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**Conceptions of Individual Rights and Freedom in Welfare Economics:
A Re-examination ***

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Abstract

This paper examines the literature in welfare economics with a focus on individual rights and freedom, two important components in welfare economics. The paper discusses conceptions of rights and freedom intuitively and presents a critical examination of the existing literature.

1. Introduction

Historically, much of normative economics has been guided by welfarism, i.e., the ethical principle that the welfare evaluation of alternative social policies should be based exclusively on their effects on the utilities of the individuals concerned. Though issues relating to non-utility aspects of social policies such as individual rights, freedom, and fairness are often figured into such welfaristic evaluations, they enter the evaluation process indirectly as instruments affecting the utilities of the individuals involved. Their independent status in assessing social policies is ignored by welfarism. In recent years, however, there has been growing recognition on the part of economists that welfarism constitutes a restrictive framework for normative economics and that non-utility information, as well as information about individual utilities, must be taken into account independently in the evaluation of social policies. For example, when a certain legislation concerning, say, internet security, is proposed, the effects on individuals' utilities are certainly legitimate concerns. At the same time, considerations of personal liberty and individual rights to privacy also play an important and independent role in evaluating such legislation.

Among the non-utility concerns that often figure in debates about alternative social policies, two, individual rights and freedom, stand out prominently. Thanks to the pioneering contributions of Sen (1970, 1970a, 1985, 1987, 1988), both individual rights and freedom have received much attention from welfare economists over the last three decades or so, and several models have been constructed to incorporate them in the formal analysis in welfare economics. The purpose of this paper is to review critically some of these models. Our focus will be on the formal formulations of the concepts of rights and freedom as such rather than the specific results derived with those formulations. In particular, we shall discuss whether these formulations are consistent with our intuition about rights and freedom. Since our review will often highlight conceptual shortcomings of some of the formal models of rights and freedom, we hasten to add that, in our opinion, these models constitute one of the most exciting recent developments in welfare economics. Their shortcomings only show that, despite the progress made so far, much more work still needs to be done to fill the analytical gaps and remove the ambiguities.

This is not entirely surprising, given the complexity and richness of the concepts of individual rights and freedom.

The plan of the paper is as follows. In Section 2, we discuss some of the intuitive aspects of rights and freedom, which will be useful for our analysis in subsequent sections. In Section 3, we classify the formal formulations of individual rights and freedom into four categories: (i) outcome-based and preference-dependent formulations; (ii) outcome-based and preference-free formulations; (iii) action-based and preference-dependent formulations; and (iv) action-based and preference-free formulations. In Section 4.1, we discuss the classical outcome-based and preference-dependent formulation of rights (we call it the social choice formulation) in welfare economics. Section 4.2 discusses the action-based and preference-free game form formulation of rights. Section 5 is devoted to models of individual freedom. We conclude in Section 6.

2. Individual rights and freedom: some intuitive remarks

2.1. Individual rights

Individual rights can take various forms. In the literature, there have been numerous attempts to classify individual rights into different categories according to alternative criteria (see, among others, Hohfeld (1923), Kanger and Kanger (1966), and Feinberg (1973)). We shall not try to give a detailed account of such classificatory principles. Instead, we shall highlight only a few of these principles, which will be helpful in our subsequent discussions.

The rights of an individual always impose obligations on other agents either explicitly or implicitly. Intuitively, these obligations may be of two distinct types. First, a right may require agents other than the right-holder not to take certain specified actions; Feinberg (1973) calls these negative rights. For example, an individual's right to criticize the government imposes an obligation on other agents, including the government, not to penalize the individual in certain ways for criticizing the government. Thus, this right requires other agents not to take certain actions with the intention of punishing the right-holder for doing something that he is permitted to do under the right. Sometimes, however, a negative right may simply require other agents not to take certain actions

without any reference to the motivation behind those actions. Thus, the right not to be arrested without a proper warrant simply prevents the state from arresting the individual without a proper warrant irrespective of the motivation the state may have for such arrest. The distinction between the two examples of negative rights given above is important for our purpose. In the first example (the right to criticize the government), the prohibition of certain actions of the other agents is contingent on their motivation; in the second example (the right not to be arrested without a proper warrant), the prohibition of certain actions of the other agents is not linked to any motivation behind those actions.

In contrast to negative rights, we have what Feinberg (1973) calls positive rights. Positive rights impose on other agents the obligation to do certain specific things.¹ These obligations typically take the form of fulfilling a claim of the right-holder rather than providing her immunities as corresponding obligations under negative rights do. Thus, the right of children to have access to free elementary education imposes on the state the obligation to establish free elementary schools at a reasonable distance from children. Note that this obligation is not contingent on any specific action of the children or their parents. On the other hand, the positive right of a creditor to get the loan repaid on demand at any time after a certain stipulated period requires the debtor to repay the loan if the creditor demands such repayment at any time after the stipulated period. Sometimes the same right may have the features of positive rights and negative rights simultaneously. The right of individuals to get certain types of information from the state imposes on the state the obligation to supply the relevant information, when the individual requests it, as well as the obligation not to harass the individual for requesting the information.

Another helpful distinction, due to Feinberg (1973), is the distinction between active rights, which give the right holder the power to do certain specific things, and passive rights, which do not give any power to the right-holder to do anything specific. The right to criticize the government is an active right, while the right not to be arrested without a proper warrant, which just offers the individual immunity against a specific

¹ Note that the distinction between negative and positive rights is an intuitive distinction rather than a logical distinction: after all, the obligation to do a can be expressed as the obligation not to do not- a , and the obligation not to do a can be expressed as the obligation to do not- a

invasive action of the state, is a passive right. It is important to note that most active rights that one can think of impose on agents other than the right-holder the obligation of not taking certain invasive actions with the motive of penalizing the right-holder for doing things that the right authorizes her to do.

2.2. Individual Freedom

In our everyday conversation, when we talk about the freedom of someone, say individual i , we typically talk about i 's freedom to do/ to be/ not to do/ not to be something, say, a . Often, our statement about i 's freedom to do/ to be a has explicit reference to the absence of some specific constraint or class of constraints. Thus, we may say that i is free from financial problems to pursue a career as an artist. Sometimes such explicit reference to the absence of constraints may not figure in our statement about i 's freedom, but, in such cases, the absence of some constraint or class of constraints is typically understood. As MacCallum (1967, p.314) writes, "Whenever the freedom of some agent or agents is in question, it is always freedom from some constraint or restriction on, interference with, or barrier to doing, not doing, becoming, or not becoming something". Let i be some agent, b be certain preventing conditions involving constraints, restrictions, interferences, or barriers, and z denote something specific that one can do / be. Following MacCallum, one can then regard freedom as a triadic relation: i is free from b to do/ not to do/ to be/ not to be z .

In the general framework of MacCallum, one can view Berlin's (1958; 1969) famous distinction between negative freedom and positive freedom as being based on the type of constraints that one may wish to emphasize. The so called negative freedoms of an individual focus on the absence of constraints imposed by other human agents, including the state. Thus, if i does not face any constraint imposed by other agents, including the state, that prevents him from traveling abroad, then i is said to enjoy the negative freedom to travel abroad. It is, however, possible that, while enjoying the negative freedom to travel abroad, i is not actually able to travel abroad because i does not have enough money to travel abroad. i is said to enjoy the positive freedom to travel abroad if and only if there are no constraints, whether or not imposed by other agents,

that prevent i from travelling abroad.² As we shall see later, welfare economists have tended to conceive an individual's freedom as the freedom to choose an outcome from the set of all outcomes feasible for her, where the notion of feasibility of an outcome takes into account all possible constraints including those imposed by other agents. In that sense, welfare economists seem to have concentrated on positive freedom in their analysis.

2.3. Individual rights and freedom: a contrast and comparison

There is considerable similarity between our everyday language relating to active individual rights and that relating to freedom. We talk about an individual's freedom to do, be, ... x , just as we talk about an individual's right to do, be, ... x . There are, of course, important differences between rights and freedom. An individual's right implies obligations on the part of other agents to do or not to do certain things, but an individual's freedom does not necessarily imply any such obligations of others. Thus, the freedom that warlords often enjoy in strife-torn areas to kill people does not imply any moral, social, or legal obligation of anybody else not to interfere with such killings; freedom need not have any basis in morality, law, or social conventions. Rights and freedom are distinct in this respect. It is, therefore, possible that an individual may have very few rights but much freedom. On the other hand, it is also possible that an individual may have extensive rights but very little positive freedom.³

3. Formulations of individual rights and freedom: a classificatory scheme

At the cost of some oversimplification, one can think of two alternative principles for classifying the various formulations of individual rights and freedom that we find in the literature. First, we have the distinction between outcome-based (OB) formulations

² While the basic idea underlying Berlin's (1958, 1969) distinction between positive freedom and negative freedom is reasonably clear, there can be considerable ambiguity about whether a particular constraint is imposed by other agents. Suppose the government deliberately chooses fiscal and monetary policies that are known to generate unemployment, and individual i and thousands of other people become unemployed as a consequence. In that case, how should one view the constraint imposed on i by his lack of income? We would be inclined to view it as a constraint imposed by the government.

³ It would not be difficult to come up with real life examples of societies with such combinations of individual freedom and rights.

and action-based (AB) formulations. Secondly, we have the distinction between preference-dependent (PD) formulations and preference-free (PF) formulations.

Consider first the distinction between OB and AB formulations. In the OB approach to the rights of an individual, the focus is on the social states that should or should not emerge as the social outcome in a given situation, given the rights under consideration. In contrast, in the AB approach to an individual's rights, the focus is on the action that the individual may or may not take and the actions that others must or must not take vis-à-vis the individual. The distinction between OB and AB approaches, however, should not be drawn in too sharp a fashion: the possible social outcomes do figure in AB formulations (see Section 4.1) and it is possible to transform certain AB formulations to corresponding OB formulations in a fairly straightforward fashion⁴. One can make a similar distinction between OB and AB formulations in the context of freedom. In OB formulations of individual freedom, an individual's freedom is reflected in the set of all mutually exclusive feasible outcomes available to the individual. Thus, the OB formulation of freedom visualizes an individual's freedom as being reflected in the set of outcomes from which the individual can choose any outcome that she likes. In contrast, the AB approach to freedom recognizes that often the individual may be in a position to choose one out of several actions but may not be in a position to choose an outcome since the outcome may be determined by the actions chosen by other agents as well as by the primary individual, i.e., individual whose freedom is under consideration. Again, the distinction between OB and AB approaches to freedom should not be taken to imply that the outcomes are considered irrelevant in the AB approach. The outcomes do matter in the AB approach. Nevertheless, when outcomes for the primary individual can be affected by the actions of other individuals, it is no longer possible to conceive the primary individual's freedom in terms of her ability to choose any one of several available outcomes. Instead, one has to consider the entire structure of actions and resulting outcomes to capture the opportunities available to an individual.

In some formulations of individual rights and freedom, the notion of preferences over the outcomes plays an important role. We shall call these formulations preference-

⁴ See, for example, Gärdenfors (1981) whose outcome-based formulation of rights represents basically the same intuition as the AB formulation of Nozick (1974), Sugden (1985a) and Gaertner, Pattanaik, and Suzumura (1992) among others.

dependent (PD) formulations. On the other hand, we also have formulations of individual rights and freedom where preferences over outcomes do not play any role whatsoever. We call these preference-free (PF) formulations.

Combining the two classificatory principles that we have considered above, we can, in principle, think of four different types of formulations of individual rights or freedom, namely, OB-PD, OB-PF, AB-PD, and AB-PF. Historically, however, the discussion of individual rights in the theory of social choice and welfare seems to have been dominated by the OB-PD and AB-PF approaches. Similarly, much of the discussion of individual freedom in the theory of social choice and welfare seems to have centered around OB-PD and OB-PF formulations. In the following two tables, we give examples of contributions in some of these categories in the context of individual rights as well individual freedom.

Table 1
Formulations of individual rights

	PD	PF
OB	Sen (1970, 1970a)	Gärdenfors (1981)
AB		Nozick (1974), Sugden (1985) Gaertner, Pattanaik, Suzumura (1992)

Table 2
Formulations of freedom

	PD	PF
OB	Jones & Sugden (1982) Sen (1988) Foster (1992)	Jones & Sugden (1982) Pattanaik and Xu (1990)
AB		

Some of the boxes in the two tables are blank, indicating that we do not have any existing formulation in the relevant categories. We shall argue later that some of these categories may be useful in capturing certain aspects of rights and freedom.

4. Formulations of individual rights

4.1. OB formulations of individual rights

The original formulation of outcome-based and preference-dependent (OB-PD) models of individual rights is due to Sen (1970, 1970a, 1992). Sen (1970, 1970a) has articulated the notion of individual rights in a framework that used the notion of social preference or social ranking over social outcomes as a primitive concept. Sen (1992) uses a somewhat different framework, where social choice rather than social preference is the primitive concept. The intuitive contents of both the formal frameworks are the same, but, for our exposition of Sen's basic ideas, we shall find it more convenient to use the language of social choice. We shall refer to Sen's (1992) articulation of the idea of individual rights in terms of social choice as the social choice formulation of individual rights.⁵

Sen (1992) starts with the notion of a social decision rule, which, for every profile of individual preference orderings over social outcomes and every non-empty set, A , of (mutually exclusive) possible social outcomes, specifies exactly one non-empty subset of A . Given the profile of individual preferences and a set, A , of possible outcomes, the non-empty subset, B , of A , specified by the social decision rule is to be interpreted as the choice set or the set of socially chosen alternatives in the following sense: given the preference profile, the alternative finally chosen by the society from A should lie in B and it does not ethically matter which of the alternatives in B the society finally chooses. Sen (1992) then introduces a formulation of individual rights, which articulates a necessary condition for an individual to have a right. According to Sen, an individual, i , has a right only if there exist at least two distinct social outcomes, x and y , such that,

if i strictly prefers x to y , then the society must not choose y from any set of feasible social outcomes that contains both x and y (i.e., given i 's strict preference for x over y , y must not be socially chosen when x is feasible), and, similarly, if i

⁵ Note that the substantive content of what we say below about the social choice formulation of individual rights applies also to Sen's (1970, 1970a) formulation in terms of social preference.

strictly prefers y to x , then the society must not choose x from any set of feasible social outcomes that contains both x and y (1)

When i, x , and y are such that ($y \neq x$) and (1) holds, we say that i is globally decisive over (x, y).⁶ Thus, for an individual to have a right in the sense of Sen, she must be globally decisive over some pair of social outcomes. The intended interpretation of x and y is that they differ only with respect to some aspects of social outcomes that relate to the ‘private domain’ of i . Thus, intuitively, Sen’s articulation of an individual’s rights proceeds through two steps. First, a social state is viewed as consisting of two groups of features. The first group consists of features that relate to the private domain of some individual or other. The second group comprises all features that are taken to be in the ‘public domain’. Secondly, in Sen’s formulation, an individual’s right is visualized as a constraint on the social choice of outcomes insofar as, if an individual i has a right in Sen’s sense, he must be globally decisive over some pair of social outcomes, the interpretation of these two social outcomes being that they differ only with respect to some feature that comes within i ’s private domain. Sen formulates his necessary condition for i to have a right in a very weak fashion by requiring that i be decisive over at least one pair of social outcomes. However, it seems consistent with Sen’s intuition to strengthen the condition for i to have a right by requiring that i be decisive over all (x, y) such that x and y differ only with respect to some matter in the private domain of i .

To illustrate the social choice formulation of individual rights, we consider the following example, which is due to Sen (1970, 1970a). Consider a society consisting of two individuals 1 and 2. There is a single copy of a certain book. The book can be read by just one individual or can be read by no one. There are three possible social states (for simplicity, we assume that all other features of social states are fixed):

$(r, nr) = (1 \text{ reads the book, } 2 \text{ does not read the book}),$

$(nr, r) = (1 \text{ does not read the book, } 2 \text{ reads the book}),$

and

⁶ The qualification ‘globally’ is intended to indicate that (1) applies to all sets of social outcomes containing both x and y . Later we introduce the notion of local decisiveness over a pair of social outcomes.

$(nr, nr) = (1 \text{ does not read the book, } 2 \text{ does not read the book})$.

For any given individual, reading or not reading the book is assumed to be a matter in the private domain of that individual. The social states (r, nr) and (nr, nr) differ only with respect to 1's private feature insofar as 1 reads the book in (r, nr) and does not read the book in (nr, nr) , while 2 does not read the book in either of these two social outcomes. Similarly, the social states (nr, r) and (nr, nr) differ only with respect to 2's private features. Suppose each individual has a right to read or not read the book. Then, consistent with Sen's intuition, 1 will be globally decisive over (r, nr) and (nr, nr) . Similarly, 2 must be globally decisive over $((nr, r), (nr, nr))$. Suppose further that we have the following preferences of the two individuals. 1 ranks (nr, r) highest, (r, nr) next, and (nr, nr) lowest ("it's really an excellent book and I would like to see 2 read it, and it would be a huge waste if no one reads it"), while 2 ranks (nr, nr) highest, (nr, r) next, and (r, nr) lowest ("it's a terrible book, and no one should read it, but, if someone has to read it, it'd better be me"). Now suppose all the three social outcomes are feasible. Then given the above preferences, and given the right, as Sen visualizes it, of each individual to read or not to read the book, a society respecting the rights of the two individuals must reject both (nr, nr) and (nr, r) and therefore choose only (r, nr) .

To assess the intuitive basis of this OB-PD formulation, it may be helpful to consider first the interpretation of the notion of a group decision rule as defined earlier. One possible interpretation of a group decision rule can be in terms of the choices that a social planner would make from different sets of social outcomes. We shall call this interpretation Interpretation I of a group decision rule. A second interpretation (call it Interpretation II) can be in terms of a (partly) decentralized decision-making process where the social planner or the government takes decisions regarding the public features of the social state and the individuals choose their respective private features in a decentralized fashion. Whether the individuals take their decisions before or after the government takes its decisions regarding the public features can be an important consideration for some purposes but is not crucial for us here. So, for the purpose of Interpretation II of a group decision rule, we shall make the (restrictive) assumption that

the individuals choose their respective private features after the government chooses the public features and they have full information about the choices made by the government.

It seems to us that the social choice formulation of individual rights was heavily influenced by Interpretation I of a group decision rule. Consider again the example of reading the book, which has played such a prominent role in the earlier literature on rights in social choice theory. Assume that $\{(r, nr), (nr, r), (nr, nr)\}$ is the set of possible outcomes. Since there is only one book which only one individual can read and it is possible for either individual to read the book, the problem of the society's choice from this set of feasible outcomes can hardly be visualized in terms of the individuals' autonomous and decentralized decision-making with respect to reading or not reading the book. It is, in fact, a classical allocation problem, where a social planner has to assign a single indivisible unit of a commodity, to exactly one of several persons.

However, the very interpretation of a group decision rule as the choices to be made by a social planner or ethical observer from alternative sets of outcomes, given the individual preferences, seems to run counter to the intuitive core of a wide class of individual rights. This is particularly true of individual rights to do or be whatever they like in their 'private' lives, such as the right of an individual to practice the religion of her choice, to be a vegetarian or a non-vegetarian, to read or not to read a particular book, to choose the colour or style of her dress, to maintain a political diary, and so on (these are precisely the rights that received so much attention in the early discussion of individual rights in social choice theory). This is also true of many other rights that do not invoke the notion of the private life of an individual, such as the right to criticize the government, to form or join a trade union, to vote, and to move freely in one's country. It is difficult to think of any of these rights outside the framework of autonomous and decentralized decision-making by individuals with respect to certain features of the social state.

The difficulties with the social choice formulation of individual rights, however, goes beyond any specific interpretation of a group decision rule. Irrespective of how we interpret a group decision rule, the social choice formulation turns out to be inconsistent with our intuition about the rights referred to in the preceding paragraph. Gaertner, Pattanaik, and Suzumura (1992) illustrate this inconsistency with the help of a simple example. In Gaertner, Pattanaik, and Suzumura's (1992) example, we have two

individuals, 1 and 2. Each individual has two shirts – white (w) and blue (b), and each individual enjoys the right to choose the colour of his own shirt. All features of a social state, other than the two individuals’ shirts, are assumed to be fixed. Thus, we have four feasible social states: (w, b) (i.e., 1 wears white and 2 wears blue), (b, w) (i.e., 1 wears blue and 2 wears white), (w, w) , and (b, b) . Since 2 enjoys the right to choose the colour of his shirt, 2 needs to be globally decisive over $((w, w), (w, b))$ or $((b, w), (b, b))$ under the social choice formulation of rights. Suppose 2 is globally decisive over $((w, w), (w, b))$. Assume that the two individuals simultaneously choose their respective shirts; and that each individual is ‘completely ignorant’ of the other individual’s preferences over the four social states⁷. Let the two individuals’ preferences be as follows;

1	2
(w, w)	(w, b)
(b, b)	(b, w)
(w, b)	(w, w)
(b, w)	(b, b)

Given complete ignorance about each other’s preferences, suppose the two individuals behave in the ‘maxi-min’ fashion. Then each will choose a white shirt. This will lead to the social choice of the outcome (w, w) , but, given that 2 prefers (w, b) to (w, w) , the choice of (w, w) will violate 2’s global decisiveness over $((w, b), (w, w))$. Similarly, if 2 happens to be globally decisive over $((b, w), (b, b))$, with suitably chosen preferences one can show that the free and decentralized choice of shirts by the two individuals will violate 2’s global decisiveness over $((b, w), (b, b))$. However, if the two individuals freely choose their respective shirts, then, no matter what social outcome results from such free choice, one can hardly claim that anybody’s right to choose his shirt is violated. Thus, our intuition about the right to choose one’s shirt turns out to be inconsistent with the social choice formulation of that right.

⁷ We use the term ‘complete ignorance’ to indicate the absence of any probabilistic belief about the other person’s preferences.

To see the intuitive origin of the difficulty that the social choice formulation of rights faces in the Gaertner-Pattanaik-Suzumura example, consider what happens when we weaken the necessary condition, as stipulated by the social choice formulation, for an individual to have a right. Suppose we say that an individual, i , has a right only if there exist at least two distinct social alternatives, x and y such that

if i prefers x to y , then, given the two-element set, $\{x, y\}$, of feasible alternatives, the society must reject y ; and if i prefers y to x , then, given the two-element set, $\{x, y\}$, of feasible alternatives, the society must reject x .
... (2)

As before, x and y are to be interpreted as differing only with respect to private features of i . When we have i, x , and y such that $x \neq y$ and (2) holds, we shall say that i is locally decisive⁸ over (x, y) . (2) is clearly weaker than (1). Under this weaker formulation of individual rights, local decisiveness, rather than global decisiveness, over some pair of social outcomes becomes a necessary condition for an individual to have a right.

Irrespective of how we interpret a group decision rule, this weaker version of the social choice formulation turns out to be consistent with our intuition about the right to choose one's shirt.⁹ Thus, in the Gaertner-Pattanaik-Suzumura example, suppose 2 is locally decisive over $((w, w), (w, b))$. Note that, if the set of feasible social alternatives is anything other than $\{(w, w), (w, b)\}$, then local decisiveness of 2 over $((w, w), (w, b))$ does not impose any restriction on social choice from the set of feasible outcomes. Let the set of feasible social outcomes be $\{(w, w), (w, b)\}$ so that, if 1 chooses his shirt at all, he can only choose a white shirt while 2 has two options, white and blue. Suppose 2 prefers (w, w) to (w, b) . Then 2's local decisiveness over $((w, w), (w, b))$ would require $\{(w, w)\}$ to be the choice set corresponding to $\{(w, w), (w, b)\}$. It is easy to see that this does not conflict with our intuitive notion of 2's right to choose his own shirt. Suppose, consistent with our intuition about this right, 2 is left free to choose his own shirt. Given that 2

⁸ The term 'locally' is used to indicate that the restriction postulated by (2) is applicable only to the two-element set $\{x, y\}$.

⁹ Cf. Pattanaik (1996a). Note the caveat in footnote 10.

prefers (w, w) to (w, b) , if 2 knows that 1 has no option but to wear a white shirt¹⁰ then 2 will choose a white shirt. Then the social outcome to emerge from such free choice will be (w, w) , exactly the outcome required by 2's local decisiveness over $((w, w), (w, b))$.

If the social choice formulation of individual rights in terms of global decisiveness conflicts with our intuition about many rights, but the weaker formulation in terms of local decisiveness does not, then the question naturally arises about the nature of the difference between global decisiveness and local decisiveness that can account for this. The intuitive difference seems to lie in a 'condition of social rationality' implicit in the social choice formulation. Consider the following condition.

Let x and y be any two social outcomes. If, given the two element set, $\{x, y\}$, of feasible social outcomes, the society chooses x and rejects y , then, given any set of feasible outcomes that contains both x and y , the society must reject y .

... (3)

(3) is a weaker version of Sen's (1986) well-known Condition α , which is often considered a rather weak condition of rationality that social choices should satisfy. It can be easily seen that, though, in general, global decisiveness of an individual over a pair of social outcomes, (x, y) , implies but is not implied by her local decisiveness over (x, y) , the local decisiveness of an individual over (x, y) and rationality condition (3), together, imply her global decisiveness over (x, y) . Thus, the social choice formulation retains some trace of the condition of social rationality stipulated by (3), while the weaker formulation in terms of local decisiveness does not incorporate any condition of social rationality. This constitutes an important difference between the two formulation. It is the modicum of social rationality embedded in the social choice formulation of individual rights that generates the difficulties the formulation faced in the Gaertner-Pattanaik-Suzumura example. That this weak trace of social rationality should come into conflict with our intuition about a large class of rights, the essence of which lies in the power of the individuals to choose separately and autonomously one of several available actions, does not come entirely as a surprise. However attractive conditions of social rationality may be as restrictions on the choices to be made by a social planner, it is not an integral

¹⁰ In the absence of this knowledge assumption, even the formulation of individual rights in terms of local

part of our notion of individual rights. Further, there is no reason to expect that, in a higgledy-piggledy world where the realized social outcome is determined, at least partly, by decentralized decision-making of several individuals, the individuals will actually make their choices in such a way that the resultant social outcomes in different situations will obey any condition of social rationality. Indeed, we have several examples elsewhere in the literature (see, for example, Sugden (1985a) and Dasgupta, Kumar, and Pattanaik (2000)) where the social outcomes emerging from such autonomous individual decisions end up by violating some of the most primitive conditions of social rationality though the individuals in these examples make their choices in a perfectly plausible fashion.

In fact, the problem may be even deeper. Not only is our intuition about a large class of rights inconsistent with the minimal trace of social rationality that is implicit in the social choice formulation of individual rights, but such intuition is also, in some ways, at odds with the very attempt to model the social decision process in terms of the formal notion of a group decision rule. Recall that the group decision rule is a function, which, for every profile of individual orderings and every non-empty set of social alternatives, specifies exactly one non-empty subset (the choice set) of that set. Thus, if the preference profile and the set of possible social outcomes remain the same, there should not be any change in the choice set under this definition. However, even this seemingly innocuous ‘uniformity’ requirement may not be satisfied in the context of the rights that we have discussed earlier. Consider again the example of the choice of shirts where each individual freely chooses for himself one of two shirts. We have seen that, when the two individuals follow the ‘maxi-min’ principle under complete ignorance about each other’s preferences, the social outcome that materializes is (w, w) . Suppose, other things remaining the same in the example, the two individuals’ behavioral rules change so that both of them now choose their shirts according to the ‘maxi-max’ rule. Then the social outcome will be (w, b) and our intuition tells us that this change in the choice set is exactly as it should be in a society that respects the two individuals’ right to choose their respective shirts. Yet, the notion of a group decision rule will find it difficult to accommodate this change in the society’s choice, given that there has been no change in

decisiveness can run into problems.

the set of feasible social outcomes and the profile of individual orderings over the social outcomes.¹¹

To sum up the discussion in this section, it seems to us that the traditional apparatus of social choice theory, with its emphasis on social rationality of some form or other and with its basic notion of a functional relation between the profile of individual preferences over social outcomes and the social choice(s) from any given set of possible social outcomes, does not provide a convenient framework for articulating our intuition about a very broad range of individual rights.

4.2. AB formulations of individual rights

The most conspicuous example of action-based and preference-free (AB-PF) models of rights is the game form formulation due to Nozick (1974), Gärdenfors (1981), Sugden (1985), and Gaertner, Pattanaik and Suzumura (1992), among others. The formulation can take many alternative, though closely related, forms, depending on whether one chooses to use strategic game forms or extensive game forms or effectivity functions. For our purpose, it will be enough to consider the formulation in terms of extensive game forms. A rights structure here is visualized as an extensive game form where, at every information set I , the set of actions, $A(I)$, available to the player, $j(I)$, who takes the decision at I , is partitioned into two sets, $\bar{A}(I)$ and $\underline{A}(I)$, $\bar{A}(I)$ being interpreted as the set of all actions which are permissible for $j(I)$ and $\underline{A}(I)$ being interpreted as the set of all actions which are impermissible for $j(I)$ at I . It is this notion of permissibility and impermissibility of actions which constitutes the intuitively crucial component of the formulation. Thus, the right of individual i to practice the religion of her choice can be represented by an extensive game form where, at some information set I such that $j(I) = i$, i 's permissible actions are simply the actions of practicing religion g_1 or religion g_2 or For all individuals $k \neq i$ and for all information sets I such that $j(I) = k$, $\bar{A}(I)$ does not include k 's action of penalizing/

¹¹ Cf. Pattanaik (1996b). It would be interesting to see whether an extended social choice framework where an extended group decision rule is defined on the basis of the set of social alternatives, the profile of individual preference orderings, and individuals' behavior will be able to accommodate the notion of individual rights in particular and the idea of an

discriminating against/ ... i because of the religion practiced by i . Given this structure, one can then define a permissible strategy of a player as a strategy that does not involve any impermissible action at any information set belonging to that player and an impermissible strategy of a player as a strategy that involves an impermissible action at some information set belonging to that player.¹²

The mathematical notion of a game form has no reference whatsoever to the individuals' preferences and motivations, etc. The game form approach to individual rights, therefore, seems to suggest that, to articulate what it means to say that someone has a right, it is not at all necessary to refer to preferences and motives. One of the issues that we discuss in some detail is whether it is really possible to articulate our intuition about rights in a framework that explicitly excludes all reference to preferences and motivations. We also discuss a second issue. A rights structure is an institution, which serves as a decision-making mechanism (at least for some aspects of the social state) and through which decisions are taken at different points of time with possibly different preference profiles for the individuals in the society. At any given point of time when decisions are to be taken through the institution represented by the game form, the preferences of the players are given. Given these preferences and given the game form, we have a game, and after this game is played, the outcomes are determined. How do we determine whether some rights have been violated in a particular play of the game? Note that this question is different from the question of how, given the preferences of the individuals, the individuals will exercise their rights, i.e., how the game defined by the game form and the given preferences, will be actually played. The question under consideration is not concerned with predicting how the game will be played or what sort of outcome will emerge from the game. Instead, it raises the conceptual issue of how one determines whether some one's rights have been violated once the game has been played somehow. It seems to us that a reasonably articulated conception of rights should be able to answer this question. The proponents of the game form formulation do seem to have an implicit answer to this question. It seems to be implicitly assumed that no one's

autonomous and decentralized decision-making process in general. We leave this for another occasion.

¹² Later we shall consider another formal structure where the permissibility/ impermissibility of a strategy is introduced as a primitive notion instead of being defined in terms of permissibility/ impermissibility of actions. In some ways, this alternative structure provides extra analytical flexibility.

rights are violated in a particular play of the game if and only if no player has used any impermissible strategy (see, for example, Deb (2004)). We raise some doubts about this implicit assumption.

Can one really represent individual rights in terms of a game form, together with a specification of permissible and impermissible actions and strategies, without any reference to the motives behind the actions of individuals? We believe that the answer to this question depends on the specific right under consideration and also on the specific aspect of a right that one may choose to emphasize.

It seems to us, insofar as the game form approach does not take into account the players' motives, it can run into serious problems in capturing the substance of a wide range of rights. To elaborate on this, we consider the following example. Consider the right of an individual, i , to practice the religion of his choice. It permits i to practice any one of several religions. At the same time, as we ordinarily understand the right to practice the religion of one's choice, it also grants i immunity from certain types of invasive actions by other agents by making those actions impermissible. Thus, in most modern societies, this right makes it impermissible for i 's employer to penalize i for practicing a particular religion. i 's right to practice the religion of his choice would lose much of its significance if he chooses to be a Muslim and is then fired by his employer, k , simply because she (i) chooses to be a Muslim. The right does not stipulate that k cannot fire i at all; what it really stipulates is that k must not fire i because of i 's religion. A formulation of this right will fail to reflect this intuition unless it refers, directly or indirectly, to the motivation and preferences underlying k 's firing of i .¹³ A point that we would like to make here is that the problem is not confined to isolated instances of rights. The problem arises practically with all active rights (see Section 2 above) which grant the holder of the right certain types of immunity. As we explained above, all active rights, while granting the holder of the right the option of doing/being a or b or ..., also simultaneously entail an obligation of all other agents not to punish/penalize/ harm i for doing/ being a or b or Therefore, a formulation, which does not have any reference to motives behind actions and which relies exclusively on the

¹³ Van Hees (1996) discusses some aspects of a similar issue.

specification of permissibility or impermissibility of physical actions, will have difficulty in capturing a vital part of the intuition underlying these rights.

What happens if we ‘refine’ the notion of an action? For example, what happens if, in our example above, we describe the action not simply as firing a worker but as firing a worker because of his religion or firing a worker because of his laziness, etc.? One can then say that the action of firing a worker because of his religion is impermissible under the worker’s right to practice his religion while firing him for his laziness is permissible. If we refine the notion of an action in this fashion and specify which of these refined versions of actions are permissible in the game form and which of them are not, we would, of course, avoid the intuitive problem that we have discussed earlier. It should, however, be noted that the problem is solved only by building the motives into the description of actions and, hence, into the description of the game form itself.

One possible way of handling the problem in the framework of extensive game forms without building motivations into the description of actions may be to introduce the notion of permissibility/impermissibility of strategies directly rather than defining it in terms of permissibility/ impermissibility of the actions available at the different information sets. In this modified framework, we no longer have, for any information set I , the partition of the set of feasible actions, $A(I)$, into $\bar{A}(I)$ and $\bar{A}(I)$. Instead, for each player i , the set, S_i , of all physically feasible strategies is now directly partitioned into the set, \bar{S}_i , of all permissible feasible strategies and the set, \underline{S}_i , of all feasible but impermissible strategies. This can now allow us to introduce certain nuances that could not be introduced when we first classified the actions at each information set into permissible and impermissible actions and then defined a permissible or impermissible strategy in terms of the permissibility of the actions involved in the strategy. Consider again the right to practice a religion of one’s choice. Suppose individual 1, an employee of individual 2, can choose to practice either Hinduism (H) or Islam (IS). After 1 has chosen his religion and knowing what religion 1 has chosen, 2 can decide to fire 1 (F) from the job or not to fire 1 (NF). then 2 has four feasible strategies: a (irrespective of whether 1 chooses H or IS, I shall choose F), b (irrespective of whether 1 chooses H or IS,

I shall choose NF), c (if 1 chooses H, then I shall choose F, and, if 1 chooses IS, then I shall choose NF); and d (if 1 chooses, then I shall choose NF, and, if 1 chooses IS, then I shall choose F). One way of capturing 1's right to practice the religion of his choice would be to specify $\{H, IS\}$ as the set of permissible strategies of 1, $\{a, b\}$ as the set of permissible strategies of 2, and $\{c, d\}$ as the set of impermissible strategies of 2. It can be argued that making the strategies c and d impermissible for 2 captures the notion that 1's right does not permit 2 to fire 1 either for being a Hindu or for being a Muslim. In some ways, this is true. Other things being the same, if 2 uses strategy c , so that 2 would fire 1 when 1 practices Hinduism but not when 1 practices IS, then there is reasonable ground for saying that 2's motive is to penalize 1 for being a Hindu; and similarly in the case of d .¹⁴ While this is true, what we are really doing here is to infer the motive of 2 in firing 1 if 1 becomes a Hindu (resp. a Muslim) by considering what 2 would have done if, other things remaining the same, 1 would have become a Muslim (resp. a Hindu). The motives of 2 then remain very much a part of the intuition underlying our specification of 2's permissible strategies, even though it may not be visible in the formal structure.

We have so far argued that, for modeling, in terms of game forms, many active rights of an individual, it may be necessary to bring in the motives of other agents directly or indirectly into our formal model. This, however, is not necessarily true of all active rights. Consider one of our earlier examples, which is about an active positive right and in which person A owes person B \$50. At a particular point of time, B can choose one of the two actions: to demand repayment and not to demand repayment. If B does not demand repayment, then A has the option of repaying or not repaying the loan. The right, however, requires that, if B demands repayment, then A must repay the loan; A 's not repaying the loan when B demands repayment is simply not consistent with B 's right no matter what may be the motives or reasons behind such non-repayment. B 's right in this example is an active positive right, and, while it imposes a certain obligation on A , contingent on B 's demanding a repayment of the loan, the obligation under consideration is in no way linked to the presence or absence of any specific motivation on A 's part.

¹⁴ Note that this nuance cannot be captured if we follow the procedure of specifying permissible and impermissible actions for each information set in the game and then define the permissibility of a strategy

The above two examples should make it clear that no categorical answer can be given to the question of whether a right can be represented simply by a game form without bringing in, explicitly or implicitly, the players' motives. Depending on the specific right, the answer can go either way.

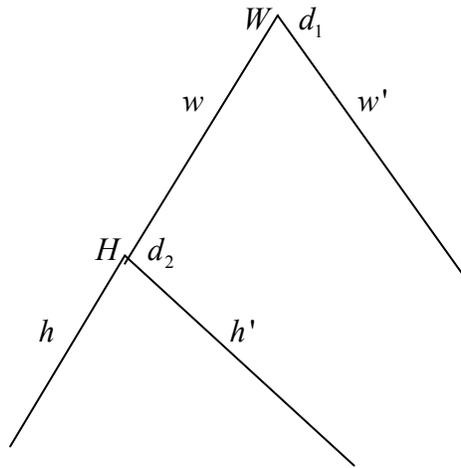
Consider now the issue, in the game form formulation, of identifying the situations where there are violations of individual rights. Can this be done without referring to the preferences of the individual(s) whose rights are under consideration? In the game form formulation of rights, it is obvious that, to predict the social outcome that will materialize from the exercise of rights, one needs to know, besides the game form representing the rights, the preferences of the individuals as well as the rules of behaviour that the individuals follow (reflected in some notion of an equilibrium of a game). We are not, however, concerned with this obvious relevance of individual preferences for predicting how the rights will be exercised and what social outcomes will arise from the exercise of the rights. Instead, we are concerned with the problem of assessing whether or not someone's rights have been violated given that the players have chosen their strategies somehow and a social outcome has emerged. Since the game form framework conceives the rights structure in terms of the permissibility and impermissibility of strategies, there seems to be a tendency to identify violation of rights with the adoption of impermissible strategies by some players. It is not obvious that this is always consistent with our intuition. We illustrate the difficulty with an example.

Consider an otherwise orthodox society where laws have just been introduced giving women the right to go out of home unescorted. Consider two individuals - a woman (W) and her husband (H). The woman has two possible actions available to her: w ('go out of home unescorted') and w' ('do not go out of home unescorted'). If W chooses not to go out of home unescorted, then status quo prevails and H does not have to take any decision. On the other hand, if W chooses to go out of home unescorted, then H knows this, and, knowing this, H has to choose from one of two actions: h ('punish W for going out of home unescorted') and h' ('do not punish W for going out of home unescorted'). Given the rights structure, it is permissible for W to go out of home unescorted (w) as well as not to go out of home unescorted (w'). However, if W goes

in terms of the permissibility of the actions involved in the strategy.

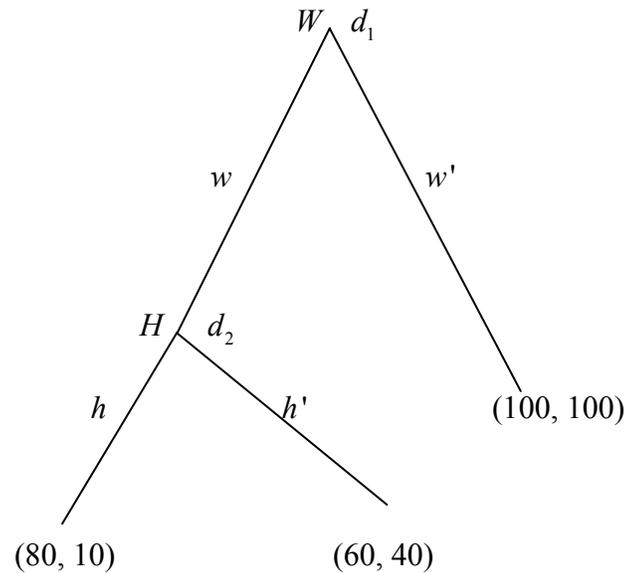
out unescorted, then punishing W for going out unescorted (h) is not a permissible action for H : given that W chooses to go out unescorted, the only permissible action for H is not to punish W for going out unescorted (h'). The very simple extensive game form that represents the right here is given in Figure 1, where: (1) d_1 and d_2 denote the two decision nodes; (2) both w and w' are permissible for W ; and (3) h' , but not h , is permissible for H .

Figure 1



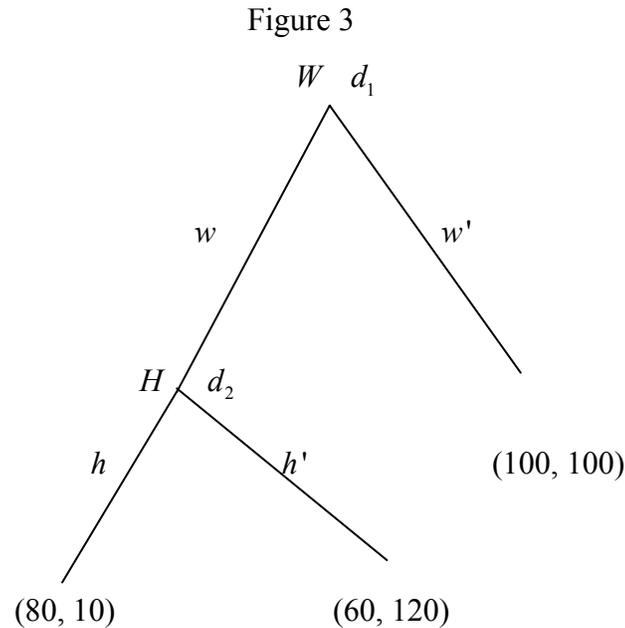
We now bring in the preferences by attaching payoffs to the terminal nodes. Suppose the payoffs are as in Figure 2 (for each terminal node, the first number denotes the payoff of H and the second number denotes the payoff of W).

Figure 2



Given the payoffs, it is natural to assume that W will adopt the strategy of not going out unescorted (w) and H will adopt the impermissible strategy of taking action h if at all he finds himself at the single decision node that belongs to him. Given these choices of strategies, H will never reach his decision node, d_2 , and the game will end with payoffs $(100, 100)$. While H has adopted an impermissible strategy, it is not obvious to us that, from an intuitive point of view, there has been any actual violation of W 's rights. The reason is this. Imagine a different game derived from the game in Figure 2 by 'chopping off' the branch h' and the corresponding terminal node, i.e., by assuming that h' is simply not available to H at the information set $\{d_2\}$. W would still choose the strategy (w') in this game. Thus, the actual path through which the terminal node would be reached when this game is played is exactly the same as the actual path through which the terminal node is reached when W and H play the game in Figure 2. At the risk of emphasizing the obvious, we would like to clarify the following point. We are not saying that, if an information set I is not actually reached as a consequence of the strategies adopted by the players, then the permissibility or impermissibility of the action at I specified by the strategy of the player, who takes the decision at I , is irrelevant for the purpose of judging whether someone's rights have been violated. It will be intuitively

unreasonable to say that. To see this, consider the following game, where the game tree is the same as in Figure 2, but the payoffs are different..



In this case, it is reasonable to assume that W will use strategy (w') and H will adopt the strategy (h). However, in that case, we feel that W 's right is violated. This is because, if it could be guaranteed that H would never adopt (h) or, equivalently, if the branch corresponding to the action h is chopped off the game tree, then W would like to adopt (w) and the path followed by the actual play of this changed game will be different from the path followed by the actual play of game in Figure 3. Intuitively, in the game in Figure 3, W adopts w' because she justifiably fears that, if she adopts the strategy w , then H will punish her by taking action h at $\{d_2\}$ and she will be worse off as compared to the situation where she adopts the strategy (w'). In contrast, in the game in Figure 2, W will adopt w' irrespective of whether h is available to H at $\{d_2\}$. Suppose, given the strategies (w'), (h) adopted by the players in the game in Figure 2, W wants to complain to the court that her right has been actually violated. Then she will have to say something like the following: "Your Honour, I am a very orthodox woman. Even if it was not possible for my husband to punish me for going out of home unescorted, I would still not like to go out unescorted by any long shot. However, I know that my husband has decided to punish me if I go out unescorted. So my husband has really violated my rights

and something should be done about that.” Does this argument sound intuitively plausible and will any court entertain this petition? We do not think so.

Yet, we do feel uncomfortable about the husband’s use of an impermissible strategy. We believe that there is no inherent intuitive incompatibility between this sense of discomfort and our feeling that the adoption the strategies $((w'), (h))$ in the game in Figure 3 does not violate W ’s right. To see this, we need to recall that the extensive game form in Figure 1 represents an institutional framework through which decisions will be taken in many different situations with different preferences of the players. The preferences depicted in Figure 2 represent one such situation. In this specific situation, there may not be any actual violation of W ’s rights. Nevertheless, we also sense that there is a potential for a violation of W ’s rights if W ’s preferences change, so that, though the institution remains the same, the game becomes the game in Figure 3. It is this potential violation of W ’s right, which makes us uncomfortable about the equilibrium pair of strategies $((w'), (h))$ in the game in Figure 3. At the same time, for reasons that we have explained above, it seems to us intuitively implausible to claim that the equilibrium pair of strategies, $((w'), (h))$ for the game in Figure 2 involves any actual violation of W ’s rights. We feel that it may be useful to distinguish between two distinct problems in the game form approach. The first is the problem of specifying what it means to say that an individual enjoys a particular right. The second is the problem of identifying whether that right of the individual has been violated, given information about the strategies that the players have actually adopted in that situation. Even if we ignore the relevance of individual preferences and motives in tackling the first problem, we may have to invoke the individual preferences in tackling the second problem.

Suppose we have a game form formulation of a rights structure and a particular profile of preference orderings. Further, suppose we have an actual play of the game that results from the game form and the preference profile. How do we decide whether anybody’s rights have been violated by this actual play of the game? At this stage, we do not have any tight and comprehensive answer to this question. Nevertheless, in light of examples such as the one in Figure 2, it seems to us that the criterion for deciding whether somebody’s rights have been violated needs to be more complex than the simple criterion of whether anybody has used an impermissible strategy.

5. Formulations of freedom

Much of the recent literature on freedom in welfare economics conceives the freedom of an individual as the opportunity to choose from the set of all outcomes available to her. Thus, if the outcome for a competitive consumer is thought of as a consumption bundle, then the consumer's freedom is seen to be the opportunity of choosing any of the consumption bundles in her budget set. Similarly, in the capability approach to the standard of living, due to Amartya Sen (1985, 1987)¹⁵, the freedom of an individual is the opportunity to choose any one of the 'functioning' bundles available to her¹⁶. In general, the conception of freedom developed by welfare economists has been predominantly outcome-based, and the main concern of the analysis has been to rank different sets of feasible outcomes in terms of the freedom that they offer to an agent¹⁷

While the analysis of individual rights has been increasingly in terms of strategies and actions, the analysis of freedom has remained outcome-based from the beginning. This sharp contrast in modelling strategies is rather surprising since, in many ways, the two concepts have considerable similarities. In particular, in both cases, we talk about the individual's actions (her freedom or right to do/be ... x) rather than outcomes.

Of course, sometimes the outcome may depend exclusively on the action of the individual under consideration. In such cases, it does not matter whether we think in terms of an individual's freedom to do x or the individual's freedom to choose the outcome o_x that follows when the individual does x . However the modelling of freedom in terms of the opportunity to choose an outcome can run into problems when the outcome depends on other people's actions as well as the action of the individual whose

¹⁵ See also Nussbaum (1988).

¹⁶ 'Functionings' are the 'doings' and 'beings' that people value. Being well nourished, being protected from the elements, and interaction with friends and family are just a few examples of what Sen (1985, 1987) calls functionings.

¹⁷ In this respect, the analysis of freedom in welfare economics differs significantly from the corresponding analysis of individual rights, where the focus has been on the incompatibility of individual rights and Pareto efficiency and there is practically no discussion of how to rank alternative situations in terms of the 'amounts' of rights that they offer to an individual.

The exercise of ranking different situations in terms of the amount of freedom that an individual enjoys in each of them has followed two distinct directions: some models (see, for example, Jones and Sugden (1982) and Pattanaik and Xu (1990)) explore the problem without introducing preferences, while some other models (see Jones and Sugden, Sen (1988, 1992), and Foster (1992), among others) give preferences a crucial role.

freedom is under consideration. Often no single agent, by himself, is able to control the final outcome; instead, the final outcome is determined by the strategies adopted by several individuals interacting with each other. An important case where such strategic interaction is absent is the classic case of perfect competition with a very large number of consumers and producers. Given the competitive equilibrium prices, the budget set of each consumer is defined and a consumer can choose any consumption bundle in his budget set. Since the number of consumers is large, a consumer can choose any bundle in his budget set without affecting the equilibrium prices. Assuming that alternative consumption bundles constitute the outcomes for a consumer, we can think of each consumer as choosing an outcome from the set of outcomes available to him. Outside the realm of a classical perfectly competitive economy, however, one can think of numerous examples of strategic interaction where no direct and tight connection may exist between an agent's action or strategy and the final outcome that he may get. An ill-paid worker has the freedom to join a strike, but whether, in the process, he will lose his job or get a pay rise, may depend on how many other ill-paid workers in the same firm join the strike. Despite anti-immigration laws, the supervisors in a firm may be racially discriminating against immigrant workers and an individual immigrant worker may have the freedom to report the matter to appropriate authorities, but the final outcome of such complaint may depend on whether other immigrant workers will come forward to give evidence, whether the officer conducting the investigation takes the complaint seriously or starts with the presumption that it is yet another case of whining by foreigners, and so on.

How does one represent the freedom of agents in such cases where the agent cannot be reasonably thought of as choosing an outcome though he certainly has choices with respect to the actions? One can take the position that, in such cases, freedom should be simply modelled as the opportunity to choose one of several actions, and one should not worry about the outcomes. Such a position seems to have serious limitations. An individual may have a large number of alternative actions available to her, but, if the outcome remains the same no matter what action she takes, then one can hardly consider her to be enjoying much freedom. Ultimately, we value the freedom to choose actions because we hope to influence the final outcomes through such choices.

In the presence of strategic interdependence, there does not seem to be any obvious way of translating the freedom to choose one of several actions to opportunities in terms of outcomes. Here we consider two possible routes; each has its own limitations as well as intuitive plausibility. As in the case of rights, here also game forms and games seem to be the most obvious conceptual tools for capturing the strategic interactions of individuals. Consider a situation where we have two individuals, 1 and 2; individual 1 can choose any one of three strategies, a , b , and c ; and 2 can choose any one of three strategies, a' , b' , and c' . The structure of strategies and outcomes is given by the following game form.

Table 3

		2		
		a'	b'	c'
1	a	x	y	z
	b	x'	y'	z'
	c	y'	x	x

Given this game form, we consider several distinct formulations (to be called formulations A , A' , and B , respectively) of the freedom enjoyed by an individual, say individual 1.

Formulation A : 1 can choose any of the strategies a , b , and c , and the set of all possible outcomes is $\{x, y, z, x', y', z'\}$. If 1 chooses a , then the final outcome must lie in the set $\{x, y, z\}$, though what exactly the outcome will be will depend on what strategy 2 decides to adopt. One way of looking at this will be as follows: by choosing a , 1 really chooses an uncertain prospect; represented by the set $\{x, y, z\}$, where the final outcome will be either x or y or z . Similarly, the choice of b by 1 gives him an uncertain prospect represented by the set $\{x', y', z'\}$, and the choice of c gives 1 an uncertain prospect represented by $\{y', x\}$. 1's freedom to choose any of the strategies, a , b , and c , can then be viewed as his freedom to choose any of the elements of the class $\{\{x, y, z\}, \{x', y', z'\}, \{y', x\}\}$.

z' , $\{y', x\}$ where each of these elements is suitably interpreted as an uncertain prospect.

Formulation A is closely related to the notion of an α -effectivity function¹⁸ that has been used to represent the power that a player enjoys in a game form. The power of 1 here is really the power to restrict the final outcome to lie in any one of the following sets: (1) $\{x, y, z\}$; (2) $\{x', y', z'\}$; and (3) $\{y', x\}$. The freedom of choice, with respect to the outcomes, that 1 enjoys here is the freedom to choose one of these three sets as the set where the final outcome will lie. In a sense, formulation A seems to capture certain aspects of positive freedom.

Formulation A' : 1 can choose any of the strategies a , b , and c . With respect to 2's choice of a' , if 1 chooses a , then the final outcome is x ; if 1 chooses b , then the final outcome is x' ; and if 1 chooses c , then the final outcome is y' . In other words, with respect to 2's choice of a' , 1 is left with an opportunity set $\{x, x', y'\}$ in which 1 can choose any of the outcomes in his opportunity set. Similarly, with respect to 2's choice of b' , 1 is left with an opportunity set $\{x, y, y'\}$, and with respect to 2's choice of c' , 1's opportunity set is $\{x, z, z'\}$. Depending on 2's choice of an action, 1 will have exactly one element of the set $\{\{x, x', y'\}, \{x, y, y'\}, \{x, z, z'\}\}$, where each of these elements is suitably interpreted as an opportunity set.¹⁹ Formulation A' seems to have certain features of negative freedom.²⁰ The opportunity that 1 enjoys in the game form is to choose an outcome from an opportunity set that is determined by 2's action: given 2's choice of a' , 1 can choose either x or x' , or y' ; given 2's choice of b' , 1 can choose either x or y or y' ; and, finally, given 2's choice of c' , 1 can choose either x or z or z' .

Formulations A and A' have their limitations. Consider formulation A , and the following two game forms. Formulation A will not be able to discriminate between 1's degrees of freedom in these two game forms, since, under each of the two game forms, the only uncertain prospect available to 1 is $\{x, y, z\}$.

¹⁸ See, for example, Moulin (1983).

¹⁹ Note that, we are not saying that player 1 can observe player 2's moves before choosing his strategies. What we are doing here is to visualize opportunities available to player 1 *if* player 2 is to adopt a particular strategy.

²⁰ The formulation is, to some extent, in the spirit of Oppenheim's (1961, 2004) conception of negative freedom.

Table 4

		2		
		a'	b'	c'
1	a	x	y	z
	b	x	y	z
	c	x	y	z

Game Form 4.1

		2		
		a'	b'	c'
1	a	x	y	z
	b	y	z	x
	c	z	x	y

Game Form 4.2

Nevertheless, it seems intuitively plausible to say that Game Form 4.2 gives 1 greater influence over outcomes than Game Form 4.1. In Game Form 4.1, given a strategy of 2, what 1 chooses to do does not matter at all so far as the outcome is concerned. In contrast, 1's strategy does matter for the final outcome in Game Form 4.2. In equating 1's freedom in Game Form 4.2 with 1's freedom in Game Form 4.1, Formulation *A* overlooks a difference that seems to be relevant if 1's freedom is to take into account 1's ability to influence the final outcome.

Similarly, Formulation *A* also cannot discriminate between 1's freedom in Game Form 5.1 below and 1's freedom in Game Form 5.2.

Table 5

		2				
		d_1	d_2	d_3	d_4	d_5
1	a	x	x	x	x	y
	b	x	x	x	x	z

Game Form 5.1

		2				
		d_1	d_2	d_3	d_4	d_5
1	a	x	y	y	y	y
	b	x	x	x	x	z

Game Form 5.2

In each case, Formulation A will translate 1's freedom to choose between strategies a and b to 1's freedom to choose between two uncertain prospects, $\{x, y\}$ and $\{x, z\}$. In doing so, Formulation A overlooks a difference between the two game forms, which may be relevant in comparing the two situations in terms of 1's freedom. For example, if we know that 1 strictly prefers x to y (this information is, of course, extraneous to the two game forms) we may feel that 1 has greater freedom in Game Form 5.1 than in Game Form 5.2.

Note that Formulations A and A' are ways of identifying an individual's opportunity to influence the outcome rather than a way of evaluating such opportunity. It is, therefore, possible to combine each of these two formulations with a preference-based approach to evaluating freedom as well as with a preference-free approach to such evaluation. In identifying an individual's control over the outcome, Formulations A and A' both rely exclusively on the information contained in the relevant game form and do not take into account the players' preferences at all. In contrast, the next formulations that we discuss make use of information about the players' preferences as well as the game form.

Formulation B : Suppose we have a game, that is, a game form together with the players' preferences. Let the game form be as in Table 3. Let G denote the game defined by this game form and the given preferences of the two players. Assume that we have some plausible notion of equilibrium and that (a, b') constitutes the unique equilibrium of the game G (presently, we shall comment on the case where there is no equilibrium and the case of multiple equilibria). Since (a, b') is the only equilibrium, 1 knows that 2 will play b' and he himself will ultimately play a . At the same time, 1 knows that he has the option of playing b or c . Since 2 is going to play b' , 1 knows that: (i) by choosing a , he can get the outcome y ; (ii) by choosing b , he can get the outcome y' ; and (iii) by choosing c , he can get the outcome x . Thus, though he knows that he is going to choose b and get the outcome y' , he also knows that he could get y or x if he so wanted. 1's freedom can then be viewed as the freedom to choose an outcome from the set $\{y, y', x\}$.

Suppose we have two equilibria, (a, b') and (c, c') . Then all that 1 knows is that 2 will play either b' or c' . Then 1 knows that: (i) if he (i.e. individual 1) plays a , the

outcome will be either y or z ; (ii) if he plays b , then the outcome will be either y' or z' ; and (iii) if he plays c , then the outcome will be x . Thus, in terms of outcomes, 1's opportunity set can be identified as the class $\{\{y, z\}, \{y', z'\}, \{x\}\}$, $\{y, z\}$ representing an uncertain prospect where the outcome may be either y or z , and similarly for $\{y', z'\}$ and $\{x\}$ (note that $\{x\}$ is a degenerate uncertain prospect where x is the only possible outcome). Finally, we note that Formulation B fails to identify an opportunity set in terms of outcomes if the game G does not have an equilibrium. This is clearly a limitation of the formulation.

6. Concluding Remarks

In this paper, we have critically reviewed several formal formulations of the notions of rights and freedom in welfare economics. In particular, we have considered: (i) the classical social choice formulation of individual rights due to Sen (1970, 1970a, 1992); (ii) the game form formulation of individual rights due to Nozick (1974), Sugden (1985), and Gaertner, Pattanaik, and Suzumura (1992), among others; (iii) the model of individual freedom in terms of the opportunity set of outcomes (see, for example, Jones and Sugden (1982), Sen (1988), and Pattanaik and Xu (1990)); and (iv) possible formulations of freedom in terms of game forms and games. Our focus has been on the conceptual and intuitive bases of these formal frameworks rather than on the specific results that have been derived, using them. Our main conclusions can be summed up as follows.

Like several other writers (see, for example, Sugden (1985) and Gaertner, Pattanaik, and Suzumura (1992)), we believe that the classical social choice formulation, which constitutes the pioneering formulation of individual rights in welfare economics, conflicts in many ways with our basic intuition about a wide range of rights. The source of the trouble lies in: (i) the implicit use of certain conditions of social rationality; and, more fundamentally, (ii) the rigid functional relation, postulated by the theory of social choice, between the profiles of individual preferences and the outcomes 'chosen' by the society. The game form formulation of rights has the advantage of being closer to our everyday use of the language about individual rights, but advocates of the game form approach (see, for example, Gaertner, Pattanaik, and Suzumura (1992) and Pattanaik

(1996)) do not seem to have appreciated sufficiently: (i) the need for bringing in the motives of individuals when we seek to model a very large class of rights (the class of ‘active rights’, to use the terminology of Feinberg (1972)) ; and (ii) the need for ascertaining the individuals’ preferences so as to determine whether the rights of a given individual has been violated in a specific play of the game that results when we combine the relevant game form with the preferences of the individuals. The outcome-based notion of freedom (i.e. the notion of freedom as being reflected in the set of feasible outcomes, any one of which the agent can choose at will) runs into trouble if the outcome for an individual is influenced by the actions of agents other than that individual. Such situations seem to be numerous and important in real life. While one can think of freedom as the freedom to adopt one of several feasible strategies, to evaluate to what extent such freedom is valuable to the agent, one needs to link the freedom to choose one of several strategies to the agent’s ability to influence the outcome through his choice of strategies. The literature does not have any intuitively compelling way of modeling such influence. In Section 5 we considered a few alternative ways of establishing this link, but as we pointed out there, each of them has its own intuitive limitations. The overall conclusion that seems to emerge is that, while, over the last four decades or so, much progress has been made in the formal modeling of individual rights and freedom in welfare economics, there still remain many analytical gaps that need to be resolved.

The formulations of individual rights and freedom, rather than the specific purposes for which these formulations have been used in welfare economics, have been our main concern in this paper. We would, however, like to conclude with a brief observation on these purposes. Possible conflicts between individual rights and the Pareto efficiency of social outcomes constitute the central theme pursued in contributions on individual rights in welfare economics. In contrast, the emphasis of the contributions on freedom in welfare economics has been on comparisons of the ‘amounts’ of freedom that an individual enjoys in different situations. It seems to us that, given the intuitive links between the two concepts, the issues explored with reference to one of these concepts can also be fruitfully pursued in the context of the other concept. For example, it will be interesting to see how one may compare the amounts of rights that an individual

enjoys in different societies, and how individual freedom may be incompatible with Pareto optimality of social outcomes.

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