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The Principal Problem in Political Economy: Income Distribution in the History of Economic Thought

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Abstract

The paper considers the history of theories of income distribution, from the time of Adam Smith until the 1970s. It is divided into two main parts. Part I considers the positive theory of income distribution, beginning with the classical economists' analysis of the functional distribution of income between wages, profits and rent. It goes on to present the new theories that emerged with the marginalist revolution and which were based on maximizing behaviour and market equilibrium. The main focus during the early stages of the new developments was on the markets for consumer goods and the role of marginal utility in price determination. The later neoclassical economists, including Alfred Marshall and Knut Wicksell, paid more attention to the special features that characterized the labour market and the role of marginal productivity in wage formation. In the 20th century the neoclassical theory was extended to include analysis of the role of imperfect competition, human capital and risk-taking. Also included in this part of the paper is a discussion of statistical and institutional approaches. Part II covers normative theories of income distribution and their implications for redistributive policy. It begins

with a consideration of the value judgements implicit in the policy recommendations of the classical economists and continues with the attempts to establish an analytical foundation for welfare economics. The rise of Paretian welfare theory with its emphasis on the impossibility of interpersonal comparisons of utility made it difficult to draw conclusions regarding income redistribution, but the older utilitarian approach, including equal sacrifice theories, continued to live on in the modern analysis of optimal redistribution. A short Part III contains some concluding reflections on the position of income distribution theory within economics as a whole.

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1. Introduction

Theories of the distribution of income between individuals and classes in society have been advanced in the literature of economics from before Adam Smith to the present day. Nevertheless, although David Ricardo in the preface to his *Principles of Political Economy and Taxation* (1817; 1951, p. 5) said that the determination of the laws of distribution was "the principal problem in Political Economy," the field has at times led a somewhat modest existence on the outskirts of mainstream academic research. One of the reasons for this may have been that the study of income distribution is so tied up with normative issues of equity and justice that many economists, keen to pursue a value-free version of their subject, have tended to shy away from it. Others, however, have found this connection to be a particularly attractive feature of the field, and have risen to the challenge of clarifying the distinction between the positive and normative aspects of the analysis of income distribution; in other words, separating explanation from justification. Both aspects of the study of income distribution are reflected in the present essay, which covers the positive theory of income distribution as well as the attempts that have been made to evaluate the distribution of income from the point of view of justice and equity. The development of normative theories of income distribution is intimately tied up with the analysis of redistributive policies, which in addition also have to take account of the positive analysis of income distribution. The chapter focuses on *theories* of income distribution, while no attempt has been made to cover the large empirical literature in the area, including the statistics of income distribution. Some thoughts on the relationship between theory and empirical work in the area are presented in the concluding section.

Taking this broad view of the field of income distribution, the literature that is relevant for this chapter becomes so large that its history cannot possibly be covered in its entirety. This is especially so since many economic theories – in areas like international trade, public finance, labour, economic growth etc. –

have implications for income distribution although the distributive aspects are not the main concern of the researchers involved. The treatment must therefore by necessity be selective, with main emphasis on the contributions of the most important and influential economists among those who have been concerned with the theory of income distribution.

For this reason as well as for reasons of space, the chapter does not by any means attempt a complete coverage of the literature. For further references and more detailed treatment there are fortunately a number of other sources that the reader may consult and that offer complementary perspectives on the field. They include classics like Cannan (1893, 1914) and Dalton (1920) and a number of more recent surveys like Atkinson (1975), Sahota (1978), Ranadive (1978), Asimakopulos (1987), Atkinson and Bourguignon (2000) and Goldfarb and Leonard (2005). Although not all of these have their main attention on the history of thought, they include a lot of relevant historical material. The same is true of Ravallion's contribution to this Handbook.

All accounts of the history of thought face two fundamental questions: When to begin and when to stop. In this chapter I have decided to start with Adam Smith as he is arguably the first economist in whose work we begin to see the contours of modern theories. The line at the other end is drawn where the literature is still being regarded as part of the contemporary set of references. This cannot be located with a great deal of precision but has been drawn roughly at some time in the 1970s.

The chapter is divided into two main parts. Following the Introduction, Part 2 is concerned with positive theories of income distribution, while Part 3 covers value judgments and redistribution; in addition, there is a short Part 4 which contains some concluding observations. This division means that the treatment of some economists has been split in two; e.g. Pareto is discussed first in the context of the debate over Pareto's Law and second in relation to his contribution to welfare economics. Although this may in some respects be

unfortunate, it should be kept in mind that the main purpose here is not to give well-rounded pictures of individual economists but to trace the development of thought within the main areas of income distribution theory. A broader treatment of the history of economic thought, including biographical sketches of the lives of the more important economists, has been given in Sandmo (2011).

2. The positive economics of income distribution

It has sometimes been claimed that one of the fundamental questions that has motivated the systematic study of economics is "Why are some countries rich and some poor?" This may well be correct when we consider the motivations of some of the leading economists. But for the large majority of mankind who, at least until fairly recent times, had little opportunity to obtain first-hand knowledge of the economic conditions in foreign countries, one would have thought that a more obvious question would have been "Why are some *people* rich and some poor?" This question might naturally have come to mind as individuals went about their everyday business in a world of large inequalities of income and standard of living. On the other hand, to what extent people did reflect on this question would presumably depend on whether they thought of the inequality of income as a basic and unalterable feature of the society in which they lived or as something that followed from man-made institutions and policies that were subject to change through the political process.

It took in fact a considerable time before this question moved to the forefront of economics; indeed, it may be asked whether it has ever reached the forefront. Some thoughts on this question are contained in Part 4.

2.1. The classical school: Factor prices and the functional distribution of income

By the classical school of economics we shall, in line with standard usage in the history of economic thought, refer to the economists from Adam Smith to John Stuart Mill who dominated economics during the century from the 1770s to the 1870s. The members of this school were chiefly English and Scottish, although there were also economists in Germany, France and other countries who felt a strong affinity to Adam Smith and his successors[1].

As regards the positive study of the distribution of income, the theoretical approach of the classical economists focused mainly on the *functional distribution* of income, i.e. the distribution of income between the main factors of production, and it was doubtless this distribution that Ricardo had in mind when he made his remark about "the principal problem." How these "main factors" were to be defined was of course a matter of judgment, but the classical economists saw them as being labour, capital and land whose incomes were wages, profits and rent. The fact that this definition of the three main categories of income should have met with such general acceptance among economists must be seen as a reflection of the fact that this particular functional distribution represented the main class division of society in the late 18th and early 19th centuries into workers, capitalists and landowners. Although as we shall see, there are elements in classical economic theory that go some way towards explaining the personal distribution of income, to a large extent the functional distribution was also considered an important component for the understanding of the distribution of income between persons.

[1] Among the prominent followers of Smith and Ricardo in continental Europe was Jean-Baptiste Say in France. In fact, Say is the only economist outside of the British Isles who is mentioned by name in O'Brien's listing of "the personnel of classical economics" (O'Brien 2004, pp. 3-9).

The theory of the functional distribution did not, in contrast to the neoclassical theory that was developed a century later, build on a unified theoretical structure. It is therefore natural to present the theory in three parts, corresponding to the three main categories of income.

Wages

In Adam Smith's great work *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776) the first chapter presents us with his famous example of technical progress and division of labour in a pin factory. In a factory that he has seen, the complicated process of the production of a pin has been broken down into "about eighteen" separate operations, with the result, according to his calculations, that each of ten men can produce 4,800 times as many pins in a day as a single worker operating on his own without specialization and division of labour. One might think that this dramatic increase of productivity would lead to a corresponding increase in wages, but this is a conclusion that Smith is in fact unwilling to draw. He points out, first, that the division of labour depends on the extent of the market. Although specialization may by itself be expected to lead to higher productivity and wages, the demand side of the market limits the extent of specialization. In the highlands of Scotland the typical farmer is often miles away from the nearest artisan and therefore has to be his own butcher, brewer and baker, and even the artisans who are located in the small towns cannot afford to be highly specialized. Second, the mobility of labour between industries would ensure that the potential increase in the wages of the workers employed in pin production would in fact be spread thinly over the wages of workers in all industries. Thirdly, and even more importantly, Smith emphasized a point that was to become a crucial component in the teaching of the whole of the classical school, viz. that any increase in the general level of wages would lead to an increase of population and therefore of the work force, and this would tend to reverse the initial increase of wages.

This idea seems to have been part of the conventional wisdom among economic and social writers at Smith's time. In a passage that reminds one of the later work of Malthus, Smith says that "every species of animals naturally multiplies in proportion to the means of their subsistence" (Smith 1776; 1976, p. 97). In this connection he refers to Richard Cantillon, who in his book *Essai sur la nature du commerce en général* (1755) had argued that the standard of subsistence toward which the level of wages would gravitate must be sufficient for a working family to have four children. For experience shows, Cantillon says, that only two out of four children will be able to survive into adulthood and on average two new adults are required to ensure the reproduction of the working class.

The theory of subsistence wages received its most famous statement in the work of Thomas Robert Malthus, whose *Essay on the Theory of Population* (1798) became one of the most influential books on economics ever written[2]. Among the public at large, the book became best known for its dramatic representation of the race between population and economic progress. This was illustrated by on the one hand the natural tendency of population to grow as a geometric series while food production, due to decreasing returns in agriculture, would only be able to grow as an arithmetic series. Thus, the increase of population would be held down by the shortage of food, and the income of workers would accordingly converge to the subsistence level. This was to be understood as a long run theory of wages. Malthus did not deny that wages for a limited period of time could rise above the subsistence level, but this would lead to an increase in the number of births, which over time would drive wages back to the long run equilibrium level of subsistence.

[2] Malthus' *Essay* came out in six editions during his lifetime. The most substantial changes in its contents occurred with the publication of the second edition which in many respects must be considered a new book. Among Malthus scholars it has therefore been common to refer to the first edition as the "First Essay" and to the second and subsequent editions as the "Second Essay".

Malthus' theory was widely accepted by the other classical economists. Gradually, however, it came to be modified as regards the essential content of the concept of subsistence. According to later thinking, a temporary increase of wages might not actually revert to the initial equilibrium level, since psychological and social adaptation to a higher level of income might dampen the desire for larger families. The level of subsistence would then have to be reinterpreted as a social rather than a biological minimum amount of income, and this could well be imagined to rise over time. Technological progress, on the other hand, had no place in Malthus' view of the determination of wages.

The Malthusian theory of wages emphasized the supply side of the labour market, while little was said about labour demand. However, the reason why wages might temporarily rise above subsistence must be seen as being caused by shifts in demand, so that in an expanding economy, a series of shifts in demand might cause wages to be above subsistence even for long periods of time. The classical economists' favourite example of an expanding economy was the United States (which at the time when Smith wrote was referred to as the British colonies in North America), where the extension of the country's territory implied a continually increasing demand for labour and therefore an upward pressure on wages. The general conclusion that they drew from this example was that it was not the amount of a country's wealth that caused wages to be high; rather, it was the *growth* of the economy that was the basic cause of a high level of wages.

According to the modern way of thinking about wage determination, wages, at least in a competitive economy, are determined by the intersection of the supply and demand curve for labour. This analytical apparatus was unknown to the classical economists, but their theory can nevertheless be interpreted in these terms. The long run equilibrium can be characterized by the intersection of a horizontal supply curve and a downward sloping demand curve whose position depends on the supply of other factors of production. If there is an

increase in the supply of capital or land, the labour demand curve shifts to the right. In the short run labour supply is approximately inelastic, so that wages rise. But the rise in wages calls forth increased supply through an expanding population. The labour force accordingly increases until a new long run equilibrium is reached where wages have come back to the level of subsistence, sometimes referred to as the natural price of labour. This dynamic process was described by Ricardo as follows:

> "It is when the market price of labour exceeds its natural price, that the condition of the labourer is flourishing and happy, that he has it in his power to command a greater proportion of the necessaries and enjoyments of life, and therefore to rear a healthy and numerous family. When, however, by the encouragement which high wages give to the increase of population, the number of labourers is increased, wages again fall to their natural price, and indeed from a re-action sometimes fall below it." (Ricardo 1817; 1951, p. 94.)

Profits

Profit was regarded by the classical economists as the rate of return on capital, defined as the rate of interest plus a risk premium that varied with the nature of the capital. Actually, Ricardo gave a more general version of this definition when he stated that a capitalist would take into consideration all the advantages which one type of investment possessed over another:

> "He may therefore be willing to forego a part of his money profit, in consideration of the security, cleanliness, ease, or any other real or fancied advantage which one employment [for his funds] may possess over another." (Ricardo 1817; 1951, p. 90.)

This is very similar to Adam Smith's theory of compensating wage differentials (to be discussed below), implying a symmetric treatment of equilibrium in the markets for labour and capital. But this broad concept of the

rate of return does not in fact play much role in the work of Ricardo or any other classical economist[3].

Although there were considerable differences among individual economists in their treatment of profits, we can still piece together a fairly unified theory from their writings. One basic question that the classical economists discussed was what it was in the working of the economic system that gave rise to a positive rate of profit. Nassau Senior (1836) provided a theory that combined the assumptions of a positive rate of time preference and the higher productivity of more roundabout methods of production. In equilibrium, capital must earn a rate of profit that compensates the investor – who is assumed to be identical to the saver – for his abstinence from current consumption. This is a formulation that foreshadows the later neoclassical theory of the rate of interest, in particular that of Böhm-Bawerk (1884-1889). In addition, the rate of profit contains a compensation for the risk undertaken by the investor. On the assumption that he is averse to risk, the risk premium must be positive, but since the degree of risk varies between projects and industries, the risk premium, and therefore the rate of return on capital will show considerable variation, even assuming pure competition.

According to the classical theory, therefore, profit must be seen as the reward per unit of capital that accrues to the individual capitalist. But for a complete theory of the distribution of income from capital one would also need a theory of the individual distribution of the ownership of capital since the income from capital accruing to the individual capitalist will be equal to the rate of return times the amount of capital that he owns. The determination of the ownership structure was an issue that did not receive much attention from the classical economists, and therefore their theory of the distribution of income within the capitalist class must be considered to be incomplete. On the other hand, this

[3] It should be noted that there is no mention in Ricardo's *Principles* of Smith's theory of wage differentials. But this does not indicate any disagreement; Ricardo makes it clear that he limits his analysis to areas where he has something new to contribute.

was an issue that did not seem to be of much concern to them. The question that formed part of Ricardo's "principal problem" was the determination of capital's share of national income, not the subdivision of this share among individual capitalists.

Rent

Rent was the income of the landowners, defined as the rental rate per unit of land times the number of units in the possession of the individual landowner. The most influential statement of the theory of rent was contained in Ricardo's *Principles* (1817). Land varies in terms of its quality or productivity. The price of corn (Ricardo's term for agricultural produce more generally) is determined by the cost of the labour and capital required to produce a unit of corn on the land with the lowest quality, i.e. the land on the margin of cultivation. On this land rent is zero. But since the nature of the product that is grown on this land is assumed to be the same as on lands of higher quality, all corn will sell at the same price, so that a positive rent will exist on all inframarginal units of land. Rent is determined by the cost of labour and capital used on the margin of cultivation, and the position of this margin is determined by the price of corn. Therefore, Ricardo concludes, "Corn is not high because a rent is paid, but a rent is paid because corn is high." (Ricardo 1817; 1951, p. 74.) An increase in the demand for corn would imply an extension of the margin of cultivation, an increase in the labour and capital cost of production and consequently a higher corn price. This would increase total rental income in the economy.

As in the case of profits, the theory of the functional distribution of income is of limited use when it comes to the analysis of the distribution of income within the group of landowners. An increase in the demand for corn will raise the rental rate for all landowners, but the distribution of the rental income between them will depend on the distribution of the ownership to land. On this distribution, regarding both capital and land, the classical theory is mostly silent.

What is likely to happen to the functional distribution of income in a growing economy? Ricardo's view of this issue is best explained by starting from his theory of rent. Beginning with a time when wages are above the level of subsistence, population will expand, the demand for corn will increase and the margin of cultivation will be extended. The share of rent in national income will accordingly go up, and so will the share of labour, even after the wage rate has returned to its level of subsistence. The implication of this is that profits will fall and eventually, because of a weakening of the incentive to invest, bring the process of expansion to a halt. The economy will then have reached its stationary state, but the process towards this state may be delayed because of "improvements in machinery … as well as by discoveries in the science of agriculture." (Ricardo 1817; 1951, p. 120.) Thus, Ricardo saw technology as an essential determinant of the functional distribution of income, and to this would have to be added the social adaptation of the level of subsistence income if, during a process of expansion, workers became adjusted to a higher standard of living.

The structure of wages

In the classical theory of factor prices and the functional distribution of income the factors of production were mostly treated as homogeneous so that the analysis could be carried out at a high level of aggregation. At the same time, it was recognized that the assumption of homogeneity was a theoretical abstraction that was particularly severe when it came to the distribution of wage income since it was obvious that wages were not in fact uniform across different professions. There could in principle be two reasons for this. On the one hand, differences in wages could be caused by competitive forces. On the other hand, they could be caused by the absence of competition, either by private restraints on the process of competition or by government regulations; the "policies of Europe", as Adam Smith used to call them.

Adam Smith's competitive theory of the wage structure is now known as the theory of compensating variations. The general idea is that wages will reflect the particular circumstances pertaining to different professions. For any particular line of work, these circumstances could be such as to imply that the wage is either above or below the average for all professions. Smith mentions several causes of wage inequality. One of these is the "ease or hardship" of the employment. A blacksmith ears less in the course of a twelve-hour day than a miner does in eight hours, for the work of a blacksmith is less dirty and dangerous, and it is carried out in daylight and above the ground. Some professions are particularly honourable, and since honour is part of the reward, wages are correspondingly lower. Other professions are held in general disgrace, which has the opposite effect. The most detested of all workers is the public executioner, but relative to the hours worked, no one is better paid than he.

Smith also argues that wages will vary with how difficult and expensive it is to learn the profession, with "the constancy or inconstancy of employment", and with the amount of trust placed in the worker. His fifth and final cause of wage inequality is the probability of succeeding in one's profession. If one trains to become a shoemaker, it is virtually certain that one will be able to earn one's living by making shoes. But if one is educated as a lawyer, Smith claims, only one in twenty will be able to do well enough to live by it. To aim at the profession of a lawyer is accordingly a lottery, and since there are so few winning tickets these must carry very high prizes. However, the wage differences in this respect are in fact less than a rational consideration of the probabilities would imply, because most people, and particularly the young, have a tendency to overestimate the probability of success. Smith suggests that this explains why so many of the young among "the common people" are ready to enlist as soldiers or go to sea.

Regarding the wage implications of education and training, Smith compares education to investment in machinery:

> "A man educated at the expence of much labour and time to any of those employments which require extraordinary dexterity and skill may be compared to one of those expensive machines. The work which he learns to perform, it must be expected, over and above the usual wages of common labour, will replace to him the whole expence of his education, with at least the ordinary profits of an equally valuable capital." (Smith 1776; 1976, p. 118.)

This is a remarkable early statement of the main idea underlying human capital theory which was yet to take almost two hundred years to be developed more fully.

Smith's theory of the wage structure is based on the assumption of perfect competition or, in his terminology, "the system of perfect liberty". But he recognized that this was not in every respect a realistic description of actual labour markets. The guild system which regulated the entry of labour into some occupations as well as government regulations that limited the regional and industrial movement of labour could lead to wage differences that were larger than they would have been under perfect competition.

It is not entirely clear how the theory of the wage structure can be reconciled with the long-run tendency towards subsistence wages. Smith's theory of the wage structure must obviously be interpreted as one of equilibrium wage differentials. But then, if the subsistence wage is to be interpreted as the average wage, some wages must be permanently below the subsistence wage, which hardly makes sense. On the other hand, if the subsistence wage is to be understood as a long run minimum level, it must be the case that the average wage for all workers will actually be above the subsistence level, and this

conclusion is not easy to fit in with the classical theory of the long run equilibrium theory of wages.

Smith's theory of the competitive wage structure came in for a good deal of criticism and modification by a later generation of classical economists, in particular by John Stuart Mill (1848). Mill argued that although Smith's theory might be a realistic one for the case of perfectly free competition with "employments of about the same grade" and "filled by nearly the same description of people", this case is very far from the labour markets that one actually observes:

> "The really exhausting and the really repulsive labours, instead of being better paid than others, are almost invariably paid the worst of all, because performed by those who have no choice. … The more revolting the occupation, the more certain it is to receive the minimum of remuneration, because it devolves on the most helpless and degraded, on those who from squalid poverty, or from want of skill and education, are rejected from all other employments." (Mill 1848; 1965, p. 383.)

Mill concluded that Smith's hypothesis that wages tended to rise with the net disadvantages associated with different occupation was wrong, and that, on the contrary, the true relationship rather was one where "the hardships and the earnings" stood in an inverse relationship to each other. In a similar vein, John Cairnes (1874) coined the term "non-competing groups" to describe a situation where individuals in the labour market were prevented by lack of education and skills and the constraints imposed by their class background to compete for positions over a wide range of occupations. In other words, inequality of opportunity led to inequality of wages as well as of net advantages, i.e. wages adjusted so as to take account of other characteristics of the different employments.

The laws of distribution

We have seen that the classical economists possessed a fairly sophisticated theory of the functional distribution of income. Their theory of the personal distribution was less advanced and restricted mainly to the framework of compensating wage differentials as developed by Smith and criticized by Mill. As regards non-labour income, their ability to analyze the personal distribution of income was limited by the absence of a theory of the distribution of ownership. A common attitude seems to have been that the distribution of ownership to capital and land was determined by historical processes that lay outside the scope of economic science. Thus, Mill claimed that as regarded the subject of Book I of his *Principles*, which is concerned with production, the "laws and conditions of the production of wealth partake of the character of physical truths." By contrast, Book II on distribution is concerned with a subject of a quite different nature:

> "The distribution of wealth … depends on the laws and customs of society. The rules by which it is determined, are what the opinions and feelings of the ruling portion of the community make them, and are very different in different ages and countries. … But the laws of the generation of human opinions are not within our present subject. They are part of the general theory of human progress, a far larger and more difficult subject of inquiry than political economy." (Mill 1848: 1965, p. 200.)

It is clear from the context that Mill meant this statement to apply to all aspects of the distribution of income and wealth. However, he was also careful to emphasize that although the causal factors behind the distribution of income had to be studied in a broad context, including non-economic considerations, the *consequences* of different distributional arrangements "must be discovered, like any other physical or mental truths, by observation and reasoning."

The Marxian perspective

The basic structure of Karl Marx' positive economic theory is consistent with the teaching of the classical economists, especially Smith and Ricardo. As in their work, his main interest in the theory of income distribution lay in the functional distribution of income and less in the distribution of income between persons. He adopted the theory of subsistence wages but added an additional component which was absent in the work of Smith and Ricardo, viz. the existence of unemployment. According to Marx, even the subsistence level of wages would not be low enough to secure full employment in the capitalist system, and the result of this was the development of what he named "the industrial reserve army" of the unemployed who live in extreme poverty and misery. He also argues that the existence of this reserve army is in fact in the interest of the capitalists. The reason is that there are significant fluctuations in economic activity that also imply large fluctuations in the demand for labour. The reserve army serves as a depository of labour on which the capitalists can draw without having to bid up wages, which they would have been led to do in a situation of full employment. Inequality and poverty therefore serve the interests of the ruling class, i.e. the capitalists.

Marx emphasized strongly that a central feature of the capitalist system was its ability to accumulate capital and generate economic growth. So what happens to the reserve army of the unemployed with the accumulation of capital? There are two effects that work in opposite directions. On the one hand, a more capital intensive technology increases the productivity of workers and tends to push wages up. On the other hand, the new technology also increases industrial concentration, and this effect lowers labour demand and pushes wages down. In the context of an increasing population, the net result of these effects may well be that employment increases, but the industrial reserve army will also increase, both in absolute and relative terms:

> "The greater the social wealth, the functioning capital, the extent and energy of its growth, and, therefore, also the absolute mass of the

> proletariat and the productiveness of its labour, the greater is the industrial reserve army. The same causes which develop the expansive power of capital, develop also the labour-power at its disposal. The relative mass of the reserve army increases therefore with the potential energy of wealth." (Marx 1867-94; 1995, pp. 360-361.)

According to Marx, therefore, and in sharp contrast to the view commonly held by the classical economists, unemployment was a permanent feature of the capitalist economic system and was central for a proper understanding of the distribution of income and wealth.

Apart from the emphasis on unemployment, a central concept of Marx' analysis of the distribution of income is *exploitation.* At the bottom of this concept is the view that labour is the fundamental factor of production in the sense that all non-labour inputs can be derived from past labour: "As values, all commodities are only definite masses of congealed labour time." (Marx 1867-94; 1995, p. 16.) But workers are only paid the subsistence wage, which is less than the value of production. The difference between the two is the worker's unpaid work for the benefit of the capitalist. This is the profit or surplus value which defines the capitalist's exploitation of the worker.

Marx did not limit himself to the presentation of his argument in terms of abstract reasoning but also provided vivid examples of the living conditions in contemporary industrial society, above all in England where he lived during the last three decades of his life and where he wrote *Capital.* In this he was also able to draw on the insights and knowledge of his friend and collaborator Friedrich Engels. Engels' study of the conditions of the English working class (Engels 1845) provided important material for Marx' own work, but is also a significant contribution in its own right. Engels, who worked as a manager in an industrial firm in Manchester that was partly owned by his father, was appalled by the living conditions of the workers that he saw in the industrial towns in England. In his book, he attempts to give a detailed description of

their incomes, housing and health, arguing that at least at this stage of the industrial revolution, workers were worse off than they had been before. He based his work both on his own observations and on various contemporary reports, and the book is notable for its extensive use of statistical data to describe social and economic conditions among the working class poor.

2.2. Neoclassical economics: The marginalist approach to the distribution of income

The marginalist revolution and the birth of neoclassical economics marked a new style of economic theorizing where, in contrast to the classical writers, the new generation of economists attempted to anchor their analysis in the behaviour of individual economic agents, using the theory of optimization and the mathematical tools of the differential calculus. But it also marked a new view of the workings of the market economy. Particular stress has traditionally been laid on the greater attention to demand as a determinant of prices, but the differences were also substantial when it came to the study of income distribution. To a large extent, the development of a new approach to income distribution was driven by the internal logic of theoretical innovation, but there can be little doubt that it was also motivated by the social and economic development that became increasingly visible towards the end of the 19th century. As an example we may take Léon Walras, who criticized Malthus for the lack of logic in his theory of population, in particular for his neglect of the role of technological progress. He also pointed out the failure of Malthusian theory to explain the actual increase in living standards for all classes in society. Thus, after having been impressed by the progress demonstrated at the World Exhibition in Paris in 1867 he wrote an article where he emphasized the benefits that advances in technology had brought to the working class and

confronted them with the "ridiculous theory" of Malthus, predicting the workers' eternal poverty and misery.

The marginalist revolution and its forerunners

While the marginalist revolution is usually identified with the early 1870s, there were important forerunners of neoclassical economics who in some respects were actually more advanced in their analytical approach than their successors. Foremost among the early champions were Johann Heinrich von Thünen and Herrmann Heinrich Gossen in Germany and Antoine Augustine Cournot and Jules Dupuit in France. In the present context, it is von Thünen and Gossen that have a special claim to our attention.

Von Thünen's main work *Der Isolierte Staat* (The Isolated State, 1826, 1850) is remarkable in this connection particularly for his early formulation of marginal productivity theory which he applied both to capital and labour use. Thus, for a producer who attempts to maximize profits, he derived the conditions that the value of the marginal productivities of labour and capital must be equal to the wage rate and interest rate, respectively, and he used this approach to study geographical variation of the choice of capital intensity in a spatial economy. Von Thünen considered the result of equality between marginal value productivities and factor prices also to be a theory of income distribution, but as such it is obviously incomplete in that it takes no account of the supply side of factor markets, thus leaving the formation of factor prices unexplained (except for the special case where factor supplies are given). Nevertheless, this was an important building block for the theory of factor prices which was to be developed later[4].

[4] Von Thünen has become particularly famous for the formula for "the natural wage" which is equal to the square root of the product of the existence minimum and worker productivity. There is general agreement that in the history of thought this should be treated as a curiosity rather than a substantive contribution (although von Thünen thought sufficiently highly of it to have it inscribed on his gravestone).

Hermann Heinrich Gossen's long neglected book on economic theory (Gossen 1854) is famous mainly for its early formulation of the theory of the utility-maximizing consumer and its derivation of "Gossen's law" that at the optimum the ratio between marginal utility and price must be the same for all consumer goods. In the central version of his theory income is taken as given so that it does not include any theory of factor supply, but he did in fact present an extension of his model in which he claims that the supply of labour can be derived from the condition that the marginal utility of consumption is equal to the disutility of work. Together, von Thünen and Gossen provided important elements for the theory of factor price formation and income distribution, but it was yet to take a long time before their approach had been developed into a logically consistent theory of income distribution.

What historians of economic thought commonly refer to as the marginalist revolution is associated with three authors and three books: William Stanley Jevons' *Theory of Political Economy* (1871), Carl Menger's *Grundsätze der Volkswirtschaftslehre* (1871) and Léon Walras' *Eléments d'économie politique pure* (1874-1877). The central concern of the three main protagonists of the marginalist revolution in the 1870s was to establish the theory of subjective value as the main causal factor for the understanding of price formation. This led them to focus first of all on the determination of prices for consumer goods, but they also extended the theory so as to apply to the formation of factor prices. The equality of marginal value productivities and factor prices as following from profit maximization is particularly explicit in Walras (1874-77; 1954, Lesson 36). Walras also emphasizes that a theory of the average rate of wages – which he considered to be the main focus of the classical economists – is not very useful; the analysis of wages must be based on a disaggregated view of the labour market with occupation specific wage rates. However, neither Walras nor the other two went very far in the analysis of income distribution. Although they considered the application of the marginalist

method to the analysis of wages and interest rates, they did not proceed to a study of how the theory could be used to explain inequality in society. For this we have to wait for the work of a later generation of marginalist or neoclassical economists, and in the coming decades a number of writers made important contributions. Here we shall focus on the work of Alfred Marshall and Knut Wicksell, who both in different ways left their mark on the development of economics during the next century.

Alfred Marshall

The contrast between the work of Léon Walras and Alfred Marshall has frequently been characterized as that between general and partial equilibrium theory. That is clearly true regarding their style of theoretical analysis. But in addition it is striking how much their great treatises differ with regard to the reliance on institutional and empirical material. Thus, when Marshall approaches the issue of what determines the demand for labour, he does it by way of a numerical example in which a sheep farmer decides how many shepherds to hire at a given rate of wages, hiring more workers as long as an additional shepherd's marginal value product exceeds the wage rate. He emphasizes that the theory that "the wages of every class of labour tend to be equal to the net product due to the additional labour of the marginal labourer of that class" does not in itself constitute a complete theory of wages since a number of other aspects both of factor and product markets need to be taken into account[5]. On the other hand, "the doctrine throws into clear light the action of one of the causes that govern wages." (Marshall 1890; 1920, p. 518).

As Walras before him, Marshall also argued that phrases such as "the general rate of wages" were apt to be misleading, for

[5] For a discussion of the relationship between the concepts of net and marginal product as used by Marshall, see Whitaker (1988). For the case of perfect competition and full substitutability of the factors of production the two concepts coincide.

> "… in fact, there is no such thing in modern civilization as a general rate of wages. Each of a hundred or more groups of workers has its own wage problem, its own special set of causes, natural and artificial, controlling the supply-price, and limiting the number of its members; each has its own demand-price governed by the need that other agents of production have of its services." (Marshall 1890; 1920, p. 533).

There is an interesting contrast here to the work of Adam Smith and John Stuart Mill in that the wages of labour are analyzed from the start within the framework of multiple (although interrelated) labour markets, while the classical economists discussed the general rate of wages, later adding on a somewhat ad hoc discussion of wage differentials. The supply and demand framework instead provided a general approach to the study of wage formation which could be used to analyze both the general level of wages (assuming, contrary to Marshall, that there is such a thing) and the wage differentials between occupations. However, Marshall also discusses the theory of compensating wage differentials, blending elements from the partially conflicting views of Smith and Mill.

Although Marshall must clearly be considered to be one of the founding fathers of the marginal productivity theory of wages[6], his theoretical perspective was much wider than this terminology may indicate. Among his significant theoretical innovations in the study of wages and the distribution of labour income should be counted his early formulation of the theory of human capital. He notes that

> "[t]he professional classes especially, while generally eager to save some capital *for* their children, are even more on the alert for opportunities of investing it *in* them." (Marshall 1890; 1920, p. 533).

[6] This term has become a standard one among historians of economic thought, although Marshall himself would no doubt have objected to it as being an incomplete description of his own theory of wage formation.

While investment in children by means of education and training will increase their productivity and thereby their opportunity to earn good wages, there are some serious imperfections in the market for human capital. One of these is the weakness of employers' incentives to invest in human capital. This capital becomes the property of the worker, so that the employer's opportunities of reaping the gains of any investment that he has made in him is severely limited; hence arises the crucial role of the parents which is limited by "their power of forecasting the future, and by their willingness to sacrifice themselves for the sake of their children." (Marshall 1890; 1920, p. 561). But although the parents play an important role in overcoming the adverse incentives of employers, this role has also other and more unfortunate consequences. Because the opportunities and insights of the professional classes are not shared by the members of the "lower ranks of society", their investment in their children is inadequate, and this evil is cumulative:

> "The worse fed are the children of one generation, the less will they earn when they grow up, and the less will be their power of providing adequately for the material wants of their children; and so on to following generations." (Marshall 1890; 1920, p. 562).

Another point that Marshall repeatedly stresses is the dependence of productivity on wages. High wages lead workers to be better fed and better educated and so increase their productivity. Marshall suggests that this mechanism may be an important part of the explanation of the historical increase in wages, contrary to the predictions of at least the simple version of the Malthusian theory.

Both his emphasis on a disaggregated view of the labour market and his early insistence on the importance of human capital and efficiency wages make Marshall a very important contributor to the theory of income distribution, at least as regards the distribution of labour income. About the distribution of

income from capital he has less to say. He applies marginal productivity theory to the study of the rate of interest but since he does not offer any theory of the distribution of the ownership of capital (and land), the distribution of income from capital becomes an unsolved issue. The contrast to labour income is an interesting one: Since the discussion of the marginal productivity of labour is usually framed in the context of man-years of labour (as in the shepherds example), and since the measurement of the distribution of labour earnings uses annual income as its basis, the distribution of wages becomes identical to the distribution of earnings. Thus, the marginal productivity theory becomes a much more important element in the theory of the distribution of labour income than in the study of the distribution of income from capital[7].

Knut Wicksell

The Swedish economist Knut Wicksell is an important figure in the history of the marginalist revolution and the rise of the neoclassical school of economic theory. While the earlier marginalists – apart from von Thünen – had focused most of their attention on the analysis of consumption, Wicksell's main interest was in production and investment decisions. It is worth noting that his initial interest in economics was kindled by his concern for social problems and the issues raised by unchecked population growth. In Volume 1 of his *Lectures on Political Economy* (1901-1906) he argued that virtually every problem in economics had to be studied in the context of a changing population; however, the population issue in fact plays relatively little role in his more formal academic writing.

Wicksell is especially well known for the first clear and precise formulation of the production function as a central tool in the analysis of production and investment decisions (including the original introduction in economics of what became known as the Cobb-Douglas function). He made explicit the idea of

[7] The shortcomings of marginal productivity theory in explaining the distribution of income from capital and land were strongly emphasized both by Cannan (1893) and Dalton (1920).

factor substitution, and the assumption of continuous substitution between factors of production was adopted by later economists as a defining characteristic of neoclassical economics. In a more rigorous fashion than his contemporaries, he showed that profit maximization involved the equality between marginal value products and factor prices. Like Marshall, he stressed the incompleteness of marginal productivity theory as a theory of income distribution since it did not take the supply side into account. He did not really manage to integrate supply and demand in a formal analysis of income distribution, but in his discussion of practical issues he showed a clear understanding of the nature of their interaction. Although he emphasized the role that technological progress had played in increasing the marginal productivity of labour, he held the view - in sharp contrast to Walras - that it was doubtful whether real wages had shown any increase during the preceding two hundred years, while rent in his opinion had "successively doubled and redoubled". The explanation for this he found in the growth of population during the same period:

> "Such an increase [in population] must, other things being equal, continually reduce the marginal productivity of labour and force down wages; or - what comes to the same thing, though the connection is easily overlooked on a superficial view - *prevent* the otherwise inevitable *rise* in wages due to technical progress." (Wicksell 1901; 1934, p. 143.)

As a purely theoretical proposition, this statement shows a very clear understanding of the respective roles played by supply and demand in the determination of wages. On the other hand, its empirical connection with actual economic developments during Wicksell's lifetime is highly

questionable and can only be interpreted as being strongly coloured by his neo-Malthusian convictions[8].

A further important theoretical issue in the neoclassical analysis of production and distribution concerns the problem of product exhaustion: Would the payments to the factors of production according to marginal productivity theory exhaust the value of output? Earlier, Philip Wicksteed (1894) had shown with reference to Euler's Theorem of homogeneous functions that this would happen if firms' production functions were linear homogeneous. The problem with this application of the theorem was that it implied constant marginal and average cost, so that the scale of production for each firm was indeterminate. Wicksell pointed out that the problem would be solved by the assumption that production functions went through phases of increasing, constant and decreasing returns to scale. This corresponds to the case of an average cost function which first decreases and then increases. At the minimum point of the U-shaped cost curve there are constant returns to scale, and this is in fact the point to which the long run equilibrium of the industry will converge, given the assumption of free entry. Factor prices correspond to marginal value productivities, and the payments to the factors of production exhaust the value of the product with pure profits being zero. But even in the case where product prices are given, as when they can be taken to be determined in world markets, this theory of distribution is incomplete in the absence of a theory of factor supply.

General equilibrium theory

The work of the neoclassical economists – from that of the early pioneers to the first and second generation of the marginalists in the closing decades of the 19th century – became consolidated in the later version of the theory of general equilibrium that was developed around the middle of the next century. The

[8] For a more general discussion of the relationship between theory and statistical evidence in the work of income distribution theorists see Part 4 below.

main achievements of this development have often been associated with the introduction of new methods of mathematical methods in economics and with the analysis of existence and stability of equilibrium, but in a broader perspective one must also include the deeper understanding of the general interdependence in the economy that it led to. A particularly important aspect of this interdependence was the relationship between the prices of consumer goods, factor prices and the distribution of income and wealth. But the connection between resource allocation and the distribution of income was not given much attention in modern general equilibrium theory; in the influential presentation of the theory by Debreu (1959), the term "distribution" does not even appear in the index. In one respect, however, the modernized version of the Walrasian system provided a more satisfactory treatment of distribution. Dalton (1920) had criticized the marginal productivity theory of distribution for not giving a satisfactory account of the distribution of income from capital and land. The theory treated only the determination of the rate of interest and the rent from land, but the distribution of capital and rental incomes had to be concerned with the interest rate *times* the ownership of capital and with the rental rate *times* the holdings of land[9]. This shortcoming of the theory is resolved in the modern theory by the introduction of the notion of endowments. Consumers are assumed to be endowed with initial resources (in principle both consumer goods and factors of production) as well as shares of the profits of the different firms in the economy, so that prices do indeed determine the distribution of income or wealth. On the other hand, part of Dalton's criticism remains valid since endowments and profit shares are taken to be exogenous and no account is provided of their origin.

[9] Cannan (1893) had directed a similar criticism against the classical economists, calling the functional distribution of income with which they were chiefly concerned a "pseudo-distribution" because it was only concerned with wages per head, profits per cent and rent per acre.

One reason why the new mathematical formulation of general equilibrium theory paid little explicit attention to the problem of income or wealth distribution was that in its ambition to achieve a high degree of generality, it rid itself of the distinction between consumer goods and factors of production. Formally, consumer goods were defined as commodities that entered the budget constraints as positive numbers, while factors of production were commodities represented by negative numbers. Moreover, the focus of the theory was on the competitive case, so that there was no scope for treating the formation of factor prices, e.g. wages, as being any different from the formation of prices for consumer goods. Labour was just like any other commodity and wages no different from all other prices.

In applications of the general equilibrium framework the situation was different. In international trade theory the effect of international trade on the domestic distribution of income had long been a central focus of the theory, and in the 1940s and ‘50s the analysis of the connection between the prices of factors and goods moved to the forefront of the theoretical development in the field; the classic contributions were Stolper and Samuelson (1941) and Samuelson (1953). The focus of this literature was on the functional distribution of income, in particular on the shares of labour and capital, while the analysis of the personal income distribution was mostly by implication, as in the study of sectoral shifts following changes in world market prices.

Another field in which one might expect the general equilibrium framework to be important for the study of income distribution is public economics. But this has hardly been the case. One explanation for this is that in contrast to international trade theory, public economics has always had a strong concern with the effect of taxes on factor supply, while in international economics one has often been content with assuming factor supplies to be given. The extension of the framework of analysis to incorporate variable factor supply leads to significant complications and this may be the main reason why the

best known use of the general equilibrium approach in public economics is Harberger's (1962) analysis of the incidence of the corporation income tax. Harberger's model turned out to be a fruitful one for analyzing a number of problems in tax incidence analysis. On the other hand, the reason why it was easy to use was precisely because, in analogy with international trade theory, it ignored the study of the effects of taxation on the supply of capital and labour; issues that have otherwise been treated as central in the theory of public economics.

Imperfect competition

The early neoclassical economists and the later general equilibrium theorists focused their analysis of the market economy on the case of perfect competition. In the case of the labour market, the assumption was that both workers and employers took the equilibrium market wage as given, while the forces of competition made any out-of-equilibrium wage rate adjust until the supply of labour was equal to demand. It was within this framework that theorists discussed the dual role of wages – and more generally of factor prices – in allocating factors of production among alternative uses and determining the distribution of factor incomes.

That the case of perfect competition was not a realistic one particularly in the labour market was already acknowledged by Adam Smith in his discussion of the determinants of wages (Smith 1776, Book I, Chapter VIII). He emphasizes that wages are influenced both by private and public restraints on competition. The guild system limits the access to certain occupations and thereby pushes up the level of wages relative to that of other lines of employment, and the government tolerates these regulations. Another point that he makes is that in bargaining over an employment contract, the natural advantages are with the employers. There are fewer employers than workers, so that it is easier for the employers to collude in order to keep wages low than it is for workers to combine to push wages up. Smith writes long before the time of strong trade

unions, and he remarks that while there are many laws that forbid workers to organize themselves for the purpose of obtaining higher wages, there are none that prevent employers in colluding for the opposite purpose. He also points out that if a conflict occurs, the employers can hold out much longer than the workers. A factory owner will often be able to live well without workers for a year or two, while a worker will find it difficult to survive for a week or a month if he is not employed. The implication is evidently that in many labour markets wages will be lower than they would have been in a situation of perfect competition with bargaining power being symmetrically distributed.

It took a long time before Smith's insights were taken into account in the neoclassical theory of the market economy. Pigou's *Economics of Welfare* (1920) discusses the functioning of the labour market with careful attention to the role of various institutions that interfere with competition in one way or the other. Since the relationship of the parties in the labour market is one of imperfect competition, there is an unavoidable indeterminateness in regard to the level of wages. In Appendix III to his book (Pigou 1920; 1952, pp. 813-814) he has a diagram that shows the deviation of the equilibrium wage from the competitive level[10], but he does not attempt to identify exactly what determines the imperfectly competitive wage level.

The year 1933 saw the publication of the two books that moved the concepts of monopolistic and imperfect competition into the core of economic theory. *The Theory of Monopolistic Competition* by Edward Chamberlin had its focus on the markets for consumer goods, while Joan Robinson's *Economics of Imperfect Competition* also contained an analysis of imperfectly competitive labour markets with obvious implications for the distribution of income (which, however, she did not discuss except in passing). Pigou's indeterminateness was removed by the assumption of completely asymmetric

[10] He also uses the deviation between the perfect and imperfect competition level of wages to measure what he calls unfairness and exploitation.

bargaining power by the two parties to the labour contract: Employers were assumed to be monopsonists while workers took wages as given. This led to an equilibrium in which wages were in general below the level of the marginal value products with the gap between them reflecting the elasticity of supply. The larger the value of the elasticity of supply, the smaller would be the gap between the two, and the less would be the degree of exploitation. The implications of imperfect competition in the labour market were also considered by Hicks (1932), whose book among a number of other issues also contained an extensive discussion of the role of trade unions. In regard to the theory of income distribution, however, Hicks' main interest was in the functional rather than the personal distribution of income. Thus, one of his most influential contributions in the book was the analysis of the effects of various types of technical progress on labour's share of national income.

The general indeterminateness of the outcome of wage bargaining which was stressed by Pigou, also played a central role in the theory developed by the Danish economist Frederik Zeuthen in his book *Problems of Monopoly and Economic Warfare* (1930)[11]. His theory is set in the framework of a bilateral monopoly model in which a firm bargains with a trade union and where neither party has any outside option; the employer has no alternative use of his capital and workers have no alternative employment opportunities. While recognizing the basic indeterminacy of the equilibrium solution, Zeuthen explored the factors that would determine the features of the bargaining process and the likely outcome. Both parties realize that failure to reach agreement will result in a conflict – a strike or a lockout – that will be costly to both of them. Zeuthen saw the bargaining process as a series of proposals and counterproposals, where proposals of high wages would make employers willing to risk a conflict, and this would put downward pressure on wages.

[11] Actually, the theory had been presented two years earlier in his doctoral dissertation, published in Danish (Zeuthen 1928), which is a broad theoretical and empirical study of the income distribution in Denmark.

Proposals of low wages, on the other hand, would make the union more willing to risk a conflict and thereby tend to push wages upward. At some intermediate wage level both parties will consider the risk of pushing for a better alternative to be equally large, and this will be the equilibrium wage. Zeuthen's theory was an important contribution to better understanding of the role of bargaining and labour conflicts and a significant extension of the neoclassical theory of labour markets and income distribution[12].

Human capital theory

An unsatisfactory aspect of the marginal productivity theory of distribution – quite apart from its neglect of the supply side of factor markets – was that it offered little explanation of why some factors of production were more productive than others. One might argue that this was simply a question of technology and the way that factors were combined in the production process, but particularly in the case of labour it is hard to escape the belief that some individuals are in some sense inherently more productive than others. However, some of the differences in productivity might be due to education and training. This point was already made by Adam Smith, and we have also seen that Alfred Marshall suggested a possible explanation for this in the investment that parents made in their children, both with the time that they themselves devoted to them and with the resources that they spent in giving the children a good education. This would result in higher wages for the children who benefited but possibly also in increased inequalities of wage income.

Another writer who pursued the idea of investment in human beings was the German statistician Ernst Engel. In his 1883 book on the cost value (Kostenwerth) of human beings he calculated the cost of training a boy to

[12] As pointed out by Harsanyi (1955a) it was also, together with the analysis by Hicks (1932), a forerunner of the game theoretic approach to bargaining associated with John Nash (1950).

practice his father's profession in the lower, middle and upper classes of society (corresponding to lower, middle and higher education)[13]. However, he did not have a theoretical framework that allowed him to explore the analogy between investment in human and physical capital, and he did not discuss the implications of his approach for the distribution of income, implicitly ruling out the possibility of mobility between income classes.

In the 20th century, the ideas of Smith and Marshall were taken up by the economists of what came to be called the human capital school. Although important contributions were made by Theodore Schultz (see e.g. Schultz 1961), the theoretical foundations were laid by Gary Becker (1962, 1964). In particular, Becker's 1964 book marked the beginning of an extremely influential line of research which also took up important issues regarding the distribution of income. As set out in Becker and Chiswick (1966), the amount of investment in human capital at the individual level is determined by the intersection of the supply and demand curve (or the marginal benefit and the marginal cost curve). Both supply and demand curves must be expected to vary among individuals. Different supply curves may reflect the income and wealth of parents and access to capital markets, while the position of the demand curve may represent individual characteristics like inherent ability and attitudes to risk. In Becker and Tomes (1979) the framework is extended to an intergenerational setting where children's endowments are partly determined by the investments made in them by their parents. This is clearly related to the ideas of Marshall regarding the long-term effects of investment in children.

As with all theoretical innovations, the growth of the human capital field can to some extent be explained by developments internal to the discipline of economics. However, it is also natural to point out explanations that reflect changes in the economy. Studies of economic growth had led to increased

[13] Engel also considered the costs of education for girls, but in their case he did not include a calculation of the cost of higher education.

attention to changes in the efficiency of labour as a determinant of growth. Perhaps more to the point in the present connection are the consequences of an increasing level of education in the labour force which made the distinction between income from capital and labour seem a less central element in a realistic theory of income distribution. A society in which an increasing number of workers had become human capitalists required a new perspective on the distribution of income.

Risk-taking and income distribution

The difference of riskiness of income between occupations figured as one element in Adam Smith's theory of compensated wage differentials. In the choice between a safe and a risky occupation (shoemaker and lawyer in Smith's example), the expected wage in the risky occupation would have to be higher than in the safe one in order to compensate individuals for their additional risk-bearing. To the extent that individuals assessed the probabilities correctly, these *ex ante* expectations would be translated into *ex post* income inequality: The incomes of lawyers would have a higher average but greater variance than the wages of shoemakers.

The possibility of formal modeling of choice in risk-taking situations was greatly stimulated by the axiomatic foundation of expected utility theory developed by von Neumann and Morgenstern (1947). Although it took some time for the theory to find applications in the analysis of real economic problems, its use in the theory of income distribution was one of the earliest. The classic article in the field is by Milton Friedman (1953) who used his earlier work with Leonard Savage (1948) to explain income distribution as the result of rational choice under uncertainty. A distinctive feature of the Friedman-Savage theory is the assumption that they make about attitudes to risk. While the assumption of risk aversion is a natural one for explaining real-world features like portfolio diversification and insurance, it does not explain

the simultaneous existence of gambling. In order to resolve this difficulty, Friedman and Savage assumed that the utility function of income had both concave and convex segments, i.e. ranges of both decreasing and increasing marginal utility. In Friedman's income distribution theory, individuals at the beginning of their lives choose between alternative income streams; at the level of abstraction of Friedman's analysis, these streams could be generated from labour as well as capital income. Although individuals have equal opportunities *ex ante*, the income lotteries in which they engage imply that some will find themselves *ex post* with high incomes while some will end up in low income groups. The special shape of the utility function gives rise to a distribution of income that, Friedman argues, is consistent with observed patterns, in particular as documented in his own empirical work with Kuznets (Friedman and Kuznets 1945). He also argues that individuals will be motivated as participants in a democratic society to introduce redistributive mechanisms that insure them against the consequences of the most adverse outcomes. According to this theory, therefore, both income inequality and redistributive policies emerge as results of individuals' free choice in a situation of equality of opportunity and will reflect their attitude to risk, in particular the relative importance of risk averters and risk lovers. The less risk averse individuals are, the greater will be the inequality of income in society.

A further development of this framework is due to Kanbur (1979), whose analysis builds on a much more specific structure than that used in Friedman's article. In Kanbur's framework, risk averse individuals choose between the safe occupation of a worker and the risky occupation of an entrepreneur. In equilibrium, the two occupations must be equally attractive, i.e. have the same expected utility, and this implies that the expected income of the entrepreneur must be higher than that of the worker. Kanbur explores the comparative statics of the model and shows that when account is taken of general equilibrium effects on the distribution of individuals between occupations,

there is no longer any simple connection between risk aversion and inequality. In a companion paper, Kanbur (1981) studies the role of taxation in the determination of the equilibrium distribution of the population between the two occupations.

On this point, Kanbur's study is related to the older analysis of taxation and risk-taking that goes back to the classic article by Domar and Musgrave (1944). Their analysis of a model of portfolio choice showed that under certain assumptions, particularly that of full loss offset, income taxation induces individuals to take more risk than they otherwise would have done. Their choice of more risky portfolios obviously has the implication that their wealth *ex post* will have a larger variance than it would have had in the absence of income taxation[14]. With full loss offset, income taxation functions in part as insurance against variations in capital income, and this insurance acts as an encouragement to risk-taking. Ex post, therefore, one would expect higher taxation to generate more inequality in the distribution of income from capital.

2.3. Non-marginalist approaches

The marginalist revolution of the 1870s left its mark on the style of economic theorizing for a long time; indeed, it remains a dominating influence on contemporary economics. As we have seen, it also played a central role in the theory of income distribution. But at the same time other contributions were made that do not easily fit into the marginalist framework. A common feature of the alternative approaches is that they pursued an inductive rather than a deductive line of investigation. Some of these will be discussed below.

Statistical approaches: The Pareto distribution

[14] The Domar-Musgrave article did not use the expected utility hypothesis. For a reformulation and sharpening of their theory along expected utility lines see Mossin (1968).

While the marginalist theory held out the promise of a theoretically more firmly based theory of the personal distribution of income, the late 19th century also saw the introduction of a more inductive theory of income distribution, founded not on *a priori* theorizing but on inference from statistical data. The pioneering contribution was due to Pareto, whose work caused a good deal of discussion and controversy during several decades after its initial publication.

Vilfredo Pareto was Walras' successor in the chair of economics at the University of Lausanne. Like Walras, he was a firm believer in the mathematical method, and he saw it as his main task to extend and refine the general equilibrium approach that Walras had developed, including the theory of factor price formation. When it comes to income distribution, however, Pareto's fame rests not on his refinements of Walrasian theory but on his formulation of what has become known as Pareto's Law[15]. Many economists only know Pareto from footnotes in textbook treatments of utility theory and welfare economics and may be forgiven for thinking of him as a pure theorist. But Pareto was an immensely productive researcher who wrote on a wide variety of topics, both theoretical and empirical, and not only in economics. He is a significant figure in the history of sociology and wrote also on statistical theory, economic history and political science. His studies of income distribution, set out in a number of articles and in his book *Cours d'économie politique* (Pareto 1896-97) drew on his knowledge both of economics and mathematical statistics and, in the matter of interpretation, also on his insights in sociology.

What posterity has come to know as Pareto's law was not derived from a theoretical model; instead it was based on a detailed study of incomes statistics for a number of countries and time periods. Pareto's analysis of these data led him to the hypothesis that all statistical income distributions have a common

[15] His other claim to fame is of course his role in the development of welfare economics, which will be considered below.

shape that one can characterize as follows. Suppose that we draw up a list of all incomes in society from the lowest to the highest. Starting from the median income, we know that 50 per cent of the income earners have an income above the median. We then move up to a level of income that is one per cent higher than the median and ask what percentage of the population has an income above this level. Obviously, the percentage is less than 50, but how much less? Pareto found that the answer was 1.5 per cent; in other words, as the level of income goes up by 1 per cent, the number of individuals with an income above this level falls by 1.5 per cent. In general mathematical terms Pareto wrote his law as

$$logN = logA - \alpha logy.$$

Here N is the number of individuals who have an income of at least y and A is a parameter that reflects the size of the population. α is Pareto's constant that he estimated to be approximately equal to 1.5. The relationship has the interesting property that the average income of those whose incomes are greater than y will be equal to $\alpha/(\alpha-1)$ times y. Thus, once again assuming that $\alpha = 1.5$, the average income of those with incomes above 10.000 francs should be equal to 15.000 francs. In the economies that Pareto studied, it turned out that the fit of the function was remarkably good, although less so at the tails of the income distribution. Later work has tended to establish that the fit is significantly better for the upper ranges of the distribution, i.e. for the right end of the income distribution curve.

Pareto's law came in for a good deal of controversy. Thus, a long discussion involving several participants arose regarding Pareto's claim that the parameter α could be used as an index of inequality. That this claim should turn out to be controversial will come as no surprise to the modern economist who from the work of Atkinson (1970) and others has been made aware that any particular index of inequality is implicitly based on some ethical judgment about the nature of inequality. The question of the conditions required for

social welfare to be written as a function of mean income and inequality as measured by Pareto's α (increasing in the former, decreasing in the latter) was settled by Chipman (1974). Having this issue clarified is of obvious interest. However, there were other aspects of the controversy that are arguably of greater general importance.

One question that naturally arises concerns the empirical validity of the law. Did Pareto actually claim the law to be one of universal validity? Here his statements do not provide an unambiguous answer. On the one hand he noted in a comment on his empirical findings that

> "[t]hese results are very remarkable. It is absolutely impossible to assume that they are due solely to chance. There must certainly be a *cause* which produces a tendency for incomes to be distributed along a certain curve. The form of this curve seems to depend only slightly on different economic conditions of the countries considered, since the effects are about the same for countries in which economic conditions are as diverse as those of England, Ireland, Germany, Italian cities and even Peru."

However, he went on to issue a word of caution:

> "True, since we are dealing only with empirical laws, we cannot be too prudent. In any case, the consequences we shall draw from this law will at least always be valid for peoples for whom we have seen that they are confirmed." (Pareto 1896-97, vol. II; quoted from Chipman 1976, p. 151.)

In spite of this and other cautionary statements Pareto was frequently interpreted as claiming universal validity for his law. Such a claim naturally proved provocative to many who believed that governments should see it as one of their objectives to bring about a more egalitarian distribution of income. On the one hand Pareto seemed to claim that the distribution of factor incomes

was given; on the other hand he also went out of his way to point out that, given the skewness embedded in the Pareto distribution of incomes, progressive taxation could only be counted on to provide a rather insignificant redistribution of income in favour of the poor. This was seen by many as proof of Pareto's alleged reactionary attitudes; however, this view is not supported by statements such as

> "… even with taxes at an equal percentage of incomes, the rich contribute far less to public expenditures that the poor, whereas they benefit much more from them. For whom, if not for the vain rich, are funds expended on armaments and the like?" (Pareto 1895; quoted from Chipman 1976, p. 115.)

However, it was the early presentation of Pareto, rather than his later and more cautious statements, that caught the attention of other economists, and a considerable amount of work was devoted to examining and criticizing his law of income distribution. Thus, in his *Economics of Welfare* (1920) Pigou devoted a whole chapter (Part IV, Chapter II) to a critical examination of Pareto's Law. In the preceding short chapter Pigou had sketched the principles underlying the equity-efficiency tradeoff (to use a more modern expression), arguing from a utilitarian perspective that any cause that increases the "national dividend" without lowering the absolute share of the poor, or increases the absolute share of the poor without reducing the national dividend, must increase welfare. By contrast, the welfare effect of any measure that increases one of these quantities but diminishes the other is ambiguous:

> "Plainly, when this kind of disharmony exists, the aggregate effect upon economic welfare, brought about by any cause responsible for it, can only be determined by balancing in detail the injury (or benefit) to the dividend as a whole against the benefit (or injury) to the real earnings of the lower classes." (Pigou 1920; 1932, p. 645.)

Pigou then went on to point out that according to one "interesting thesis" there was no need to be concerned about these cases of disharmony: Pareto's alleged law of income distribution implied that, since the relative shares of the different income groups were at least approximately constant, the only way to ensure an increase in the absolute share of the poor was to increase the national dividend. Pigou was clearly skeptical to the conclusion and also expressed strong doubts with respect to several aspects of Pareto's work. He criticized the empirical basis for Pareto's generalization, but a more important point that he raised concerns the basis for assuming a given distribution relating to all sources of income. Pareto's distribution is skewed to the left, and Pigou argued that in the case of labour income one would rather like to assume that the distribution of "capacities" follows the normal distribution[16]. He also pointed out, however, that capacity is a multi-dimensional concept, and that although manual and mental capacity might both be normally distributed, their joint distribution would not be, and this fact might go some way towards explaining the form of the Pareto distribution. On the other hand, the reference to capacity, whether manual or mental, does not explain the distribution of income from capital or property, which is largely determined by inheritance, the importance of which depends in a crucial manner on the nature of legal and political institutions. The view that the distribution of income, and in particular the share of the poor, cannot be affected by measures of economic policy therefore becomes untenable.

Towards the end of the chapter Pigou quotes Pareto as remarking about his own distribution that

[16] If capacity is taken to mean marginal productivity it is of course not sufficient to argue that the normal distribution of capacity is reflected in a corresponding normal distribution of wages. According to marginal productivity theory wages correspond (under competitive conditions) to the value of the marginal products, so that the distribution of wages also depends on the distribution of product prices and accordingly on the distribution of workers between industries.

> "[some] persons would deduce from it a general law as to the only way in which the inequality of incomes can be diminished. But such a conclusion far transcends anything that can be derived from the premises. Empirical laws, like those with which we are here concerned, have little or no value outside the limits for which they were found experimentally to be true." (Pigou 1920; 1932, p. 655.)

So it appears that Pigou's criticism of Pareto to some extent missed its target. That it still was felt to be necessary to devote a chapter to it in 1920 must be explained by the popular attention that Pareto's original formulation had attracted. The idea that the distribution of income was determined by a sort of immutable law appeared to have far-reaching consequences for the feasibility – or rather infeasibility - of redistributive policies.

Pigou was not the only economist to be critical of Pareto's law of income distribution. Edgeworth (1896) at an early stage of the debate argued that Pareto's contribution bore strong similarities to previous work by the English statistician Karl Pearson. Pareto reacted strongly to what he saw as an accusation of plagiarism and gave a heated reply in which he remarked that "it must have displeased Mr. Edgeworth to see me poach on territory which is apparently reserved for Professor Pearson, just as political economy is reserved for Professor Marshall." (Pareto 1896). Further exchanges did little to soften the tone of the debate, and as late as 1926, three years after Pareto's death, Edgeworth wrote about Pareto's reaction that it "is of interest as throwing light not only on the character of the curve, but also on that of its discoverer." (Edgeworth 1926; 2003, p. 492.)

Pareto's formulation of his law as well as the later controversies to which it gave rise constitute an interesting episode in the history of economic thought, and the Pareto distribution continues to play a role in the empirical study of

income distribution. Although it has received a good deal of criticism, it has also been hailed as a milestone in the empirical study of income distribution[17].

Other statistical approaches

The tradition established by Pareto's work to look for regularities or empirical laws in the distribution of income was continued by a number of later writers. A characteristic feature of this literature is that the authors do not attempt to found their hypotheses on the neoclassical theory of factor market equilibrium but start instead from some observed empirical regularity, just as Pareto did. Just a few examples of this approach will be given here.

Roy (1950, 1951) claimed that observed earnings distributions could be reasonably approximated by the lognormal distribution and argued, echoing Pareto, that "[t]here must be some rational explanation of the fact that all these earnings' distributions have such similar shapes" (Roy 1950, p. 490). He attempts to discover this explanation by studying a number of industrial cases in which workers perform a standard and identical task and where individual output is easy to measure. These include tasks like packing boxes of chocolate, stitching shoes and pressing gramophone records. Altogether, for the twelve different cases studied it turned out that the lognormal distribution performed slightly better than the normal. To the extent that people are paid according to output, this result could go some of the way towards explaining the earnings distribution in terms of the distribution of individual skills. In Roy (1951) he studies the theoretical case of a "primitive" society in which people can choose to work in two or more occupations and where their skills differ between occupations. He then discusses how different skill correlations give rise to different statistical earnings distributions (always assuming that earnings are proportional to output), emphasizing the central role played by the lognormal

[17] For a survey of the statistical literature which, although critical, takes an overall positive view of Pareto's contribution, see Bresciani-Turroni (1939). A balanced survey of the controversy surrounding Pareto's Law is the article by Chipman (1963).

distribution. Champernowne (1953) considered a dynamic model in which it is assumed that every income earner has a probability of a rise or fall in income between one period and the next which is proportionate to his income in the first period. He showed that over time this will result in convergence towards the Pareto distribution. In a comment on this article, Lydall (1959) argued that this stochastic process was implausible for labour incomes and showed that the Pareto distribution could be generated on the alternative assumption that in an industrial firm each supervisor controls the same number of persons and that he is paid according to the total income of those below him. A similar assumption about the pyramidal structure of organizations is employed by Herbert Simon (1957) in his analysis of the compensation of executives.

A different and more macroeconomic approach was taken by Kuznets (1955), whose goal was to explain the long term trends in the inequality of income in the economy as a whole. While on the basis of data for the United States, England and Germany he found that income inequality had decreased after the end of the First World War, he suggested that this period had been preceded by one of increasing inequality. In his view, the period of widening income gaps began with the industrial revolution in the late 18th century; for England he suggested that it ended around the middle of the 19th century and for the others a few decades later[18]. His explanation for this development was based on the shifts from the agricultural or traditional sector of the economy to the non-agricultural or modern sector where income from capital plays a larger role for the distribution of income. Initially, inequality is larger in the modern sector than in the traditional one, and this generates an increased inequality of income for society as a whole as the modern sector expands. Over time, however, as the modern sector becomes more mature a variety of forces combine to reduce

[18] Setting the date of the change from the first to the second phase at roughly 1850 for England, Kuznets suggests that Marx's view of the inevitable rise of inequality of income under capitalism may have been an overgeneralization from observations of the last stages of the first phase.

inequality there, particularly through an increased share of the lower income groups and a lowering of the income from capital. Consequently, overall inequality diminishes. In his own words:

> "One might thus assume a long swing in the inequality characterizing the secular income structure; widening in the early phases of economic growth when the transition from the pre-industrial to the industrial civilization was most rapid; becoming stabilized for a while; and then narrowing in the later phases." (Kuznets 1955, p. 18.)

This hypothesis is what has become known as the Kuznets curve in the form of a bell-shaped curve describing the relationship between per capita income and the degree of inequality. It should be emphasized, however, that Kuznets was careful to point out the inadequacy of the empirical evidence for the hypothesis, particular as regards the earlier phase of economic growth.

The various statistical approaches to the study of income distribution are attempts to rationalize the observed distribution of income by using some stylized facts or assumptions about the generation of income to explain observed patterns of the distribution of income. To call these approaches non-theoretical might be somewhat misleading; however, it is clearly the case that they are not founded on theories of optimizing behavior and market equilibrium.

Institutional theories of income distribution

There have always been economists who were skeptical to the central role played by formal models in economic theory. In the area of income distribution we have seen that even a prominent theorist like John Stuart Mill argued that "the laws of distribution" must be understood in a political and social context, and since this context was determined by institutions, the understanding of the distribution of income and wealth would have to take

proper account of institutions in addition to the mechanism of demand and supply. Karl Marx emphasized that the distribution of income in the society of his time reflected the particular phase of social development that he called capitalism. Along similar lines, the German historical school, led by Wilhelm Roscher and Gustav Schmoller, downplayed the role of theory in favour of an approach based on a detailed study of historical data. If successfully carried out, this line of research would presumably be less able than e.g. the marginal productivity theory to offer explanations with a claim to universal validity; on the other hand, it might hold out a promise of generating more insights with relevance for the particular society being studied.

It was especially in the United States that institutional approaches to the study of the economic system received a position that made many regard it as an important alternative to the theoretical approach of the neoclassical school of economists. Thorstein Veblen is widely regarded as the founder of American institutional economics, but his approach - more satirical than analytical - in books like *The Theory of the Leisure Class* (1899) and *The Theory of Business Enterprise* (1904) was too idiosyncratic to attract many direct followers[19]. Neither he nor the other most prominent members of the institutional school, John R. Commons and Wesley C. Mitchell, paid particular attention to the distribution of income except for a general emphasis on the importance of power relations and evolutionary processes. The chief importance of the institutional school may have been as critics of the neoclassical theory in its focus on rational behavior and competitive equilibria. But the lack of general propositions in the work of the institutional school contributed to its gradual decline as an influence on modern economics.

[19] The closest that one may come to such a follower is perhaps John Kenneth Galbraith, whose satirical style and skepticism towards mainstream economics are in many ways reminiscent of Veblen. His book *The Affluent Society* (1958) contains several discussions of issues of income distribution with criticism of mainstream views but does not offer any alternative explanations of observed patterns of inequality.

An interesting question that arises in the study of the effects of institutions on the economy is: What constitutes an institution? Here Veblen adopted a broad definition which encompassed "settled habits of thought common to the generality of men." A modern version of this idea came with Gary Becker's work on the economics of discrimination (Becker 1957), in which racial discrimination in the labour market is assumed to arise from a common preference for not working alongside people with a different skin colour. In pursuing the implications of this idea, Becker may be said to have followed the guidelines for economic research recommended by the institutional economists; however, the tools that he used in this work were entirely neoclassical.

As regards the inequality of wage income, important contributions have been made by specialists in labour economics and industrial relations. It is natural to group these with the institutional economists because like them they emphasize the crucial role of institutions for the understanding of the distribution of income, specifically the distribution of wage income. In the United States, the work of Dunlop (1944, 1958) described wages as determined by the interaction between company owners, management and workers as represented by trade unions[20]. The book by Phelps Brown (1977) collects a number of his studies of wage inequality in different countries and under different economic systems. His work is notable for the attempt to explain inequality of pay by drawing both on economic and sociological approaches, paying attention to such factors as social class and status, discrimination, intergenerational mobility and mental ability.

[20] It should be noted that Dunlop's work is not institutional in the sense of showing aversion to theoretical modeling. As an example, in his 1944 book he discusses the formal mathematical modeling of trade union behavior in a situation of unemployment, analyzing the relationship between the union's wage claim and the rate of unemployment compensation and thereby the distribution of income between the employed and the unemployed. This analysis foreshadows the numerous contributions to the theory of trade union behavior in the 1970s and '80s.

The role of property ownership and inheritance

The role of inheritance as a determinant of income distribution has received relatively little attention in the theoretical literature. In the world of the early neoclassical economists and the later general equilibrium theorists the subject did not fit easily into their models. The time dimension – essential to get a grip on inheritance – could indeed be added through the introduction of time-dating consumer goods as well as factors of production, but this failed to provide a convincing picture of the nature of inheritance. In the world of general equilibrium theory, as described e.g. in the book by Arrow and Hahn (1971), property ownership was represented by "endowments", initial holding of goods and factors of production that were taken as exogenous. But models of this type are unable to explain the passing on of property from parents to children and the persistence of inequality between generations. The nature of these intergenerational transfers is determined by the rules of inheritance, which will therefore have an important influence on the distribution of income and wealth. But as Dalton remarked almost a century ago,

> "Many thinkers of high reputation still talk, or remain silent, about the law of inheritance, as though it had fallen immutable from heaven into the Garden of Eden." (Dalton 1920, p. 285.)

Meade (1964) considered the development of the personal distribution of wealth on the background of what he saw as the likely development of the functional distribution of income. In his view, the dominating technological trend was towards "automation" which would imply a significant reduction in the demand for labour and falling wages. This would lead to a shift in the functional distribution of income away from labour and in favour of income from property. Since, as he pointed out, income from property is much more unequally distributed than income from labour, this shift would imply a greater overall inequality in the population. This trend towards increased inequality in

the distribution of income might in Meade's view be reinforced by demographic factors, such as higher rates of growth for large than for small fortunes (due to better opportunities for diversification), the genetic inheritance of earning power and the tendency towards assortative mating (the rich marrying the rich). As later pointed out by Stiglitz (1969), it could also be influenced by the rules governing inheritance, either by law or custom. If all wealth goes to the first born (primogeniture), this leads to a more unequal distribution of wealth than the alternative of dividing wealth equally among one's children.

Inheritance is of obvious importance not only for material wealth but also for human capital. We have seen that this point had already been emphasized by Marshall (1890), and some decades later Cannan argued that the individual qualities required both to earn a good income from labour and to manage one's property wisely were passed on from one generation to the next, so that this tended to stabilize the degree of inequality over time. However, this tendency was not without exceptions:

> "The able members of the poorest class are constantly rising to the top, and the particularly incompetent members of the richest class are constantly falling to the bottom; but all the same, among the bulk of mankind there is a continuous hereditary transmission of inequality of income, the importance of which it is foolish to ignore." (Cannan 1914; 1928, p. 217.)

The role of inheritance in determining the degree of inequality in the ownership of property is obviously an important one and requires attention to the broader subject of what Mill called "the laws and customs of society." Perhaps his warning, that this was a much larger and more difficult subject than economics, played some role in the development that led economists

largely to neglect this important aspect of the distribution of income and wealth.

3. Value judgments and redistribution.

The interest in the question “Why are some people rich and some poor?” has always been motivated by something more than pure intellectual curiosity. A notable feature of the observed distribution of income has always been that it is unequal, and a natural second question is therefore “Can inequality be justified?” A possible response to this question is that it is one that should be answered by moral philosophers and not by economists whose science does not provide them with the tools needed to answer it. There are indeed some economists who have taken this position, but there are also a large number who have not, and this includes many of the most prominent characters in the history of the subject. The reasons for this are not difficult to see. On the one hand there is the fact that many economists – from Adam Smith to Amartya Sen - have had a foot in the camp of the moral philosophers, so that crossing the borders between the two fields has come naturally to them. On the other hand, there is the existence of the borderland between the two fields which is the study of the effects of redistribution policy. In order to understand the design and consequences of redistribution policy, one must know something both about economics and moral philosophy, and the attempts to combine them constitute the normative part of the study of income distribution.

3.1. The normative economics of the classical school

The natural starting point for economic theories of distributive justice is the distribution of income that is generated by the market economy. Although the

main concern of the classical economists was with the positive analysis of income distribution, they were also concerned with ethical issues and with the evaluation of redistribution policy.

Adam Smith

A point of reference for the classical view of this issue is Adam Smith's theory of the invisible hand. In the most famous single passage in the *Wealth of Nations*, he claims that each individual, by pursuing his self-interest also promotes the interest of society:

> "He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it." (Smith 1776; 1976, p. 456.)

The most common interpretation of this passage is that private incentives operating in the context of a market economy promote an efficient use of resources in the sense of maximizing "the annual revenue of society", although this interpretation is not undisputed[21]. Does it also promote a just distribution of income? There is no systematic discussion of this in the *Wealth of Nations*, although most readers of the book will find it reasonably clear that this was not his view. It is remarkable, therefore, to find in Smith's other main work, *The Theory of Moral Sentiments* (1759), a paragraph in which he makes the claim that the rich, without intending to do so, promote the interests of the poor. His statement of this claim is also of interest because it contains the second of his three uses of the metaphor of the invisible hand[22]. The rich, he says

[21] For a discussion of alternative interpretations of the meaning of Smith's statement of the invisible hand see Chapter 3 of Sandmo (2011).
[22] The third use occurs in his essay on the history of astronomy.

> "… in spite of their natural selfishness and rapacity, though they mean only their own conveniency, though the sole end which they propose from the labours of all the thousands whom they employ, be the gratification of their own vain and insatiable desires, they divide with the poor the produce of all their improvements. They are led by an invisible hand to make nearly the same distribution of the necessaries of life, which would have been made, had the earth been divided into equal portions among all its inhabitants, and thus without intending it, without knowing it, advance the interest of the society." (Smith 1759; 1976, pp. 184-185.)

The proposition that the distribution of necessaries is almost the same as if the economic system had been designed with a view to an equal distribution is certainly a striking one, although one should note that there is no claim that the income that finances the consumption over and above that level is distributed in a similar fashion. The self-interest of the rich is claimed to guarantee a certain minimum income to the poor, but not to the extent of leading to equality of living standards. Almost regardless of one's interpretation of the substantial content of this proposition, it is difficult to see that Smith provides any convincing support for it, and it is hardly surprising that this version of the invisible hand has had little influence on subsequent thinking about income distribution.

Going back to *The Wealth of Nations*, although it does not contain any systematic discussion of the normative aspects of the distribution of income, there are many passages in the book that demonstrate Adam Smith's concern with inequality and poverty as well his sympathy for the poor. One example is his positive attitude towards trade unions, which leads him to suggest that it is an inconsistency of economic policy to allow employers to collude while forbidding workmen to form trade unions (Smith 1776; 1976, pp. 83-85). Another example which, although in itself of minor importance, is suggestive

of his attitude, is his discussion of the system of the tolls that should be charged for different types of public transport. The principle that was most commonly used at Smith's time was that of charging according to the weight of the carriage. He argues against this principle and in favour of the alternative of charging higher rates for luxury carriages and lower rates for carriages of necessity. Such a reform, he argues, would have the effect that "the indolence and vanity of the rich is made to contribute in a very easy manner to the relief of the poor, by rendering cheaper the transportation of heavy goods to all the different parts of the country." (Smith 1776; 1976, p. 725).

A clearer statement of Smith's more general perspective on the distribution of income between rich and poor comes in a passage that follows a discussion of the effects of lower prices of necessities:

> "Is this improvement in the circumstances of the lower ranks of the people to be regarded as an advantage or as an inconveniency to the society? The answer seems at first sight abundantly plain. Servants, labourers and workmen of different kinds, make up the far greater part of every great political society. But what improves the circumstances of the greater part can never be regarded as an inconveniency to the whole. No society can surely be flourishing and happy, of which the far greater part of the members are poor and miserable. It is but equity, besides, that they who feed, cloath and lodge the whole body of the people, should have such a share of the produce of their own labour as to be themselves tolerably well fed, cloathed and lodged." (Smith 1776; 1976, p. 96).

It is clear from the context that Smith meant this statement to apply even to the case where the improvements in the standard of living of the lower ranks were achieved at some cost to the higher ranks of society.

What consequences did Smith draw for redistributive policy? Here we must keep in mind that the instruments available for redistributive policy were

limited in number in Smith's time, so that his policy recommendations were mostly incidental, as in the above passage concerning charges for public transport. His discussion of taxation in Book V of the *Wealth of Nations* is not very explicit when it comes to the redistributive effects of the tax system as a whole; he is content to discuss the main categories of taxes one by one with apparently little regard for the overall impact of the tax system. However, this discussion is introduced by the presentation of four normative "maxims" of taxation, and in the first of these we find the following principle:

> "The subjects of every state ought to contribute towards the support of the government, as nearly as possible, in proportion to their respective abilities; that is, in proportion to the revenue which they respectively enjoy under the protection of the state. In the observation or neglect of this maxim consists what is called the equality or inequality of taxation." (Smith 1776; 1976, p. 825).

The principle may not be entirely clear to the modern reader and could be interpreted in two different ways. The first part of the passage indicates that the principle is one of ability to pay while the second part might suggest that we should read it as a recommendation of the benefit principle, according to which taxes should be seen as payment for services rendered by the state. However, the most reasonable interpretation of the term "revenue" is "income"; a central service that the state provides is security of private income, so that income is both a measure of ability to pay and benefits received. Thus, the tax system as a whole should be as nearly as possible proportionate to income. It is important to note that this is not a recommendation for the form of an income tax – about which Smith has little to say – but for the more general design of the tax system as a whole.

Malthus and Ricardo on the Poor Laws

While redistributive taxation played little role at the time of the early classical economists, the form that support for the poor should take was a major issue of public policy[23]. There was widespread concern over the established system of poor relief, which provided assistance both to those too sick or too old to work and to those who were able to work but found it difficult or impossible to earn a living. Malthus applied his theory of population to this issue and argued that support for the poor would not in the long run improve their position in society. Because the provision of a minimum standard of living would encourage the poor to have more children, in the long run they would not be better off on an individual basis; there would simply be a larger number of poor people in society. In addition, the resulting increase of population would drive up the price of food and cause more workers to rely on poor relief:

> "They [the poor laws] may be said, therefore, to create the poor which they maintain; and as the provisions of the country must, in consequence of the increased population, be distributed to every man in smaller proportions, it is evident that the labour of those who are not supported by parish assistance will purchase a smaller quantity of provisions than before, and consequently more of them must be driven to apply for assistance." (Malthus 1803; 1992, p. 100.)

Malthus therefore recommended the abolition of the poor laws in order to increase the incentives of the able-bodied poor to provide for themselves through their own work. In this he received strong support from other prominent economists, in particular from his friend David Ricardo. According to Ricardo, "the comforts and well-being of the poor" cannot be secured without some effort of their own, especially to regulate the increase in their numbers. But, he argued,

[23] The history of thought regarding public policy towards the poor is discussed both more broadly and in more depth in Martin Ravallion's chapter in the present *Handbook*.

> "The operation of the system of poor laws has been directly contrary to this. They have rendered restraint superfluous, and have invited imprudence, by offering it a portion of the wages of prudence and industry.
>
> The nature of the evil points out the remedy. By gradually contracting the sphere of the poor laws; by impressing on the poor the value of independence, by teaching them that they must look not to systematic and casual charity, but to their own exertions for support, that prudence and forethought are neither unnecessary nor unprofitable virtues, we shall by degrees approach a sounder and more healthful state." (Ricardo 1817; 1951, p. 107.)

In a stark form the critique of the poor laws introduced a theme that was destined to become a major issue in the economic analysis of poverty and redistribution: The possible conflict between the objectives of justice (poor relief) and efficiency (labour supply). Later classical economists, in particular Nassau William Senior who was chairman of the 1832 Royal Commission on the poor laws, strongly recommended a reform of the system that ensured that poor relief would never be organized in such a way as to make it more attractive than to earn one's living by regular work.

Mill

John Stuart Mill is known as one of the most prominent spokesmen for the philosophy of utilitarianism, which he expounded in particular in his book *Utilitarianism* (1863). One might expect then that in his *Principles* he would use the utilitarian approach to evaluate income inequality, but this perspective is in fact absent from his analysis[24]. Like in the case of Adam Smith, we search in vain for a unified theoretical principle that can be used to evaluate income distribution from a normative point of view. On the other hand, there

[24] The last edition of the *Principles* that appeared during Mill's lifetime was the 7th, which came out in 1871. Thus, he clearly had the opportunity to use material from *Utilitarianism* for this purpose.

are numerous opportunities to gain insight into his views on distribution from his discussion of more specific issues.

On such issue is that of inheritance. Although Mill supports each individual's rights to the fruits of his own labour and property, he draws a line when it comes to income from inherited property. In a passage that may have been more controversial to his readers than he indicates (Mill 1848; 1965, p. 218), he writes that "although the right of bequest, or gift after death, forms part of the idea of private property, the right of inheritance, as distinguished from bequest, does not." He therefore supports restrictions regarding inheritance in the form of limits on how much an individual may be allowed to receive. His arguments for such restrictions run partly in the form of incentives: While restrictions on how much a parent is allow to leave to his children may weaken the parent's desire to accumulate wealth, this is outweighed by the adverse incentives to work and save that arise for children who receive large amounts of wealth that they have done nothing to deserve. But he also defends the proposed restrictions by its distributional consequences. If children's inheritance were to be limited to some maximum amount,

> "… the benefit would be great. Wealth which could no longer be employed in "over"-enriching a few, would either be devoted to objects of public usefulness, or if bestowed on individuals, would be distributed among a larger number." (Mill 1848: 1965, p. 226.)

According to Mill, therefore, there is a social benefit associated with a more even distribution of wealth[25].

Another issue is that of the most desirable form of taxation. In his chapter "On the General Principles of Taxation" (Mill 1848: 1965, Book V, Chapter II) Mill cites with approval Adam Smith's four maxims on taxation. After having

[25] A century later, Mill's recommendations were echoed by Meade (1964), who proposed progressive taxes both on wealth and inheritance for the purpose of achieving a more equal distribution of the ownership of property.

quoted them *in verbatim* he comments that while their meaning is mostly clear, the maxim that is concerned with equality in taxation (and which was cited above) requires further examination since it is concerned with a concept that is often imperfectly understood. He then states that the fundamental principle of equality in taxation is equality of sacrifice, which means "… apportioning the contribution of each person towards the expenses of government, so that he shall feel neither more nor less inconvenience from his share of the payment than every other person experiences from his." (P. 807). He then goes on to discuss the consequences of this general principle for the design of the income tax. Although expressing some sympathy for the idea of a graduated income tax, he concludes in favour of a linear tax in which e.g. the first 50 pounds of income is tax exempt while the excess income is taxed at a constant rate. He also recommends that saving be exempt from taxation, the main argument being that taxing the parts of income that are devoted to consumption and saving at the same rate involves a "double taxation of saving" and therefore a disincentive to saving and investment.

Mill's tax policy recommendations emerge as a compromise between the abstract idea of equal sacrifice and more ad hoc considerations, but it is difficult to see to what extent his conclusions can be derived from the philosophical principles of utilitarianism. In his book *Utilitarianism* (Mill 1863; 1969, p. 254-255) there is a brief discussion of alternative concepts of justice in taxation, but the text is rather inconclusive: Mill describes alternative points of view that give support to a head tax, a proportional tax or progressive taxation. He then states that "[f]rom these confusions there is no other mode of extrication than the utilitarian." However, he does not conclude as to the form of taxation that would follow from the application of utilitarian principles, and as we have seen this connection is not clear in his discussion in the *Principles* either.

It may seem surprising that John Stuart Mill, an intellectual known for his radical sympathies, should not have come out more strongly in favour of redistributive taxation. The main explanation is probably that he saw taxation as being of secondary importance in this regard in comparison to structural reforms aiming to expand the range of choice open to all layers of society. Such reforms would include better education for the lower classes, ending the restrictions on entry into various occupations as well the discrimination of women in the labour market. The latter issue was one that he considered to be of special importance. He wrote the influential book *On the Subjection of Women* (Mill 1869), and in the *Principles* he wrote:

> "Let women who prefer that occupation [as a wife and mother]; adopt it, but that there should be no option, no other *carrière* possible for the great majority of women, except in the humbler departments of life, is a flagrant social injustice." (Mill 1848: 1965, p. 765.)

It is notable that it was to take more than a century for the gender issue once again to make its appearance in the normative economics of inequality and income distribution.

3.2. The neoclassical economists: Efficiency and justice

With the emergence of marginalism and the neoclassical school of economic theory there began a more systematic exploration of the optimality properties of the market allocation of resources and in particular the relationship between on the one hand the efficiency of the market economy and on the other hand the distributive justice of its allocation of resources. In the long run perspective of the history of ideas the neoclassical interest in these issues may be seen as a desire to clarify Adam Smith's proposition that the invisible hand of the market led to a result that was in conformity with "the publick interest."

Walras

The three main protagonists of the marginalist revolution paid little attention to the role of the competitive market system in the determination of income distribution and even less to the ethical aspects of it. Among the three however, Léon Walras is notable for raising an issue that goes back to Adam Smith's theory of the invisible hand and the ability of the market mechanism to function in a way that is consistent with the public interest. Towards the end of his detailed analysis of exchange in a two-commodity world he wrote that

> "[the] exchange of two commodities for each other in a perfectly competitive market is an operation by which all holders of either one, or of both, of the two commodities can obtain the greatest possible satisfaction of their wants consistent with the condition that the two commodities are bought and sold at one and the same rate of exchange throughout the market." (Walras 1874-77; 1954, p. 143.)

The context makes it clear that Walras meant the conclusion to apply beyond the simple case of two commodities and pure exchange, so it must be understood as a more general characterization of a competitive economy.

The characterization can be read as a modernized version of Smith's statement about the invisible hand; however, it can be interpreted in two different ways. Several economists have taken the view that the expression "the greatest possible satisfaction of their wants" refers to the collective society of all individuals; according to this interpretation, Walras says that the competitive equilibrium generates the greatest possible satisfaction of wants for society as a whole. In this perspective, Walras comes out as a rather naïve apologetic for the free market system. The other interpretation is obviously that each individual can obtain the greatest possible satisfaction of wants *for himself.* There can in fact be no doubt that the second interpretation is the correct representation of Walras' position. On the one hand he insists that his

analytical description of the competitive market has no broader normative significance:

> "Though our description of free competition emphasizes the problem of utility, it leaves the question of justice entirely to one side." (Walras 1874-77; 1954, p. 257.)

On the other hand, he emphasizes the non-comparability of utility, so that he must have rejected the notion that there exists such a thing as wants satisfaction for society as a whole.

On the latter point, however, we have evidence that for Walras, at least in this case, old habits of thought died hard. In a letter to the German economist Wilhelm Launhard in 1885 Walras defends himself against the charge that he had maintained that competition necessarily led to maximum satisfaction for society as a whole. Suppose, he argues, that commodities can be sold at a low price to the poor and a high price to the rich. The rich would then have to give up some consumption of "superfluous" goods, while the poor would be better able to afford necessities. "Consequently, there would be a large increase in utility." (Jaffé 1965, Vol. II, p. 50.) Here, utility evidently refers to aggregate or social utility; hence, there is an assumption, contrary to the statement in the *Eléments*, that individual utilities can be compared and aggregated.

In addition to this lapse from theoretical consistency, the modern economist might also question Walras' use of the example of price discrimination for consumer goods to illustrate redistribution policy. Clearly, an example that would both be more striking and more realistic would be redistribution of *income* from the rich to the poor. The consequences in terms of the consumption of luxuries and necessities would be the same, and the connection with policies that were within the realm of the feasible would be much stronger.

In modern terminology, the conclusion to which Walras came close, although he did not manage to state it with great clarity, was that the market equilibrium was efficient although it did not necessarily result in a just distribution of resources and income. Although imperfectly formulated, this insight was a step forward in the understanding of the connection between the market mechanism as a system for efficient resource allocation and as a determinant of the distribution of income and welfare between individuals in society. The insight was to be further studied and clarified by the next generation of marginalist thinkers of whom the most important were Alfred Marshall and Walras' successor in Lausanne, Vilfredo Pareto.

Marshall

What were Marshall's views regarding the normative aspects of income distribution? In welfare economics, Marshall is chiefly remembered for his invention of the partial equilibrium concept of the social surplus (the sum of producers' and consumers' surplus) which can be measured as the area between the demand and marginal cost curves. Since this area achieves its maximum at the point of intersection between the two curves, i.e. at the competitive equilibrium, Marshall was able to conclude that

> "a position of (stable) equilibrium of demand and supply is a position also of *maximum satisfaction*." (Marshall 1890; 1920, p. 470.)

This is a conclusion very similar to that of Walras, although Marshall was more careful in qualifying it so as to avoid misunderstandings. It is obvious that he meant the conclusion to apply beyond the simple case of an individual commodity to the general equilibrium of demand and supply, including the markets for the factors of production. And although the term maximum satisfaction was meant to apply to society as a whole, Marshall emphasizes that it is an aggregate measure which is built on the assumption that

> "all differences in wealth between the different parties concerned may be neglected, and that the satisfaction which is rated at a shilling by any one of them, may be taken as equal to one that is rated at a shilling by any other." (Marshall 1890; 1920, p. 471.)

He then argues that if e.g. it were the case that the producers as a class were much poorer than the consumers, "aggregate satisfaction" might be increased by a restriction of supply that would, assuming demand to be inelastic, increase the income of the producers. The terminology here is apt to be confusing, since it seems strange to argue that aggregate satisfaction can be increased by moving away from a position of maximum satisfaction. But quite apart from the terminology, the underlying argument is clearly based on the utilitarian assumption of decreasing marginal utility:

> "It is in fact only a special case of the broad proposition that the aggregate satisfaction can *primâ facie* be increased by the distribution, whether voluntarily or compulsorily, of some of the property of the rich among the poor." (Marshall 1890; 1920, p. 471-472.)

In his concluding chapter on "Progress in relation to the standards of life" he becomes at the same time more explicit and more cautious regarding the desirability of less inequality:

> "The drift of economic science during many generations has been with increasing force towards the belief that there is no real necessity, and therefore no moral justification for extreme poverty side by side with great wealth. The inequalities of wealth though less than they are often represented to be, are a serious flaw in our economic organization. Any diminution of them which can be attained by means that would not sap the springs of free initiative and strength of character, and would not therefore materially check the growth of the national dividend, would seem to be a clear social gain." (Marshall 1890; 1920, p. 713-714.)

This is a forceful expression of the view that excessive inequality is a social evil, and one notes also Marshall's claim that this moral judgment can claim the support of economic science. On the other hand, the desirability of a move towards increased equality must take account of the possibility that it might weaken productivity and economic incentives, a point of view that would become a cornerstone in the analysis of welfare state policies that was to occupy the work of many economists in the coming generations.

What would be the means that could be used to achieve reduced inequality? On this topic Marshall's *Principles* has less to contribute. There is the emphasis on education as a means of improving one's position in society but little attention to the possibility of compulsory redistribution that he alludes to. Foremost among the instruments of such redistribution is taxation, but there is hardly any systematic discussion of the principles of taxation in Marshall's book, and what mention there is, is mostly incidental and for the most part relegated to footnotes or appendices. This is in marked contrast to the treatises of Smith, Ricardo and Mill, in which issues of taxation (as well as public expenditure) occupied a major part of their presentation of the principles of economics. A possible explanation of this neglect on the part of Marshall is that he initially saw his *Principles* as the first of a work in two volumes, where the second volume was to contain the application of theory to several areas of economic policy; a sketch of the proposed contents of Volume 2 dated in October 1887 lists "Taxation" as one of six such areas, while in 1903 "Public finance" had become one of nine areas. When his *Industry and Trade* was finally published in 1919 these topics were no longer parts of the content of the book[26].

J. B. Clark

[26] An interesting study of Marshall's plans for a second – and a third and possibly a fourth – volume of the *Principles* is Whitaker (1990).

John Bates Clark was a pioneer of the modern marginalist thinking in the United States who introduced the concepts of marginal productivity and marginal utility both in academic and more popular writings. But his 1899 book *The Distribution of Wealth*, has become less known for its restatement of marginal productivity theory (which is its main focus) than for what Stigler (1941) refers to as its "naïve productivity ethics." In Clark's view, the equality between factor prices and marginal value productivity was not just a descriptive theory of how the market worked; it was also the manifestation of a natural law. This view is expressed already on the first page of the preface:

> "It is the purpose of this work to show that the distribution of the income of society is controlled by a natural law, and that this law, if it worked without friction, would give to every agent of production the amount of wealth which that agent creates." (Clark 1899, p. v.)

This statement may be read simply as a characterization of factor market equilibrium under perfect competition although it raises the issue of how an agent's marginal productivity can be identified with "what he creates". Clark maintained that this problem was less complex than many people thought, for it was essentially of the same nature as that which arose in a simple frontier society:

> "In particular, it is necessary to know that the primitive law which puts a man face to face with nature and makes him dependent on what he personally can make her yield to him is still, in essence, the law of the most complex economy." (Clark 1899, p. 37.)

A further and crucial issue is whether the distribution that results from the operation of the law is just. On this point there is a certain ambivalence in Clark's exposition. On the one hand he says that this question lies outside his enquiry, "for it is a matter of pure ethics" (p. 8). On the other hand, he argues that what he creates belongs to the agent by right, and that nobody can

complain if he is paid according to what he creates. The competitive distribution of income is therefore both fair and consistent with social stability, for if some agents are paid less than what they create

> "there would be at the foundation of the social structure an explosive element which sooner or later would destroy it." (Clark 1899, p. 9.)

Although most modern economists will no doubt find Clark's "productivity ethics" unconvincing, there are also elements in his thought that have been taken up by others. The most obvious parallel is the analysis by the philosopher Robert Nozick in his book *Anarchy, State, and Utopia* (Nozick 1974). Nozick's basic idea is what he calls the entitlement theory of distributive justice. Any distribution that reflects an acquisition of income or wealth that is considered to be fair, i.e. to have been fairly acquired according to certain axiomatic criteria, is just. Moreover, given such a distribution, there is no case for public redistribution of income. Although it is not linked to the marginal productivity theory of income distribution, Nozick's theory evidently has some elements in common with the ideas of Clark.

Pareto

We have already encountered Pareto as an empirical researcher on income distribution. Although his influence in that area was significant, his contribution to welfare economics was more fundamental and of more lasting significance. It had important consequences for the way that economists thought about normative issues, including their views on income redistribution as a goal of economic policy.

The starting point for Pareto's welfare economics was his study of utility and demand. Arguing in his *Manual of Political Economy* that only an ordinal concept of utility was required as a foundation for the study of consumers'

demand[27], he went on to point out that this concept of utility did not lend itself to interpersonal comparisons:

> "The utility, or its index, for one individual, and the utility, or its index, for another individual, are heterogeneous quantities. We can neither add them together nor compare them … A sum of utility enjoyed by different individuals does not exist; it is an expression which has no meaning." (Pareto 1909; 1971, p. 192.)

From this it would seem to follow that the search for a criterion of aggregate utility or welfare would be in vain. However, Pareto went on to introduce his own criterion of social welfare or efficiency that we now call Pareto optimality:

> "We will say that the members of a collectivity enjoy *maximum utility* 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 utility enjoyed by each of the individuals of that collectivity increases." (Pareto 1909; 1971, p. 261.)

"Maximum utility" was clearly not a good name for this concept since it suggested precisely the type of aggregation that Pareto sought to avoid, but he may be excused for not inventing the term "Pareto optimality".

Pareto showed that a competitive equilibrium satisfied the conditions for optimality in this sense. From the assumption of incomparability it followed that his optimality criterion was unable to judge the welfare effects of a redistribution of income that led to diminished incomes for the rich and increased incomes for the poor because this would make the rich enjoy less utility and the poor more. If the economy were to find itself in a competitive

[27] In order to distinguish this concept from that of cardinal utility, he even coined a new word, ophelimity (*ophélimité*) to represent it – a word that never caught on. In the quotations that follow, I have substituted "utility" for Pareto's "ophelimity".

equilibrium both before and after the redistribution of income, both states of the economy would satisfy the conditions for Pareto optimality, but the optimality criterion would not be able to rank the two situations relative to each other. Judgments about income distribution and redistribution in terms of justice or fairness should, according to this view, be regarded as occupying a position outside the field of economics as a scientific discipline. Although this interpretation is not very explicit in Pareto's own work, it became a central proposition in the further elaboration of Paretian welfare economics that was carried out by a number of 20th century economists. But the acceptance of Pareto optimality as an important concept of welfare economics took a long time. As late as 1947 Paul Samuelson, after having presented the definition of Pareto optimality, could write that "it has not yet received attention from economists commensurate with the importance which he [Pareto] attached to it." (Samuelson 1947, p. 212.)

3.3. Utilitarianism and the economics of redistribution

The insistence by Walras and even more strongly by Pareto on the subjective nature of utility might have been expected to lead to the total banishment of utilitarian philosophy from the normative analysis of income distribution. However, this did not happen. There were several reasons for this. One is that the work of Walras and especially Pareto did not become widely known in the international community of economists until well into the 20th century. Another was that utilitarianism continued to hold a strong attraction for economists in search of a philosophical foundation for their egalitarian convictions and for the design of redistributive policy, particularly in the tax field.

Maximizing the sum of utilities

A good example of such an economist is Francis Ysidro Edgeworth. He adopted the view of the older utilitarians that social welfare should be seen as the sum of individual utilities but was critical of the use that they made of it, pointing out that it was difficult to see, in the absence of mathematical formalization, how their conclusions followed from their ethical premises. In his book *New and Old Methods of Ethics* (1877) he built on the analogy with the Weber-Fechner Law in psychology, which stated that the perception of a sensual stimulus increases less than proportionally with the strength of the stimulus, to argue that utility must increase less than proportionally with income. From this he drew strong conclusions for the socially optimal distribution of income. In the case of a given total income to be divided between all members of society the optimal distribution would be one of complete equality, assuming that all individuals had the same utility function of income. He also analyzed the case of variable work effort and found that under certain assumptions those with the greatest capacity should do the most work.

A related approach was that of Pigou. In his *Economics of Welfare* (1920) he used an explicit utilitarian argument – although without reference to the Weber-Fechner Law - to argue in favour of redistribution of income from the rich to the poor:

> "… it is evident that any transference of income from a relatively rich man to a relatively poor man of similar temperament, since it enables more intense wants to be satisfied at the expense of less intense wants, must increase the aggregate sum of satisfaction. The old "law of diminishing [marginal] utility" thus leads securely to the proposition: Any cause which increases the absolute share of real income in the hands of the poor, provided that it does not lead to a contraction in the size of the national dividend from any point of view, will, in general, increase economic welfare." (Pigou 1920; 1932, p. 89.)

In other words, it is assumed that there exists a utility function of income that is concave and the same for everybody. In the following pages the proviso of "similar temperament" is spelled out further. Pigou admits that under existing social conditions a rich man may in fact be able to produce more utility from any given amount of income than a poor man. But this advantage has come about through past inequalities of income and the standard of living and cannot therefore be used to argue against income equalization: In the long run the poor who experience increased incomes will be as able as the current rich to generate utility from their income. The last part of the quotation introduces an important qualification: Policies that aim to redistribute income from the rich to the poor may have an adverse effect on incentives, in particular on the incentives to work and save. This may lead to a reduction of the national dividend or national income so that there will be less income available for distribution.

In analytical terms we might restate this argument as saying that if there are no incentive effects of redistribution it should be carried to the point where the marginal utility of income is the same for all; in the case of identical tastes this would imply complete equalization of incomes, as in the analysis of Edgeworth. If incentive effects are present, the optimal amount of redistribution would stop short of this point, with the gap between the marginal utility of income between rich and poor determined by the strength of the incentive effects.

Critique of utilitarianism

The assumptions of identical utility functions, decreasing marginal utility and interpersonal comparability of utility all became the subject of critical scrutiny as Pareto's work on demand theory and welfare economics became more widely known. Since these assumptions had been shown to be unnecessary for the study of consumer demand they were also held to be inappropriate for

making welfare judgments. Justifications of income redistribution such as that advanced by Pigou gradually came to be viewed as non-scientific and simply subjective expressions of one's personal taste for income equality. On the desirability of redistribution, economics as a science would have to remain silent. This view was particularly forcefully put in the influential book by Lionel Robbins (1932).

Robbins' influence is clearly discernible in the New Welfare Economics that was developed by several writers during the 1930s and '40s. In the reformulation of welfare theory by Bergson (1938) and Samuelson (1947) a crucial role was played by the social welfare function that depicted social welfare as an increasing function of individual utility levels, represented by ordinal utility functions. The conditions for social welfare maximization could then be stated as two set of conditions. One set described the conditions for Pareto optimal allocation of factors of production and consumer goods, while the other represented the conditions for optimal distribution of goods between consumers – i.e. optimal income distribution – as requiring equality of the social marginal utility of income between individuals[28]. While the new formulation made clear the distinction between welfare judgments related to efficiency on the one hand and distributive justice on the other, the generality of the conditions that Samuelson (1947) referred to as the interpersonal optimal conditions was such that it became virtually impossible to draw any conclusion regarding the socially desirable form of income redistribution. At the most general level of analysis, the only conclusion that could be drawn from the analysis was that the desirable extent of redistribution was determined by one's ethical beliefs. Regarding the *form* of redistribution, however, the analysis had rather strong implications: In order to achieve a full optimum of social welfare, redistribution ought to be carried out by means of

[28] Pareto optimality is a necessary but not sufficient condition for a maximum of an individualistic social welfare function.

instruments that did not lead to violation of the efficiency conditions. The only instruments that could achieve this were individualized lump sum taxes and transfers (although some economists, e.g. Hotelling (1938), implicitly assumed that the income tax was at least approximately equivalent to lump sum taxation).

A comeback for utilitarianism

While the new welfare economics helped to clarify the relationship between economists' statements regarding efficiency and distributive justice, one might still ask whether the representatives of the new approach went too far in their rejection of the old welfare economics which was based on a cardinal definition of utility and interpersonal utility comparisons. This view has been argued by Cooter and Rappoport (1984), who maintain that the concepts of utility used by the post-Pareto ordinalist school and the older economists whom they refer to as the material welfare school were fundamentally different. The concept of utility employed by the material welfare school was not intended to represent the individual's tastes but his needs, and these needs were assumed to be objectively observable as for instance in the form of physical fitness. To use this concept for interpersonal comparisons did not involve a comparison of subjective preferences but of empirically observable standards of living. The consumption goods that were bought using the individual's income were used to produce his standard of living, but like other factors of production the goods obeyed the law of diminishing returns, which in this case was translated into the concept of diminishing marginal utility of income. It was this concept of utility that was used by economists like Edgeworth[29] and Pigou to justify the recommendation of transfers to the poor and progressive taxation. The concreteness of the concept is well brought out

[29] Samuelson (1947, p. 206) says that «to a man like Edgeworth, steeped as he was in the Utilitarian tradition, individual utility – nay social utility – was as real as his morning jam.»

in Hugh Dalton's (1920) comment on Jevons' (1871) discovery[30] of the law of diminishing marginal utility.

> "From this law a practical conclusion of the greatest importance follows, namely, the extreme wastefulness from the point of view of economic welfare of large inequalities of income. It is obvious to the modern economist that, from this point of view, a considerable equalization of incomes is desirable, provided that production is not checked thereby. But before Jevons wrote, this was by no means obvious, or at any rate it was not widely perceived." (Dalton 1920, p. 90.)

Dalton's use of the word "wastefulness" is suggestive. In the new welfare economics framework this term would be meaningless, but in the approach taken by the material welfare school it has a concrete interpretation in terms of a smaller quantity of aggregate welfare which is due to the inequality of income. Given the way that income is distributed, it produces a smaller amount of material welfare or standard of living than that which would result from a more equal distribution.

A new justification for the utilitarian social welfare function arose in the early post-war period. It started with an article by William Vickrey (1945) which was apparently concerned with the possibility of measuring the marginal utility of income on the basis of the von Neumann-Morgenstern expected utility hypothesis. But in the middle of the article Vickrey changed his focus to that of discussing the question of the socially optimal distribution of income. His approach is nicely summed up in the following statement:

[30] Jevons was in fact not the first to formulate this principle. As he was later to acknowledge, Gossen (1854) had done so before him. Even earlier, although in a different context, the principle had been formulated by Bernoulli (1738). For references and further discussion see Sandmo (2011).

> "If utility is defined as that quantity the mathematical expectation of which is maximized by an individual making choices involving risk, then to maximize the aggregate of such utility over the population is equivalent to choosing that distribution of income which such an individual would select were he asked which of various variants of the economy he would like to become a member of, assuming that once he selects a given economy with a given distribution of income he has an equal chance of landing in the shoes of each member of it." (Vickrey 1945, p. 329.)

The idea was developed further by several writers, including Marcus Fleming (1952) and John Harsanyi (1955b), neither of whom, however, referred to Vickrey's work. Harsanyi's article in particular showed how a utilitarian social welfare function, additive in individual utilities, could be derived from a set of axioms governing individual and social welfare judgments. Using this approach, one could go back to the issue raised by the earlier utilitarian economists and ask which distribution of a given amount of income would maximize social welfare. If social welfare can be expressed as an unweighted sum of individual utility functions, and if these functions are concave (representing risk averse attitudes), the answer would once again be that the optimal distribution would be one of complete equality.

This implication was not emphasized by Harsanyi whose interests centered on the logical foundations for this particular social welfare function, not in its implications for social organization and economic policy. Vickrey on the other hand developed these implications in some detail, pointing out both the optimality of equal distribution if total income could be taken as fixed and the qualifications needed when one takes account of the objection that the total amount of income cannot in practice be taken as independent of the way it is

distributed.[31] Therefore, he argued, "some degree of inequality is needed in order to provide the required incentives and stimuli to efficient cooperation of individuals in the production process." (Vickrey 1945, p. 329). From this observation he proceeded to an attempt to determine the welfare maximizing amount of redistribution by calculating an optimal income tax function using the calculus of variations. He succeeded in deriving the Euler equation for this problem but concluded that "even in this simplified form the problem resists any facile solution." (Vickrey 1945, p. 331.)

There is a direct line from Vickrey's analysis to the modern theory of optimal income taxation as pioneered by James Mirrlees (1971). Mirrlees also adopted the utilitarian assumption of social welfare as the sum of individual utility functions (which he also assumed to be identical) but without the choice theoretic foundation adopted by Vickrey and Harsanyi; it is also notable that he does not refer to Vickrey's 1945 article. In the Mirrlees model individual utility functions depend on consumption (or income) and leisure. Lump sum taxation is ruled out as infeasible, and redistribution has to be carried out by means of a non-linear income tax that distorts the choice between leisure and consumption. The shape of the optimal income tax function accordingly has to reflect the tradeoff between equality and efficiency. By adopting some additional assumptions relative to Vickrey's model Mirrlees was in fact able to characterize the optimal income tax function, although in rather general terms. More specific results were derived by a simulation analysis of special cases. A surprising feature of the optimal tax schedule that emerged from these numerical experiments was that although the average tax rate was increasing in income, the marginal tax rate tended to stay approximately constant and if

[31] Vickrey's argument is strongly reminiscent of that of Pigou in the *Economics of Welfare*, but he makes no reference to Pigou or any of the other early utilitarian economists.

anything showed a tendency to decline with income.[32] Mirrlees' contribution has led to a long line of refinements and extensions of his analysis, including a critical examination of the utilitarian foundations of the social welfare function. In the 1970s the book by the philosopher John Rawls (1972) created a great deal of interest among economists who were interested in public policy analysis, and Rawls' "maxi-min" criterion by which the welfare criterion to be maximized is the utility of the least fortunate person in society, was applied to the problem of optimal income taxation by Atkinson (1973). His numerical results indicated that with this criterion the marginal tax rates and the degree of progression were likely to be considerably higher than in the case considered by Mirrlees.

As an aside, it may be noted that a different argument for low marginal tax rates had earlier been discussed by Ragnar Frisch in an article published in Norwegian (Frisch 1948). Frisch based his argument on the distinction between what he called the internal and external marginal productivity of labour. The external marginal productivity in a particular sector refers to the effect on output in other sectors which is not taken into account in the employment decision. Frisch believed that this effect as a rule was positive, so that work effort tended to be too low in a market economy. This might call for a negative marginal tax rate[33] which, however, was not practically feasible, "at least not at the present time." Instead he suggested a zero marginal tax rate on the part of income that was directly related to effort, while the remainder of the individual's income could be taxed according to a progressive scale.

3.4. Sacrifice and benefit theories

[32] Later work by several economists demonstrated that under certain assumptions the optimal marginal rate of income tax at the top of the income schedule should be equal to zero. For an interpretation of this result and further references see e.g. Sandmo (1999).
[33] Or in other words a Pigouvian subsidy to work effort, although Frisch does not use this terminology.

There are other ways to analyze the normative problems of redistribution than via social welfare maximization, and in this section we consider two of these. Equal sacrifice theories caught the attention of economists around the end of the 19th century and were for a time influential in policy debates. Benefit theories of taxation whereby taxes are seen as payment for benefits received from the state have traditionally had a strong appeal to those who look for fairness in the relationship between the individual and the state.

Equal sacrifice

The utilitarian approach to income distribution and taxation is sometimes referred to as an equal sacrifice theory. In the simple case which forms the starting point for the utilitarian analysis, pre-tax incomes are given and the government aims to collect a given amount of revenue by using individualized lump sum taxes to maximize the sum of identical and concave utility functions of income. The resulting optimal distribution of after-tax incomes is one of complete equality of income where the marginal utility of income is the same for all. The solution represent a minimum of aggregate sacrifice, since the outcome with equal marginal utilities of income is the maximum of total utility that can be obtained relative to the tax revenue that is to be collected. It is a solution of equal sacrifice between persons only in the sense of equal *marginal* sacrifice: The sacrifice of the last dollar paid in taxes is the same for all.

It might be expected that some economists who thought about the just distribution of the tax burden should come to think that this notion of equal sacrifice had limited appeal. In the case of substantial inequality of pre-tax incomes, the loss of utility from going from the pre-tax to the after-tax situation will obviously differ between individuals, and if one thinks that this is unjust it is natural to look for some alternative notion of equal sacrifice that could be applied to such non-marginal changes in the distribution of income. This led to the development of equal sacrifice theories in the more specific

sense, and in particular the theories of equal absolute and equal proportional sacrifice; theories that were first discussed analytically by Cohen-Stuart (1889) and Edgeworth (1897). The criterion of equal absolute sacrifice)[34] can be formalized as

$$U(Y)-U(Y-T)=k.$$

Here Y is pre-tax income and T is the amount of tax, while k is a constant that is the same for all taxpayers[35], so that the sacrifice of utility that results from taxation is the same for all individuals. To see how the amount of tax varies with income according to this principle, one may take the derivative of the left-hand side of the equation with respect to Y, treating T as a function of Y. Solving for the marginal tax rate, we obtain

$$dT/dY=[U'(Y-T)-U'(Y)]/U'(Y-T).$$

One sees immediately that the assumption of decreasing marginal utility of income implies that the marginal tax rate is positive, but the assumption does not take us any further in supplying an argument for progressive taxation. In order to study the implications for progressivity, one can use the result to derive the elasticity of income after tax with respect to income before tax. For progressivity this should be less than one, but whether this is the case or not turns out to depend on whether the elasticity of the marginal utility of income is less than or greater than minus one. For the logarithmic function, where the elasticity is just minus one, equal sacrifice in this sense implies proportional rather than progressive taxation, as pointed out by Samuelson (1947, p. 227). From the point of view of the history of public finance, this conclusion is of

[34] The central contributions of Cohen-Stuart and Edgeworth have been reprinted in Musgrave and Peacock (1958). The criterion of equal relative or proportional sacrifice, whereby the difference in utility levels is related to the before tax utility level, leads to slightly different conditions for progressive taxation but does not raise any new issues of principle. See Musgrave (1959, p. 96).

[35] k must reflect the government's revenue requirement, so that T is higher, the higher is k.

particular interest, since it was for some time widely believed that the principle of equal sacrifice combined with the assumption of decreasing marginal utility of income was sufficient to justify progressive taxation[36].

Although the principle of equal sacrifice may have some appeal to economic intuition, the main reason that it has disappeared from the modern discussion of optimal redistribution must be that its assumptions are difficult to reconcile with the maximization of a social welfare function. From that perspective, the straightforward utilitarian approach is much more appealing. In addition, the equal sacrifice theory lends itself less easily to generalizations incorporating variable labour supply and the second best considerations introduced by the work of Mirrlees and others into the utilitarian framework. From this point of view, the equal sacrifice theory of income redistribution proved to be a sidetrack[37].

The benefit principle of taxation

The utilitarian and related approaches to the issue of optimal income distribution considered the question of the just or fair distribution of income in isolation from the distributive effects of public expenditure. In the older literature, we have seen that Adam Smith recommended that the contributions of taxpayers should be in proportion to "the revenue which they respectively enjoy under the protection of the state," and one interpretation of this rule is that taxes should be levied so as to correspond to the benefits that people received from the activities of the state. However, the further elaboration of the benefit principle of taxation mainly took place in the writings of a number

[36] Cohen-Stuart (1889; 1958) surveys a number of earlier studies of this issue by German and Dutch writers who claimed that progressive taxation could be rationalized along these lines. See also the book by Blum and Kalven (1953) which surveys both economic and legal discussions of tax progressivity with emphasis on the arguments derived from equal sacrifice theories..

[37] Or, as put by Edgeworth (1897, p. 566): "… whatever view we take of the relation of the principle of like sacrifice to pure utilitarianism, the sphere of its action independently of that supreme principle appears to be insignificant."

of continental European economists during the late 19th and early 20th centuries. Two different types of claims were made for the implementation of the benefit principle of taxation. The first was that taxes levied on individuals according to the benefits that they received from the provision of public goods would somehow establish a price system for public goods or publicly provided goods that would correspond to competitive prices for private goods with similar efficiency properties. This idea suffers from the weakness that at least for public goods in the proper sense these prices do not provide individuals with the incentives to reveal their true preferences so that they cannot fill the functions of the price mechanism in the private goods part of the economy. The second claim, which is the one that is relevant for the normative analysis of redistribution policy, is that the benefit principle represents justice in taxation and that it therefore is important for normative judgments about income distribution in a mixed economy. The best known statement of this position is that of Knut Wicksell (1896)[38].

The concept of just taxation as used by Wicksell is quite different from that employed by economists in the utilitarian tradition. Wicksell sees the relationship between government and citizens as basically one of exchange, and one that should be carried out on terms that are fair. The starting point for his argument is that no public project should be carried out unless society's aggregate willingness to pay is at least as high as its costs. Given that this condition is satisfied, it ought to be possible to distribute the costs in such a manner that every citizen makes a gain from the exchange, and this is the principle of justice in taxation: "No-one can complain if he secures a benefit which he himself considers to be (greater or at least) as great as the price he has to pay." (Wicksell 1896; 1958, p. 79.) From this he drew the conclusion that any political proposal about public projects should be voted on as a

[38] The collection of translations edited by Musgrave and Peacock (1958) contains many of the most important contributions to this line of analysis by German, Italian and Swedish economists, including a central extract from Wicksell's book.

balanced budget tax-expenditure "package", and that it should only be passed on the basis of a unanimous vote.

It may seem surprising that Wicksell with his reputation for political radicalism should favour a system that seems to exclude the possibility of income redistribution through the public budget. It is at this point that one has to keep his peculiar definition of "just taxation" in mind. Wicksell says explicitly that the principle does not take account of distributional issues. Given the distribution of income in society, Wicksell's principle, as described here, does nothing more than assure that the adoption of any new public project does not harm any citizen.[39] He also emphasizes that this principle, if adopted in the Swedish society of his own time, would be in the interests of the lower classes who in his view were exploited by the higher income groups to contribute to the financing of public projects that involved little or no benefit to themselves.

However, Wicksell recognized that for this principle to be fully convincing both from an economic and ethical point of view, it would have to be embedded in a broader framework of distributive justice: "It is clear that justice in taxation tacitly presupposes justice in the existing distribution of property and income." (Wicksell 1896; 1958, p. 108.) On this broader concept of justice, however, he has actually little to say, although he emphasizes that too much redistribution may harm the upper classes in a way that is harmful to society as a whole, since these classes "undeniably include a significant share of a nation's intelligence and economic initiative." (Wicksell 1896; 1958, p. 117.)

Wicksell's analysis was followed up by his countryman Erik Lindahl whose monograph on the theory of taxation introduced the concept which later came

[39] Wicksell later modified the unanimity requirement so as to apply to groups rather than individuals.

to be known as Lindahl prices (Lindahl 1919). In a later article he discussed in more detail the argument that the benefit principle had a claim to be considered a standard of justice in taxation. Here, on the one hand, he emphasized the broader concept of distributive justice in which the benefit principle had to be embedded[40]:

> "… justice in taxation is inextricably linked with justice in the distribution of property, since it would obviously be nonsense to speak of "a just portion of an unjust whole."" (Lindahl 1928; 1958, p. 227.)

On the other hand, Lindahl also argued that there did not necessarily exist any contradiction between the principles of benefit and ability to pay, since ability to pay could often be taken as a good indication of the benefit derived from public expenditure. On this point, Lindahl's argument is reminiscent of Adam Smith's first maxim of taxation which indicated that it would be possible for taxation simultaneously to reflect both the individual taxpayers' ability to pay and the benefits that they received under the protection of the state.

4. Concluding reflections

A chapter of the history of economic thought regarding income distribution theories does not lend itself easily to a summary in the way of a few main conclusions. Looking back on a two hundred years long history, however, it does induce one to offer a few general reflections on the nature of the field and its development. Below, accordingly, I make a few remarks on two general issues. The first concerns the relationship of economic theory to empirical evidence, in particular before the time when econometrics was established as the main framework for empirical study. The second set of remarks relates to

[40] The term "property" should here be interpreted in a broad sense as including all individual economic resources, including income.

Ricardo's characterization of income distribution as the principal problem of economics: Does the history of economic thought confirm his view of the importance of the subject?

Theory and evidence

The present chapter has been primarily an account of *theories* of income distribution; to include also the statistical and empirical work that has been done over the two centuries covered by the survey would be impossible within the confines of a single article. However, a brief discussion may be in order regarding the connection between theoretical and empirical work during the period. Thus, an interesting question to consider is to what extent the theorists of income distribution were aware of and were influenced by the empirical work that was undertaken at about the same time. In particular, the 19th century witnessed the growth of official statistics covering both the development of national income and its distribution.

The questions of awareness and influence are very general, and it is not easy to provide clear and simple answers. One reason for this is that the influence of empirical knowledge on economic theorists may have been rather indirect; some characteristics of the real economy may have been considered to be common knowledge, so that theorists saw no need to provide exact documentation. But one should realize that there was not always agreement about what that supposedly common knowledge actually was. A case in point is John Stuart Mill's disagreement with Adam Smith regarding the structure of wages. As we have seen, Smith believed that labour market competition would ensure that occupational wage rates would tend to compensate for non-economic advantages and disadvantages, whereas Mill claimed that quite to the contrary, wage differentials reinforced the inequalities arising from different working conditions. In the 18th century empirical data on this issue were presumably hard to come by; nevertheless, Smith does refer to empirical

observations in support of his hypothesis, although by modern standards these references are both incomplete and unsystematic. By the middle of the next century, however, the situation had changed and it would have been possible for Mill to provide if not direct evidence at least some empirical illustrations that could throw light on this matter and more generally on the distribution of income. But he obviously felt no need to do this. Well into the next century, Hicks (1932) wrote about the effects of competition on the structure of wages with hardly any reference to empirical relationships. In fact, the only instance in which he does refer to empirical evidence is where he cites data for wages of agricultural labourers in Lancashire in 1794, showing how they vary with the distance to the nearest manufacturing centre[41].

To blame the economists of the 18th and 19th centuries for not supplying formal statistical tests of their theories would of course be pointless, since at that time econometrics was not even in its infancy (see Morgan 1990). What one might nevertheless have expected was a greater interest in drawing on data that could illustrate the importance and relevance of theoretical reasoning.

From this point of view, a more striking instance of the lack of connection between theoretical and empirical work is Knut Wicksell's belief that real wages had not risen significantly over the past two centuries, as seen from the perspective of 1901. At that time there had actually accumulated a large amount of statistical data documenting the significant rise in real wages during the 19th century in countries such as Germany, Italy, Great Britain and the United States (see e.g. Bresciani-Turroni 1939) as well as the Scandinavian countries. The data for Germany were particularly extensive and at Wicksell's time had been used in academic studies by several German economists. Wicksell read (and wrote) German, but for whatever reason this work had little or no influence on his own thinking. If he had utilized it, he would have seen

[41] These data were drawn from Redford (1926).

that his belief was firmly rejected by the empirical evidence[42]. But at least on this particular issue, he must have felt no need to confront his theoretical conclusions with statistical evidence[43].

The history of the interaction – or lack of it – between theorists and empirical researchers in the study of income distribution is a large topic in itself which cannot be surveyed here, particularly since it cannot be separated from the broader issue of the connection between theoretical and empirical research in economics more generally. The present examples of the lack of such a connection should simply be taken as an indication that at least in the pre-econometric age there were sometimes large gaps between theoretical and empirical insights.

The principal problem of political economy?

Towards the end of this review of the development of theories of income distribution, it is natural to reconsider the quotation from Ricardo with which we began. Is Ricardo's view reflected in the actual importance that the theory of income distribution has had in the history of economics? It may well have been true that Ricardo in this way expressed his conviction of the nature of economics, but his vision must be interpreted in light of the state of the science at the time in which he lived as well as the nature of society. To a modern economist, the proposition that the functional distribution of income between workers, capitalists and landowners should be considered the most important problem in economics will hardly be a convincing one. One of the reasons why Ricardo gave such emphatic priority to the problem may have been a

[42] In the case of Sweden, later economic historians have found that real wages increased at an annual rate of more than two per cent during the period 1860-1895 (Phelps Brown and Browne 1968). Although these particular statistics were not available to Wicksell, it is hard to imagine that this growth was not noticeable for people living at the time.

[43] Wicksell must also have known several economists and statisticians who had personal experience of the empirical work. Thus, he had extensive contacts with Norwegian economists, among whom was Anders Nicolai Kiær who was an acknowledged expert on income and wealth statistics.

conviction that the analysis of this issue also went far to explain the personal distribution in a society with a modest degree of mobility between social and economic classes. Another reason may have been that he did not see the economic theory of his day as providing a set of analytical tools and concepts that would be useful in a more disaggregated analysis of the personal distribution of income.

All this has of course changed. With the marginalist revolution of the late nineteenth century, economists acquired a set of theoretical tools that gradually came to improve their opportunities for analysis of both the positive and normative aspects of income distribution. But to what extent did they exploit these opportunities? When one reads the contributions of the early marginalists it becomes obvious that they applied their new theories mainly to the explanation of price formation in the market for commodities and less so in the markets for factors of production. When the general equilibrium followers of Walras put the finishing touches to the neoclassical theory of competitive markets, commodities and factors were treated symmetrically with the result that less attention was given to the special features of the markets for labour, capital and natural resources. Labour economics was for a long time considered to be a field on the outskirts of theory-based economics, and the literature on financial markets paid little or no attention – and continues to pay little or no attention - to the study of the personal distribution of income and wealth. Only in recent decades has formal economic theory begun to catch up on its neglect of the determination of income distribution. But this neglect is still visible in the allocation of space in introductory textbooks and books on microeconomic theory.

These remarks pertain in particular to the positive economics of income distribution. But the attention to normative issues has fluctuated even more. Questions of distributive justice were certainly discussed by the classical economists but without the benefit of a formal theoretical structure. With the

breakthrough of marginal utility theory the situation changed, and many economists saw no objection to utilizing the hypothesis of decreasing marginal utility both to explain consumer demand and to justify the utilitarian argument in favour of income equality. This approach suffered a setback in the early nineteenth century with the adoption of ordinalism and the ideas of a value-free science. Later on it once again became accepted that welfare economics could make an important contribution in clarifying the borderline between statements of facts and values, while since the 1960s, as Atkinson (2001) has pointed out, many modern textbooks seem to have adopted the view that the basic elements of welfare economics do not form a central part of the training of the modern economist. In regard to the theory of income distribution, many economists seem be held back from a discussion of distributive justice presumably because it will lead them into areas where they have to confront issues that are of an ethical or philosophical nature.[44]

The desirable awareness of the relationship between positive and normative approaches to issues of income distribution may also be promoted through better knowledge of the history of thought in the area. Here there is definitely room for improvement. History provides many examples of how new theories have been formulated without apparent awareness of the work of earlier economists. As an example, the modern theory of optimal income taxation could probably have been developed and presented with a broader appeal to the general economics profession if it had been set in the context of the work by earlier utilitarian economists such as Edgeworth and Pigou. It is undeniable that economics has many of the features of a cumulative science in which new theories replace old ones because of their higher explanatory power or because they lead to better insights in the problems that arise in the design of economic policy. But even a cumulative science can benefit from awareness of its roots.

[44] A reviewer of my book on the history of economic thought (Sandmo 2011) wrote that «I hate the word social justice because I do not know what it means.»

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