## CHAPTERI. INTRODUCTORY

# 1.1. Main Subjects of this Book

The subjects dealt with in this book may be summerized as the analysis of figures on income distribution published by other authors—persons or institutions. The analysis there around three questions, in developed countries namely: (1) how can income inequality be explained?

(2) hou can it de reducéel?

and (3) what aims should be pursued in reducing it?
The way these questions are dealt with can be understood from
the Table of contents of the book.

The subjects to be dealt with can also be defined in a negative way, by an enumeration of what the reader will not find in this look. The following subjects have been excluded:

- (a) a critical discussion of what corrections have been applied by the authors quoted on the base material on incomes they used;
- (6) the broad question of the optimal social order of whith an optimal income distribution can be seen as a component;
- (c) income distribution of developing countries, a subject on which especially Irma adelman and Cynthia Taft Mours have proncered.

This exclusion does not mean that connexions with these subjects have been entirely neglected. Still less it means that subjects (a)-(c) are considered of less importance; for each, the contrary is true. They have been excluded because a reasonably clear delimitation of this book's

Exclusion of (c) acro imposes that having my allention has been given to the role played by expected income or expite given their metalence deen arrivated mainly because many other authors have been dealing with them in considerable detail. Intofect would recen promble acrong the frontiers occorrence excession.

the structure of the present problection has our dien in peters, In the remainder of this enopher a order's eye's very of the area covered as well as some of the adjucent territories is presented. Engineer 2 runmarized some important descriptions of income inequality and its Variation over time and arrong segraphical areas, Chapter 3 sets out the main instrument of analysis used; it is the instrument of supply and demand analysis. The same chapter illustrates this instrument by estimations, from empirical material, of the so-called price equation for productive services, mainly latour. Since distribution is our subject, it is the distribution of these prices and have of these its dekurninants which is eventually dealt with. Chapter & deals with the supply side and its ultimate determinants, apprairing in his intiting principles the many individuals in groups supplying labour of various kinds. Arnong these deferminants, needs and cynobilities/play invportant roles. Chapter 5 considers the demand side and (available) its ultimate source, production functions, expressed in terms of the various types of labour and hence of capabilities required. As a matter of course, questions of substitution between various types of labour and between capital and labour enter the picture. In addition, technological development will be introduced. Chapter 6 concentrates on what emorges as a central theme in the explanation of changing income inequalities: the race between education and technological development. While the preceding chapters contain some cleus in the explanations and Hos some ways to influence it, Chapter 7 ( of income inequality)

attempts to make a contrabution to the provious choice of aims. In a simple complete economictic model for the Notherlands the numbers of individuals with first, se could and there- level education are considered to be implies controllable withen limits and the minimum possible (or fearible) inequality is estimated. In addition an optimality concept is proposed and optimal income inequality deduced. In they, ten 8 a definition of equity is proposed and used as an elemative aim. Chapter 9 discusses what means can be used to change income inequality and what the likely extent of their influence is. It comparison between trestern and Eastern European countries illustrates the impact of social order. Finally, the pter 10 summarizes our findings.

### Introduction

#### 1.1. Main subjects of this book

The subjects dealt with in this book may be summarized as the analysis of figures on income distribution published by other authors – persons or institutions. The analysis revolves around three questions, namely:

- (1) How can income inequality in developed countries be explained?
- (2) How can it be reduced?
- (3) What aims should be pursued in reducing it?

The way these questions are dealt with can be understood from the table of contents of the book.

The subjects to be dealt with can also be defined, in a negative way, by an enumeration of what the reader will not find in this book. The following subjects have been excluded:

- (a) a critical discussion of what corrections have been applied by the authors quoted to the base material on incomes they used;
- (b) the broad question of the optimal social order of which an optimal income distribution can be seen as a component;
- (c) income distribution of developing countries, a subject on which especially Irma Adelman and Cynthia Taft Morris have pioneered.

This exclusion does not mean that connexions with these subjects have been entirely neglected. Still less does it mean that subjects (a)—(c) are considered of less importance; for each, the contrary is true. They have been excluded because a

reasonably clear delimitation of this book's subject would seem possible along the frontiers described.

Exclusion of (b) also implies that hardly any attention has been given to the role played by capital income or capital gains. These subjects have been excluded mainly because many other authors have been dealing with them in considerable detail.

The structure of the present publication has been chosen as follows. In the remainder of this chapter a bird's-eye view is presented of the area covered as well as some of the adjacent territories. Chapter 2 summarizes some important descriptions of income inequality and its variation over time and among geographical areas. Chapter 3 sets out the main instrument of analysis used; it is the instrument of supply and demand analysis. The same chapter illustrates this instrument by estimations, from empirical material, of the so-called price equation for productive services, mainly labour. Since distribution is our subject, it is the distribution of these prices and hence of its determinants which is eventually dealt with. Chapter 4 deals with the supply side and its ultimate determinants, appearing in the utility function of the individuals or groups supplying labour of various kinds. Among determinants, needs and capabilities available play important roles. Chapter 5 considers the demand side and its ultimate source, production functions, expressed in terms of the various types of labour and hence of capabilities required. As a matter of course, questions of substitution between various types of labour and between capital and labour enter the picture. In addition, technological development will be introduced. Chapter 6 concentrates on what emerges as a central theme in the explanation of changing income inequalities: the race between education and technological development. While the preceding chapters contain some clues to the explanation of income inequality and some ways to influence it, Chapter 7 attempts to make a contribution to the possible choice of aims. In a simple complete econometric model for the Netherlands the numbers of individuals with first, second and third-level education are considered to be controllable within limits and the minimum

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possible (or feasible) inequality is estimated. In addition an optimality concept is proposed and optimal income inequality deduced. In Chapter 8 a definition of equity is proposed and used as an alternative aim. Chapter 9 discusses what means can be used to change income inequality and what the likely extent of their influence is. A comparison between Western and Eastern European countries illustrates the impact of the social order. Finally, Chapter 10 summarizes our findings.

#### 1.2. Problems dealt with by various groups of authors

In the last decade or so numerous publications have dealt with the problem (i) of the determinants of income or of income distribution, as well as with the problems (ii) how, and (iii) to what extent, income distribution can be influenced. Already the three problems mentioned are different and should be clearly distinguished. Assuming that the determinants of income, defined in some way, have been found and their quantitative impact measured, income distribution can be derived from this result by taking some measure of income distribution, say its standard deviation, and correspondingly taking the standard deviations of all the determinants included in the equation 'explaining' income. Whether or not these results can be used to answer the question how income distribution can be influenced largely depends on the nature of the determinants chosen: if among them there are instruments of socio-economic policy, the answer can be given.

In all this a distinction should be made, moreover, between direct and indirect determinants. Most of the authors I am going to deal with have opted for the former alternative; in principle, however, a complete socio-economic model should be used, in which each relationship only describes direct determinants of one of the endogenous variables of the model. Income (or its distribution) can then be expressed in terms of the exogenous variables by eliminating all other endogenous variables. This yields the reduced form of the income variable

equation and among the exogenous variables there will be, as a rule, a number of instruments.

Depending on the approach chosen three groups of scholars can be distinguished who recently have dealt with the problem of 'explaining' incomes. The first group consists of the wellknown human capital school (the Schultzes [58, 59], Mincer [44, 45], Chiswick [14, 15, 16], Husén [31] and De Wolff and Van Slijpe [20], cf. Chapter 4). These authors concentrate their attention on the supply side of the market for production factors, mainly labour of various types. Demand is introduced only by including unemployment, typically a short-run treatment. On the supply side the capabilities available are the variables connecting price, that is income, with the quantities supplied. Only a few capabilities are available from statistical measurement and considerable gaps in our information on non-cognitive capabilities still have to be closed. Yet years of schooling and years of work experience together are able to explain a considerable portion of the variance of observations. I come back to both questions, especially in Chapter 4.

The second group may be called the *education planning* school and is represented by such authors as Bowles [5], Dougherty [21, 22] and Psacharopoulos [52]. They concentrate their attention on the demand side, deriving demand for various types of labour from production functions containing these types (cf. Chapter 5). So far they have alternatively described labour with the aid of capabilities, mainly schooling, and with the aid of the profession or job taken. I submit that categories of labour might be described by two suffixes, one for the quality offered and one for the quality required.

A third group of authors on the subject may be called the demand and supply school, since essentially they introduce both these sides of the market. One outstanding example is Freeman [24] and another Ullman [74]. I adhere to this group and made some attempts to combine the excellent work of all three groups (cf. Chapters 3 and 6). As an alternative to production functions I also used dummies for the demand side; a very simple one is the average income level of the geographical unit

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considered and a slightly more precise one is the economic structure of such a unit, described by the sum of the weighted percentages of people engaged in the four main sectors: agriculture, industry, trade and transportation, and other services.

#### 1.3. Work on related problems

Among the authors already mentioned Bowles concentrates on a different problem, the character of American or Western society and its tendency to perpetuate a certain *class structure*.

Bowles and Gintis [6] find little correlation between IQ and income and suggest that our school system, by attaching so much importance to selection with the aid of IQ, fulfils the function of 'fooling' the population into thinking that an equitable system of sorting them out prevails.

Similarly, Jencks and his collaborators [33] give much attention to the influence of family background, measured by socio-economic status, IQ and education of the individual's parents. In their models a role is also played by the *occupational status* of the future job, a variable which appears to be rather precise, to judge from the high degree of consensus found to exist in various Western societies at different points of time. The role given to this variable in their models has not so far become quite clear; they seem to suggest that in the choice of future job and hence education a fairly important role is played by occupational status aimed at rather than by income expected.

Further Jensen [34] may be quoted who summarized and enriched the literature about 'how to boost IQ', concentrating on the question of hereditariness of IQ.

In contradistinction to the authors quoted in this section my own concentration was rather on the problem of how *inequality* of income can be reduced and by how much [64, 66] (cf. Chapters 7, 8 and 9). I did not pay attention (except in practical advice to my government) to income from capital, partly (as already said) because this is a subject which has been repeatedly

analysed by others and partly because in most North-Western European countries a considerable part of this income is taxed to such an extent that the inequality in incomes after tax is predominantly due to inequality in labour income. We might even speak of exploitation by human capital as more important today than exploitation by capital in the old sense.

#### 1.4. Differences in material used

Most of the authors mentioned use data on schooling, age, occupation and income, and sometimes add sex, race and economic structure in the limited sense mentioned. These data are available from regular statistical sources, such as population censuses, samples therefrom, tax statistics and sometimes education and vital statistics. In addition figures on IQ, parents' IQ, socio-economic status, occupation and income have been used by some of the authors mentioned. These figures have been obtained from special sample inquiries, referring to a limited number of individuals investigated in more depth. Whereas the former sources often publish the relationships found between averages for groups of individuals only, the latter often base the relationships shown on the individual data.

With few exceptions, if any, results of regression analysis on groups have shown very high correlations, from 0.85 upwards, whereas such analysis applied to individuals yields correlations below 0.7, sometimes much below. Clearly in the latter cases some determinants have not been included although they are relevant to the problems dealt with. It cannot be assumed that these lacking variables are highly correlated with those included, because then high correlations would also have been obtained in the research on individuals. Hence the impact of the neglected determinants appears to cancel out in the case of group studies. In agreement with this statement we find that some of the main regression coefficients obtained are roughly the same whether obtained from the study of groups or of individuals. For example the effect of one more year of educa-

tion on income is found to be \$ 240 for 35-year-old individuals in the USA in 1960 as compared to \$ 310 for Sweden in 1964, and \$ 360 for all ages in the USA in 1960 as compared to a figure of \$ 380 for the Netherlands in 1960. It may be even significant that this figure rises with a lower average income of the country considered (cf. also Section 3.5).

#### 1.5. A remark on methods used

As already noted, scientifically the most satisfactory treatment of our problem is one using complete *models*. Models consist of a number of relations each expressing changes in one endogenous variable by one or more other variables supposed to exert a direct influence on that endogenous variable. As an example of the communication gap between disciplines it can be stated that, ignorant of psychological research, econometricians introduced such models around 1936, whereas in psychology such models had been introduced in 1918 under the name of *path analysis* [23]. Thus, as an econometrician, I have been talking path analysis for 38 years without knowing it!

There are some slight differences, though. In their diagrammatic presentation with the aid of an 'arrow scheme' for each direct influence, psychologists are accustomed to using normalized variables (that is, variables transformed so as to have standard deviations of unity) and to noting the partial regression coefficient with each arrow. Econometricians do not normally use normalized variables (although it may happen), but are more precise about the time lags involved. The latter remark also applies to the models introduced into biology by Volterra [81] referring to the relations between the members of various species (whether as predator and prey or as competitors for the same food, to quote a few examples). In both econometrics and the branch of biology just mentioned, knowledge of the time structure is important for the explanation of cyclic movements in the variables.

#### 1.6. Differences in conclusions

The answers given by various authors, mentioned already or still to be mentioned, to our main question — Can income inequality be reduced? — are widely different. Let me subdivide them into skeptical, not-so-skeptical and optimist answers (cf. Chapter 10).

Skeptical answers have been given by the education planning school and the Jencks group [33]; Jensen probably agrees with the latter [34]. Bowles and Gintis [6] see, as already observed, the class perpetuation as one argument, but also, together with Dougherty [21, 22] and Psacharopoulos [52], the high elasticity of substitution, in production, of one type of labour by other types. A high elasticity of demand corresponds with a low price flexibility, meaning small changes in incomes of different types of labour, even if their relative supply quantities were to change considerably. I tried to show elsewhere that their use of the US census and similar international material can be criticized for not sufficiently identifying demand and supply side. With their own material I find for university-trained vis-à-vis other labour, supply and demand elasticities around unity (negative for demand, positive for supply), a result not far from Freeman's [24]. This is why I do not share their skepticism [70] (cf. also Chapter 5).

The not-so-skeptical answers are given also by Burns and Frech [9] and by Ullman [74]. While I have my doubts about the results of the first two authors, their results may be mentioned. They imply that in order to reduce inequality by one-half, average income should be doubled, meaning that Western Europe would have to reach present American income levels. With growth rates around four per cent in income per capita, this could be attained in 18 years.

My own theory, elaborated in Chapter 6, sees the reduction of inequality not as an *automatic* consequence of rising average incomes, but possible only if the expansion of *education overtakes* the expansion required by technological development. Both Ullman and I have collected evidence from which this conclusion can be drawn.

The ratio between qualified and less qualified labour income as defined by Ullman has fallen from 2.50 in 1900 to 1.43 in 1960. On the basis of my theory I forecast that the ratio between income of university graduates and all other labour will fall from 1.9 in 1960 to 1.45 in 1990. For the Netherlands this latter ratio fell from 8.2 in 1900 to 4.6 in 1960 and will continue to fall to 2.9 in 1980 and 2.4 in 1990. The ratio may also be influenced in the future by a deliberate manipulation of technological development — a proposition already made for developing countries, but relevant as well for developed countries. With increased awareness of the possibility and desirability of planning technological research somewhat more, rather than leaving it to laissez-faire, we may at least explore the extent to which such planning may affect the nature of technological development (cf. Chapters 6, 9).

Too optimistic answers seem to have been given, if I am not misinterpreting them, by some colleagues from Cambridge, Britain. Their theory could be formulated - somewhat exaggerated, admittedly - as considering income distribution the result of an autonomous political decision and technology as well as demand for final products as being flexible enough to adapt itself to any income distribution desired. I have not seen any quantitative tests of this theory; but there are some results of previous empirical research which make me doubt very much the truth content of this theory. First, technology of most industries or activities is given within narrow limits of substitution; it is rigid with only a few exceptions (agriculture, building, textiles and handling of materials in any industry). Secondly, the distribution of demand over the main categories of consumer goods and investment goods is inelastic also. High elasticities of substitution have only been found to exist between narrowly related goods, such as Henry Schultz' beef, pork and mutton. So I don't expect the econometric testing of the theory to be successful. Moreover, if it were so easy to freely choose the income distribution, why are the differences in income distribution between Britain and Poland (Wiles and Markowski [83]) so small? And why did the Soviet Union

have to make income distribution more unequal in the 1930's?

Looking at the battlefield as a whole I tend to stick to my middle-of-the-road view that we can attain less inequality in a few decades if we let education overtake technology by its supply of more qualified manpower.

There remain other means of attaining less inequality, for example, by tax policies. In a number of countries income and wealth taxes can be made more progressive, although hardly so in North-Western Europe – except the tax on capital gains. In a more remote future psychotechnicians may develop a more reliable test battery to estimate an individual's capabilities. This may then enable us to use such a test as a tax basis rather than income. By so doing we might open up new possibilities to attain less inequality, since such a tax can be applied as a lump-sum tax (cf. Chapter 8).