Distributive Equity and Economic Efficiency: Trade-off and Synergy

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1. - Introduction

The issue of equity and efficiency is once again gaining the attention of economists. There has not been such a volume of theoretical and empirical works since the 1950s, when the debate was introduced as part of the critical appraisal of the various economic doctrines by Kaldor and subsequently in an empirical context by Kutznets. This paper aims to critically re-examine these new contributions, indicate their limits and common elements and, lastly, put forward a more general theory that allows one to precisely place the problems raised between equity and efficiency.

The relation between equity (understood as redistribution that aims to reduce inequalities of income or wealth) and efficiency (understood as the maximum production that can be obtained given the resources available), an issue of considerable importance in economic theory, is even more important today. Capitalism and the market economy have perhaps won the historical challenge with the planned economy and «real» socialism, but that in no way means that the equity-efficiency problem no longer exists. On the contrary, it is a crucial issue in all modern industrial societies. The question being asked by many is in fact «What sort of capitalism?». Leaving aside the various formulas, models, historical roots, we are once again talking about combining and synthesising the difficult equation economic efficiency/social justice.

This is obviously the main issue that should be faced in the policies for privisation and refounding the welfare state that have been introduced in the various industrialised countries. From this viewpoint, however, we should make a clear distinction between an evaluation «internal» to the welfare state and an «external» evaluation. The inefficiencies and also the damage that the welfare state contains and produces can be analysed. There is certainly no lack of empirical material on the various experiences[1]. But the inefficiency with which the welfare state is managed, which should be rightly noted and eliminated, does not provide a response to the «external» question of whether it is useful and/or opportune to have an efficiently managed welfare state.

We should note immediately that in the traditional approach the goal of equity is in net contraposition to that of efficiency, i.e., it has often been asserted that there is a trade-off between economic growth or wealth and a more equitable distribution of income. Such an approach therefore falls within the embrace of the fundamental question of relations between ethics and economics.

The aim of this paper, however, is instead to investigate the historical and institutional conditions that interact with the technological conditions to give rise to a synergic relation which engenders better conditions for growth via a more equitable distribution of income. It is obvious that where equity and growth are synergic in an economy the problem takes the form of ensuring the internal efficiency of the welfare state which, once achieved, will positively interact with the economy's growth conditions. The age-old dilemma of ethics or economics would resurface only when the economy once again finds itself in a trade-off situation.

The paper should therefore be viewed as the initial contribution to a strand of future research on the relations between growth, wealth and economic equality. We intend to identify a «golden rule» that will allow us to determine the point at which efficiency and equity are no longer synergic but antitheses. Placing the economy at this point

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[1] See PHELPS E.S. [8].

N.B.: the numbers in square brackets refer to the Bibliography at the end of the paper.

therefore means measuring the optimum distribution of income (equity) while maintaining the maximisation of wealth (efficiency). Only when this point has been determined can one then identify the true relation between ethics and the economy, i.e., a modified golden rule (a platinum rule?) in the sense of an even more equitable distribution which, entering directly in the social welfare function, entails the payment of an economic price in terms of less potential welath but which maximises the affluence of a society which is prepared to transfer from the well-off to the less well-off.

This paper comprises three sections. The first section summarises the results of previous studies in term of growth theory, allocation of resources and redistribution of income[2]. This section furnishes an overview of the various phases of the debate as regards the technological frontier that equity and efficiency make available to society and society's choice of the optimum point on this frontier.

It should be made clear that any evaluation of the impact of distributive equity measures should be made on the basis of two concepts that are quite separate from one other. Our analysis refers first to a concept of equity which can and should disregard ethical considerations and hence limit itself to only the strictly economic effects that it produces.

In this case, equity is not part of the social welfare function which is expressed solely in terms of efficiency, i.e., in terms of maximisation of the consumption or per-capita income flows. This approach has already been employed in several important contributions. There is considerable room to demonstrate that equity and efficiency can be synergic: i.e., there is a phase of improvement of the conditions of equity which cause greater accumulation and hence greater economic growth. The trade-off vanishes to leave room to a synergic effect. This takes place until this effect, where it exists, overcomes the depressive impact on accumulation exercised by the

[2] For a preliminary study of the direct consideration of optimum public-budget programmes for an economy's growth path by reallocation of resources, i.e., when the composition, in addition to the level of public spending and taxation, also counts in economic policy, see BALDASSARRI M. [2].

increased fiscal pressure or by the lesser effect on demand that redistributive equity entails.

This analysis indicates that contraposition between efficiency and equity is not a fixed universal rule for dealing with the problem.

However, equity can also have an ethical significance: the distribution of income can become a direct element of the social welfare mechanism in a utility function with two parameters, consumption and equity. This is the issue we will deal with in the second part of this paper where we explicitly consider a welfare function with two parameters, per-capita consumption and the index of distributive equity. In other words we shall consider a welfare function à la Atkinson, which incorporates greater or lesser aversion to inequality which in turn varies according to changes in the average income or wealth available to the economy.

We shall conclude by showing that a golden rule other than the traditional golden rule can exist. Initially, greater equity stimulates the economy to greater growth or wealth and hence to greater social welfare which incorporates both efficiency and equity effects. Having exceeded the limit of the golden rule (dentified with the point of maximum consumption or per-capita income on the «technological» frontier, also achieved by a more equitable distribution) further equity measures for greater egalitarianism will incur a negative marginal effect on savings, investment or aggregate demand. The social welfare function which explicitly contains the two opposing parameters will then be charged with optimally resolving the trade-off problem (the «platinum» rule).

We will finally mention two extreme solutions both involving the disappearance of the efficiency parameter as an argument of the welfare function, which is hence determined solely by the income distribution parameter. In a first case this may occur in the synergic part of the equity-efficiency curve. This hypothesis would lead to a perfectly egalitarian society which would have as a consequence equal but minimum per-capita incomes for all, in some extreme cases nill. In a second case this same parameter may decrease with the increase in equity (precisely as a result of its own iniquity). The maximisation of this perverse welfare function would lead to maximum iniquity but at the same time minimum aggregate income.

2. - Equity and Efficiency in Some Recent Contributions

2.1 *The Frontier of Equity-Efficiency Opportunities*

If it is true that income distribution has effects on the growth process and/or per-capita income, we should first ask why there has been a protracted silence, apart from some papers by growth theory authors (related to the opposing casual link[3]) on this issue from the 1960s to the early-1980s.

We believe this was due to the success in that period of the neoclassical paradigm in microeconomics, while macroeconomics was entrusted to Keynesian policies without however, unlike J.M. Keynes, revisiting its microeconomic foundations.

As Kaldor maintains, for marginalist economists, «the problem of distribution is simply one aspect of the general process of price formation»[4], marginalistic analysis does not endow income distribution with an independent significance. Although this aspect can be strongly criticised, part of the success of this vision which is indifferent to the role of distribution, can be attributed to the forecasting inability of the other two strands, namely Ricardian and Marxist, which, on the contrary, place distribution at the centre-stage of economic policy. In these two strands, notes Kaldor, the income shares of production factors is not stable over time (more precisely, the income share tends to wane, as indicated by both Ricardo and Marx albeit with very different arguments). The implicit dependence of the relative income shares in the marginalistic analysis on factors that are purely technological and hence potentially more stable makes this strand more compatible with the empirical evidence that the shares of production factors are very stable over time.

More recent literature, as we will see below, presents evidence that there are three possible mechanisms via which distribution influences the efficient production frontier: 1) the existence of at least[5] one element of heterogeneity among the economy's agents; 2) the

[3] See PEROTTI R. [6].
[4] See KALDOR N. [4], p. 84.
[5] There is often only a single element of heterogeneity in those models which place

existence of fixed costs in technology; 3) the existence of market imperfections.

As regards the first aspect, it is evident that the greater importance attributed by the marginal school to the analysis of the choices of a representative agent is a logical consequence of the limited attention paid to the problems of distribution. Heterogeneity of agents is a necessary, albeit by itself not sufficient, condition if the distribution problem is to have a more than slight significance.

As regards technology, the importance of the hypothesis of constant returns to scale for the general equilibrium theory makes the technological aspects irrelevant for individuals with different endowments: each individual can «set up» «his» company regardless of his level of wealth. Finally, although neoclassical marginalistic analysis did not strictly limit itself to analysing choices in perfect market regimes, it is nonetheless true that market imperfections are often labelled as part of the culture of other shools, such as the neo-Keynesian school.

The microfoundation of possible «Keynesian» mechanisms, which flourished in the 1980s, enabled income distribution to regain that critical role in determining growth or welfare that Ricardo attributed to it. We will now examne how some recent contributions have introduced these three hypotheses.

The mechanism via which the heterogeneity of the agents influences the growth of income or income itself in a nation appears obvious when one admits the existence of wealth redistribution mechanisms, more specifically the existence of institutions, «States», which come into being for the specific purpose of ensuring this mechanism. To ensure that distribution affects the economy it is obvious that this «state» should be «neutral», in the sense that it passively responds to the solicitations of society as a whole and is not equipped with its own objective function which would water down the orders imposed on it by heterogeneous agents (this would be the case for a bureaucracy that attempted to maximise its own personal benefit). The further, obvious preference of researchers for a system

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the median voter at the centre of their analysis. However, multidimensional versions of such models do also exist.

of democratic choice (such as that furnished by the absolute majority rule) has had the effect of ensuring that this institution reacts by following the choice of the median voter. The different agents will vote for a control variable such as taxation, transfers, public spending, etc., which guarantees each of them the maximisation of their own utility: the median voter mechanism will then enable one to identify the «political» equilibrium value of this variable.

Perhaps the two most important contributions on this issue are those by Alesina-Rodrik [1] and Persson-Tabellini [7] which aim to explain phenomena other than those described by the Kutznets curve, as they deal with the effects of the *rate of growth* of income rather than seek to explain the link between income distribution and the *level* of income.

In Alesina-Rodrik's model, the heterogeneity of the agents derives from the endowment of physical capital and labour factors, while for Persson-Tabellini it is due to the initial availability of wealth. In both models more transfers from the well-off to the less well-off[6] reduce the appropriability of the returns on investment and hence reduce the incentives for capital accumulation and growth. In Persson-Tabellini the median voter should compare this effect to the more direct effect due to the receipt of transfers deriving from taxes raised from the more well-off agents. In Alesina-Rodrik, the trade-off is enriched by the fact that the aim of taxation is not merely to transfer resources between individuals but also to finance productive public spending which would increase the return on investments.

The addition of this trade-off justifies the various conclusions reached by the different authors: in Persson-Tabellini an increase in the wealth of the median voter will lead him to internalise more the return gross of taxation on investments and hence to demand less taxation which will in turn increase the economy's growth rate. Since the greater wealth of the median voter is considered (arbitrarily) comparable to greater equality, the authors conclude that greater

[6] Although in PERSSON-TABELLINI the redistribution goes from savers to non-savers, as the authors assume that the well-off save more in absolute value than the less well-off then the redistribution can also be read as from the well-off to the less well-off. If the less well-off were to save more than the well-off, the increase in wealth of the median voter (which coincides, according to the authors, with a step towards greater equality) would depress growth.

equality leads to greater growth. It should be noted, however, that the increase in the wealth of the median voter does not necessarily imply greater equality in society: neither if the median voter's wealth is below average wealth (which generally leads to the taxation of capital accumulation) nor above average wealth (when it tends to subsidise accumulation). In Alesina-Rodrik on the other hand, we obtain an equity-efficiency frontier (understood as the maximum growth rate achievable given the taxation) that first rises (as the positive effects of the redistribution of public spending prevail over the negative effects from the reduction of the appropriateness of the returns on investment as a result of the increased fiscal pressure) and subsequently falls. The assumption that the median voter is less well-off that the average voter leads one to act, according to the authors, on this second section of the equity-efficiency trade-off curve.

In these models taxation directly reduces the return on investment, however other models have shown that redistribution may make the investment unfeasible as a result of the fixed costs that it entails. The plausible, intuitive consequence of these models is that the effects of the redistribution do not necessarily «need» capital taxation to affect growth or per-capita income. Furthermore, the models are based, for their functioning, on a particularly realistic hypothesis which is that of the imperfection of the markets, in particular of the credit market.

Perotti's model is halfway between the political models discussed above and these models which are based on imperfect markets, where it is allowed neither to borrow nor loan. In this model, if redistribution deprives the well-off of resources that they would otherwise, if not taxed, have invested, there are two possible consequences. If the well-off are «sufficiently wealthy» then even with redistribution they will be capable of investing but at the same time they will allow the less well-off to also invest, something the latter could not have done prior to the redistribution. In this case then redistribution («greater equality») stimulates growth and per-capita income. But if the well-off are not excessively wealthy, a bigger redistribution will prevent all from investing, thus creating a sort of vicious circle of poverty, triggered by the pursuance of an objective of equity that in fact impoverishes all.

The model allows one to obtain an equity-efficiency curve (efficiency being understood as per-capita income) which first rises and then falls: ceteris paribus, greater inequality in society will never allow (even with redistribution) the less well-off to invest while greater equality will allow no-one to invest. The interesting aspect of this model is that it introduces, as all models with fixed costs and heterogeneity of agents, the importance of initial inequality in explaining the effects of growth.

Two equally important contributions are those by Galor-Zeira [3] and Murphy, Shleifer and Vishny [5]. Although Galor-Zeira's model disgregards the median voter hypothesis, it too places imperfect credit markets at the centre of its analysis. As in Perotti, the final results depend on the initial distribution of the resources (in this case the inheritance made available to heirs) but the results are such that a high level of equality or inequality, ceteris paribus, depress growth. The contribution's recommendation is therefore to stimulate the broadening of the middle class.

The model used by Murphy, Shleifer and Vishny is probably the most interesting to be found in the abundant literature on distribution and growth. Although induced by a hidden imperfection in the capital markets which does not allow everyone to invest in technologies with increasing returns to scale, this model functions not so much in the field of supply-side policies but rather in giving importance to the role of demand. The authors' conclusions are similar to those of Perotti or Galor-Zeira: maximisation of the size of the middle class should be the backbone of redistributive policies and explains the trend over time of the various real economies. In the paper the class inequality discharges itself on demand in the sense that individuals who have no shares in land or industry with a high technological content consume only primary goods produced by technologies with diminishing returns. Land owners and entrepreneurs in the specialised sector on the other hand spend part of their income in goods with a high technological content.

As usual, a very equal distribution of income makes it difficult to cover the fixed costs which can start the growth process rolling. On the other hand, excessively unequal distribution does not allow the majority of individuals to enjoy the profits of industrial activity and

hence to consume its goods. This in turn depresses demand and the profits of activities with a high technological content and hence, on balance, the activity will not be undertaken as it will not cover the fixed costs. The size of the market for the product which triggers mass production is therefore a necessary condition for growth itself: only if there is a big middle class will the economy grow.

In all these models, the assumption of a single available technology (one single fixed cost) makes the results of the redistribution in time partially uninteresting: what happens when the economy has become rich enough to allow all agents to invest? Does redistribution no longer count? Alternatively, if a poor economy cannot allow itself a «high» technology (understood as high fixed costs with high returns) why should it not consider adopting a «lower» technology (understood as a technology with lower fixed costs and lower returns which, however, ensures positive growth paths and hence will sooner or later enable the country to choose the «high» technology that it previously had to renounce)?

It is therefore evident that a more complete analysis should include a study of the market imperfections considering a continuum of fixed costs-productivity combinations which can explain the possible trend of the efficiency-equity frontiers according to the country's level of development.

2.2 - *What Point on the Frontier?*

All the modern contributions to the theory of the link between income, growth and distribution centre on determining the frontier of the possibilities of an economy with heterogenous agents. The various attempts to incorporate a parameter representing equity in the utility function have been left to one side. In other words, modern theory does not deal with, if only indirectly, the issue of what possible equity-income combination (of the many identified, as we have seen in the previous paragraph) should be chosen by the policy-maker.

What is the cause of this reticence? The neo-classical assumption, that there exists a function that can accurately represent social judgements and the preferences of the economic policy makers

(which led to the concept of the social welfare function à la Bergson-Samuelson), allowed one to treat the equity-efficiency issue overcoming the set of the interpersonal comparisons of utility: the policy-maker had to choose the point of tangency between the possible utility frontier and the social welfare function. The functional specification of the latter enabled one to identify the level of inequality (iniquity) in society which derived from this process of maximisation. For esample, in an economy without production, applying Rawls' principle, only the improvements of the poorest members of society influence a society's welfare. In this specific case the optimum is at the point of maximum equality in income distribution[7].

Arrow's work and his theorem of the impossibility of achieving a reasonable mechanism of democratic aggregation of consensus which provides well-defined social peferences (i.e., complete, reflective and transitive) probably had considerably weight in the abandonment of the use of functions à la Bergson-Samuelson which were also affected by said theorem. Nonetheless, as we shall demonstrate below, many of these models which limit themselves to describing the construction of the frontier of the equity-efficiency possibilities do so going against Arrow's theorem. Some of these models are generally based on the median voter theorem, which as is well known contradicts one of the five axioms required by Arrow to construct the social welfare function, that of universal domain. While Bergson-Samuelson infringe the axiom of the independence of the irrelevant alternatives[8], probably the most contested of Arrow's five requisites, the median voter theorem infringes what is perhaps the most relevant axion of universal domain, restricting the possible classes of admissible individual preferences.

The other categories of models, those that consider imperfect markets and those that concentrate on the role of increasing returns to scale, neglect to deal with these aspects. The reason proffered is generally that the authors wish to furnish a «positive» and not a «normative» theory, showing that efficiency tends to be influenced by

[7] Production entails slight variances from the maximum equality, increasing with the increase of incentives to production that inequality involves.

[8] Under this axiom, the state preferred within a certain set of possible choices should not change if such set of choices was limited to a subset of the original one.

income distribution. Nevertheless, these papers rarely resist the temptation to give a prescriptive contribution in accordance with their result, since, for example, to say that greater equality engenders growth inevitably means recommending those who have the power (the State) to redistribute resources. What then should be the size of the redistribution? What has guided the rulers during the economic growth of a country in their choice of deciding the size of the redistribution? What point should be chosen once we have identified the link between the various levels of redistribution and growth or wealth, allowing one to overcome the problem of fixed costs which hampers growth?

A general theory that justifies the trends in time and between countries should give reasons also for these final responses.

In fact, while these models perceptively highlight the role that redistribution has had or plays in the development and growth process, they consider their task fulfilled in the moment in which the problem of the imperfection of the market and of technological discontinuities has been overcome. Most countries, however, do not fall into the trap of the vicious circle (low income, strong equality for some and[9] strong inequalities for others, low income) but overcome the critical point thanks to redistributive policies: does the role of equity and hence of redistributive policies terminate for those countries at that moment? What should at that point guide the government's choices? The attainment pure and simple of efficiency as requested by the neo-classicists who abhor interpersonal judgements?

3. - The Equity-Wealth Choice

As we have seen, the positive implications of the various models of modern economic literature on distribution and growth are surprisingly similar. All the models considered (with the exception of Persson-Tabellini) highlight a relation between equity and income growth or income itself that first increases and then decreases. In the

[9] Perotti maintains that extreme equality triggers a vicious circle, while for Persson-Tabellini it is extreme inequality and for Murphy, Shleifer and Vishny both.

fixed-costs or imperfect market models the relation between equity and income depends on society's level of development. Once the limit of the vicious circle of poverty has been passed, for some through more inequality (Perotti) for others never (Murphy, Shleifer and Vishny), the models agree in attributing equality an important role in the growth process.

We will make partial reference to the theory of Murphy, Schleifer and Vishny. In the presence of given fixed costs (given technology), redistribution generates the critical mass of demand for high-technology goods which makes investment in such industries profitable and hence triggers growth. An excessive redistribution does not allow the existence of potential investors, while a limited redistribution does not allow the existence of potential demand. Given the technology, Murphy-Schleifer-Vishny find a relation on the axes (equity, income) that first increases and then decreases. It is between these various points that the prescriptive choice of the optimum point will take place.

What combination will be actually chosen?

We have seen in the first section of this paper that the confrontation between equity and efficiency gives rise to the same problems of the adoption of political mechanisms as the median voter theorem. This induces us to accept with lesser caution possible transgressions of the ban on interpersonal comparisons. Nonetheless, in our analysis we diverge from social welfare functions à la Bergson-Samuelson. The latter, are, as is well known, individualistic by definition. Not in the sense that they have to take into account the fact that the behaviour of the various components of society is egoistic (it is not excluded that each individual incorporates the choice of other individuals in his own utility function) but rather that the social evaluation of different combinations of «baskets» should always base itself on the individual evaluation of such «baskets». In other words there is no room for ethical considerations per se: if anything ethics come into play in creating the trade-off between the different evaluations. For example, in Rawls, ethics come into play only when weight 1 is given to the utility of the poorest members of society and weight zero to that of all the others.

This type of function has a double disadvantage for us. One is

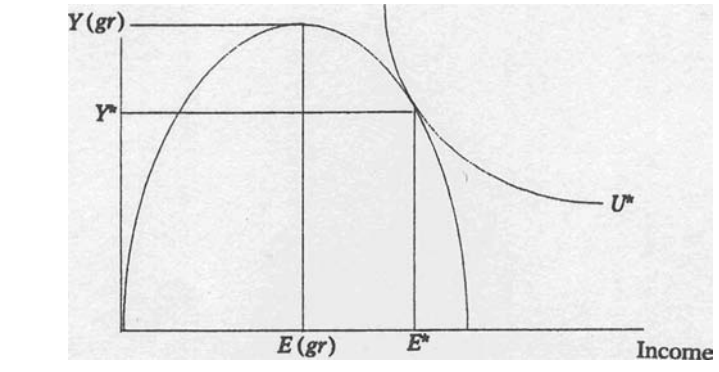
analytic: it does not allow the systematic creation of a relation between efficiency and equity according to the economy's stage of development. Secondly, it is by no means certain that a social welfare function should not necessarily evaluate ethics for its own sake, i.e., be necessarily individualistic. Moreover, literature on income distribution has provided ethic-economic indicators of welfare appropriate to our analysis (to which the macroeconomists rarely refer).

We shall then introduce the map of inequality-averse functions. As is known, thanks to Atkinson's theorem we can say that if in a society the «principle of transfers» holds (i.e., that any transfer from the higher to the lower incomes improves that society's welfare) then given two societies with the same average income, if the Lorenz curve of one society is always above that of the other, then the welfare in the former is higher than in the latter. These functions have in fact much in common with the utility functions for choice in uncertain conditions. There can be functions with greater or lesser aversion to inequality just as we have such functions for risk. Hence as for the choice in conditions of uncertainty[10], they can be represented for analytical reasons on the Cartesian axes (average income, variance in individuals' incomes). A decreasing function is an inequality-averse function: a lesser average income for society can be compensated by greater equality so as to ensure the same level of welfare for society. The level of welfare described by each contour increases the further it moves from the origin. An increasing «pro-inequality» function can be probably imagined for dictatorial countries or those governed by a oligarchy or one in which individual envy prevails. If we hypothesize the opportunities frontier as a parabola that first rises and then falls, we note the result that any inequality-averse country will be located on the falling path of the equity-efficiency opportunities frontier (see Graph 1), while a country which likes inequality will be located on the rising path (see Graph 2). Furthermore, each of these two inclinations entails verification of the possible convexity or concavity of the social indifference curve. Inequality-aversion may give rise to a falling marginal rate, when society accepts increasingly lesser reductions in

[10] See Mossin for the link between quadratic utility functions and return-risk utility functions within the portfolio theory.

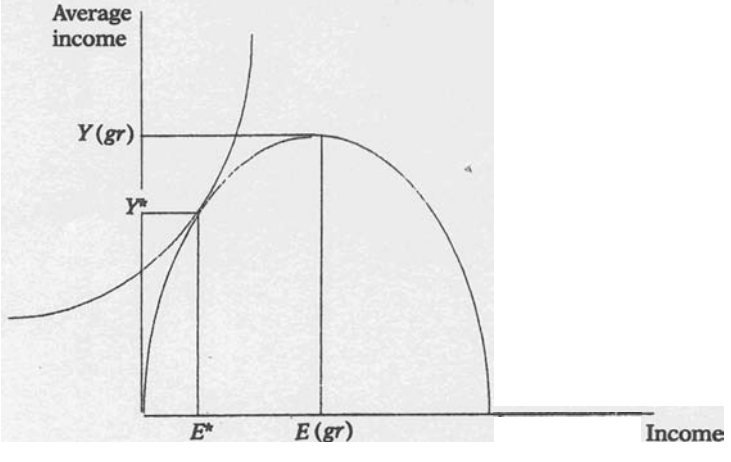
GRAPH 1

THE CASE OF AN INEQUALITY-AVERSE DECISION-MAKER



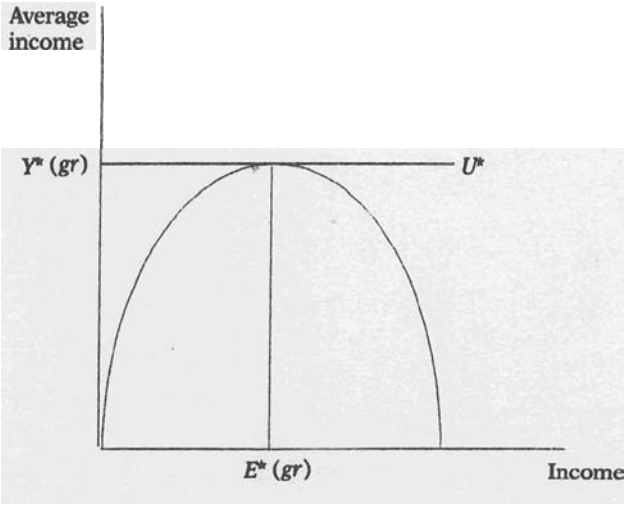
GRAPH 2

THE CASE OF AN EQUALITY-AVERSE DECISION-MAKER



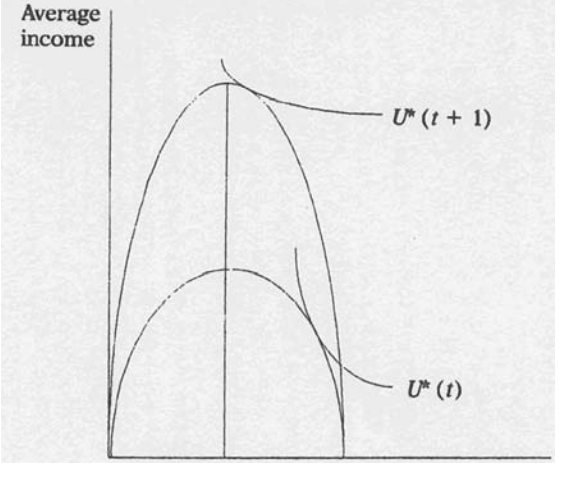
GRAPH 3

THE CASE OF AN INEQUALITY-NEUTRAL DECISION-MAKER



GRAPH 4

THE POLICY-MAKER'S CHOICE IN TIME



the average level, of income with the increase in equality, or a rising marginal rate when the opposite holds. In the first case, which we consider «normal», an optimum point is located in the falling section of the efficiency frontier. In the second case, the optimum solution will coincide with the perfect egalitarianism of a society destined to have the minimum income among the potential or else with the point of maximum distributive equity compatible with the maximum level of per-capita income, i.e., with the peak of the efficiency frontier[11].

In the case of equity-aversion (rising indifference curves), one may also encounter a condition of a rising or falling marginal rate of substitution. If, utility being equal, the growth in equality is less than proportional to the increase in income, the indifference curve will be convex towards the horizontal equity axis and the optimum solution will be located at a point along the rising section of the frontier. The opposite case, on the other hand, will give rise either to an optimum solution at the frontier's turning point or at the origin of the axes where income will be minimised, as in the previous case, but at the point of maximum iniquity, not maximum equity!

What form will the choice take in the most plausible case of a inequality-averse society with a falling marginal rate? This aversion will decrease in strength the more we approach the so-called «golden rule» point which maximises per-capita income, the maximum point for any inequality-netural government.

We have to date located our analysis in a static environment. It is obvious that, as for the risk-averse functions, we can assume that the attitude towards inequality changes in line with modifications in the conditions of wealth, which themselves change over time. If we assume functions with an (absolute) fall in inequality aversion we can identify a path on the indifference curves which associates greater wealth with a increasingly decreasing inclination to equality. It is therefore clear that there are many admissible efficiency-equity paths which maximise a society's welfare.

[11] This result is obtained even if one considers a society «indifferent» to equity, where this gives horizontal indifference curves (see Graph 3). A similar conclusion will be obtained in dynamic analysis when the growth of income gives rise to a progressive reduction of aversion to iniquity. In this case the indifference curve, even though an upwards concave, will tend to rotate towards the income axis with the increase of the latter and the optimum situation may coincide with the frontier's peak (see Graph 4).

On the other hand, we can also introduce changes in technology that imply shifts of the efficiency frontier. If we think of time as capable of determining technical progress in advanced technology, how does this curve move? This issue will be the subject of a future work. Assuming that this curve shifts upwards, maintaining constant the level of equality that maximises the product given a specific advanced technology we obtain Graph 4.

If it is possible to trace a series of frontiers of the efficiency-equity production possibilities as those assumed here, which are in any case generally compatible with the recent literature on growth and distribution, then the final question to be answered is: What combination will be actually chosen?

Where aversion to inequality decreases with the growth of a society's wealth, the optimum efficiency-equity path will be determined by the trend of technology and preferences, i.e., by the upwards movement of the efficiency frontier and the progressive flattening of the social indifference curve. The growth path that results will have increasing lower levels of inequality while tending, however, toward the point of maximum income.

If we were to consider a movement of the efficiency-equity frontier that is «non-vertical» but towards the simultaneous growth of income and equity, the path of the economy will move towards the point of maximum income while not necessarily associating itself with decreasing levels of equity. Finally, in the case of technological change that moves the frontier upwards to the left, the economy will move toward the point of maximum income with increasing levels of iniquity. The intuitive relations presented in this paper will be formalised in a future paper.