

Pierangelo Garegnani: Rebuilding Economic Theory

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1.

Pierangelo Garegnani, one of the subtlest and most innovative Italian economists, passed away on October 15, 2011. His writings have proved widely influential, triggering debate with eminent scholars such as Blaug, Bliss, Hahn, Joan Robinson and Samuelson and his work has constituted a point of reference for generations of students and researchers both in Italy and abroad, regardless of whether they fully share his theoretical views. Painstaking reconstruction of the analytical frameworks in which the theoretical propositions under examination are embedded, a key characteristic of Garegnani's aims and approach, enables and indeed compels those coming into contact with his studies to take cognisance of aspects and problems whose complexity might otherwise have made them difficult to grasp. This 'educational' side-effect of his work could hardly be ineffective, by making it necessary at least to face his arguments squarely.

This note will open with an outline of Garegnani's academic itinerary and then go on to examine his contribution to economic theory, focusing on aspects of his research that I consider particularly significant. Given the breadth of the issues tackled by Garegnani during his long career, the selection is necessarily by no means exhaustive and unquestionably reflects my personal response to certain results of his work.¹

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¹ For an updated list of Garegnani's works see de Vivo (2012).

2.

Pierangelo Garegnani (Milan, 9 August 1930 – Lavagna, 15 October 2011) graduated in political science from the University of Pavia in 1953, with a dissertation on Ricardo prompted by Sraffa's introduction to Ricardo's *Principles of Political Economy*^{2,3} and then continued his studies in economics at Cambridge University, where he was admitted to the PhD course and obtained a doctorate in 1959. His thesis, *A Problem in the Theory of Distribution from Ricardo to Wicksell*, was developed with the assistance of Maurice Dobb as official supervisor and Piero Sraffa. The academic career embarked upon soon afterwards in Italy involved teaching political economy at the universities of Rome 'La Sapienza', Sassari, Pavia, Florence, La Sapienza again and finally, from 1992 until his retirement in 2005, at Roma Tre University, where he became professor emeritus in 2007. Garegnani's intense activity as a scholar also included periods of research and teaching at major universities outside Italy including Cambridge (UK), Stanford, MIT and the New School (New York). He became a member of the Academia Europaea in 1989 and a corresponding member of the Accademia dei Lincei in 2001. Piero Sraffa appointed him his literary executor and as general editor of Sraffa's unpublished papers, together with Heinz Kurz, Garegnani supervised the ongoing work of publishing this material, in addition to taking direct responsibility for part of it.

3.

It is, I believe, generally agreed amongst economists whatever their theoretical persuasion that Garegnani made a fundamental contribution to the progress of economic theory. His work, both critical and constructive,

² This information is taken from Petri (2000), where further details of Garegnani's academic career can be found together with an accurate outline of the main content of his work up to that date.

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greatly advanced the degree of theoretical development of several topics in the areas of economic analysis opened up by Sraffa and Keynes.

The attack launched by Sraffa (1960) on what was then the dominant marginalist view of the theory of value and distribution was consolidated and expanded upon by Garegnani across a range of aspects and along both its major axes, namely a critique of the treatment of capital and a return to the theoretical approach of the classical economists as something essentially different from, and alternative to, marginalism.

As regards capital theory, Garegnani's numerous contributions supplement and extend the results that emerged in Sraffa's *Production of Commodities by Means of Commodities*. He clearly highlights the difficulties lurking within the dominant theory's view of the determination of prices and distribution in terms of demand and supply deriving from the fact – suggested in the very title of Sraffa's book – that capital consists of *producibile* goods. As Garegnani said, this raises a whole tangle of difficulties. We shall start with those concerning the 'traditional' versions of the theory⁴ and go on in sections 4 and 5 to address Garegnani's view of its contemporary formulations as sequences of general 'intertemporal' equilibria.

Garegnani's criticism of Walras shows that if an endowment of capital is arbitrarily taken as given in its physical composition, as it is in Walras, it is impossible to satisfy the condition of uniformity of the rate of return offered by each distinct capital good (where the relevant rate of return is calculated on the price that covers the respective cost of production). It is therefore the dual necessity of allowing capital to assume a composition compatible with that condition and of taking the available 'quantity' of capital as given at the same time, as is required by the theory's structure of demand and supply, that in fact explains why most neoclassical authors diverged from Walras and adopted a conception of capital as a single factor measured in terms of value⁵, and as such capable of changing in 'form' without changing in 'quantity'. At

⁴ A detailed and exhaustive treatment of these problems can be found in Garegnani (1990).

⁵ Upon recognition of the general invalidity of a measurement of the 'quantity of capital' in any kind of technical units, as would be the case for the 'average period of production'.

the same time, as Garegnani clearly shows, the uniformity of the return of capital was perceived as a natural requisite for the meaningfulness of the magnitudes determined by the theory. We shall return to this point in section 5.

The source of the problems that arise for the dominant theory from the measurement of capital in terms of value is the interdependence thus established between the price system and the quantity of one of the 'factors' of production. On the one hand, these problems are regarding 'supply', it being logically illegitimate to posit the availability of capital that is assumed to be known in terms of value before any determination of the system of prices by means of which the value of any commodity, or aggregate of commodities, must be expressed. On the other, they also concern the 'demand' for capital, both because of the possibility that the most profitable technique at 'low' interest rates will prove to be such at 'high' interest rates (but not at intermediate rates) too, and because of the possibility that in the neighbourhood of an interest rate \hat{r} at which two techniques are equi-profitable, the technique that would be more economical for $r > \hat{r}$ will employ a *higher* capital/labour ratio (and vice versa).

The ascertained possibility of these two phenomena, known respectively as 'reswitching' and 'inverse capital deepening', contradicts a fundamental precept of the theory, namely that the employment of one factor of production in proportion to others is inversely related to the relative price for its service, and hence to its rate of remuneration. Presented as a straightforward consequence of the rationality of agents' behaviour in the choice of both methods of production and consumption goods (with the effects produced by the latter choice on the overall ratios of factor employment), this appeared to be a *necessary* and hence indispensable proposition. As the 'principle of substitution'⁶ that supposedly guides the pursuit of maximum individual advantage, it was thus elevated to the status of a basic tenet of the theory applied to the circumstances which the latter takes to be what Garegnani called its

⁶ Garegnani (1990), p. 8.

factual basis, namely the existence of alternative methods of production and alternative consumption goods.⁷

In addition to addressing the analytical aspects of this principle, Garegnani also sought to shed light on its relevance to marginalist theory and hence on the weight of the criticism calling it into question. The possibility of the condition of minimum cost being satisfied by the same technique at different (non-adjacent) intervals of the interest rate, or by a more capital-intensive technique at higher interest rates, is incompatible with the assumption that a rise in the rate of interest prompts a change in the most economical method of production due to the incentive to 'save' on capital with respect to labour, as the principle of substitution claims. Results of this kind can also arise from the choice of consumption goods in the event of changes in the interest rate and the price system affecting the ranking of the different consumption goods in relation to how capital-intensive their processes are.

It thus follows that the supposed factual foundations of the principle of substitution, i.e. the availability of alternative methods of production and alternative consumption goods, are actually unable to bear the weight placed upon them. The logical, and therefore necessary, deduction which should allow the principle of substitution to ensue from those factual circumstances (together with the maximising behaviour of individuals) proves fallacious as soon as the scale of one of the factors of production is no longer independent of the price system.

The failure of the principle of substitution also destroys the general analytical foundation of factor demand functions, understood as inverse relations between the ratios of the quantities of factors profitably employable and the ratios of their respective remuneration. Garegnani attaches crucial importance to this result of his critique and uses it in order to argue that the theory is unable to express the real determinants of distribution and prices. It is in the 'perverse' – i.e. at variance with the principle of substitution – behaviour of the relations supposedly representing the forces of factor demand that Garegnani detects a cause of possible instability of general equilibrium, as well as the possible non-

⁷ *Ibid.*, p. 71.

existence of equilibrium for strictly positive values of prices and remuneration. And the fact that the theory might prove incapable of providing definite results or indeed produce ‘explosive’ results, evidently contrary to observation, reveals that it has built up a fictitious system of relations that fails to grasp the circumstances that actually and systematically operate in the real world.

4.

Garegnani maintains that this critique of the principle of substitution demolishes the very foundations of neoclassical theory and therefore holds regardless of how the latter may be formulated. This is connected with a central aspect of his reconstruction of that theory, prior to any criticism. Garegnani points out that in the logic of the theory the action of the principle of substitution, which governs the employment of capital in proportion to labour, is projected onto the temporal flow of gross investment, whose magnitude must adjust to the gross savings generated by incomes and prices corresponding to equilibrium on the factor markets. Savings are seen within the theory as a demand for interest-bearing assets that opts indifferently for whatever physical ‘portfolio’ offers the highest rate of return (Garegnani speaks in connection with this of the demand for what Walras called ‘perpetual future income’⁸) and are therefore defined as a magnitude of *value*. Due to the conditions imposed, this has repercussions on investments, which are required to balance this demand in a state of equilibrium and hence to assume values consistent with this requirement. It is precisely the principle of substitution that supposedly guarantees this result. For example, a potential surplus of savings would be absorbed by the larger flow of gross investment induced by a lower interest rate through the incentive to adopt more capital-intensive methods of production and consume a larger proportion of consumption goods produced with a high ratio of capital to labour. Capital goods whose employment is no longer possible or economical

⁸ Garegnani (1960), p. 96; Garegnani (2000), par. 26.

would thus be replaced with capital goods of greater value with respect to the labour employed.⁹

5.

Another area in which Garegnani made a very important contribution, giving rise to fruitful debate, was concerning the meaning attributable to theoretical magnitudes, especially in their relations with actual or observable magnitudes. As discussed in greater detail below, Garegnani was prompted to address this problem in the course of his reconstruction of the changes made subsequent to Hicks's *Value and Capital* in formulations of the concept of general equilibrium: capital being regarded no longer as a single magnitude measured in terms of value but as a vector of n physically specified goods, and equilibrium as a sequence of equilibria formally related to a series of dates in time rather than a system of quantities and prices interpretable as normal, or long-period, magnitudes.¹⁰

Garegnani points out the several implications of this change, which he interprets as an attempt on the part of neoclassical theory to evade the difficulties connected with a 'quantity of capital' measured in value terms (difficulties perceived to some extent even before the debate of the 1960s and '70s that brought them explicitly and definitely to light). The questions raised in connection with this include the meaning to be attached to the prices and quantities constituting the object of theory. It was Garegnani's analysis of this problem that led to clarification of a basic methodological aspect common to classical theory and to the 'traditional' formulations of general neoclassical equilibrium. Theoretical magnitudes were seen in both approaches as values to which the corresponding actual magnitudes tend to adjust under the pressure of the pursuit of individual advantage and hence of competition. The assumption that this should constitute the empirical content of theoretical

⁹ Garegnani (1978), par. 5.

¹⁰ Garegnani (1976).

magnitudes emerges from the nature of the circumstances taken by the two theories as determinants. Though differing from one theory to the other, those circumstances shared a quality of *persistence* with respect to the whole series of factors that may affect economic variables at any particular moment. The magnitudes constituting the object of the theories thus formed what Garegnani calls ‘long-period positions’ or ‘normal positions’. As the expressions themselves suggest, the idea is that over a period of time long enough to allow for the compensation of temporary and accidental influences, these magnitudes would emerge as central positions of the values that can be observed moment by moment – as “centres of gravitation” of actual values, to borrow Smith’s well-known analogy for the concept of “natural price”.

The same nature cannot instead be ascribed to the theoretical variables that appear in modern formulations of neoclassical theory. The need to construct temporal sequences of general equilibria reveals the non-persistent character of at least one of the determinants, namely the physical composition of the stock of capital goods. Once a particular stock of capital is arbitrarily taken as given in the types and quantities of its constituent items, it will generally prove not to be the most appropriate with respect to the other circumstances that the theory takes as given, namely consumer preferences and available methods of production. As Garegnani had already remarked in his critique of Walras,¹¹ the time of a single productive cycle would therefore be sufficient to alter the physical composition of the existing capital stock appreciably. This could hardly be overlooked in the construction of the theoretical system, which consequently assumes a sequential structure capable of admitting one endogenous change after another in the capital-good vector, starting from an arbitrarily given stock that constitutes the initial endowment of means of production. The theory thus takes the form of a succession of general equilibria, each of which consists of a system of prices and quantities related to a specific ‘date’.

Garegnani’s objection is that the speed with which the prices and quantities vary in the abstract time of the theory makes it impossible to

¹¹ Garegnani (1960), pp. 116-117.

interpret these magnitudes as central values that actual magnitudes would tend towards in real time.¹² Nor can they be conceived as direct approximations of actual magnitudes, as the latter are influenced by a range of circumstances that is much larger than the restricted selection made by the theory and indeed not susceptible of delimitation *a priori*. The empirical content of those theoretical magnitudes, i.e. their relationship with observable variables, thus remains wholly undefined and the theory loses much of its meaning as a result. If we now return to formulations of the theory in which capital is conceived as a magnitude of value and free as such to be ‘embodied’ in the physical forms required by equilibrium conditions, Garegnani shows a connection between this view of capital and the need to maintain some correspondence between theoretical and observable variables.¹³ Treating capital as a vector of heterogeneous goods in order to avoid the analytical difficulties connected with a ‘quantity of capital’ as single magnitude therefore comes at a high price in relation to the theory’s potential explanatory capacity. And that price will be paid in vain if those difficulties reappear, as Garegnani maintained they would do,¹⁴ even in the contemporary versions of the theory, albeit in a less evident form.¹⁵

6.

In addition to his key role in the critique of the dominant theory, Garegnani made an equally important contribution to the reappraisal of the classical approach initiated by Sraffa. Three of the many aspects of that contribution will be considered here.¹⁶

The first is in-depth reconstruction of the theories of value and distribution of the classical economists and Marx. This enables Garegnani to show that despite differences with regard to specific analytical points,

¹² Garegnani (1979), section 5.

¹³ Garegnani (2005a), section 6.

¹⁴ Garegnani (2003).

¹⁵ Garegnani (2003), section 27.

¹⁶ See Garegnani (1987) for a detailed overview of his contribution to the reappraisal and development of the classical approach.

these analyses share a common view of the nature of the circumstances determining the distribution of the national product between income classes. For these authors, distribution is governed first of all by the historical and social factors upon which the level and composition of real wages are regarded as being dependent. Lying at the root of this vision is the idea of a *subsistence* wage, commonly accepted by society as minimal and hence indispensable for the ordinary worker. Actual wages may coincide with or rise above this level depending on the further circumstances affecting the bargaining power of labour in the given situation. This kind of explanation leads to a logical-analytical framework in which the real wage is taken as given with respect to other types of income (profits and rent), which are therefore determined residually as shares of the (net) social product after wages.

By highlighting the particular character of the classical explanation of distribution, Garegnani develops and makes explicit what was implicit in Sraffa's introduction to Ricardo's *Principles* and in his *Production of Commodities by Means of Commodities*, about the difference between the classical approach and the subsequent marginalist or neoclassical theory. Garegnani's analysis clearly shows the contrast between the classical approach, with its view of the historical and social nature of the circumstances governing distribution and the resulting asymmetry of wages and other forms of income, and neoclassical theory, which maintains the simultaneous and symmetrical determination of the shares of income allotted to 'factors of production' on the basis of supply and demand.

The second basic element of Garegnani's contribution to the reappraisal of the classical approach is the clarification of its analytical framework. Garegnani distinguishes two areas in the classical theory made up of relations with different degrees of generality: a) a strictly quantitative 'core' comprising the univocal and general relations between distributive variables and the relative prices that can be defined for given levels of output and available methods of production; b) the set of relations involving the determinants of distribution, output levels and methods of production, which need not be univocal or as general as those included in the core. The core relations derive from the system of price

equations together with the conditions that select the most profitable methods of production from those available, and therefore possess the same qualities of necessity and abstraction as the equations and conditions that constitute their analytical basis. The properties of the relations outside the core can instead differ in relation to factors of economic and social context, such as the possible influence of social and institutional circumstances on real wages, of real wages on total output and vice versa (especially through the level of employment of labour), and of output on methods of production. The distinction between the two groups of relations makes it possible in particular to understand the sense in which the levels of production enter as *given* into the relations included in the core of the theory and specifically, as we find in Sraffa, into the system of price equations. This view of output levels is a manifestation of the analytical separation of the determination of prices and the determination of quantities that derives in the classical theory precisely from the absence of links of a general character between those two groups of magnitudes. The possibility of such separation constitutes a radical difference with respect to neoclassical theory, where production costs depend functionally on outputs through the determination of distribution in terms of equilibria of demand and supply for 'factors of production'. The classical theory instead entails no such functional link, while obviously admitting the possibility of outputs affecting distribution and the relative prices of commodities. This can happen, for example, at the 'micro' level through the effect of increasing returns to scale or the employment of scarce natural resources, and at a primarily 'macro' level because of the direct relationship between aggregate output and labour employment, as referred to above, with consequent repercussions on circumstances (e.g. workers' bargaining power) that can influence the level of real wages, and hence on the price system. These examples serve to show the low degree of generality that can be attributed to such influences, which can vary from case to case both in intensity and in direction in relation to various characteristics of the economic systems or the specific types of production taken into consideration. It is therefore natural in this theoretical approach that changes in distributive variables and prices should be studied first by using the relations between these

magnitudes that can be specified while taking the relevant levels of output as given, and then considering, at a lower level of abstraction, what changes in outputs may result and what their possible repercussions on distribution and prices may be.

The clarification of the analytical structure of classical theory, and in particular of the aspect just examined, enabled Garegnani to argue in various discussions with neoclassical authors¹⁷ that the separation of the determination of prices and outputs, and therefore the absence of a *simultaneous* determination of the two groups of variables, does not have to entail the restrictive hypothesis of constant returns in the classical approach. Garegnani thus makes still more explicit the sense of the similar caveat addressed by Sraffa in the preface to *Production of Commodities by Means of Commodities* to those who, “accustomed to think in terms of the equilibrium of demand and supply[,] may be inclined [...] to suppose that the argument rests on a tacit assumption of constant returns in all industries”.¹⁸

One strictly analytical contribution made by Garegnani in support of the classical theoretical approach concerns determination of the general rate of profit. If the level and physical composition of the wage rate is taken as given, which is generally the case in the classical economists and Marx, the rate of profit is determined in the part of the economy whose task is to produce the commodities entering into wages and to reproduce the direct and indirect means of production of those commodities, and which is wholly uninfluenced by the conditions of production of other industries. This is in line with what emerges, albeit under restrictive conditions, in the theories of profits put forward by Ricardo in the *Essay on Profits* and then in his *Principles*. Using Adam Smith’s ‘labour commanded’ as a measure of value, Garegnani developed a correct determination of the rate of profit as the single unknown of a single equation, thus reviving the ‘surplus equation method’ of Ricardo and Marx, which was vitiated in their work by the adoption of the labour theory of value (or, in the earlier Ricardo, by the special assumptions

¹⁷ See for instance Garegnani (2007a), in particular section I.

¹⁸ Sraffa (1960), p. V.

implied by his ‘corn model’). In this equation, the rate of profit is determined, within the sector that reproduces the wage goods (directly and indirectly), by spreading across the value of the capital advanced an amount of profit obtained by subtraction from the net product of the sector and known independently of the profit rate itself.¹⁹ By comparison with the system of price equations, this determination thus has the advantage of preserving the image of profits as surplus income, and hence residually determined, which is peculiar to classical theory, and which is obscured in the solution offered by the price equations by the fact that the values of total profits and the value of the social product are themselves determined simultaneously with the rate of profit.

7.

As mentioned at the beginning, the constructive content of Garegnani’s work includes supplementing the classical theory of distribution with an analysis of the levels of aggregate output based on the autonomy of demand with respect to the potential output of the economy.²⁰ The classical explanation of distribution admits the possibility of non-temporary unemployment of labour even under conditions of free competition, the ‘normality’ of unemployment in that approach being rather one of the circumstances that contribute to determine the generally weak position of workers in distributive bargaining. Within the classical theory, the Keynesian principle of effective demand can therefore be combined with a determination of distribution consistent with conditions of underemployment of resources and therefore with the principle itself. The latter can thus rely on foundations of a more solid and general character than those upon which Keynes managed to establish it in his time, in the absence of a critique of, and an alternative to, the dominant theory of distribution in terms of the equilibrium of demand and supply for factors of production. The absence

¹⁹ Garegnani (1987), sect. VI.

²⁰ For the arguments considered in this section, see Garegnani (1978) and (1979).

in the classical framework of univocal relations between levels of distribution and output thus engenders a flexibility that makes it open in fact to alternative views on the determination of aggregate output, such as Say's law, adopted by Ricardo but now found unacceptable, and the opposite and analytically superior principle of effective demand.

As is true for all of Garegnani's work, this part again addresses a central issue of economic theory with implications that therefore involve a variety of aspects.

One basic implication regards the role of demand in determining levels of activity, which has been whittled down in modern macroeconomics and confined (ever since the 'neoclassical synthesis') to conditions of rigidity of prices and wages, limited either to the short period or to non-competitive market forms. When combined, however, with a theory of distribution that does not rely on the demand for, and supply of, 'productive factors', and hence on price mechanisms that would ensure the tendency to full employment of resources, the autonomy of demand with respect to potential output presupposes no obstacle to the free working of the price system, and can therefore extend to the long period and to competitive conditions. If investment is regarded as the 'autonomous' determinant of aggregate demand (in the absence of public expenditure and international commerce), there is thus no reason why the possibility of it remaining below the level that generates an aggregate demand equal to potential output should derive from the lack of a drop, or an insufficient drop, in the rate of interest. There is no analytical basis in the classical theory for a functional dependence of investment on the rate of interest (and on the price system in more general terms). It is therefore possible in this theoretical framework for the demand for investment to remain (even while fluctuating) below the 'full employment' level for any level of the interest rate (and any price system). A similar argument applies when the problem is considered from the standpoint of the 'labour market', in which case there are no grounds to claim that the existence of involuntary unemployment should necessarily be attributed to the lack of a decrease in real wages. While there is in fact no analytical foundation in the classical theory of distribution for a functional dependence of labour

employment on real wages, the introduction of the principle of effective demand gives rise to the possibility that decreases in real wages, with the associated changes in income distribution, will have *negative* effects on the demand for products and hence on the demand for labour.

From the extension of the role of aggregate demand to the long period, Garegnani derives a view of the accumulation process in which the size of the stock of capital is itself a variable responding to the level of demand for products. The incentive to utilise productive capacity at a 'normal' level induces firms to adjust the scale of capacity to the levels of output that the market can absorb. Garegnani points out in particular that the elasticity with which productive capacity can react to the stimuli generated by demand is greater than it may appear at first sight, because initial expansion creates margins for further and ever-larger potential expansion as a result of the ever-larger flows of gross investment that could materialize, *ceteris paribus*.²¹ It follows that the stock of *existing* equipment in a given period constitutes neither an upper limit for the levels of output that could be obtained in the future nor an index of the levels of output sometimes reached in the past, which may have been even higher, as the 'traces' left by a subsequent and persistent drop in demand with respect to productive capacity would be erased by non-renewal of surplus capacity. It should be noted in connection with this that while some influence of demand on investment is obviously involved here, Garegnani did not regard this relation as susceptible of formulation in sufficiently general terms to be represented by a 'function'. In his view, the connection between demand and investment belongs to the group of relations that stand outside the core of the theory, the ones that do not lend themselves to formulation in the abstract and general terms required for their representation in mathematical form.

This view of the accumulation process, in which the very creation (or destruction) of productive capacity responds to the stimuli generated by demand, marks a substantial divergence of Garegnani's position from other lines of thought that still share the idea of the independence – also in the long run – of investment decisions from full-employment savings. I

²¹ Cf. Garegnani (1992).

refer to the theoretical views often described as ‘post-Keynesian’ and characterised by the idea that the adjustment of savings to investment would operate precisely in the long run not through the level of income but rather by suitably altering the distribution of income between wages and profits, and with it society’s general propensity to save. The distribution of income would thus be determined by the intensity of the accumulation process, as formally expressed by means of the ‘Cambridge equation’, i.e. by using the equality $g = s_c r$ as a causal relation in which, given the share of savings out of profits s_c and on the assumption of zero savings out of wages, the rate of profit r depends on the rate of growth and accumulation g .²²

What ultimately distinguishes the two approaches is that while the changes in distribution entailed by the above equation presuppose the inflexibility of total output with respect to different levels of investment, Garegnani maintains that the elasticity with which the level of output can adjust to demand is even greater in the long run than the short. Changes in the scale of productive capacity would indeed extend this flexibility beyond the short period limits of greater or lesser utilisation of existing capacity.²³ Garegnani thus fully acknowledges the role of demand in governing the long-term levels of output through changes both in the rate of utilisation and in the scale of capacity, and this is not devoid of implications for the content of the equation $g = s_c r$, which Garegnani regards as wholly irrelevant to any explanation of distribution. On the one hand, if this relation is satisfied through deviations of the effective average utilisation of capacity from the normal rate, the variable r appearing in it merely expresses the ratio of *realised* profit to capital stock, a magnitude capable of assuming different values without entailing changes in the *normal* rate of profit r^* (which of course implies normal

²² The Cambridge equation is generally established within steady growth conditions (as is shown by the identification of the rate of capital accumulation with the rate of growth of the economy). A radical denial of the usefulness of the steady-growth hypothesis in the analysis of accumulation is to be found in Garegnani and Trezzini (2010), which points out the role that can be played by fluctuations in investment, combined with asymmetrical behaviour of the marginal propensity to consume during expansions and contractions of income, in generating a growing trend of overall output.

²³ Garegnani (1992), section II.

capacity utilisation) and hence in real wages.²⁴ On the other hand, as a result of the tendency of the scale of capacity to adjust to levels of demand, the very possibility of conceiving the rate of accumulation – i.e. the ratio of (net) investment to the capital stock – as an *independent* variable is called into question.

8.

It should finally be stressed that Garegnani's theoretical work has helped to open up fruitful conceptual horizons for the analysis of real problems and the formulation of policies to address them. While his writings were only occasionally concerned with matters of applied economics, Garegnani himself drew attention in some comparatively recent contributions²⁵ to the opportunities offered for the analysis of real phenomena (and the consequent framing of economic policies) by criticism of neoclassical theory and reappraisal of the classical approach, coupled with the role of aggregate demand. First and foremost, the critique of the dominant theory destroys the analytical foundations of the claim that the flexibility of prices and wages – and in more general terms the functioning of market mechanisms – is sufficient for an 'allocation' of society's resources that can be regarded as efficient, above all with regard to levels of employment. It thus affords a clearer view of the limitations – and indeed the contradictions with respect to the set aims – of the kinds of action often put forward as policies to nurture growth and employment, which consist to a large extent of institutional reforms aimed at eliminating or reducing elements that impede the reciprocal adjustment of demand and supply in the various markets, not least the labour market. It is evident that such measures implicitly hinge precisely on the 'principle of substitution' that supposedly guarantees a sufficient

²⁴ For the normal rate of profit, its relationship with normal capacity utilisation and comparison with the ratio of realised profit to existing capital stock, see Garegnani (1992), pp. 56 and 60-61; Garegnani and Palumbo (1998), pp. 14-15. See also Ciccone (1986) and (1990).

²⁵ Garegnani (2007b); Garegnani (2011), sections 4 and 5; Cavalieri, Garegnani and Lucii (2004).

degree of elasticity in the demand for factors of production as well as goods, the validity of which is the primary object of Garegnani's criticism. On the constructive side, the theoretical framework put forward by Garegnani takes up the classical approach to the theory of distribution and prices and buttresses it by assigning demand a central role in determining levels of output. It therefore presupposes no univocal relationships between the price system and levels of output and employment, let alone the capacity of the price system by itself to provide results that can be regarded as in any sense optimal in the use of resources. From this perspective, policies capable of increasing the levels of activity and employment cannot be confined to acting on prices, as is the case of measures designed to counter dominant market positions and to foster competition, regardless of whatever merits they may possess in other respects. Effective policies must act rather on the sources of aggregate demand and, contrary to the views prevailing nowadays, this means that public expenditure and state intervention in general are to be seen as useful tools for the growth of the economy.

Similar considerations apply to redistributive policies designed to increase society's 'propensity to consume', whereas measures leading to wage cuts can be viewed as counterproductive for production and employment, due to their depressive influence on aggregate demand. Moreover, as noted in the previous section, the role of demand as a determinant of long-period levels of output has a complementary factor in the elasticity with which the creation of productive capacity responds to the stimuli generated by demand itself. Garegnani is thus able to point out that the opportunities for growth of the economy stretch beyond those that are 'visible' on the basis of the *existing* stocks of equipment, and that these potential opportunities are the ones that materialise during the phases of rapid and intense expansion often described as 'economic miracles' or booms, as witnessed recently in the cases of some Asian economies and China.²⁶

Along with the implications of theoretical derivation discussed above, Garegnani draws attention in one of the contributions mentioned

²⁶ Garegnani (2011), p. 602.

at the beginning of this section to a methodological aspect that distinguishes the classical approach from the neoclassical at the level of practical application, and stems from the difference between their respective analytical structures. The argument was developed in response to the claim that in making predictions about the effects of policies, the separation into analytical stages characteristic of the classical theory would be a disadvantage by comparison with the mechanics of 'routine predictions' permitted by the simultaneous determination of variables in neoclassical theory. Garegnani responded by pointing out that the separable analytical structure of classical theory is instead a factor of elasticity, as it involves the existence of relations falling outside the quantitative core of the theory and open to the influence of institutional aspects, which makes it possible to address the complexity of the real world better than the pre-defined applications of neoclassical general equilibrium.

The observation with which Garegnani brings his discussion of this issue to a close is particularly significant and can therefore also be used to end this note:

“As for method in policy analysis, I believe it can be said that there is bound to be less space for 'routine predictions' about the effects of policy, whether from theoretical analysis, or econometric models: the fact that as we said the analysis would largely have to be carried out outside the 'core' of classical theory will see to that. There will be in fact few grounds left for the idea that policy may be left to technicians who will steer an exact course in some objectively specifiable collective interest.”²⁷

The striking relevance of these words, which may have an almost prophetic ring for today's readers, especially those with misgivings about the alleged indispensability of the policies currently adopted in our economies, bears witness to the fertility of the reconstruction of economic analysis to which Garegnani made a crucial contribution with the work and commitment of a lifetime.

²⁷ Garegnani (2007b), p. 236.

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