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Equitable income distribution

8.1. Difficulties around the concept of justice or equity

For centuries mankind has been interested in justice or equity in socio-economic affairs. As an illustration we only need to quote the mediaeval discussion of the concept of *iustum pretium*, the equitable price, not only for commodities but also for the borrowing of capital. Economists generally adhere to the opinion that the definition of justice is not part of their science, but rather of ethics, morals or the philosophy of law. Yet the problem cannot be solved either by representatives of these disciplines and until quite recently not much of a useful answer has come from them. What answers have been given, even by respectable scholars such as Perelman [51], hardly surpass the self-evident – justice requires equal treatment of equals. What has to be done with unequals remained in the dark. This state of affairs is understandable, however, since the problem of defining justice or equity cannot be solved without knowledge about the consequences of changing the economy on the basis of some equity concept. And the search for these consequences does belong to the realm of economic science. Clearly, then, the problem is interdisciplinary and either requires co-operation between economists and moralists or study by one person of two disciplines. Lately some remarkable work has been published by Rawls [55] and by Roscam Abbing [57]. This chapter attempts to make another contribution, directed more particularly at what seems to be measurable at this time. We must remain aware of the tentative and provisional nature of what can be done in the present state

of the debate and with the limited knowledge obtained by measurements that we have of the relevant aspects.

It seems appropriate, though, to remain aware of the long and deep-digging history of the search for justice or equity and even *equality*. That last word has been used in such solemn declarations as those by theologists about 'equality before God', by lawyers about 'equality in court' and by politicians about 'equal voting rights'. The last reflects the primitive way in which at present most Western societies – and since a relatively short span of time only – make their collective decisions.

It also seems appropriate to put on record that because of a process of rapid development of all possible types of measurement we are increasingly well-informed about the many ways in which human beings are *unequal.* In crude experiments unequal physical strength of different individuals of a same species of animal is established periodically and used in violent processes of selection to determine the hierarchy and leadership in collective action. More refined measurements and studies of the inequalities measured are presented in the work of early statisticians such as Quetelet [53] and have since expanded over a real labyrinth of physical and psychical properties of, among other animals, man. *Physical measurements* have been extended beyond well-known measures needed for apparel or for beauty, to all sorts of details of the body, among them skull features. *Psychical measurements* probably found their earliest representatives in school marks, later followed by IQ 'and all that', whereas relatively recent surveys have dealt with occupational status. Alongside direct measurement of the capabilities of individuals an enormous arsenal of standards has been created in what is known as *job evaluation.* Strictly speaking this technique measures *job requirements,* but implicitly each appointment of an individual to a particular job also measures the person involved. An increasing number of types of examinations in the form of comparisons among participants add to the huge volume of information now available but hardly used for our purpose.

In the face of this state of affairs this study proposes to accept inequality of individuals in a large number of respects, but only *when measured*. This seems a scientifically sound attitude. We propose to combine this scientific contribution with an *ethical postulate* that despite all inequalities a hard core of 'fundamental equality' remains as has always been felt by religious and political idealists referred to above. A more down-to-earth interpretation of this 'fundamental equality' or 'equivalence' is also conceivable: the fact that each human being is a member of the human race in contradistinction to other living beings. What is added in this study is a concrete *mathematical* expression, introduced in Chapter 4, of 'fundamental equality' or 'equivalence' by postulating that the utility functions of all human beings have the same mathematical shape and the same coefficients. This postulate enables us to make a primitive start at measuring utility.

8.2. Evolution of the economist's concept of equity

The present attitude of agnosticism vis-à-vis a definition of equity or justice which is also preferred by most economists was preceded by a period in which many economists whom we in Europe today call liberalist – or Manchester liberals – did have a definition of justice. Justice was considered to consist of the equality between an individual's *income received* from society and his *contribution* to society by making available part of the production factors he owned. The definition is typically individualistic in that it deals with the relationship of each individual to society as an abstract entity and does not compare individuals to each other, at least not directly.

In increasing numbers members of our society are doubting this interpretation of what we feel when we speak about justice or equity. Two implications of a new concept of justice stand out. One is that the factors 'nature' (or 'land') and capital can be 'owned' and that the justice of this *ownership* is debatable. The other implication is that personal capability, although an intrinsic part of a personality, is a gift of God or Nature –

different formulations are possible here – and its distribution among individuals is *not necessarily equitable* either. While two elements of doubt lead us to deny the appropriateness of the definition quoted, they do not automatically provide us with a new concept.

Our positive suggestion consists of adhering to the definition that equity stands for *equal welfare for all individuals*. For economists welfare is identical to utility in its broadest sense and is also identical to happiness in a restricted sense. The happiness meant might be indicated as '*social* happiness', that is happiness as far as it is dependent on social variables and parameters, or variables and parameters as far as they are relevant for the individual's *role in society*. It excludes such entirely personal elements as friendship, love, or religion; and there are more. The frontier between personal and social may be a matter for debate and may also shift over time. Clearly we are up against a realm of analysis hardly opened up yet.

From the definition proposed it is clear that it is *unacceptable* to those who deny the measurability of utility. In the debate on measurability our point of view is that the only statement that can be reasonably made in this controversy is that so far utility has not been measured *with great precision*. To us it seems unacceptable to maintain that utility *cannot* be measured. It is an essential ingredient of scientific activity to try to work with measured concepts, since measurement only can show a possible incompatibility between a theory and reality. For a long time now political and family decisions have been made which in fact are based on a vague and intuitive way of measuring welfare, of making comparisons between the welfare of different groups or persons. Both Parliament and individual households currently make such decisions. In Parliament and sometimes in other institutions the element of arbitrariness in these vague and intuitive decisions is reduced by the system of *voting*, comparable to checking measurements of a more scientific character by repeating measurements. In many sciences we observe the evolution of measurement from a vague and crude classification ranking and finally to cardinal

measurement as the most perfect method of measurement. While in the beginning measurement may be done in a somewhat arbitrary way, further research may later lead to giving more background to the method chosen and to distinguishing between various alternative methods for different problems. Thus, heat was originally considered a 'feeling' with no possibilities for being measured; later the thermometer was introduced as an instrument of measurement. Subsequently physicists began to make a distinction between the 'degree' of heat, called *temperature*, and the quantity of heat, one of the forms of the more general concept of *energy*. The thermometer can be said to have been based on the experience that most substances expand proportionally and that, in a way, these substances, by 'majority vote', tell us what temperature is. Only a majority indeed and not unanimity, since there are a number of circumstances under which a given substance behaves differently, for instance at its melting or its boiling point.

Our method of measuring welfare or utility has been set out in Chapter 4 and some use of it has been made in Chapter 7, where a *social* welfare function was introduced, equal to the unweighted sum of individual (or household) welfare. With its help a precise meaning could be given to social optimality. In this section an additional attempt has been made to give a more precise meaning to the concept of justice or equity.

8.3. Implications of proposed definition; equity and optimality

A few simple implications of the proposed definition of equity may illustrate its character, especially by informing us about what equity is not. It was observed already that equity cannot mean equality, since in many respects individual members of a community decidedly are not equal and cannot be made equal.

In addition it can be easily seen that equity does *not* imply *equality of income*. This would only follow under a number of additional assumptions which are not warranted at all. A sufficient assumption would be that welfare only depends on income. In that case equality of welfare implies equality of

income. Since welfare, even in the simple illustrative case used in this study, depends also on such variables as occupation chosen, or such parameters as number of years of schooling, equality of welfare will not, in a general way, imply equality of income. Similarly, incomes of *households of different size* will not have to be equal in order to attain an equitable income distribution. It is conceivable to regulate other variables, such as working hours, with the purpose of letting equality of incomes coincide with equity, but it is not a necessary but rather an arbitrary regulation.

Finally a comparison between *equity and optimality* seems helpful for a clear understanding of both concepts. Optimality of a socio-economic state of affairs means that social welfare has been maximized under a set of restrictions imposed by the environment of nature and natural laws. With the choice made in this book for the definition of social welfare, discrimination has been avoided by giving equal weights to all individuals or all individual households. Yet the maximum of social welfare need not imply equal welfare for all. It so happens that in the particular model used in Chapter 7 optimality does imply equality of welfare for all. This is due to some particularly symmetrical properties of our model. More precisely, equations (7.24) through (7.29) express this coincidence of optimality and equity and it is easy to see that this need not apply for more complicated utility functions. Thus, if utility were, for an individual (h, h'),

$$\omega_{hh'} = f\{x_{hh'}(1 + c_3 h) - c_0 h + c_1 h' - \tfrac{1}{2}c_2(h - h')^2\}, \tag{8.1}$$

optimalization of total welfare would require, instead of (7.24), etc.,

$$f'\{\,\}(1 + c_3 h) + \tau = 0, \tag{8.2}$$

or equality of $f'\{\,\}(1 + c_3 h)$ which does not imply equality of all $\omega_{hh'}$.

Of course we can pose *another problem*, namely the maximization of social welfare subject to the *constraint of equity*.

Generally this will be a solvable problem, but a more complicated one; and as a rule the solution will constitute a lower value of social welfare – every additional restriction will lead to lower social welfare in the optimum position. Generally speaking, with all $\omega_{hh'}$ equal, the $\partial\omega_{hh'}/\partial x_{hh'}$ will no longer be equal, since optimum conditions (7.24) through (7.29) will now become considerably more complicated.

Our conclusion is that equity and optimality are concepts of a different kind, that optimality need not imply equity, but that equity and optimality can be combined at the expense of some social welfare. This sacrifice happens to be zero in our special case.

Some *final remarks* are needed about the *institutional implications* of our definition of an equitable income distribution. In fact we should repeat the question posed in paragraph 7.7 with regard to optimality: Is equity feasible and, if not, can we indicate the institutions needed to attain feasibility? As an answer we must first repeat that our models are highly simplified and that a distinction must be made between these models and more complicated ones. In our models the only institutions explicitly involved are factor markets and educational, research, and tax institutions. The limitations which have shown to be possible for the realization of equity are similar to the ones discussed with respect to optimality. As far as markets are concerned *monopolies of high income groups* cannot be accepted. *Educational* limitations may be either *natural*, if an insufficient number of individuals can absorb higher education or training, or *institutional*, if an insufficient access to education exists. Since in our model optimality and equity coincide, Table 7.V illustrates the orders of magnitude involved. At the level of technology existing in 1962 six to seven per cent of the active population should be able to absorb higher education and this is about double the percentage that had such an education in 1960. If we may assume that higher education absorption is proportional to university education absorption, Table 6.VI suggests that before 1980 the 6 to 7 per cent level will be reached. *Techno-*

logical development as it has advanced so far will, however, continue to increase the demand for more people with higher education. If the ratio of the income of university graduates to the income of all labour is to be kept constant, the percentage of academically trained people around 1990 must be at least 40 per cent higher than around 1975: this figure can be derived from the last two columns of Table 6.V. In this respect Passenier's figures (Table 6.VI) are encouraging. But a time may come when this problem becomes more difficult. This depends also on the possibilities of *reorienting research* in the direction so that fewer highly trained individuals are required for the years beyond the year 2000 than the present trend implies.

As for the *tax system*, we already emphasized the possible limitations of our present system. While the optimum does require, in generalized models, the lump-sum tax system already discussed in Section 7.7, we can repeat that with our simplified model even the rather progressive tax studied in case B'''' of Table 7.III does not satisfy the conditions for income after tax needed according to Table 7.V. Perhaps much higher taxes on capital income could produce the necessary redistribution and this would constitute an institutional change in the direction of *traditional socialist* policies.

Only further refinement of utility measurement will be able to give us information about whether equity meets stronger or weaker limitations than optimal income distribution. Without specifying and testing such more complicated utility functions as mentioned above we cannot make more precise statements.

8.4. Effects of neglected factors

Clearly the very simple illustrative examples of how to estimate welfare functions need many corrections. When applied to individuals or individual households, such parameters as age or the number of members of households can be easily introduced, as has been shown by Van Praag [79]. At the same time, there is hardly any need to introduce them for groups of

approximately the same age distribution or household size distribution. The differences in the coefficients found for the Netherlands and for the states of the USA, however, point out the necessity of finding parameters characterizing different ethnic groups. Thus, differences in the coefficient c_0 signify different relative valuations of money (that is, consumption) with regard to additional efforts. Similarly, differences in c_2 may be interpreted as differences in the relative valuation of money and 'doing work below or above one's capabilities'. We already formulated some alternative assumptions concerning these latter two differences in Section 4.6.

On some of the additional parameters or variables some more information is already available. Thus, the possible difference in *working hours* between wage and salary earners in the Netherlands appears to be negligible, according to a recent inquiry by the Free University of Amsterdam. Also the inquiries by Van Praag and collaborators [79, 80] mentioned earlier contain additional information on the differences between the *utility functions* for families in which the *wife works* and for families in which the *wife doesn't work*. The additional influence of *working experience* can also be read from our equation (3.12).

Evidently a vast programme of further research is called for. The present study is meant to make a start for some of this research, but its results can only be considered first attempts.