LECTURE 1

CONCEPTS, DATA AND THEORIES

1.1. Income concepts, inequality measures

These lectures devoted to recent research on income distribution by a number of authors have been arranged in about the same way as my book *Income Distribution* (Tinbergen, 1975). I have taken this occasion to deal at more length with a number of interesting contributions published only after I finished my text, and to elaborate on parts of the text which lack clarity, as some critics, among them Jan Pen, have rightly pointed out. [1]

To begin with, I want to limit my discussion of income concepts to a few main categories, without

[1] I want to express my sincere thanks to Mrs. S. Kleyngeld for the care given to the typing of this text.

dealing with refined theoretical and administrative distinctions as made by those who did the really precise data collection, grouping and transformation. What I have to say refers to some confusing uses of the word 'income' in political discussions and in general theories of income distribution.

A clear distinction should be made between incomes of different categories of receivers and users. It is always necessary to mention, in the discussions referred to, whether one speaks of incomes of households, of earners or of consumers. A household may have more than one earner, and an income, whether of a household or of one earner, may finance the consumption of several consumers. Households may be families or single persons. I use the word 'earner' as synonymous with recipient, even if it refers to a recipient of unearned income in the older sense. Consumers may be counted as persons or, preferably, as adult equivalents, taking into account that children usually consume less than adults. To add the remark that an earner does not coincide with a taxpayer is superfluous. The really precise data collectors have struggled with this problem right from the start of their valuable but tedious work. Somewhat arbitrarily let me express my sincere thanks to Messrs. Massizzo (1975), Nicholson (1974), Stark (1972) and Wiles (1974), whose work I recently studied, and apologize to some others that I have not attempted to be complete in my compliments.

Another clear distinction should be made, of course, between income before tax, after tax and after complete redistribution. For developed Western countries these figures are, for some groups of the population, deviating substantially, much more than, for instance, in Eastern European countries. I feel these deviations have not been given sufficient attention by Michal (Michal, 1973). Complete redistribution takes into account, apart from taxes, the supply by the community of some services at prices far below their cost (e.g., education, transportation and health services).

I am not going to say much about *inequality measures.* Like Wiles, I prefer to use ratios of incomes between well-defined groups, such as the upper and the lower 25 percent (quartiles), 20 percent (quintiles), 10 percent (deciles) or 5 percent (semi-deciles). For the general public it is useful to add that a discussion of what ratio 'between the highest and the lowest' incomes is considered acceptable is meaningless as long as the size of the groups compared is not specified.

1.2. Data: Changes over time

Increasing amounts of data have become available in the last few decades, sometimes dealing with recent developments only, sometimes with developments over considerable time spans (Soltow, 1965;

Ullman-Chiswick, 1972). Quite a few authors express the opinion that income distribution over the last few decades has changed only marginally. Such statements contributed to pessimistic judgements on the capability of the present social system to move in the direction of more equity. Often the statements concerned have not been clear as to which income distribution they referred. It is true that the distribution of *household* incomes *before tax* has not changed dramatically (a recent survey has been given by Roberti, 1974). Some after-tax figures, for instance those given by Douben (1970), show a similar picture. There are a number of other aspects, however, which change the picture. Figures after complete redistribution (Tinbergen, 1975) are more encouraging in the socially advanced countries. In the Netherlands, figures per consumer are more favourable because the size of poor households is now considerably smaller than that of prosperous households. In some other countries similar demographic factors favourably change the picture and hence the prospects (for the United States cf. Kuznets, 1974). In Denmark between 1941–2 and 1967–8, for the lowest decile of earners, the number of children remained 0.25, whereas for the top decile it went up from $\frac{2}{3}$ to 1. In a general way Wiles (1975) states: 'equality is breaking out all over the place'.

Developments over longer periods, for instance over a century or half a century, clearly show an

outspoken change. *Income from capital,* according to Kuznets (1966), over the century between 1850–60 and 1950–60 for Britain and France, fell from 40 percent of national income to 21 percent. Over the half century his U.S. figures cover, the same per annum rate of reduction applies. Estimates for the Netherlands in the year 1968 are in the neighbourhood of 10 percent. These incomes include incomes from insurance capital alongside incomes of wealthy individuals. The latter are heavily taxed, in contradiction to the situation a century ago. Day (1974) estimated that of Great Britain's wealth in 1911–13, 92 percent was owned by the top 10 percent, and in 1973 by 63 percent. These figures are very close to Atkinsons (1974). The top 1 percent, according to Day's figures, owned 69 percent in 1911–13 and 23 percent in 1973. Interesting figures, based on publicly accessable data, have been collected by Soltow (1965) for a few towns in Norway. The ratio of average income of the upper decile to general average income, amounting to 5.7 in 1840, had fallen to 2.4 in 1960 (pretax incomes). For the U.S., Ullman-Chiswick (1972) estimates a fall in the ratio of incomes of qualified workers to incomes of less qualified workers from 2.5 in 1900 to 1.6 in 1963 (again pretax incomes). If similar figures had applied to the ratio of highly qualified to qualified individuals, the ratio between highly and less qualified would have fallen from 6.25 to 2.56.

1.3. Data: Differences among areas

Income differences among countries of the world are only too well known. In an attempt to correct for differences in price levels (a cumbersome operation, as shown by Hulsman (1975)), I estimated that the average income per capita of the richest countries (with 10 percent of the world population) in 1970 was about 13 times as high as that of the poorest (also with 10 percent of world population). Calling this the *geographical decile ratio,* I applied the same procedure to regions within countries, without correcting for price differences, and found the following geographical decile ratios.

	1960–1970	1930–1940	1880	1860
United States of America	1.8	3.1	3.2	
France	1.7			2.6
Federal Republic of Germany	1.5			
Italy	2.1			
The Netherlands	1.9			
European Economic Community	3.2			
India	2.9			

From this modest evidence we may perhaps infer that within a well-integrated political unit the geo-

graphical decile ratio is less than 2; and that over the last century it has fallen. These figures may help us to speculate about the ratio needed in order to 'keep the world together' – a ratio of 13 clearly doesn't.

Another interesting comparison is one between countries with different *social systems*. By far the most penetrating study comparing Eastern and Western Europe I know of is the one presented by my predecessor in this series, Professor Peter Wiles (Wiles, 1974). For incomes per consumer after tax he presents semi-decile ratios, the ratio between the upper and lower five percent, for some recent years. The best figure for a Western country is Sweden, with a ratio of 3; next comes the United Kingdom at 5. Holland is not mentioned; my own estimates based on official figures for 1962 (Tinbergen, 1975, p. 25) are lower than Wiles' for the United Kingdom, but refer to decile ratios (3.0 as compared with 3.4). The figures for *Eastern Europe* are, in ascending order, 3.8 for Bulgaria, 4.0 for Hungary, 4.3 for Czechoslovakia and 5.7 for the U.S.S.R. Other Western figures are 12.7 for the U.S. and 11.2 for Italy. For a proper interpretation of the figures we should be aware of the size differences among the countries considered, with larger countries showing more inequality, and of the degree of industrialization, which is lowest in Bulgaria and, for the countries considered, highest in Sweden and the United Kingdom. Another fact seems to be

that, in Western Europe, Latin countries show greater inequality than Anglo-Saxon and Germanic countries (cf. also Roberti, 1974). An otherwise careful study by Michal (1973) comparing small Eastern-European and some Western-European countries compares, in a footnote, figures after complete redistribution for the former with after-tax figures for the latter (which is incorrect), to say nothing about income per consumer.

1.4. Theories: Stochastical elements

A wealth of different theories of the personal income distributions discussed has been presented in the last half-century, and more particularly in the last few decades. In this lecture I only want to discuss the nature of the most important groups of theories, as a prelude to whatever attempts at verification can be and have been undertaken. Verification – or, for that matter, falsification – with the aid of quantitative and qualitative information constitutes a vital link in the chain of scientific progress, as is illustrated by the recognition which econometrics, as part of the scientific process in socioeconomic matters, has gained during the last forty years.

Keeping this in mind, it is commonplace that no theory can or wants to disregard the phenomenon of *random* components in any socioeconomic vari-

able. The existence of such components is also called the stochastic aspect of the object of the social and other sciences. We should not overlook, however, the '*testimonium paupertatis*' implied in too extensive a use of the stochastic element. Ideally, as many random components as possible should be *identified* and replaced, in a later stage of elaborating the theory, by the variables they stood for. A very simple example to illustrate this point is that prices of agricultural products can, to begin with, be decomposed into a trend plus a large random component. In all probability, a considerable portion of the latter represents changes in *harvest yields.* Such yields should then be introduced as an independent variable into the relation determining the price series considered. The resulting second stage of the theory is more satisfactory since it brings in a phenomenon which can rightly be considered a cause of price movements. Theories of income distribution contain several explanatory variables which may behave in a random way in the group of human beings considered: thus it has been stated at an early stage of quantitative research of human characteristics that several of these, both physical and psychological, show almost normal, or log-normal, distributions. This makes me feel that those among my colleagues who at present stick to the statement that income distribution is to a large extent random should be urged to continue their research, in order to identify some of the more

important explanatory variables which in my opinion are still hidden in their random residuals. I am thinking in particular of Jencks (1972) and his collaborators, who have done interesting work but overlooked some important noncognitive skills and some demand factors which make for income differences. They may hence have overestimated the unexplained part of income variations among individual earners.

1.5. The human capital school

Turning now to some groups of more determinist theories, let me first mention the human capital school. This school, with such impressive members as Becker (1964), Chiswick (1967, 1973), Mincer (1957, 1970, 1974), Schultz (1971) and Taubman (1975), concentrates on the education process as a supply factor on the labour market and sees that process as an investment in what they call 'human capital'. They consider as given the individual's inborn capabilities and part, especially the earlier part, of the family and the childhood environment, which they treat as residuals in their regressions. They have extended the education process to include informal training, either explicitly or more implicitly as experience (Mincer, 1974). Their statistical treatment is very careful, but I am inclined to call their approach supply-biased because demand

for different degrees of qualification is only introduced in the form of unemployment, standing for the difference between demand for and supply of such qualification (cf. Lecture 3).

A point could be made to add to their human capital concept the capitalized value of innate abilities, the rent of which seems to be considerable (cf. 4.1, *infra*). This generalized concept of human capital could illustrate even more strongly the importance of human capital as compared to traditional capital and the 'exploitation' going with it. Interesting figures have been given recently by Pen (1975).

1.6. The 'opportunity school'

Another school of thought on income distribution mainly represented by American scholars – as far as careful quantitative research is supplied – may be given the name 'opportunity school', although they don't use that phrase themselves. Its members adhere to radical views and try to show how deeply the social class structure of American society affects income distribution. The explanatory variables they concentrate on are some of those taken as given by the human capital school, such as childhood IQ, socioeconomic status of parents and occupational status. Among these scholars are Bowles (1972, 1974), Duncan (1968) and Jencks (1972). They try

to show that incomes depend to a high degree on inherited capabilities such as IQ and environment and that the upper classes have a tendency to perpetuate themselves. Moreover, they defend the thesis that schooling is not really relevant for later jobs and incomes. Schools are rather an instrument of the ruling class to educate the masses so as to tame them and produce conformists. They give much attention to the heridity issue, which in the U.S. is narrowly connected with racial issues and often dealt with extremely emotionally – as can be understood. Their relationships also show a rather large random component, with the exception of one as yet unpublished analysis where 78 percent of the variance between incomes of individuals has been explained – so far the best result. The explanation is partly that in the latter analysis, in contradistinction to the other pieces of research, non-cognitive factors have been introduced in a way. The class perpetuation theory in my opinion overlooks that, in some respects at least, the class of élite is *growing rapidly,* which reduces the elitist character of society. I am referring here to the fact that in the Netherlands from 1900 to 1990 the percentage of the active population having a university degree will have risen tenfold, from 0.54 percent to 5 percent (Passenier, 1972).

An interesting question arises with regard to the role attributed by this group of scholars, as well as by others, to the parameter '*occupational status*'.

A large number of jobs have been rated according to the 'prestige' they give, and opinions on this rating don't seem to deviate very much among people from different social statuses as well as different time periods in the past. (In the Netherlands Van Heek (1968) has studied this phenomenon.) From the American 'path analyses' (comparable to econometric models) shown, it is not clear what role the occupational status of the job held has played in the choice of education, by the parents or the persons themselves. There is a lacuna here requiring clarification. The main question may be formulated thus: is it income expected or occupational status or both which affect the choice of education in the various stages of the education process?

1.7. The education planning school

By the name of education planning school I indicate scholars such as Dougherty (1971, 1972), Ullman-Chiswick (1972) and, in the Netherlands, Kuipers (1973, 1975), who in their research give much attention to the demand side of the labour market. In the early stages of education planning, rigid ratios were assumed to exist between production volumes of individual commodities or groups of commodities and the quantities of people with various educational performance. Later more flexible relations appeared to exist. The same product

can be obtained with the aid of varying combinations of people with different education. The scholars mentioned have made attempts to measure the *elasticity of substitution,* in production functions, between a number of educational groups taking part in the production process. They have found, in a number of cases, very high elasticities, often of the order of –5. In an ongoing discussion of these results I have tried to show that these results were due to an unsatisfactory *identification* of the relationships between income ratios and employment ratios (Tinbergen, 1975, 1975a, 1975b). While it has been agreed upon that an identification of the relation tested as a demand relation is necessary, the alternative results obtained are still rather divergent. I am coming back to the state of this debate in Lecture 2 (section 2.3). At this stage I only want to state that in the early stage of the work of this school the main emphasis was on the demand side, neglecting or taking as given the supply side of the labour market.

1.8. The need to consider both demand and supply

As economists we shall have no difficulty in accepting that the explanation of incomes, or income distributions, requires a combined demand and supply analysis. I will go into specifics in the other three lectures, but want to put on record some widespread

misunderstandings of the general public regarding the nature of the subject, resulting mainly from the neglect of the demand side, but sometimes the supply side.

Quite often the opinion is held that income differences in a rigid way reflect differences in the productive qualities of people. As a consequence, the inequality between human beings is seen as a reason for income inequality to persist, not to say to be preordained. Even if we assume for a while that differences in ability cannot be changed, it is overlooked by those I refer to that what matters is the difference between qualities *available* and qualities *required* by the demand side, that is, by the organizers of production. It is perfectly conceivable that incomes become almost equal not because all people are equally able, but because the numbers demanded of different sorts of people coincide with the numbers supplied.

Narrowly related with this misunderstanding is the belief and even the claim that ratios between incomes for different categories of jobs have to remain unchanged over time. Income ratios between university-trained and other people in advanced countries such as Sweden, Canada or Australia are different than those in less developed countries such as Italy.

The idea that it is difficult to obtain Dutch applicants for some types of dirty or rough work might change if, as put by Thierry (1974), twenty

percent more income was offered than our immigrant workers are willing to accept.[2]

Somewhat along the same line is the fear, expressed by leading politicians, that we shall have unemployed academics in 1990. If only we accustom ourselves to the idea that academics may have to give up part of their relatively high income, there need not be unemployed among them; and there should not be, of course, since there is far too much research that has to be done.

[2] In Paris-Match (2 August 1975, p. 17) an inquiry was made about the willingness to do hard or dirty work. From the data given, a supply elasticity of 1 for men's and 0.75 for women's jobs can be derived.