modern standards and the mathematical requirements for a study of the temporal equations. Its aim being to show the value of the classical approach to-day, a reexamination is moreover required, since the working of capitalism, the markets, the institutions, the money, the type of production and competition, the financing, the international environment, etc..., have changed considerably over the last 150 or 200 years.

The lessons of such a model rely on its formulation and on the study of its qualitative or quantitative behaviour. The phenomena taken into account to describe the dynamics (other than excess supply or demand) can be considered as specific to the neo-Ricardian approach and thereby differentiate it from the neoclassical school (a distinction *outside* the steady equilibrium path). As for the mathematical study of the long run behaviour, there is very little hope of establishing the convergence of "the" classical gravitation process in any case, since the technical assumptions required for such a conclusion would be very restrictive. In this sense, the "classical postulate" that production prices are economically meaningful remains unproved. Nevertheless the discovery of other plausible issues, or the classification of alternative regimes, need to be considered as new steps in the development of neo-Ricardian economics.

CONCLUSION

We have stressed that production prices should be referred to in connection with an evolution of the economy along a steady growth path. Under that condition, the neoclassicals would agree with this qualification of general equilibrium prices. Differences between neo-Ricardians and neoclassicals may still appear in the study of effective paths and in the long run dynamics of the economy.

Not all neo-Ricardians would agree with the above views, which are indeed quite different from those explicitly or implicitly expressed by Sraffa thirty years ago. They imply the gap between the (modern) marginalist and the neo-Ricardian theories cannot be found either in a logical deficiency in the first or in the study of the equilibrium position alone. Our interpretation also closes off some directions for future research, and leaves little prospect for a "post-Keynesian programme" if conceived as the conjunction of production prices with effective demand. The suggestion is that Sraffa's formalization, centred on the concept of production price, has had the perverse consequence of impoverishing the understanding of other parts of the classical school which we should now rediscover, even if the theory of prices loses its actual pre-eminence. The study of dynamics may be the best way for this renewal.

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