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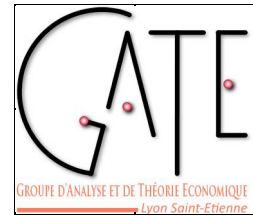
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Welfare economics¹

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Abstract. This paper presents the Paretian Watershed and the fundamental theorems of welfare economics. It distinguishes the British approach (à la Kaldor-Hicks) from the American approach (à la Bergson-Samuelson) to new welfare economics. It develops the more recent domains of happiness economics, the comparative approach by Amartya Sen, and the theory of fair allocation by Marc Fleurbaey.

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Key-words: Welfare economics, Kaldor-Hicks, Social Welfare Function, Pareto, comparative approach, happiness economics, fair allocation

Welfare economics is the economic study of the definition and the measure of the social welfare; it offers the theoretical framework used in public economics to help collective decision making, to design public policies, and to make social evaluations. Questions usually tackled by welfare economics are the following: What is social welfare? Is there a reliable and satisfying way to measure it? If social welfare is based on individual preferences, can we derive a social preference from the preferences of individuals? Are competitive equilibrium outcomes optimal in the sense that they lead to the highest social welfare? Can any optimal outcome be achieved by a modified market mechanism? Can we really formulate recommendations for public policies on the basis of such welfare analyses?

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In spite of the uncontroversial importance of all these issues, some have been overshadowed while others have drawn enormous attention. From then on, the death of welfare economics has been often foretold (Hicks 1939a: 697; Chipman and Moore 1978: 548; Mishan 1981; Hausman and MacPherson 1996: 96). Setting out the history of welfare economics implies firstly to recall its evolution, secondly to discuss the reasons why it has almost missed its project —among others the role of interpersonal comparisons of utility, the subjective interpretation of utility, and the rejection of value judgment out of economics. Thirdly, we shall claim there are strong reasons to hope: welfare economics is back (Sen 1999a; Fleurbaey and Mongin 2005), yet at the cost of accepting the normative nature of (welfare) economics.

The pre-history of welfare economics is as old as political economics: classical and neo-classical economists were studying the efficiency and equity of productive systems, more specifically wondering how to value commodities or labor, and to assess the best allocation of goods and of tasks for the society (Myint 1965). Utilitarianism which, since Bentham, aimed at providing tools to measure and improve individual and collective well-being, may be considered as the genuine root of welfare economics. From then on, the evolution of welfare economics marks up different periods and types of contributions. Following here Philippe Mongin (2002c,2006b), its history may be divided in at least four successive stages. First stage, the creation of the first tool of welfare economics goes back to Marshall —or even before in the works of Jules Arsène Dupuit—: the introduction of the notion of consumer surplus is meant to provide a method to measure relative change in consumers' utility. They may derive some policy recommendations from the surplus analyses. But it was more clearly born with Arthur Cecil Pigou's book published in 1920, *The Economics of Welfare*³ in which he has among others developed the famous distinction between private and social marginal cost or productivity⁴, the role of the size and the distribution of the national

³Notice the first version of this book, *Wealth and welfare*, was published back in 1912.

⁴A private marginal cost is the marginal cost borne by the individual who decided the change, which is induced by the infinitesimal growth in the use of one input. The social marginal cost is that which is borne by the whole population. Notice externalities emerge in case of a difference between both measures.

dividend in measuring economic welfare⁵, and his defense of the transfer principle⁶. The definition of welfare was not really unified at this stage: it could be the ‘national dividend’ or a mix between the amount of the dividend and the distribution of income, and even something else. Second stage, the new welfare economics established a clear separation between the optimality conditions based on the Paretian condition and their applications to the market. The definition of welfare was uniformly based on strictly ordinal and subjective individual utilities. The best-known applications are the fundamental theorems of welfare economics. The question of income distribution, including when applying the principle of compensation, was then mostly left aside. Third stage, after the Arrowian negative result tolled the bell knell in the fifties, social choice theory, public economics and the theories of inequality and poverty have been kept separate for decades. The only noteworthy element of continuity and unity is that most contributions were then welfarist, that is to say that the only relevant information for social welfare or public decision was individual utilities. Fourth stage, some post-welfarist economic theories of justice or fairness have been recently developed. Some economists suggest redirecting their research for example to analyze rights, or to integrate information such as talents and handicaps, opportunities and capabilities among others.

This chapter is organized as followed. The Paretian watershed exposed in the next section marks the evolution from the first to the second stage of welfare economics and the formulation of the two fundamental theorems of welfare economics. The problems raised with both approaches of the new welfare economics described in section 2 provide some clues to understand the disintegration of the third stage. Recent and promising avenues for researches are developed in section 3. Section 4 concludes.

⁵There are some connections between the national dividend and our gross national product, standardly used nowadays to assess and compare social states. National dividend basically distinguishes from national income by its specific focus on the actual overall consumption rather than on raw production.

⁶According to the Pigou-Dalton transfer principle, a distribution of income is less unequal when the rich become less rich and the poor become less poor, when the national dividend remains equal. This can be obtained by progressive transfers from the rich persons to the poor persons. On certain conditions, economic welfare may increase when inequality decreases.

1 – The Paretian watershed

1.1 – The old and the New Welfare Economics

At the turn of the century, Vilfredo Pareto introduced the concept of ophelimity in economics and, on the basis of scientific criteria, encouraged to narrow the amount of information we could derive from it: it should be an ordinal concept, and interpersonal comparisons of ophelimity ought to be ruled out. Would the term ‘ophelimity’ not be retained afterwards, this watershed has yet been confirmed by the publication in 1932 of Lionel Robbins’ famous book, *An essay on the nature and significance of Economic Science*, in which he disputed the meaning of interpersonal comparisons of utility and the material definition of economics. As far as a subjective account of utility holds, there exist no way, whichever by introspection or by observation, to compare the intensity of satisfactions of two different persons (Cooter and Rappoport 1984). If assertions implying the meaning of cardinal utility or of comparisons, such as the rule of decreasing marginal utility⁷ are formulated, they necessarily derive from a value judgment. Notwithstanding, if economics claims to remain a science, hence to be value neutral, such comparisons should be absolutely avoided.

Paul Anthony Samuelson (1947: 249) draws the consequences of the ban of interpersonal comparisons of utility, as well as of the restrictions of utility to the scientific theory of demand, by distinguishing the old from the new welfare economics: “While in a real sense there is only one all-inclusive welfare economics, which reaches its most complete formulation in the writings of Bergson, it is possible to distinguish between the New Welfare Economics [...] which makes no assumptions concerning interpersonal comparability of utility, and the Old Welfare Economics which starts out with such assumptions.”

1.2 – The Pareto Criterion

The only uncontroversial normative criterion at the collective level for the New Welfare Economics relies on individual utilities, as far as comparing utilities among individuals is not required nor even allowed. According to Pareto (1906: 261), “the members of a

⁷Remind that a consequence of the law of diminishing marginal utility may be that giving one more Euro to a poor person than to a rich person is collectively better.

collectivity enjoy maximum ophelimity in a certain position when it is impossible to find a way of moving from that position very slightly in such a manner that the ophelimity enjoyed by each of the individuals of that collectivity increases or decreases. That is to say, any small displacement in departing from that position necessarily has the effect of increasing the ophelimity which certain individuals enjoy, and decreasing that which others enjoy, of being agreeable to some, and disagreeable to others.” *A social state is hence said Pareto optimal if it is not possible to improve the situation of certain individuals without making the situation of at least one other individual worse off.*

Let us consider how to use this criterion. Compare different social states for a given population, where everyone has monotonous preferences over the commodities x and y . In state S_1 , the allocation of resources among individuals is fully equal for each commodity. Now, if individuals’ tastes are heterogeneous —some prefer to have more x while others want relatively more y —, they will find opportunities for exchange between x and y . In the social state S_2 , the situation of individuals who saw an interest in the exchange has improved while the situation of others did not deteriorate from S_1 to S_2 . S_2 is better than S_1 according to the Pareto criterion as the situation of some has improved without damaging the others’. Nobody has a vested interest to go back from S_2 to S_1 , and at most, some are indifferent. The fundamental theorems of welfare economics characterize this optimum, and specify the conditions of its existence (See subsection 1.3). The choice among different Pareto-optimal equilibria, notably on the basis of explicit value judgments, is the task devoted to the Bergson-Samuelson version of welfare economics (See subsection 2.2).

Imagine now that, in state S_3 , resources entirely belong to a single rich individual, while the others are totally deprived. The Pareto criterion does not help to compare S_1 and S_3 . May the unequal distribution of S_3 be repellent, the rich individual’s satisfaction would drop from S_1 to S_3 , which implies that at least one person would suffer a downturn. As the Pareto criterion does not apply, no ranking between S_1 and S_3 , or S_3 and S_2 may be derived. Hence a strict Paretian welfare economics is mute as to whether or not public policies should go towards state S_1 or S_2 while in S_3 . More generally, it cannot disentangle situations in which trade-offs among the satisfactions of different individuals are required. However, most policies are likely to hurt some individuals or groups of individuals in order to improve the situation of another significant group of people. They imply trade-

offs at the end, hence they rely on some kinds of interpersonal comparisons of utility. That is why, after Robbins' attack against the normative aspects of economics and especially against the use of interpersonal comparisons, welfare economics was likely to become silent for any policy recommendations and could have lost its *raison d'être*. The British version of the Paretian welfare economics provides some tricks to generate recommendations without, so they claim, involving any value judgments (See subsection 2.1). The new approaches to welfare economics such as the capability approach (See subsection 3.2) and the equity theory (See subsection 3.3) succeed in considering these situations and formulate explicit normative criteria to justify the trade-offs.

1.3 – The fundamental theorems of welfare economics

The social optimum is well described through the fundamental theorems of welfare economics, which formalize some ideas already present in Pareto's works (especially for the first theorem) and in Walras' (especially for the latter).

Oskar Lange, Abba Lerner, and Harold Hotelling have provided the first order conditions for economic efficiency, and the primary proofs of the first theorem. The problem of maximizing overall welfare amounts to maximizing the utility of each individual under the constraints of others' utility, possible allocation and transformation functions, which is up to three conditions. First, individual utilities are maximized if the marginal rates of substitution for two given commodity between two different individuals are equal. Second, the aggregate output and the optimal allocation of goods among individuals are obtained by equalizing the marginal rates of substitution with the marginal rates of transformation between the two given commodities. Finally, the marginal rates of transformation of the different firms among any two commodities must be equal to guarantee the efficiency of production for the various technologies. Notice these results, now rigorously established, resume some economic laws previously discovered by the precursors of the marginalists, such as Hermann Heinrich Gossen in 1854, and by the marginalists themselves, such as William Stanley Jevons in 1871.

Kenneth Arrow (1951b), Gerard Debreu (1951), and then the two together (Arrow and Debreu 1954) have generalized the proofs and these results. In formal terms, they have overcome the use of calculus, though intuitive to use for demonstrations related to optimization problems, by now using set theory. They have shown, with very few conditions, that the optimum more fundamentally derives from the price system. That is how they have formulated

what is now called the two fundamental theorems of welfare economics.

The first theorem of welfare economics states that competitive equilibria are Pareto-optimal, if individual preferences are monotonic and if there are complete markets.

The second fundamental theorem of welfare economics states that one can achieve any Pareto-optimal allocation in a competitive equilibrium when the social planner undertakes an appropriate redistribution of endowments. Among several Pareto optima, some are probably more satisfactory than others. The theorem points out that the preferred social optimum can be achieved by a competitive equilibrium if accompanied by proper redistribution policy which shall establish the new 'initial' allocations. An important consequence of this theorem is that it is not necessary to alter the competitive system to obtain Pareto optimality. A trade-off between efficiency vs. equity is not any more required; however, the issue of the redistribution is pregnant.

2 – The new welfare economics

Two types of approaches of the new welfare economics have been developed in the 1930ies and the 1940ies, which we may call the British approach on the one hand and the American approach on the other hand.

2.1 – The British approach to the New Welfare Economics

As far as the only uncontroversial normative criterion is the Pareto criterion, welfare economics establishes a clear test: a situation is economically efficient if it could not be better for the individuals without decreasing some people's satisfaction, which implies unanimity to justify any change. If it were nonetheless confined to such unanimous improvements, its object would be far too restrictive. The British approach, particularly represented by the works of Nicholas Kaldor (1939), John Hicks (1941) and Tibor Scitovsky (1941), essentially coming from the London School of Economics, developed a new concept of Pareto improvements in order to reach a decision and bypass the problem of comparisons. They propose a 'Pareto efficiency criterion' which considers the possibility of hypothetical compensations, and then applies the test of unanimity. Because the compensations are just hypothetical, they claim their consideration does not imply any value judgments.

Imagine a single individual i loses x by a new public policy, while all others gain. The strict version of Pareto criterion cannot conclude that this policy should be implemented. Imagine now that

others gain of an amount that is greater than x . Would the winners compensate Mrs. i by transferring her the amount x , they would still gain from the new policy, while Mrs. i would now be at most indifferent. *The change would be a Pareto-improvement, i.e. would be unanimously better, if such compensation were made. In all cases, this change passes the test of hypothetical compensations and is considered to be "Pareto-efficient", then could be recommended.* Economists are however not entitled to decide whether or not these transfers should eventually be made; such responsibility should be left to politicians on a second and distinct stage. This division of tasks between the economist as a scientist and the policymaker, as a politician, allows to comply with Robbins' contentions, yet to formulate public policy recommendations. From then on, this general framework rehabilitated surplus analyses and paved the way to the widespread use of cost-benefit analysis.

Extremely serious and skeptic critics have been raised against this approach by the leading experts in the field (Arrow 1963, Sen 1979d, Boadway and Bruce 1984 among others). Firstly, the internal consistency of the model is challenged. Among others, this welfare criteria "could not escape the possibility of giving rise to an inconsistent sequence of policy recommendations, unless either the distribution of income and wealth or the forms and degree of dissimilarity of consumers' preferences were assumed to be suitably restricted" (Chipman and Moore 1978: 578). Secondly, the normative aspects of this approach are strongly contested: even though it pretends to avoid interpersonal comparisons of utilities, it operates exactly on the basis of their existence (Cooter and Rappoport 1984, Blackorby and Donaldson 1990). Yet it does prevent any discussion of the value judgments involved in such analysis. Thirdly, beyond the problem of aggregation, these tests are more generally blamed because they are 'welfarist'. A social welfare evaluation is called welfarist when it relies on subjective individual utilities only (Sen 1979a, 1979b). Amartya K. Sen and many others have shown the logical, pragmatic and normative limits of such account of individual welfare in the context of designing or assessing public policies. In short, Chipman and Moore concluded in 1978: "judged in relation to its basic objective of enabling economists to make welfare prescriptions without having to make value judgments and, in particular, interpersonal comparisons of utility, the New Welfare Economics must be considered a failure." In spite of such an acknowledgement, the success of this approach in occupying a leading position in most

contemporary works of public economics, industrial economics or international economics remains today unchallenged.

2.2 – The American approach to the New Welfare Economics

What we shall call here ‘the American approach’ is associated with the position of Abram Bergson, from the MIT, and Paul Samuelson, from Harvard University, *i.e.* both coming from Cambridge (Mass.) in the United States. Bergson formalized the concept of social welfare in 1938 (Burk 1938). He defines it as a function of all the elements relevant for welfare: all products, consumer’s goods, the amount of work of each type, non-labor factors, characteristics of the environment, etc. Through the application of the Pareto criterion, the function may emphasize the “fundamental value of individual preference.” The social welfare function, as eventually formulated by Samuelson (1947), is defined as a function of the individual utility functions that each individual derive from the social state. The shape of these functions captures some value judgments that are explicitly formulated.

How can we legitimately decide which would be the right social welfare function? And what does a "social preference" even means? The question was notably asked by the logician Olaf Helmer to Kenneth Arrow when both were working at the Rand Corporation in 1949. Consistently, this function should rely on the individuals’ views, yet without resorting to interpersonal comparisons of utility. Arrow (1963) provides a first answer in 1950. He shows that, under certain conditions, it is impossible to aggregate the preferences of at least three rational individuals in a single collective preference, which would itself be rational (*i.e.* represented by a complete and transitive relation over social states). These conditions are the following: we must not exclude any combination of individual preferences (no restriction domain); we do not wish to resort to dictatorial decision (non-dictatorship); the collective decision should not contradict the unanimous preferences (Pareto Principle). Arrow also imposes a independence to non-relevant alternatives conditions, which he interpreted as a ban on interpersonal comparisons of utility⁸. This impossibility is at the

⁸This interpretation is though debatable. It has been shown that the independence condition also rules out further relevant ordinal information on individual preferences since it focuses on binary comparisons. This nuance has been taken seriously by the theorists of equity, so that they go beyond the arrowian impossibility, as we shall see below, yet still avoiding interpersonal comparisons of utility.

very least annoying: we cannot derive a collective judgment on the basis of individual preferences unless it is dictatorial. It is hence questionable whether the notion of collective welfare would at all make sense. For this reason, the New Welfare Economics seemed bound to a failure again. Fortunately, this prediction turns out not to materialize.

3 – A promising future for welfare economics

Different challenges indeed need to be taken up to restore a future for Welfare economics. It should be possible to make recommendations of public policies; either interpersonal comparisons of utility are impossible and not required, or their meaning and their status should be clearly defended; a framework to explicit which value judgments are at stake is needed; it is necessary to go beyond the Arrowian impossibility to legitimate the use of social welfare function. While the economics of happiness (subsection 3.1) has provided some positive evidences of the necessity to challenge the notion of welfare, the comparative approach (subsection 3.2) and the theory of equity (subsection 3.3) lead us to expect a promising future for a normative welfare economics.

3.1 – Economics of Happiness

Back in the 1950ies, Richard Easterlin has examined whether income promoted happiness in the population on the basis of opinion surveys. In his famous article published in 1974, he has observed that, in a given country, people with higher incomes are more likely to claim to be happy. However in international comparisons, at least for countries with income high enough to meet basic needs, the expressed level of happiness does not vary much with the national *per capita* income. Finally, although the *per capita* income has increased steadily in the United States between 1946 and 1970, expressed happiness recorded no upward trend in the long run, and even decreased between 1960 and 1970. Facing the Easterlin paradox, the standard public policies, which are based exclusively on economic growth, seem to be missing their target. If growth and wealth is not all what counts, the least would be to primarily identify the factors for happiness. ‘Economics of happiness’ is essentially a positive, interdisciplinary, and empirical literature. It describes what is, but does not study what ought to be. Happiness studies are interdisciplinary in the sense that they belong to economics, cognitive sciences, humanities and social sciences. Notice it constitutes an alternative to the standard economic model. First, it moves away from the revealed preference model and from

the usual assumptions of rationality. Then the overall satisfaction of individuals is at stake, rather than just the satisfaction they derive from the consumption of market goods. It consists in conducting econometric studies of happiness, emotion, subjective well-being, quality of life, life satisfaction —insofar as those terms are, in this specific context, interchangeable— to identify their factors. Measurement of happiness often relies on self-assessment scales, based on responses to questionnaires in which participants express how happy they feel.

Since the Easterlin paradox, many studies have tried to explain why at the aggregate level, growth of national income did not necessarily enhance well-being. Among others, results of economics of happiness reveal that poverty reduce more happiness than wealth increases it; an increase of income for a poor person is more likely to increase her happiness than an increase in income for a rich person. Happiness can be enhanced by reducing inequalities, improving working conditions, the reduction of working time and in some cases, neutralizing the negative effects of unemployment and some school reforms. Besides, we learn that the influence of purely economic factors in the happiness of people is generally overestimated in our representations as compared with factors. However, unemployment and labor relations can have considerable influence in the lives of people. Unemployment kills happiness, even after individuals got their jobs back. Some think happiness may constitute a yardstick, and that it is possible to transcribe it in money measures, which allow cost-benefit analysis to be completed.

Gathering information on the factors to enhance or to avoid decreasing of happiness, as well as on the measure of happiness, may most likely be of great help for policy-makers. It appears to be a particularly innovative and important contribution to understanding the determinants of happiness, for making ex post evaluation of certain public policies, and to complete the data needed by policy makers who should not be satisfied with economic data. Nevertheless, the analyses of surveys have given rise to many criticisms, at the methodological and the normative level. Some highlight difficulties to interpret the replies, challenge their reliability, and doubt cross-country comparisons are meaningful. More generally, the very status of subjective data is discussed. Would individuals be with what they have and what they do, they may be happy out of adaptation. This becomes highly problematic if adaptation is nothing but resignation. Beyond the methodological criticisms, some question its ability to formulate policy recommendations. At a pinch this research could justify to

administer tranquilizers to everyone, as it comes in Layard 2005. Though very few economists would seriously defend this view, this counter-intuitive example invites to beware of any possible manipulations of happiness indicators. Furthermore, economics of happiness describes what could be the target of a benevolent policy maker —as did classical utilitarianism—, but as a pure positive science, regardless of any justifications neither discussions of the relevance of the happiness criterion. Happiness may be important for individuals, yet this does imply governments are responsible for enhancing it (See the justice cut by Dworkin).

Lucie Davoine (2009: 905) concludes: “happiness is a necessary but not sufficient: even though the economics of happiness can prevent a form of paternalism and ethnocentrism, the surrounding methodological doubts and the objections in principle induce not to consider happiness as the barometer of public action.”

3.2 – The comparative approach

Throughout his critical analysis of the welfarist approach (See in particular Sen 1979a,b), Amartya Sen suggested assessing social situations by considering quality of life rather than just utility or wealth. He developed the bases for the ‘comparative approach’ in general and the illustration of what it could be, the capability approach, notably in his Hennisman lecture published in 1985 and his first Tanner lectures published in 1980 (See also Sen 1987, 1992a, 1993b). It constitutes an intermediate response to the debate on ‘equality of what?’ which opposes welfarist approaches to resourcist theories. It provides rankings of situations based on explicit criteria of justice, and considers objective descriptions of life situations as relevant information to capture quality of life, i.e. an index of individual welfare as an ‘individual basis for justice’. On the one hand, utility, says Sen among many other critics, is too sensitive to adaptation, and on the other hand, resources do not pay attention to the particular individual ability to transform commodities into well-being. Quality of life may hence be better captured with functionings, which Sen (1985: 6-7) defines as “what the person succeeds in doing with the commodities and characteristics at his or her command. [...] It is an achievement of a person: what he or she manages to do or to be. [...] The alternative combinations of possible functionings a person can achieve and from which he or she can choose one collection” is called ‘capability’ (Sen 1985: 7). At any moment, according to his situation, his tastes, his life plans, a person may choose some particular functioning among the capability set. The wider this set is, the more the individual is free to choose between different

lifestyles. The use of capabilities as an informational basis to assess quality of life therefore focuses not only on the role of commodities in generating well-being, takes into account individual's specific ability to transform commodities into well-being, but also values for itself the freedom to choose their lifestyle.

We should add two technical remarks and one further discussion. Firstly, as far as this information is objective in the sense that they are observable and measurable on a common scale, interpersonal comparisons are meaningful (Baujard 2011) so that the latter are justified and well accepted in this context. Secondly, the assessment of capabilities is based on some valuation of lists of different functionings, themselves being a vector of achieved doings and beings. Such multi-dimensionality is likely to cause moral dilemmas in certain situations, hence to generate substantial incompleteness. For instance, what if I have more health but less education or social relations? A possible answer, specific to Sen, is to accept the rankings of social states may be incomplete. He does not indeed consider incompleteness as a relevant problem in the context of normative issues (See notably Sen 2009). Another approach is to gather each functionings into an index by weighting them according to their importance (Robeyns 2005a). Thirdly, the crux of the debate opposing these two different philosophical capability approaches lies in the question of operationalization (on this opposition, see Lessman 2006, Robeyns 2005b, Baujard 2007b). Following Aristotle, Martha Nussbaum believes that there is a single notion of the human good, virtues and flourishing life (Nussbaum 1988, 1993). This leads to propose a concrete and comprehensive list of functionings, so that the approach belongs to fundamental universalism. Operational applications are therefore implementable for scientists (Alkire, Robeyns 2006). The fact that values and weighting are determined by scientists rather than by the individuals themselves explains why this approach is often criticized for its paternalism. In contrast, Sen's position meets certain relativism, in order to give to public deliberation the main role in a democracy. Therefore, he refuses to provide a clear list of functionings which could measure well-being for everyone on a common scale. It is therefore difficult to implement a mere application of Sen's capability approach since it fundamentally relies on the public debate. The latter is the only legitimate place to decide which moral values should be at stake, hence to retain specific lists of functionings and, eventually, to measure capabilities.

The extremely extensive literature on the capability approach, at least since the 2000s, is but a multi-dimensional analysis of

living conditions, for which the UNDP human development index (HDI) is only one very rough illustration. As the approach was generalizing, it has yet lost its specificity, which was to pay special attention to the value of freedom, understood as the possibility for everyone to live the life one has reason to value.

3.3 – Equity theory

The theory of fairness or equity theory, including fair allocations theory and even applications to public economics, borrowed the axiomatic methods from social choice theory and the theory of bargaining to study the implications of equity criteria in the framework of Arrow-Debreu general equilibrium model.

Different fairness criteria can be contemplated for division rules. The idea of ‘no-envy’ was independently introduced by Jan Tinbergen (1953), Duncan Foley (1967) and developed by Serge-Christophe Kolm (1971), Allan Feldman and Alan Kirman (1974). An allocation is ‘envy-free’ if no individual would like better anybody else’s basket. A fundamental result of equity theory is such that the competitive equilibrium with equal endowments, that is to say equal budgets, satisfies both the criteria of no-envy and Pareto. Refinements of such analyses were first conducted in the context of distribution of a consumption economy without production, then to study equal opportunities, incentives and optimal taxation, division of a single divisible good with single-peaked or monotonic preferences, the allocation of several commodities, the properties of a production economy...

The no-envy criterion, however, may conflict with the criterion of efficiency. This was proved by Elisha Pazner and David Schmeidler in 1974: no allocation respects Pareto efficiency and fairness (as no-envy) in the context of production with unequal skills —in other words with production handicaps. This impossibility result can be interpreted as the incompatibility between a principle of reward and a principle of compensation. The non-envy test indeed requires that the allocation of individuals with identical preferences must be on the same indifference curve. According to the principle of reward, individuals with similar talents should not envy each other, since it should not be any different treatment for different preferences. And, according to the principle of compensation, individuals who have identical preferences should have the same benefit, eliminating the inequalities due to talents.

The same authors proposed in 1978 another test of fairness based on egalitarian equivalent allocations. An allocation is egalitarian-equivalent when each one is indifferent between the

basket of goods in the allocation and the basket she would have in an egalitarian economy. In this perspective, Marc Fleurbaey and François Maniquet (2005)—among other similar contributions—considered the introduction of skills heterogeneity, and studied the consistency between compensation of skills inequalities and the condition of equal access to resources for all preferences. To deepen the subject of responsibility and unequal handicaps, see Fleurbaey (2008) and, for a comprehensive presentation of the economic theory of fairness, see Fleurbaey and Maniquet (2011).

The theory of equity took up the different challenges welfare economics was facing. First, it's worth noticing it eventually overcame the Arrowian impossibility. Second, it did reject interpersonal comparisons of utility. Unlike standard economics which relies on the model of subjective revealed preferences, welfare is here described as an index of resources; and unlike the comparative approach, they still keep some account of individual ordinal preferences, which avoids the risk of paternalism. Third, the theory of fairness accepts the challenge of value judgments transparency in making clear the criteria of justice.

4 – Conclusion

Public policies are expected to increase social welfare. Welfare economics aims at providing the framework to accomplish such goal, developing a wide range of techniques to adapt different situations. But looking careful, we have seen this wonderful textbook world may be gloomier than it seems at first sight. Is welfare economics bound to death because of its difficulty to handle value judgments? Recommendations are indeed always linked with some normative involvement, even through the undebated Pareto criterion. Beyond, welfare economics suffers from the fact that a necessary discussion on the very definition of welfare had been shirked for too long (Baujard 2011). What is indeed welfare? How can we justify this or that meaning of welfare for public policy? Pareto or Pigou acknowledge that overall welfare is much more, or even different, than economic welfare⁹. Yet Pareto developed a pure theory of ophelimity which was afterwards taken as such by economists. Pigou eventually

⁹We here refer to the distinction of utility and ophelimity for Pareto, and the distinction between total welfare and economic welfare by Pigou. Pigou (1920 : 20-33) for instance argues the difference is meaningful as soon as you pay attention to time and interactions.

focused on economic welfare, and especially on the national dividend; from then on GDP appeared as an acceptable approximation of welfare for decades. These assumptions are today more and more debated.

Among others, it seems now generally accepted that GDP is a questionable goal, and the definition of welfare becomes a topic of discussion. The theory of fairness and social welfare, which took over all challenges faced by welfare economics, now provides a unified approach of social choice theory, the theory of fair allocations and public economics. Sen's capability approach rehabilitates the role of public debate and reintroduces democracy in economics. All is there to expect a promising future for (welfare) economics.

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