Global Communications and National Power: Life on the Pareto Frontier
Author(s): Stephen D. Krasner
Published by: Cambridge University Press
Stable URL: http://www.jstor.org/stable/2010398

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GLOBAL COMMUNICATIONS AND NATIONAL POWER
Life on the Pareto Frontier

By STEPHEN D. KRASNER*

INTRODUCTION

THERE is no single international regime for global communications. Radio and television broadcasting, electromagnetic spectrum allocation, telecommunications (telephone, telegraph, communications satellites, transborder data flows), and remote sensing are governed by a variety of principles, norms, rules, and decision-making procedures—or, in some cases, by no regime at all. Variation in outcomes can be explained by the interests and relative power capabilities of the actors in each case.

Global communications have been characterized not by Nash equilibria that are Pareto suboptimal but rather by disagreements over which point along the Pareto frontier should be chosen, that is, by distributional conflicts rather than by market failure. Changes in the relative power of states have led to changes in international regimes. The apparatus of economics, which has been so heavily deployed in regime analysis, has focused on information and monitoring rather than power, implying, if not explicitly arguing, that intelligence (figuring out the right institutional structure) is more important than the underlying distribution of capabilities. Regime analyses based upon market failure inevitably obscure issues of power because, given a Pareto suboptimal situation and a concern with absolute not just relative gains, it is possible to make at least one actor better off without making others worse off—an outcome that can be resolved through cleverness rather than by resort to power, threat, and coercion.

Information flows and knowledge have been less important than relative power capabilities for international communications regimes or the lack thereof. Where there have been disagreements about basic principles

* I would like to thank Peter Cowhey, John Ferejohn, Robert Jervis, Robert Keohane, Terry Moe, and especially William Drake, who is also especially absolved of any responsibility for the conclusions of this paper.

World Politics 43 (April 1991), 336–66
and norms and where the distribution of power has been highly asymmetrical, international regimes have not developed. Stronger states have simply done what they pleased. Radio broadcasting and remote sensing offer the clearest examples.

Where there are coordination problems and the distribution of power has been more symmetrical, however, regimes have been established. The level of conflict has varied according to whether states were dealing with pure coordination problems or with coordination problems that had distributional consequences. The resolution of the former has caused little conflict because the purpose of the regime has been to avoid mutually undesirable outcomes. The allocation of the radio spectrum before the 1970s and the telecommunications regime before the 1980s offer two examples.

By contrast, in cases that have had distributional consequences, conflict has been more intense: though the states agreed on mutually undesirable outcomes, they disagreed on their preferred outcome. Controversies were triggered by changes in power, usually resulting from the development of new technologies. In recent years distributional questions have precipitated conflict over the allocation of the radio spectrum and over international telecommunications. The outcome of these disputes has been determined primarily by the relative bargaining power of the states involved. Whereas previous institutional choices had not imposed much constraint, new interests and power capabilities conferred by new technologies have led to new institutional arrangements.

This is not to say that institutional arrangements were ever irrelevant: indeed, they were necessary to resolve coordination problems and to establish stability. Without regimes all parties would have been worse off. There are, however, many points along the Pareto frontier: the nature of institutional arrangements is better explained by the distribution of national power capabilities than by efforts to solve problems of market failure.

**Explaining International Regimes**

The consequences of different configurations of interests for the creation and maintenance of international regimes has been elaborated in a number of studies over the last decade. There are four possible configurations of interests, two of which can give rise to international regimes. Regimes are irrelevant for situations characterized by either harmony or pure (zero-sum) conflict. Rather, regimes can arise under what Arthur Stein
has called dilemmas of common aversions or dilemmas of common interests.¹

Under zero-sum conditions there is no basis for regimes and no reason to coordinate policies, because one actor’s loss is another’s gain.² In a situation of harmony, too, there is no reason to create a regime, because each individual player, acting without regard for the behavior of others, maximizes both its own utility and that of the system as a whole. Purely self-regarding behavior produces both a Nash and Pareto optimal equilibrium.³

By contrast, dilemmas of common aversions and dilemmas of common interests are distributions of preferences that do create incentives to establish and maintain international regimes. Both involve strategic interaction. Dilemmas of common aversions refer to situations in which actors must coordinate their policies by agreeing on some set of rules or conventions, to avoid mutually undesirable outcomes. The specific content of these rules will matter only if the actors disagree about which is the most desirable outcome. If there is no disagreement, then the outcome is a Nash equilibrium and is Pareto optimal: there is no incentive for any actor to defect and no opportunity to increase any actor’s utility without damaging that of another. Cheating is therefore not a problem. There is no need to develop elaborate mechanisms for generating and monitoring information, because there is no sucker’s payoff to worry about. One set of rules is as good as any other, provided that all states agree to do the same thing. For instance, starting from a situation in which no prior investments have been made, it does not matter whether cars drive on the left or right side of the road provided that all drivers adopt the same rule. It may not matter to a couple whether they go to the mountains or the ocean for a vacation, provided that they go to the same place. Such a configuration of interests is shown in Figure 1.

With a minimal level of coordination (actors need only avoid switching back and forth at the same time when one starts from the right and


² The essence of conventional realist thinking as exemplified in the work of Kenneth Waltz is that the quest for power, which is inherently a relative concept, inevitably places states in a zero-sum situation. See Waltz, Theory of International Relations (Reading, Mass.: Addison-Wesley, 1979), as well as Joseph Grieco, “Anarchy and the Limits of Cooperation: A Realist Critique of the Newest Liberal Institutionalism,” International Organization 42 (Summer 1988), 485–507.

Mountains & Ocean
Left Right
Mountains
Left
1 0
Ocean
Right
0 1

FIGURE 1
SIMPLE COORDINATION PROBLEM

the other from the left), all actors will end up driving on either the left or the right, or both members of a couple will go to either the mountains or the ocean.4

Dilemmas of common aversions, however, can involve questions of distribution in addition to those of coordination. Although actors may recognize that all would be worse off without some agreement, they may disagree about precisely what the terms of that agreement ought to be. There are many points along the Pareto frontier.

Such a distribution of interests is shown in Figure 2. This game is commonly referred to as the Battle of the Sexes. The story line here is as follows: Both members of a couple prefer to do something together, but they disagree on their preferred outcome, vacationing in the mountains or at the ocean. With such a distribution of interests, the choice of mountains or ocean, or left or right, matters, for vacationing in the mountains gives the column player a higher payoff than going to the ocean and vice versa. Both parties are averse to an absence of coordination in which they

Mountains & Ocean
Left Right
Mountains
Left
2 3
Ocean
Right
0 2

FIGURE 2
BATTLE OF THE SEXES

4 I am indebted to Joanne Gowa and Susan Woodward for suggesting what I hope is a gender neutral example. As Snidal (fn. 1), 931, notes: "Sometimes coordination is presented simply as the problem of two or more actors matching policies where they are indifferent about where they match. . . . Here there is no disjuncture between individual and collective rationality and no problem of collective action. It requires not more than communication and common sense to achieve an outcome that is both individually and collectively optimal."
take different vacations, but the payoff matrix itself provides no information about which of the two equilibrium points will be chosen. The problem is not how to get to the Pareto frontier but which point along the frontier will be chosen.

In the international relations literature that has evolved since Schelling, commitment has been the analytic device that has most commonly been used to understand which outcome will be chosen, and commitment has usually referred to cleverness (such as throwing a steering wheel out the window in a game of Chicken). The resolution of distributional conflicts could, however, be resolved through a very different route: the exercise of state power, which could be manifest in at least three ways.

1. Power may be used to determine who can play the game in the first place. In international relations less powerful actors are often never invited to the table.

2. Power may also be used to dictate rules of the game, for instance, who gets to move first. In Figure 2 the player who moves first can dictate the outcome, provided that the other player is convinced that the first player's strategy is irrevocable.

3. Power may be used to change the payoff matrix. For instance, a more powerful row player might use tactical linkage to change, or credibly threaten to change, the payoff matrix in Figure 2 to the one presented in Figure 3. A large importer (read the United States) might threaten to bar imports from an exporter (read Japan) if the latter failed to make basic changes in the structure of its domestic economy, such as the distribution system.

One of the two forms of coordination (right right) is now unambiguously superior for both players, even though both forms of coordination are Nash equilibria. The players can secure the right right outcome with a

9 Similar kinds of reasoning about commitment have been used in the recent literature on strategic trade theory. One element of this analysis is that state intervention to promote a particular industry is desirable because it demonstrates a level of national commitment that could not be provided by the action of private firms. See, for instance, James A. Brander, "Rationales for Strategic Trade and Industrial Policy," in Paul R. Krugman, ed., Strategic Trade Policy and the New International Economics (Cambridge: MIT Press, 1986), 30.

6 Snidal (fn. 1), 938, points out that the threat of exclusion can itself be an effective bargaining tool. By threatening to exclude, a more powerful state might secure the compliance of a weaker state.


8 Albert Hirschman has argued that the credibility of such a threat would be determined by the relative opportunity costs of change; see Hirschman, National Power and the Structure of Foreign Trade, rev. ed. (Berkeley: University of California Press, 1980). Tactical linkage is discussed in Ernst B. Haas, "Why Collaborate? Issue-Linkage and International Regimes," World Politics 32 (April 1980), 357-405.
minimum level of coordination, for instance, by playing the game in an extended form in which either player has the option of going first. Once this outcome is reached, it is both Nash and Pareto optimal; there is no incentive for either actor to change.

In contrast to situations involving distributional choices along the Pareto frontier, such as the Battle of the Sexes payoff structure, problems of collaboration, which are generated by dilemmas of common interests, are concerned with market failure. They are characterized by Pareto suboptimal outcomes; at least one actor can gain without compromising the utility of others. The locus classicus of this set of problems is Prisoner’s Dilemma.

A great deal of the cooperation and regime literature in international relations has been devoted to analyzing how actors can escape from a situation in which there are incentives to cheat but in which mutual cooperation is better than mutual defection. The fundamental question has been: How can players move toward the Pareto optimal outcome of mutual cooperation?

Several answers have emerged. Cooperation is more likely when there is iteration and no defined number of plays, and when discount rates are

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9 The terms coordination and collaboration are taken from Stein (fn. 1).

10 Robert Axelrod and Robert O. Keohane point to Pareto suboptimality in general as the defining problem for the cooperation literature, arguing that “what is important for our purposes is not to focus exclusively on Prisoner’s Dilemma per se, but to emphasize the fundamental problem that it (along with Stag Hunt and Chicken) illustrates. In these games, myopic pursuit of self-interest can be disastrous. Yet both sides can potentially benefit from cooperation—if they can only achieve it”; Axelrod and Keohane, “Achieving Cooperation under Anarchy: Strategies and Institutions,” World Politics 38 (October 1985), 226–54, at 231.

11 Charles Lipson, for instance, argues that “because the Prisoner’s Dilemma highlights both the potential gains from cooperation and the temptations that prevent it, it has been taken as an elegant expression of the most profound political dilemmas, including that of the social contract. Indeed, Jon Elster once defined politics as ‘the study of ways of transcending the Prisoner’s Dilemma’”; Lipson, “International Cooperation in Economic and Security Affairs,” World Politics 37 (October 1984), 1–23, at 3.
low and the difference between the payoffs for cooperation and defection are modest.\textsuperscript{12} Most important for the international relations research program growing out of the literature on market failure is the investigation of the way in which cooperation can be facilitated by institutions that reduce the temptation to lie, cheat, and disseminate by increasing the symmetry and amount of information, raising the cost of illegitimate behavior, promoting convergent expectations, and fostering cross-issue-area linkages.\textsuperscript{13} The central normative concern of cooperation theory is to develop institutional mechanisms that inhibit cheating.\textsuperscript{14}

Market failure analyses, which have dominated the literature on international regimes, pay little attention to power. Once the game is defined, all actors are treated symmetrically with regard to their capabilities. Both the row and the column player have the same competence to play the game. No one is eliminated through brute force as opposed to choosing a bad strategy. In this game, clubs are never trump.\textsuperscript{15} Everyone could be better off if only market failure problems were solved. Power—which can be understood as the ability to determine who plays the game, or to define the rules, or to change the values within the payoff matrix—does not matter as much as information and monitoring capabilities. When analysts working within the cooperation research program have discussed the larger question of the context within which the game is specified, they have pointed to the ways in which issue linkage or limiting the number of players might facilitate cooperation rather than the distributional consequences of power.\textsuperscript{16}

**Global Communications**

For international communications, however, market failure problems have been irrelevant. Monitoring and information were never a central consideration. Power, not just interest, did matter, though. And the

\textsuperscript{12} For an exceptionally intelligent and nuanced discussion of the impact of these factors on the prospects for cooperation in Prisoner's Dilemma and other games, see Kenneth A. Oye, "Explaining Cooperation under Anarchy: Hypotheses and Strategies," *World Politics* 38 (October 1985), 1-24.

\textsuperscript{13} The most important exposition of the functions of institutions can be found in Keohane (fn. 3), chap. 6.

\textsuperscript{14} The central importance that neoliberal institutionalism accords to the problem of cheating is elegantly elaborated in Joseph M. Grieco, *Cooperation among Nations: Europe, America, and Non-Tariff Barriers to Trade* (Ithaca, N.Y.: Cornell University Press, 1990), esp. chaps. 1, 2.

\textsuperscript{15} Grieco (fn. 14), 38, points out that one of Axelrod's premises is that there is no way to eliminate a player or to avoid interactions.

\textsuperscript{16} Axelrod and Keohane (fn. 10), 253, summarize: "We have seen that governments have often tried to transform the structure within which they operate so as to make it possible for the countries involved to work together more productively."
question was not how to move to the Pareto frontier, but rather which point along the frontier would be chosen.

In the four issue-areas considered in this paper—radio and television broadcasting, remote sensing, allocation of the electromagnetic spectrum, and telecommunications (telephone and telegraph links including communications satellites)—there are no examples of harmony. And in two cases, radio broadcasting and remote sensing, there are no international regimes: there has been no agreement on principles and norms because more powerful states have been able to secure their first best outcome through unilateral action. The critical weakness of some states in these issue-areas was their inability to regulate access to their own territory because they could not effectively block all broadcasting signals or remote sensing probes.

In the other two issue-areas—allocation of the electromagnetic spectrum and telecommunications—there have been international regimes. Both initially posed pure coordination problems; actors wanted to avoid the mutually undesirable outcomes of radio interference and incompatible national communications systems. In recent years, however, distributional issues have become more consequential. Third World statesmen have worried that the entire electromagnetic spectrum would be allocated without taking account of the future needs of their countries. The regime has responded to these concerns because in this case Third World countries have power conferred by their ability to interfere with other states’ broadcasts and by their membership in the ITU.17

In the area of telecommunications, technological change has altered the capabilities of actors and increased distributional conflicts. International regimes, in turn, have changed in response to these changes in capabilities. More precisely, technological innovation gave some private actors, primarily domiciled in the United States, an incentive to press for a more competitive telecommunications regime both domestically and internationally. The direct and indirect economic bargaining power conferred by these new technologies gave the United States the leverage to secure some changes in the extant regime (which had legitimated national monopolies) either through direct pressure or by changing the international market incentives confronting other actors.18

Modifications of the regime have been initiated by public threats of defection or unilateral action. Cooperation theory—which has focused

17 This same analysis of the allocation of radio frequencies is offered by Stein (fn. 1), 131–32.
18 Here and later in the paper I draw heavily on the superlative analysis of Peter Cowhey; see Cowhey, “The International Telecommunications Regime: The Political Roots of International Regimes for High Technology,” International Organization 44 (Spring 1990), 169–99.
heavily on market failures arising from dilemmas of common interests and on the need for regimes that provide information to facilitate monitoring and enforcement—is not relevant for global communications.¹⁹

Radio and Television Broadcasting

Radio Broadcasting

There is no international agreement on the fundamental issue associated with international radio broadcasting: the right to transmit signals across state boundaries without the prior consent of the target country. States have not agreed on basic principles and norms, save that of noninterference with existing transmissions (more on this below). Some states, notably Western market-oriented democracies, have defended the right to the free and open dissemination of information. Others, the Soviet Union and some Third World states, urged either that prior consent be obtained before broadcasting across international boundaries or that the content of international broadcasts be controlled. Although states have episodically condemned the broadcasting of hostile propaganda, they have failed to move toward any operational definition. Those few international agreements that have been endorsed are filled with the kind of confusing and contradictory language that betrays underlying disagreements about principles and norms.²⁰

Given these disagreements, as well as the inability of states to block access to their own territory completely, the advocates of open dissemination have prevailed. In radio broadcasting, technology provides senders with more capability than is available to their targets. One of the basic attributes of de facto sovereignty, the ability to regulate transborder flows, has been compromised by the international transmission of hertzian waves. States with adequate resources can build globe-spanning

¹⁹ This argument has been forcefully made by Stein (fn. 1), 130. Stein’s analysis offers a much more differentiated perspective on the problem of cooperation than does most of the other regime literature because of the distinction between dilemmas of common aversions and dilemmas of common interests. Although the latter have gotten most of the attention, in part because of the fixation on Prisoner’s Dilemma, the former may, in fact, be the more common area of concern.

transmitting facilities, but targets cannot completely block access to their
own territory. Inexpensive radio receivers, compatible with international
as well as national broadcasts, are readily available. Transmitting units
are much cheaper than those for television. Radio signals can travel long
distances without resort to satellites or other devices that might be mon-
tored or controlled by national authorities. Unlike telephone and trans-
border data flows, it is not necessary to be hooked into a national net-
work that can be regulated by state authorities. Jamming is difficult and
expensive.

On the basis of the principle that states had sovereign control over
their own airspace, the initial reaction to international radio in the 1920s
and 1930s was that states had the right to control hertzian waves moving
through their atmosphere. At the same time, however, states asserted the
right to assign any frequency, provided that it did not interfere with
broadcasts originating in another state. It was this principle that pre-
vailed. By exercising the power to send out signals, subject only to the
proviso of noninterference, states tacitly rejected sovereign control over
radio waves transmitted through territorial airspace. Despite a number
of vaguely worded resolutions about war propaganda in both the League
of Nations and the United Nations, there has been no international
agreement on norms that would limit the content of international radio
broadcasting.21

There is a great deal of international broadcasting. During the First
World War, Germany used radio for propaganda purposes. The earliest
broadcasts were in Morse code and, hence, accessible to only a very small
audience. In the 1920s the Soviet Union began the systematic use of radio
as a propaganda tool. In the following decade the use of radio for inter-
national propaganda increased dramatically: by 1939 some twenty-five
countries had international transmissions. And all of the major combat-
ants in the Second World War broadcast propaganda messages. The
United States, which had relied on commercial stations before the war,
created the Voice of America in 1942. Another burst of activity was
prompted by the beginning of the cold war in the late 1940s. By 1983
there were at least eighty countries with international services, and the
major broadcasters—the United States, the Soviet Union, China, Ger-
many, and the United Kingdom—were sending signals in more than
thirty languages. There are also large commercial stations that beam
their signals to other countries, such as Radio Luxembourg, Radio Monte
Carlo, and various international religious broadcasters.22

21 Martin (fn. 20), 71–75, 78–81.
22 Bernard Bumpus and Barbara Skelt, Seventy Years of International Broadcasting, Com-
Efforts by receiving countries to block international radio transmissions have had only limited success. Jamming has been used almost since the inception of international broadcasting. Austria, Germany, and Italy jammed foreign broadcasts during and before the Second World War. The Soviet Union has jammed since the 1930s. Spain under Franco, some Middle Eastern countries, and China have also engaged in jamming.23

States have also attempted to control what their citizens can hear by limiting the capacity of radio receivers. In 1951, according to one study, only 18 percent of radio receivers in the Soviet Union were capable of direct reception; the rest could receive only over wires. South Africa developed an ultrahigh frequency network and produced sets with only one wave band, making it impossible to receive international broadcasts. Ghana at one time sold sets capable of receiving only a few stations.24

Efforts to impede the reception of radio transmissions have never been fully effective however. Jamming requires both long- and short-range stations, and, even with extensive capital investment, it is difficult to block all signals. Western broadcasts to the Soviet Union, for instance, have operated on as many as sixty frequencies and can cozy up to Soviet stations.25 Furthermore, efforts at state control may only increase the curiosity of potential listeners. Radio receivers are too widely available and too easily altered to permit effective state regulation.

States have even had difficulty coping with pirate stations. Northern Europe has been the most fertile ground for pirate radio stations, because government-based monopolies limit options for listeners. In Italy and France land-based pirates were so successful that the respective governments were forced to legitimate them. Spain refused to sign a European agreement that would have prohibited Spanish subjects from supplying and repairing pirate stations at sea. British regulations impeded, but did not eliminate, pirate stations in the London area.26

In sum, the technology of radio broadcasting has made state control of transborder radio transmissions extremely difficult. Hertzian waves do not recognize political boundaries. The technology of radio, unlike that of television, developed one universal standard: a receiver that worked in one country would also work in another. Radio signals could

23 Ibid., 100–102; Murty (fn. 20), 56; Martin (fn. 20), 85–86.
24 Bumpus and Skelt (fn. 22), 102; Murty (fn. 20), 55.
be transmitted over very long distances. Because states have disagreed about the basic principles and norms that should govern radio broadcasts and because the available technology gives senders more power than receivers, there is no international regime for radio broadcasting. Those states that favor the open dissemination of information (or propaganda, depending on one's perspective) have prevailed.

TELEVISION BROADCASTING

The international spillover of signals has been less problematic for television than for radio. This difference, however, is more a reflection of the relative power imparted by technology than of any agreement on principles and norms: television is less geographically promiscuous. As ground-based television broadcasts do not travel long distances, spillovers have been limited to contiguous geographic areas. Even with the larger footprint of direct broadcasting satellites, signals are still regionally contained.

Although terrestrial TV signals can travel only a few hundred miles, there have been at least twenty-four cases in which broadcasting affected another country. The United States licensed TV stations aiming at a primarily Canadian audience. Israel initially tried to keep out television entirely because it was regarded as lowering cultural standards, but the government ultimately capitulated because Israeli citizens were receiving broadcasts from stations in Arab countries that carried many American programs. Hungarian and Czechoslovakian televisions were converted so that they could receive broadcasts from neighboring Western countries, a more complicated procedure than altering a radio, but one that could be performed by many television technicians. Most significantly, West German television could be received in most of East Germany. It was so popular that the East German government was compelled to install cable around Dresden, the one part of the country that could not directly receive Western broadcasts—this, to attract workers to the area.27

The development of direct-broadcasting satellites (DBS) posed more substantial challenges to national control. Initially, DBS, like radio, ap-

peared to be a technology that could circumvent state control, because any individual with a television receiver could access transmissions from other countries. This fear has proven to be unfounded, though; interstate agreements have effectively regulated most satellite television broadcasts.

International agreements have endorsed the principle that television signals should be limited as much as possible to national markets. The 1971 World Administrative Radio Conference (WARC) on space telecommunications concluded in part that DBS spillover should be minimized unless there was an explicit agreement among countries. WARC delegates have agreed to utilize different channels, different orbital positions, and different polarizations for their transmissions from direct-broadcasting satellites. If these provisions were breached there would be interference with the broadcasts. Implied by the WARC agreements, therefore, was the de facto acceptance of the principle of no broadcasting without prior consent.28

Agreement, however, has been limited to areas where states have shared interests and relatively equal power. Europe offers the prime example. European states have authorized the expansion of direct-broadcasting satellites as one manifestation of a more integrated Europe; they have also, however, imposed restrictions on advertising and content and encouraged the development of more European programming. Commenting on American objections to a Community directive that at least 50 percent of programming—excluding sports, game shows, and advertisements—be produced in Europe, Jacques Delors, the president of the European Commission stated: "I say to the United States, 'Have we the right to exist, to perpetuate our traditions?'"29

In contrast, there has been no agreement on broadcasting between Cuba and the United States. The United States has beamed television signals at Cuba, and the Cuban government has jammed them. Likewise, West Germany consciously acted to penetrate East Germany. When East Germany adopted a color TV system that was incompatible with West German broadcasts (the black and white systems had been the same), the West Germans began broadcasting on both their own and the East German standard.30

In sum, land-based television broadcasting has presented less of a

30 Quester (fn. 27), 126.
problem than radio because the available technology has limited reception; nevertheless politically controversial spillovers did occur in the Middle East and Europe. When direct-broadcasting satellites increased the footprint of signals, states with the same preferences and the mutual ability to interfere with each other's broadcasts, such as the members of the European Community, could coordinate, but those with disagreements, such as Cuba and the United States, could not. Where disagreements on the principle of prior consent existed, the payoff matrix was Deadlock. There was no agreement because for both parties the first best choice was unilateral uncoordinated action. Those states favoring open access prevailed because the distribution of power, derived from the available technology, made it easier to transmit successfully than to block radio and television transmissions. The issue was where states would end up on the Pareto frontier, not how to get there.31

Remote Sensing

Remote sensing is another issue-area in which there is no agreement on basic principles and therefore no foundation for an international regime. Remote sensing involves electronic information gathering from satellites. States have disagreed about basic principles and norms—the right to sense versus the need to secure prior consent from the target state. Power is asymmetrically distributed: target states have not been able to block sensing probes. The behavior of those more powerful states that are able to engage in remote sensing has been constrained only by the need to secure territorial access to make use (usually commercial) of some of the data secured from satellite probes.

The first American remote sensing satellite was launched in 1972. A number of countries, including India, China, France, and Japan, have their own programs. These satellites can gather important strategic and commercial data from anywhere. It is very difficult, and in many cases impossible, for sensed states to disrupt this process (as distinct, say, from the possibilities in systems with gateways such as oceanic cables that are easily accessible to state authorities). While some commercial applications of data gathered by remote sensing, such as the exploitation of minerals, do ultimately require territorial access, other kinds of information, such as the deployment of military forces or the prospects for crop yields, do not.

The international rules that have evolved in the area of remote sensing

31 Assuming no agreement on principles, the future of state control will depend on power derived from technological choices. It would, for instance, be easier to regulate transmissions sent through fiber-optic cables than those sent via satellites. Ibid., 138–39.
are not constraining.\textsuperscript{32} The UN General Assembly has endorsed the following principles: remote sensing is not to be carried out in a way that would be detrimental to the sensed state; sensed states are to be allowed to participate in programs and are to be given access to processes as well as raw data; sensing states are to notify the UN of their programs. The United States, the Soviet Union, and Japan, however, have stated that they do not regard these rules as legally binding.\textsuperscript{33}

A number of possible regimes were rejected. Developing countries had initially endorsed the view that there should be no remote sensing without the prior approval of the sensed state.\textsuperscript{34} But without the ability to block satellite probes, states could not enforce such a rule or compel others to accept it. Sweden had advocated the creation of an international regime similar to that for satellite communications, in which control over the gathering and dissemination of remote sensing data would be subject to a formal international agreement. This too failed.\textsuperscript{35} Unlike telecommunications, where the technology would be useless or its benefits severely curtailed without state-authorized territorial access, remote sensing allowed actors in one state to secure useful information about conditions in another without formal approval.

Nonetheless, remote sensing has not entirely evaded the control of sensed states. From the outset, the United States accepted the fact that the commercial benefits of its remote sensing program would be limited unless it engaged the support of other countries. It backed the development of local receiving stations and made the raw data secured from its \textsc{landsat} available to all comers at affordable prices, an approach that coincided with the traditional American commitment to the free flow of information. Not surprisingly, this openness was not extended to the security arena; satellite photographs with very fine resolution remain highly classified.\textsuperscript{36}

Hence in the area of remote sensing, as with radio and television broadcasting, there is no agreement with regard to the basic principle of prior consent, that is, the right of a national state to control access to its own territory. Remote sensing is an area in which more powerful states have not confronted problems of coordination or distribution. Consequently, their first best solution was to act unilaterally; they have provided target states with some information because the latter had the power to control the territorial access necessary to realize some of the commercial benefits of remote sensing.


\textsuperscript{33} Blatherwick (fn. 28), 72–76.

\textsuperscript{34} Ibid., 62–64.

\textsuperscript{35} Ibid., 74–77.

\textsuperscript{36} Ibid., 57, 77.
THE ELECTROMAGNETIC SPECTRUM

In the last two issue-areas related to international communication considered in this paper—allocation of the electromagnetic spectrum and telecommunications—no state could achieve its objectives through purely unilateral action. The allocation of the electromagnetic spectrum involves a classic coordination problem. If there is no general agreement on frequency allocation, then broadcasts can interfere with each other. This can happen even if states agree on the principle of the open dissemination of information without prior consent. Distributional issues, which are also a factor, include determining which groups of broadcasters should have standing, allocating geosynchronous orbit slots for broadcast satellites, and, most important, defining the principle that should be used for partitioning the electromagnetic spectrum. Since the spectrum is a limited resource, who gets how much and why?

The International Telecommunication Union (ITU)—an intergovernmental organization and the various World Administrative Radio Conferences (WARCs) that it sponsors—has been the venue within which these issues have been resolved. States have played the decisive role because they are the only actors capable of enforcing agreements, that is, of controlling broadcasts emanating from within their own territory.

The major question associated with the electromagnetic spectrum has been the determination of principles and rules upon which allocation should be based. Occasionally this matter has been resolved on technical grounds; for instance, the spark wireless sets used on ships at the beginning of the twentieth century were inexpensive but very wasteful of the radio spectrum. They were eventually phased out.

Most competing claims have not been so easily settled, however, for instance, the allocation of geosynchronous orbits, which are the most efficient locations for broadcasting satellites. The claims of some equatorial states to sovereign control of slots above their own territory have simply been ignored by more powerful states. The allocation of these slots has been made at World Administrative Radio Conferences dealing with space orbits. These deliberations have given INTELSAT, an international consortium that controls most communications satellites, priority rights over national and binational satellite systems. INTELSAT had the support of Third World and other countries.37 The regime clearly mattered here because the venue for making this decision, the ITU, which sponsors WARC, is a universal international organization based on the principle of sovereign equality: one nation, one vote. The issue here is not whether

the Pareto optimal frontier would be reached but which point along the frontier would be chosen.

In dividing up the spectrum there have been two rival positions. The first, which dominated allocation until very recently, has been that frequencies should be designated on a first-come-first-serve basis, provided claimants could make effective use of the resource. The second, championed by less developed countries, has been that at least some portion of the spectrum should be allocated on the basis of sovereign equality. The concern of the developing countries is that by the time their needs increase, already developed countries will have claimed virtually all usable frequencies.

The principle of basing allocation on usage was agreed to very early. The 1906 convention on radiotelegraphy specified that certain radio bands be used for certain types of services. Radio frequencies were registered on a first-come-first-serve basis. Countries notified the Bureau of the International Telegraph Union (the predecessor of the International Telecommunications Union) in Bern that they had established a communications channel. Other countries, in turn, were prohibited from interfering with stations that were on the Bern list.38 By 1980 this first-come-first-serve set of rules had resulted in a situation in which the Soviet Union and the United States claimed half of the available frequencies and 90 percent of the spectrum was allocated to provide benefits for 10 percent of the world’s population.39

Developing countries have challenged rules of the game based solely on present need, arguing that some part of the spectrum should be reserved for future demand. Delegates to recent WARCs have accepted this principle. Developing countries derived leverage from the fact that, as states, they had a presumptive right to participate in ITU conferences, which afforded them access to the relevant decision-making forums and facilitated coordination of their strategies. Unlike many other areas, in which LDCs have little or no directly relevant power capabilities (they cannot with two or three exceptions, for instance, launch satellites, nor can they shoot them down), developing states can interfere with the signals of neighboring countries.

The political issues involving the international regime for allocating the radio spectrum were not generated by market failures leading to Pareto suboptimal outcomes (the problem that has informed most theo-


ries about international regimes). Rather, they grew out of matters involving coordination with distributional consequences. Unilateral action would leave all actors worse off, but any form of coordination would privilege some over others. This is a classic Battle of the Sexes payoff matrix. The point along the Pareto frontier that has been chosen—one at which most frequencies are still allocated on a first-come-first-serve basis that benefits industrialized countries—reflects the existing distribution of power capabilities as manifested by the present demand for communications channels. Nevertheless, the preferences of developing countries have not been completely ignored; unlike the cases of radio broadcasting and remote sensing where targets had little power, in the case of the electromagnetic spectrum Third World states could exercise some leverage through their votes in the ITU and their ability to interfere with broadcasts from other states.

**Telecommunications**

International telecommunications—telegraph, telephone, and transborder data flows—pose a fundamental coordination problem: assuring the economic and technical compatibility of international links. Choices also have distributional consequences. In recent years the most controversial aspect of these choices has concerned which actors could participate in global telecommunications and whether prices should be set by market competition or administrative fiat. The major impetus for change came from technological innovations that altered the interests, and ultimately the power, of the various public and private players. These technological changes led some actors, especially in the United States, to press for a more market-oriented regime, as opposed to one that legitimated national monopolies.

Despite astonishing technological changes beginning with the invention of the telegraph in 1836 and continuing through the initial deployment of high-quality fiber-optic cables and satellites in the 1960s, the international regime for telecommunications remained fundamentally stable. It was a regime based on national monopolies, usually public post and telephone and telegraph agencies (PTTs) but occasionally privately owned firms, as with American Telephone and Telegraph (AT&T) in the United States. Prices were set through administrative fiat both nationally and internationally. The sending country could charge whatever it wanted for a call and paid a fixed fee to the receiving country. Senders were prohibited from routing calls along cheaper paths or from selling blocks of calls, which together essentially precluded price competition. Within countries, at least in the case of many industrialized countries,
suppliers of telecommunications equipment were usually limited to national entities such as Western Electric, the equipment-manufacturing subsidiary of AT&T before the latter was broken up.40

The history of international organizations dealing with telecommunications began with the International Telegraph Union, which was created after a meeting called by Napoleon III in 1865. (The name was changed to the International Telecommunications Union in 1932, when radio transmission was formally added to its portfolio.) The inaugural session dealt with such coordination problems as designating hours for sending and receiving, agreeing on a common code (the international Morse code), and setting technical standards. International cable links (the first telegraph cable was laid under the English Channel in 1851) were jointly owned by the operating entities at the termini of the cables. Like cables, international wireless communication, which was first developed at the end of the nineteenth century, had to be tied into national communications networks at a limited number of gateways, to provide telegraph or telephone service. States jealously guarded their right to regulate wireless communication, even between ships. National regulations frustrated an effort by the Marconi company, the original developer of such equipment, to set its own international rules.41

The International Telecommunication Union (ITU) and INTELSAT, the consortium created to launch and operate communications satellites, were designed to reinforce this system. INTELSAT was a common carrier for common carriers, not a rival for established national monopolies. Peter Cowhey has argued that the "regime was in fact a political invention so successful that it eventually disappeared from sight."42 The old regime legitimated a system of national monopolies and administered prices so successfully that the ITU and its committees came to be viewed as little more than agencies for dealing with questions of technical compatibility.

In recent years the fundamental principles and rules of the old regime—national monopolies and administered prices—have been challenged by new actors with new power capabilities, the result of techno-


42 Cowhey (fn. 18), 169.
logical change. Telecommunications is eroding the distinction between voice and data forms of transmission. The microchip revolution created potent new equipment manufacturers. Communications systems have been linked with computers. Fax machines have obscured the difference between conventional mail and telecommunications.

New technologies gave large users and new equipment producers an incentive to change the extant system of national monopolies. Large users could reduce their communications costs by developing alternatives to those services offered by national PTTs. The producers of new equipment could realize greater economies of scale by accessing foreign as well as domestic markets. More efficient telecommunications services could enhance the competitiveness of particular companies or even national economies. Unlike even the dramatic technological changes of the 1830s through the 1950s, the more recent developments have made it possible for individual companies to achieve greater efficiencies by developing their own telecommunications systems rather than relying entirely on national monopolies.

It is not surprising that changing incentives have changed national policies. The United States has been at the forefront of the demands for a more competitive international system, one that would be based more on market competition than on public or private monopolies imposing state-authorized tariffs. Many of the large users and manufacturers that would benefit from a more competitive environment are domiciled in the United States. Moreover, the United States had already deregulated its domestic regime for telephone communications. Once the United States opened its own market to foreign manufacturers of equipment, it had an incentive to pry open the markets of its competitors as well.

The United States has not been alone in pushing for a more competitive international environment. The United Kingdom and Japan have also supported change. Like the United States, these two countries are hubs of global communications and the home countries for major international financial and manufacturing companies that can derive large savings by introducing new communications facilities and services. The United States, the United Kingdom, and, to a lesser extent, Japan have supported what Cowhey has called the big bang—a major move away from national monopolies.

43 Ibid., 188; Drake (fn. 49), 40–42, 46–48.
44 For instance, beginning in the 1960s IBM developed its own communications system based on satellites and lines leased from PTTs. This system now extends to 145 countries; Business Week, special issue no. 3033–44, January–March 1988, p. 141.
46 Cowhey (fn. 18), 191–95.
There was initially little support for the Anglo-American position. The European PTTs were not anxious to open their national markets to competition. But some of the large European companies supported change, if only because they feared that national restrictions would give an advantage to their American competitors, who worked in a more market-oriented system. The European Community eventually supported American initiatives to place services, including telecommunications, in the GATT negotiations, where the prevailing principles and norms were market-oriented, rather than solely within the purview of the ITU, which had historically legitimated national monopolies. Even within the ITU there has been some change. A 1989 agreement recognized the right of new entities, such as IBM, to operate under the same rules as established private phone companies.47

In response, the PTTs and their national governments have not simply acceded to demands for a purely market-oriented regime. They have used regulations and standards to maintain their national control, for example, prohibiting the connection of private lines to publicly switched networks, banning independent transmission facilities, and requiring PTT equipment for initial connections. Because of anxiety about budget deficits, pressure from manufacturers of new equipment, and perhaps the insistence of the United States, the Japanese government has privatized Nippon Telephone and Telegraph (NTT) and permitted some competition for international services, but it has not yet endorsed a free and open market. The EC is committed to introducing a free market for terminals, private branch exchanges (PBXs), and value-added services as part of the 1992 program. PTT monopolies may be limited to such basic services as telephones.48 Although the Canadian system is more open than those in Europe, it has more restrictions than that of the United States.49

Changing national policies in the area of telecommunications reflect the way in which technological innovation can alter national power and policies. Once domestic deregulation had eliminated ATT's long-distance monopoly, the company's interest in preserving monopolies in other countries disappeared. Indeed, many American producers and users would be better off under a more competitive international system, but the United States could not impose a competitive system on other countries. It could, however, pressure other actors, most obviously by threatening to block access to the very large American market for equipment

47 Ibid., 196; Drake (fn. 40), 49, 66.
but also by adopting national regulations that would leave more restricted foreign telecommunications users at a competitive disadvantage.

In sum, the international regime has changed. Although national monopolies still control basic domestic services in most countries, a wider range of telecommunications facilities has been introduced. There has been movement toward a more market-oriented international regime. A few large countries, especially the United States, have changed the incentives offered to other actors in the international system. Whatever the final outcome of the movement toward a more market-oriented system, the issues involved have not been ones of market failure. Nor is this a situation of harmony in which unilateral choices maximize both individual and collective interest. The tough bilateral and international negotiations over the rules governing the provision of telecommunications equipment and services suggest that while states need to coordinate their behavior, they also differ in their views about which is the most desirable point on the Pareto frontier.

**Satellite Communications**

The case of the development and deployment of communications satellites raised issues of coordination yet again. On the one hand, the absence of coordination would have left all actors worse off; on the other hand, the choice of which form of coordination to adopt would inevitably have distributional consequences.

The new international regime for communications satellites departed from existing practices in significant ways. International cables, the first means of transmitting messages across open waters, were usually jointly owned by various national operating entities. For satellites, INTELSAT, a new entity organized as a consortium of member states, was created. Instead of placing communications satellites under the purview of the ITU, where one-nation-one-vote practices would have given Third World and Eastern bloc countries some leverage, the new consortium distributed votes according to usage. This gave the heaviest users the largest number of votes. INTELSAT itself, rather than national operating entities, owned satellites, a departure from the practice governing international cables. Nevertheless, INTELSAT reinforced rather than challenged the prevailing system of national monopolies. Satellites that had at least the potential for point-to-point communication were not initially allowed to disturb the prevailing regime of national monopolies.50

The United States, the prime mover in the creation of INTELSAT, had

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50 Cowhey (fn. 18), 181.
originally hoped to handle satellite communications through a series of bilateral agreements that would have maximized the bargaining power of the United States, with its substantial technological lead in the early 1960s. The Europeans countered with a proposal to create a new international organization that would constrain American influence. The idea of a consortium, the institutional arrangement that was ultimately accepted, was also proposed by the Europeans.

Given a new set of problems in which the power resources of the actors were different from those affecting radio and cable communications, the U.S. and the major Western European states acted on their own to create a new organization rather than rely on an existing entity, such as the ITU or the United Nations Committee on the Peaceful Uses of Outer Space. The consortium reflected a distribution of power in which the United States controlled vital technology but other states still regulated access to their national systems. The Soviet Union and LDCs were excluded from the opening negotiations, although the United States did conduct bilateral talks with the Soviet Union. Japan, Australia, and Canada played peripheral roles.

In June 1964 the participants concluded an interim five-year agreement. Ownership and voting power would be based on usage, which gave the United States 61 percent and Western Europe 30.5 percent of the votes. Australia, Canada, and Japan received 8.5 percent. Quotas could be adjusted to give developing countries up to 17 percent, but no more. These arrangements allowed the United States to maintain a secure controlling interest—but with limitations. If there was disagreement on important issues, voting rules mandated that passage required 12.5 percent of votes over and above the votes of the member with the largest number of votes. Hence, the United States could not act alone. 51

Nineteen official actors (eighteen countries and the Vatican) signed the final agreement in July 1964. Membership in INTELSAT has since grown to more than one hundred countries. Voting power is still based on usage and is reallocated once a year on the basis of activity over the previous six months. 52

The national power capabilities provided by technological and financial resources initially gave the United States the dominant role in INTELSAT, even if American policymakers failed to secure their first best insti-

tutional preference of bilateral arrangements. Not only did the United States have more voting power, but its designated operating entity, Comsat (the Communications Satellite Corporation established as a joint venture for American participation in communications satellites), was recognized in the 1964 Interim Agreement as the operational manager for INTELSAT. Daily operations were entirely in Comsat's hands. No INTELSAT secretariat or international civil service was specified by the Interim Agreement. Over time, the influence of the United States eroded, as the underlying power capabilities of other states increased with the diffusion of technology. Negotiations for a permanent agreement to supplant the 1964 Interim Agreement took place between 1969 and 1973. These discussions resulted in a decrease in American control including a reduction in the role of Comsat.

In more recent years INTELSAT has actually hindered American efforts to create a more competitive market-oriented regime by developing alternatives to INTELSAT's satellites. The director general of INTELSAT argued in a 1986 article that

one other conclusion which may be reached is that foreign policies and relations should not be the product of a "Johnny-one-note" economic philosophy. U.S. estrangement from INTELSAT is not a desirable or viable alternative for world peace and understanding. And, while the currently popular economic trilogy—deregulation, pro-competition, and private sector predominance—may have its value and applicability, it is simply insufficient to serve as a complete litmus test for enlightened and effective foreign relations.

The United States itself has approved some new satellite operations, but with substantial restrictions that recognize the central role of INTELSAT. The FCC ruled that new operations could not connect with public switching networks, because they would have directly competed with INTELSAT's services. New systems could be established only with the permission of a foreign government and if they went through an INTELSAT review of coordination.

Alternative satellite systems would be useless so long as states have effective control over gateways to domestic networks. As in the case of cables, the acceptance of INTELSAT competitors will depend upon national calculations of interests. Central decision makers in the United States have endorsed private initiatives. State actors in other technologically advanced countries may do the same. International competition will give

51 Pelton (fn. 51), 82. 52 Colino (fn. 52), 208. 53 Ibid., 123; Kavanaugh (fn. 37), 97. 54 Aronson and Cowhey (fn. 45), 121-32.
states with more limited technological capacities an incentive to accept non-INTELSAT satellite systems lest their economies be placed at a competitive disadvantage. With the erosion of INTELSAT's monopoly, the international regime for communications satellites will become more appealing for some states and less so for others.

The development of communications satellites created a new set of technological challenges and new problems of distribution and coordination among states and operating entities. The resolution of these problems was consistent with the distribution of power in this issue-area. Without active American participation, the development of communications satellites would have been impossible in the first place; the United States initially enjoyed a dominant position because of its command of technology. Other states preferred a satellite system in which the United States wielded the greatest influence to no system at all, but they were still in a position to force some compromises because they still controlled access to their own national communications networks, and without such access satellites would be useless. Communications satellites were regulated by a consortium not a set of bilateral treaties. Moreover, as American technological capabilities declined relative to those of other industrialized states, U.S. influence in INTELSAT eroded. As in the area of telecommunications more generally, the United States has had some, but far from total, success in pushing for a more market-oriented regime. The main incentive for acceding to American pressure has been the fear of being placed at a competitive disadvantage. The main instrument for resisting such pressure is the ability of states to regulate access to their own systems.

The issue in the case of communications satellites was not market failure or monitoring adherence to agreements. Rather, it concerned the distribution of rewards. There are many points along the Pareto frontier. Those that have been chosen have reflected the relative bargaining power of states.

Conclusions

The literature on international regimes has focused on market failures. It has emphasized the possibility of mutual gains. When the logic of individual utility maximization leads to Pareto suboptimal outcomes, appropriate institutional constructs can enhance well-being. Power, the conventional focus of the literature on international relations, is not necessarily inconsistent with this perspective. Robert Keohane has argued that what he calls the contractual approach is not a substitute for a
power-oriented or interdependence position, but is rather a supplement to these "traditional modes of political analysis."^^57

Research programs, however, have both a denotation and a connotation. While the denotation, or explicit logic, of a research program based on the investigation of market failure is not inconsistent with a power-oriented analysis, the connotation of this research program is that power can be ignored. The connotation of a research program suggests which questions are most important, what kind of evidence should be gathered, and, often tacitly, which issues should be ignored. In a penetrating analysis of the positive theory of institutions, Terry Moe argues that

over the last decade, as the positive theory of political institutions has developed as an intellectual enterprise . . . the theme that gets driven home again and again is that political institutions help mitigate collective action problems—and that this is why they exist and take the forms they do. While the positive theorists are well aware that politics is a game of winners and losers and that institutions are crucial means by which winners win and losers lose, this is not an equally important theme. All too often, it is not discussed at all.^^58

The research program that emerges from an emphasis on market failure, one specific manifestation of the problem of social choice, suggests that the most important issue is how to reach the Pareto frontier. Prisoner’s Dilemma is the exemplary payoff matrix, but other situations such as Stag Hunt or Chicken, all of which can result in Pareto suboptimal outcomes, are also examined. Deadlock, the one other game that has been mentioned with any frequency in the cooperation under anarchy literature, is not extensively discussed because it is not analytically interesting. Battle of the Sexes is hardly noted at all as a possible payoff matrix.^^59 Analysis involves investigating the kinds of institutional arrangements that can overcome the problem presented by a payoff structure in which the Pareto optimal outcome is not a Nash equilibrium. For example, although Keohane explicitly argues in After Hegemony that both power and exchange determine outcome, the most heuristically compelling section of the book, chapter 6, examines the ways in which institutions can overcome problems of market failure by, for instance, increasing the symmetry and amount of information, making it easier to establish reputation across several issue-areas, and promoting convergent

59 For an excellent discussion of various payoff matrices, see Oye (fn. 12), 12–18.
expectations. It is this chapter that has influenced the research program on cooperation, not Keohane's recognition of the fact that institutions are created within a power-driven context.

Power is ignored because the research program based on the analysis of market failure does not provide either heuristic insights or analytic techniques for investigating relative capabilities. Power recedes into the background not only because scholars have studied absolute rather than relative gains, but also because it is not evident how power is relevant for solving problems of market failure. If the purpose of international regimes is to enhance both the amount and the symmetry of information so that states can be more confident that they can prevent cheating, then the cognitive ability to construct efficacious institutional arrangements is more important than national power capabilities. Cleverness can make everyone better off.

Conversely, a power-oriented research program is not logically inconsistent with the analysis of market failure. But again, the connotation of such a research program pushes issues of Pareto suboptimality, cheating, and monitoring into the background. The most important issue for a power-oriented analysis is the distribution of capabilities and benefits. Charles Perrow, for instance, argues that there is always a struggle within an institution because control of the institution can bring with it a variety of rewards including security, power, and survival. For a power-oriented research program, power is exercised not to facilitate cooperation but to secure a more favorable distribution of benefits. And analysis seeks to explain outcomes in terms of interests and relative capabilities rather than in terms of institutions designed to promote Pareto optimality.

The primary motivation for establishing international regimes for international telecommunications has been to solve coordination problems that have distributional consequences—not to address problems of market failure. States wanted some set of rules for the allocation of the electromagnetic spectrum and international telecommunications including satellites, because the failure to coordinate policies on noninterference and on the compatibility of national networks would have left everyone

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60 This point is forcefully made in Grieco (fn. 2).
61 Perrow, Complex Organizations: A Critical Essay, 3d ed. (New York: Random House, 1986), 132. Perrow criticizes economic analyses, such as the principal agent literature, for ignoring the distribution of power (pp. 230, 257–58).
62 Contrast (1) the discussion in Axelrod and Keohane (fn. 10), 249, about the way in which background conditions, such as issue linkage, can be altered to facilitate cooperation with (2) the analysis in this paper, in which power is used to alter background conditions (players, issue linkage, payoff matrix) to change the distribution of benefits.
worse off. But because the decisions would be consequential for the distribution of rewards, conflict arose over how such coordination problems should be resolved, that is, where along the Pareto frontier they would end up. While all actors were better off with some form of coordination rather than none, the form of coordination adopted would affect them differently.

The regimes that have been established for the allocation of the radio spectrum and international telecommunications have reflected the relative power of states and have changed as the distribution of power has changed. Regimes were not irrelevant; without at least some shared rules all actors would have been worse off. Power has been determined by three considerations: technology and market size, which have influenced the relative opportunity costs of change and therefore the ability to make credible threats; membership in universal international organizations, which has given states the presumptive right to influence policies that are affected by one-nation-one-vote decision-making procedures; and control over territorial access provided by juridical sovereignty.

For instance, INTELSAT became much less of an American preserve as the technological capabilities of other states improved. Third World states were able to secure some changes in the first-come-first-served principle of allocating the electromagnetic spectrum because they had a presumptive right to membership in the ITU and because, once they had their own broadcasting facilities, they could interfere with the radio signals of others. The United States was able to secure some movement toward a more market-oriented regime for global telecommunications because some actors in other states feared that they would be put at a competitive disadvantage by unilateral American action, but U.S. leverage was limited by the fact that state authorities controlled access to their own national networks.

In two cases—radio broadcasting and remote sensing—there has been no agreement with regard to the basic issue of whether sending states have to secure the prior consent of targets. States opposed to prior consent could secure a better distribution of rewards through unilateral action, that is, by broadcasting or sensing without the prior consent of target countries rather than by attempting to coordinate with those opposed to the free dissemination of information. Third World states secured

63 This argument is elaborated in Krasner (fn. 39).
64 Such control is not foreordained even for telephone communications. While international links for both satellite and cable are now connected to national systems through a limited number of easily regulated gateways, Motorola has announced plans to develop a portable telephone system that could send and receive calls point to point anywhere on earth by bouncing signals off seventy-seven satellites; New York Times, June 26, 1990, p. 1.
some data from remote sensing because their approval for territorial access was needed to realize the commercial benefits of some information.

There has been no systematic classification of international regimes with regard to whether market failure, coordination, or distributional questions have been central. Are interactions among states best characterized by Prisoner's Dilemma, Stag Hunt, Deadlock, the Battle of the Sexes, or some other payoff matrix? The literature on cooperation has focused on payoff matrices in which cheating is a central problem because the Pareto optimal outcome is not a Nash equilibrium. This research program is academically attractive because it allows political scientists to deploy a heuristically powerful array of analytic tools developed by economists, not to speak of the appeal of identifying with a discipline higher on the social science pecking order and better able to present itself as a true science, Nobel prize and all.  

How important is market failure for the study of international relations? It is illusory to suppose that this issue will be resolved on the basis of empirical studies. The literature now contains enough examples to suggest that both market failure and power-oriented research programs can present plausible analyses, often about the same issue.

There are, however, three aspects of the international system that suggest that a power-oriented approach is, in many cases, more appropriate than analyses based on market failure. First, there are some issues in international politics, especially but not exclusively related to security, that are zero sum. What is at stake is the power, that is, the relative capacity, of actors. Power-oriented concerns may be directed either toward altering the behavior of others or toward preserving one's own autonomy. Market failure is never at issue here; one actor's gain is another's loss.  

Second, in international relations it is possible to eliminate some players through the use of force or to compel an actor to accept an outcome that it would never agree to voluntarily. This is an option that is not analytically tractable for a market failure research program, which assumes that actors are in a position to make voluntary choices. The Austro-Hungarian Empire did not chose to dismantle itself after the First World War. Munich compelled Czechoslovakia to accept an outcome that left it absolutely worse off.

Third, even if states are interested in absolute rather than relative

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65 Robert Jervis has also argued that one of the attractions of Prisoner's Dilemma is that it lends itself to interesting manipulations; see Jervis, "Realism, Game Theory, and Cooperation," *World Politics* 40 (April 1988), 317-49, at 323.

66 See ibid., 334, for a similar formulation. Grieco (fn. 14) places particular emphasis on the desire of states to preserve their freedom of action.

67 I am indebted to Terry Moe for pointing out this line of argument.
gains, the initial allocation of property rights will have distributional consequences, even if any particular specification of such rights can lead to a Pareto optimal outcome. Different choices will differentially privilege different actors. Changing the rules for using the radio spectrum, or setting tariffs for Intelsat, or lending IMF resources, or assigning landing rights for international airlines, or limiting whale catches would benefit some actors at the expense of others. The issue here is movement along the Pareto frontier, not how to reach the frontier. Power and interests, not monitoring capacity, determine outcomes. These three characteristics—concern with relative power, the ability to eliminate actors, and the assignment of property rights—are the core of much of the literature on international relations.

This is not to say that institutions or market failure problems are irrelevant. First, as John Ruggie, in particular, has elegantly argued, the existence of the basic actors in the contemporary international system—national states—must be understood in a larger, historically grounded institutional context. The issue here, however, is not the temptation to cheat and the ability to monitor but rather an understanding of how the players in the game came to exist in the first place. Second, the free-rider problem that emerges when there is a very asymmetrical distribution of power will lead to the Pareto suboptimal provision of collective goods. In these circumstances, however, the problem is not cheating and monitoring but rather the fact that the more powerful state (or small group of states) prefers to provide the collective good regardless of what the smaller states do, and the smaller states prefer to defect regardless of what the larger state does. A situation of Prisoner's Dilemma arises only if there are a larger number of smaller states, no one of which is willing to provide collective goods unilaterally. Third, past institutional choices do influence the contemporary interests and power of actors exactly because such choices privilege some players at the expense of others.

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69 For instance, Joseph Grieco's recent study of the nontariff barrier codes negotiated during the Tokyo Round suggests that conventional concerns about relative power are a more persuasive explanation of outcomes than neoliberal considerations involving cheating and information. Grieco argues that both absolute and relative gains must be included in the utility function of states; see Grieco (fn. 14), 40–49.

70 Snidal (fn. 1), 935, demonstrates that a more powerful state, understood as the actor which is less in need of coordination, will, in a bilateral bargaining situation, secure an outcome closer to its most desired point than its weaker antagonist.

Nevertheless, for a very large class of global issues, indeed the classic agenda of the study of international politics—security, autonomy, and the distribution of valued resources—power needs to be given pride of place. These issues are not characterized by the fact that Pareto optimal outcomes are not Nash equilibria. Neoliberal speculations about the positive consequences of greater information are fascinating (even if empirical demonstrations of such benefits are scarce). But they obscure considerations of relative power capabilities, which draw attention to how the payoff matrix was structured in the first place, how the available options are constrained, who can play the game, and, ultimately, who wins and who loses.