Chapter - 2

From Choice of Techniques to Social Choice
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II.1. Introduction

In the presentation speech for the 1998 Nobel prize, Amartya Sen’s work on the theory of social choice, and the notion of capability leading to his measures of human development are cited. So is his work on famines. What does not find mention is the work Sen did in his PhD dissertation, later published in book form as *Choice of Techniques* (*COT*), and his considerable writings up to 1970 on various aspects of economic development in underdeveloped countries. In this chapter we take a brief look at this early stage in Sen’s career.

Although Amartya Sen’s work in the field of welfare economics can be said to have properly begun from the 1970 publication *Collective Choice and Social Welfare* (*CC&SW*), it is important to look at his journey from his Ph.D. thesis in Cambridge, to social choice theory. In this period he was concerned with the problems of development planning in an underdeveloped economy. However, in the analytical tools he developed in looking at these issues and the theoretical framework he prefers, we can trace the beginnings of his interest in the formal theory of social choice.

In 1970 Sen published *Collective Choice and Social Welfare*, which was, as he says in his preface, a part of a series in “Mathematical economics texts”. Here he has already shifted his attention away from the practical problems of planning in an underdeveloped economy, and he describes the subject of this book as “the relation between the objectives of social policy and the aspirations of members of a society.” This book therefore marks the beginning of the set of concerns that belong to his later career, and ultimately find recognition in the Nobel prize.

Sen himself thought fit to collect together some of the articles of the period 1961-70 when he published, *Resources, Values and Development (RVD)* in 1984, two years after *Choice, Welfare and Measurement*, in which a fairly evolved version of his work on social choice and inequality measurement is presented. Although was published as a
collection in 1984, that is, after *Collective Choice and Social Welfare*, it contains articles from Sen’s early years, i.e. from 1961 onwards. In the Introduction to this volume he reflects on these papers and relates them to his current interests. *RVD* is in two parts; in the first we have a chance to read some papers written before 1970; in the second is a collection of some writings on various subjects that reflect the concerns of his later career. One can say that the papers of the first half, together with *Choice of Techniques*, belong to a different discourse, that of the theory of economic development which was a rich field of study for economists of that period. It in fact continued to be such a field, but Sen no longer contributed to it. When he started writing about development again, it was within a quite different paradigm. In the last-but-one paper in *RVD*, “Development: Which Way Now”, (1983), Sen makes, so to speak, a settlement of accounts with his earlier writing on economic development. He maintains the view, consistent with his earlier writings, that the role of the state in economic development is important; also that good growth performance in poor countries is generally associated with a high level of investment; and also that policies oriented towards “industrialisation” are in general found to contribute to growth. However, he introduces his newer concepts of “entitlements “and “capabilities” in arguing that economic development cannot be measured by growth of incomes alone. These arguments will be explored in later chapters of this thesis. Here we are concerned with Sen’s early work on economic development and planning.

Since there was thus a definite break, or paradigmatic change, in Sen’s area of interest after 1970, this chapter will briefly examine some of his concerns of the earlier period, (a) to establish that there was indeed such a break, and (b) to track some of the ideas that find echoes in the later phase. There is no attempt to be exhaustive.

2.2 Sen and Maurice Dobb

Sen’s guide for his PhD thesis at Cambridge was Maurice Dobb, who was a member of the British Communist Party and author of “Soviet Economic Development
Since 1917". Sen’s Choice of Techniques argues that an underdeveloped country planning for economic growth, even if it has abundant supplies of unemployed labour, should not choose the most labour-intensive techniques in setting up its industrial base, but use techniques that can maximise the future rate of growth and put the economy on a long-term path of growth. These conclusions are consistent with the Mahalanobis approach to planning which found its concrete expression in India’s second five-year plan.

Here an important reference text is Maurice Dobb’s 1969 book, “Welfare Economics and the Economics of Socialism: Towards a Commonsense Critique”. Dobb points out that “Much of the modern discussion of economic welfare developed out of a debate about economic rationality in a socialist economy”. This refers, on the one hand, to the famous 1930’s debate sparked off by von Mises’ claim that in a socialist economy, in the absence of a market, there can be no rational allocation of resources, with Oscar Lange’s attempt to demonstrate that a centrally-planned economy can use prices to guide the allocation of resources even in the absence of a market in capital goods; a market for consumer goods can exist in such an economy. Also, at the time of publication of this book, most of the economies of the Soviet bloc were debating “economic reforms” and the practical use of prices in attaining a “maximum level of welfare.” There is no doubt that the subject of “welfare economics” was at this time largely concerned with the comparison of economic systems. On the one hand, von Mises had claimed that a rational allocation of resources was impossible in a socialist economy. Then the “fundamental theorem of new welfare economics” tried to demonstrate that a competitive market mechanism brings about an allocation of resources that is Pareto-optimal, and also that every Pareto-optimal position can be attained by the workings of a competitive market, starting from a given distribution of income. The criterion of Pareto-optimality, that is, a situation in which no-one can be made better-off without making someone worse-off, of course rules out any comparative evaluation of different distributions of income.
Dobb, however, is very much concerned with income distribution. This is one aspect of his criticism of contemporary welfare economics: the notion of Pareto-optimality tries to avoid the issue of inter-personal comparison of welfare, but this means that it is a criterion of very limited applicability. But most attempts to go ‘beyond’ the Pareto criterion, however ‘neutral’ they try to be, do involve taking an explicit or implicit stand on income distribution. This applies equally to Abram Bergson’s social welfare function (Bergson was, incidentally, the author of one of the earliest critical books on Soviet planning) and to Kaldor’s compensation principle, both of which are examined in the above volume.

Dobb, while he is sceptical about the neoclassical approach to problems of economic welfare, nevertheless feels that something useful can be garnered from these discussions in viewing “the actual problems of a socialist economy,” which was his primary concern, and he indicates that the discussion might also be useful for discussions of economic planning in underdeveloped economies outside the socialist bloc (which was a major area of interest for Sen in his pre-1970 writings). Sen in his early writings shares most of Dobb’s concerns and his commonsense approach, as I will try and demonstrate. He is of course much more proficient than Dobb in applying and developing the mathematical apparatus of welfare comparisons: for example, he has written extensively about the logical aspects of the Pareto criterion. Yet, it will be argued here that Sen gradually moves away from his involvement with theoretical and practical aspects of economic planning in India and other underdeveloped countries. We illustrate this later in this chapter by looking at some of his articles of this period, including some from RVD.

Dobb says: (p.5) “There is a particular respect...in which the approach to problems of economic welfare has been biased by those theories which, since Jevons, have analysed exchange-value in terms of the subjective attitudes or the behaviour-reactions of individual consumers. This bias is implicit in the essentially individualistic presuppositions of that approach. The individual is treated as the primary atom, and his
wants or preferences as the primary data of the problem; individuals being regarded as independent units with respect to the influences affecting demand." He thus reminds us that the wants of the consumer are also socially determined and will be influenced by state economic policy and by producers (a) through advertising and other factors bringing about changes in tastes and (b) because any policy measure will affect the distribution of incomes, and thus change consumers' wants both individually and in the aggregate. However, having reminded us that the individual consumer is socially located, he does hold that economic welfare considerations imply allowing the consumer to freely use his money income to purchase the goods he (there is no 'she' in these days before feminist awareness) thinks will maximise his satisfaction. That is, there should be a market in consumer goods (even in a socialist economy). The consumer can then allot his expenditure on various goods in such a way that the marginal satisfaction obtained by the last unit of expenditure on each good is equal to its price. This is the first proposition of modern welfare economics.

Dobb is much more critical of the second contention of modern welfare economics, that consumers' wants are signalled to producers through the price mechanism and that the market brings about an allocation of productive resources that maximises economic welfare. He holds (p. 7) that "there is no such thing as a unique set of 'rational' prices, ...and no such thing as a uniquely efficient production pattern and allocation of productive resources," pointing out that efficiency concerns cannot be separated from income distribution concerns. This is because, as Sen says in Chapter VIII of COT, "...even the calculation of the time series of national income is not entirely a matter of positive economics. There is the problem of relative valuation of different goods and services. ...relative prices are not independent of the distribution of income.' In this context Dobb carries out a lucid critique of various contemporary propositions in welfare economics, using a minimum of mathematics and using illustrations rich in references to actual conflicts and choices facing economic policy-makers. A similarly practical approach can also be seen in much of Sen's pre-1970 writing on economic development, as we shall see.
Dobb then (p.209 seq) discusses the idea (first rigorously set out by Arrow in 1951) that if the distribution of incomes between different social groups and individuals is to be modified by government intervention, it should be done "through the medium of money incomes rather than of prices;" because the attempt "to influence distribution through prices must always involve a failure in some degree to adjust supply to individual demand in the most 'perfect' manner." This he terms the third important contention of modern welfare economics. Dobb disagrees, on essentially practical grounds, because income differences serve an incentive purpose, and the traditional rule of equal pay for equal work should not be contravened (even in a socialist economy). "It may well seem desirable in these circumstances to differentiate between different members or groups within the same category (because they have different 'capabilities'? --WS) --- an example might be the difference between single men and those with families or the physically strong and the physically weak (whether from age or ill-health.) On incentive grounds -- and perhaps on the grounds of deep-rooted trade union custom --- these would have to be paid the same for the same quantity of work and the same job. "Dobb suggests that subsidising certain goods and services might be more appropriate than giving money allowances to the disadvantaged. "Real-income variation will be better tailored to need if things of special benefit to children such as milk or children's clothing or schoolbooks or education or additional house-room are subsidised through the price system; or in the case of those in ill-health or advanced in years by subsidised medical care and free or cheap medical supplies or home-help." This is a debate that is still relevant today, when for example subsidies on education are discussed in the India context. (here a few things are worth noting. One, the presumption of a nuclear family with a male head. Secondly, the mention of a trade union or working-class tradition, which may be problematised in the present day. --WS)

Dobb in WE&ES also gives an account of how the pricing of capital goods can be determined in a centrally planned economy. His major conclusions are that the rate of growth should be an exogenous variable, chosen by the planners, and, once this is decided, the distribution of investment labour among projects of different capital
intensity can be worked out. The theoretical aspects of this, based on a Marxian model of economic reproduction or on a Sraffa-type scheme, need not concern us here. Sen in any case indicated in a 1974 paper that he did not have much patience with this kind of theoretical debate. But Dobb here also refers to Sen’s 1961 essay, “On Optimising the Rate of Saving” in this context. He endorses Sen’s view in “Choice of Techniques”, (1960), that, in an underdeveloped economy planning for future growth, choosing methods of production that maximise employment in the present may actually postpone the date at which full employment is attained. So, Dobb is implying that his arguments apply not just to a socialist economy, but to any underdeveloped economy where planning is undertaken.

I have spent some time looking at this work of Maurice Dobb, an economist who is not much read today, because it relates the issues of contemporary welfare economics with some practical policy problems, not only of socialist economies, but of developed and underdeveloped economies in which the state takes on some responsibility for the welfare of its citizens. Sen in his pre-1970 writings also refers to these debates, and uses the concepts of welfare measurement based on individual utilities, though with some caveats, while discussing certain problems of economic planning. I will try to show that his approach in this period has much in common with that of Dobb, but differs from the latter in some significant respects.

We confine ourselves here mainly to papers in the first part of RVD and specifically to aspects that deal with welfare economics. However, an important article of this period is the essay entitled “A Game Theoretic Analysis of Collectivism in Allocation”, written earlier but published in T. Majumdar (ed.), Growth and Choice, in 1969.
2.3 The Choice of Savings Rate

A central issue being discussed by development economists in the 1960’s was how much a developing country should save out of current output. Here, too, the point for comparison was the high rates of savings and investment which had been a characteristic of the Soviet economy from the 1930’s onwards, and were thought to be a major factor in its rapid growth over that period. In the 1983 article (Development: Which Way Now?) published in the latter part of RVD, Sen points out how the issues of that debate have been overtaken by actual eventualities. He quotes a 1952 paper by Hans Singer, suggesting that the rate of net savings required to achieve even a 2 per cent rate of per capita growth was about 16 1/4 per cent, and that ‘this rate of saving is about three times the rate actually observed in underdeveloped countries’. By 1983, the average rate of saving in these countries was about 22 per cent. This indicates that the imperative need to increase the savings rate was no longer an issue for development economics by then. However, in the 1950’s and 1960’s, this was seen (by Dobb, Sen and others) as an instance where state intervention in economic development was essential, as the rate of savings resulting from the operation of market forces was sub-optimal in relation to the desired growth rate. An opposing school of thought held that the market should be allowed to determine the rate of savings.

Sen made important interventions in this discussion, and, as we have seen above, he was in favour of state action to increase the rate of savings. He argues in a paper in RVD (p.207) that ‘the determination of the optimum size of total savings and that of the optimum capital-intensity of investment are interdependent problems’. This paper formed the introduction to the third edition (1968) of Choice of Techniques. A major argument here is that, even if the social opportunity cost of labour is zero in an underdeveloped economy with surplus labour, the employment of labour is not costless, when seen in the overall perspective of the growth of the economy. Therefore the recommendation made by many contemporary development economists that the most labour-intensive technique be chosen out of all the efficient ones, will not be appropriate if savings in the economy are sub-optimal (—our emphasis), since the marginal product
of labour may be positive but less than the additional consumption generated by the extra wage payment, so that the positive impact on our objective function through greater output may be countered by a shift from investment to consumption, which makes a negative contribution given the lower weight on consumption.

It is worthwhile to compare this reasoning of Sen about the interdependence of the saving rate which is sub-optimal in relation to the desired rate of growth, and the choice of capital-intensity of investment, with that of Dobb, who says that once the rate of growth is chosen in a socialist economy—which is essentially a political decision—, the appropriate prices for capital goods can be derived from a Marxian or Sraffa type model of the economy as a whole. Sen, on the other hand, argues that capital-intensive techniques should be preferred in industry even in an underdeveloped economy with surplus labour. He argues in COT that labour may not really be surplus in the agricultural sector, and also that choosing techniques that maximise industrial employment in the short run may jeopardise the future rate of growth, both because they will increase consumption at the expense of investment, and because they will yield a smaller product. He steers clear of the controversy on the pricing of capital goods. In fact, in a 1974 article, On Some Debates in Capital Theory, (included in the first part of RVD) he makes fun of the whole debate. His approach is practical: (RVD, p. 168-9) ‘We may not be absolutely certain of the correct relative price of baskets vis-à-vis bulldozers, but within the limits of variations that may be relevant the former may involve a lower capital-intensity than the latter in each case... just because one cannot rank overall capital intensities in some cases, one should not rule out the rankings that one can do.’

We will later look more closely at Sen’s views on the criteria for evaluation of investment projects. What about the choice of the rate of savings itself? Chapter VIII of COT deals with this problem, and the ideas in that chapter are developed at greater length in ‘On Optimising the Rate of Saving’ (1961), the fourth paper in (RVD).

In Chapter VIII of COT, which bears the title “Choice Involving Time”, Sen discusses the arguments of several economists who hold that the market-determined rate
of saving is a reflection of consumers’ ‘pure time preference’, and that, just as the
market prices of other commodities reflect consumers’ preferences and production
conditions, this rate should not be interfered with. Sen argues that social time preference
need not be identical with individuals’ time preference for several reasons. For example,
respecting individual time preference on the basis of the principle of ‘consumer’s
sovereignty’ begs the question of interpersonal comparison, between consumers of
different generations who will be affected by the choice of the rate of saving made by
present-day consumers. Time preference can also be based on the existence of
uncertainty about the future. Ultimately, Sen concludes, echoing Dobb (see above), the
choice of rate of saving for a society is at least partly a political decision.’

Towards the end of the chapter (p. 88), Sen makes some interesting qualifying
remarks about the implications of choosing a high rate of saving and a high rate of capital
intensity of investment. In a poor country with a high rate of inequality and
unemployment, the choice of capital-intensive techniques will probably have an adverse
impact on the distribution of income. Also, the distribution of income will affect the
relative prices of commodities; ‘In a society with inequality, as most societies are, the
relative prices may not therefore be very meaningful, and we should not attach too much
importance to the aggregate figures, conventionally measured, as reflecting total flows of
goods and services weighted according to their relative social usefulness.’ These
reflections certainly bear the mark of Dobb’s influence.

When Sen expounds on the theme of choice of rate of saving in the 1961 paper,
he refines some of the arguments discussed above, showing that it is not legitimate to
deduce from the principle of diminishing marginal utility of consumption for the
individual a similar principle of social time preference. He points out an ambiguity in the
use of the term ‘utility’: if it signifies the satisfaction of the individual consumer, there is
(RVD, p. 115) ‘no necessary reason for treating it as the thing to be maximised’ when a
society is choosing its optimum rate of saving: other factors, e.g. national pride, altruism,
preference for a “just” distribution of satisfaction between different generations of the
nation, have considerable relevance to the problem’. On the other hand, if ‘utility’ is used
as ‘a synonym for the equally vague expression “welfare” defined by some “welfare function”, then ‘we cannot prove that the “marginal utility” of consumption will definitely decline with increasing consumption.’ Sen is here clearly stating his distance from the “new welfare economics” of Ian Little and Abram Bergson. On the other hand, he also disagrees with the Yugoslav economist Branko Horvat, who argues for a high rate of saving corresponding to ‘the maximum investment which may be productively applied in a given economy’ (RVD, p.119) At most, this criterion may yield a maximum above which the rate of saving should not go. To regard it as a criterion for the optimum would be to disregard the fact that ‘The marginal usefulness of consumption is not in fact nil in any known community, so that the marginal disutility of saving is positive.’

Sen concludes that inasmuch as the choice of the rate of saving is a complex one, inevitably involving interpersonal comparisons both within a generation and especially between present and future generations, it is fundamentally a political decision. As it is a political decision, we might also be interested in how this decision is reached. He then proceeds to investigate (RVD, p.122) ‘whether there is any reason to believe that individual decisions made by members of the present generation through the market mechanism would give us the same result as the one they would themselves choose if they were voting collectively on the question.’ He believes that there is ‘a fundamental problem involved in individual and social decisions arising from the nature of the choice in the two cases.’ It is this aspect that he explores by means of what he calls ‘the isolation paradox’.

2.4 The Isolation Paradox

In Sen’s 1961 paper, ‘On Optimising the Rate of Saving’ he first introduces this concept which he later explores in various other contexts. He says: (RVD, p.123) ‘Now, this individual faces a choice.... Between one unit of consumption now, and three units of consumption in twenty years’ time. He knows, for some reason, that in twenty years he will be dead. He cares for the future generations, but it is not enough, let us assume, to make him sacrifice a unit of his present consumption for three units for the generation
living in twenty years’ time. He decides, therefore, to consume the unit; but another man comes and tells him that if he saves one unit of consumption the other man will also save one unit. It would not be, by any means, irrational for the first man to change his mind now and to agree to save a unit.’ He explains the paradox a little later (RVD, p.124):

‘This possibility of the apparent paradox is present whenever his relative valuation of others’ consumption is such that he would prefer them to sacrifice some consumption for the future generations; and sacrificing something himself might, because of the indivisibility of the political decision, be the means of achieving this to a sufficient extent to over-compensate the loss that he would incur from his own act of sacrifice’. (Sen’s italics).

The paradox relates to the distinction between individual and collective choice, a subject which Sen explores at length at a later stage. He concludes the present article by rejecting the arguments of two contributors to the debate who argue for imposing a high rate of saving to ensure rapid growth, Roy Harrod and Tinbergen. That is, he rejects the Harrod model in which a given aggregate capital-output ratio interacts with the aggregate rate of savings to determine a specific growth rate; also, if both unemployment and shortage of labour are to be avoided, the economy has a determinate “natural” rate of growth which cannot be much influenced by policy. The “natural” rate of growth will also determine the appropriate rate of savings. Tinbergen, on the contrary, makes the contention that “within the limit set by the capital-output ratio, one can have any rate of growth by varying the savings ratio, without the capital-output ratio moving against one due to the limitation of labour supply or of technological improvement”. According to Sen (1957), it is by no means certain that “as soon as we try to speed up the full capacity of growth of output by choosing a higher rate of saving, progress of technical knowledge will also be speeded up to the required extent.” Sen thus takes a position between the rigidity of the Harrod model and what he calls the “too flexible” approach of Tinbergen. His arguments show a lively awareness of the real-world problems facing an underdeveloped economy trying to grow fast through imposing a higher rate of capital accumulation: of “the experiences acquired in making new investments”, and he also touches on the political aspects of the process of reaching a decision on the rate of saving.
These practical considerations are also apparent in an article based on a seminar paper presented by Sen in 1970, later published in the *Economic Journal* (1972) and included in *RVD* under the title “Control Areas and Accounting Prices.” Sen argues: “The planner, to whom much of planning theory is addressed, is part of a political machinery and is constrained by a complex structure within which he has to operate.” The major objections he raises to the methodology of cost-benefit analysis proposed by Little and Mirrlees in the OECD *Manual of Industrial Project Analysis* in this paper are practical rather than theoretical. How to deal with sub-optimal savings in the economy is touched on again here.

Sen develops the game-theoretic aspects of the problem of how the rate of saving is chosen in more detail in a paper entitled ‘A Game-theoretic Analysis of Collectivism in Allocation,’ later published in T. Majumdar (ed.), *Growth and Choice* in 1969. The isolation paradox outlined above can be seen as a case of the famous game known as the Prisoners’ Dilemma. $A_1$ and $B_0$ stand ‘for providing an additional unit of saving for future generations, and $A_0$ and $B_0$ for not doing it. Each individual prefers most that others save, but not he, for the benefit of the future generations. They have, however, enough regard for the future generations’ welfare to consider saving by none to be inferior to saving by both.’ Thus the ordering of the four possible combinations of choices for the two individuals is:

$$F^A(A_0, B_1) > F^A(A_1, B_1) > F^A(A_0, B_0) > F^A(A_1, B_0)$$

$$F^B(A_1, B_0) > F^B(A_1, B_1) > F^B(A_0, B_0) > F^B(A_1, B_1)$$

Among the characteristic features of this ‘game’ (Game I in this article) that Sen points out are the following:

1. There is a strictly dominant strategy for each player, viz. $A_0$ for $A$ and $B_0$ for $B$. $A_0$ is a dominant strategy because $F^A(A_0, B_j) > F^A(A_1, B_j)$ for $j = 1$ and 2. Similarly for $B_0$.

2. The outcome of this non-cooperative game must be Pareto-inoptimal. In view of 1 the players $A$ and $B$ will respectively select $A_0$ and $B_0$. $(A_0, B_0)$ yields a Pareto-
inoptimal outcome, in fact the only possible Pareto-inoptimal outcome in this
game.

3. Through an enforced collective contract each player can be better off than in the
outcome of the non-cooperative game. ...a collective contract to do \((A_1,B_1)\), (that
is, for both to save) ensures this, since \(F^k(A_1,B_1) > F^k(A_0,B_0)\) for \(k = A\) and \(B\).

Sen contrasts this case with one discussed by Baumol, regarding ‘the minimum
size of fruitful effort’. He quotes: ‘the individual as a citizen, having his share of local
pride, may desire an improvement in the general future state of welfare of the
community. If, however, he alone directs his activities in a manner conducive to it,
the effects of his action may be quite negligible.... Thus neither private interest nor
altruism (except if he has ground for assurance that others, too, will act in a manner
designed to promote the future welfare of the community) can rationally lead him to
invest in the future, and particularly the distant future, to an extent appropriate from
the point of view of the community as a whole.’

In this case, then, there is no need to enforce a collective contract. However, Sen
points out that this situation involves a different ordering of the choices from that
implied in the Isolation Paradox above. He calls this Game II. Here the ordering is:

\[
F^A(A_1,B_1) > F^A(A_0,B_0) > F^A(A_0,B_1) > F^A(A_1,B_0)
\]

\[
F^B(A_1,B_1) > F^B(A_0,B_0) > F^B(A_1,B_0) > F^B(A_0,B_1)
\]

Some characteristics of this game are as follows:

1. There is no strictly dominant strategy for either player. The Maximin strategy
in the game of pure strategies is \(A_0\) for \(A\) and \(B_0\) for \(B\). This is because
\[
\text{Min} \left[ F^A(A_0,B_j) : j = 1,2 \right] = F^A(A_1,B_j) > \text{Min}[F^A(A_1,B_j) : j = 1,2] = F^A(A_1,B_0).
\]
That it is not a strictly dominant strategy follows from the fact that \(F^A(A_1,B_1) > F^A(A_0,B_1)\).

2. If both players follow the Maximin pure strategy, the outcome will be Pareto-
inoptimal. It follows (from the above) that the point chosen will be \((A_0, B_0)\),
which is Pareto-inoptimal, because of the extreme position held by \((A_1, B_1)\) in both the players’ orderings.

3. Through a collective contract each player can be better off than the outcome of each player following the Maximin pure strategy. The same result can be achieved by assuring each that the other will follow the optimal strategy.

The feature 3 in the case of game II is different from that in Game I, since \((A_1, B_1)\) is an equilibrium point in the former game since, once in this position, neither player can improve his outcome by changing his move. That is, \(F^A(A_1, B_1) > F^A(A_0, B_1)\) and \(F^B(A_1, B_1) > F^B(A_1, B_0)\). This means that, in contrast with the isolation paradox, there is no need to enforce the collective contract; an assurance is enough.

Sen also explains here that this is an extremely simplified model since it involves only two players, and hence there is one outcome, viz. \((A_1, B_1)\), that will make both better off. When there is more than one collective solution, ‘it is not clear what kind of a collective contract will be drawn up. He concludes the article by saying, ‘these theories are a great deal more successful in showing the inefficiency of individualistic allocation than in developing the theory of a precise collective alternative.’

The article we have discussed here is not reproduced in *RVD*, but Sen refers to the isolation paradox in several papers in that volume, explaining the distinction between it and the case represented by Game II, which he calls the ‘assurance problem.’ Whereas in the above discussion only an ordering of the various alternatives is considered, in the 1967 paper “Isolation, Assurance and the Social Rate of Discount”, the model is elaborated by considering the individual as giving certain weights to his own consumption today, to the consumption of his contemporaries, to the consumption of his own heirs in the future, and to the consumption of others in the future generation. Again, he concludes that (*RVD*, p.146), unless some very special assumptions are made, ‘the optimality of the market rate of saving and the market rate of discount are unlikely to hold in any economy that we know of.’ In Chapter 9 of *RVD*, “Optimum Savings, Technical Choice and the Shadow Price of Labour”, which
forms the Introduction to the third, 1968, edition of COT, Sen mentions the Isolation Paradox, but goes on to point out that that particular treatment of the sub-optimality of the savings rate is based on Paretian orderings, and goes on to discuss other types of welfare criteria. The inadequacy of the Pareto criterion is a theme that engages Sen quite intensely in the period after 1970, as we will see in Chapter 3.

In his treatment of the isolation paradox, Sen is at first concerned with matters of development policy. He takes pains to show that the rate of savings reached through the operation of the market is very likely to be sub-optimal, and therefore favours some kind of state action to enforce a higher rate of savings, an action that, he tries to demonstrate, will lead to an outcome that is in fact preferred by individuals who would not have reached that outcome acting on their own. But having worked out the logical elaborations of his argument, he clearly becomes much more interested in these arguments from a more abstract point of view. He has already commented (see above) that it is much easier to demonstrate the inefficiency of market-based allocations (between different generations, say) than to work out a precise collective alternative. He then moves away from the theory of development policy to his study of the logical assumptions and arguments of welfare economics, quite a different sphere of enquiry. We have tried to trace this movement through Sen’s treatment of the Isolation Paradox.

We have referred above to the 1983 article “Development: Which Way Now?” included in RVD. Sen says that ‘the time to bury traditional development economics has not yet arrived.’(RVD, p. 495) The development economics of the 1950’s and 60’s was on the whole right in emphasising the importance of rapid accumulation and industrialisation for bringing about high rates of growth. However, although many developing countries had by then achieved rates of savings much higher than those envisaged in the earlier debates, their growth performances were quite uneven. He is not interested in the question of how and why higher savings rates were achieved, or whether the experience in relation to savings rates bore out those arguments about individual and collective choice. In fact, by 1983, Sen has also moved away from his
interest in the elaborate logical structures of theoretical welfare economics. In reviewing the state of research in development economics, he raises the question of how high growth rates have often failed to bring about significant social change: a pointer to the concept of human development and its measurement. He then talks about entitlement failures as causes of famine, a problem he is then becoming interested in by the mid-1970's.

We now turn in Chapter 3 to Sen's contribution to theoretical welfare economics: he was writing on this area side by side with his work on development economics, in papers published in economic journals from 1963.

Notes
1. Dobb's defence of the Soviet economic system will not be taken seriously today. But this book is useful for its commonsense critique of contemporary discussions in the field of welfare economics. His approach, which uses only the simplest mathematics, is to pose questions about what various statements about economic welfare and its measurement actually imply for economic policy. His discussion is relevant even to contemporary advanced capitalist economies in which issues of price policy and income policy are discussed, and certainly underdeveloped economies in which some form of economic planning was being undertaken.

References

