even though expenditure programs have been authorized previously by congressional legislation. As will be seen later, this limitation has interfered with efficient conduct of public debt operations.[21]

H. CONCLUSION

This review of federal fiscal institutions, sketchy though it is, suffices to show that the fiscal machinery is highly complex and slow-moving. Many functions appear in triplicate, at the executive, House, and Senate level, and coordinating them is cumbersome and not readily responsive to changing situations. Yet, much of this is the reflection of our executive system of government, and of the bicameral organization of Congress. The expenditure and taxing process, which is at the heart of the governmental operation, can hardly be exempted from the constraints which this system imposes. At the same time, better coordination could be obtained and a higher degree of flexibility should be possible, without disturbing the basic balance provided by our constitutional system.

Further Readings

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[21] See Chap. 25, Sec. A.

chapter

3

The Theory of Social Goods*

A. The Nature of Social Goods: *Private and Social Goods Distinguished; Individualistic versus Collective View; Public Provision.* B. Efficient Provision of Social Goods: A Partial View: *Market Analogy for Social Goods; Qualifications.* C. Efficient Provision of Social Goods: A General View: *Pareto Efficiency; The Samuelson Model; The Budget Model; Appraisal.* D. The "Proper" State of Income Distribution: *Optimal Distribution; Mandatory Redistribution; Voluntary Redistribution.* E. Further Issues in Social Goods: *Bargaining in the Small Group; Spatial Limitation of Benefits and Local Finance; Benefit Externalities from Private Consumption; Alternative Modes of Provision.* F. Social Bads, External Costs, and Pollution: *Efficiency Aspects; Equity Aspects.* H. Merit Goods.

The theory of social goods was sketched in Chapter 1 in the discussion of the allocation function, but it must now be examined more closely. While difficult to resolve, this theory is of central importance to the economics of the public sector, just as the theories of the consumer household and of the firm are at the core of private sector economics.

**Reader's Guide to Chapter 3:* This chapter explores in some detail the complex problems underlying the theory of social goods. While this theory is of central importance to the economics of public finance, the basic issues (as happens not infrequently in economics) must be examined first in general and rather abstract terms. The bare outline of the problem is given in sections A and B. Section C carries the analysis further and may be omitted by the less technical reader. Section D deals with distributional issues, and the final sections take up special aspects of the social goods problem.

Taking a normative view, the problem is how to extend the principles of efficient resource use to the public sector. Some believe this to be an impossible task and hold that the determination of budget policy is a matter of "politics" only, not amenable to economic analysis. This view is unduly pessimistic and cannot be accepted. The importance of conducting the public sector efficiently is evident in the modern economy, where one-third of total income flows through the public budget, and public purchase of factors and products comprises one-quarter of total output. Although it may not be possible to find the optimal solution, not all feasible policies are equally good. Efficiency of policy, here as in the private sector, is a matter of degree. The task is to design a mechanism for the provision of social goods which will be as efficient as is feasible and for this the underlying issues must be understood.

A. THE NATURE OF SOCIAL GOODS

To begin with, we return to the features which distinguish social from private goods. This distinction arises from certain technical characteristics of such goods which in turn have important bearing on the mechanism by which they can be provided.

Private and Social Goods Distinguished

It is generally recognized that under certain conditions the market is an efficient mechanism for the provision of private goods. This is the case (1) because such goods permit application of the "exclusion principle" which renders them marketable and (2) because consumption is "rival" so that exclusion may be applied without efficiency loss. In the case of social goods these conditions are not met and a different form of provision is needed.

MARKETABLE PRIVATE GOODS The market mechanism can function only if the "exclusion principle" applies, i.e., if A's consumption is made contingent on his paying the price, while B who does not pay is excluded. Exchange cannot occur without property rights, and property rights require exclusion. Given such exclusion, the market can function as an auction system. The consumer must bid for the product, thereby revealing his preferences to the producer, and the producer under the pressures of competition is guided by these signals to produce what consumers want. Such at least is the case with a well-functioning market.

Moreover, the nature of private goods—such as food, clothing, housing, automobiles, and millions of other marketable private goods—is such that the benefits derived therefrom flow to a particular consumer. Thus, benefits are internalized and consumption is *rival*. A hamburger eaten by A cannot be eaten by B. At the same time, the nature of the goods is such that exclusion is readily feasible. The goods are handed over when the price is paid and the market mechanism is well equipped to handle their provision. We refer to them as marketable private goods.

MARKET FAILURE DUE TO NONEXCLUDABILITY A first instance of market failure arises where exclusion is not applicable. While most goods which are rival in consumption also lend themselves to exclusion, this is not always the case. Consider for instance travel on a crowded cross-Manhattan street during rush time. The use of the available space is distinctly rival and exclusion (the auctioning off, or sale of the available space) would be efficient and should be applied. Use of crowded space would then go to those who value it most and who are willing to offer the highest price. But such exclusion would be impossible, or is too costly at this time.[1] We have here a situation where exclusion *should* but *cannot* be applied. Here the difficulty of applying exclusion is *the* cause of market failure. Public provision is required until techniques can be found to apply exclusion.

Consider once more why it is that nonexcludability causes market failure. If partaking in consumption is not made contingent on payment, people are not forced to reveal their preferences in bidding for social goods. Such at least is the case if the number of participants is large.[2] Since the total level of provision will not be affected significantly by any one person, the individual consumer will find it in his interest to share in the provision made by others as a "free rider." With all consumers acting in this fashion, there is no effective demand for the goods. The auction system of the market breaks down. Producers are given no signals about what to produce and there is no one to whom they can sell. Hence a different method of provision is needed.

MARKET FAILURE DUE TO NONRIVAL CONSUMPTION A second instance of market failure arises where consumption of certain goods is nonrival. Such goods are here referred to as "social goods." These are goods where A's partaking in the consumption benefits does not reduce the benefits derived by all others. Because of this it would be inefficient to apply exclusion even if this could be readily done. Since A's partaking in the consumption benefits does not hurt B, the exclusion of A would be inefficient.

Consider for instance, the case of a bridge which is not crowded.[3] A's

[1] As suggested by Prof. William Vickrey, of Columbia University, electronics devices may be developed in the future which record the passage of vehicles through intersections and permit the imposition of corresponding charges, adjusted to differ for rush hours and slack periods. Such charges may then be billed to the vehicle owner via a computer, and the costs of crowding city streets may thus be internalized. See Chap. 29, Sec. D.

[2] For the small-number case, see p. 72.

[3] The reader might ask why the government has not avoided this by building a smaller bridge. The answer is that certain products are "lumpy" for technical reasons and are not available in small incremental units. In other instances, a given facility is needed to meet the demand in peak hours, while leaving excess capacity during slack periods. For a further discussion see Chap. 29.

crossing, therefore, will not interfere with B's. Charging a toll would be quite feasible, but so long as the bridge is not crowded, it would be inefficient to do so since it would curtail use of the bridge.[4] Or consider the case of a broadcast, which (by jamming devices) could be made available to listeners only if they pay by renting a clearing device. Again, this would be inefficient since A's reception does not interfere with B's. We have here situations where exclusion *can* be applied but *should not* be, because consumption is nonrival. But for previously noted reasons, provision through the market cannot function without exclusion. Consumers will not bid to reveal their preferences, because they can enjoy the same benefits as free riders. Hence a political process of budget determination becomes necessary.

COMBINED CAUSE OF MARKET FAILURE While the features of nonrival consumption and nonexcludability need not go together, in fact they frequently do. In these instances—e.g., air purification, national defense, streetlights—exclusion both *cannot* and *should not* be applied. Since these are situations where both causes of market failure overlap, it may be futile to ask which is *the* "more basic" cause. However, the nonrival nature of consumption might be considered as such, since it renders exclusion undesirable (inefficient) even if technically feasible.

SUMMARY The previous distinctions might be summarized as follows, classifying goods according to their consumption and excludability characteristics:

Consumption	Exclusion	
	Feasible	Not Feasible
Rival + excludability	1	2
Nonrival	3	4

Case 1 is the private-good case, combining rival consumption with excludability. This is where provision through the market is both feasible and efficient. In all the other cases, market failure occurs. In Case 2 this is due to nonexcludability or high costs of exclusion and in Case 3 to nonrival consumption. In Case 4 both impediments are present. If we applied the term "social good" to all situations of market failure, Cases 2, 3, and 4 would all be included. It is customary, however, to reserve the term for Cases 3 and 4, i.e., situations of nonrival consumption. These situations, to be sure, are similar to Case 2 in that provision is without exclusion and hence a budgetary process is called for. But they differ from Case 2 in that the existence of nonrival consumption changes the conditions of efficient resource use from those applicable where consumption is rival.

[4]Strictly speaking, this is the case for a bridge which requires no maintenance. A charge to sustain increased maintenance cost required by additional use is in order even in the absence of crowding. See Chap. 6.

Individualistic versus Collective View

The previous distinction between private and social goods was drawn in a framework in which all wants are experienced and evaluated by the individual consumer. This holds for benefits arising from the provision of social as well as private goods. In other words, the preference maps of individuals include social as well as private goods. The consumer's system of indifference curves not only expresses his preferences as between oranges and apples (the textbook symbols of typically private goods) but also as between private backyards and public parks, where one is a private and the other a social good.

Our distinction between private and social goods, therefore, must not be confused with an alternative approach which distinguishes between individually and collectively experienced *wants*. According to the latter view, private goods are provided to satisfy private wants, experienced by the individual in his personal budget calculus, and satisfied in his own interest; and social goods are provided to meet collective wants, experienced by the group as a whole and provided in its common interest. As will be noted later, this distinction does not stand up under close scrutiny. In the end, all wants are experienced by individuals.[5] A social group does not exist as an entity which can experience wants. To be sure, individuals do not live in isolation, but in association with others. Therefore, A's preferences will be influenced by those of B and C. Dominant tastes and cultural values influence individual preferences and in turn are determined by them. Fashions are a pervasive factor in molding tastes and not only so in clothing. To say that wants are experienced individually, therefore, is not to deny the existence of social interaction.[6]

Moreover, we do not propose that individual preferences relate only to the satisfaction which a person derives from his own consumption. Others will enter into a person's value scales. If A is a socially minded person, he will derive satisfaction not only from his own consumption but also from consumption by B; or, if he is selfish, he may enjoy his own consumption more if B cannot match it. Utilities are interdependent and, as we shall see later, this broadens the range over which the economics of social goods apply.[7] What matters now, however, is that satisfaction is experienced in the

[5]See Chap. 4, p. 103.

[6]Nor can it be argued that social goods differ from private goods because they satisfy the more noble aims of life. The wants to be satisfied may be noble or base in either case: social goods may carry high cultural or aesthetic values such as music education or the protection of natural beauty, or they may relate to everyday needs such as roads and fire protection. Similarly, private goods may satisfy cultural needs such as harpsichord recordings, or everyday needs such as bubblegum. Clearly, no distinction can be drawn on this basis.

[7]See p. 71.

last resort by A or B individually and not by a mysterious third entity called A + B.

Public Provision

How then are goods to be provided if exclusion is impossible and/or inefficient? The crux of the problem is how to induce consumers to reveal their preferences. Since they need not bid at the market counter, an alternative mechanism is needed. This mechanism is provided through the political process of decision by voting.

Confronted with the choice between alternative budget programs, individuals will find it in their interest to vote for that solution which will move the outcome closer to their own desires and in this way they will be forced to reveal their preferences. By serving as a mechanism of preference revelation, the voting process must link tax and expenditure decisions. The voter must be confronted with a choice among budget proposals which carry a price tag in terms of his own tax contribution. This price tag will depend on the total cost for the community as a whole as well as on the share to be contributed by others. His choice is thus contingent on his knowledge that others must also contribute in line with the adopted tax plan. It is this mandatory nature of the budget decision which induces preference revelation and permits the determination of social-good provision.[8]

As will be seen in the following chapter, the political mechanism is imperfect and can only approximate what would be the optimal budget choice. But it is the best (or only) available technique and must be used as well as it can be.

B. EFFICIENT PROVISION OF SOCIAL GOODS: A PARTIAL VIEW

It follows from the preceding discussion that the nonrival nature of social-good consumption poses two important problems, including its implications for (1) what constitutes efficient resource allocation and (2) how this allocation is to be achieved. Our concern in the present chapter is primarily with the first aspect. We begin with a partial-equilibrium view which will serve to bring out the essential nature of the problem. The more complex formulation in general equilibrium terms is considered in the next section.

Market Analogy for Social Goods

The left side of Figure 3–1 shows the familiar market for a private good X. D_A and D_B are A's and B's demand curves, based on a given distribution of

[8]As noted previously, the term "provision" as used here refers to the choice and payment process rather than to whether the products or services are *produced* by government (such as the services of civil servants) or by private firms (such as private construction companies which are contracted to build public roads). See Chap. 1, p. 8.

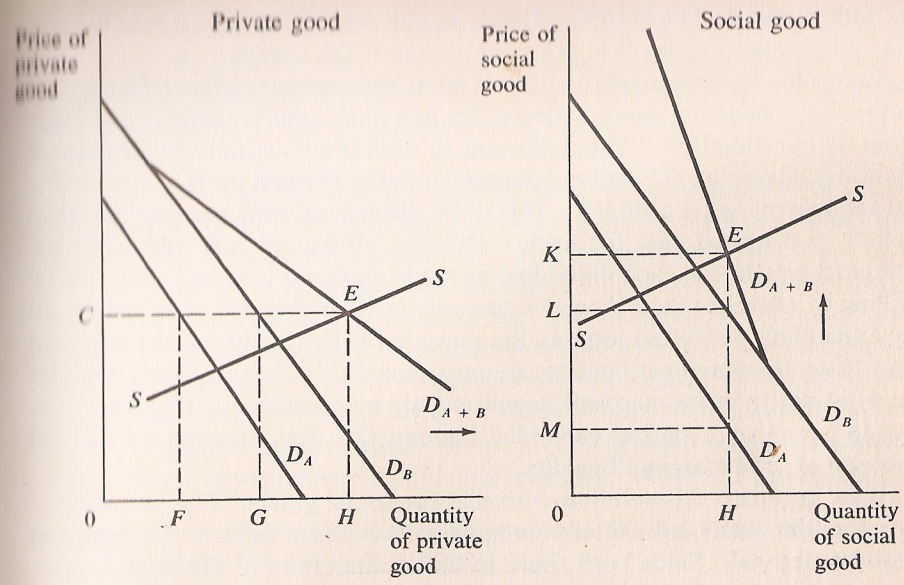


FIGURE 3-1
Demand for Private and Social Goods

income and prices for other goods. The market demand curve D_{A+B} is obtained by *horizontal* addition of D_A and D_B, adding the quantities which A and B purchase at any given price. SS is the supply schedule and equilibrium is determined at E, the intersection of market demand and supply. Price equals OC and output OH, with OF purchased by A and OG by B where $OF + OG = OH$.

The right side of the figure shows a corresponding pattern for a social good. As before, D_A and D_B are A's and B's respective demand curves, subject to the same conditions of given incomes and prices for other goods. Drawing such demand curves is based on the unrealistic assumption that consumers volunteer their preferences, and such curves have therefore been referred to as "pseudo-demand curves." The crucial difference from the private-good case arises in that the market demand curve D_{A+B} is now obtained by *vertical* addition of D_A and D_B.[9] This follows because both consume the same amount and the combined price paid by the two equals the sum of the prices paid by each. SS is again the supply schedule, showing marginal cost (chargeable to A and B combined) for various outputs of the social good. Equilibrium output equals OH, which is the quantity consumed

[9]This vertical addition of the demand curves for social goods was first presented by Howard R. Bowen in *Toward Social Economy*, New York: Rinehart, 1948, p. 177.

The demand curves are added vertically to show the sum of the prices which A and B are willing to pay for any given amount, the same amount being available to both since consumption is nonrival.

by both A and B. The combined price equals OK, but the price paid by A is OM while that paid by B is OL, where $OM + OL = OK$.

Returning to the case of the private good, the vertical distance under each individual's demand curve reflects the marginal benefit which he derives from its consumption. At equilibrium E, both the marginal benefit derived by A in consuming OF and the marginal benefit derived by B in consuming OG equals marginal cost HE. This is an efficient solution because marginal benefit = marginal cost for each consumer. If output falls short of OH, marginal benefit for each individual exceeds marginal cost and each will be willing to pay more than is needed to cover cost. Net benefits will be gained by expanding output so long as the marginal benefit exceeds the marginal cost of so doing and net benefits are maximized therefore by producing OH units, at which point marginal benefit equals marginal cost. Welfare losses would occur were output expanded beyond OH, for marginal cost would thereby exceed marginal benefits.

Now compare this solution with that for social goods. The vertical distance under each individual's demand curve again reflects the marginal benefits derived. Since both share in the consumption of the same supply, the marginal benefit generated by any given supply is obtained by vertical addition. Thus the equilibrium point E now reflects the equality between the *sum* of the marginal benefits and the marginal cost of the social good. If output falls short of OH, it will again be advantageous to expand because the sum of the marginal benefits exceeds cost, while an output in excess of OH would imply welfare losses since marginal costs outweigh the summed marginal benefits.

Thus the two cases are analagous but with the important difference that, for the private good, efficiency requires equality of marginal benefit derived by each individual with marginal cost, whereas in the case of the social good it is the sum of the marginal benefits that should equal marginal cost.

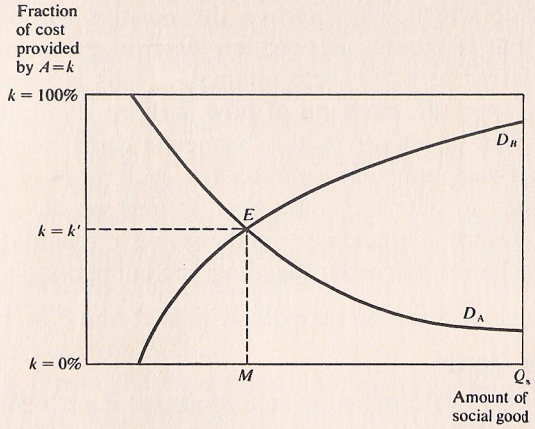
We also note that by applying the same pricing rule to both social and private goods—where the price payable by each consumer equals his marginal benefit—different results are obtained in the two cases. Whereas in the private-good case A and B pay the same price but purchase different amounts, in the social-good case they purchase the same amount but pay different prices. Yet, in both cases, the same pricing rule is applied. Each consumer pays the same amount for successive units of the good purchased and marginal benefit equals price.[10]

Qualifications

This way of looking at the matter is instructive because it brings out an important distinction between the conditions of efficient resource use in the provision of private and social goods, but it does not tell the entire story. In defining what constitutes efficient resource use, the solution is incomplete in that it presents only a partial view. Given the production limitations imposed by the limited availability of resources, the quantities of social and private goods produced are interdependent and so are their prices. It is not possible, therefore, to draw the left and right sides of Figure 3–1 independently. To allow for this interdependence, a general view will be taken in the next section.

Apart from this, Figure 3–1 may be misleading in suggesting that the provision of social goods might be implemented by a market mechanism of demand and supply, with equilibrium at E as applies in the case of the private good. This assumes that consumers will bid as they do for private goods and thus overlooks the crucial fact that preferences for social goods (or willingness to bear shares of the cost in line with marginal benefits) will not be revealed voluntarily in the absence of exclusion. Where the number of participating consumers is large, the free-rider problem arises and the auction system of the market breaks down.[11] The demand schedules shown in the right half of the figure do not come into play. As noted before, they are

[10]A somewhat different way of presenting the case of the social good, first used by the Swedish economist Erik Lindahl, is as follows:



The vertical axis measures k or the fraction of unit cost contributed by A. Given the unit cost C and assuming it to be constant, kC is the price paid by A and D_A is his demand schedule for the social good S. Since B's price equals $(1 - k)\,C$, and since both share the same quantity of S, B's demand curve drawn with regard to k is given by D_B. Individual A may then look upon D_B as showing the price at which various quantities of S are available to him, i.e., as a supply schedule for the social good which confronts him. B similarly may regard D_A as his supply curve. The fraction of the price which both are willing to pay (k for A and $(1 - k)$ for B) adds to I at the intersection of D_A and D_B, at output OM. See Erik Lindahl, "Just Taxation: A Positive Solution," in Richard A. Musgrave and Alan Peacock (eds.), *Classics in the Theory of Public Finance*, International Economic Association, London: Macmillan, 1958, pp. 168–177. See also J. G. Head, "Lindahl's Theory of the Budget," *Finanzarchiv*, Band 23, Heft 3, October 1964, pp. 421–454; and H. Shibata, "A Bargaining Model of the Pure Theory of Public Expenditures," *Journal of Political Economy*, January 1971.

[11]Where small numbers are involved, bidding will occur but the outcome will be determined by bargaining and may diverge from the competitive result. See p. 72.

pseudo-demand schedules only, based on the unrealistic assumption that preferences are revealed. A political (voting) approach must be taken and the problems raised in Chapter 4 must be brought into the picture.

C. EFFICIENT PROVISION OF SOCIAL GOODS: A GENERAL VIEW

In this section we restate the efficiency problem in a general equilibrium setting.[12] For the time being we again disregard the question of how the efficient solution can be realized in practice and assume that preferences are known.

Pareto Efficiency

Textbooks on price theory list various conditions for efficient resource allocation in the provision of private goods.[13] These include the condition (1) that the marginal rate of substitution among any two products must be the same for all consumers, and (2) that this rate must be equal to the marginal rate of transformation of the products in production. Unless these conditions are met, welfare can be improved in the sense that a rearrangement can be made which will improve the position of some consumers without hurting that of others. A situation which does not permit such improvement is referred to as "Pareto optimal." This is helpful so far as it goes, but leaves open the question of how welfare should be distributed. This question cannot be solved by the "someone gains, no one loses" rule. Since there is a Pareto-efficient solution for each state of distribution, it becomes necessary to determine the best among various Pareto-efficient solutions. The concept of efficiency—in the sense of reaching the best of all solutions—thus acquires a broader meaning, including distributional considerations.

The Samuelson Model

The first problem is to determine the conditions for Pareto-efficient resource use if the existence of social goods is allowed for. The solution, which was first given by Professor Samuelson, integrates the case for social goods into the theory of welfare economics.[14] For this purpose he assumes that there exists an omniscient planner, to whom all the necessary data (factor supplies, production functions, preference patterns) are known.

THE SET OF EFFICIENT SOLUTIONS Leaving open the distribution question,

[12]The analysis is more complex than the partial equilibrium case and may be passed over by the less technically inclined reader, who may wish to proceed directly to section D.

[13]For a compact statement and literature references, see Francis M. Bator, "The Simple Analytics of Welfare Maximization," *American Economic Review*, pp. 22–59, March 1957.

[14]See Paul A. Samuelson, "The Pure Theory of Public Expenditures," *Review of Economics and Statistics*, pp. 387–389, November 1954; and, "Diagrammatic Exposition of a Theory of Public Expenditures," ibid., pp. 350–356, November 1955.

the planner may determine the set of alternative arrangements which reflect efficient solutions under all alternative states of distribution. To simplify matters, suppose that there are only two individuals A and B and two goods X and S, where X is a private and S a social good. As shown in the upper part of Figure 3–2, the production possibility curve DC records the mixes of X and S that may be produced with available resources. The middle section of the figure shows the amounts of X and S consumed by A and the lower part gives the corresponding picture for B. Since both consume the same amount of S, both will be at the same point on the horizontal axis; but they may consume different amounts of X and be at different points on the vertical axis. These points are related, however, by the condition that the amounts of X consumed by A and B must equal the total output of X. To illustrate, suppose that A is at G in the middle panel, consuming OF of S and FG of X. We know from the upper panel that the efficient output mix which includes OF of S also includes FE of X. Since FG is consumed by A, the amount left for B equals $FE - FG = FH$, placing B at point H in the lower panel of the figure.

We now choose a particular level of welfare for A, say that indicated by the points on his indifference curve ai_1 which passes through G. We have seen that if A is at G, which is a point on this indifference curve, then B will be at H. Next, let us move A along ai_1 to such points as P, T, or W. Following the same reasoning, this places B at points L, Z, and K. As A travels from W to the left along ai_1, B travels to the left along $KHLZY$.[15] Since all points on ai_1 are equally good for A, welfare is maximized by choosing the corresponding point which is best for B.[16] This is at L where YLK is tangent to B's highest indifference curve, leaving A at the corresponding position P. If A is to be at indifference level ai_1, the best solution is that where total output includes ON of S and NM of X, divided between A and B so that A receives NP and B receives NL.

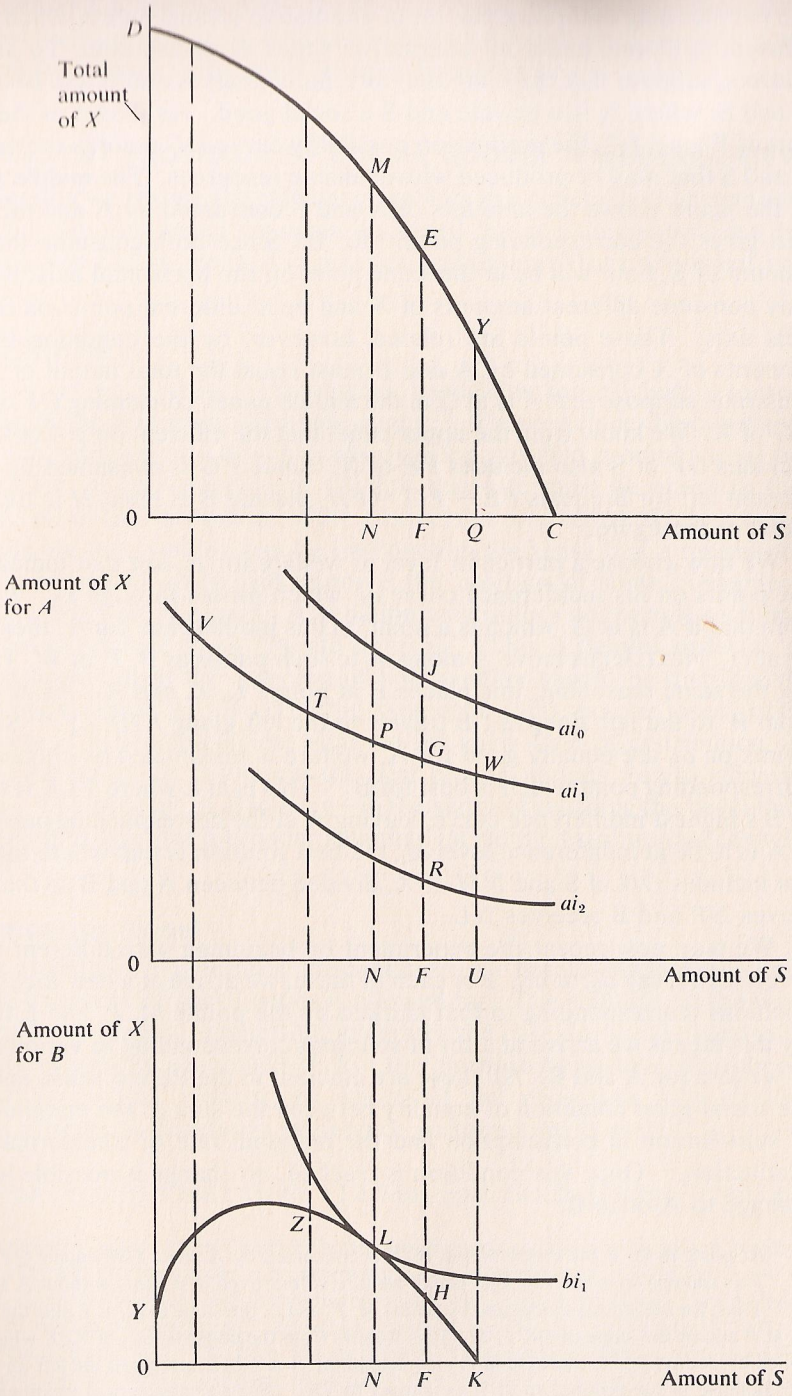
We may now repeat the experiment by beginning with different welfare levels for A, say ai_0 or ai_2. For each of these, we arrive at a new locus of B's positions (corresponding to that marked by the points M, P, and L for ai_1). By this means we arrive at a set of solutions corresponding to various levels of welfare for A and B. All these are efficient in the Pareto sense and meet the social-good condition of equality between the sum of the marginal rates of substitution in consumption and the marginal rate of transformation in production.[17] Once this condition is reached, no change is possible without damage to A or to B.

[15]At point K for B the entire output of X is consumed by A since UW equals QY.

[16]This follows from the rule that social welfare is improved if B gains without A losing.

[17]Thus, for the solution indicated by points M, P, and L, the slope of bi_1 at L plus the slope of ai_1 at P equals the slope of DC at M. This follows from the construction of YZK which is obtained by deducting the increase in A's consumption of X when moving to the left on ai_1 from the increase in the production of X as shown by DC. For a mathematical treatment of the theorem, see Samuelson, "The Pure Theory of Public Expenditures," op. cit.

FIGURE 3-2
Social and Private Goods in General Equilibrium

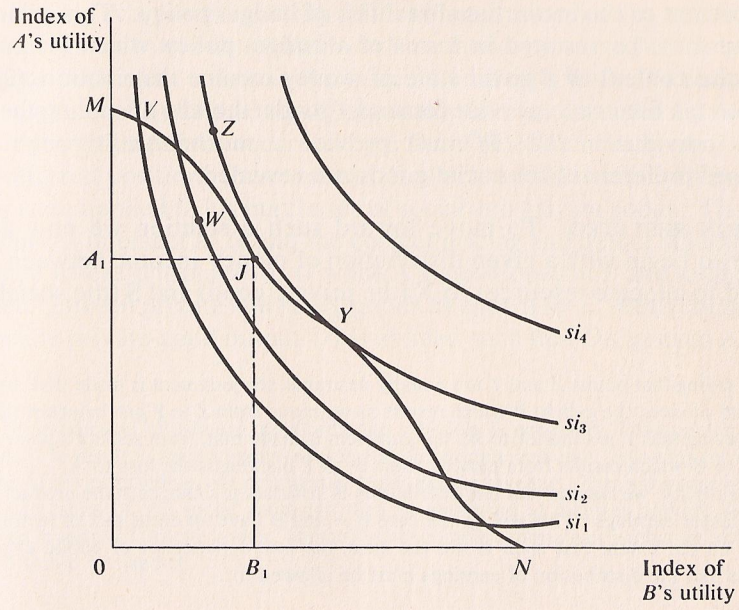


CHOICE OF OPTIMUM Having completed this job, our planner, acting as an omniscient technician, has provided important information, but it remains for the policy makers to choose between these equally efficient alternatives. This choice is a matter of judgment on distribution and as noted before, cannot be made according to the efficiency rules by which Pareto optimality is defined. A tradeoff between the welfare levels of A and B is involved.

This is illustrated in Figure 3–3. Suppose that A's welfare level, obtained by being on ai_1 in Figure 3–2, corresponds to A_1 in Figures 3–3, where the vertical axis records a welfare index for A. Similarly, suppose that B's welfare level, obtained from being on bi_1 in Figure 3–2, corresponds to B_1 in Figure 3–3 where the horizontal axis records a welfare index for B. The coordinates give us point J. We may now list all other efficient solutions (corresponding to various welfare levels for A) and thus obtain a "utility frontier" such as MN, which shows for each level of utility (welfare) allowed to A the largest possible level of utility obtainable for B. Each of these solutions involves a particular pattern of resource use between social and private goods and division of private goods between A and B. The best possible points lie on this utility frontier with points north and/or east thereof unobtainable and points south and/or west inferior.

While the rules of Pareto efficiency guide us to the frontier, the choice

FIGURE 3-3
The Distribution Choice



among the "best" points traced by this frontier involves a tradeoff between gains for A and losses for B or vice versa. As we move from M to N, A's welfare declines while B's rises, and vice versa. The choice is one of distribution and must be made on the basis of a social welfare function, expressing an ordering by which society assigns relative values to levels of welfare experienced by A and B. Assuming these assignments to be known, they may be expressed by the social indifference curves si_1, si_2, etc., where each curve shows mixes of welfare derived by A and B, which from society's point of view are equally "good."[18] The point of tangency of the utility frontier with the highest possible social indifference curve Y is the "bliss point," the best of all possible solutions, which is therefore chosen. It reflects efficiency in the broadest sense of allowing for the distributional judgment of a social welfare function.

This then is the final solution. By choosing it, the planner simultaneously determines the corresponding product mix between X and S (i.e., a point on the production possibility curve in Figure 3–2) *and* the division of X between A and B. The determination of the best product mix and of the best state of welfare distribution is thus made jointly.

The Budget Model

The Samuelson model provided a breakthrough in social-good theory by integrating it into the general theory of welfare maximization, but it does not constitute a workable theory of public finance. In the absence of omniscient planners, the student of public finance must search for ways to relate the argument to the institutional realities of budget policy. This means that the case must be restated in terms of a budget policy which (1) operates within the context of a given state of money income distribution, (2) must call upon tax finance to provide for social goods, thereby allocating their cost among individuals, and (3) must provide a mechanism through which consumer preferences for social goods are revealed.

SOLUTION RESTATED To move toward such a solution we now ask the planner to begin with a given distribution of money income between A and B,[19] and to allocate resources to X (the private good) and S (the social good)

[18]By saying that points Z and Y are equally desirable, the judgment is made that, from society's point of view, the gain to B which results as we move from Z to Y just balances the loss to A. By saying that Y is superior to W, the judgment is made that, from society's point of view, the gain to B which results from moving from W to Y outweighs the loss to A.

[19]To simplify, we assume that this distribution is invariant to changes in the product mix and relative factor earnings. This will be the case if A and B have an equal mix of factor endowments. To the extent that such is not the case, the interdependence of public expenditure decisions and the distribution of earnings must be allowed for.

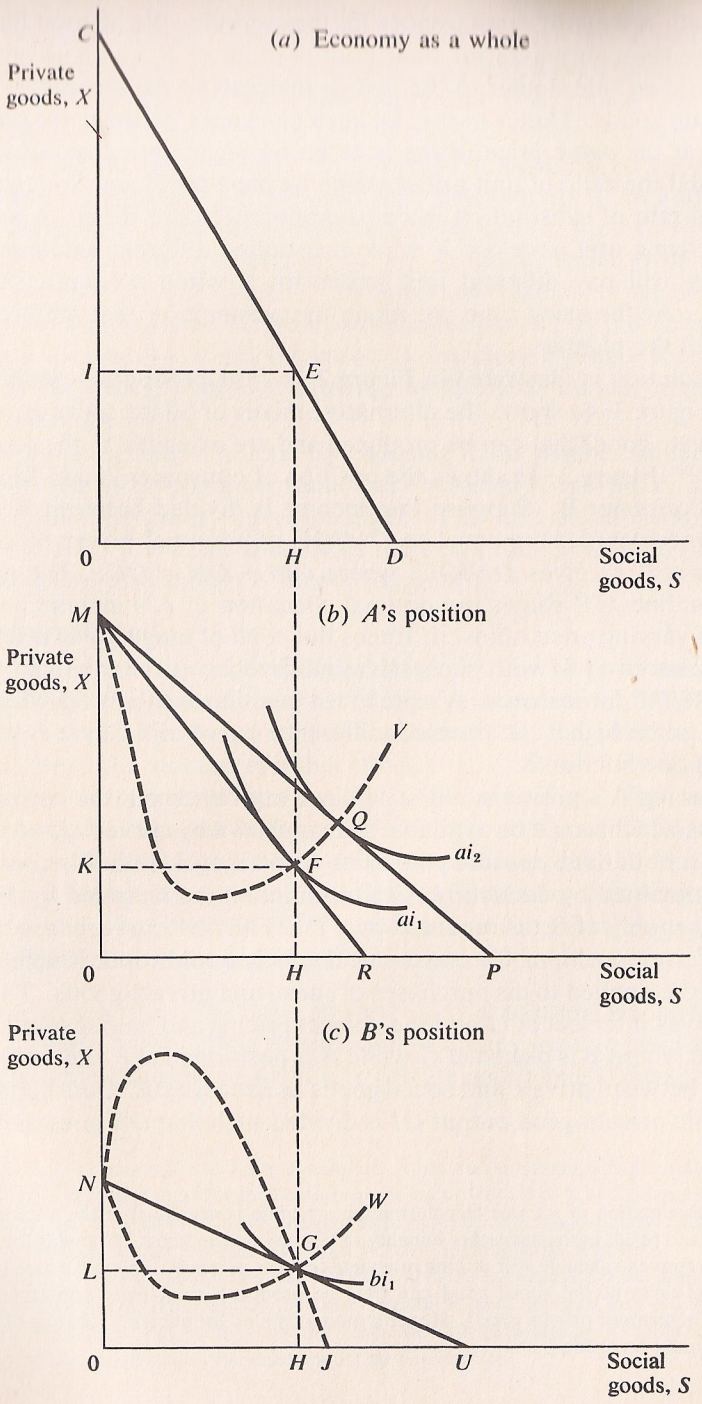
in line with A's and B's preferences for these goods. We instruct him further to charge the consumers for their consumption of X and S in accordance with a pricing rule similar to that which operates in the competitive market for private goods. That is to say, for each consumer, all units of a good are to be sold at the same price (there is to be no higher price on intramarginal units), and the ratio of unit prices which he pays for X and S is to equal his marginal rate of substitution in consumption between them. A and B will pay the same unit price for X while consuming different amounts thereof; and they will pay different unit prices for S while consuming the same amount. At the same time we retain the assumption that preferences are known to the planner.

The solution is illustrated in Figure 3–4. The production possibility line CD in Figure 3–4*a* shows the alternative mixes of S (the social good) and X (the private good) that can be produced and are available to the economy as a whole.[20] Figure 3–4*b* shows the position of consumer A and Figure 3–4*c* that of consumer B. Suppose that income is divided between A and B so that A receives a share equal to OM/OC of potential private good output OC, while B receives ON/OC, where $OM + ON = OC$. The price-consumption line MV shows the optimal allocation of A's income between X and S at varying price ratios. It traces the point of tangency of a set of price lines anchored at M with successive indifference curves. Given the price ratio OM/OP for instance, A's preferred position will be at Q where MP is tangent to the highest attainable indifference curve ai_2. Curve NW traces a similar price line for B.

Following A's positions along MV, we may trace out the corresponding positions which would be available to B as shown by curve NJ. At each pair of points, both must consume the same amount of S while B's consumption of X is obtained by deducting A's consumption (as recorded by MV) from the total supply of X (as recorded by CD). The NW curve in turn traces out the preferred positions for consumer B which would result if different price ratios were applied to his purchases of social and private goods. The NJ and NW curves intersect at G and the correct pricing and output solution is thus obtained where B is placed at G while A is positioned at F and total output is divided between private and social goods as shown by E. Both consume OH of S while private-good output OI is divided such that OK goes to A and OL

[20]The assumption of a linear transformation schedule is necessary if the pricing rule here specified is to result in the necessary equality of tax revenue and cost. Allowing for increasing cost and a convex schedule, our pricing rule yields excess revenue. This is the case because intramarginal units of the social good can then be produced at a lower opportunity cost as measured in terms of private goods. Hence a more complex formula or a rebating of the excess revenue would be needed.

FIGURE 3-4
Social and Private Goods with Given Distribution



to B where $OK + OL = OI$. This solution has the following characteristics:

1. The solution conforms to the initial distribution of income, with A's share equal to OM/OC and B's share equal to ON/OC.
2. A and B each pay a tax price such that his marginal rate of substitution of S for X in consumption is equal to his price ratio, so that our pricing rule is complied with.[21]
3. The combined tax contribution of A and B equals the cost of S to the group as a whole.[22]
4. The solution meets the efficiency criteria of the Samuelson model, i.e., that the sum of the marginal rates of substitution equals the marginal rate of transformation.[23] The solution E thus reflects *a* point on the utility frontier of Figure 3–3, it being that point which corresponds to our given income distribution and specified pricing rule.

Appraisal

This restatement of the model is helpful in providing a more realistic setting, where an initial distribution of money income is taken to exist and tax shares are determined. This also is in line with our view of the problem as laid out in Chapter 1, where the allocation and distribution functions were viewed as distinct parts of the process, with the latter determining the proper distribution of money income and the former determining the provision (and finance) of social goods on that basis.

Nevertheless, the model as presented in the preceding section remains unsatisfactory in that it still stipulates an omniscient referee to solve the problem. It thereby assumes away the crucial issue of preference determination and the role of the voting process therein. To provide a link to a more operational view of the problem, the assumption of known preferences must be changed and the model must be extended to incorporate a theory of the

[21]The unit price for private good X or P_x is the same for both A and B, but the unit price for S differs. A's price ratio $P_S{}^A/P_X$ as given by price line MR equals OM/OR (Figure 3–4*b*). Since the price line is tangent to the indifference curve at F, the price ratio equals the marginal rate of substitution in consumption. The same holds for B's ratio $P_S{}^B/P_X$ equal to ON/OU (Figure 3–4*c*), with price line NU again tangent to the indifference curve bi_1 at G.

[22]The amount of tax paid by A or T_A equals $P_S{}^A \cdot OH$. Given $P_S{}^A/P_X = OM/OR$ and setting $P_X = 1$, we have $P_S{}^A = OM/OR$ and $T_A = (OM/OR)\ OH$. Since $OM/OR = KM/KF = KM/OH$, we obtain $T_A = KM$. Arguing similarly for B we obtain $T_B = LN$. Since $OM + ON = OC$ and by construction of NW we know that $OL + OK = OI$, it follows that $T_A + T_B = IC$.

For the group as a whole the price ratio is given by $P_S/P_X = OC/OD$. Setting $P_X = 1$ we have $P_S = OC/OD$ with the cost of supplying OH of S equal to $(OC/OD)\ OH$ which again reduces to IC. See, however, note 20, p. 85.

[23]This follows because $(OM/OR) + (ON/OU) = (KM/OH) + (LN/OH) = IC/OH$.

voting process.[24] The task is then to determine a voting system which is most effective in securing preference revelation, thus leading to an efficient provision of social goods.[25] This is a matter to be examined further in Chapter 4. Through the voting process, the pseudo-demand schedules are brought into the open. The model thereby becomes more than a means of stating efficiency conditions and, it is hoped, a basis for appraising the conduct of fiscal affairs.[26]

D. THE "PROPER" STATE OF INCOME DISTRIBUTION

Yet, we are left with the question of how the "proper" state of distribution is to be determined. Economists have not been able to say much about this topic since it cannot be resolved with the usual efficiency tools. Rather, it has been in the domain of the philosophers, social reformers, and politicians. Nevertheless, the distribution problem is a crucial aspect of fiscal policy and must be considered in this context.

[24]Indeed, it may be argued that without such an extension, the distinction between allocation and distribution, with the resulting introduction of a money income distribution and of tax shares, is superfluous. But it becomes essential if a more operational view of the problem is taken. For the benefit of readers who wish to pursue this somewhat subtle issue further, the following summary of the argument is offered:

Critics of the distinction have held that, *given preferences to be known*, nothing is gained by introducing a distribution of money income and tax shares into the model. If resource allocation, as determined by the budget model, is to be optimal, the initial state of money income distribution must also be optimal. But the optimal distribution of money income cannot be determined without knowing relative prices and hence allocation. (This is the case because the basic issue of distribution must be seen in terms of real rather than of money income.) It follows that the general model must be solved in any case, thus determining distribution and allocation simultaneously, and that nothing is gained by introducing the distribution of money income and tax shares.

The situation differs, however, if *preferences are unknown*. A voting process is now needed to secure revelation of preferences, but voting must be based on a given income distribution. To avoid circularity, the pricing rule which is implied in the voting process must then be allowed for in determining the proper state of income distribution. Viewed in this way, the separation of allocation and distribution becomes consistent with the general model while affording a bridge to a more operational theory of the public sector. The approach is analogous to that in the provision of private goods, where it is convenient to use the market mechanism to secure efficient allocation with a given distribution of income, while making distributional adjustments through the tax-transfer process.

For a further discussion of the separability of allocation and distribution aspects, see the contributions by Paul A. Samuelson and Richard A. Musgrave in J. Margolis and H. Guitton (eds.), *Public Economics*, New York: St. Martin's, 1969.

[25]To be efficient, the pricing rule used to solicit preference revelation must equate each consumer's rate of substitution with *his* price ratio at the *margin*. But it is not required that the intramarginal units be sold at the same price. By charging higher prices for intramarginal units of the social good, "consumer surplus" will be taxed away. This bears on the resulting distribution of welfare, but it does not interfere with achievement of an efficient solution. Thus more than one efficient pricing rule is available. Among them, that one should be used which best permits implementation through the voting process.

[26]The need for this broader view was clearly seen when the problem was formulated initially by the great Swedish economist Knut Wicksell and in its subsequent development in the writings of Erik Lindahl. See Musgrave and Peacock, op. cit., pp. 72–119.

Optimal Distribution

Consider first what constitutes an optimal state of distribution, the ideal which we would want to achieve if things could be arranged *de novo*.[27] One approach is to think of the optimal distribution as decided upon by vote. This sounds simple but is only a superficial answer since it leads to the further question of how votes should be distributed and what voting rules (e.g., what degree of majority) should apply. Pushed sufficiently far, one is led back to the terms of the "social contract" which should govern the relationship among men in a just society and to the basic philosophical questions associated therewith.

Theories of the social contract have viewed this problem in terms of certain absolute standards to which all members of society are both entitled and committed. Thus natural law philosophers such as Hobbes and Locke postulated a man's innate right to the fruits of his efforts, thereby laying the basis for an ethical sanction (at least with regard to earned income) of distribution by factor pricing in a competitive market.[28] The Utilitarians, such as Bentham, would have distributed income so as to achieve the greatest sum total of happiness, an objective which they thought appealing to all reasonable men. Under certain conditions—fixed total income with equal, comparable, and declining income utility schedules—this would call for equality of income distribution,[29] but under others it might not. Rousseau and Marx proposed a distribution according to need, which may or may not be equal. John Rawls, following in the Kantian tradition, recently argued that "justice as fairness" requires an equal state of distribution with inequalities permitted only if they raise the level of income of the lowest group.[30]

Thus there is a variety of ethical standards among which one must choose. At a more detailed level, and apart from the degree of equality, one must choose the terms in which equality is to be defined. Does society wish to set its distributional standards in terms of annual or of lifetime earnings?

[27]That is to say, we consider what philosophers call the "state of nature" where neither the distribution of income nor other aspects of social organization have as yet been determined.

[28]See Ernest Baker (ed.), *The Social Contract*, London: Oxford University Press, 1946.

[29]See Chap. 8 and F. Y. Edgeworth, *Papers Relating to Political Economy*, vol. 2, London: Macmillan, 1925, pp. 100ff.

[30]Visualize an "initial" (precontract) situation in which individuals are to agree upon the principles to be followed. Individuals consider the question of equality or inequality in the abstract, not knowing what position on the scale they will occupy. Rawls argues that the principles chosen would call for (1) equality in the assignment of basic rights and duties, with (2) inequalities being "just only if they result in compensating benefits for everyone and in particular for the least advantaged members of society." See John Rawls, *A Theory of Justice*, Cambridge, Mass.: Harvard, 1971, p. 14.

Would it wish to concern itself with actual earnings or with equality of endowments "at the beginning of the race"? Should concern be with the overall distribution of income or would there be special concern with the lower end of the scale, with a guaranteed minimum income but inequality above that level? How would the income-receiving unit be defined, i.e., in terms of individual earners or of consumption units?

Many such questions must be raised and there are no simple answers, nor can a simple solution be expected. Social views of what is considered fair and just change and the economist's training does not provide him with the ultimate answer.

Moreover, the ethical aspects of income distribution cannot be viewed in isolation. The relationship between distribution and the level of output must be allowed for, as must be the bearing of distributional arrangements upon the social and political structure and with it upon other values such as individual freedom and the quality of human relations.

Mandatory Redistribution

While it is interesting and important to philosophize about a *de novo* design of optimal distribution, society is an ongoing business and the debate over distribution policy proceeds against the background of an existing distribution. The practical issue is one of redistribution, not of creating a *de novo* system. This is important because in the latter case one might consider the state of distribution in the abstract, not knowing at just which point in the scale one would be. In the case of redistribution, any change is associated directly with gains or losses for particular individuals, and this is a different matter.

Suppose first that a person is concerned with his income only, without interest in the position of others. Those in the lower and middle third of the income scale might then form a coalition and vote a redistribution from the top third. Voters in the top third would oppose but (assuming majority rule) would lose. Thus involuntary redistribution does occur and differs from expropriation only in that it operates through constitutional and democratic channels, i.e., the budget process. Such adjustments are made and have been a major factor in the changing structure of budget policy (e.g., the rise of the "welfare state") during recent decades.

It would be incorrect, however, to assume that all individuals who lose in the distribution process would have opposed such a vote, or to assume that all who stood to gain would have favored it. That an equal distribution of votes coexists with a highly unequal distribution of income (coupled with the requirement of only a majority vote in fiscal matters) testifies to this point. Reasons for this are numerous. People in the lower half of the income scale may favor inequality because they hope to rise. This may be annoying to the low-income oriented reformer, but it is a fact nevertheless. Similarly, people in the upper brackets may favor equalizing measures, whether because they believe this to protect their positions in the long run or because they derive satisfaction from improving the position of others. This poses the problem of voluntary redistribution which has received much attention in recent years.

Voluntary Redistribution

Voluntary redistribution is readily explained if we allow for personal interdependence of utilities. Man is a social being and his satisfactions are not derived in isolation.

INTERPERSONAL GIVING Thus A derives utility not only from his own consumption but also from the consumption of B and C. After A's own consumption has reached a relatively high level, he may derive greater satisfaction from giving income to B whose consumption is low than from adding to his own consumption. This will be a basis for voluntary redistribution from A to B and indeed offers the rationale for charitable giving.

A's preferences may be such that he derives utility from B's consumption independent of what products B consumes. In this case, he will wish to make a transfer to B in terms of money income; or A may derive more satisfaction from B's consumption of milk than of beer, in which case giving will take a paternalistic form and the transfer will be made in kind. Whatever policy is followed, such *voluntary* redistribution may be analyzed with the same tools as apply to determine efficiency in allocation economics. Since gains are obtained by both donor and donee, adjustments in distribution now improve efficiency under the "someone gains, no one loses" rule. The problem of redistribution may then be handled in the context of Pareto optimality.[31]

REDISTRIBUTION AS A SOCIAL GOOD Giving of this sort may proceed on a person-to-person basis but it may also arise in the budgetary context. A high-income individual may desire to secure a higher degree of equality in the overall distribution but know that, acting by himself, no significant dent can be made. However, he will be willing to contribute to a redistribution if the same is done by other high-income individuals. In this way, provision for greater equality becomes a social-goods problem. A political process will be needed to induce the givers to reveal their valuation of obtaining a higher degree of equality and to implement the needed transfers through the budgetary process.

[31]See H. H. Hochman and J. D. Rodgers, "Pareto Optimal Redistribution," *American Economic Review*, September 1969.

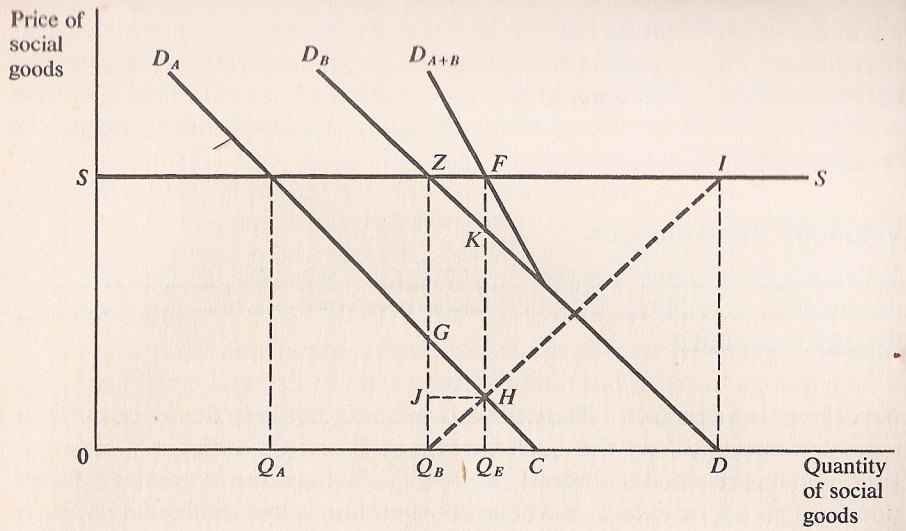


FIGURE 3-5
The Small Number Case

E. FURTHER ISSUES IN SOCIAL GOODS

Having outlined the major aspects of the problem, we now turn to certain additional issues arising in the provision of social goods.

Bargaining in the Small Group

Our preceding argument has been that a political process is needed to provide for social goods because voluntary payments and preference revelation will not be forthcoming in the absence of exclusion. The reason for this was that any one individual will not consider it worth his while to pay because with large numbers involved, his own contribution will not significantly affect the total supply. This difficulty does not arise if numbers are small. People will then find it worthwhile to contribute and to bargain.

One way of looking at the bargaining process and its results is shown in Figure 3–5.[32] D_A and D_B are A's and B's demand schedules for the social good while SS is the supply schedule. Suppose that initially both A and B purchase their own supply without considering the other. Thus A purchases Q_A while B purchases Q_B. Now A finds that given B's provision of Q_B, his marginal evaluation of an additional unit is only Q_BG. Since he must pay a market price of OS for his own purchases, he will discontinue them. The initial position is thus one where B purchases Q_B at market price OS with A purchasing nothing and acting as a free rider.

[32]Figure 3–5 follows that given in James M. Buchanan, *The Demand and Supply of Public Goods*, Chicago: Rand McNally, 1967, p. 30.

This is where the situation would remain if there was no bargaining. But bargaining is advantageous to both parties and will occur. A will be willing to purchase additional units at prices indicated along the GC range of his demand schedule. B will be willing to purchase more along the ZD range of his schedule. This will become possible if A contributes the difference between the ZS and ZD schedules. Plotting this difference as Q_BI, Q_BI becomes from A's point of view a supply schedule for additional units.[33] Equilibrium output is determined at Q_E, where Q_BI and GC intersect. The final position is thus one where OQ_E is purchased at the market price OS. For the amount OQ_B the full price OS is paid by B, while for the additional amount Q_BQ_E he pays only a net price HF with Q_EH contributed by A. We thus find that bargaining leads to increased output and an efficient solution. The latter is the case since output OQ_E is the same as would be derived by vertical addition of demand curves. D_{A+B}, as shown in Figure 3–5, intersects the supply schedule at output OQ_E.[34]

This illustration shows what may happen, but some difficulties must be noted:

1. A's contribution per unit of additional output Q_BQ_E may not equal Q_EH but be larger. That is to say, B may drive a harder bargain and force A to pay higher prices for the earlier units of the additional output, thus taxing away A's entire consumer surplus thereon (equal to JHG). While the model leads to the same level of output as arrived at by vertical addition of demand curves, it does not follow that our earlier pricing rule would apply.
2. We have assumed that in the initial position B purchases Q_B and that the bargaining relates to A's contribution to additional units only. But B may also demand that A contribute to the earlier units OQ_B and threaten to discontinue their purchase unless A contributes. While B stands to lose more by this than A, it does not follow that some contribution may not be extracted from A.
3. Assuming a process of incremental bargaining, the efficient output OQ_E will be reached, but this need not be the case if an "all or nothing" type of bargaining is followed. In this case, one of the parties may succeed in getting a better deal by settling on a level of output which falls short of the efficient amount.

Thus the assumption of small numbers renders bargaining possible, but the results are uncertain and there is no assurance that an efficient outcome will be reached. The same holds for the case of bargaining over private goods where small numbers (and thus a noncompetitive situation) are concerned. But whereas in that case increasing the number of participants leads to a competitive solution, such will not be the case where social goods are

[33]Alternatively, we may move along B's demand schedule from Z to K and plot B's supply schedule as the difference between SS and GC. The latter schedule, anchored now at Q_A, will intersect ZD at K with equilibrium output again at Q_E. In this case, the purchase of additional units is made by A with B the contributor.

[34]GC and Q_BI must intersect at output OQ_E since $Q_EH + Q_EK = Q_EF$ (by construction of D_{A+B}) and since $HF = Q_EK$ (by construction of Q_BI).

concerned. While bargaining imperfections are reduced, individuals will have no further reason to reveal their preferences and make their contributions. A political process now becomes necessary to solve the problem.

While the problem of social goods arises primarily in the large-number context, there are important situations in which the small-number case applies. Neighbors, for instance, may get together in a mutual effort at tree spraying; municipalities may join in a common garbage disposal plant; or national governments may cooperate in undertaking joint ventures.

Spatial Limitation of Benefits and Local Finance

When speaking of social goods as "being available to all," we do not really mean that the world population, or even the entire population of one country is to be included. The spatial benefit area is limited for most social goods and the members of the group are thus confined to the residents of that area. This does not change the nature of the preceding argument. A group which is sufficiently large to require provision for social goods by political process need not be all-inclusive. At the same time, this feature of spatial limitation of benefits is central to the application of social goods theory to local government. This being a major topic in its own right, consideration is postponed until the issues of fiscal federalism are examined.[35]

Benefit Externalities from Private Consumption

Throughout the preceding discussion, a sharp distinction was drawn between private goods such as hamburgers the benefits of which are wholly internalized (rival) and others such as air purification whose benefits are wholly external (nonrival). This polarized view was helpful in understanding the essential difference between private and social goods, but it is not realistic. In reality, mixed situations of various sorts arise and social-good-type problems arise not only in the budgetary context but wherever private consumption generates externalities.

SMALL-NUMBER CASE Suppose that A, by spraying his own lawn to eradicate dandelions, also benefits the adjacent lawn of B but that B's spraying does not benefit A. B will then find it to his advantage to contribute to A's spraying. The situation is quite similar to that of Figure 3–5. As a result of bargaining, A's spraying will be increased and that of B will be reduced. Total consumption of spray protection is increased, although the total input of spray may be reduced.[36] By moving the spraying from B where it does not generate externalities to A where it does, the efficiency of the process is

[35]See Chap. 26.

[36]See J. M. Buchanan and M. Z. Kafoglis, "A Note on Public Goods Supply," *American Economic Review*, June 1963.

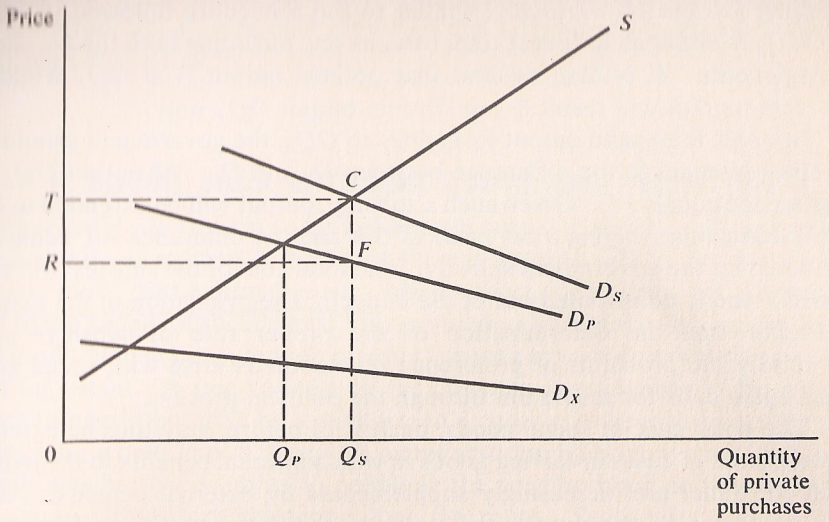


FIGURE 3-6
Consumption Spillovers with Large Numbers

increased. Whereas in the general case of social goods (as shown in Figure 3–5) the benefit flow is reciprocal, we deal here with a situation where it moves in one direction only.[37] This being the case, it now matters where the own-input occurs, whereas it did not in the preceding case.

LARGE-NUMBER CASE A bargaining solution will not result where large numbers are involved. For instance A derives benefits from having himself inoculated against polio, but so do many others for whom the number of potential carriers and hence the danger of infection is reduced. Or, by educating himself, A not only derives personal benefits but also makes it possible for others to enjoy association with a more educated community. Since numbers are large, bargaining does not work and a budgetary process will again be needed to secure preference revelation. But the budgetary intervention in this case will not involve full budgetary provision; rather, it will take the form of subsidy to private purchases.

This is shown in Figure 3–6 where D_P represents the market demand schedule (obtained by *horizontal* addition of individual demand schedules) for a private good. Now let D_X be the supplementary schedule reflecting the further demand for external benefits generated by private consumption and obtained by vertical addition of individual demand curves for such benefits.

[37]The option given in footnote 33, p. 73 no longer applies. The spraying *must* be done by A. Note also that the spillover benefits received by B will typically be at a diluted level. If so, A's demand curve for B's spraying in Fig. 3–5 will lie to the left of that for his own spraying and the equilibrium output will be to the left of Q_E.

Adding D_P and D_X *vertically*, similar to the procedure followed in Figure 3–1, D_S is obtained to reflect total benefits and including both the D_P and D_X components. It is then evident that optimal output is at OQ_S while the private market will result in equilibrium output OQ_P only.

In order to expand output from OQ_P to OQ_S, the government should pay a subsidy equal to the difference between D_S and D_P. At output OQ_S this difference equals FC. Given such a subsidy, output will be extended to OQ_S with consumers paying a net price of OR and the difference RT being contributed by the government subsidy. The total cost of the subsidy will equal $RFCT$ and is contributed out of the budget. The evaluation of the external benefits—and the determination of the proper rate of subsidy—poses precisely the problems of preference revelation as arise with social goods and again calls for resolution through the political process.

The polar case of social goods, dealt with before, may thus be extended into a band of cases involving goods in which internal benefits to the individual consumer are increasingly supplemented by external benefits. At the one extreme of the purely private good the distance FC in Figure 3–6 becomes zero, as D_S is the same as D_P and the subsidy becomes zero. At the other extreme of the purely social good, D_S becomes equal to D_X and the subsidy pays the entire price, i.e., the good is entirely provided for through the budget. In between we have the cases of mixed goods, to be financed by a mix of private payments and of subsidies. The tax-expenditure theory of Sections A and B may thus be restated more generally as a subsidy theory, with subsidies ranking from zero to 100 percent.

It might be argued that the externality problem dealt with here is in fact all-pervasive, so that the cases of purely internal or wholly rival consumption become nonexistent. This point has some merit but it should not be permitted to wipe out the basic difference between the consumption of private and social goods. After all, most distinctions in economics are somewhat arbitrary (as, for instance, that between consumer and capital goods) but this does not mean that they are useless.

Alternative Modes of Provision

Another obstacle to a clear-cut distinction between social and private goods arises because certain needs may be met in a variety of ways, some of which involve provision of private and others provision of social goods. Thus, the need for protection may be met by private locks for each house or they may be met by police protection for the city block. If the first route is taken, provision may be left to the market, while in the second, budgetary provision is needed. In situations where this option exists, a choice must then be made between the two modes. Since the private mode has the advantage of permitting individuals to consume different amounts, the social goods mode, to be preferred, must more than outweigh this advantage by offering a lower cost per service unit.[38]

F. SOCIAL BADS, EXTERNAL COSTS, AND POLLUTION

The preceding discussion so far has been in terms of social *goods* and external *benefits*. It remains to note that there is another side to the picture, i.e. social "*bads*" and external *costs*. While budget policy does not address itself to the supply of social bads,[39] the problem of external costs, incidental to the production or consumption of other (private or social) goods is pervasive and important. A free concert on the common is enjoyable to those who come to hear it but may be a disutility to a captive audience of nearby residents who would like to sleep. A manufacturing plant may emit smoke or smells which are a disutility to people in the neighborhood and the noise of jet planes will disturb residents along the route. Such costs are external costs. They are real from a social point of view but they are not included as costs by the producer. He does not have to pay for them, as he must for labor or materials. Such costs are not internalized and hence are disregarded. Social costs—which include both internalized (or private) *and* external costs—exceed private costs. Since the market accounts for the latter only, the price is too low and the good tends to be oversupplied. Similar problems arise where externalities are generated in the process of consumption (e.g., automobile pollution) rather than production. In either case, costs to society are disregarded. This is the problem of pollution.

Efficiency Aspects

As with the case of external benefits, the problem differs depending on the numbers involved. If numbers are small on both sides, the polluter and his victims can get together and, by bargaining, achieve a more or less efficient solution. Thus, if there are only two people involved, the victim V and the polluter P, V will find it worth his while to pay P to reduce pollution (either by curtailing the pollution-causing activity or by substituting other techniques) up to the point where the cost of the side payment comes to equal the

[38]See Carl S. Shoup and John Head, "Public Goods, Private Goods and Ambiguous Goods," *Economic Journal*, September 1969.

[39]It may be, however, that the minority not only values particular social goods less highly than the majority, but considers them a disutility. Pacifists may attach a negative value to defense or people who like sun may object to cloud seeding.

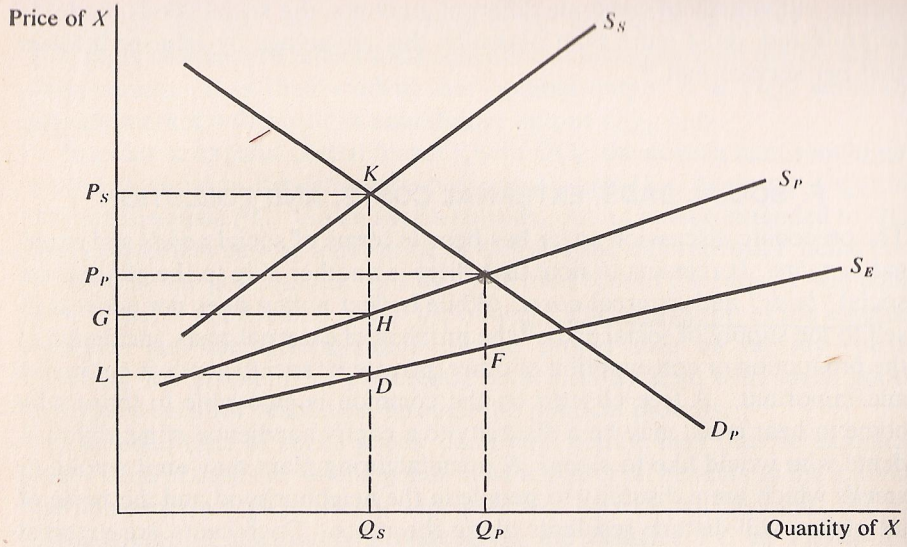


FIGURE 3-7
Adjustment for External Cost

marginal burden of pollution. As before, a more or less efficient bargaining solution may be arrived at and no government regulation will be needed.[40]

Once many parties are involved (on the V and/or the P side), the bargaining solution ceases to apply. Payments by any one V will no longer suffice to check the pollution. Hence no offers will be made. As in the social-good case, market failure results and a political process is needed to achieve an efficient outcome.

Figure 3–7 shows how this is accomplished. D_P is the market demand schedule for product X and S_P is the industry supply schedule. It reflects only such costs as are internalized (i.e., involve outlays by) the firm. Output is at OQ_P and price is at OP_P. Suppose now that the production of X generates an external cost, such as a smoke nuisance or the pollution of a river through the effluence of chemicals. Proper allocation requires that the cost of such damage be allowed for. Let this cost be reflected by S_E. The pollution or external cost at output OQ_P thus equals Q_PF. Social cost (obtained by vertical addition of the two S schedules) is then given by S_S. To allow

[40]Because of this it has been argued that market adjustments will tend to internalize what would seem to be external costs and benefits through mutual adjustment among the parties, thereby avoiding the need for regulatory measures. This proposition, which has come to be known as the "Coase Theorem" (see R. H. Coase, "The Problem of Social Cost," *Journal of Law and Economics*, October 1960) has merit in a small-numbers setting but cannot be generalized to the large-number case. Moreover even for small numbers, the equity issue remains to be resolved. See next section.

fully for social cost, a tax (equal at each level of output to S_E) should be imposed thereby raising the supply schedule from S_P to S_S. As a result, price rises from OP_P to OP_S and output falls from OQ_P to OQ_S. The tax per unit at output OQ_S equals $HK = Q_SD$ and private cost equals Q_SH. The role of tax in Figure 3–7, it will be noted, is analogous to that of the subsidy in Figure 3–6.

The tax correction will not wholly eliminate the polluting activity. Some degree of pollution cost Q_SD remains, but it will be smaller than the pretax level Q_PF. The problem of pollution control, therefore, is not to eliminate pollution but to cut it back to its efficient level, i.e., the level at which the marginal cost of production (including the social cost of pollution) ceases to exceed the benefits derived by the consumers of the product.

In practice, the problem is complicated by the fact that production and pollution are not linked in a fixed relationship as assumed in Figure 3–7 but that the level of pollution may be changed by adopting a different technology. Raising the height of chimneys may reduce pollution although it raises private costs. The problem, therefore, is not only one of adjusting the level of output for a given technology but also of adapting the technology to reduce pollution. Pollution-reducing changes should be made until the marginal private cost exceeds the marginal social benefit thereof. Public policy must thus be designed to encourage the choice of efficient pollution-reducing devices.

Moreover, the pollution problem always involves two parties, and prevention devices may be applied on either side. The remedy should be applied where it is cheapest, which may be where the damage is suffered rather than where it originates. Thus it may be cheaper to relocate residents of a flood-prone area than to require upstream residents to build a dam.

A final difficulty in designing policy correctives is that the magnitude of external costs (the level of the S_E schedule) is not known but must be determined. As in the case of benefits, the true level of this cost is not readily revealed. Claims will be readily solicited, but they may be too high.[41] Thus, a political process may again be needed to determine costs. Correction for pollution inefficiencies, though not difficult in theory, poses complex problems of implementation.[42] These matters will be examined further in Chapter 29.

Equity Aspects

Whatever is done to solve the efficiency problem, there remains an equity issue to be dealt with. In the *small*-number case, the V's may reduce pollu-

[41]In some instances, external costs may be registered in the market, e.g., the cost of noise pollution may be measured through its effects on real estate values close to airports.

[42]See Ralph Turvey, "On Divergence between Private and Social Costs," *American Economic Review*, August 1963; and Chap. 29, Sec. E below.

tion to the efficient level by making payments to the P's. This will improve their position as compared with the no-payment situation, but they will still be worse off than if the pollution problem had not arisen. If P undertakes an activity which burdens V and V must bribe P to cease it, P in fact imposes a tax on V. The question is whether V is entitled to do so. This, in the last resort, is a matter of property rights.[43] Does V have the right to undisturbed nights and to oilfree beaches? If so, this problem is not solved by bargaining, even in the small-number case. Legal rules will be required which call upon P to compensate V for such pollution burden as remains after pollution has been reduced to the efficient level.

In the *large* number case, the proceeds from the tax may be used to compensate the victims of the remaining pollution costs. The revenue, equal to $GHKP_S$ in Figure 3–7, will just cover the remaining cost OQ_SDL if measured at the marginal level or exceed it if measured as the area under the S_E curve.

H. MERIT GOODS

Our discussion of social goods has been based on the premise of consumer sovereignty, i.e., that the allocation of resources should be determined in line with individual preferences, and that this premise should hold equally for private and for social goods. It remains to consider situations where this does not apply.

In certain instances it appears to be the very intent of the decision maker to interfere with or override individual preferences. Thus sumptuary taxes are imposed on liquor because the consumption thereof is held undesirable, or low-cost housing is subsidized because decent housing for the poor is held desirable. The consumption choices which are penalized or supported in some instances involve goods which by our previous definition are private (rival in consumption) and in others goods which are social (nonrival). The issue now under consideration, therefore, must not be confused with the distinction between private and social goods itself.

Such policies cannot be explained in terms of our earlier approach to social-goods theory. Although that approach called for the compulsory acceptance of the voting decision and involved some interference with minority views, such interference was but the unfortunate by-product of a procedure designed to meet individual preferences as well as possible. In the situations now considered, such interference is not accidental but the

[43]It has been suggested that the victim should be entitled to claims if, when acquiring a property (subsequently damaged by pollution) a prudent man could not have been expected to anticipate the development of such damage. See F. I. Michelman, "Property, Utility, and Fairness: Comments on the Ethical Foundations of 'Just Competition' Law," *Harvard Law Review*, **80**: 1165–1258, 1966–1967; and H. Demsetz, "Towards a Theory of Property Rights," *American Economic Review, Papers and Proceedings of the A.E.A.*, pp. 347–379, May 1967.

very purpose of public policy. Certain goods are held meritorious (they are considered "merit goods") while others are held undesirable.

One explanation may simply be that even a democracy such as ours has aspects of an autocratic society, where it is considered proper that the elite (however defined) should impose its preferences. This seems in outright contradiction to free consumer choice. Alternatively, what appears to be a contradiction may turn out to be a correction for deficiencies in the prevailing exercise of consumer choice. Given incomplete consumer information, temporarily imposed consumption choice may be desirable as part of a learning process, so as to permit more intelligent free choice thereafter. Moreover, individuals may not know the consequences of particular consumption choices and may need guidance. Children in particular are in need of protection. But though reasonable to all but the most doctrinaire individualist if used as an informational device, these considerations can be readily subject to abuse and become the excuse for totalitarian indoctrination.

However this may be, such an interpretation of merit goods hardly serves to explain away many budget items which imply imposed preferences, such as low-cost housing or school lunches. That provision for merit goods is frequently directed at the poor suggests paternalism as an explanation. If the purpose of such subsidies were merely redistributional, the purpose could be served better by making cash transfers, allowing the recipients to use the cash in line with their own preferences. That this is not done returns us to our earlier discussion of motivations for redistribution. People are more willing to contribute to better housing for the poor, than to raise their incomes in general.[44] Putting it differently, they are willing to make gifts which are earmarked, but less willing to underwrite cash grants which may be used without the donor's control.

Where does this leave the concept of merit goods? It appears that the concept lends itself to a variety of interpretations which should be distinguished, to avoid confusion. Interpreted as imposition of preferences of the ruling group or decision makers, allocation on a merit-good basis stands outside what has been dealt with here as the theory of social goods. Interpreted as a device to provide consumer information, as a means of allowing for externalities or as an expression of interpersonal utility preferences (as a basis for giving in kind), the merit-good concept falls within the framework of traditional analysis in which efficient allocation must in the end be related to individual choice.

Further Readings

Bator, F. M.: "The Simple Analytics of Welfare Maximization," *American Economic Review*, pp. 22–59, March 1957.

Buchanan, J. M.: *The Demand and Supply of Public Goods*, Chicago: Rand McNally, 1968.

[44]See p. 71.