

# THE NEW CONCEPTUAL LIMITS OF LAISSEZ-FAIRE

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## 1. Introduction

Any system made of non trivially moving and interacting elements - and no economist would deny that such features belong to any economic system - is in need of various forms and mechanisms of regulation, in order to survive and to perform its tasks. Such regulatory factors may be either external to the systems, or embodied in their architectures [<sup>1</sup>], or both. The regulation may be loose, such as to allow the survival of the systems or their satisfactory performance [<sup>2</sup>] under average circumstances, or optimal. Different schools of thought differ in their way of regarding the needs or the options for regulation, basically as a corollary of their vision about the functioning of the system.

The neoclassical paradigm holds that an economic system in which atomistic and selfish, fully rational and informed economic agents interact, through the production and the exchange of goods, in perfectly competitive markets is at the same time self and optimally regulated, reaching thus spontaneously, *under appropriate conditions*, a state of equilibrium and of *relative optimality* [<sup>3</sup>].

The normative proposition of *laissez faire* - that is, the message "let the market work" - stems from this: an optimally self-regulated system is in no need of external intervention; on the contrary, such an intervention would carry the system to suboptimal states. The only interventions which might be needed concern either the possible lacking of the "*appropriate conditions*" (giving rise to a set of cases of so called "market failures" [<sup>4</sup>]) or the initial distribution of resource/endowments among the different individuals

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<sup>1</sup>] If they are embodied the system is self-regulated.

<sup>2</sup>] Given the tasks assigned to them or embodied in their inner structure.

<sup>3</sup>] Referred to as "Pareto optimality", or Pareto efficiency. A collective optimum in the Pareto sense is a situation in which no one can be made better off without making some one else worse off.

<sup>4</sup>] The scholar who first systematically explored such an area was Pigou 1920.

[<sup>5</sup>]. This position, which represents at the same time an optimistic view about the functioning of the economic systems and a way to praise the role of the market, is supported and fully developed by a very specific normative branch of neoclassical theory, the Welfare, in particular the "New" Welfare (or Paretian) Economics [<sup>6</sup>]. Section 3 presents the main issues dealt with by Welfare Economics and the rationale of the (substantially "residual") policy interventions within that framework. In section 4 some of the drawbacks of the welfare theory - those that might result more interesting for the comprehension and the management of industrial problems - are considered in some detail.

Whether there is a need for policy or it is better to leave the market free to work, and in case which are the scope and the range of suitable policies, depends - as we said - on the theoretical structure according to which we interpret the functioning of the real world economies. Welfare theory depends on a particular theory about equilibrium, the one initially outlined by Walras and more recently revitalised by Arrow and Debreu. Different views about equilibrium, and in particular about the possibility of spontaneously attaining it, raise in a rather different way the problem of public intervention, and thus of *economic policies* and of theories founding them. Since this broader frame is somewhat more general and preliminary with respect to the welfare theory, it is reviewed first, in general terms, in section 2.

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<sup>5</sup>] The optimum which is reached through the market interactions is conditional to a given state of the initial distribution of the resources endowments. This implies a plurality of optima, each one corresponding to a different distribution of the endowments. The possibility of narrowing the set of Pareto optima, by deciding about the distribution on the basis of pure economic (and not political) considerations, has been the main concern of the so called "new" - or Paretian - welfare economics, involving scholars such as Hicks, Kaldor, Robbins, Scitovski, Samuelson, De Graaf and many others (see next footnote).

<sup>6</sup>] The term "new" was for contrasting such developments to the Pigouvian welfare economics, in which the problem of plurality of optima did not arise, since Pigou assumed individual utilities to be measurable and comparable. The use of Pareto criteria, thus, involves substituting a concept of ordinal utility to that of cardinal utility used by Pigou: only the concerned individual may say whether he is made better off by a given change of state, but he cannot communicate by how much, nor anything might be said about a collectivity being made better off unless none of its component individuals are made worse off and at least one is made better off.

The principle that normative considerations depend on the underlying interpretative views, which is the focus of section 2, is revived in sections 5 and 6, where the attention is brought upon the keystones that inspire the modern more unorthodox approaches, in particular those adopted by the scholars contributing to our program.

The focus is on problems and questions which differ from the traditional ones: economic systems continuously change their structures and performances through time and they do so unavoidably facing time-consuming distortions; most of competitive phenomena depend on such changes and the pressure for competition is among the forces which produce differentiation and change; changes occurring in the modes of production and consumption imply cultural changes, which are brought about by previous and contemporaneous changes and are the premise of new ones to come.

Optimal allocation in a static environment ceases to be the central issue. The homogeneity of the modes of production, and the analytically connected corner-stones of equilibrium and of systems' stability, which are emphasized in the traditional static environment, are only one - neither the more likely nor the more fortunate - of the possible systemic features.

Economic agents - or rather economic "actors" - are regarded as taking their decisions on the basis of expectations, the formation of which may be various and subject to evolution. The subsequent attempts to implement such decisions produce effects in future periods, which may or may not result compatible at the level of the system, because of different types of constraints, part of which have to do with what the system has inherited from past actions, part of which depend on the inconsistency of individual plans, part of which derive from the institutional set-up and from the "models" according to which government agencies interpret the functioning of the system and undertake policy actions. Some form of ex post compatibility almost always results from such constraints, but the features of their interplay deeply affect the qualitative features of the outcome - and thus its desirability - and the ways in which the plans are revised, influencing thus the directions towards which the contemporaneous sequential processes may evolve.

The plurality of possible paths, the unviability of part of them and the different quality of the viable ones, open a wide range of opportunities for policy actions, which are tentatively discussed in the last section.

## 2. An overview

The normative rule of *laissez faire* is the other face of a coin which stresses the role of the market, is regarded as the ultimate source of the material well-being attained by our societies since the beginning of industrial revolution, in producing the pressure towards efficiency and at the same time towards automatic coordination between independent decision-makers. How might the market succeed in such a miracle? How might it guide the interplay of conflicting individual interests so as to produce such an extraordinarily good collective result? The efforts of building abstract and formalised models of the ways the markets work are basically led by such questions, and this partly explains the overwhelming emphasis they put on the issue of equilibrium and of its desirability properties.

### *2.1 The early versions of the neoclassical paradigm and its systemic optimality properties*

Since the material objects which are produced and used in, or by the system are the results of the independent activities of the agents of whom the system itself consists, it is evident that the market is regarded to assure the full coordination of such activities; in the neoclassical approach equilibrium and coordination end up being the same thing, regarded as the product of the signalling role of the relative prices [<sup>7</sup>]. The simplest, and at the same time the oldest way of presenting how this outcome is produced is to tell the story of the tâtonnement process [<sup>8</sup>].

For a specific set of relative prices, which are regarded by the agents as given [<sup>9</sup>], the agents are considered as being able to establish what they want to buy (their demands) and what to produce and/or sell (their supplies, or "negative demands") for each good or service. Suppose that an auctioneer sets a list of arbitrary relative prices and communicate it to the individuals, and that individuals communicate in reaction what they would be ready to trade at such prices. If declared positive and negative demands

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<sup>7</sup>] The so called "Invisible Hand".

<sup>8</sup>] Initially put forward by L.Walras. It should be said, however, that there are general equilibrium models, namely those based on rational expectations hypotheses, which do not depend on tâtonnement.

<sup>9</sup>] The agents are regarded as "atomistic", that is, such as to think they are too small for influencing the prices through their behaviours. For fully homogeneous goods or services the attempt to set a price different from the one set by the market would produce either zero or infinite sales for the individual agent. Agents are thus said to behave "parametrically" with respect to prices.

match, there is equilibrium; otherwise the excess (positive or negative) demands recorded by the auctioneer bring him to revise the initial price set, so as to re-orient the decisions of the agents in such a way as to tend to eliminate the mismatching [<sup>10</sup>].

When this ultimately occurs [<sup>11</sup>], there is equilibrium (and coordination). Such an equilibrium is optimal [<sup>12</sup>], and corresponds to the maximisation of net national output at (perfect) market prices. Notice, however, that the active role is played by relative prices; absolute prices depend instead on the availability of a given quantity of money, which plays thus a purely passive role. Furthermore, it is evident that full employment is nothing but an implicit aspect of such an equilibrium [<sup>13</sup>].

## 2.2 *The Keynesian view and suboptimal equilibria*

Keynes' proposition that we can have out-of-full employment equilibria amounts to arguing that the system is not optimally self-regulated, needing thus further [<sup>14</sup>] external regulation. The

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<sup>10</sup>] This ability of the price set to respond to excess demands in such a way as to eliminate them, which has to do with the stability of the equilibrium, depends indeed on very stringent conditions assumed for the production and the utility functions: they have to be such as to generate supply functions which are upward sloping, and demand functions which are downward sloping with respect to prices. The existence of the equilibrium under statical conditions derives from the duality between the vector of prices and the vector of the quantities of the goods and services which occurs when the quantities supplied and demanded at that (equilibrium) vector of prices happen to be equal.

<sup>11</sup>] Notice that no transaction should take place before the equilibrium prices have been determined, since such transactions out of equilibrium would modify the endowments of the involved individuals, eventually producing a different final equilibrium, which would depend on the chancy nature of the initially announced price set.

<sup>12</sup>] See the section 3.1 below.

<sup>13</sup>] Labour is nothing but one of the quantities the excess demands of which must be zero in equilibrium. On the other hand it is intuitive that, should the potential resources for production be idle when not all the needs are saturated yet, this would indicate a non optimal allocation.

<sup>14</sup>] Keynes 1936 thought the market able to assure a substantial consistency between the composition of production and that of purchases (and thus between allocation and preferences structure), but he believed the market-based system unable to reach

coexistence of unsatisfied needs and unemployed resources, such as labour, ready to be used for increasing the production suitable to satisfy those needs, clearly implies a system's malfunctioning.

We cannot explain here in depth the analytical reasons behind Keynesian suboptimal equilibria. The central point is that in the interpretative and analytical view of Keynes the double duality which constitutes the core of the neoclassical approach - the one between real variables and money and the one between the vector of exchanged quantities and the vector of relative prices - is abandoned. The interest rate is no more regarded as the relative price able to equate supplied and demanded savings, but as the price for the availability of money [<sup>15</sup>]. This forestalls the working of Say's law, according to which total demand and supply cannot but be equal [<sup>16</sup>]. For Keynes, instead, given the demand for consumption - that he regards as function of available income [<sup>17</sup>] - savings are a residue, which has no reason to be equal to intentional investments. These depend instead, for a given state of long run expectations, on the interest rate and, thus, on the availability of money, whose level should be regarded as analytically random [<sup>18</sup>]. Since the total supply of goods is made to depend on the total level of demand, with a self-

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spontaneously (if not by chance) the level of activation corresponding to full employment.

<sup>15</sup>] Which is considered to be worthy in itself. The supply of money, thus, is able to affect the total demand for commodities, through its effects on the interest rate and consequently on the demand for investment goods.

<sup>16</sup>] Since what is not spent for consumption cannot but be spent for intentional investments.

<sup>17</sup>] Which depends, on its turn, on the level of total supply, through the payments made to the involved factors of production.

<sup>18</sup>] In the classical world the supply of money affects the level of prices but has no effect on the optimal equilibrium of real variables. In the Keynesian world it affects the level, not necessarily optimal, of equilibrium output (as it will be shown in a moment). Obviously, in a world endowed with Keynesian consciousness, the supply of money might be used to carry the equilibrium output to a full employment level.

However, according to Keynes the monetary policy may meet difficulties because of the so called "liquidity trap", which might occur if individuals, because of their expectations on future increases in the interest rate, become ready to exchange all of their financial assets for money at a given price. This event would put a floor to the further pursued decline of the interest rate.

adjusting relative price of labour [<sup>19</sup>], the level of total demand, for a given state of expectations and of money supply, has no guarantee, through the working of endogenous forces alone, to correspond to full employment.

In order to attain full employment, the level of demand should then be properly exogenously "managed", and budgetary and monetary instruments be used in order to maximize production and eliminate involuntary unemployment; and this was regarded as the end of laissez faire. The instruments for such an exogenous regulation were developed along the lines indicated by Keynes himself, and, later on, by scholars such as A.Hansen 1941, A.Lerner 1944, Tinbergen 1952 and others, who may be considered as the founders of the theory of economic policy. The concept itself of "economic policy", apart from ideological factors, could not exist out of an analytical background that predicts the inability of systems, based only on self-regulating mechanisms, to work in a satisfactory way.

### *2.3 The revival of the classical outlook; why it is important to consider them in depth.*

More recently the Keynesian views, which had been widely influential until the early seventies, appear to have been made out-moded by two main alternative lines of thought. One of them - the new classical macroeconomics - revived the old classical and monetarist approaches, eliminating their more naive features, valorising the role of expectations and of their possible errors in the short run. The second one is represented by the latest evolutions of the Keynesism of the so called "neoclassical synthesis", which regard the rigidities of the real wages as responsible for unemployment, as for the "classical" economists against which Keynes argued.

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<sup>19</sup>] With fixed money wages and an elastic supply of labour at such a wage, any level of the demand for commodities would command a price for them able to adjust the real wage rate at the profitability conditions which justify the corresponding supply. This stems from the auction conditions implicitly assumed for the formation of the prices of commodities, and holds for any shape of the supply function. If such a function is flat (as in the fix-price version of Keynesian models), the level of real wage rate does not matter; under conditions of rising marginal costs (formally assumed by Keynes himself), instead, any increase of the demand for commodities would automatically increase their equilibrium price, and thus lower the real wages, of the just needed amount.

The reversal of the policy frame brought about by the late Keynesians of the neoclassical synthesis will stem from the removal of such a spontaneous and flexible adjustments.

There are good theoretical reasons for putting the two approaches in a single bunch, despite the initial reciprocal hostility which divided them and some residual differences [<sup>20</sup>]. The major reason is that they both end up in policy implications which are profoundly "anti-Keynesian". At the theoretical level, both approaches have been influenced by the new and robust relaunching of the general equilibrium theory, along the lines established by the famous contribution by Arrow and Debreu, appeared on *Econometrica* in 1954.

Both schools have been very influential [<sup>21</sup>] and, because of their asserted or pretended microfoundations, due to their connections with the general equilibrium theory, have strongly contributed to re-establish a climate favourable to the principle of *laissez faire*. This is why there are good reasons for considering them in some depth here, in a work concerned with the issue of market and organisation. Let us comment this choice briefly.

While the "old" and the "new" classical economics mainly consist of their microeconomic foundations, the prestige of their normative implications derive from the optimality properties of the aggregate results of the microeconomic interactions based on such foundations; this could not but be reinforced by the appearance of apparently robust and well structured theories which appear to succeed in placing the optimality properties of aggregate results not only in the subtle and abstract context of Paretian economics, but in the more intelligible world and in the more palatable language of macroeconomic policies. On their turn, however, the systemic optimality features reverberate, from an operational viewpoint, at the micro level: to assure the pure functioning of competitive markets, or to reproduce how the markets would have worked if they might have existed when they are lacking or not perfect, becomes

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<sup>20</sup>] The approach based on rigidities, the one which continued for a long time to regard himself as Keynesian, tended to avoid to rely upon the role of expectations, which was obviously crucial under rational expectations hypotheses. This appears now understandable - so long as the original enemy was considered Friedman's approach - but also paradoxical, provided the apparently strategical role that Keynes asserted to attribute to expectations.

<sup>21</sup>] The tendencies towards deregulation and privatisation are not independent of the climate generated by such approaches. This applies mainly to the first group of contributions, while the second one appears to have influenced above all the macro-policies, often through the intermediation of the central banks, because of its implications about the need to control the dynamics of nominal wages.



again the only "norm" for action. Anti-trust activities and most of cost-benefit applications are a good example of this [<sup>22</sup>].

On the other hand, the only influential and prestigious systemic approach holding that the economies are neither self nor optimally regulated was that of Keynes; but Keynes' theory was not micro-founded and belated attempts to give to it robust micro-foundations [<sup>23</sup>] cannot be said to have been a success [<sup>24</sup>]. Thus, most of the post-war state interventionist attitudes, which certainly derive from Keynesian ideas, have been carried on, at least for what concerns the micro and the "meso" levels, more on the basis of contingent and pragmatistical considerations [<sup>25</sup>] than of well-linked micro-foundations [<sup>26</sup>].

#### 2.4 *Arrow-Debreu as a turning point*

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<sup>22</sup>] Although the principle of selecting alternative projects according to of how much expected benefits exceed expected costs appears to have general applicability in our cultures, the way benefits and costs are evaluated and aggregated when they are - as they usually are - heterogeneous, is, again, contingent to specific theories about the features of the real world. The prevailing approaches use an evaluation principle based on the conjecturing about which would have been the sub-set of prices that would have been generated by perfectly competitive markets if they might have existed, in situations in which they actually lack or are imperfect.

<sup>23</sup>] Weintraub 1977. Harcourt 1977. For a critical survey see Amendola V. 1990.

<sup>24</sup>] Despite these drawbacks in the theoretical specifications, many scholars have regarded the period of high expansion and relative full employment which prevailed in the sixties as the result of Keynesian active policies; other scholars, on the contrary, regarded them as the far causes of the problems of stagnation and inflation that emerged afterwards.

<sup>25</sup>] When the interventions have been based upon serious preliminary economic researches, these have mainly consisted of directly observed, detailed econometric relationships, more or less along the line suggested by Tinbergen's approach.

In any case there are few doubts that the interventionist approach is also a result of a specific cultural and historical mood and, at least indirectly, of the loosening (due again to Keynes's ideas) of the previously prevailing constraints on public expenditures.

<sup>26</sup>] In many cases, above all at micro-levels, cost-benefit analyses - based on Pareto-welfare assumptions - have been used, despite their inconsistency with the Keynesian framework.

However, is the opposite front is in a better shape? We consider the axiomatic treatment by Arrow-Debreu 1954 as a real turning point.

The aim of general equilibrium theory, since Walras and Pareto, has been to show that the market is able to reconcile the different and conflicting interests and plans of the individuals. The *pressure* to such a spontaneous coordination should be assured by the only means of the signalling role of the relative prices, while the *compatibility* of the economic decisions should be assured by the occurrence of equilibrium. However, until Arrow-Debreu, the features of the assumptions allowing the equilibrium - above all those concerning the cognitive abilities attributed to the individuals, the ensuing relationships between decisions, time and uncertainty, and finally the morphological aspects of the choice sets - were not satisfactorily spelled out.

The choice to use an axiomatic treatment has not only allowed to prove rigorously the existence of the equilibrium, but to frame the connected problems of its uniqueness and stability. In particular, the very same deepening of the features of the model has led the concerned scholars to hold the impossibility to solve them under sufficiently broad and general conditions. The weakness concerning the uniqueness has consequences on the arguments about the Pareto optimality of market solutions; those concerning the stability raise doubts about the procedural ability of the price signals alone to push towards equilibrium.

The world of Arrow-Debreu (AD) does not differ too much from the one described in section 2.1. It is only more specific and better defined [<sup>27</sup>]. It can allow for uncertainty [<sup>28</sup>], but it needs neither

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<sup>27</sup>] An AD "commodity" is a good delivered at a certain date in a certain place; if N is the number of goods as usually identified (for example in section 2.1 above), and there are M locations where the goods are to be delivered at T future dates, it is as if we had a single, atemporal market session in which  $N \times M \times T = K$  commodities will be the objects of transactions. Obviously, the transactions concerning future dates will consist of contracts which define simple rights, representative of future deliveries.

<sup>28</sup>] This depends on the peculiar definition of AD commodities. If we assume that there are S mutually exclusive and jointly exhaustive possible states of the world, we will have the possibility to trade  $K \times S$  contingent commodities, basically with no more problems than those occurring in a world made of K commodities, the price of a single contingent commodity being the one to be paid in order to obtain a given commodity should a specific state of the world happen to occur.

expectations nor forecasting [<sup>29</sup>], since it is basically timeless: the transactions take place once and for all at the beginning of time, and only deliveries are carried on through time [<sup>30</sup>]. This depends on the assumed completeness of the AD markets: this is crucial in allowing the equilibrium outcome and its efficiency properties, but it is also the main source of weakness once the theory is regarded in terms of interpretative power.

The axiomatically defined features of the AD world have been read by most of the scholars as "restrictions" to be made in order to argue about general equilibrium outcomes. But "restrictions" with respect to what? The obvious, though hard to prove answer is that the AD hypotheses do not appear to correspond to what most of us economists regard as features of observable economic facts and behaviours: the markets we know do not concern "futures" or insurance-type contracts if not in a limited range, they periodically re-open themselves to new spot transactions, preferences and technologies do evolve in an unpredictable way, the assumptions about the convexity of the production set do not appear to correspond to the real world options, money appears to matter, while it has no crucial role in the AD world, etc..

Thus, despite the consciousness of the muddy epistemological nature of any attempt to talk about the "realism" of a model, in economics no less than in any other discipline, few doubts can be cast upon the constant and diffuse desire to set up models empowered with interpretative capacities. In the case of general equilibrium theory, it is as if our fellow economists were captured in a double binding situation: on the one side the theory is so appealing - as it offers an elegant equilibrium solution, which furthermore lets the market play the role of an efficient coordination operator - that most of the economists are reluctant to part from it; on the other one, however, its more strategic results are contingent to an effort of abstraction which is pushed too far away from the common experience about the real world to result as immediately acceptable. And this explains why the issue of "missing" markets, and thus of expectations and forecasting, variously became the core of a wide

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<sup>29</sup>] The only cognitive abilities which are required for each of the individuals - apart from the computational ones which are needed for maximising the utility he obtains from the commodities - concern his future demand and supply functions .

<sup>30</sup>] As it happens during the Hicksian week, once the market has been closed on monday evening (Hicks, 1939, 1965). But in the Hicksian approach of temporary equilibrium the markets re-open on the following Mondays and new transactions take place, while, should markets re-open at future dates in the AD world, no transaction would occur.

set of more "applied" versions, aimed at dealing with the real world problems while attempting to maintain the general equilibrium framework [<sup>31</sup>].

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<sup>31]</sup> To say the truth, the most frequent reactions have been to overlook the more stringent limitations of the AD model, and only the more serious ones to integrate the architecture of the model, so as to confer to it more acceptable features for what concerns its asserted "realism".

### 2.5 *The interpretative efforts of new classical macroeconomics*

As it is well known the theory of Keynes had rapidly become the object of a neoclassical "reading" through the so-called "neoclassical synthesis" (Hicks 1937, Modigliani 1944). The next step has been to reformulate such a synthesis in a stylised macroeconomic/general equilibrium frame (Modigliani 1963). The results of Keynes of unemployment equilibria were regarded as a short run possible outcome of a more general model, whose occurrence is contingent to the rigidity of the nominal wages (or other forms of rigidities), on its turn connected with the hypothesis of money illusion. Since in the long run none of such assumptions appeared to most of the concerned scholars to be tenable, the system was regarded as endogenously tending to full employment equilibrium through the working of the wealth effect [<sup>32</sup>].

Such a view was variously adapted during the hard phase in which the model had to face the challenges posed by the Phillips curve first, and by stagflation later on. Though the basic analytical philosophy remained substantially unchanged, the role attributed to the money illusion crucially changed its flavour: while in the early sixties the stress was put on the downward rigidity of nominal wages, which forestalled the spontaneous attainment of full employment and because of this might have required Keynesian expansionary policies in order to reach full employment faster, later on it became the loss of money illusion on the side of wage earners the source of any evil, since it was the implicit or explicit indexation of nominal wages with respect to prices which was regarded to forestall the necessary downward flexibility of real wages and to feed high levels of inflation together with unemployment (Modigliani-Padoa Schioppa 1977) [<sup>33</sup>]. The resulting outcome from the policy

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<sup>32</sup>] Modigliani 1963 was very cautious in spelling out all of the conditions under which neoclassical results were possible, but, as Rodano 1987 notices, the ensuing literature tended to overlook the *caveats* put forward by Modigliani.

<sup>33</sup>] Other approaches based on the same underlying philosophy tended to stress more the role of dynamic disequilibria as a source of non market clearing (Barro-Grossman 1976; Benassy 1982 and 1986; Malinvaud 1977). This stream may be framed in a particular intertemporal variant of general equilibrium models, in which market sessions re-open periodically and temporary equilibria are sought (see Grandmont 1977 for this analytical environment, and Grandmont 1987 for some of the macroeconomic implications). If within a period some of the prices (not necessarily the wages) are considered as rigid, some form of quantities rationing would result. But the excess demand mismatching in some of the markets cannot but reverberate in the remaining ones, producing unemployment

viewpoint is the control of nominal earnings associated to the abandonment of active macropolicies; a recipe that is very close to laissez faire.

As for the "opposite" current of thought, pivoting around the revival of various monetarist specifications, the road was opened by the famous contribution by Friedman 1967 (but see also Phelps 1967). Here the inner tendency towards market clearing, which among the "classical" (pre-Keynesian neoclassical) economists was connected to full rationality and perfect information, is tempered by a combination of adaptive expectations and of a soft form of learning. The rational workers increase the supply of their services as the real wage rate increases, but in the short run - and for one spell only - they may be cheated by an increase in the nominal wages, which appears to them as an increase in the real ones, that is, as an increase of wages with respect to the average level of prices of consumption goods.

Since any attempt of active macropolicies to force expansion beyond the natural equilibrium output (employment) would increase wage rates, but such increases would immediately afterwards be matched by equivalent increases in the prices of goods, leaving the real wages unchanged, further attempts to similar policy actions could not but fail, since workers would have learnt the illusory nature of the ensuing nominal wages increases. In order to attain the envisaged real results, the government would be obliged to reinforce its action, seeking to compensate for the expectations about price increases which had been previously embodied in the minds of workers by the previous experience. If the government were so dull to practice such a self-frustrating strategy, a vicious spiral of growing inflation would unavoidably be activated.

Later on the hypothesis of adaptive expectations was substituted by that of rational ones (Lucas 1972), and the seed started to spread in several directions, from econometric testing to economic policy theory (Sargent-Wallace 1975 and 1976). The starting point was that the AD hypothesis of completeness of markets is untenable in any model aiming at the real world interpretation, since, in the real world, market sessions, where new spot transactions, as well as transactions upon futures, take place, are periodically re-opened (Hahn 1982). Where markets are missing one can admit that their role may be somehow compensated, if not substituted at all, by reliable expectations about prices. Rational expectations allow each of the individuals to estimate, by the means

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within the period and pressures upon prices for the market sessions next to come. However, it is really hard (and probably useless) where to classify these contributions, which according to many scholars belong to the rational expectations wave (Taylor 1985).

of an efficient use of all of the available information, which would be the outcome occurring under the condition of completeness of AD markets.

However, should this always apply with no errors or delays, or should one assume immediate real adjustments, the analysis would fall back to the pre-Keynesian results and would not be able to resist the challenge of empirical testing on the macroeconomic ground, since the Phillips curve would result as completely rigid in the short as well as in the long run, and so would correspondingly be the aggregate output supply function. Data show instead a positive correlation between output and price levels.

This problem is faced in various ways, functionally similar to the transitory money illusion hypothesis adopted by Friedman [<sup>34</sup>]. One way is the introduction of estimation errors on the side of individual agents in the detection of relative price changes in an environment facing absolute price changes, due to local, but transitory, informational limitations (Lucas 1972a, 1972b, 1973, 1975). Alternatively asymmetries in the time lags between perception and decisions, and/or decisions and effects, for different types of agents - the firms, the workers, and the policy maker - are introduced (Fischer 1977; Gray 1976; Phelps-Taylor 1977); the resulting disequilibria, which produce effects either on nominal prices or on quantities dynamics, have to be regarded, however, as transitory, given the embodied Walrasian principle of market clearing [<sup>35</sup>].

The consequences on the theory of economic policy are quite radical (Sargent-Wallace 1976). Individuals, having rational expectations, are able to embody announced or expected government policies in their decision framework, neutralising their effects; only unexpected policies might have some - though anyway transitory - effect, given the long run general equilibrium environment.

## 2.6 *Some comments on the core issues*

If one would be asked to define *ex ante*, but exploiting the experience gained along the last fifty years, the scientific program of

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<sup>34</sup>] There is an important difference between the Friedman and post-Lucas approaches, concerning the costs of disinflation, which is high in Friedman's perspective - due to the need of decumulating through time the previously accumulated inflationary expectations - and is, quite consistently, nihil under rational expectations.

<sup>35</sup>] The latter specifications converge with the final ones adopted by the scholars of the Keynesian neoclassical synthesis recalled above. For a comparative analysis of the different specifications of the new classical macroeconomics with rational expectations see Taylor 1985.

the macroeconomists after Keynes, this might roughly stated in the following way: "find out various ways for obtaining (a) the possibility of having unemployment and (b) a pro-cyclical correlation between prices and output, *under the constraint* (c) that the resulting model has the features of long run general equilibrium".

The Keynesians of the neoclassical synthesis have used rigidities affecting the wages, the nominal ones first, the real ones later on, holding that various forms of imperfect indexation are at work [<sup>36</sup>]. Friedman has used a transitory money illusion; Lucas forecasting errors. The models with rigid prices and rational expectations have used time lags between the decisions of different agents (or between their effects).

These are the variances in the solution proposed for reconciling the target (a) with the constraint (c): all of them have the common feature of causing *transitory disequilibria*. As for target (b), it is always obtained with a rising aggregate supply curve, which is compatible either with the traditional hypothesis of rising marginal costs or with a procyclical mark-up (Bruno 1989).

As we noticed earlier, however, the picture would not be complete if we omitted another component that continuously pervaded the above-sketched program: that of conferring more interpretative likelihood to the models inspired by the general equilibrium theory. The road towards interpretative power which most of such approaches were obliged to adopt was the one, formerly outlined in economics by Friedman 1953, according to which a model shows interpretative power so long as it allows correct forecasting, independently of how abstract or "unrealistic" its founding assumptions are [<sup>37</sup>]. The method of Friedman, indeed, suits very well the scientific program after Keynes outlined above, given the constraint of consistency with the general equilibrium approach.

However, the forecasting ability alone cannot be able to allow to discriminate between different models, so long as even conflicting models may produce good data fitting and acceptable forecasting. And the one proposed by Friedman is not the only way of regarding the issue of the real world interpretation. As we said, this is a rather muddy issue, and it is worthwhile to discuss some further viewpoint.

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<sup>36</sup>] Notice the crucial importance of the indexation being imperfect. Should it not be so, the tendency towards long run full equilibrium would be lacking (Bruno, 1989).

<sup>37</sup>] Usually the underlying methodological assumption is of the "as if" type. The most classical example is that may be the human beings are not fully rational optimisers, but we can represent the economy "as if" they were so.



We can acquire some knowledge concerning how the real world works only through the lenses of some model, even when the model is concealed to the consciousness of the analyst. A model always implies a process of abstraction, and thus a selection of the aspects of the problems posed or of the features manifested by our perception of the real world. The choice of the hypotheses upon which models are built, which most of the scholars would agree as belonging to a pre-scientific phase, highly depends, thus, on the questions one is interested to answer. However - and this is a second level scrutiny - the hypotheses themselves may be subject to empirical testing or, alternatively or jointly, they may be derived by an elaboration of descriptive observations, which put into evidence facts, the search for the causal factors of which become the object of further enquiry and the aim which guide the process of model building [<sup>38</sup>].

If we regard now the program after Keynes with such further methodological lenses, many points of dissatisfaction arise.

Most of the scholars of the new classical macroeconomics focussed their attention upon the issue of the cognitive features of the individual agents, in an effort to overcome the problem connected with the completeness of markets of the AD world. While the deepening of the attention brought upon expectations has contributed to make our views about expectations and about economic policy less naive, it is dubious whether the rational expectations models succeed in solving the problem of missing markets (Hahn 1982; Frydman-Phelps 1983). Underlying both hypotheses is a postulate of perfect trust (Gale 1982), the only one allowing a general equivalence between contracts on futures and actual deliveries.

What macroeconomists appear to forget, however, is that the completeness of markets was only one of the "restrictions" of the AD world. There are also those concerning the utility and the production functions, which are necessary for stability, and are no less important than missing markets for the general equilibrium solution to hold. Macroeconomists, however, fail to consider them at all [<sup>39</sup>]. It appears as we had ended up, thus, in a rather odd situation, where

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<sup>38</sup>] Obviously, even descriptive observation does not escape the suspicion of being model-biased, but this is compensated in some degree by the fact that descriptive enquiries represent deliberately open models.

<sup>39</sup>] This is not all, however. The whole of macroeconomics after Keynes crucially depends on the *assumption* of rising supply functions in order to attain target (b) of the program outlined above. However, most of factual observations about firms do not correspond to such an assumption (see next section).

the main scientific programs have been acknowledged -implicitly or explicitly - as being in bad troubles, if not failed at all, by their more reputed representatives, while their followers, belonging to the approaches which derive by such programs, pretend to ignore such failures.

### 2.7 *The other face of the coin with respect to realism*

The general equilibrium theory offers a good example of how the assumptions may be selected in such a way as to confer the desired features to the model constructed upon them. Other approaches prefer, as we said, to start from the facts of observation, and to attempt to build up models aimed at solving the puzzles posed by them.

During the last half a century plenty of theoretical and inductive researches about the imperfect competition, the oligopolistic markets, the behaviour of firms and organisations, the decision processes, etc. have been induced by this latter way of facing the problem of realism. What they have shown is how far is the real world from the assumptions upon which the model of perfect competition is based, up to the point that the situations which might be thought as stylized by such a model appear to be rather the exception than the rule [<sup>40</sup>].

In particular, a remarkable emphasis has been put upon the fact that real world decisions are taken on the basis of imperfect information and/or according to satisficing, and not optimizing, criteria, along the line suggested by the theory of bounded rationality (most of the immense production of H.Simon concerns this issue; just to grasp some of the central points, see Simon 1955, 1972, 1978 and 1979) [<sup>41</sup>]. While the criticisms against optimising

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<sup>40</sup>] This should raise serious problems about Pareto efficiency, because of the theorem of second best. According to Lipsey and Lancaster 1956, if there is a constraint in a general equilibrium system "...which prevents the attainment of one of the Pareto conditions, the other Paretian conditions, although still attainable, are, in general, no longer desirable". Thus, when some situation of non-perfect competition exists and cannot be eliminated, there is no assurance that the pursuing of the competitive equilibrium conditions in the remaining part of the system is the appropriate strategy in order to assure the Pareto efficiency.

<sup>41</sup>] Paradoxically enough, such lines of thought, either based on observation and induction, or in any case aiming at a greater realism, have remained peripheral in terms of the attraction exerted towards the majority of the economists. This is likely to be due to their alleged inability to produce generalisations at the systemic level. This has undoubtedly contributed at maintaining the hegemony of some of the various guises of the neo-classical paradigm and of their commonly shared *laissez-faire* implications. Most of the economists appear evidently to forget that even the model which promised the more in terms of generalisation - the general equilibrium one - has not been able to attain the hoped results. They are the very same ones who appear to be over-

have been substantially overlooked [<sup>42</sup>], those concerning the limitations of information of the agents have attracted a great deal of attention, in particular on the side of the self-defined "New Keynesian Economics" (Stiglitz 1987a, 1987b, 1988; Stiglitz-Weiss 1987; Gordon 1990; Greenwald-Stiglitz 1987), but which should perhaps be regarded as an aspect of a broader emerging "Economics of information" (Spence 1974; Hart-Holmstrom 1987; Philips 1988), and of modern institutionalism (Alchian-Demsetz 1972; Lindblom 1977; Schotter 1981; Boyer 1986; Boyer-Mistral 1978; and above all Williamson 1985), most of them ripening from the far back seed of Coase 1937.

Information is limited, often unevenly distributed among the agents -there are, thus, informational asymmetries - and costly. Given this, the agents have usually asymmetric information about the costs and the benefits associated to any specific market transaction; in the meanwhile any attempt either to a preliminary elimination of the asymmetry, or to set up contracts designed in such a way as to compensate for, or neutralize the opportunistic exploitation of informative advantages on the side of one of the dealers, is costly. This makes it convenient on the one side to select different forms of transaction in different informational contexts, on the other one to set up systems of shared rules (legal or customary) which bind the individuals to respect contracts and to give them appropriate interpretations.

In particular any allocation problem, given the specificities of the asymmetries and the costs and risks associated to them or to their removal, may be solved alternatively by buying goods or services in the market or by self-producing the same things, through the setting up (or the use) of an organisation; this implies to rely upon administrative relationships with hired labour [<sup>43</sup>]. Different conditions carry different individuals to behave as entrepreneurs or as workers, according to different informational and resources

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attracted (if not obsessed) by the need to confer to their system-representing models the ability of producing perfectly determined and univocal solutions.

<sup>42</sup>] May be for their disruptiveness; see Heiner 1983.

<sup>43</sup>] The contracts concerning the buying and the selling of products, and in some degree of structured services, highly differ from the labour contracts. The working tasks within an organisation and their standards of performance are regarded as highly idiosyncratic, that is, they could not be completely enumerated and properly defined, or it would too costly to do so. The management of such contracts requires thus a complex association of incentive schemes and systems of supervision and control, which implies the setting up of organisations and their proper structuring.

endowments [<sup>44</sup>], and carry the firms themselves to choose between the alternatives "to make" or instead "to buy".

Thus, firms are not a useless empty box anymore, as it is in the plain neoclassical approach. Intra-firm and inter-firm relationships are alternative ways of solving allocation problems; the choice among them depends on the contingent terms in which the distribution of information, the cost of transactions, the risks of opportunistic behaviours and the established rules present themselves. The application of these analytical tools to widespread and important contracts, such as the labour contracts, leads to draw important conclusions at the level of the macro-economic performance of the system, apparently finding new basis for the explanation of involuntary unemployment. Furthermore, the relevance of organisational set-ups allows to discuss, beside the market failures, the cases of government failures (Stiglitz 1986). In other words, when an allocation problem exists, the relative performance, in terms of organisational skills and options, of a public and a private solution should be considered comparatively, and the choice should then be made according to the contingent features of the problems and of the relative abilities to solve them.

The approaches pivoting around the limitation and the cost of information are certainly of great interest and certainly far away from the world of post-Keynesian macroeconomics surveyed in the previous sections, above all for their policy implications, which are themselves far away too from *laissez faire*. However, they still belong, in our opinion, to the general equilibrium program. Two main features push towards such a view: the focus upon the domain of allocation and exchange activities (in the frame of which the production problems continue to be considered), and the method of equilibrium analysis.

Time certainly plays a role which it cannot have in an AD world, but it performs the role of a simple environment where knowledge - in the strict form of information - is accumulated, modifying the point of departure of subsequent market sessions, in each of which a new optimal equilibrium is sought. Multiple equilibria (and thus unemployment), as in the world of Keynes, are again possible, and are due to the fact that different paths may derive from the specific way in which, in each market session, the decisions affect, and are affected by, the distribution of information among the agents. The optimality is relative to the set of feasible equilibria, and it is different thus from the specific Pareto optimality such as it

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<sup>44</sup>] This breaks the indifference which is typical of the traditional neoclassical world, according to which it is indifferent to hire labour or to hire capital, also because informational limitations deeply affect the credit sector.

would appear to an omniscient external observer; the duality between Pareto optimality and perfect market solutions is thus broken, the limitation of information acting as a pervasive producer of systematic externalities [<sup>45</sup>]. The public sector has a role, either in removing the external informational diseconomies, or whenever he is able to manage organisational options better than the market. Money has a role to play, because of the uncertainty and the likelihood of systematic "errors".

### 2.8 *The focus upon production processes and their changes*

The selection of hypotheses, as we said, is also functional to the problems to which the models seek to provide answers. The neoclassical approach is basically concerned with optimal allocation and exchange, with respect to which production has a basically ancillary role. Most recently two groups of scholars have concentrated instead their attention on the production processes and on how and why they are brought to change through time and intentional efforts, the evolutionary (or neo-Schumpeterian) approach and the sequentialist one (often referred to as neo-Austrian [<sup>46</sup>]).

These approaches regard as important other features of the economic system. While standard economic theory focuses its attention upon basically synchronic, competitive interactions between economic agents, such approaches consider as important, instead, the cooperative and diachronic interactions between agents. For the traditional theory production takes place as an act, occurring in a single period and within the sphere of a single agent, the firm, whose organizational features are basically regarded as unimportant; for these approaches, instead, the firm is no more a black box, both its external and internal relationships are considered as important, together with the internal and external organizational features that allow such interactions and contribute in shaping them. Furthermore all these phenomena are regarded as long-lasting *activities* (as distinct from single *acts*) that feed cumulative processes (implying the existence of temporal asymmetries); activities and processes are regarded as being highly characterised by changing information sets and learning [<sup>47</sup>]. Non-trivial relationships are regarded as specific

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<sup>45</sup>] See below.

<sup>46</sup>] Because of the use, by Amendola, Gaffard 1988, of a Neo-Austrian model for the representation of the productive process, which vertically and intertemporally integrates the phases of construction of productive capacity and those of production of current output.

<sup>47</sup>] Ciborra 1992 points out effectively the difference of focus: "The problem with the transactions cost approach (Williamson 1985) is that it considers trade offs between institutional arrangements in a

and being constructed through time; since each agent builds up relationships with well-specified external and internal agents, the process of construction of relationships is specific itself [<sup>48</sup>]; the investments associated to it, imposing sunk costs, are specific too, and usually cannot be substituted by spot market transactions. Innovation is conceived as a time consuming activity made of investment and of the setting up of specific relationships among agents [<sup>49</sup>].

The evolutionary approach regards competition in a dynamic perspective and the market as a Darwin-type environment where the natural selection of the more endowed subjects is continuously performed. Most of competition and selection depends on the ability the subjects have to change. The emphasis is put then on technology and on the reciprocal relationships between the scientific and technological spheres and the world of the firms, which on the one side are the agents which are able to transform the knowledge hints coming from those spheres into real business options, on the other one can provide stimuli to them. The forecasting features of evolutionary theories pivot around the centrality of "technological

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static way. However, it may well be that in a turbulent environment an arrangement that has bad transaction costs properties is far more efficient .. than an organization with good transaction costs in equilibrium .. in high-tech industries the trade off that must be considered is the one between efficiency and flexibility" (p.92). Not transaction costs savings, but "new knowledge is the outcome, and the goal.." of the establishment of specific organizational strategies.

<sup>48</sup>] In the traditional theory, instead, all forms of relationships between firms are reduced to anonymous *market transactions*.

<sup>49</sup>] The traditional theory regards instead innovation as an act, or event, occurring in given moments of time; innovative events are basically considered thus as exogenous, and what is investigated is the decision to adopt them by the agents and how such decisions affect the equilibria in a world made of basically synchronic interactions among the agents. This way of regarding innovation substantially reflects the way of looking at the accumulation of capital and its effects. Firms choose among a set of available techniques, solving a problem of long-run profit maximization. No particular attention is given to the fact that production takes time, and, in particular, that the building up of productive capacity takes a relevant length of time. Since a poor attention is given to the relevant period which is taken by the construction of productive capacity, and above all of new and innovative productive capacity, equally overlooked are the problems of the uncertainty and of sunk costs connected to such processes of construction.

paradigms", regarded as specific sets of homogeneous and self-reinforcing pieces of knowledge and operational skills.

Among the most interesting dynamic aspects which are considered by the evolutionary approach there is the alternation between changes occurring *within* a technological paradigm and ruptures, or discontinuities associated with a *change of paradigm* (Nelson, Winter 1982). The changes occurring within a paradigmatic path have essentially to do with the adoption and diffusion of technologies belonging to the paradigm. Although the innovations emerging along a paradigmatic path might be associated in broad terms to a learning process, there is a widespread and continuous consciousness that there is something more than bare "learning by doing": innovations are intentionally pursued in order to obtain infra-paradigmatic innovations (Dosi 1982; 1988a; 1988b; Pavitt 1984).

The analysis of the discontinuity generating a new paradigm is less clear-cut. The basic idea appears to be that sooner or later the exploitation of the innovative potential of a given paradigm faces decreasing returns to further investments and efforts. This should push the agents to increase their efforts to search for new paradigms [<sup>50</sup>]. As a result we have a framework where innovation is almost completely exogenous when it concerns the change from one paradigm to another, while it is ancipital when it occurs along a paradigmatic path [<sup>51</sup>]. This appears to suggest a dynamic feature of the system which is characterized by a substantial degree of determinism, associated however to stochastic disturbances: there is a long cycle, the one between two paradigmatic ruptures, and "patterned" sequences of shorter cycles corresponding to the different phases of exploitation of the potential of a given paradigm. The first type of cyclical structure reminds the Schumpeterian one.

In the sequential approach the focus of the attention is brought on the economic aspects and mechanisms which shape a process of creation of technology; i.e. allow the starting off of it and condition it

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<sup>50</sup>] The finding of a new paradigm is eased by the progressive achievement of a quasi-complete knowledge of the paradigmatic environment, both from a scientific and from an economic view point. The quasi-completeness of knowledge of a problematical set favours the trespassing of the borders of the set, in a way which closely reminds the alternation of scientific paradigms proposed by Kuhn (Dosi 1982).

<sup>51</sup>] The latter one is endogenous, in fact, in so far as it might be seen as a result of specific economic efforts and mechanisms. It is exogenous, instead, so long as the occurrence of actual innovations responds to laws of "probabilistic mechanics", which strictly depend on the scientific-engineering features of the given paradigm.



from the viability view point [<sup>52</sup>]. The process is allowed and conditioned by an appropriate sequence of interactions between expectations, decisions, availability and activation of human resources and availability and use of money assets.

The system is put into motion by expectations, in particular by changes of them. The perception of new possible needs and options might lead the producer to make new processes start off, hiring and putting at work the labour which is, or is made available in the construction of new specific inputs. The transformation through time of the inputs will carry with it corresponding specific processes, which will contribute to give shape, on the way, to the new technology-product. Sunk costs are necessarily met during this time/process, whose feeding in terms of workers and liquid assets on the one side conditions its viability and, on the other, generates feed-backs in the economy that might contribute to the financing and to the qualitative shaping of demand.

It is easy to notice an important change of perspective with respect to the evolutionary view. The attention is shifted away from the scientific-engineering aspects of innovation to its economic aspects and features. Innovation is made as far economically endogenous as it is conceivably possible [<sup>53</sup>]. The dynamic path shown by a neo-Austrian system is not bound to any mechanical alternation of long cycles (although it can admit them), while the perception "on the way" of new options, disclosed by the previous efforts along the construction of a new technology, might relaunch

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<sup>52</sup>] It is interesting to notice that Amendola, Gaffard 1988 (and elsewhere) do not consider deliberately the factors that subjectively motivate the starting off of the innovative process. Though certainly interesting, they do not consider such an enquiry within the range of issues that should be investigated by the economic analysis. The "Innovative Choice" (which is the title of their main contribution in the line considered here) is considered thus from the viewpoint of its viability and not of its origin. This position is clearly very untraditional, not only with respect to the neoclassical approach, which is centred around the motivation engine of utility maximisation, but also with respect to the many scholars interested in innovative processes and in organisational strategies who have chosen to investigate about the cognitive patterns occurring when inventions and learning take place.

<sup>53</sup>] With the proviso established in the previous footnote. The deepening of the more technological and organisational aspects are left to more specific and contingent enquiries (MUST, 1990; Queré, 1987).

new paths in the creation of technologies, also out of the case of crisis of previous paradigms [<sup>54</sup>].

It is clear, in the sequentialist approach, how the traditional concept of equilibrium, considered as a system of relationships between synchronic variables, tends to fade away and lose its importance. The agents decide on the basis of expectations and correct their course of action when expectations change. Furthermore, while stability and equilibrium remain the main concern not only of plain neoclassical approaches, but also of the neo-institutional, of the neo-Keynesian, and even of the evolutionary one, the focus of the sequentialist approach is upon change and its viability. To change implies to build up, through a process necessarily out of equilibrium, additional or different productive capacity and/or new goods. The processes of investment are thus crucial; investing takes time, a time whose length is multiple of the period of production for consumption goods, and it implies to spend money out of accumulated or newly created liquidity without the immediate possibility of obtaining new cash proceeds related to the new investments [<sup>55</sup>]. In the meanwhile, current flow magnitudes, such as wages and consumption, depend on the process of implementation of previous investment decisions, so that what are traditionally named "short" and "long" run periods are mainly the complex faces of a sequential process characterized by intertemporal complementarities. Time ends to be the Marshallian logical time and becomes the historical, unidirectional one.

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<sup>54</sup>] On the other hand, the sequential approach finds itself presently in a relatively backward stage for what concerns micro, and micro-macro relationships, which, instead, have been the object of much wider reflection and investigation by the evolutionary approach. For the latter conception the plurality of agents is indeed a prerequisite. For some effort to enquire about inter-subjective relationships see Gaffard 1987; Queré 1987; Amendola, Bruno 1990; MUST 1990; Gaffard 1990.

<sup>55</sup>] Investments come before production, and this is visible only out of steady states, when a change occurs (Hicks 1974; Amendola-Gaffard 1988).

### **3. Optimality, market failures and Pareto-consistent regulation**

The normative theory upon which the principle of laissez faire is based is the "New", or Paretian Welfare Economics [<sup>56</sup>]. Such a theory was completely defined by its founding fathers around the mid fifties [<sup>57</sup>], more or less when Arrow and Debreu had been defining their axiomatic treatment of General Equilibrium Theory. The popular feeling within the economists' community -the cultural attitude of the "followers", which never should be confused with that of the founding fathers - is that the two theories belong to the same substantial approach, of which constitute different facets.

This is disputable. The New Welfare Economics continued the program originally established by Pigou, despite the fact that the change of the hypothesis about the comparability of the individual utilities obliged the scholars who adopted the Paretian principle to question in much more depth some of the involved philosophical and ethical issues. Such a program consisted in the normative use of positive knowledge [<sup>58</sup>]. This being the goal, the investigation about optima is the primary concern, while the correspondence between perfect competition and optimum is, from a purely logical viewpoint [<sup>59</sup>], a fortuitous and fortunate, but anyway instrumental accident. The large attention brought upon the cases of market failures is perfectly consistent with this interpretation of the Welfare Economics research program.

The research program of General Equilibrium Theory is different: that of transforming economics "...into a rigorously quantitative discipline, into a mathematical science on a par with astronomy and physics" (Ingrao-Israel 1990). Such a program, whose initial hints may be traced back into the rationalism of the Enlightenment period of 18th-century, takes a definite shape around

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<sup>56</sup>] See footnote 5 above.

<sup>57</sup>] With the two articles published by Samuelson in 1954 and 1955 on the *Review of Economics and Statistics*, which set the issue of the relationships between Pareto optimality and public goods, the "novel" of the new welfare economics was substantially achieved.

<sup>58</sup>] "The goal sought is to make more easy practical measures to promote welfare -practical measures which statesmen may build upon the work of the economist, just as Marconi, the inventor, built upon the discoveries of Hertz" (Pigou 1920, Ch.I, sect.5).

<sup>59</sup>] This is not to deny that most of the contributing scholars were driven by the desire to argue that the market is the best institutional arrangement for our societies. However, one thing is their motivations, another one is the analytical structure of their arguments.

a core, that of general economic equilibrium, with Walras (1874-7) and Pareto (1909). Until Arrow-Debreu 1954 the effort of stylising the real world is evident from the attitude towards the choice of the hypotheses upon which the different specifications of the models are based: externalities and market failures were not of concern for the scholars dealing with welfare problems only, but for anybody involved in building up a sufficiently comprehensive model for the interpretation of the economic systems.

With Arrow-Debreu this attitude is reverted, and the exercise becomes that of selecting the hypotheses in function of the possibility of having equilibrium solutions and of certain features of such solutions. Externalities, in particular, have no room in the Arrow-Debreu world, which consists by definition of the goods and the services for which a market does exist.

Unfortunately, while the "founding fathers" of both theories are very careful and cautious about both, the assumptions and the implications, of their contributions, the same thing cannot be said about the community of the followers, who either utilise for more applicative purposes (as in cost-benefit analyses) or, more simply, "popularise" the high-rank theorising of the founding fathers in palatable textbooks. Because of this, it is worthwhile to reconsider in some more detail some of the standard arguments behind *laissez faire*.

### *3.1 Pareto optima and competitive equilibria*

The individuals are assumed to be perfectly informed utility maximisers. Utility is a growing function of the consumption of a bundle of goods. The options which to decide upon are consumption, production and exchange.

Exchange is the only form of interaction among the individuals; since such interaction is voluntary, it will take place only at the condition that no one of the dealers is made worse off. This implies that any act of exchange complies with the Pareto criterion. The pressure towards exchange exists whenever to any individual is given the possibility of obtaining more useful things in exchange for what the same individual regards as less useful things [<sup>60</sup>].

Given for each individual a set of endowments and production options before the exchange, any optimizing individual attains his best possible situation either in consumption or in production. The option of exchanging expands his possibilities of consumption and of production beyond what is made possible through the direct use of his original endowments only. However, there are no doubts that

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<sup>60</sup>] This is the bulk of the famous Edgeworth box, which already contains all of the main outcomes of Paretian Economics. In particular, the contracts curve is a locus of Pareto optima.

such theories conceive production in function of the exchange, up to the point that the theory of production is little more than an appendix to the theory of exchange.

The voluntary nature of exchange guarantees that the results after the exchange are collective optima, since they are the intersection-set of individuals' sets of optima. Competition in the exchange produces arbitrage, that is, a pressure towards the uniqueness of relative prices among each couple of goods; such prices, on their turn, reflect the relative values (or marginal rates of substitution) that the involved goods have for the consumers. Production is optimised in function of these relative prices, giving as a result a correspondence between such prices and the relative marginal costs for producing any pair of goods [<sup>61</sup>].

### 3.2 *Externalities*

Exchange being the only form of voluntary interaction, the utility of any individual should be subject to change, given the endowments, only by an act of exchange. Should it not be the case, that is, should an act of consumption or an act of production of one individual alter directly the utility or the production functions of any another individual, we would have cases of non voluntary change in an individual's utility or production due to the action of another individual.

Such cases are told as of "externalities", either in consumption or in production. Also exchange activities produce externalities, through the consequences of variations of prices due to changes in the demand or the supply (pecuniary externalities). Such externalities are not normally considered as relevant for Pareto efficiency, while the occurrence of any other externality is commonly acknowledged as discarding the correspondence between private and collective optimality [<sup>62</sup>].

This is because the individual who takes the decision does not take into consideration the consequences, in terms of benefits and costs, which this decision produces on other individuals' utilities or

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<sup>61</sup>] The latter result, however, occurs at the conditions that the marginal cost of a good (relatively to the other ones) is an increasing function of its quantities in the relevant range; the absence of such a condition creates problems (see later on).

<sup>62</sup>] The tendency to exclude pecuniary externalities from the set of efficiency-relevant externalities is perfectly understandable from the point of view of the neoclassical approach. Should they do not so, any market adjustment would result in an externality, given the general interdependence which characterises market relationships; that is, the normal market functioning would automatically produce diffuse and unavoidable externalities.

productions. There is no market that can take care of the externalities [<sup>63</sup>]; in order to account for them, administrative/political set-ups are thus needed.

The more commonly mentioned cases of externalities are those concerning pollution, education [<sup>64</sup>], road congestion, etc. The attention brought more recently on the consequences of imperfect information makes of it the more important and more pervasive form of externality.

### 3.3 *Other market failures*

Other cases in which active exogenous interventions are needed are when either the production or the consumption sets have "wrong" convexities. The most relevant case is considered the one in which economies of scale occur in the range which is relevant for the matching of supplied and demanded quantities for a certain commodity. In such a case a fragmentation of production among different producers will be clearly inefficient, since the smaller the production of each of the producers would be, the higher the unit cost would be too, and thus the price. In such a case, therefore, the substitution of several producers by a single one would assure the production at minimum cost for the whole collectivity [<sup>65</sup>].

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<sup>63</sup>] Unless a world of perfectly defined rights and with no transaction costs is assumed. In such a world, according to Coase 1960, "...the ultimate result (which maximizes the value of production) is independent of the legal system if the pricing system is assumed to work without cost". Such a statement has been labelled afterwards the "Coase theorem" (Stigler 1966), and used often to get rid of the uncomfortable problem of externalities. This was against the willingness of Coase and beyond his intentions (Coase 1988, Ch. One, "The Firm, the Market and the Law"), since Coase has always thought that transaction costs do exist. Anyway, it is easy to explain the essence of the underlying rationale, after what has been said in section 2. If the rights are so well defined as to be tradeable, they amount to a special case of AD commodities. The right to be compensated for having being damaged may be sold to the potential damager in a world where such a right is given to the potential victim; in an alternative world where this right does not exist, the potential victim might buy the right to damage from the potential damager. The allocation would be the same in the two worlds (obviously not the distribution in terms of utilities)

<sup>64</sup>] So long as the education of my child benefits also other subjects.

<sup>65</sup>] The case where a production of a given set of outputs by a simple firm is more efficient than the same production performed by several firms is called of "subadditivity", and occurs also when economies of

Even in such a case, however, the private production of the concerned commodity would not be efficient under market conditions. The producer would either set the production at a quantity which corresponds to a maximum total profit for him, or, even assuming that the producer were bound to renounce to any profit, at the quantity for which the price equals average costs, in such a way as to recover the total costs. However, given the economies of scale, in such a solution the marginal cost would be still lower than the price.

This would result in a welfare loss, since it would imply that the value that the commodity has for a potential additional consumer is still larger than the cost for producing an additional unit of the commodity. The collectivity would thus be made better off by producing more; this would imply, however, a price lower than the average cost, and for the producer to incur in a financial loss. The choice would thus be inefficient for the collectivity because of the market allocation mechanism.

In such a case, the common suggestion is the one of subsidizing the producer up to the point of allowing him to equate price and marginal cost, and of setting-up in the meanwhile a regulation that compels him to do so (ruling out thus the possibility for the producer to exploit the subsidies for making more profits).

### *3.4 Distribution*

The third relevant case of advocated political intervention has to do with the distribution of the initial endowments among different individuals. As we noticed, for each given state of the distribution of the endowments, there is a Pareto optimum, and, under appropriate conditions, there is a competitive market equilibrium corresponding to it. All possible states of distribution generate thus a frontier of Pareto optima. How to choose among them? Three solutions have been proposed:

- 1) the Kaldor-Hicks compensation criterion;
- 2) the social welfare function;
- 3) the separation between efficiency and distribution decisions.

According to (1) a state of the world should be considered better if it appears that the individuals who would be advantaged by the change were so better off as to be able to compensate those who would be damaged by it (Kaldor 1939; Hicks 1939). The compensation should be potential (the actual decision to change the distribution could not be evaluated by the economists under the principle of ordinal utilities).

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scale hold for a multi-product firm (Baumol-Panzar-Willig 1982-1988).

The problem is that changing the state of the world without changing the distribution would be likely to modify the relative prices (values) according to which the alternative states of the world are evaluated. It might thus happen that, given two states of the world, A and B, B appears to be better than A when regarding it from the allocation and distribution set-up prevailing in A. It might also happen, however, that, once in B, A might appear as better than B, because of the change in the relative prices occurring when moving from A to B (Scitovski 1941 and 1952). More in general there is no assurance that the potential compensation principle does not raise problems of inconsistency. The social welfare function (SWF) is a way of weighting the utilities of different individuals (Samuelson 1947, Ch.8; Bergson 1938). The adoption of a "paternalistic" SWF amounts to say that distribution does matter for the choice of the general optimum, but its determination is delegated outside the sphere of economics.

It is possible to think of the possibility of deriving a SWF directly from the preferences of the individuals, in particular respecting the Pareto criterion (that discards any possibility that would not obtain the unanimity of votes, if voted). Arrow (1951; 1967) holds that the possibility of deriving such a SWF respecting largely shared ethical judgements and not violating logical criteria is impossible in general. The acceptance of this interpretation of Arrow is controversial [<sup>66</sup>]. Others regard as important the fact that the Paretian aggregation of preferences on distribution is possible when the preferences have a fair degree of homogeneity.

Notice that the prescription to pursue efficiency, that is, the direct adoption of the Pareto criterion, is in itself a SWF [<sup>67</sup>]. It amounts to say that any solution on the Pareto welfare frontier is better than a solution inside it and thus to be preferred. This is implied when interpreting the role of economic advisors as that of recommending the attainment of Pareto efficient solutions, *independently of the distribution*, the judgement upon which is not an economist's task [<sup>68</sup>]. This position is the more shared among

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<sup>66</sup>] The controversy involved too many scholars to be mentioned here. See Samuelson 1981 and Arrow 1983; for a bibliography Suzumura 1987.

<sup>67</sup>] This proposition has been somewhat outlined by Graaff 1971.

<sup>68</sup>] Notice that the Pareto criterion as a SWF differs from a paternalist SWF. In such a latter case distribution, though exogenously evaluated, must be considered *together* with allocation; there are solutions within the frontier that are better than solutions on the frontier when the latter are held as being too distributionally unfair. In other words, with a paternalist SWF efficiency must be normally traded off for better distributions, so that nothing can be said about



economists, probably on the basis of the wrong premise that it is value-free. From a practical point of view it amounts to the recommendation of *laissez-faire*, because of the asserted correspondence between competitive equilibria and Pareto optima.

#### **4. Some of the drawbacks of welfare economics**

Most of the attention of the normative debate has been attracted by the issue of distribution. The interested reader may find more information about it in standard text-books in welfare economics. Here we will concentrate our attention upon a few issues, which may be of interest for policies oriented toward production, and which are not usually considered or are overlooked in the standard debate.

##### *4.1 Interdependence between distribution and production*

The first thing to notice is that there are cases where distribution is not neutral with respect to allocation. The more extreme and classical example is the one where a redistribution of resources in favour of the most deprived part of the population can increase its productivity to such an extent to increase the total output accruing to all individuals (Graaff 1971). When this occurs allocation and distribution are complementary. Not only positive actions in favour of distribution induce an increase in production (and are thus favourable to development), but it might happen that it is impossible to increase production without acting upon distribution.

The case is likely to be more general than it might appear at first glance. It is in fact sufficient to relax, even slightly, the assumptions about full rationality and perfect information, that the distribution of the endowments is no more neutral from the allocation point of view. In other words, the production possibilities set of the system is affected by the state of distribution: it becomes thus important to whom certain resources belong. The problem may become more evident if, in addition, the market of credit is considered far from being perfect. The most important example that could be provided is the issue of the choices affecting human capital.

##### *4.2 Rights and institutions*

The second case which deserves more our attention is that of externalities; and this is from a double viewpoint.

a) while exchange presupposes voluntary agreements - and this is why exchanges contribute to welfare in the Pareto sense - the acts of consumption and of production do not presuppose it, at least apparently. However, externalities arise because the acts of

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welfare abstracting from distribution; under Pareto criterion, instead, abstracting from distribution is the rule.

production or of consumption undertaken by a set of individuals interfere with the production and/or the utility functions of another set of individuals.

However, can we really take as normatively acceptable propositions indirectly based on the assumption of a complete freedom to produce and to consume? It is evident that we cannot. Virtually no human society, which we have knowledge of, has ever left complete freedom to individual decisions or undertakings. Restrictions have always been put on certain forms of consumption, such as drugs, while production (the object of production or the way of producing) have been subject to legal constraints, such as the banning of certain productions, the control over dangerous practices, work legislation etc.

It is evident that the state of rights and/or of customary rules - that is, the state of the institutional environment - constitutes the framework in which consumption and production take place. Therefore, the production possibility set and the consumption possibility set of a given society is contingent to its institutional and legal frame; in particular the production set (the social transformation function) is contingent to the specification of the set of rights and rules of the particular concerned society.

What neo-classical and welfare economists appear to have done has been to extend in a wrong way the principle of voluntary agreement which holds in the sphere of exchange to the sphere of production and consumption [<sup>69</sup>]. Alternatively they have implicitly postulated an environment ruled by an unspecified natural law. To assume, as it is normally done, that the institutional set-up is "given" (that is, it is part of the "fundamentals", as the preferences) is not a sufficient answer to the problem, so long as welfare propositions are applied also to a world of competing institutional environments (typically, countries).

If we put ourselves for a moment in a perspective of Paretian economics, it is evident that, since the system of rights and rules is such as conditioning (at least) the production possibility set, the rights and rules enter as an economically relevant instrumental variable in the determination of the Pareto frontier, exactly as any commodity-input (that is, a commodity which is not an argument of the utility functions but is strategically relevant for the production of the commodities which enter in the utility functions). Rights and rules cannot thus be excluded from the range of interests of economists (at least within a consistent way of approaching

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<sup>69</sup>] This is made evident also by the fact that in the neoclassical approach an autonomous theory of production is lacking. The analytical tools for production are borrowed from the theory of consumption.

economic welfare problems); but welfare economics do not provide any explanation for the presence and the role of such rights and rules [<sup>70</sup>].

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<sup>70</sup>] R.Coase and the scholars inspired by him make quite an exception.

#### 4.3 Externalities and time

b) It is not by chance that externalities have attracted the attention not only of the economists (when) dealing with problems of collective welfare, but also of those mostly concerned with industry (beginning with Marshall) and with the taking-off of development processes (Streeten 1959, Hirschman 1958, Rosenstein Rodan 1943, Scitovsky 1954). Notice that most of the scholars concerned with the two analytically distinct issues were the same, and that the issues appeared to them as complementary aspects of a real world which they aimed at interpreting and possibly at guiding towards more affluence and social justice.

From the viewpoint of development, external economies occur whenever the previous or (at least apparently) simultaneous undertaking of specific production is of advantage for other specific productions. According to Marshall, for example, environments in which there is a high concentration of certain industries make it easier for further firms belonging to such industries to establish themselves and being prosperous, because of the previous existence of accumulated skills and specific systems of relationships. Rosenstein Rodan holds that, in order to establish a self-sustaining development, a set of simultaneous investments has to be established such as to reproduce approximately the same structure of supply and demand which exists already; in such a way the additional wages and inputs requirements would feed the additional demand which justify and match the additional production; this would not happen with investments concentrated in the expansion of production of certain industries only. Simultaneous "proportional" undertakings produce thus reciprocal externalities.

According to the supporters of unbalanced growth, such as Hirschman and Streeten, the previous establishment of certain activities, which had constituted in itself an unbalance, may be able to induce further undertakings in a later stage; the latter ones would not be established without the formers, because their establishment is motivated either by the need to compensate the previous unbalanced investments, or because the previous establishment of certain activities makes it available inputs which are necessary or contribute in shaping the potential demand which justifies the further undertaking.

There are no doubts about the fact that all of those cases fit the definition of externalities that has been provided above within the frame of Paretian welfare economics. However there is an important difference, which is given by three, intimately linked additional factors: *knowledge, incentives, and the flowing nature of time.*

For development-external economies to arise, either the establishment of certain activities has to occur *before* (in historical

terms) other activities being established, or at least certain agents have to be strongly reassured about the fact that certain activities shall be established, without the possibility that such reassurance may constitute a market transaction.

What the different types of externalities have in common is the feeling that "something" is lacking in the way in which the market forces act in establishing the necessary motivations and coordination mechanisms. The externalities considered by welfare economics may be regarded as a case of "missing markets", but in a sense subtly different from the issue of missing markets in general equilibrium theory.

Development-externalities may be regarded as cases of insufficiency of information and binding legal constraints concerning future transactions, which do not allow strong enough incentives to undertake new additional activities. Richardson 1960 is the one who perhaps better captures this point, when he argues that the prices, which are the only signalling device considered in pure competition, do not convey enough information and reliability in order to induce the firms to undertake time-consuming investments [<sup>71</sup>]. Explicit coordination agreements are required and usually practiced in the real world markets; real world markets which in fact highly differ from the perfectly competitive ones considered by the theory.

#### 4.4 *Monopoly and time*

However, it is the way the problem of monopoly and the connected issues are dealt with by the neo-classical normative approach that constitutes the most important evidence of how such an approach overlooks the problems connected with time, knowledge and motivations.

Under monopolistic (or oligopolistic) conditions, the goods are sold at a price higher than their marginal cost. As in the case of economies of scale considered previously, this would exclude from consumption individuals for whom the value of the good is higher than its marginal cost; this exclusion would constitute thus, according to the standard approach, a useless welfare loss [<sup>72</sup>].

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<sup>71</sup>] Richardson distinguishes, about the investments of other agents, the case of competitive and that of complementary investments. In order to be reassured and to decide to invest, a firm should rely upon the fact that the competitive investments are not in excess, and that the complementary ones are sufficient; *in the first case what is desired is the lack of action of other agents, in the second one their positive action* (Ch.4,sect.2).

<sup>72</sup>] The more extreme case of the same type is that considered by Dupuit since the last century, about optimal tariffs. If the use of an infrastructure, such as a bridge or a road, does not produce extra

The point is that often the attainment of extra profits constitutes the motivation (ex ante) and the reward (ex post) of previous efforts and costs for finding out new goods and/or new and less costly processes of production. The existence of such extra profits is thus the mechanism that induces the firms to continue to take risks and spend in research and development in order to introduce further innovation and to improve their competitive performance.

Notice that in most of the cases the cost conditions which are made possible by a long-established situation of monopoly/oligopoly are much lower than the regime of costs that would have existed if only small and fragmented firms had existed in the same environment. In other words, a narrow link may be conjectured between the long run monopolistic features of the environment, the set of production options which exist in a given moment of time and, very often, the very same existence of the preferences from which the current demand derives.

The traditional official hostility against monopolistic practices, which is made evident by the diffusion, in industrialised economies, of anti-trust authorities, reflect instead, beyond the welfare arguments mentioned above, the fear of unfair competition and of (possibly leading to) the exploitation of rent positions on the side of monopolistic or oligopolistic firms. The theoretical framing of oligopolistic competition in terms of obstacles, for potential competitors, to entry into the market (Bain 1956, Sylos Labini 1956) reinforced such a fear. If barriers exist, or once they have been built up through specific efforts, they play the role of a shelter which allows the incumbent firms a discretionary margin which can be used either for higher prices or for delaying the moment in which to adopt innovative options. The ensuing slackening of competitive pressures, more in general, might thus produce a "slumbering" effect, leading the concerned companies to overlook the interests of the buyers and to lower the pace of technical progress.

The nature and the role of oligopolistic set-ups are thus ambiguous: they can either foster progress or slow it down. This should prescribe a selective attitude on the side of anti-trust authorities, which should be able to discriminate which are the actual features of oligopolistic situations in single cases, abstaining from the application of exceedingly general rules, such as the traditional

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maintenance costs, the use of them should be made free. The problem of the recovery of the investment costs should be solved through other means such as lump-sum transfers.

Here we have a case in which the motivations to set up infrastructure might exist, but the use of market rules has to be prevented because of the asserted non-Pareto efficient results.

one, based on the actual existence of countless, powerless and fragmented firms.

The attention brought on potential competition has actually contributed in overcoming this normative rule, with the theory of contestable markets (Baumol-Panzar-Willig 1982). What is regarded as important in order to assure competitive performances is to assure conditions which allow any potential firm to enter in that market and to exit from it, without incurring in any additional costs specific to that particular market. Under such conditions, in fact, incumbent firms would be obliged to practice a competitive price.

This way of revisiting the problem is of great interest, because it appears to acknowledge for the shapes that modern competition has acquired, through various forms of construction of markets which are somehow sheltered with respect to price curtailing. It is doubtful, however, whether such a theory is of much help. Most of the times, indeed, the obstacles to entry and the need for the potential entrant to meet sunk costs are nothing else than the other face of the efforts and the risks which have been faced in the past by incumbent firms, and the motivation for them to continue along the same lines in the future. Establishing that the incumbent firms and the potential entrants should face ex-ante similar costs and opportunities amounts to denying the cumulative nature of knowledge and of specific systems of relationships, which are constructed through time.

It is certainly true that the contestability rule might be applied in order to remove any "artificial" condition which constitutes an "unnatural" obstacle to entry or to exit. The point is, however, that it is extremely difficult to establish, at least in the guise of general statements, what is "artificial" and what is natural about the obstacles to new entries.

## **5. Decisions, coordination and equilibrium**

Before the axiomatic treatment by Arrow and Debreu appeared to settle the question of the founding hypotheses of general equilibrium, other scholars -such as Marshall, Hayek, Wicksell, Lindahl, Myrdal, Keynes, Hicks and many others - whose theoretical activity was aimed at achieving a better comprehension of how real world economies work, were variously attempting to reconcile two different ways of looking at equilibrium: (A) equilibrium as a specific set of quantitative relationships among analytically synchronous variables, endogenously resulting from the interaction between the optimising behaviours of the atomistic agents, and (B) equilibrium conceived as the intertemporal consistency of plans and events.

### 5.1 Possible uses of the two concepts of equilibrium

These ways tended to be felt by such scholars, though according to different perspectives, as two different aspects of the same underlying mechanism. This applies, for example, to the Keynes of the General Theory [<sup>73</sup>] no less than to the Hicks of *Value and Capital*.

Chapters IX and X of the latter contribution are perhaps the more conscious and lucid effort to keep the two concepts of equilibrium together: individuals are assumed to have "perfect contemporaneous knowledge" [<sup>74</sup>] during the Monday - when the market sets the prices which will hold for the whole Hicksian Week - but to be able only to make guesses about the future prices, upon which to base the plans which are drawn up in that very same Monday [<sup>75</sup>]. During the Week there is full "temporary equilibrium" (the prices set on Monday are such as to eliminate excess demands, excepting voluntary accumulations of stocks); however, only if expectations and plans are fulfilled week after week, that is, only if the prices which form themselves by the evening of a given Monday happen to be those which were expected by the evening of the previous Monday [<sup>76</sup>], there will be also "Equilibrium over Time" [<sup>77</sup>].

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<sup>73</sup>] The Keynes who fits in the IS-LM construction belongs to (A), while the Keynes who lets the system adjust its scale to unforecasted changes of the inventories belongs to (B).

<sup>74</sup>] Hicks 1939, Ch.IX, 4.

<sup>75</sup>] "The current activities of a firm are part of a plan, which includes not only the decision to make immediate purchases and sales, but also the intention to make sales (at any rate, and usually purchases as well) in the more or less distant future... firms (and private persons) draw up or revise their plans on Mondays in the light of the market situation which is disclosing itself ... This means..that when markets close on Monday evenings, they have reached the fullest equilibrium which is possible on that date" (*ibidem*, Ch.IX, 5). "The plans which are adopted in any given week depend not only on current prices but also upon the planner's expectations of future prices" (*ibidem*, 6).

<sup>76</sup>] It is worthwhile noticing that the only expectations which appear to be relevant to Hicks 1939 are those concerning prices. This implies to have assumed in advance a world of price-takers and/or the existence of the general equilibrium solution, where the vector of equilibrium quantities is dual to that of equilibrium prices. In reconsidering the "method" of temporary equilibrium in 1965, in *Capital and Growth*, Hicks investigates about other expectations, above all in relation to a fix-price world.

<sup>77</sup>] "The wider sense of Equilibrium - Equilibrium over Time, as we may call it, to distinguish it from the Temporary Equilibrium which



However, equilibrium was, for Hicks, basically a (set of) method(s) for carrying on analytical investigations about specific issues. The terse evidence of this appears as one telescopes his contributions as an open sequence of quiet tales about his own reasoning on model-building for specific purposes; so, for example, most of the reasoning which the method of temporary equilibrium allows is actually used for conjecturing on whether and how the forces put into motion by specific situations of disequilibrium might act, so as to orient the system towards the further paths it may take. Equilibrium over time is never regarded, instead, as the most likely event, though the forces possibly acting in such a direction were the bulk which deserved the attention.

Most of the economists took instead an opposite way. Equilibrium should have been the natural and spontaneous outcome of any economic system. Given this "objective function", the model-building should have been guided by the need to reach a formal representation of the system such as to produce such an outcome: the choice of the founding hypotheses could not but become, thus, the set of the dependent variables of the problem. Though the whole set of authors mentioned at the beginning of this section were emotionally attracted by the miracle of ordered results stemming from independent decisions, most of them appear now to have focused their investigative attention on the existence, the nature and the performance of initially unknown mechanisms of feed-back, able to keep the system within the borders of a relatively ordered path. Such feed-backs were not conceived a priori as being necessarily spontaneous, economically endogenous, always at work and efficient; this is why they deserved to be investigated and why economic problems appeared always to be thought, though sometimes ambiguously, as *processes*.

For the opposite (and later on hegemonic) front, instead, the endogenous, sufficient and efficient nature of the equilibrium-leading feed-backs should be assured a priori, and thus directly embodied in the structure of the constructed models.

The demonstration that a given model has at least one possible equilibrium outcome and the knowledge of its properties are important achievements. They are important, however, only on the analytical ground. The existence of an equilibrium (equilibria) has nothing in itself to do with the likelihood of its (their) actual

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must rule within any current week - suggests itself when we start to compare the price-situations at any two dates". Prices need not to be constant over time in general, if not in a stationary economy. The condition is instead that "... the prices realised on the second Monday are the same as those which were previously *expected* to rule at that date" (Ch.IX, 2; italics of the author).

occurrence [<sup>78</sup>]. The existence of equilibria and the likelihood of their occurrence depend, on the one side, on the cognitive features which are attributed to the elementary decision-makers of which the system is made to consist, and, on the other side, on the structure and the complexity that are attributed to the production options. The traditional approach and the sequentialist one differ on both of these sets of elements. Furthermore, they differ also for a different attitude with respect to the role of equilibrium itself, as we will see later on.

## 5.2 *Alternative cognitive assumptions*

The only conditions under which the two different concepts of equilibrium, (A) and (B) referred to above, may be made to be consistent are those equivalent to a hypothesis of perfect foresight on the side of the individual agents [<sup>79</sup>]. This was tersely perceived, for example, by Hayek 1937 [<sup>80</sup>], but is widely and involuntarily confirmed, in my opinion, by the analytical elaborations about rational expectations and Grandmont's temporary equilibrium models.

Out of the case of perfect foresight, the two concepts of equilibrium appear to correspond, rather, to two mutually exclusive sets of founding assumptions about the cognitive ability upon which individuals take their decisions: (a) the individuals maximize the attainment of their goals under condition of perfect information; (b)

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<sup>78</sup>] As for the uniqueness of equilibrium, it is by no means a logical necessity; rather, it is an ideological constraint, to be analytically overlaid in order to confer the features of spontaneous optimality to the equilibrium outcome.

<sup>79</sup>] All of the other hypotheses of the Walrasian approach remaining the same.

<sup>80</sup>] Starting from a vision of the equilibrium of type B, he regarded as the magical problem to be dealt with that of the compatibility of the plans of myriad individuals (and thus their coordination). On these premisses Hayek founded a fundamental criticism of the standard new-classical approach. The problem which is faced - according to him - is how the spontaneous interdependence of a certain number of individuals, each of them possessing a given amount of information, can determine a state of the world in which the equilibrium relationships among economic magnitudes - such as prices and costs, etc. - apply, and which could be produced only by the means of a conscious coordination performed by someone who might control the total of the knowledge which belongs, but in a fragmentary way, to all of the concerned individuals (Section 9). The way in which standard theory solves the problem - according to Hayek - is making it trivial, that is, through the assumption that each one of the individuals knows everything.

the individuals take their decisions on the basis of their expectations and they revise through time their decisions when they change their expectations. The alternative (a) is the one chosen by Arrow-Debreu and adopted, under various guises, by most of the macroeconomic approaches which have been somewhat inspired by the general equilibrium theory. The alternative (b), instead, is compatible with the approaches which stress the importance of imperfect information, or which focus their attention on the role of institutions and on the processes of economic change. The nature of the equilibrium resulting from the different founding assumptions, or even whether a notion of equilibrium is needed, depends on a correct specification of their implications.

Assumption (b) implies that individuals (b.i) have a limited information about contemporaneous events, in particular about the decisions which other individuals are simultaneously undertaking [<sup>81</sup>], (b.ii) develop conjectures about possible futures, on the basis of the information they have and of models allowing them to give sensible meanings to the available information, (b.iii) may change such conjectures because the elapsing of time - a time during which relevant things happen [<sup>82</sup>] - allows new information and new models to emerge.

By contrast, assumption (a) cannot but imply that all the individuals (a.i) know, before they decide, all of the attainable results which are compatible with other individuals' decisions and (a.ii) are computationally able to select the best of such options. Furthermore, it is evident (a.iii) that such options cannot but concern an unlimited future: rational expectations, in other words, are the only consistent implication of the hypothesis of perfect information. The decisions, thus, (a.iv) cannot but take place once and for all; considering the elapsing of time is not necessary, since the goodness of the choices cannot be disturbed but by completely exogenous events [<sup>83</sup>].

*Any, however small, distancing from these features, implies to shift from assumption (a) to assumption (b).* In other words, by no means assumption (a) can be considered as the limit to which

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<sup>81</sup>] Should it not be so, individuals would know the future events depending on other individuals' plans.

<sup>82</sup>] Effects cannot but occur *after* the decisions producing them; a relevant time interval, however small but never logically negligible, must thus elapse between decisions and ensuing events.

<sup>83</sup>] The adoption of a so called "time horizon" amounts to a completely arbitrary assumption about the time of occurrence of exogenous disturbing events. The estimation errors of Lucas-type macroeconomic constructions manifest in such a more basic frame their anomalous and ad hoc nature.

assumption (b) tends as the amount of information available for the individuals and as the quality of the models used for the analysis of the available information improve. *A hiatus - made by the conception of the relationships between time and knowledge - keeps the two assumptions as necessarily distinct.* That is why it is so important to understand how the knowledge of the individuals change [<sup>84</sup>].

This way of contrasting the two different sets of founding assumptions has important consequences on the issue of coordination. As we noticed already, the equilibrium within a neoclassical setting amounts to the full coordination of the independent agents. This cannot but depend on the fact that under the cognitive assumption (a) the problem of coordination does not exist in itself, since it is absorbed by the assumed previous common knowledge of compatible options [<sup>85</sup>]. In the neoclassical world, thus, it is the equilibrium which implies the coordination, and not, as anyone biased by its perception of the real world would be carried to believe, the other way round; that is, *coordination being the causal premise and equilibrium its possibly eventual result.*

Such a latter perspective is the one adopted by all those who part themselves from the general equilibrium approaches based, on a way or another, upon perfect knowledge in the long run. For all of them coordination takes place through positive actions implying, or consisting also of exchanges of information. The market is surely a powerful vehicle for such an exchange, but by no means the only one. Institutions and organisations are born because the markets are insufficient instruments for the establishment of satisfactory degrees of coordination, such as they are required, or more performing, in given historical environments. Furthermore, the market itself is a

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<sup>84</sup>] This corresponds to the unachieved intuition of Hayek 1937, who held that the only empirical content of the economic theory - that he regarded as its only non-tautological part, the one dealing with causes and effects - may be reduced to *propositions concerning the fashions in which knowledge is acquired by economic agents.*

<sup>85</sup>] This occurs, to say the truth, only under the hypotheses of rational expectations, while there is some difficulty in the original Walrasian world. In such a world, in fact a substantial informational role is played by the auctioneer. The auctioneer forestalls transactions out of equilibrium, elaborates the information contents of potential needs, calculates the equilibrium vector of prices, assures that actual transactions take place in the same instant of time. Despite such important informational performances, neither the clearly institutional role of the auctioneer is fully endogenously or exogenously explained, nor any effort is made in order to show whether or how such roles are performed by substitute-agents in the real world.

human artefact, which requires a priori accumulation of information in order to establish itself, and pieces of information - additional to those transmitted through market transactions - in order to work and possibly to improve through time [<sup>86</sup>]. Information (and expectations) that has to be used for coordination has no reason to be limited to those concerning prices.

The exchange of information implies some form of learning on the side of involved agents, through a redistribution of the existing set of knowledge. For the evolutionary and for the sequentialist approaches this is not enough to explain the patterns of an ever-changing world: also forms of learning implying a change of the overall set of knowledge which exists in the system deserve being considered.

### *5.3 AD world versus AG world*

As we said, the existence or the likelihood of equilibrium solutions, or at least the existence of regularities and viable dynamic paths, do not depend only on the cognitive abilities of the decision-makers, but also on the features and on the complexity patterns of the production phenomena, and obviously on the interrelationships between such objective factors and the subjective ones. It is on this ground that the sequentialist approach parts itself from all of the other non orthodox ones.

From the viewpoint of the methodology of presentation, Amendola-Gaffard 1988 (AG) are very similar to Arrow-Debreu 1954, in so far as they, too, define axiomatically the world in which the considered economic activities take place. Where they are instead radically opposite is in the way which is chosen for representing the features of the production processes, and, consequently, for partitioning the relevant agents of the economy.

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<sup>86</sup>] An effective history of the emergence and progressive structuring of the markets is yet to be done. The primitive markets were spaces where to convene at certain dates which have customary or conventionally become sheltered from otherwise prevailing violent interactions. City authorities have always contributed to the emergence and the regulation of urban markets since ancient times (the ancient Roman "Annona" is only the most famous example). Food-stuff prices have a long tradition concerning their uneffectiveness in inducing the most appropriate composition and timing of agricultural production; in most recent times, even in most market-oriented areas, such as the U.S.A. and the EEC, a good share of agricultural production is planned out of the market rules. The recent proliferation of specialised financial markets, such as that for Futures, is the fruit of institutional arrangements.

In the AD world the time which is taken for performing a productive activity has no autonomous relevance. Although the model admits in principle a delay between the moment in which all transactions take place and the moment in which a share of the commodities should be delivered [<sup>87</sup>], such a delay depends on the time preferences of the individuals and not on the material constraints embodied in the activity of production. For anything which might matter, production in the AD world is an instantaneous act; all of the needed inputs are instantaneously transformed into the pertaining outputs, so that inputs have no reason to be produced one or more periods before they are used for further production.

The choice made by AG to make use of a neo-Austrian production process compels to consider the inputs as coming before - in historical time - with respect to the output. The production process, indeed, consists of a sequence of periods. In the first part of the sequence (say for  $t=1, \dots, m$ ) a new productive capacity is created by the means of labour, used as a primary factor; expenditures are thus met, while no corresponding output exists yet. In the second part of the sequence (say for  $t=m+1, \dots, n$ ) an output is currently produced (through the use of labour and of previously created capacity) and possibly sold [<sup>88</sup>]. This way of representing the production process amounts to a fully vertically integrated sector, associated to a time specification of the embodied inputs (Bruno-De Lellis 1992).

AG consider an apparently very simple system, made of production processes shaped in the above described way, where the object of productive decisions is made of the number of processes to be started and of those to be kept alive (either for carrying on further stages of goods in process or for producing the consumption goods), where such decisions are taken on the basis of expectations, and where the agents (roles) are - apart the producer - the families (who supply labour services and demand consumption goods) and an institution freely providing liquid assets to the producer. On such a basis, they analyse the dynamics of an innovative change [<sup>89</sup>] and the conditions of its feasibility. Given this specification, the attention is focused on the complementarity relationships concerning

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<sup>87</sup>] However this cannot apply for the commodities to be obtained immediately.

<sup>88</sup>] The whole process resembles the case of a fruit tree, which needs a certain number of years of nursing before giving fruits, and then produces yearly crops for a certain number of further years.

<sup>89</sup>] But the analysis should apply also to any acceleration of growth.

production [<sup>90</sup>]: that is, on input-output relationships, which are to be regarded, however, in a necessarily diachronic perspective.

Furthermore, such relationships matter above all as time-quantity relationships, with prices playing a subordinate role [<sup>91</sup>]. The reason for this is simple: the attainment of any outcome concerning the output envisaged for a given calendar-time is - first of all - *mechanically conditioned by the attainment, one or more periods earlier, of strictly complementary outcomes concerning the pertaining inputs*. The intrinsic difficulty of the time-quantity scheduling (or intertemporal coordination) of the activities concerning the vertically integrated process is intuitively evident, above all when one reflects on the fact that such a scheduling does not concern a firm in a vacuum, but a whole system, with its countless feed-backs which cannot fail to interfere with the production decisions [<sup>92</sup>].

Finally, if one takes the AG world as able to stylise some important features of the real world, then s(he) should be ready to admit that the problem of coordination is even more complex in the real world, since the decisions concerning the different complementary productive activities which belong to the vertically integrated process (sector) are actually fragmented among a multitude of independent decision-makers [<sup>93</sup>].

#### 5.4 *The interaction between cognitive and objective factors*

If we now attempt to put together the cognitive and the production factors so far examined, the central role and the analytical thickness of the problem of coordination begins to take a more definite shape. *Coordination is considered as a produced artefact; the markets, the entrepreneurial organisations, the institutions are nothing but samples of the continuous and happily often cumulative efforts the human beings set up in order to attain and possibly improve suitable mechanisms for coordinating their activities*. This view is basically shared by all of non-neoclassical approaches, plus the area which stresses the role of imperfect information. There are issues, instead,

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<sup>90</sup>] This is obviously at the cost of overlooking, at least in a first stage of the enquiry, the competitive relationships which constitute instead the core of the AD world. However see Amendola-Bruno 1990.

<sup>91</sup>] Here again the perspective is opposite to that of AD, for whom the prices are the *Deus ex Machina* of the whole set-up.

<sup>92</sup>] As it will be clarified in the next section.

<sup>93</sup>] Bruno-De Lellis 1992 connect this problem of inter-subjective, but diachronic coordination relationships with the issue of the emergence of development processes, establishing meaningful links between the literature on innovation and that on development.

for which the sequentialist approach differs from all of the other ones.

What is implied by a system where the existence of a relevant time period for the gestation of productive capacity plays a crucial role, is an intricate sequence of interchained events. In particular, what is made evident by this class of models [<sup>94</sup>], is that

1) during the period of gestation of additional productive capacity, costs have to be incurred which do not correspond to the sale of what [<sup>95</sup>] is currently produced; correspondingly, the wages paid to the workers engaged in the construction of productive capacity feed a demand-component which is not matched by a corresponding production of consumption goods. A process of change necessarily induces, thus, unbalances and distortions [<sup>96</sup>];

2) many of the past choices, made on the basis of the expectations about the present, contribute in shaping the present (and part of the future) events, together with part of the present choices, made on the basis of today's expectations about future events;

3) not only today' expectations are influenced by the relationships between past expectations and present events, but whether expectations will be fulfilled will depend not only on contemporaneous expectations and decisions of other agents, but also on everybody' future expectations;

4) if we want to confer to the change of the knowledge (learning), necessarily connected to the elapsing of historical time, some *economically relevant* meaning, one is bound to conjecture that there is some form of interaction between the most important economic phenomena, such as production and consumption, and learning; and since the elapsing of time is consubstantial to our behavioural assumptions, the interaction cannot but be diachronic. Tastes and technologies, such as we observe them in a given moment, can no

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<sup>94</sup>] It is my opinion that most of the AG analysis applies to any model where a relevant role is attributed to the time consuming nature of the gestation period of capital goods and where a properly interlocked sequence is established between the productive stages, their feed-backs on consumption and the expectations leading to the production decisions.

<sup>95</sup>] Given the vertically integrated process, such a "what" cannot but be made of consumption goods. Just to complete the definitions, notice that the term "additional" must be referred to the ongoing stable trend.

<sup>96</sup>] The way such distortions are taken care of depend, among other things, on the institutional patterns of the given environment. The way how the distributive distortions - associated, for example, to an acceleration of growth - may be managed, highly differs in a barter economy and in a system with money.



more be thought as being totally independent of the choices concerning production and consumption made in the previous periods [<sup>97</sup>];

5) for a system so characterised it has no sense to talk about statics (the system is intrinsically dynamic), nor to distinguish between short and long run, which are strictly interlocked. The viability of the system, and above all its quantitative and qualitative performance, depend on whether proper intertemporal complementarities (Amendola-Gaffard 1988), beside intersubjective coordination among the private actors and between them and institutions (Richardson 1960; Bruno-De Lellis 1992), succeed in establishing themselves; many factors condition the dynamic outcomes, such as the availability of human and financial resources, not to mention the way how the expectations form themselves or are shaped and coordinated by institutions;

6) so long as the system stays on a viable path, it has no need to stay in equilibrium. Steady state paths are simply a sub-set of the set of the possible viable paths. Quite on the contrary, certain low rate steady states look more like a stagnation trap, which makes it difficult to let options to change disclose themselves (Bruno-De Lellis 1992). It is certainly true that relatively stable, but not equilibrium, paths, are analytically bound, sooner or later, to collapse or to explode; however, *analytically, this depends on the fact that any formal analytical model works on the basis of given, specific assumed feed-backs. In an evolutive world also the feed-backs may change; that is, the decision-makers may change the models according to which they form their expectations and take their decisions;*

## **6. The space for policy**

The traditional theory of economic policy has been established with reference to a world made of what we might call "parametric optimisers".

### *6.1 The inadequacy of the traditional theory of economic policy*

By this we mean that the individual agents, as well as their aggregations, self-determine their behaviours through the solution of some problem of maximum (minimum), operated upon a set of functions whose general shape is uniform for the same kind of agents and whose parameters depend on the systemic forces and on the institutional set-up. In such a world, the policy instruments consist in a change of some of the parameters, this producing a change - whose direction is known and whose intensity may usually be estimated - in the optimal solution adopted by each of the

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<sup>97</sup>] In other words the "fundamentals" must be made, at least in part, endogenous.

relevant agents [<sup>98</sup>]. The so-called "decision-makers" are thus pure automata, which give basically mechanical responses to appropriate stimuli.

Under the hypotheses of rational expectations, instead, the economic policies are useless, not only because we would live already in the best of the possible worlds, but because economic policy actions would be ineffective. The reasons for such ineffectiveness are that the agents are assumed (i) to have systemic consciousness and (ii) to be able of strategic behaviours.

Also under the hypotheses of limited and imperfect information and/or bounded rationality the scheme of mechanical and automatic responses of the classical theory of economic policy does not hold. The reasons partly differ from those considered for the rational expectations hypothesis. The decision-makers have not necessarily homogeneous choice-sets; they are not necessarily able to optimise, nor to perceive and correctly interpret the policy changes and their likely effects; they can possess some degree of systemic consciousness; they can be able of practicing some form of strategic behaviour.

The class of systems whose model has been outlined above admits a plurality of dynamic paths (solutions). This implies that the system, though heavily bounded by its inner dynamic structure, is still open to a plurality of possible strategies on the side of the actors, who not only play within the system, but also contribute in shaping its patterns, while building up the productive capacity, while setting up cumulative systems of rules and relationships, while learning. This immediately suggests that there is a wide room for policy actions.

In order to grasp how the problem of policy posits itself in this new framework, it is interesting to stress some of the most important consequences of the above outlined change of perspective:

- i) no mechanical correspondence between policy actions and individuals' responses can be established, as it happens under traditional schemes based upon optimisation hypotheses;
- ii) there are asymmetries of information not only among private actors, but also among institutions and between private actors and institutions (comprising governments, national and local, and government agencies);
- iii) various forms of informational exchange may, and usually do take place.

## 6.2 *The subjects of the policy environment*

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<sup>98</sup>] The analysis of fiscal incidence provides the best and widest set of examples of this kind.

A further (often implicit) assumption behind economic policy is that the public subject has, beyond more power, more knowledge and systemic consciousness than the private agents. After what has been said at point (ii) above such an assumption should be dropped.

The identity itself of what corresponds to the generic label of "state" must be redefined, in such a way as to let it correspond to specific, historically contingent organisations, belonging to the public sector but endowed with definite and different sets of information, skills, interests, styles.

Similar considerations apply to private firms - which have to be considered no more as undifferentiated "agents", but as subjects characterised by specific cultural features and culture-dependent *wills* - as well as to groups of consumers, or of voters, etc. Some of these subjects, those more endowed with systemic consciousness and strategic abilities, are able to behave in a way which is very similar to that of public subjects, except for the fact that the subjects belonging to the public sector have *normally* more formal, and often substantial power, and "should" carry on more general interests than the private ones. Because of this, the public subjects have to comply with more rigid and structured rules and procedures, and to accept more external controls, the aim of which is to guarantee against abuses and to allow to trace back political and legal responsibilities. This, however, does not rule out the possibility that private subjects might have more or less concentrated power, and carry on more or less general interests, which go well beyond what is usually regarded as purely economic concerns.

This picture - which begins to resemble the common everyday perception - needs not to produce chaotic results, so long as the decision-makers are characterised by roughly stable patterns of behaviour and/or as long as a fair amount of coordination takes place, through various forms of cognitive exchange. It is true, in fact, that if synchronous decisions undertaken by different subjects are shaped not only independently, but under conditions of reciprocal ignorance, this would hardly produce the regularities we observe in our societies; but the point is exactly this, that in our societies, under normal circumstances, *some form of coordination among the subjects has been created in advance* through long lasting cumulative but somewhat differentiated processes [<sup>99</sup>].

The adoption of routines, the compliance to rules and customs, communicative actions [<sup>100</sup>], the sharing of expectations about the behaviour of the system, the use of signalling (encompassing the

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<sup>99</sup>] This explains also why sudden changes may impair or destroy regularity.

<sup>100</sup>] The resemblance with the title of Habermas' famous book (Habermas 1981) is intentional.

announcement of policies), explicit communication, the search for explicit agreements, are all mechanisms (or strategies) producing some degree of coordination, which confer order and stability to the environment and reduce the uncertainty or the risks and costs associated to it.

Three types of problems can arise. The coordination might be insufficient; it might be wrong, for its direction or for its timing; better dynamic paths are forestalled or impaired by wrong or anyway removable constraints. Here only some hints can be provided.

### 6.3 *The grounds of policy*

We can make reference to the theory of rational expectations as a useful benchmark. If it applied to the real world, we would have full and optimal coordination. The point is that in the real world the individuals do not usually share the same model and that the existing models are likely to be inappropriate, when not barely wrong.

A wide sharing of a model may produce a high degree of coordination and stability, independently of whether the model is right or wrong. The reason is that there are cases in which the expectations produced by the wrong models are able to produce expectations-fulfilling actions [<sup>101</sup>]. The problems with wrong models usually arise when the system is affected by a shock or expectations happen to change, because the "distortions" which necessarily tend to occur (must occur) when shifting (in order to shift) from one path to another (Amendola-Gaffard 1988) risk to be misinterpreted, either by the private or, worse, by the public actors, producing responses which forestall the starting up of a better path, and/or impair a more promising state of expectations [<sup>102</sup>].

Anyway, the stability assured by the spontaneous or "forced" [<sup>103</sup>] sharing of a wrong model is unlikely to result as satisfactory, and might even become a sort of trap [<sup>104</sup>], from which it is hard to

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<sup>101</sup>] Non full employment Keynesian equilibria might be regarded as a case in point. In general any system growing in steady state may be regarded as a case of self-fulfilling expectations: if no constraints are binding, people expecting that the demand will grow in the future by x% will be likely to invest correspondingly; however this will tend to feed an increase in demand by the same x%.

<sup>102</sup>] For example, an acceleration of growth is likely to be associated with a certain increase in the relative prices of consumption goods and requires an availability of liquid assets larger than usual on the side of the firms. Presently prevailing models would be likely to lead the authorities in charge of macropolicies to interpret the former event as a generic upsurge of inflationary pressures, and induce them to exert tighter controls upon liquidity. However this would be likely to forestall the taking off of a otherwise possible development.

<sup>103</sup>] See next footnote.

<sup>104</sup>] In my view this applies to the present situation. If the Treasury and the Central Banks of the more important countries share the view that a rate of growth larger than 2-2.5% will lead the systems to unsustainable inflationary pressures, and have credibly made clear that they will not accept this, but will react through tighter policies, it is hard to think that the firms would dare - out of the case of very specific markets - to invest in function of a larger growth. In this case the expectations are clearly "forced". In such a case, however,

escape. It is natural to think that our Western economies are now facing a trap of this kind, in face of their low rates of growth and extraordinarily high rates of unemployment.

The considerations above apply above all at the macroeconomic level. Problems of insufficient coordination arise, or are more visible, at more microeconomic levels and/or when problems of qualitative change, or of development, are concerned (Bruno-De Lellis 1992). The take-off and the achievement of transformation paths usually require a timely exploitation of complementarities, most of which are specific and/or require diachronic and intersubjective coordination.

Well targeted public sector policies may be of much help. Public agencies may provide credible signals in definite directions (as it happens with broad-spectrum national programs) [<sup>105</sup>], favour informational exchanges among different subjects (as among firms, or between the sphere of firms and that of research) [<sup>106</sup>], provide captive markets for innovative products, set up systems aimed at lowering or insuring risks. What these different forms of intervention have in common is that they are based neither on coercion nor on traditional incentives, but rather upon suasion and negotiations; they have more the nature of a convenient and prestigious deal among partners who envisage options for transforming differences and specificities into synergisms.

A transfer from the public budget may be part of the deal, but more to contribute to its credibility than because it constitutes an essential feature of it. These interventions require thus cognitive abilities and favourable attitudes towards learning on the side of the involved public sector subjects, who are called to acquire a sophisticated knowledge of the problems, of the options and of the constraints which are faced in specific environments.

Finally, the public sector may play a relevant role in timely removing the constraints which can encumber or forestall envisaged

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should the demand happen to grow, for some exogenous reason, faster than the expected rate, inflationary pressures would be likely to emerge because of a dynamic shortage of productive capacity (Bruno 1987). This would tend to corroborate the model of the Treasuries, though for wrong reasons.

<sup>105</sup>] The French experience is rich of examples in this direction, as for the program on nuclear energy, the case of Concorde, that of space activities.

<sup>106</sup>] A certain experience is being made in the field of technological and of scientific parks. A good example of more spontaneous coordination of this type was that performed in the structuring of local industrial districts.

processes of innovation and/or of development. The most important among such constraints are those concerning the availability of financial and of human resources (Amendola-Gaffard 1988).

Further constraints, which have become increasingly important in contemporary economies, concern the infrastructuring of the national environment to which the firms belong and in which they perform their activities. This depends on the increasing importance of international competition, which has deeply affected the role of infrastructures. The reason is that, in a relatively open economy, most of the services produced by the infrastructures of a country directly influence the ability the firms of that country have to compete with foreign firms, which have the advantage or the disadvantage of using, for their production, differently efficient infrastructures. This implies that the competitiveness is only in part in the hands of the competing firms; most of it depends, instead, on the quality and the effectiveness that is manifested by the systems on their whole.

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