The Benefits of Cooperation

Joseph Heath
Department of Philosophy
University of Toronto

There is an idea, extremely common among social contract theorists, that the primary function of social institutions is to secure some form of cooperative benefit. If individuals simply seek to satisfy their own preferences in a narrowly instrumental fashion, they will find themselves embroiled in collective action problems – interactions with an outcome that is worse for everyone involved than some other possible outcome. Thus they have reason to accept some form of constraint over their conduct, in order to achieve this superior, but out-of-equilibrium outcome. A social institution can be defined as a set of norms that codify these constraints.[1] Simplifying somewhat, one can then say that social institutions exist in order to secure gains in Pareto-efficiency.

This theory is one that I take to be in large measure correct.[2] My concern, however, is that it tends to be formulated at too high a level of abstraction. By focusing on the structure of the interaction – a structure that is often specified simply in terms of the utility functions of participants – the theory tends to abstract away completely the *mechanism* through which social benefits are produced. Thus major philosophical writers working in the social contract tradition, such as David Gauthier and John Rawls, make no attempt at all to specify *how* cooperation improves the human condition. Rawls, for example, states simply that "social cooperation makes possible a better life for all than any would have if each were to live solely by his own efforts," without saying how.[3] Gauthier focuses entirely upon the role of institutional constraints in resolving "prisoner's dilemmas," but with no systematic analysis of what people are typically trying to accomplish when they get into these dilemmas.

Social scientists interested in the subject of cooperation have not achieved much greater clarity. One often hears talk of "social capital," for example, as a generic resource, a fund of trust and solidarity that individuals can draw upon in order to overcome collective action problems without having to institute a formal system of sanctions.[4] This is often accompanied by some specific empirical examples of cooperative arrangements that rely upon this sort of trust, but very seldom is there any discussion of the type of cooperative projects that social capital gets used for, or what sort of benefits cooperation can produce. When a more abstract mechanism does get mentioned, the discussion tends to focus upon the best-known instance of such, which is the *gain from trade* achieved through market exchange (or the division of labor). Thus social capital is often characterized as a resource that is used to reduce *transaction costs*, in order to facilitate exchange and reduce deadweight losses.[5] While this is no doubt true, it represents only one of the ways that social capital can be used.

In this paper, I would like to correct this deficit, by specifying five different mechanisms of cooperative benefit. I refer to them as *mechanisms*, and not simply as "social goods," because they represent different ways in which individuals can help each other to achieve each others' objectives, whatever those objectives may be.[6] While each of these mechanisms is, on its own, well known, there has been no systematic attempt to classify them, or to draw out the implications that such a classification has for social contract theory, or for political philosophy more generally.

What are some of these implications? The first thing one notices when laying out such a typology is that much of contemporary social contract theory has been marked by what might be referred to as a *catallactic bias*, which result from a tacit conceptual privileging of gains from trade as the primary mechanism of cooperative benefit.[7] One can find the primary source of this

catallactic bias in the influence exercised by the so-called "invisible hand theorem" of welfare economics, which shows that the equilibrium of a perfectly competitive market will be Pareto-optimal.[8] It is well-understood that these results obtain only under a set of highly idealized conditions, which are never satisfied in the real world.[9] What is more seldom recognized is that this theorem focuses only upon one *mechanism* of cooperative benefit to the exclusion of all others.[10] Thus the reason that real-world markets fail to achieve Pareto-optimal outcomes is not just because of imperfections in the system of competitive exchange (such as transaction costs, or externalities), but because there are entire other categories of efficiency gain that these institutions do not even presume to promote. Indeed, I will attempt to show that not only does market exchange fail to promote certain types of cooperative benefit, but the relevant set of institutions often interferes with our ability to produce such benefits. Thus we often face hard choices when it comes to determining the structure of our social institutions – along with significant social conflict over the type of cooperative benefits that should be accorded priority.

The major impact of catallactic thinking in political philosophy has been to promote a highly misleading account of the role that the welfare state plays in a capitalist economy. More specifically, it has encouraged the widespread perception that, when it comes to efficiency, the central functions of the welfare state are all residual. According to this view, the central purpose of the market is to maximize the number of efficiency-promoting exchanges concluded. The central economic role of the state, when it comes to efficiency, is to assist in this function: ensuring that the system of property rights is respected; preventing collusion and other anti-competitive practices; regulating the price level in cases of natural monopoly; internalizing externalities, either through taxation or regulation, to compensate for incompleteness in the system of property rights; and finally, forcing certain exchanges to occur, through taxation and

public goods provision, in cases where it proves impossible to organize a private market. Above and beyond this range of efficiency-promoting functions, all other activities are then classified as "redistributive" in character.[11]

The result, I will argue, has been a serious misunderstanding of the contemporary welfare state, one that dramatically overstates its redistributive character. This has, in turn, led philosophers to dramatically overestimate the extent to which its programs require an egalitarian justification. Elements of the "social safety net," for instance, such as state pensions, unemployment insurance, and socialized medicine, are routinely described as redistributive (and thus, tacitly, as egalitarian). This is, I will argue, a misclassification. The social safety net is first and foremost a set of risk-pooling arrangements, which are organized in the public sector primarily in the interest of promoting efficiency gains. Furthermore, the mechanism of cooperative benefit that is exploited in this case is fundamentally different from the gains from trade that are achieved in market exchange. Thus there is no reason to think of the state's role in this domain as residual. On the contrary, the state often takes a lead role when it comes to promoting certain forms of cooperative benefit. Distinguishing the various mechanisms of cooperative benefit therefore provides, not only a more satisfactory articulation of the different forms of cooperation that are enabled by the welfare state, but also a more sophisticated approach to defending its normative foundations.

Forms of cooperation

I would like to start out where social contract theorists typically do start out – with the state of nature. It is useful when trying to conceptualize the benefits of cooperation to imagine a state of society in which there is a complete absence of cooperation, and then to consider what

would be *missing* in such a scenario. So imagine two Robinson Crusoes, living on closely adjoining islands. They have the choice of either ignoring one another, or interacting with one another. Why might they choose to interact?

In answering this question, we should begin by distinguishing between benefits that can be achieved through purely instrumental action, and those that require some form of cooperation and constraint. One Robinson may derive enjoyment simply from watching the other go about his business, but this is of no particular interest to the contractualist, because it can be achieved quite easily through straightforward instrumental action (in the standard run of cases). It requires no constraint, and thus no agreement.

Within the set of benefits that do require cooperation to produce, we can also distinguish between two very important types: those produced when individuals agree to engage in actions that have positive externalities, and those produced when individuals agree to refrain from actions that have negative externalities.[12] For example, purely instrumental action might lead the two Robinsons to raid each other's food stocks, which would in turn force each to take costly defensive action. This is a classic prisoner's dilemma. Thus they might both benefit from an arrangement under which they refrain from raiding each other's food stocks. But since the benefit here comes from the elimination of a negative externality that arises from social interaction, it is not really an inducement to cooperation. After all, the two Robinsons could achieve the same result by finding a couple of even more isolated islands and avoiding each other completely. Thus the agreement does not capture the "upside" of social interaction, it simply allows them to eliminate one of the many "downsides." The focus here will be quite specifically on ways in which individuals are able to generate positive externalities, and where they depend upon some structure of reciprocity in order to motivate them to do so.

The other major constraint in the analysis that follows is that I will be ignoring all of the benefits that arise from what we might typically think of as primary socialization. Individuals obviously derive significant benefits from language acquisition, the development of norm-conformative competencies, and various other aspects of socio-cognitive development that occur during childhood, *via* social interaction. There is some question as to how much "cooperation" is required in order to produce these benefits to the individual, given the extent to which parental investment in the young, for reasons of inclusive fitness, is independent of any system of reciprocity.[13] But without getting into these debates, simplicity alone may serve as an adequate motive for confining the analysis to the type of cooperative benefits that fully-developed adults are able to provide for one another.

With this in mind, five primary mechanisms are immediately apparent:

1. Economies of Scale. The most obvious form of cooperation arises because of the simple fact that not all jobs can be done by one person. Nature sometimes organizes things in such a way that people can do better working together than they can working individually. One Robinson may have a large rock, blocking his view of the sea, which he would like to have moved. Unfortunately, it is too heavy for him to move on his own. With the assistance of the other Robinson, he would be able to move it. If the other Robinson has a similar job over on his island, then the two are in a position to engage in mutually beneficial cooperation.

This example is actually just a "lumpy" version of what are commonly known as economies of scale. Some jobs are such that adding another person generates a disproportionate increase in output. If one individual is able to produce an output of x per unit of labor, an economy of scale is present when adding a comparable unit of labor from another individual

increases output by more than *x*. This increase can be either continuous (as with a harvest, where each new worker's contribution speeds up the process, thus reducing the chances that the crop will be rained on), or it can be lumpy (as with a barn-raising, where certain parts of the structure can only be assembled with a minimum number of hands).

This mechanism is so familiar that we often refer to it simply as "cooperation". However, despite the obviousness of the benefits, self-interest alone is often not enough to secure cooperation of this type. If the cooperative system requires reciprocity over time, each individual may have an incentive to defect after the work that benefits him has been performed (and anticipating this, others may refuse cooperation from the outset). If the benefits are produced and divided up in a single shot, then each individual has an incentive to "shirk" – i.e. contribute as little effort to the collective project as possible. The extent to which benefits can be secured under such conditions without constraint will then be determined by the observability of effort.[14]

2. Gains from trade. This second mechanism is slightly more subtle than the first, and has therefore attracted greater theoretical interest. Plato's account of the ideal city in the *Republic* starts from the observation that people are naturally suited for social life, because they have different needs and abilities. In cases where these differences are complementary, they can serve as a source of cooperative benefit. In particular, individuals may be able to achieve benefits by rearranging the distribution of goods, or of tasks, among themselves. This is what motivates various forms of exchange. These gains are often analyzed under two headings:

Consumption: Gains from trade can be achieved because individuals have different needs and tastes. One person may not like carrots, another may not like potatoes. If they trade vegetables, they are able to improve both of their consumption bundles, each from his or her own

perspective. It is important to realize that if everyone had identical tastes and needs, no such gains could be made. There are of course a variety of reasons why people have different needs, but one of the most important is that people are of different *ages*, and that their preferences change as they age. Gender is also an important source of complementarities.

Production: Gains from trade can also be realized because individuals have different abilities. Even if everyone had identical tastes, and therefore sought identical consumption bundles, it would still be advantageous to have a division of labor. Some people are better at certain types of work, and so it makes sense to have them carry out these tasks "for everyone," while instituting a structure of reciprocity such that their other needs will then be taken care of by others.

The important point about this class of gains is that they can be achieved without actually increasing the stock of goods, in the former case, or the stock of productive resources, in the latter. When individuals cooperate in order to achieve economies of scale, the results of this cooperation are quite tangible. But when they change the allocation of goods, in order to better satisfy the preferences of all, or the allocation of resources, in order to better take advantage of productive abilities, the gains are less obvious. It is because of the more subtle character of these gains that they were felt to be very much a discovery among early economists. Edward G. Wakefield, for example, in his heavily annotated 1835 edition of Adam Smith's *The Wealth of Nations*, drew particular attention to the difference between "simple cooperation" ("when several persons help each other in the same employment") and "complex cooperation" ("when several persons help each other in different employments"). "Of the former," he wrote, "one is always conscious at the time of practicing it: it is obvious to the most ignorant and vulgar eye. Of the latter, but a very few of the vast number who practice it are in any degree conscious."[15]

Cooperation is essential to achieving gains from trade, simply because all of the individual advantages come from the reciprocation of the other. Of course, there is a longstanding project in political philosophy which seeks to show that these sorts of gains would also arise "spontaneously" in a state of nature, or that market exchanges constitute, in David Gauthier's term, "a morally-free zone."[16] These arguments studiously ignore the free-rider strategies that arise in contexts of economic exchange (notably theft and fraud).[17]

3. Risk-pooling. Thanks to the work of the classical economists, both of the above sources of collective benefit are well known. Both mechanisms deal with the reproduction of what Marx called the "material basis" of society. It is an unfortunate feature of the human condition, however, that we are afflicted not only by scarcity, but also by uncertainty. Our ability to plan for the future is severely compromised by our inability to determine precisely what the future has in store. One of the primary benefits of collective action is that it enables individuals to reduce the subjective dimension of this uncertainty. This is due to a phenomenon referred to loosely as "the large of large numbers."

The world is full of risk. Knowing the probability of various events is extremely useful when it comes to engaging in practical deliberation. Unfortunately, what matters to most of us when we make our plans is not the background probability of an event, or the long-run average that we can expect, but also the degree to which actual outcomes can be expected to diverge from the average. When confronted with stochastic variability, people worry not just about the mean, but also the variance. In this context, the "law of large numbers" becomes important, because it offers us a way of reducing this variance. For example, we know that a fair coin has a 50 per cent probability of landing heads, but we also know that flipping it 10 times is quite unlikely to

produce exactly five heads and five tails. However, it is also well known that as the number of tosses increases, the frequency will tend to converge with the probability. In other words, increasing the number of trials induces *statistical stability*.[18] This is the basic connection between "large numbers" and the reduction of variance (or standard deviation).

To see how groups of individuals can benefit from this, it is important to remember that individuals are often risk averse. Consider a subsistence farmer who under normal conditions is able to produce 10 tons of grain – enough to feed his entire family well throughout the winter. However, his land is also subject to a highly localized blight, which sometimes wipes out the entire crop. Suppose that the chances of this blight striking his field in a given year are 20 per cent. Although the expected annual output of his field is therefore eight tons, he would gladly swap a guaranteed revenue of eight tons for the gamble that he faces between 10 tons or nothing. That way, his family would have a bit less to eat, but they would never risk starvation.

On his own, this is something that he cannot achieve. Suppose, however, that there are 100 small farmers who find themselves in identical circumstances, all facing the danger of this highly localized blight. They might agree to a "risk-pooling" arrangement, under which farmers who lose their crop in a given year are compensated by those who do not. Under this arrangement, the objective risk of blight does not diminish: 20 of the 100 farmers can, on average, expect to lose their crops. However, with the risk-pooling arrangement, each farmer can expect a revenue that will be, with 95 per cent probability, between 7.2 and 8.8 tons.[19] Adding in more farmers narrows that band, until it comes very close to 8 tons precisely.

Thus insurance is a mechanism that generates a convergence between the subjective utility associated with a gamble and its mathematical value. What is important to recognize is that risk-pooling is, like gains from trade and economies of scale, a *sui generis* source of

collective benefit.[20] It shares with (allocative) gains from trade the characteristic that its benefits are invisible – it simply increases everyone's utility. However, *unlike* these sorts of gains from trade, the benefits of risk-pooling are available even to individuals with identical preferences. Many theorists have encouraged confusion on this point, by conflating the benefits that come from pooling risks with those that come from trading risks.[21] Insurance, for example, is often analyzed as an exchange between a risk-averse and a risk-neutral individual (and thus the welfare benefits are classified as merely a gain from trade). A typical "mutual society" arrangement, however, involves risk-pooling among individuals who may all be equally risk-averse.[22] The benefits come, not from the fact that risks are transferred, but from a reduction in the variance achieved through the "law of large numbers" effect, and the utility gain this provides to risk-averse individuals.

Thus risk-pooling is a more subtle mechanism of cooperative benefit than either gains from trade or economies of scale. Furthermore, because an understanding of the key probability concepts was a relatively late development, and has largely been confined to specialists, it was only in the mid-19th century that a more general appreciation of the social significance of risk-pooling began to develop. Thus it was not until 1855, with the publication of Emile de Girardin's *La politique universelle*, that the first serious attempt was made to integrate an understanding of insurance into social contract theory (de Girardin argued that the primary function of the social contract was to found a system of "universal insurance").[23]

4. Self-binding. Individuals are subject to dynamic preference inconsistency. Everyone discounts future satisfaction to some degree. However, theorists who use something like interest rates as their model of how much compensation individuals require in order to defer satisfaction are

likely to be misled. This is because the sort of smooth exponential function suggested by the analogy to interest rates produces preference orderings that are temporally invariant – if *a* is preferred to *b* at time *t*, then it will also be preferred at any other time. In reality, individuals seem to discount satisfaction quite sharply in the very near term, with the curve then smoothing out as it heads off into the future.[24] In other words, the difference between today and tomorrow often seems like a very long time compared to the difference between Nov. 7, 2017 and Nov. 8, 2017, when seen from the present.

This feature of our discount rates has the capacity to generate temporary preference inversions. George Ainslie has provided a number of striking illustrations of this phenomenon.[25] For example, given a choice between a check for $100 that can be cashed right away, and a check for $200 that can be cashed in three years, many people will choose the former. But many of these same people, when given a choice between a $100 check that can be cashed in six years, and a $200 check that can be cashed in nine years, will take the $200. This preference structure will generate dynamic inconsistency: the individual who would take the $100 check right away and chooses the $200 check that can only be cashed in nine years will want to change the latter decision in six years' time. Ainslie refers to this as "hyperbolic" discounting, since the rate of discount is so highly exaggerated in the short term.

For a long time, this sort of inconsistency was castigated as a form of irrationality (i.e as *akrasia*, or weakness of the will).[26] There is no reason to go so far. The fact that a set of preferences interact with one another in such a way as to generate instability over time is not necessarily irrational. What matters for our purposes is that the forms of instability we see are eminently predictable. Something that is judged to be the "lesser good" from afar may start to look more attractive in the very near term. This is usually a temporary phenomenon – our

evaluation reverts back to the original ranking after the event has passed. Because we are all familiar with this pattern, we often take preventative steps in order to ensure that we will not act upon such temporary preference reversals. Thus we have a range of self-binding mechanisms that we use to constrain our own future choices.

In some cases, we are able to carry out these self-binding strategies alone. One of the great advantages that we achieve from social interaction, however, is the ability to enlist others in our aid. (In fact, it has been widely noted that compulsive and addictive behavior is strongly associated with social isolation.[27]) In the company of other people, we may entrust goods to our neighbors for safe-keeping, we may authorize family members to make decisions on our behalf, or instruct our friends to ignore our demands. In some cases, what we anticipate is the impairment of our own decision-making abilities (e.g. the individual who gives away his car keys before he starts drinking). In other cases, it is the tendency toward heightened impatience in the near term that we seek to control (e.g. the person who opts for an increase in employer contributions to her retirement plan, in lieu of increased salary). We often rely upon the cooperation of others to carry out these self-binding strategies (for the simple reason that, with other people, we can give instructions in advance that specify what we want done, which they can then follow). Jon Elster refers to this as the "giving away the key" approach to self-control.[28]

Our ability to enlist others to help us maintain self-control has sometimes been cited as one of the most important advantages of cooperation. David Hume, for example, was quite clear that the problem of heightened impatience in the near term offered the primary explanation for "the origin of civil government and allegiance."[29] By authorizing others ("civil magistrates, kings and their ministers, our governors and rulers") to punish me, should I fail to choose the greater good, I am able to guard against my own preference reversals. Of course, at the time that I am

forced to refrain from choosing the lesser good, this will seem like a hardship. I am willing to commit to it in advance only because I also discount this hardship to the same degree that I do the lesser good. Thus "the provision we make against our negligence about remote objects, proceeds merely from our natural inclination to that negligence."[30]

Contractualists have often shied away from assigning too great a role to this mechanism, because of the traditional association between dynamic preference inconsistency and irrationality. Hume himself was part of the problem, insofar as he characterized the conflict as one between "passion" and "judgment."[31] Viewed in terms of discounting, however, there is no reason to regard self-binding strategies as irrational. Insofar as other individuals help us to carry out these strategies, it represents another *sui generis* mechanism of cooperative benefit.

5. Information transmission. Another major advantage of social interaction is that it allows individuals to economize on learning costs. Sometimes this does not require cooperation. One person may simply observe another's behavior and imitate it.[32] However, there are a variety of ways in which we can encode and transmit information to one another, and this type of interaction normally requires cooperation. This is actually not specific to humans. Some animals (such as vervet monkeys or ground squirrels) emit alarm calls when they detect a predator, which communicates important information to their fellows. This behavior is altruistic, since the individual who emits the alarm call generally attracts attention to himself, and is therefore more likely to be killed than the others. Thus communication systems of this sort are vulnerable to free-rider problems.[33]

Humans have of course vastly more sophisticated means at their disposal, yet the same free-rider problem persists. Most of what we know about the world is not a product of direct

experience, or trial-and-error learning, it is acquired through linguistic communication with others. It is by tapping into this system of communication that we gain access to the vast cultural inheritance of humanity. It gives us knowledge of events far removed from us, both in time and in space, which in turn allows us to plan our own activities with much greater success. Clearly we all benefit from an arrangement in which individuals volunteer such information when it seems relevant and refrain from crude falsification of their reports when it suits their interests to do so, but the preservation of such a system will require cooperation.

Although information often seems to spread in a quasi-natural fashion – consider the way a rumor moves through a crowd – it is important not to lose sight of the fact that communication is underpinned by a generalized system of trust.[34] The norm of truth-telling is the most apparent example. As the story of "the boy who cried wolf" reminds us, individuals whose behavior is determined by their own interest, rather than by the norms governing the relevant language game, undermine the integrity of the system. A certain amount of social learning is possible simply through observation and imitation, but the more powerful mechanisms of cultural transmission that we have available all involve cooperation. This mechanism of cooperative benefit is one that contractualist theorists like Jürgen Habermas have placed considerable emphasis upon, particularly in his account of the role of language in cultural evolution.[35]

Although I am not aware of any omissions, this list need not be exhaustive. The primary goal is to show that human beings derive a wide range of different benefits from cooperation with their fellows. Each of the mechanisms outlined above has, at one time or another, been held up as *the* key to understanding the motivations underlying the social order. Hume, for instance, thought that the self-binding function of social institutions explained the "basis of civil

association." De Girardin thought the purpose of the social contract was to create "universal insurance." John Locke thought the goal was to protect property, and thus to promote and secure the gains from trade. But of course, there is no reason why any one of these mechanisms of cooperative benefit must predominate. Instead, "civil association" may be conceived of as a set of social institutions whose role is to secure as many of the benefits along each of these different dimensions as possible.

Critics may see all sorts of troubling omissions from this list. Some of these are intentional. For example, I make no mention whatsoever of reproduction, which would seem to be a social activity *par excellence*. The reason for leaving it off the list is that, strictly speaking, reproduction is not something that requires cooperation, and is not necessarily an activity that generates mutual benefits. The systems of cooperation that exist in the domain of reproduction tend to be secured by institutions such as the family. It is my conviction that these institutions are best analyzed, not in terms of their role in facilitating reproduction (for which they are not strictly necessary), but rather in terms of how they secure cooperative benefits using one of the mechanisms outlined above. We learn more about the family, I would argue, by analyzing the sexual division of labor and the gains from trade it facilitates than we do by focusing on reproduction. In other words, there is no *sui generis* form of benefit associated with the institution of the family life – it is simply one way of securing benefits that arise from other sources.

Similarly, it may seem that security is one of the major reasons that humans have always banded together into groups (security being understood as protection against danger, rather than pooling of risk). However, it seems to me that there is no *sui generis* mechanism of cooperative benefit here either. Individuals are able to provide some security for themselves all alone, but in

a group they are able to take advantage of economies of scale, complementarities of ability, and information transmission. Thus security is best analyzed as one of the social goods produced through cooperation, not as a separate mechanism of cooperative benefit.

Finally, I do not mention anything pertaining to social status, the "social bases of self-respect," self-esteem, or mutual recognition. While it might be argued that healthy self-esteem is one of the positive benefits of social interaction, I am inclined to analyze it in terms of its opposite, and regard low self-esteem as a potential negative consequences of social interaction. Social interaction, according to this view, elicits dominance behavior, which in turn generates status hierarchy. Self-esteem is generated by the perception of one's own position in this status hierarchy.[36] Refraining from dominance behavior is therefore a form of cooperation, insofar as it eliminates one of the many "downsides" of social interaction. Self-esteem, from this perspective, is not a social good, but merely the absence of a bad. Since the analysis in this paper is confined to the "upside" of social interaction, no mention is therefore made of these issues.

Institutional Solutions

The analytic perspective that is being proposed here takes as its point of departure the suggestion that the primary function of social institutions is to secure cooperation. This in turn suggests that various institutions can be usefully analyzed by considering the role that the different mechanisms outlined above play in securing these cooperative benefits. One way of gaining purchase upon this question is to consider the type of collective action problems that these social institutions resolve, in terms of the free rider strategies that the institutional constraints prohibit. The social contract tradition has focused considerable attention upon the practice of promising, along with its legal correlates in contract law. This is of course a perfectly

generic mechanism that can be used to overcome a wide range of collective action problems. However, we also have a range of more specific institutional arrangements, designed to address the free rider strategies that arise with specific mechanisms of cooperative benefit. For example, when it comes to economies of scale, cooperation is particularly vulnerable to shirking. If effort is unobservable then individuals have an incentive to invest less than their full effort in the task.[37] One of the basic institutional building-blocks that we use to overcome these problems is the formation of teams or groups.[38] Individuals are sorted into relatively small groups, then encouraged to build strong trust relations through exercises in reciprocity. Group bonding or "identification" may give individuals a strong incentive to cooperate, in order not to let down "the side."

These "internal" incentives are integrated in various complex ways with the superior external incentive schemes that team organization permits.[39] Effort is more directly observable within small groups, and among people who know each other well. Nevertheless, a team might still opt to impose supervision upon itself. One need only consider the role that a coach plays on a typical sports team to see these structures in effect. The military also provides a clear-cut example. Similar team structures are reproduced in economic contexts – through the formation of corporations, or work-groups within larger corporations. Thus the catallactic theory of the firm, which regards the corporation as simply a "privately owned market," obscures the primary rationale for this institution, by trying to shoehorn it into a model of efficiency gains based purely on exchange.[40] Even within a transaction cost framework, the primary function of the corporation can be understood much more naturally as an attempt to create an environment that is insulated from certain patterns of market behavior, in order to foster reciprocity, trust, and therefore more effective teamwork.[41]

In the case of complementarities of needs and abilities, cooperation generally takes the form of exchange, which then generates a series of free rider strategies that exploit this practice. The fundamental problems are theft and fraud. Each exchange is mediated by a promise to pay, which the parties then usually have an incentive to violate.[42] The institution of exclusive property rights represents one of the most sweeping mechanisms for the elimination of such strategies. Property rights can be thought of as an all-purpose mechanism for "internalizing" externalities. They allow individuals to "capture" some part of what would otherwise be positive externalities generated by their effort, while also allowing them to "deflect" negative externalities generated by the activities of others.[43] This facilitates the development of exchange, by giving individuals the confidence that the complementarity needed to sustain specialization will be actualized.

In the case of risk pooling, the two most common free rider problems are moral hazard and adverse selection.[44] Moral hazard arises because individuals who are indemnified against a given risk have a reduced incentive to take precautions aimed at avoiding the loss. In cases where the risk in question is influenced by the agent's behavior, this means that the decrease in subjective uncertainty produced through risk-pooling will be accompanied by an increase in the objective probability of the unfortunate event. The other free rider strategy, adverse selection, occurs when some individuals face a higher probability or magnitude of loss, and yet are able to conceal this fact. By entering into risk-pooling arrangements, they are able to effectively transfer costs associated with this elevated risk level onto others. Both of these free rider strategies can create very straightforward collective action problems.[45]

Many traditional social institutions have had important risk-pooling functions. Indeed, in an economic environment characterized by high variability in returns, with a mean return only slightly above the subsistence level, the benefits to be achieved through risk-pooling tend to far

outweigh those that are achievable through trade. Generations of ethnographers, for instance, have been impressed by food sharing practices in hunter-gatherer societies. Indeed, the presence of extensive networks of sharing and gift-giving is largely responsible for creating the widespread impression that people in such societies are less "acquisitive" or more "collectivist" in their social attitudes.[46] Yet sharing only looks altruistic when compared to market exchange. Its primary economic function is to reduce the variability of returns. In other words, it merely serves to secure a different *type* of cooperative benefit, one that is of much greater importance than trade in a near-subsistence economy.

Evidence for this hypothesis is reflected in the fact that food-sharing arrangements are typically more dominant in the "hunting" than in the "gathering" segment of foraging economies. Among the Aché of Paraguay, for instance, the mean standard deviation in returns to hunting (and honey-collecting) across days is several times greater than it is for gathering, and a far greater percentage of meat (and honey) captured is shared outside the nuclear family.[47] This system of sharing breaks the "feast and famine" cycle of irregular returns produced by the reliance on these two food sources (which provide around 75 per cent of the caloric intake of the Aché).[48] It is, in other words, an insurance mechanism. A gift economy offer a more flexible version of the same mechanism – in times of plenty, an individual can give away whatever is in surplus, in order to "call in the favor" when returns are more scarce.

The development of agriculture and animal husbandry created much more stable returns, and therefore diminished the need for risk-pooling arrangements in these central areas of economic life. But risk-pooling remained an important function of various other institutions. In the European Middle Ages, for instance, the church provided various types of "insurance," some more obvious than others. Monasteries, for example, often sold "corrodies," which functioned

very much like life annuities. In return for a lump-sum payment upfront, the corrodian was entitled to a standardized room and food ration for the rest of his or her life.[49] Early pension homes, usually funded by craft guilds, were organized along the same lines. Other guilds ran the equivalent of pay-as-you-go defined benefit pension schemes (often means-tested) among their members. Furthermore, farmers often organized their inheritances through the "sale" of a pension to their children. They would transfer ownership of the land in return for (contractually specified) fixed periodic payments of cash and crops, or often just room and board in what had previously been their own home.[50]

Many guilds also provided the equivalent of disability insurance. More expansive schemes, like the Chatham Chest in England, provided disability insurance to seamen from the late 16th century until the early 19th.[51] The development of industrial capitalism naturally disrupted many of these craft and guild-based arrangements. Thus the late 18th and early 19th century saw the widespread emergence of more "associational" insurance arrangements. During the late 18th century, for example, so-called "friendly societies" enjoyed enormous popularity in England (and "*sociétés de secours mutuels*" in France). Working men all paid a monthly fee to belong to these organizations, with the understanding that the group would pay for medical emergencies affecting any member. These societies also supported the widows and orphaned children of group members. In the early 19th century, approximately one million people belonged to such organizations in England.[52] This says a lot about the importance of the benefits generated though risk-pooling. Since there was absolutely no actuarial basis for calculating the anticipated liabilities of these groups, there was very little guarantee of their ongoing solvency. Nevertheless, the advantages of the limited protection offered were sufficient to make these organizations extremely popular, and "level premium" friendly societies persisted well into the

1920s.[53]

Institutions that enforce self-binding strategies are slightly more difficult to find. This is because, of all the mechanisms of cooperative benefit outlined above, "giving away the key" is the strategy most open to abuse. The free-rider strategy in this case is straightforward betrayal of confidence. Once Ulysses has been tied to the mast, and has instructed his crewmen to disregard all his future orders, there is very little that he can do to prevent himself from being taken advantage of.[54] As a result, self-binding institutions tend to arise only where there are very high-trust relationships. The family obviously represents the primary locus of such relations. When legally recognized, they generally take the form of explicitly fiduciary relations. Guardianship represents the most formal mechanism through which one person can be legally empowered to act in the interests of another. There are also the so-called "helping professions," which include counseling, social work, human resources development, addiction control and rehabilitation, therapy, etc. All are largely focused upon helping individuals overcome the effects of hyperbolic discounting.

Even though institutions with an exclusively self-binding focus are rare, many social institutions have a self-binding dimension, or are structured in such a way that individuals can use them to control short-term temptations. For example, Ainslie has argued that money, because it is not consumed directly, serves as a stand-in for a temporally extended sequence of satisfactions, and therefore can be used as a psychological self-control mechanism.[55] This is why people have such a strong tendency to focus on prices when trying to exercise self-control (rather than thinking in terms of opportunity costs). To take a somewhat different example, Elster has argued that constitutions serve an important self-binding function.[56] Legislatures know that on certain issues they make be inclined to act impetuously, and so seek to preempt this by

entrenching their present, presumably more well-considered, judgments.

When it comes to information transmission, lying and misrepresentations are the primary forms of free-rider strategy. As a result, institutions whose primary function it is to generate the pool of shared knowledge that individuals in a society rely upon often incorporate procedures that enforce the norm of truth-telling. In specialized research, in particular, peer review lends official sanction to this norm. Much the same applies to the code of journalistic ethics that governs mainstream media outlets.

Schematizing very roughly, one can show how the different types of social institution that make up the macrostructure of a modern economy facilitate cooperation across these five dimensions. (1) Corporations institute teamwork, and thus help achieve economies of scale; (2) the system of property rights helps individuals to achieve gains from trade; (3) the insurance industry provides a basic set of risk-pooling arrangements; (4) the helping professions, along with certain types of fiduciaries, provide a wide range of expertise in developing and assisting in the implementation of self-binding mechanisms; and finally, (5) the media and publication industry provide a general mechanism for the transmission of information. Of course, each of these institutions typically promote cooperation in several different dimensions. Corporations, for instance, also produce significant benefits for their employees through internal diversification (e.g. making it less risky for workers to develop highly specialized skills).[57] The suggestion is simply that the corporate organizational form permits individuals to achieve economies of scale that would be impossible (or prohibitively expensive) to organize through market contracting, and that this provides the primary explanation for its success.[58] Instead of subsuming these various institutions under the market, and treating their "outputs" as just different classes of services being exchanged in order to produce gains from trade, I think it is helpful to see them as

exploiting fundamentally different mechanisms of cooperative benefit.

Conflicts

Analyzing the benefits of cooperation in terms of five distinct mechanisms suggests a multi-dimensional understanding of social institutions. Institutions promote efficiency, but they do so in very different ways, and they need to control very different free-rider strategies, depending upon the primary type of cooperative benefit that they are focused upon delivering. Yet already, just surveying the basic institutional building blocks used to create cooperative benefits in these various dimensions, it is easy to see the potential for conflict that they create. In an ideal world, in which individuals always voluntarily refrained from free-riding, there is no reason that cooperative benefits could not be secured along all the relevant dimensions simultaneously. In the real world, however, in which institutional constraints and external incentives must be supplied in order to motivate cooperative behavior, conflicts often arise. Arrangements designed to facilitate the production of one form of cooperative benefit may simultaneously undermine the arrangements needed to secure some other.

Consider the case of the competitive market, an arrangement that has as its primary goal the maximization of gains from trade. This example is particularly illustrative, because we have available a formal statement of the conditions that must be satisfied in order for the relevant set of institutions to achieve efficiency in this one dimension. The "invisible hand theorem" (or "first fundamental theorem of welfare economics"), shows that the competitive equilibrium of a market economy will be Pareto-optimal as long as certain "standard" conditions obtain.[59] The list is quite long, but includes *inter alia* constant returns to scale, individuals with well-behaved utility functions, symmetric information, a complete set of futures markets, and in cases of

uncertainty, a complete set of insurance markets. In other words, the theorem shows that markets achieve perfect efficiency, so long as every other mechanism of cooperative benefit is excluded from consideration – *either by assuming that no such benefits are possible, or that all such benefits are freely available*. To see how uninformative this is, consider how we would respond to someone who proposed a model for the "optimal" production of scientific knowledge, based upon the assumption that both material resources and labor were available in unlimited supply and at zero cost. Whatever its technical merits, such a model would give us very little assistance with real-life policy questions.

Thus the interesting questions arise only when one looks at the market as a real-world institution, and consider how the constraints that it imposes interact with the institutional arrangements needed to supply other types of cooperative benefits. As one might expect, conflicts develop along all four dimensions:

1. Economies of scale. The conflict between economies of scale and gains from trade is well-known (it forms the central theme, for instance, of John Kenneth Galbraith's critique of "the competitive model" in economics[60]). Natural monopolies represent the most extreme manifestation. Within a system of private property, exchange alone does not have an optimizing structure. Between two individuals exchanging goods, any price level that gives both parties some portion of the "cooperative surplus" is a potential equilibrium. Thus there may be a deadweight loss in the exchange, because not all of the mutually beneficial exchanges that might occur will occur at the prevailing price level. In a sense, "not enough" exchanges take place. The standard solution is therefore to introduce more buyers and sellers, in order to provoke competition among them. This drives prices toward the level at which the market clears,

reducing the size of the deadweight loss.

So in order to secure gains from trade, it is important to have not only exchange, but also competition between multiple sellers and buyers. Unfortunately, the tendency for economic activities to exhibit economies of scale works at cross-purposes with this need for competition. In the case of electricity, for instance, once a distributor has hooked up one person's house to the a generator or substation, it costs only a tiny bit more to hook up that person's neighbor, the neighbor's neighbor, and so on. Thus it is impossible for any other distributor to compete in that neighborhood. Water supply, sewage, "land line" telephony, and cable television all have the same structure, giving the typical distributor a natural monopoly within a given territory.

At this point, we need to decide which is most important – the gains that come from the economies of scale, or those that come from maximizing the number of exchanges. If we decide that the former are more significant, we will allow one dominant firm to emerge, then try to minimize the deadweight losses by regulating the price level at which it does business. If we decide that pricing is more important, we might artificially break up the firm, or take anti-trust measures designed to prevent a single dominant supplier from emerging. Either way, in trying to hit one target we are very likely to miss the other. Thus each one of these institutional compromises generates potential conflict among parties who stand to benefit more from one or the other type of cooperative gain. The fact that, over the course of decades, the "pendulum" tends to swing back and forth between these two strategies is a symptom of the fundamental nature of the underlying conflict.

2. Risk-pooling. Similar conflicts arise between the imperative of trade maximization and that of effective risk-pooling, although they are less often noted. The classic argument for private

property is that the pooling of economic effort encourages free-riding, and thus generates a "tragedy of the commons." Consider the standard story. When all peasants are allowed to graze their animals in the common pasture, everyone has an incentive to overgraze, simply because the costs of doing so are largely externalized (i.e. borne by the other peasants who graze their animals on the pasture). Similarly, the benefits of keeping one's animals off the land, in order not to overgraze it, would largely be enjoyed by those who disregard these concerns and continue to overgraze. The solution is to divide up the commons into a set of individual plots, then restrict each peasant to grazing his animals on his own land. This effectively internalizes all the externalities, and thereby eliminates the free-rider strategy that generated the tragedy.[61] Everyone lives happily ever after.

Looked at from the perspective of risk management, however, this happy ending is not assured. The system of property rights, which resolved the tragedy of the commons, also has the effect of "unpooling" a certain type of risk. If the pasture is afflicted by a localized blight, then a system of common landholding will automatically divide the loss up equally among all the peasants. When a misfortune befalls the commons, "there followeth not the undoing of any man, but the loss lighteth rather easily upon many than heavily upon few" (to quote the English insurance act of 1601). Thus the commons offers a form of insurance to the peasants.[62] When it is broken up into private holdings, this may result in better land management practices, but it also exposes everyone involved to much greater risk. It is precisely the mechanism of "internalizing" the losses that, on the one hand, encourages more responsible land management, but on the other hand, generates much greater volatility in returns to individuals.

The general problem is that often the only way to "pool" a risk associated with a particular activity is to pool the costs and benefits that result from it. This sort of risk pooling

may generate moral hazard, but it may also generate completely unrelated free rider strategies, such as shirking in the production of the benefits.[63] The important point is that the institutional arrangements needed in order to take advantage of the law of large numbers are often the exact opposite of the arrangements needed to deliver gains from trade or specialization. The development of specialization itself may exacerbate risk. Individuals who invest in the development of specialized skills are faced with the prospect that demand for these skills may disappear. Instead of having 100 underemployed general construction workers, there may be 10 totally unemployed stonemasons or plasterers. As a result, certain forms of specialization may never develop, if nothing can be done to shield individuals from exposure to the risks associated with the acquisition of such competencies.

It is interesting to reconsider the history of 19th and 20th century "class struggle" in this light. What the early industrial revolution achieved, from this perspective, was a massive "unpooling" of risk. This may have generated increased production, better use of material resources, and better distribution of the ultimate product, but it also exposed members of the working classes to unprecedented levels of risk (unemployment, disability, penury in old age, and so forth.), against which the institutions of traditional rural society had once offered them some protection. (For example, instead of having generalized underemployment spread across the countryside, industrialization produced highly localized bouts of complete unemployment concentrated in urban areas.) It is unclear to what the degree the appalling of conditions of working class life, documented by so many contemporary observers, were due to the *distributive* consequences of the market mechanism, and to what degree they were caused by *inefficiencies* imposed by the market, through its undoing of traditional risk-pooling arrangements. The Marxian reading of the history of working class struggle, which regards it as essentially a

conflict over distributive shares, has cast a long shadow over this discussion. As a result, little attention has been paid to the suggestion that this struggle might also have involved substantial conflict over the *type* of efficiency gain that should be assigned priority. (Although he does not put it in these terms, this is the plausible thesis at the core of François Éwald's analysis of the welfare state.[64] He treats its development as a process through which private insurers, and ultimately the state, came to take on many of the risk-pooling functions that had been discharged by precapitalist rural institutions, filling the vacuum that had been created through the emergence of the market. His account is valuable because of its emphasis upon the incongruity between these insurance arrangements and the logic of market relations.)

3. Self-binding. One can see a similar tension between many of the institutional innovations needed to establish a market economy and the self-binding strategies that people adopt. Savings is perhaps the area where the tension between the gains from trade and self-binding strategies are the most apparent. In a pure market economy, there would be no mandatory savings, in deference to the fact that people's preferences over present versus future consumption differ. A regime of private voluntary savings generates advantages through the complementarities between those who have a greater interest in consuming now, and those with a greater interest in consuming later. However, this generates a persistent problem with dynamic preference inconsistency. Most people have trouble saving, and a significant percentage of the population will not save anything under any circumstances. Thus financial innovations aimed at reducing the transaction costs associated with market exchanges (and thus reducing deadweight losses) may have had the unwanted side-effect of undermining savings. Economist David Laibson has argued that financial innovation, by increasing the overall liquidity of assets, has made it increasingly

difficult for individuals to create "golden eggs."[65] The difference between savings and checking accounts has become purely nominal; the introduction of ATMs has meant that everyone has access to their money at all hours (and so withdrawing a fixed amount at the beginning of the week can no longer be used as a self-control mechanism); reverse mortgages allow people to drain the asset value of their homes; and, of course, consumer credit has rendered the practice of "saving up" for a major purchase almost obsolete. This sort of "easy money" is a mixed blessing to consumers, in the same way that a 24-hour beer store is a mixed blessing to the alcoholic.

In this context, one of the major attractions of state pension systems around the world is precisely their mandatory character. Of course, the insurance-like character of pension plans means that often there is no conflict between the compulsion needed to secure self-binding and the overall efficiency goals. Nevertheless, we should not harbor any illusions about where the principal benefits of these programs come from. The mere fact that people are forced to save is a source of huge long-term welfare gains. At the same time, these pension arrangements clearly restrict the extent of private contracting, and hence gains from trade, in the domain of savings and investment.

To take a more concrete example, many people in modern industrial societies have difficulty controlling their diet. Obesity, along with certain of its consequences such as Type II diabetes, are rapidly become major health issues in the United States. There is, however, enormous resistance to any proposal that seeks to use *institutional* resources to change diet (other than simply providing individuals with more information). Thus taxes on junk food or soda, along the lines of the taxes that exist on alcohol and tobacco, are rejected on the grounds that they are paternalistic, or that they interfere with "consumer sovereignty." (It is sometimes argued that tobacco and alcohol are addictive, whereas junk food is not – a specious distinction, when

looked at through the lens of hyperbolic discounting. It also ignores the fact that cigarette sales exhibit considerable price elasticity.[66]) This deference to market choice leaves many individuals forced to devise their own self-binding strategies. They may subscribe to diet services that provide them with meals, so that they no longer do their own food shopping. Of course, because of the voluntariness of these remedies, they are only successful with individuals who are very close to being able to exercise effective self-control. Those who require more irreversible pre-commitment strategies are increasingly opting for "stomach stapling" and other forms of gastric surgery as a way of controlling food cravings. The obvious inefficiency of these arrangements should clearly be marked down as one of the "costs" imposed by our commitment to maximizing the gains from trade in the market for food. It is precisely the fact that our social institutions offer individuals so little assistance in developing self-binding strategies that they are forced to turn to drastic alternatives whose sole advantage is that they can be carried out individualistically.

4. Information. Finally, the patent and copyright system offers a straightforward example of a conflict between the institutional arrangements needed to promote the production and dissemination of ideas and those required to achieve gains from trade. Both offer incentives to producers by granting them a short-term monopoly over the sale of a particular expression of an idea, or else its practical application. Furthermore, cross-licensing or "patent pooling" arrangements between competitors creates the possibility of legal cartelization of an industry (and hence price-fixing).

Theorists who try to square the circle through talk of "intellectual property" – treating ideas and information as though they were commodities to be bought and sold like any other – are willfully disregarding fundamental differences in the nature of the cooperative benefit in the

two domains. Ideas are non-rival in consumption, and thus the problem of scarcity, which is fundamental to the structure of property rights and exchange, simply does not arise. In the case of intellectual production, efficiency involves creating the incentives required for an optimal rate of innovation.[67] In practice, this has often meant imposing restrictions on trade that create significant deadweight losses.

To take just one example, after Wilbur and Orville Wright discovered the rudiments of a workable aircraft, they promptly patented various aspects of their design. They subsequently refused to grant any licenses to other designers who had been experimenting with aircraft, forcing many to abandon their efforts. They also engaged in protracted litigation against Glenn Curtiss, who developed a superior solution to the problem of lateral control (the aileron, which is now used in all modern aircraft). These disputes carried on well into the First World War, impeding the production of aircraft for military purposes. It was only at the request of the Secretary of War and the Navy in 1917 that the U.S. government intervened to impose a resolution.[68]

The lessons to be learned from examples like this are fairly clear. As Adam Jaffe and Josh Lerner observe, "Patents are blunt instruments. Because of the complexity of the evolution of technology, the monopoly that they create will sometimes retard rather than encourage competition. This means that, in the best of worlds, a patent system is a compromise among competing objectives."[69] This is reflected in the fact that public policy with respect to patents also exhibits a pendulum-like swing, moving back and forth over the course of decades between a system that favors patentees and one that favors more open use.

There is a clear pattern that emerges from this discussion. The market economy does an

extremely good job at promoting gains from trade, but is often inefficient or obstructive when it comes to providing cooperative benefits of the other four types. Thus these other forms of cooperative benefit are often organized through "administrative" rather than "market" transactions.[70] Economies of scale have been successfully exploited in the private sector, but not so much through market exchange as through the internal structure of the corporation.[71] Markets greatly exacerbate the risk that individuals are exposed to. The production of information also occurs largely in the interstices of markets relations – very seldom is information bought or sold. Some of these problems are corrected within the corporation. However, when it comes to correcting the failures of the market, the most important actor is, and has always been, the state. Unfortunately, the full range of state action in this regard has seldom been adequately appreciated, because the mainstream understanding of the state has also been marked by an overemphasis on gains from trade, along with a failure to appreciate the extent to which the pursuit of these gains can conflict with the objective of achieving other types of cooperative benefit.

Rethinking the Welfare State

The catallactic perspective encourages theorists to regard the efficiency problem as essentially solvable – simply a matter of getting the incentives right. As Galbraith put it, the competitive economy is often interpreted as offering a *solution* to the problem of efficiency.[72] This in turn has encouraged the view that the welfare state plays nothing but a residual role. Because markets already achieve the overwhelming majority of efficiency gains, state action must either be aimed at patching up gaps in the system of property rights, or it must be motivated by some other consideration entirely, such as a concern over distribution. The influence of this

idea is widespread. For example, it is the fundamental presupposition underlying both the "right-wing" view that political action is dominated by "rent-seeking" behavior, and the "left-wing" view that the primary function of the welfare state is to secure distributive justice.[73]

There are, however, an enormous number of state activities that enhance overall quality of life and yet are difficult to fit into this taxonomy. Various aspects of the "social safety net," for example, are difficult to classify in the traditional model, and so are described as redistributive welfare programs. For example, the money paid to individuals from programs like unemployment insurance is often treated as a redistributive income transfer, rather than as an insurance payment.[74] Similarly, state pensions are said to generate a transfer from the young to the old (especially when funded on a "pay as you go" basis), motivated by a set of egalitarian commitments (such as "reduction of poverty among the elderly"). This analysis ignores the fact that defined-benefit pension plans are essentially insurance systems, which offer protection against the risk of outliving one's savings. Risk-averse individuals will normally want to "oversave," in order to increase their confidence that they will have adequate retirement income. By pooling their retirement funds, they are able to achieve the same level of confidence with a much lower rate of savings. Of course, this means that the pension system generates a transfer among individuals, but that does not mean that it is governed by an egalitarian-redistributive logic. All insurance generates transfers *ex post* – car insurance transfers wealth from those who do not have accidents to those who do, just as pensions generate a transfer from those who die young to those who live longer. But in neither case does the transfer follow an egalitarian logic – it could well be regressive from the standpoint of overall income. Thus the conflict over privatization of pension systems, which is spearheaded by those who point to the much higher rates of return obtainable through private savings, is not really a conflict between efficiency and

equality, but between two types of efficiency gains. Those who recommend individual retirement savings accounts are, in effect, interested in securing cooperative gains from complementarities. Those in favor of defined-benefit pension systems assign higher priority to the gains obtainable through risk-pooling. From the perspective of the latter, concern over the rate of return reveals a fundamental conceptual error.[75]

One can see a more abstract version of this tendency to misclassify insurance arrangements, and thus to overstate the egalitarian character of the welfare state, in Ronald Dworkin's resource egalitarianism. By relying upon a Walrasian auctioneer to achieve an envy-free and efficient distribution of resources, Dworkin is presupposing the basic framework of the invisible hand theorem.[76] The attendant catallactic bias shows up in the fact that he introduces insurance only after the auction has been conducted. At that point it is brought in, not as a source of *sui generis* cooperative benefit, but merely as a mechanism used to buffer the egalitarian distribution from the effects of brute luck (i.e. as a way of maintaining some approximation of dynamic envy-freeness).[77] He fails to observe that the distribution of the benefits produced through the insurance system itself raises an independent question of distributive justice. In particular, he does not ask whether risk aversion should be regarded as an expensive taste or as "bad preference luck."[78] It also encourages him to interpret the payment of taxes under the welfare state ("tax as premium") as essentially governed by an egalitarian-redistributive logic, rather than an efficiency-promoting one.[79]

The way to avoid such problems is to stop thinking of the state purely in terms of residual activities. Markets were *designed* to facilitate exchanges, and thus gains from trade, not to create mutual-security societies, or to encourage laboratory research. Thus it would be no surprise to discover that when it comes to providing certain classes of cooperative benefit, the state has

often taken the lead role. In the same way that the private sector contains institutions generating benefits in all five dimensions, one can very easily find ways in which the state discharges each of these five functions (see Table 1). The state is not only the insurer of last resort, but also provides a number of fundamental insurance services, without which the market economy itself could barely function, such as limited liability and deposit insurance.[80] The state enforces a wide range of seemingly "paternalistic" policies, such as mandatory retirement savings, that are in effect self-binding strategies. More importantly, the state provides extensive "social work" services, dealing with problems of substance abuse, delinquency, child neglect, domestic strife, etc., all of which are related in important ways to problems of hyperbolic discounting. Finally, beyond its role as a straightforward producer of information (ranging from the census and weather forecasts to scientific research undertaken with state subsidy) the state plays an essential role certifying information produced in the private sector and enforcing standards of veracity (e.g. drug testing, food labeling, truth-in-advertising, financial auditing, etc.). It is able to take a lead role in this domain because various state agencies enjoy a level of *credibility* that few private institutions can match.

Mechanism of cooperative benefit	**Private sector**	**Public sector**
Economies of scale	Corporations	Natural monopolies
Gains from trade	Markets	Public goods
Risk pooling	Insurance industry	Social safety net
Self-binding	Helping Professions	Social work
Information transmission	Media	National statistics, certification

Table 1. Private and public institutional forms

Rather than trying to shoehorn these various functions into the model of gains from trade, it is better to regard each as exploiting a *sui generis* mechanism of cooperative benefit. This is

helpful in a variety of ways. The most important is that it forces us to keep in mind just how partial the picture of society is that standard welfare economics models supply. When doing cost-benefit analyses for the development of economic policy, for instance, it is not adequate to accommodate stochasticity simply by taking certain key variables in the model and declaring them to be averages. One must also consider the variance, in order to weigh the risks that particular arrangements impose upon individuals. In the calculations concerning privatization of state electricity supply, for instance, cost-benefit analyses were often made on the basis of average prices, with surprisingly little attention paid to the disutility for consumers generated by price volatility. The way that state monopolies level the peaks of these price shocks is essentially an insurance function, yet its value was not calculated as one of the efficiency gains associated with that mode of supply. (As a result, many governments that privatized electricity were forced to backpedal and impose price caps, in response to consumer outrage over price volatility.[81]) The catallactic perspective, which encourages us to equate efficiency with exchange, prevents us from articulating the logic of the conflicts that erupt in these and other domains. The issue (higher mean versus lower variance) is not distributive, in the narrow sense of the term. It is over which type of collective action problems we should resolve, at the expense of which others.

Conclusion

It is common among contractualists to think that social institutions must be governed by two fundamental norms: first, a principle of efficiency that specifies "how much" cooperative benefit should be produced, and second, a principle of equality that specifies "who gets what" in the distribution of these benefits. It is then often assumed that, because there is a common interest in maximizing the cooperative benefit, yet a conflict of interest over who will get what

share, that efficiency is somehow easier to achieve, or less controversial, than equality. Increased attention to the prisoner's dilemma has gone some way toward showing that efficiency gains cannot be taken for granted – since individual self-interested action will not, in many cases, lead to Pareto-efficient outcomes. However, there has still been a tendency to think, on this basis, that the real problem with efficiency gains is just an incentive problem. According to this view, the choice of institutional arrangement should be uncontroversial – the problem is simply the technical one of bringing the free riders under control. I have tried in this paper to show that even this assumption is too sanguine. The institutional arrangements needed to bring one set of free riders "under control," in order to resolve a particular collective action problem, often preclude the sort of institutional arrangements needed to resolve some other collective action problem. And this naturally generates a conflict of interest among parties who are not indifferent to the benefits produced from these two classes of interactions. The most clearcut example of this is the privatization strategy in a tragedy of the commons, which is needed in order to resolve externality problems and kick-start the market economy, yet at the same time eliminates a certain sort of risk-pooling arrangement, and thus leaves individuals exposed to greater variability in returns.

As a result, efficiency gains are often just as controversial as "pure" distributive issues.[82] Unfortunately, very little thought has been put into the question of what principles should govern our choice when we are forced to trade one form of cooperative benefit off against another. The suggestion that society should be committed to promoting economic growth, for example, still seems self-evident to many, despite the fact that this maximizes only one form of cooperative benefit. The need to break free from such patterns of thought should become more urgent with the recognition that each mechanism of cooperative benefit is also subject to diminishing returns.

For example, the growth of the market leads to a steady decline in the utility gains to be achieved through further trade (since the most significant complementarities of need and ability will be the first to be exploited). If expansion of the market also has the effect of increasing the level of risk-exposure of the average worker, then one can easily imagine a scenario in which the welfare losses associated with the latter begin to outweigh the increasingly marginal gains from trade. But the only way to appreciate the problem this creates is to break free from a "monistic" conception of the mechanism that generates the benefits of cooperation.

1 One can see this idea most clearly in the work of David Gauthier, *Morals by Agreement*, (Oxford: Clarendon, 1986), or Andrew Schotter, *The Economic Theory of Social Institutions* (Cambridge: Cambridges University Press, 1980).

2 The dominant opposition to this view stems from those who consider "conflict" to be a more important determinant of the structure of social institutions than the "consensus" that Pareto-efficiency supposedly creates. As we shall see, the version of the "consensus" approach used here predicts much higher levels of social conflict than the more traditional versions, and thus goes a long way toward undermining the force of the "conflict" objection.

3 John Rawls, *A Theory of Justice*, 2nd edn. (Cambridge, MA: Harvard University Press, 1999), p. 4. When he does go on to discuss more concrete institutional proposals, his analysis suffers from the catallactic bias diagnosed below (especially his proposal for an "exchange branch" of the state to handle efficiency issues, pp. 249-250).

4 Robert Putnam, *Bowling Alone* (New York: Simon & Schuster, 2000), p. 19-26. James Coleman, who introduced the concept, writes, "Social capital is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors – whether persons or corporate actors – within the structure. Like other forms of capital, social capital is productive, making possible the achievements of certain ends that in its absence would not be possible." "Social Capital in the Creation of Human Capital," *American Journal of Sociologyy*, 94 supp. (1988): S95-S120, at S98.

5 See Putnam, *Bowling Alone*, p. 21, also Francis Fukuyama, *Trust* (London: Penguin, 1995), p. 27.

6 For an example of an analysis based upon a list of goods, rather than mechanisms, see Jack Knight, *Institutions and Social Conflict* (Cambridge: Cambridge University Press, 1992), pp. 22-24. When he does specify mechanisms (p. 25), he presents only one: gains from trade, along with two abstract categories: gains from cooperation, and gains from coordination.

7 The term "catallaxy" was introduced by Friedrich A. Hayek as a way of referring to a system of order

established through exchange. See his *Law, Legislation and Liberty, Vol. 2* (Chicago: University of Chicago Press, 1977). The highest expression of this catallactic perspective can be found in the work of James M. Buchanan, who essentially redefines efficiency in such a way that only gains from trade count as efficiency-promoting. See "Rights, Efficiency, and Exchange: The Irrelevance of Transaction Costs," in his *Liberty, Market and State* (Brighton: Harvester, 1986), pp. 92- 107.

8 Mark Blaug, *Economic Theory in Retrospect*, 4th edn. (Cambridge: Cambridge University Press, 1985) pp. 585-597. Also known as the "first theorem" or "first fundamental theorem" of welfare economics, e.g. see Gareth D. Myles, *Public Economics* (Cambridge: Cambridge University Press, 1995), pp. 37-40.

9 Although the extent to which these limitations prevent one from drawing normative conclusions is often not fully appreciated. In particular, there is a widespread failure to recognize the significance of the "second best theorem." See Richard Lipsey and Kelvin Lancaster, "The General Theory of Second Best," *Review of Economic Studies*, 24 (1956): 11-32. This is, however, not my focus in this paper.

10 Of course, the exclusion of economies of scale is explicit. However, the significance of the assumptions made about information, uncertainty, and preferences is less obvious. Sophisticated economists have long understood these limitations (e.g. see Kenneth Arrow, "Limited Knowledge and Economic Analysis," *American Economic Review*, 64 [1974]: 1-10, at 7), but these reservations have not fully percolated through the broader intellectual community. Consider, for example, David Gauthier's "No Need for Morality: The Case of the Competitive Market," *Philosophic Exchange*, 3 (1982): 41-54. He acknowledges that the presence of externalities limits the "invisible hand" reasoning that he seeks to deploy, but he ignores entirely the impact of asymmetric information. For an accessible survey of these and other issues, see Joseph E. Stiglitz, *Whither Socialism?* (Cambridge, MA: MIT Press, 1994), pp. 27-44.

11 Perhaps the most important example of this in contemporary political philosophy is Rawls, *A Theory of Justice*, pp. 242-251. For more explicit version, see Nicholas Barr, *Economic Theory of the*

Welfare State, chap. 4; Adam Przeworski, *States and Markets* (Cambridge: Cambridge University Press, 2003), describes this as the "markets whenever possible, the state whenever necessary" view, p. 40.

12 This broader way of speaking of externalities – not as an effect on a third party, but merely as an effect upon another – is one that I find very helpful. It is used in this way by Gauthier, in *Morals by Agreement*, p. 96 and passim.

13 W.D. Hamilton, "The Evolution of Altruistic Behavior," *The American Naturalist*, 97 (1963): 354-356 also J. Maynard Smith, "Group Selection and Kin Selection," *Nature*, 201 (1964): 1145–1147. To see the significance of the distinction between kin (or inclusive fitness) altruism and reciprocal altruism, see Peter Hammerstein, "Why is Reciprocity So Rare in Social Animals?" in Peter Hammerstein, ed. *Genetic and Cultural Evolution of Cooperation* (Cambridge, MA: MIT Press, 2003), pp. 83-93, also Robert Boyd and Peter Richerson, "Solving the Puzzle of Human Cooperation," in Stephen Levinson, ed., *Evolution and Culture* (Cambridge, MA: MIT Press, 2005).

14 Bengt Holmstrom, "Moral Hazard and Observability," *Bell Journal of Economics*, 10 (1979): 74-91.

15 Adam Smith, *Inquiry into the Nature and Causes of the Wealth of Nations, 3 vols.* ed. E.G. Wakefield (London: C. Knight, 1985-36), 1:26. John Stuart Mill saw fit to reproduce lengthy segments of this discussion in his *Principles of Political Economy* (Amherst: Prometheus, 2004), p. 134.

16 With regard to the former, see Friedrich A Hayek, *The Counter-Revolution of Science* (Indianapolis: Liberty Books, 1979), on the later, see Gauthier, *Morals by Agreement*, p. 83.

17 See Walter J. Schultz, *The Moral Conditions of Economic Efficiency* (Cambridge: Cambridge University Press, 2001), pp. 67-70.

18 See Ian Hacking, *An Introduction to Probability and Inductive Logic* (Cambridge: Cambridge University Press, 2002), p. 190-2.

19 The standard deviation is 0.4 tons. See David A. Moss, *When All Else Fails* (Cambridge, MA: Harvard University Press, 2002), pp. 28-31.

20 The law of large numbers is also at the root of the "wisdom of crowds" phenomenon – the fact that two heads are generally better than one, even in the absence of complementarities. This connection is stated most explicitly in the Condorcet Jury Theorem, but see also James Surowiecki, *The Wisdom of Crowds* (New York: Anchor, 2005).

21 For an example of a discussion that unhelpfully blurs the distinction between the two mechanisms, see Nicholas Barr, *The Economics of the Welfare State*, 3rd edn. (Stanford: Stanford University Press, 1998), p. 111-2, or Frank H. Easterbrook and Daniel R. Fischel, *The Economic Structure of Corporate Law* (Cambridge, MA: Harvard University Press, 1991), p. 53.

22 Ian Hacking, "Risk and Dirt," in Ericson, R.V. and A. Doyle (eds.) *Risk and Morality* (Toronto: University of Toronto Press, 2003), refers to the former as the "Lloyd's of London" model of insurance. The mutual society model, on the other hand, which involves symmetry in the relation between all policy holders, is the arrangement that predominates in the standard categories of health, life, home and automobile insurance.

23 Emile de Girardin, *Politique universelle* (Paris: Librairie Nouvelle, 1855).

24 See George Ainslie, *Picoeconomics* (Cambridge: Cambridge University Press, 1992). See also Howard Rachlin, *The Science of Self-Control* (Cambridge, MA: Harvard University Press, 2000).

25 George Ainslie, *Breakdown of Will* (Cambridge: Cambridge University Press, 2001), p. 33.

26 Jon Elster provides an extreme formulation of this thesis. Following Henry Sidgwick, he regards zero discounting as the only "rational" preference, and thus treats all time-preference as a symptom of irrationality. Jon Elster, *Ulysses and the Sirens* (Cambridge: Cambridge University Press, 1979), p. 66.

27 Rachlin, *Science of Self-Control*, p. 89. Jon Elster, *Ulysses Unbound* (Cambridge: Cambridge University Press, 2000), pp. 76-77.

28 Elster, *Ulysses Unbound*, p. 66.

29 David Hume, *A Treatise of Human Nature*, 2nd. Edn., ed. P.H. Nidditch (Oxford: Clarendon, 1978), p. 537.

30 Hume, *Treatise of Human Nature*, p. 536. Incidentally, it is sometimes thought that Hume's argument relies merely upon our tendency to privilege our "short-term" over our "long-term" interests. Yet this alone is not enough to explain the phenomenon of self-binding (and thus the reasons we have for enlisting the assistance of others). A person who merely privileges his short-term over his long-term interests has no reason to take pre-emptive action to constrain his own future choices, since the lesser, nearer good will *always* appear superior to him. What Hume's argument relies upon is the preference *reversal* that occurs as the lesser good becomes nearer. The anticipation of such reversals is what motivates pre-commitment, and such reversals occur not merely through impatience, but rather through heightened impatience in the near term. It is only this specific sort of infirmity that is capable of becoming "a remedy to itself."

31 Hume writes, "Tho' we may be fully convinc'd, that the latter object excels the former, we are not able to regulate our actions by this judgment; but yield to the solicitations of our passions, which always plead in favour of whatever is near and contiguous," *Treatise of Human Nature*, p. 535.

32 Michael Tomasello, *The Cultural Origins of Human Cognition* (Cambridge, MA: Harvard University Press, 1999).

33Lee Dugatkin, *Cheating Monkeys and Citizen Bees* (Cambridge, MA: Harvard University Press, 1999), pp. 17-20.

34 See Joseph Heath, *Communicative Action and Rational Choice* (Cambridge, MA: MIT Press, 2001), pp. 86-107, Robert Brandom, *Making It Explicit* (Cambridge, MA: Harvard University Press, 1994), pp. 3-66. The role of cooperation in transmitting information is typically underemphasized in the so-called "memetics" literature, with the central role that is assigned to imitation. See, e.g., Daniel Dennett, *Darwin's Dangerous Idea* (New York: Simon & Schuster, 1995), pp. 342-369.

35 Jürgen Habermas, *The Theory of Communicative Action*, trans. Thomas McCarthy (Boston: Beacon Press, 1986), p. 77-92. Habermas himself is loathe to accept the "contractualist" label, for reasons that are somewhat beside the point here. Reasons for including him in this camp can be found in Samuel

Freeman, "Reason and Agreement in Social Contract Views," *Philosophy and Public Affairs*, 19 (1990):122-157.

36 For an analysis of the "politics of recognition" in terms of status, see Nancy Fraser, "Social Justice in the Age of Identity Politics: Redistribution, Recognition and Participation," in Nancy Fraser and Axel Honneth, *Redistribution or Recognition?* (London, Verso: 2003).

37 Bengt Holmstrom, "Moral Hazard in Teams," *Bell Journal of Economics*, 13 (1982): 324-349.

38 See James G. March and Herbert A. Simon, *Organizations* (New York: John Wiley & Sons, 1958), pp. 59-70.

39 John Kenneth Galbraith, *The New Industrial State* (New York: New American, 1971), pp. 138-9.

40 Armen A. Alcian and Harold Demsetz, "Production, Information Costs, and Economic Organization," *American Economic Review*, 63 (1972): 777-795, at 795.

41 See Joseph Heath, *The Efficient Society* (Toronto: Penguin, 2001), pp. 151-159.

42 The availability of free-rider strategies in this context is consistently downplayed, both by Humeans who emphasize the "conventional" nature of property arrangements, and by proponents of "spontaneous order," who for ideological reasons want the market to be conceptually prior to any formal systems of constraint, such as the law. See Schultz, *Moral Conditions of Economic Efficiency*, pp. 60-70.

43 Robert Nozick, *Anarchy, State and Utopia* (New York: Basic Books, 1974), p. 280.

44 Eric Rasmusen, *Games and Information*, 3rd edn (Cambridge, MA: Blackwell, 1989), pp. 165-169.

45 For an accessible overview, see Rasmusen, *Games and Information*, pp. 224-235.

46 For example, see Karl Polanyi, *The Great Transformation* (Boston: Beacon Press, 1957), p. 49.

47 See Hillard Kaplan, Kim Hill and A. Magdalena Hurtado, "Risk, Foraging and Food Sharing among the Aché," in Elizabeth Cashdan ed., *Risk and Uncertainty in Tribal and Peasant Economies* (Boulder: Westview Press, 1990).

48 Kaplan, Hill and Hurtado, "Risk, Foraging and Food Sharing among the Aché," p. 129.

49 See C.G. Lewin, *Pensions and Insurance Before 1800* (East Lothian: Tuckwell Press, 2003), pp. 37-48.

50 Lewin, *Pensions and Insurance Before 1800*, pp. 49-51.

51 Lewin, *Pensions and Insurance Before 1800*, p. 216.

52 Ian Hacking, *The Taming of Chance* (Cambridge: Cambridge University Press, 1990), p. 48. For further discussion, see Gøsta Esping-Anderson, *The Three Worlds of Welfare Capitalism* (Princeton: Princeton University Press, 1990), p. 88-92.

53 The former observation was apparent to 19th century commentators as well, e.g. see Charles Ansell, *A Treatise on Friendly Societies* (London: Baldwin and Cradock, 1835), p. 4., On the persistence of "level premium" societies into the 20th century, see J. C. H. Emery, "Risky Business? Nonactuarial Pricing Practices and the Financial Viability of Fraternal Sickness Insurers," *Explorations in Economic History*, 33 (1996): 195-226.

54 Jon Elster, *Ulysses and the Sirens* (Cambridge: Cambridge University Press, 1979).

55 Ainslie, *Breakdown of Will*, pp. 100-101.

56 Elster, *Ulysses Unbound*, pp.88-89. Elster notes certain disanalogies, however, since constitutions bind collectivities (i.e. legislatures) and only indirectly individuals.

57 Heath, *The Efficient Society*, pp. 160-161. John Kenneth Galbraith's discussion, in *The New Industrial State*, pp. 85-97, pays due regard to the diversity of functions the modern corporation serves. For reasons of his own, however, Galbraith chooses to subordinate all of these various mechanisms of cooperative benefit under the general rubric of "planning."

58 Oliver E. Williamson, *The Economic Institutions of Capitalism* (New York: Free Press, 1985), pp. 90-98.

59 See Barr, *Economics of the Welfare State*, p. 78; see also Blaug, *Economic Theory in Retrospect*, pp. 592-595; Gareth D. Myles, *Public Economics* (Cambridge: Cambridge University Press, 1995), chap. 2.

60 John Kenneth Galbraith, *American Capitalism* (Cambridge, MA: *Houghton Mifflin*, 1952), p. 110.

61 This example of course draws its force from the elimination of a collective action problem that arises through negative externalities, whereas in this paper I am only considering arrangements that resolve collective action problems involving the failure to produce positive externalities. However, it would be quite easy to vary the example to provide the correct illustration. The Jamestown bowling story, for example (in which no one is willing to work the fields, because the crops are divided up equally among all, regardless of work effort) would suffice. See Robert C. Ellickson, "Property in Land," *Yale Law Journal*, 102 (1993): 1315-1400.

62 This fact has been noted by anthropologists (e.g. see Bruce Winterhalder, "Open Field, Common Pot: Harvest Variability and Risk Avoidance in Agricultural and Foraging Societies," in Cashdan, ed. *Risk and Uncertainty in Tribal and Peasant Economies*, pp. 68-70), but the impact of the observation has not been widely felt in normative economics and political philosophy. The "tragedy of the commons" argument for property rights is still typically presented as a straightforward efficiency gain.

63 Rasmusen, *Games and Information*, presents a simple model of an insurance arrangement in which "there is a trade-off between efficient effort and efficient risk allocation," p. 187. The fact that this trade-off arises from a conflict between two different mechanisms of cooperative benefit is obscured, however, by the fact that Rasmusen analyzes insurance contracts as a trade between a risk-neutral insurance company ("perhaps because it is owned by diversified shareholders") and a risk-averse individual (p. 183). This treats the central mechanism as a gain from trade, obscuring the role played by the law of large numbers.

64 François Éwald, *L'état providence* (Paris: Grasset, 1986).

65 David Laibson, "Golden Eggs and Hyperbolic Discounting," *Quarterly Journal of Economics*, 112 (1997): 443-477.

66 World Bank, *Curbing the Epidemic* (Washington, D.C.: World Bank, 2000), ch. 4.

67 I am grateful to Patrick Turmel (personal communication) for this formulation of the distinction.

68 George Bittlingmayer, "Property Rights, Progress, and the Aircraft Patent Agreement," *Journal of Law and Economics*, 31 (1988): 227-248.

69 Adam B. Jaffe and Josh Lerner, *Innovation and Its Discontents* (Princeton: Princeton University Press, 2004), p. 51.

70 For this distinction, see Alan Shipman, *The Market Revolution and Its Limits,* (London: Routledge, 1999), p. 297.

71 Williamson, *Economic Institutions of Capitalism*, pp. 90-96.

72 Galbraith, *American Capitalism*, p. 24.

73 For the former, see Gordon Tullock, *Private Wants, Public Means* (New York: Basic Books, 1970) and Anthony Downs, *An Economic Theory of Democracy* (New York: Harper & Row, 1957); for the latter, see Rawls, *Theory of Justice*, pp. 240-250.

74 See, e.g. Harvey S. Rosen, Bev Dahlby, Roger S. Smith and Paul Booth, *Public Finance in Canada,* 2nd edn. (Toronto: McGraw Hill, 2003), p. 88.

75 Teresa Ghilarducci, "Myths and Misinformation about America's Retirement System," in Jeff Madrick (ed.) *Unconventional Wisdom: Alternative Perspectives on the New Economy* (New York: The Century Foundation, 2000): 69-92.

76 Joseph Heath, "Dworkin's Auction," *Politics, Philosophy and Economics*, 3 (2004): 313-335.

77 Ronald Dworkin, *Sovereign Virtue* (Cambridge, MA: Harvard University Press, 2000), p. 73.

78 On the latter, see Ronald Dworkin, "A Reply," in Justine Burley, ed. *Dworkin and His Critics* (Oxford: Blackwell, 2004), p. 348. Dworkin does state that risk aversion is the basis for the utility gain associated with insurance (*Sovereign Virtue*, p. 95), but he goes on to elaborate this point in a way that suggests otherwise. For example, he writes, "I buy insurance on my house because the marginal utility loss of an uncompensated fire is so much greater than the utility cost of the premium," p. 97. It goes without saying that the loss of the house is worse than the payment of the premium, but that fails to explain why anyone buys insurance. People buy insurance because – or more to the point, *to the extent*

that – the expected utility associated with the gamble between losing and not losing one's house is less than the loss of utility associated with paying the premium.

79 Dworkin, *Sovereign Virtue*, pp. 99-109.

80 Moss, *When All Else Fails*, p. 314-315.

81 See Michael J. Trebilcock and Roy Hrap, "What Will Keep the Lights on in Ontario?" *C.D. Howe Institute Commentary*, No. 131 (2003), p. 6. For similar experience in Alberta, see National Energy Board, *Canadian Electricity: Trends and Issues* (Calgary: National Energy Board, 2001), p. 24.

82 This observation has been made before, in different ways (see Knight, *Institutions and Social Conflict*, pp. 34-37).