NON-ECONOMIC ACTIVITIES, INDIRECT EXTERNALITIES, AND THIRD-BEST POLICIES

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I. GENERAL DISCUSSION

While recognizing that science has both the functions of shedding light and bearing fruit, I would go along with Pigou in regarding the second function as the more important one. I would also use social welfare as the criterion of ultimate fruitfulness. Hence, most scientific studies should ultimately contribute to the advancement of human welfare (if not that of all sentient creatures). As economists, and especially as welfare economists, we are concerned with economic welfare. However, as Little observes, 'there is no part of well-being called "economic well-being". The word "economic" qualifies not well-being, but the causes of well-being or changes in it (...). The economic causes of changes in the happiness of an individual are taken to be those things and services which the individual

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1. It does not matter very much what concept of social welfare one is using provided it depends somehow on individual well-being. For my part, I have argued elsewhere (Ng, forthcoming) that, with rather weak assumptions, our social welfare function is the unweighted summation of individual utilities that satisfy a certain convention.

2. One should not insist on immediate results; much of basic research may appear irrelevant to human welfare at the time but may eventually prove to be highly useful.
consumes or enjoys, and which could be exchanged for money, together with the amount and kind of work which the individual does' (Little 1957, p. 6).

One can meaningfully concentrate on the economic factors affecting welfare only if there is no significant interdependence between the economic and the non-economic factors. If a change in the economic factors also leads to a change in some non-economic factors affecting welfare, analysis concentrating on the effects of economic factors alone may not be adequate. Hence, welfare economic analysis is based on the assumption that 'for relatively small changes in these economic variables, other elements in welfare (...) will not be significantly affected' (Bergson 1938, p. 312). This presumption may be true for some non-economic factors such as the form of government. A significant reduction in per capita income may result in a revolution, but relatively small changes in the amount and composition of output are unlikely to affect the form of government by any appreciable degree. However, there exists a type of non-economic factors that does not seem to satisfy this presumption, as discussed below.

Apart from the kind and amount of work performed, goods and services consumed (which, for brevity, will all be lumped together and referred to only as 'goods'), the happiness of an individual will also be affected by a host of other things including the climate, the system of government, and various non-economic or semi-economic activities he and others undertake such as chatting to a neighbour, strolling in a street, attending social activities, etc. If we define these activities widely enough, then one may argue that the system of government must be embedded in these activities and hence not a separate factor affecting welfare. Moreover, these activities would then include most of the economic factors as well. On the other hand, if we confine these activities to those undertaken by the individual in his leisure time without the simultaneous consumption of significant amount of goods, it may exclude many interesting activities from our analysis. Hence, I deliberately leave the definition of these activities vague so that its scope can be developed more naturally and

3. It may be noted that this Marshall-Pigou-Little definition of 'economic' differs from the Robbins definition. If economics is to coincide with 'what economists do (as economists)', then it seems that neither definition gives a perfect fit.
usefully. Suffice it to say that individual well-being is affected by such activities as well as by the amount of goods consumed.

It may be objected that there is really no need to distinguish between goods and activities since an activity may just be regarded as another good and hence traditional analysis applies. This is true for certain problems at a certain level of abstraction. But there are significant differences between goods and activities that make separate treatment not only insightful, but also necessary for certain problems. For example, the marginal rate of transformation (MRT) between two activities is, in general, not a constant for an individual. Thus, if 'goods' subsume 'activities', an individual does not face a fixed price vector. This may then seem to violate the assumption used for the proof of the Pareto optimal nature of a competitive equilibrium. Yet the equilibrium may still be Pareto optimal if there is no external effect since the individual concerned can choose his own activities. If we introduce externality, the distinction between goods and activities will also be seen to imply significantly different policy implications.

For the moment, let me come back to the interdependence between goods (economic factors) and activities (non-economic or semi-economic factors). It is clear that a change in the amount or composition of goods consumed will, in general, have a significant effect on the desired pattern of activities and vice versa. The possession of a car tends to encourage such outdoor activities as travelling and picnicking while a (non-portable) TV set is more a substitute for such activities. Similarly, travel leads to the use of more disposable stuff and reading saves a lot of material consumption. Hence, economic analysis is not complete without taking account of the interdependence between goods and activities. For example, TV broadcasting in itself may seem to improve individual welfare tremendously. But if television leads to a substantial reduction of social interaction between individuals which is an important element conducive to social welfare, then one is less certain about the contribution of television to welfare. One could of course ask, if social interaction is more conducive to welfare than watching TV, why does an individual choose the latter? If we assume perfect knowledge, rationality and the absence of externality, then an individual who chooses to watch TV must be better off watching TV. Therefore, the possibility of a
reduction in social welfare cannot arise. While recognizing that perfect knowledge is not a realistic assumption, I would go along with the liberal view that, if imperfect knowledge is the trouble, the solution is to improve knowledge, not to overrule individual choice. However, absence of externality is not an acceptable assumption either. Granted the existence of external effects, individual free choice need not produce a social optimum. An individual's participation in social activities need not only yield utility for himself, but may also have beneficial effects on others, e.g., by making the activities more interesting. Moreover, the beneficial effect of social interaction may not be confined to those individuals participating in it and to the time of participation only. The beneficial effect may be more in the form of promoting a long-term harmony of the society and the feeling of identification of individuals than in the form of immediate enjoyment from the activities. If this is true, then television may actually result in a reduction in social welfare, perhaps at the margin.

The external effect of television described above and similar externalities may be termed 'indirect externalities'. Watching TV broadcasting may not in itself have any external effect. Its externality arises indirectly through being highly competitive with another activity that produces an external effect. It is natural to ask, why don't we attribute the externality to whatever good or activity produces it, and dispense with the concept of indirect externality? This brings us to another reason for distinguishing activities from goods.

When a good produces a significant external economy/diseconomy, the traditional Pigovian solution is to impose a tax/subsidy according to the marginal damage/benefit involved (for a critical survey, see Ng, 1971). It is true that there are difficulties in estimating the damage/benefit, problems of second-best, administrative costs, etc. But these problems are not inherently insuperable. If the externality involved is a very substantial one, then a tax/subsidy based

4. Many liberals believe that, though certain illiberal policies may appear to improve social welfare in the short run, they are detrimental to social welfare in the long run. If some illiberal policies are beneficial even in the long run, the liberals are faced with the difficult choice of whether to use social welfare or liberalism as the ultimate criterion. This choice distinguishes the fundamental liberals from the instrumental liberals; see Ng (1973).
on a reasonable estimate is likely to improve matters even after allowing for administrative costs. However, if the externality is produced by a non-economic activity the difficulties involved is likely to be of a higher order of magnitude. Moreover, at least for some cases, the distortion of the externality cannot be removed by taxes or subsidies or even by regulation or control.

A good is usually physically identifiable and produced by a firm. Hence it is more susceptible to the levy of a tax or grant of a subsidy or some other form of control. On the other hand, an activity is usually undertaken by an individual in his leisure time and thus more difficult to identify and control. Take the example of careless driving. A careless driver has to exceed a certain level of ‘carelessness’ and then he has to be spotted and caught by the police before he can be convicted and penalized. A careless driver, even if he does not actually cause an accident, imposes external costs on other drivers and pedestrians by creating a feeling of insecurity. Drivers who do not have much consideration for others, are very difficult to penalize for external diseconomy caused by them especially if they are also ‘careful’ enough to observe the legal speed limit whenever a policeman is in sight.

If the prevention of careless driving by fines and controls is very difficult and costly, the encouragement of some externally beneficial activities such as social interaction by subsidy, regulation, or negotiation is inherently incapable of achieving its objective. For example, suppose friendly chatting and mutual visits are socially beneficial. Assume that there is no difficulty in giving subsidies to individuals engaging in such activities. But once these subsidies are given, they may change the nature of such activities. Any person engaging in these activities may become suspect of aiming at the subsidy rather than spontaneously displaying a friendly attitude. If anything, the subsidies will tend to discourage such activities as most people would dislike being suspected of being greedy. Even if the reverse is true and more such activities are undertaken, their nature may have changed from being socially beneficial to being socially harmful. Neither can these activities be fostered by regulation such as requiring each individual to chat with his neighbours at least two hours a week. Private negotiation between individuals is also unsuitable as a means of internalizing the externality, even assuming no costs
of coming to an enforceable agreement. Once Mr. A. has to be paid by Mr. B. to be friendly, Mr. B. will no longer enjoy spontaneous friendliness, but a substitute in the form of paid companionship. It is even doubtful to what extent such activities can be encouraged by moral suasion. Many such activities are enjoyable and contribute to a more harmonious society only if people feel free and casual in taking part in it. Being 'non-economic' in nature these activities cannot be tackled directly by an economic approach. Hence, apart from modifying the general cultural and institutional environment (through education and other means), the only thing that can be done to encourage such activities seems to be the encouragement/discouragement of the consumption of goods and undertaking of activities that are highly complementary to/competitive with such activities. Hence the indirect external effect which is generated by a good or activity by being highly complementary to or competitive with another activity that produces an external effect difficult to be accounted for directly. If one believes in merit and demerit goods and activities, then one may also similarly define an indirect merit/demerit good/activity as one that is highly complementary to or competitive with another merit/demerit activity which cannot be affected directly. For example, if milk is a merit good, it can easily be subsidized directly. But if physical exercise is a merit activity and if laziness and lack of time rather than the costs of equipments are the main factors affecting people’s participation in exercises, then a subsidy on sporting goods may not yield appreciable effects. The alternative may be the encouragement/discouragement of goods or activities highly complementary to/competitive with (TV again?) physical exercises.

Does the argument above justify concrete policy measures to encourage or discourage by means of tax/subsidy or regulation the consumption of certain goods or the pursuit of activities that yield indirect externality? First, this depends on whether it can be established or whether it is widely accepted that certain activities produce important external effects difficult to be dealt with directly. There seems to exist some degree of agreement that an important element in social welfare (especially if a long-term view is adopted) is a close relationship between individuals. To my knowledge, this seems to be consistent with most psychological and sociological studies as well as casual experience. For example, it is said that, after the introduc-
tion of air-conditioning into a small town in a hot climate, psychological and sociological problems became more serious as most people stayed within their own four walls. Secondly, the desirability of concrete policy measures depends on the practicability and costs of pursuing such policies. Among other things, this depends on whether we have a small number of goods and activities that are close substitutes and/or complements to those activities recognized to have important ‘non-amenable externalities’. If an activity with non-amenable externality (or a non-amenable merit/demerit activity) has only one single close substitute or complement, then the costs of encouraging/discouraging the consumption of this substitute or complement are likely to be relatively small. On the other extreme, if the non-amenable activity does not have really any close substitute or complement, i.e., its complementarity relationships with other goods and activities are diffused more-or-less evenly throughout the system, then a good or activity that indirectly produces this particular externality does not even exist. In less extreme cases, the activity is likely to have a number of close substitutes/complements. To what extent it is desirable to pursue the policy of encouragement/discouragement then depends on the effects and costs of doing so.

It is true that the over-all extent to which an activity is beneficial or harmful is very difficult to establish precisely\(^5\). However, imperfection in our knowledge does not mean that we have to stand idle and do nothing. We have to base our decision on the information we have. Unless our information indicates an almost complete ignorance, an activity can be classified according to its probable effect. Moreover, with the advancement of our sciences (especially economics, psychology, sociology, medicine, genetics, etc.), we are likely to know more about the effects of goods and activities on human welfare. Hence, as time goes by, the concept of indirect externality is likely to become more relevant.

If one wishes to know the full consequences of a change (economic growth, a policy measure, etc.), one has to take into account both

\(^5\) This applies even to, say, air pollution, a more-or-less certain case of external diseconomy. It may happen that some forms of air pollution, within limits, may delay the coming of an ice-age and hence prove to be externally beneficial. However, before this is established, it is reasonable to regard air pollution as most probably a diseconomy and to act accordingly.
the direct and indirect effects, both the short and long-term effects. This means that, at least for sufficiently large changes, economists probably need the assistance of practitioners of other social studies and even of the natural sciences before a definite policy proposal can be made. This should occasion no surprise. If we are interested in overall social welfare rather than the narrow concept of, say, gross national product, it is clear that all factors affecting welfare have to be taken into consideration. For example, while economic growth has provided material abundance to the majority of people in the economically advanced countries, many people are sceptical of the value of growth in advancing human welfare due to the less measurable effects of growth. The concept of indirect externality seems to provide a useful framework for a more comprehensive appraisal of the value of such changes as economic growth.

The insufficiency of an analysis focusing only on purely economic factors does not indicate the uselessness of economists. Rather, it points to the need to expand our scope and to collaborate with workers in other fields. Due to the complexity and interrelatedness of human society, most changes have widespread repercussions. In this perspective, the so-called general equilibrium analysis of economic theory becomes a partial analysis. If we agree that our interest is in promoting overall social welfare, we must take a step further and widen the scope of our analysis.

In the following section, a simple case with the absence of external effects is first discussed. Externalities and the associated policy-issues are discussed in later sections.

II. A SIMPLE CASE

Beginning with a simple case without external effects, we write the utility function of the i-th individual as:

\[ U_i = U^i(G_1, \ldots, G_n, A_1, \ldots, A_m) \]  

where \( G_j \) is his consumption of the \( j \)-th good and \( A_j \) his indulgence in the \( j \)-th activity.

6. See e.g., Bensausan-Butt (1960), Mishan (1967).
NON-ECONOMIC ACTIVITIES, INDIRECT EXTERNALITIES

Assuming non-satiation and maximizing (1) subject to the constraint (2) which the individual faces

\[ f^i (G_1^i, \ldots, G_n^i, A_1^i, \ldots, A_m^i) = 0 \]  

(2)
yields, assuming differentiability and ruling out corner solutions

\[ \frac{U_{ij}^i}{U_{nj}^i} = f^i_j / f^i_n \quad (j = 1, \ldots, n - 1) \]  

(3a)

\[ \frac{U_{ij}^i}{U_{nj}^i} = f^i_{ij} / f^i_n \quad (j = 1, \ldots, m) \]  

(3b)

where \( U_{ij}^i = \partial U^i / \partial G_j^i \), \( U_{nj}^i = \partial U^i / \partial A_j^i \), \( f^i_j = \partial f^i / \partial G_j^i \), and \( f^i_{ij} = \partial f^i / \partial A_j^i \). The last good, \( G_n^i \), is being used as a numeraire.

\( f^i_j / f^i_k \) is the MRT at which individual \( i \) can transform the \( k \)-th good into the \( j \)-th good. If the individual is a price taker, this private MRT is equal to the price ratio \( P_j / P_k \). Thus (3a) gives the traditional equality between marginal rates of substitution (MRS) and price ratios.

The transformation between goods and activities may not seem possible except through variation in the hours of work done. However, in general, the feasible set of activities may be a function of the set of goods consumed. For example, if one eats more nutritious food, one may then be able to engage more in activities demanding physical fitness. Similarly, the transformation of one activity into another is influenced not only by the time available, but also by one’s physical and intellectual abilities.

Now turn to the conditions for Pareto optimality. To derive these conditions, we maximize, without loss of generality, the utility of the first individual subject to the constancy of the utilities of all other individuals, as well as the feasibility constraint.

\[ F(G_1^1, \ldots, G_n^1, G_1^2, \ldots, G_n^2, A_1^1, \ldots, A_n^1, A_1^2, \ldots, A_m^2) = 0 \]  

(4)

where \( s \) is the number of individuals concerned. We have,

\[ \frac{U_{ij}^i}{U_{nj}^i} = F^i_j / F_n \quad (i = 1, \ldots, s; j = 1, \ldots, n - 1) \]  

(5a)

\[ \frac{U_{ij}^i}{U_{nj}^i} = F^i_{ij} / F_n \quad (i = 1, \ldots, s; j = 1, \ldots, m) \]  

(5b)

where \( F^i_j = \partial F / \partial G_j^i \) (assumed equal for all \( i \)) and \( F^i_{ij} = \partial F / \partial A_j^i \).

Comparing (5) with (3), it can be seen that, if the price ratios of
goods $P_j/F_n$ (taken to be the same for all individuals) are equal to the society's efficient MRT, $F_j/F_n$, then (5) will be satisfied if (3) is satisfied since in the absence of external effects, $f_{ij}/f_{ij}$ should equal $F_{ij}/F_n$. Thus, with appropriate second-order conditions, the decentralized adjustment process leads to Pareto optimality. However, with the introduction of externality into the model, this will no longer be necessarily true, as we shall see in the next section.

Before going into externality, it may be noted that our analysis deals with the general case where the transformation between goods and activities is possible. There is a special case where such transformation is not possible. If an individual is required to do a fixed number of hours of work for which he is paid a fixed salary, and if the only constraint on goods is income and the only constraint on activities is leisure time, then ruling out 'do-it-yourself' goods, he cannot transform one into another. He is faced with two separate constraints. He will then be equating his MRS for a pair of goods with the corresponding MRT and similarly for a pair of activities, but the MRS between a good and an activity has no significance. If the constraint on the hours of work is taken as binding by society, this does not affect the Pareto optimal nature of decentralized adjustment.

### III. INDIRECT EXTERNALITY

For simplicity, let us confine externality to one activity only. Suppose the first activity of each individual enters into the utility functions of all individuals.

$$U^i = U^i (G_1^i, \ldots, G_n^i, A_{1,1}^i, \ldots, A_{1,1}^i, A_{2,1}^i, \ldots, A_{m,1}^i)$$

(i = 1, \ldots, s) (6)

Maximizing (6) subject to (2), by selecting values of variables under his control, the individual equilibrium conditions (not position) stay the same as (3). The Pareto optimal conditions are also the same as (5) except that, for the first activity, we have,

$$\sum_k U_{i1}^k/U_n^k = F_{i1}/F_n \quad (i = 1, \ldots, s)$$

which is not the same as the corresponding conditions in (5). Hence, except by coincidence, the individual decentralized adjustment proc-
cess characterized by (5) does not lead to Pareto optimality. An obvious solution seems to be a tax/subsidy on $A_1$ with marginal rates determined by $\sum_{k \neq i} U_{i1}^{k} / U_{n}^{k}$. If $A_1$ is an ordinary economic good, then this may be a practicable solution. However, for a non-economic activity, as discussed in Section I, the cost of imposing the tax/subsidy or some other form of control is likely to be very high. More importantly, at least for some activities, the very imposition of control or encouragement tends to defeat its very purpose. In terms of our mathematical model, this means either that the method of control itself enters into individual utility functions or that the control alters the nature of the activity concerned such that it is no longer the original activity. In either interpretation, the tax/subsidy or other method of control fails to achieve the desired result. The optimal feasible policy may then be the control (tax/subsidy or some other method) of one or more goods or activities which are more susceptible to economic manipulation and which are highly complementary or competitive with the activity directly producing the externality. As is shown in the following section, this policy is neither a first-best nor a second-best policy (as commonly called). Under most circumstances such policies are not feasible.

IV. THE THIRD-BEST POLICY

In the model of the preceding section, if $A_1$ is the only activity not susceptible to economic manipulation, we may yet be able to achieve a first best solution. The Pareto optimality conditions (5) and (7) are in the form of MRS and MRT and involve pairs of goods/activities. If only $A_1$ is not amenable to economic manipulation, we may achieve the desired equalities in (5) and (7) by manipulating all other goods and activities, and, ignoring administrative costs, obtain a first-best solution.

7. Taxes on all goods and activities except $A_1$ may be recognized to be equivalent to a subsidy on $A_1$ and hence may lead to the same difficulty as a tax on $A_1$ itself. However, in a model with a number of goods/activities producing external costs and benefits, there will be in general, a number of goods/activities not subject to tax/subsidy and a number subjected to taxes, and some subjected to subsidies for achieving the first best. Hence, the implicit subsidy on $A_1$ will not be seen clearly.
However, it is more likely that, due to either prohibitive administration costs or the nature of activity, there are two or more activities that are not susceptible to economic manipulation. Suppose both $A_1$ and $A_2$ are such activities. We have the constraint,

$$\frac{U_{1i}^t}{U_{12}^t} = \frac{F_{i1}}{F_{i2}} \quad (i = 1, \ldots, s) \tag{8}$$

and the corresponding second-best problem of maximizing (6) subject to (4) and (8). The Lagrangean function is

$$L = \sum \lambda^i U^i - \theta F - \sum \alpha^i \left( \frac{U_{i1}^t}{U_{i2}^t} - \frac{F_{i1}}{F_{i2}} \right) \tag{9}$$

where $\lambda^i$, $\theta$, and $\alpha^i$ are the Lagrangean multipliers associated with the respective constraints. The necessary conditions for Pareto optimality are now,

$$\lambda^i U^i_j = \theta F_j + \alpha^i \left( \frac{U_{i1}^t - U_{i2}^t}{(U_{i2}^t)^2} - \frac{F_{i1} - F_{i2}}{(F_{i2})^2} \right) \quad (i = 1, \ldots, s; j = 1, \ldots, n) \tag{10a}$$

$$\lambda^i U^i_{ij} = \theta F_{ij} + \alpha^i \left( \frac{U_{i1}^t - U_{i2}^t}{(U_{i2}^t)^2} - \frac{F_{i1} - F_{i2}}{(F_{i2})^2} \right) \quad (i = 1, \ldots, s; j = 2, \ldots, m) \tag{10b}$$

$$\sum_k \lambda^k U^k_{i1} = \theta F_{i1} + \sum_k \alpha^k \left( \frac{U^k_{11} - U^k_{21}}{(U^k_{2})^2} - \frac{F_{k1} - F_{k2}}{(F_{k2})^2} \right) \quad (i = 1, \ldots, s) \tag{10c}$$

where $U^i_{1j} = \partial U^i_t / \partial A^i_j$, $U^k_{1j} = \partial U^i_t / \partial A^i_j$, etc.

Eliminating $\alpha$'s and denoting

$$Q^i_j = \frac{U^i_{11} - U^i_{21}}{(U^i_{21})^2}, \quad R^i_j = \frac{F_{i1} - F_{i2}}{(F_{i2})^2}, \quad \text{etc.}$$

8. Taking $\partial F_{ih} / \partial G^k_j = 0$ and $\partial F_{ih} / \partial A^k_j = 0$ for $i \neq k, h = 1, 2$ and all $j$. My consumption does not affect the costs of your activities. Relaxation of this assumption introduces a slight complication in the notation which is already cumbersome, but does not affect the essence of the analysis below.
we have

$$\frac{U_j}{U_n} = \frac{F_j}{F_n} \left( 1 + \frac{\alpha^i}{\theta F_j} (Q_j^i - R_j^i) \right) \left( 1 + \frac{\alpha^i}{\theta F_n} (Q_n^i - R_n^i) \right)^{-1}$$ (i = 1, ..., s; j = 1, ..., n - 1) (10a')

$$\frac{U_{ij}}{U_n} = \frac{F_{ij}}{F_n} \left( 1 + \frac{\alpha^i}{\theta F_{ij}} (Q_{ij}^i - R_{ij}^i) \right) \left( 1 + \frac{\alpha^i}{\theta F_n} (Q_n^i - R_n^i) \right)^{-1}$$ (i = 1, ..., s; j = 2, ..., m) (10b')

$$\sum_k \frac{U_k}{U_n} = \frac{F_{k1}}{F_n} \left( 1 + \sum_k \frac{\alpha^k}{\theta F_{k1}} (Q_{k1}^k - R_{k1}^k) \right) \left( 1 + \sum_k \frac{\alpha^k U_{k1}}{\theta F_n U_k} (Q_n^k - R_n^k) \right)^{-1}$$ (i = 1, ..., s) (10c')

These illustrate the well-known result that the second-best solution indicates a general departure from the first-best conditions (Lipsey and Lancaster 1956). Unless the complicated ratios (bracketed) on the right hand side happen to equal unity, the nice equality between MRS (or aggregate MRS) and MRT is broken all round. While this seems to be quite devastating to welfare policy, we shall argue below that the damage is not as great as might be believed.

The complicated second-best solution is best only under the implicit assumption that the informational and administrative costs of achieving the complicated equalities are negligible. In the presence of these costs, the second-best solution is not only non-optimal, it is usually not even feasible. The informational requirements and administrative costs involved in achieving the complicated conditions throughout the economy is clearly prohibitive. The optimal feasible or the third-best solution can be attained only by ignoring those interrelationships that are not likely to be important and by aiming at something that will probably be close to the optimal. This third-best policy depends of course on the amount of information we have and the estimates as to which relationships are important and which

are not. With the advancement in our knowledge regarding the precise relationships, the third-best solution approaches (but is not likely to coincide with) the second-best solution. Adopting the philosophy of 'actions based on rough estimates are better than inaction or random policies', let us proceed to examine the third-best solution in a little more detail.

First, it may be noted that our argument for a third-best policy also applies to cases where no distinction is made between goods and activities. Hence, in the following discussion, goods and activities may be taken to be used interchangeably.

Consider 
\[ R_j = \frac{(F_{i1,j} F_{i2} - F_{i2,j} F_{i1})}{(F_{i2})^2} \]
which equals zero if either (i) \( F_{i1,j} = 0, F_{i2,j} = 0 \); or (ii) \( F_{i1,j} F_{i2} = F_{i2,j} F_{i1} \). The first condition will be met if the production constraint is linear. Failing this, condition (ii) will still be met if the partial derivatives of \( F_{i1} \) and \( F_{i2} \) with respect to \( G_j \) are equal, with units of \( A_{i1} \) and \( A_{i2} \) chosen to make \( F_{i1} = F_{i2} \). This will be so if the resources released by a reduction in the production of \( G_j \) are not particularly favourable for the production of either \( A_1, A_2 \) in comparison to the other. Hence, for those \( G_j \) where such resource 'bias' is not expected to be important, \( R_j \) may be taken as approximately zero. Unless \( A_1, A_2 \) are very dissimilar in their resource requirements, this can be taken to be so for most goods.

Now consider \( \theta \) and \( \alpha^t \). As the Lagrangean multiplier associated with the production constraint (4), \( \theta \) is the marginal contribution of resources to the objective function and may be taken as positive. Similarly, \( \alpha^t \) is the multiplier associated with (8), which may be written as

\[ \frac{U_{i1}^t}{U_{i2}^t} \cdot \frac{F_{i1}}{F_{i2}} = constant = 1, \text{ or } U_{i1}^t/U_{i2}^t - F_{i1}/F_{i2} = constant = 0 \]

If \( A_i^t \) does not have any external effect, this constraint will not be effective in reducing the value of the objective function and \( \alpha^t \) will be zero. If the external effect of \( A_i^t \) is an economy, an increase in the constant term in constraint (8) decreases the feasible value of the objective function; \( \alpha^t \) can therefore be taken as negative\(^{10} \). For the

10. Cf. KAWAMATA (1974). It is reminded that we are concerned with a probably optimal feasible policy and not with the rigorous proof of a theorem.
case of an external diseconomy, $\alpha^t$ is positive. In the following, we shall consider the case of external economy where $\alpha^t/\theta F_j$ may be taken as negative; the argument applies *mutatis mutandis* to other cases.

Since the choice of the numeraire good is arbitrary, it is not logically required, but most straightforward to choose one such that $Q_n^k - R_n^k = 0$. This is satisfied if $R_n^k$ is zero (which is easily satisfied as shown in a previous paragraph) and $Q_n^k$ is also zero. This is so if either (i) $G_n$ is practically independent of both $A_1$ and $A_2$, or (ii) the degrees of *Edgeworth* complementarity between $G_n - A_1$ and $G_n - A_2$ are equal. [Recalling that, with units of $A_1, A_2'$ chosen to make $F_1 = F_2$, we also have $U_{t1}^k = U_{t2}^k$ from (8).] If $R_n^k$ is not zero, $Q_n^k - R_n^k$ may still be zero if $Q_n^k$ equals $R_n^k$. In any case, if the numeraire good is chosen such that $Q_n^k - R_n^k$ may be taken as approximately zero, the bottom bracketed terms in equations (10') may all be neglected.

From the above discussion, it can be seen that for all those goods where $R_j$ can be taken as approximately zero, whether MRS should exceed or fall short of MRT depends only on the sign of $Q_j$. The latter is positive if $G_j$ is more complementary (or less competitive) to $A_1$ than $A_2$. If the degrees of complementarity are weak, the first-best equality between MRS and MRT may be kept unchanged without much loss in efficiency (possibly with much gain, if informational and administrative costs of pursuing a second-best policy is taken into account). If $G_j$ is highly complementary to/competitive with $A_1$ in comparison to $A_2$, then $Q_j$ is positive/negative and high in absolute value, justifying a MRS much below/in excess of MRT. This is the basis for the proposed tax/subsidy on goods and activities producing indirect externality discussed above.

**V. CONCLUDING REMARKS**

In conclusion, it may be said that, while the introduction of non-economic activities seems to complicate analysis and casts doubt on the practicability of welfare policy, our argument for a third-best policy limits the thrust of second-best theory and make welfare policy more practicable even in the wider perspective. However, the pro-
posal of encouraging/discouraging goods/activities with indirect externalities may be objected to as being deeply illiberal or as politically infeasible. I hope that the following will help to dispel such doubts.

If I understand it correctly, liberalism is the philosophy that individuals should be left free to do what they want unless their actions significantly affect other individuals. In the case of indirect externality, other individuals are in fact affected significantly, even though the effect may be indirect. As I mention elsewhere (Ng 1973), it is likely that we are liberals because we believe that liberalism contributes to social welfare. Thus, liberals would like to let factory-owners have the freedom to emit smoke if air pollution was not a problem. But if pollution has become serious enough to affect the welfare of mankind, most liberals will agree to restrict air pollution in some way. The encouragement/discouragement of the consumption of goods or the undertaking of activities with indirect externalities does not seem to me more illiberal than the tax/subsidy or regulation on direct externalities. If it is politically feasible to subsidize some merit goods (e.g. milk) and to prohibit some demerit goods (e.g. hard drugs), it seems to me that it should be politically feasible to encourage/discourage goods/activities widely recognized to be important indirect merit/demerit goods/activities or to have important indirect externalities.

Over the recent years, there seems to be signs of increasing criticisms and doubts about the relevance of economic theory especially among our students. Personally, I believe that many of these criticisms and doubts are unfounded or exaggerated and I am in much agreement with McDougall's (1974) recent praise of economics. Nevertheless, there are certain elements of validity in these criticisms and I think that one of the main reasons for such 'disillusion' is the recognition that, at least in the economically advanced countries, economic factors narrowly conceived are secondary in importance to social welfare in comparison to non-economic factors. If economists continue to restrict their scope of analysis by self-imposed and dubious scruples, the relevance of economics will become increasingly doubtful.
NON-ECONOMIC ACTIVITIES, INDIRECT EXTERNALITIES

REFERENCES


SUMMARY

This paper extends economic analysis to those non-economic activities (e.g. friendly chatting, social functions, etc.) whose welfare significance and whose inter-dependencies with the economic factors are too strong to be ignored. Since many non-economic activities are inherently not susceptible to the direct application of economic measures (tax/subsidy, regulation, etc.), this gives rise to the concept of indirect externality. A good or activity produces indirect externality by being highly complementary to or competitive with an activity which has external
effects not amenable to direct economic measures. The constraint imposed by
the failure of direct measures brings about a second-best situation. While the
pursuit of a second-best policy is usually infeasible or extremely costly, it is argued
that a third-best policy is desirable which involves taxes/subsidies or regulations
on goods and activities producing indirect externalities. This argument limits the
thrust of the second-best theory irrespective of whether non-economic activities
are being considered. On the other hand, the consideration of these activities
points to the need of more comprehensive multi-disciplinary studies in which
indirect externality may serve as a useful analytical concept.

ZUSAMMENFASSUNG

In diesem Aufsatz wird die ökonomische Analyse auf solche nicht-wirtschaftliche
Tätigkeiten (zum Beispiel freundschaftliche Plaudereien, gesellschaftliche Anlässe
usw.) angewandt, deren ökonomische Bedeutung und Interdependenz mit wirt-
schaftlichen Faktoren zu stark sind, um ignoriert zu werden. Da manche nicht-
wirtschaftliche Tätigkeiten für die unmittelbare Anwendung wirtschaftlicher
Massnahmen (Steuern/Subventionen, Regelungen usw.) nicht zugänglich sind,
wird in diesem Zusammenhang der Begriff der «mittelbaren Externalität» ent-
vwickelt. Eine Ware oder eine Tätigkeit erzeugt eine «mittelbare Externalität»
dann, wenn sie entweder komplementär oder kompetitiv zu einer anderen Tätig-
keit ist, die externe Folgen hat, die sich nicht für die unmittelbare Anwendung
wirtschaftlicher Massnahmen eignen. Das Versagen unmittelbarer Massnahmen
führt zu einer zweitbesten Situation. Während eine zweitbeste Politik normaler-
weise nicht ausführbar oder äußerst kostspielig ist, wird hier behauptet, dass eine
drittbeste Politik wünschenswert ist, die sowohl Steuern/Subventionen als auch
Regelungen von Waren und Tätigkeiten umfasst, die «mittelbare Externalitäten»
hervorrufen. Diese Schlussfolgerung begrenzt die Anwendbarkeit der Theorie des
Zweitbesten unabhängig davon, ob nicht-wirtschaftliche Tätigkeiten berücksich-
tigt werden. Zugleich jedoch weist die Betrachtung solcher Tätigkeiten auf die
Notwendigkeit für umfassendere, multi-disziplinäre Untersuchungen hin, in
denen der Begriff der «mittelbaren Externalität» sich als ein nützliches analyti-
sches Konzept erweisen mag.

RÉSUMÉ

Cet article englobe l'analyse économique d'activités non rentables (telles que
conversations amicales, réunions mondaines, etc.) dont les conséquences du point
de vue de prospérité et dont les interdépendances avec des facteurs économiques
sont trop sérieuses pour qu'on n'en tienne pas compte. Puisque bien des activités
non rentables ne peuvent pas être soumises à une application directe de mesures
economiques (taxes/subventions, règlements, etc.), ceci donne lieu au concept
d'extériorité indirecte. Une marchandise ou activité provoque une extériorité

524
NON-ECONOMIC ACTIVITIES, INDIRECT EXTERNALITIES

indirecte en suppléant ou en rivalisant avec une activité ayant des effets externes qui ne se soumettent pas à des mesures économiques directes. La contrainte imposée par l’échec de mesures directes n’est qu’un pis-aller. Tandis que la recherche d’un pis-aller est d’ordinaire impossible ou extrêmement coûteuse, on avance qu’il est désirable d’introduire un objectif de troisième ordre comportant des taxes/subventions ou règlements sur les marchandises et activités produisant des extériorités indirectes. Cet argument restreint la poussée d’une théorie de pis-aller sans tenir compte d’activités non rentables. D’autre part, l’examen de ces activités démontre la nécessité d’études plus étendues dans plusieurs disciplines dans lesquelles l’extériorité indirecte peut être utilisée comme concept analytique.