

ECONOMIC FOUNDATIONS OF THE LAW OF THE SEA

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The law of the sea derives from an array of treaties and customary norms dating back centuries. The United Nations Convention on the Law of the Sea (UNCLOS) represents an effort to codify and to some extent reform the law of the sea for the modern era.¹ The Convention has been ratified by most major nations, but the United States remains a holdout.

UNCLOS has received little attention outside the specialized international law and oceans affairs literature except for occasional flurries of press when the U.S. Senate considers the question of accession. Yet the treaty is among the most significant developments in international law of the last half century. States traditionally sought to maintain international order by dividing the world and assigning exclusive or quasi-exclusive regulatory authority over specific areas to the countries with the power to control them. This authority covered their territory and internal waters, and a small band of coastal sea. For the most part, the large tracts of ocean over which no state could assert control were not subject to the jurisdiction of any particular one. Each state had the right to use the seas and to exercise jurisdiction over ships flying its flag, and the duty to ensure that its freedoms were exercised with reasonable regard for the exercise of high seas freedoms by other states.

The resultant regime of open access to natural resources was tolerable as long as the oceans were effectively an inexhaustible resource. But population growth, technological change, and economic development have increased demand for the ocean's resources to the extent that overexploitation and congestion have become serious problems; in the meantime, advances in marine technology have made control over larger portions of the ocean possible. States have responded by extending authority over larger portions of the waters and seabed and subsoil, albeit subject to certain rights of other states; and trying to create international mechanisms for the regulation of areas and activities beyond the control of individual states, an effort that has made notable gains in the safety of navigation and overflight.

Drawing on simple principles of microeconomics, this paper examines the most important features of UNCLOS from an economic perspective.² In brief, we argue that the Convention

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¹ United Nations Convention on the Law of the Sea, *opened for signature* Dec. 10, 1982, 1833 UNTS 397 [hereinafter UNCLOS], *available at* <http://www.un.org/Depts/los/>. For a short, lucid history, see DAVID ANDERSON, *MODERN LAW OF THE SEA* 1–22 (2008).

² The most thorough economic treatment of issues within the scope of UNCLOS that we have encountered was written by Ross Eckert before UNCLOS was finalized. ROSS D. ECKERT, *THE ENCLOSURE OF OCEAN RESOURCES* (1979). Of course, the general economic problem that justifies some kind of international regulation of the oceans—namely, the tragedy of the commons—has been widely recognized. *See, e.g.*, Garrett Hardin, *The Tragedy of the Commons*, 162 *SCIENCE* 1243 (1968); Robert L. Friedheim, *A Proper Order for the Oceans: An Agenda for the New Century*, in *ORDER FOR THE OCEANS AT THE TURN OF THE CENTURY* 537, 539 (Davor Vidas &

represents a broadly sensible response to a wide range of externality problems that arise when nations act noncooperatively in regulating (or failing to regulate) activities at sea. Regulatory jurisdiction is predominantly allocated to the nations that value it the most or can exercise it most cheaply. Constraints on jurisdiction respond to externalities that arise when regulators tend to ignore the welfare of other nations. International cooperation on regulatory matters is encouraged and facilitated where national regulation alone is inadequate.

Part I of this paper provides an overview of the externality issues that arise from the regulation or nonregulation of activities at sea, and introduces some economic concepts that bear on how best to address them. Part II then considers particular issue-areas within UNCLOS, and evaluates its approach to each issue from an economic perspective. These issue-areas include fisheries and seabed minerals, marine pollution, piracy and other crimes, navigation, and various aspects of border protection.

The abiding theme is that UNCLOS generally facilitates global efficiency gains through its approach to these issue-areas. We stipulate at the outset, however, that economic analysis cannot provide fine-grained explanations of the rules. For example, one can argue (as we do) that economic principles support a regime in which states have authority over coastal areas and resources that they can effectively control, but one cannot prove that the optimal width of the territorial sea is 12 miles, or that of the exclusive economic zone (EEZ) 200 miles, rather than some other determinate distance. To make such fine-grained determinations, one must have detailed empirical evidence, and this evidence is largely lacking. Thus, we aim only at providing a general analytic framework for evaluating the economics of the law of the sea.

I. THE ECONOMIC RATIONALE FOR AN INTERNATIONAL LAW OF THE SEA

The economic theory of international law suggests that the primary function of international law, whether customary or treaty law, is to ameliorate international externalities.³ International externalities arise from the activities of both individuals and states, and why nations acting unilaterally may fail to address them is easily understood. For example, consider a firm that is conducting an activity that generates pollution, and assume that the pollution flows across the border to another nation. Because the harm occurs abroad, the government of the nation where the firm is located may have no incentive to take measures to control the pollution, even if such measures would be worth their costs from a global perspective. Likewise, imagine that a national government is engaged in some form of domestic regulation that raises costs for regulated firms. If those firms are in large part foreign and will lower their prices to absorb some of the costs of regulation to avoid losing customers, the government concerned may regulate excessively in the sense that the global costs of regulation may exceed its benefits.⁴

Willy Østreng eds., 1999) [hereinafter ORDER FOR THE OCEANS]; Richard James Sweeney, Robert D. Tollison, & Thomas D. Willett, *Market Failure, the Common-Pool Problem, and Ocean Resource Exploitation*, 17 J. L. & ECON. 179 (1974). Our analysis also relates closely to theories regarding the emergence of property rights. See Harold Demsetz, *Some Aspects of Property Rights*, 9 J. L. & ECON. 61 (1966). Eyal Benvenisti briefly touches on some issues of the efficiency of the law of the sea in the course of an article focused on international courts. Eyal Benvenisti, *Customary International Law as a Judicial Tool for Promoting Efficiency*, in THE IMPACT OF INTERNATIONAL LAW ON INTERNATIONAL COOPERATION 85 (Eyal Benvenisti & Moshe Hirsch eds., 2004).

³ See, e.g., Alan O. Sykes, *International Law*, in 1 HANDBOOK OF LAW AND ECONOMICS 757 (A. Mitchell Polinsky & Steven Shavell eds., 2007).

⁴ Robert W. Staiger & Alan O. Sykes, *International Trade and Domestic Regulation* (Stanford Law & Econ. Olin Working Paper No. 387, 2009), available at <http://ssrn.com/abstract=1504913>.

When the behavior of governments deviates from global cost-effectiveness, an opportunity for beneficial cooperation arises that can improve the welfare of all nations as long as cooperation is not too costly. Such cooperation is often (although not always) orchestrated through international law.

International externalities commonly result from activities at sea. In particular, the sea contains a wealth of valuable resources, including food, minerals, energy, and materials for bio-research. When such resources are unowned or found in a "common pool," they may be exploited inefficiently because of some familiar externality problems associated with the creation of property rights.⁵ As we shall suggest, international cooperation is necessary to address these externalities.

The sea is also a means of transportation, which can become subject to congestion and navigational hazards. In addition, various activities that endanger life or property, or that undermine governments' efforts to regulate on land or to protect territory, occur at sea. These activities include shipboard crimes, piracy, smuggling, and espionage. Moreover, the sea is the locus of important military activity. In some cases, externalities arise because the activities of one government interfere with those of another. In other cases, the problem lies with a kind of "free rider" situation and governments' attendant lack of incentive to control the harmful acts of individuals. Again, international cooperation is required to address such issues.

We divide the discussion of externality problems into two sections. The first concerns "common pool" issues, and the second encompasses other types of externalities.

Common Pool Resources and the Sea

Until such time as a government or private actor asserts dominion over them, the valuable resources of the sea are unowned and available to all comers. In this sense, they represent a "common pool" resource. A common pool resource has two defining characteristics: no single actor has established control over it; and the consumption of the resource is to some degree "rivalrous," meaning that when one actor consumes the resource, its quantity or quality is diminished for other potential consumers.

Background economics. The exploitation of common pool resources can create some important and familiar negative externalities.⁶ One type of externality leads to excessive consumption of resources and the dissipation of social surplus from their exploitation. Another related externality leads to excessive investment in search of resources.

To understand overexploitation, let us assume that resources in a common pool are available to any actor who can capture them, and that no actor can secure control of the entire common pool. Put differently, users can lay claim to a "flow" of resources from the pool, but not to the pool itself (to the "stock" of resources). For example, a fishing enterprise may take ownership of any fish that it can catch in a setting where no one owns the fishery as a whole.⁷

⁵ See Hardin, *supra* note 2.

⁶ See generally ECKERT, *supra* note 2; THRAINN EGGERTSSON, ECONOMIC BEHAVIOR AND INSTITUTIONS (1990); Dean Lueck & Thomas Miceli, *Property Law*, in HANDBOOK OF LAW AND ECONOMICS, *supra* note 3, at 183.

⁷ This assumes, of course, a regime in which title vests upon capture. That is the case under the traditional high seas regime with respect to virtually all living resources. Insofar as private property rights to wild swimming stocks are concerned, it is also often the case in waters subject to the sovereignty or jurisdiction of a state.

Because consumption of common pool resources is at least partly rivalrous by definition, the consumption of the resource by one actor raises the cost to other actors of obtaining the same quantity of the resource. To use the fishing example once again, fishing by one enterprise will generally reduce the stock of fish and thus make it more costly for another enterprise to secure a catch of a given size. The effect on the costs of other enterprises is an externality, assuming that users of the resource will maximize their own returns from exploiting the resource without regard to the increased costs imposed on others.

The result of the externality is overconsumption of the resource and dissipation of the economic surplus available from its exploitation. To illustrate why, continuing with the fishery example, imagine a competitive fishing industry in which each enterprise is small. Assume that the influence of each small fishing enterprise on the cost of catching fish is de minimis, and that each enterprise ignores the tiny effect that its own activity has on its own costs, as well as the costs of others. Thus, each enterprise perceives that the *marginal* returns to fishing effort are equal to the *average* returns to fishing effort. Further, let each fishing enterprise obtain labor for fishing at a fixed wage rate. In a "competitive equilibrium," each enterprise will fish up to the point where the cost of additional labor is exactly equal to the perceived value of the catch from additional labor, which will equal the average returns to fishing per unit of labor as noted. It follows that the total wage bill for the industry will equal the value of the total catch, and the fishery will generate zero net surplus.⁸

Suppose, by contrast, that the entire fishery is owned by a single enterprise that seeks to maximize its value. Assume further that the enterprise knows how the total amount of fishing will affect the costs of fishing. Such an enterprise will then correctly perceive that the marginal return to additional fishing labor is below the average return, and will then maximize profit by fishing only up to the point where the marginal cost of labor is equal to the (correctly perceived) marginal return to labor.⁹ This policy in turn maximizes the value of the fishery.

Intermediate cases can be posited in which multiple enterprises exploit the fishery, but each is large enough to appreciate the effects of its own fishing effort on costs. Although such enterprises will tend to take account of the effects of their activity on their own costs in a profit-maximization calculus, they will nevertheless ignore the adverse effects on the costs of other enterprises. An externality remains and overexploitation of the resource still results, albeit to a lesser degree. In general, as the number of enterprises increases (and their behavior correspondingly approaches that in the competitive case above), both the magnitude of the externality and the overexploitation of the resource increase.

⁸ More formally, let y and h denote the catch and hours devoted to fishing of a small company, let Y and H denote the aggregate catch and fishing hours for the entire industry, and let p denote the price of a unit of fish. Fishing labor is elastically supplied at the wage of w per hour. Each small company perceives the profit function per season of $\pi = py - wb$, where y is equal to the average productivity of fishing for the industry as a whole (Y/H) times hours of fishing, and this average productivity is taken to be fixed by each company. Equilibrium requires zero profits, which in turn implies that $p = w(H/Y)$. This equation states that in equilibrium, price will equal the average cost of fish, in contrast to the condition for maximizing the value of the fishery, which requires price equal to marginal cost. Because average cost lies below marginal cost, the equilibrium involves excessive fishing. Moreover, with price equal to average cost, the aggregate profit from the fishery is zero. The classic exposition of this result is H. Scott Gordon, *The Economic Theory of a Common-Property Resource: The Fishery*, 62 J. POL. ECON. 124 (1954).

⁹ Gordon, *supra* note 8, develops the point in a static model. Much the same points can be made in a dynamic setting, where current fishing activity affects both the costs of other fishing in the current period and the rate of reproduction in the fishery, which determines costs in future periods. See Sykes, *supra* note 3, at 761–68. A more elaborate treatment of the dynamic case may be found in the appendix to Richard N. Cooper, *An Economist's View of the Oceans*, 9 J. WORLD TRADE L. 357, 372 (1975).

Although the discussion to this point has used the illustration of a fishery, the general problem it identifies applies to other resources at sea. In the case of energy resources such as oil and natural gas, for example, the exploitation of a deposit by one enterprise will reduce underground pressure and increase the costs of extraction for other enterprises drawing from the same deposit.¹⁰

Marine pollution may also be understood as a variant of a common pool problem. In this case, the common “pool” is the sea itself, and pollution is the equivalent of consuming a portion of it. Polluters raise the costs (or equivalently for economic purposes, lower the value) of uses of the sea by others—for example, by destroying marine life that would otherwise be caught and consumed, or by damaging the recreational value of a coastal area. Absent incentives for polluters to take this negative externality into account, the tendency will be to pollute excessively.

The externality that leads to overexploitation of a resource, as noted, arises when multiple enterprises compete for the flow of resources from a common pool. It does not arise when the common pool has a single owner—that is, it does not arise when a single entity has the right to the entire “stock” of the resource contained in the common pool. But an analogous externality problem does arise when multiple enterprises compete for the right to become the single owner. In particular, when ownership of a common pool is given to the enterprise that is the first to discover it, the result will often be overinvestment in search of common pool resources.

Enterprises will invest in search up to the point where the marginal cost of additional search is equal to the marginal expected return. Suppose in this regard that the number of enterprises is so large that marginal returns to search and the average returns appear to converge. Suppose further that each relatively small enterprise can purchase inputs into the search process at a fixed price. Each enterprise will then expand its search for new resources to the point where the costs of exploration are equal to the average expected return. As in the classic common pool situation, the value of the resource is fully dissipated—the expected returns from search are equal to the value of the resources expended on search.¹¹

In essence, undiscovered resources present their own common pool. With open access to the process of search, resources are again dissipated because firms ignore the fact that their own efforts at search make the process more costly for other enterprises—as discoveries are made, new discoveries become harder to make. This problem arises, for example, in the case of mining. When one miner strikes gold, that lode is no longer available to other miners, who must consequently incur greater costs searching for gold in more remote areas. Miners will therefore “race” to be first, in the process incurring costs that would be saved in a more orderly procedure. As we will see, this problem applies straightforwardly to undersea resources such as minerals in the seabed.

As before, this problem disappears when only a single enterprise has the right to search.¹² If search rights belong to a single entity, it will take proper account of the effects of its own

¹⁰ Undersea hydrocarbon deposits, however, are often more localized than fish populations, and so the allocation of regulatory authority to a single government often has a better chance of solving the problem with oil and gas than it does with fisheries, as we note below. Nevertheless, even then deposits of hydrocarbons pose common pool problems that are addressed both by private law and public law, municipal and international.

¹¹ See EGGERTSSON, *supra* note 6, at 84–91; Lueck & Miceli *supra* note 6.

¹² The allocation of jurisdiction over the resource to a single state, of course, does not solve this problem unless the state thereafter takes measures to limit search by private actors.

search efforts on its own costs, and the external effects on other entities will vanish. Also as before, the tendency toward overinvestment in search rises as the number of entities allowed to search rises.

Implications: The role of government and international cooperation. The simple economic points developed above assume that rational private actors pursue their own economic interests without regard to the interests of other actors. Conceivably, as highlighted in the work of Elinor Ostrom, private actors may overcome the resulting externality issues through voluntary cooperation.¹³ Perhaps, for example, the fishing enterprises that exploit a particular fishery will voluntarily agree to limit fishing. But in many cases, voluntary private cooperation will be too difficult to orchestrate or enforce, and a role for government will arise.

In cases where private actors compete for the flow of resources from a common pool, governments may be able to increase the value of the resource by restricting the rate at which the resource can be consumed. Governments may restrict fishing hours or the volume of the catch in a fishery, restrict the rate at which oil can be withdrawn from an oilfield, and the like. Similarly, with respect to marine pollution, governments may restrict or prohibit the harmful activity.

Governments may also devise a single-owner solution in some cases, as by auctioning off the mineral rights for an entire oil or gas field on public lands to the highest bidder. As noted, a single-owner structure will generally lead private actors to maximize the value of a known common pool resource.

Analogous possible solutions can be applied when multiple enterprises compete for ownership of undiscovered resources and overinvest in search as a result. Governments may restrict the right to search to only a few enterprises or a single enterprise, perhaps by administering an area of potential discoveries as public lands.

Of course, any governmental solution to these problems is costly. The costs of creating and enforcing the regime must be considered, as must the costs of resources that may be dissipated by private enterprises that lobby to affect the regime. In some cases, governmental intervention may be more costly than it is worth.

More important for our purposes, however, the difficult trade-offs that must be confronted in the management of common pool resources will often be a purely domestic affair. Overfishing in Lake Okeechobee may be a problem, for example, but it is unlikely to have material effects on the welfare of nations other than the United States, and we would not expect international law to address it, apart perhaps from more general environmental concerns such as protection of endangered species.¹⁴ When the geographic scope of a common pool resource is confined to the territory of a single nation, international externalities often do not arise.

Resources at sea, however, are by definition outside the land territory of any individual nation. This observation suggests an immediate rationale for international cooperation on two margins.

First, nations (and their citizens) may assert competing claims to the common pool resources of the sea. For example, the United States may claim the right to all oil and gas discovered

¹³ See, e.g., ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* (1990). Ostrom's work is in part a response to more pessimistic analyses such as Hardin, *supra* note 2.

¹⁴ Domestic pollution, by contrast, may have international consequences if it later becomes pollution of the oceans. Sovereignty over internal bodies of water is, to this degree, not unlimited, as we note below. See also UNCLOS, *supra* note 1, Arts. 193, 194(2).

within x miles of the U.S. coastline, and other nations may dispute that claim. International cooperation is thus valuable to resolving competing claims over resources. Absent resolution of these claims, costly international conflicts can arise, and the costs of private exploitation may increase as well, owing to uncertainty about the locus of regulatory authority. Furthermore, even if conflict does not result, unresolved competing claims are themselves manifestations of the common pool problem. Each actor will seek to maximize the value of the resource to itself, without regard to the costs imposed on other parties with competing claims. Overexploitation of the resource will follow, under circumstances in which no government has the generally recognized authority to abate it.

Second, circumstances will arise in which no government can or will claim appropriate jurisdiction over the entire common pool. This situation may occur because no nation wishes to claim jurisdiction over the area containing the resource, or because the resource is mobile across geographic areas under jurisdiction claimed by different nations. In either instance, the fundamental common pool problem reemerges.

In the first case, where no government claims jurisdiction over a resource, private actors may overexploit it as they compete for the flow of returns, or may invest excessive amounts in search of a resource over which they can assert dominion privately. In some instances, the global costs of abating these problems may exceed the benefits. But in other cases, global gains from controlling the rate of exploitation or search may be possible, yet no nation undertakes the task because of a free rider problem—the nation that regulates the resource will bear the costs of regulating, but the benefits will flow in part to others. Here, international cooperation can enable nations to share the costs of regulation appropriately, or can create an international regulatory authority, to abate the free rider issue.

Now consider the second case, where a resource is mobile across the jurisdiction of different countries. Such mobility is characteristic of much marine life, and of the sea itself. Here, a common pool problem arises for a somewhat different reason. Each nation will tend to maximize the value of the resource to itself without regard to the adverse effects on other nations that wish to exploit the same resource. If salmon migrate between the waters of the United States and Canada, for example, and even if both nations undertake self-interested fishery regulation with respect to those stocks, regulators may tend to ignore the fact that local salmon fishing (say, in Canada) increases the costs of salmon fishing elsewhere (say, in the United States). Again, the tendency will be toward overfishing, and cooperation between the two nations can usefully address the problem. As another example, if marine pollution in waters under the jurisdiction of the United States travels north to Canada, the United States may tend to underregulate pollution in the waters that it controls. Again, international cooperation to establish higher anti-pollution standards may be warranted.

Proximity as a basis for resolving competing claims: The coastal seas. To recapitulate, common pool issues of one sort or another arise with respect to all of the valuable resources of the sea—fisheries, undersea oil and gas, seabed minerals, and the sea itself. As indicated, the potential role for international cooperation (and for UNCLOS) in relation to these issues is threefold: to minimize and resolve competing claims between states (and their nationals) over resources; to encourage and facilitate international cooperation when governments decline to engage in optimal regulation because of free rider problems; and to improve the quality of regulation when common pool resources are mobile across jurisdictions. Of course, it remains to be seen how well the UNCLOS concepts succeed at these tasks.

With respect to the first of them—the avoidance and resolution of competing claims—we shall see that the most important guiding principle in UNCLOS is the proximity of the resource to the claimant. The approach of the Convention to the natural resources of coastal seas, in particular, is to award regulatory control to the coastal state (including the power to create private property rights). The logic is straightforward. Coastal seas are close and relatively easy to patrol, and at least their living resources are comparatively cheap to exploit for nearby actors. As a rule of thumb, the state closest to the resources will have a cost advantage in exploiting them and in regulating to prevent overexploitation or excessive search. Coastal states thus have strong incentives to make rules for the resources and to enforce those rules.

Allocation of authority to the coastal states is likely to be not only the most efficient option, but also essential if international cooperation regarding the allocation of jurisdiction is to be stable. In general, cooperation will not arise unless nations gain more from cooperation than from opting out of it. For the reasons just given, if nations were denied authority over resources proximate to their coast under any proposed international arrangement, they would probably conclude that participation in the international arrangement was unattractive.¹⁵

Naturally, proximity cannot be the sole consideration in the choices that must be made in devising a treaty like UNCLOS. In some instances, resources may be located close to the coasts of multiple nations. Some reasonable basis for dividing them must be fashioned that will be acceptable to all participants. Similarly, common pool resources may straddle the resulting dividing lines, necessitating further cooperation.¹⁶

One must also ask, how close is close? Beyond a certain distance, proximity to the coast may become a poor proxy for which nation can regulate most cheaply. Moreover, it would be a mistake to suppose that the proper geographic scope of regulatory jurisdiction is the same for all resources. The capacity to monitor activities and enforce regulations may vary considerably according to the nature of the resource; it may be far easier to detect and prevent unacceptable offshore drilling from fixed installations at long distances, for example, than to detect and prevent unauthorized fishing from mobile vessels at such distances. As shall be seen, these considerations come into play in various aspects of UNCLOS.

Distant resources and the high seas. As noted, the approach taken by UNCLOS to the coastal seas is akin to the assignment of private property rights in land. An alternative approach to regulation, however, is analogous to open access regimes that are subject to a set of rules that all actors must obey. For example, a government might allow all persons to enter a lake and fish, but subject them to regulations governing how many fish they may catch, the equipment they may use, and so forth. UNCLOS takes this general approach to the resources of the high seas. These resources are generally subject to open access, yet states must obey certain rules in navigating the high seas¹⁷ and exploiting their resources.¹⁸

¹⁵ This observation may help to explain some aspects of UNCLOS that are sometimes viewed as inequitable, such as the fact that landlocked states do not receive any exclusive allocation of ocean resources. See Bernard H. Oxman, *The Territorial Temptation: A Siren Song at Sea*, 100 AJIL 830, 834 & n.22 (2006).

¹⁶ This problem is particularly likely in the case of fisheries, discussed further below.

¹⁷ Some such rules are found outside of UNCLOS. Rules regarding such matters as maritime safety and prevention of pollution are contained in conventions developed under the auspices of the International Maritime Organization. UNCLOS encourages the development of such rules and promotes their universal application. See UNCLOS, *supra* note 1, Arts. 39(2) & (3), 94, 210, 211(1) & (2), 217.

¹⁸ The limits on open access include those concerning seabed minerals, discussed in detail below, requirements concerning pollution by ocean-going vessels such as those in UNCLOS Articles 211(2) and 217(1), and various limits

Why does UNCLOS set forth an open access regime (subject to regulation) for the high seas and a limited-access regime for coastal seas? There are several possible reasons. First, the cost of patrolling vast distances is surely a factor, even if satellite technology and other advances are reducing this cost. States may be reluctant to expend the resources necessary to exert jurisdiction over the high seas unless the gains will be very high. Second, until the latter half of the twentieth century, seabed resources at great depths and distances from shore could not be exploited profitably; this situation has been changing, and many such resources now fall within coastal state jurisdiction pursuant to the expansive definition of the continental shelf in the Convention as extending either to 200 miles or to the edge of the continental margin, whichever is further seaward. Third, the environmental costs of activities further out to sea are not (yet) perceived to be as serious as those of activities close to shore. Fourth, in the case of safety of navigation on the high seas, regulation is generally self-enforcing¹⁹ because all parties have a mutual interest in avoiding collisions, and rules pertaining to the identification of ships and the facilitation of navigation do not pose difficult distributional problems.

Of course, the result will be highly imperfect. While UNCLOS requires conservation of high seas resources, and while that obligation is subject to compulsory arbitration or adjudication, the Convention cannot in itself solve some of the thorniest common pool problems like overfishing (discussed below), which requires precisely targeted regulation, careful monitoring, and effective enforcement by governments.

Other Externality Issues

The law of the sea must confront a variety of additional issues that extend beyond conventional common pool problems, but that nevertheless involve situations in which the actions of one nation can have adverse impact on (create negative externalities for) others. One can again divide cases into those where the activities of nations at sea conflict in some way, and those where problems arise at sea that no nation has an adequate incentive to address unilaterally.

The clearest example of the first type of situation is the conflict between international navigation and the desire of nations to protect themselves against activities that infringe their resource rights or territorial integrity. Such activities include smuggling, illegal immigration, and the poaching of resources. As we suggested above, it is natural for jurisdiction over such matters to be allocated to the coastal state with a proximate coastline. But the coastal state might respond by prohibiting foreign vessels from passing near its coast, or near an area containing resources that it controls. Such policies can increase the costs of navigation considerably, and some mechanism must be devised to accommodate the tension.

Accordingly, regulatory rights in coastal seas are not absolute. States have general discretion to regulate natural resources but cannot, for example, deny certain navigational rights and freedoms to other states. This pattern is simply explained. We have already suggested why every state probably values the resources of its coastal sea more than any other state. But states also value freedom of navigation, which reduces the costs of commercial activity at sea and also serves a variety of important military and security objectives. As long as vessels in transit take

established in accordance with the UNCLOS framework but in complementary agreements, such as the obligation to cooperate in the conservation of highly migratory species, also discussed below.

¹⁹ On self-enforcing aspects of international law, see, for example, JACK L. GOLDSMITH & ERIC A. POSNER, *THE LIMITS OF INTERNATIONAL LAW* (2005).

measures to avoid creating congestion hazards and harms such as pollution, freedom of navigation imposes few costs on coastal states while conferring substantial benefits, and is thus efficient. Yet if coastal states were allowed to regulate without any restriction, they might curtail navigation by foreign ships extensively or even prohibit it, perhaps out of stated concerns for security, pollution, and so forth. International cooperation to prevent the imposition of such externalities, while attending to the legitimate concerns of coastal states, is valuable.

Crimes at sea offer examples of situations that straddle the two classes of problems delineated above: sometimes multiple nations will wish to exercise jurisdiction over the purported criminal, and at other times no nation may have an adequate incentive to act against the criminal. A shipboard homicide, for example, may illustrate the first situation, as multiple nations may claim an interest based on the nationality of the ship, criminal, or victim, or the geographic location of the crime. Other crimes, such as piracy in the open ocean, may attract no governmental action, as the nation from which the offending ship emanates may have little interest in punishing a crime that benefits its nationals, and those harmed by such crimes may face a substantial free rider problem in patrolling the oceans to prevent incidents of piracy. In both types of situations, it is in the interest of the international community to allocate jurisdiction over the criminal act to the nation or nations that can most cheaply take steps to deter crime²⁰ and, if necessary, to provide incentives for those nations to exercise jurisdiction. It may also behoove nations to encourage cooperative efforts to overcome the free rider problem. It remains to be seen how effective UNCLOS may be in addressing such potential problems of underenforcement.²¹

With this background in hand, we now turn to the substantive rules of UNCLOS that bear upon these various subjects. We will argue that, for the most part, they are broadly consistent with a sound economic approach to the underlying externality problem, with the stipulation that UNCLOS does not (and cannot reasonably be expected to) solve all of the international externality problems that one can identify.

II. THE UN CONVENTION ON THE LAW OF THE SEA

UNCLOS divides the seas into zones over which states have greater or lesser authority. At one extreme are lakes and rivers, over which the state has exclusive control, just as it does over its landmass. At the other extreme are high seas, over which no state may claim sovereignty. In between, as we will see, the state's right to control activities over, on, or under water decreases as distance from the coast increases. The coastal state has sovereignty over certain bodies of water close to the coast such as bays, which are treated as internal waters like lakes and rivers, and the territorial sea, which forms a belt that projects up to 12 nautical miles from the coast or coastal baselines. In the territorial sea, all ships enjoy the right of innocent passage, and the more liberal right of transit passage is accorded to all ships and aircraft where the territorial sea overlaps a strait used for international navigation. Beyond the territorial sea, the coastal state may exercise more limited authority in the contiguous zone, which may extend another 12 miles; the exclusive economic zone, which may extend up to 200 miles from the coastal baselines (approximately 188 miles from the 12-mile limit of the territorial sea); and the continental

²⁰ The first type of situation, illustrated by the shipboard homicide, may also raise difficult conflict-of-law issues relating to the substantive elements of the crime or the attendant penalty.

²¹ See *Agora: Piracy Prosecutions*, 104 AJIL 397 (2010).

shelf, which may extend to the outer edge of the continental margin or at least to 200 miles from the coastal baselines.

The High Seas

The starting point for our discussion is the high seas. Under UNCLOS the entire regime of the high seas applies to those portions of sea that are not included in the exclusive economic zone, the territorial and inland waters, and archipelagic waters.²² The high seas are governed by the classic principle of freedom of the seas, which goes back to the seventeenth century. UNCLOS specifies that the freedom of the high seas includes, *inter alia*:

- (a) freedom of navigation;
- (b) freedom of overflight;
- (c) freedom to lay submarine cables and pipelines, subject to Part VI;
- (d) freedom to construct artificial islands and other installations permitted under international law, subject to Part VI;
- (e) freedom of fishing, subject to the conditions laid down in section 2;²³
- (f) freedom of scientific research, subject to Parts VI and XIII.²⁴

The freedom of the seas establishes an open access regime. It therefore raises a puzzle. If open access regimes are overexploited, why would international law have evolved to include one?

To resolve this puzzle, we need to consider the alternatives. The principle of freedom of the seas arose as a reaction to attempts by powerful states to claim exclusive control over vast swaths of the oceans. One alternative, then, would be to carve up the oceans among all states in the same way that (almost) all territory has been carved up and assigned to states. Such a regime would surely produce constant conflict, as some states would be tempted to send ships across, and exploit resources in, areas over which other states have jurisdiction but no real control. Another alternative would be to subject the oceans to the jurisdiction of some kind of international authority. A final alternative would be to give states overlapping jurisdiction over activities on the high seas.

Freedom of the seas might best be understood as reflecting the assumption that no country has an interest in attempting exclusive control of the oceans except along its coast. The cost of enforcing assertions of jurisdiction over foreign ships in remote ocean spaces is just too high. Originally, freedom of the seas reflected a preoccupation with navigational access, as well as the judgment that states either do not have the capability, or would prefer to avoid expending the resources necessary, to secure global lines of trade and communication against interference by other states. Mutual agreement not to engage in such interference therefore served the interest of global cooperation. The logic can be extended to the protection of fishing and other forms

²² UNCLOS, *supra* note 1, Art. 86. Most of the high seas provisions, other than those concerning living resources, also apply within the EEZ pursuant to Article 58(2).

²³ Of Part VII.

²⁴ UNCLOS, *supra* note 1, Art. 87(1). Paragraph 2 of that article provides that these freedoms shall be exercised “with due regard for the interests of other States in their exercise of the freedom of the high seas.”

of resource extraction. There may be some limits to this proposition, as we will see, but in general it seems correct.

In addition, freedom of the seas originally may have reflected the view that overexploitation of portions of the oceans remote from the coasts is not a serious problem. Given the vastness of the areas and their resources, congestion and overexploitation are at most limited problems and laws are of limited utility. Moreover, states would have weak incentives to enact and enforce any desirable laws, so that states with exclusive jurisdiction would often fail to act.

Thus, the high seas are not partitioned among states. Rather, a set of basic rules are set forth in UNCLOS that reduce the risk of conflict that might occur on the high seas. These include a general duty to have due regard to the interests of other states, and some more particular rules that, among other things, require ships to send signals that identify their locations and to take other steps to minimize the risk of collision.²⁵ These rules are essentially self-enforcing. A ship from state *X* benefits by making itself visible to a ship from state *Y*, because the ship from state *X*, as well as the one from state *Y*, would be harmed by a collision. Where the means of making oneself visible to others involves a choice among technologies (such as radio bands), then it is in everyone's interest to use whatever technology everyone else uses and the relevant actors can coordinate on a standard. As a result, enforcement of the rules of the road on the high seas does not pose a serious challenge.²⁶

A more ambitious set of rules for the high seas—for example, rules that protect fisheries against possible overfishing—would pose a more significant challenge because it would require states to expend resources with the expectation that other states would do the same. But if it is extremely costly to monitor and patrol the high seas, as we have suggested, it will also be difficult for states to prevent free riding and defections from any rule-based regime. We will say more about these issues in the section on fisheries (and whaleries) below.

UNCLOS recognizes the traditional authority of states to regulate ships that fly their flag and the conduct of those on board. This rule may be justified on two grounds. First, to the extent that the ship has connections with the state whose flag it flies (for example, if the crew and passengers are nationals of that state, or the ship's home port lies on the coast of that state), the state has both an interest in regulating the ship and the capacity to enforce regulations (inasmuch as relevant people and assets are likely to be located on the state's territory when not on the ship). Second, to the extent that states make their flags available to ships owned and operated by foreigners, the rule still makes clear which state is responsible for order on the ship without regard to the nationality of those on board. Those at risk of being harmed know which state to ask for help. When ships collide, the flag states and states of nationality of the accused officers or crew members have overlapping jurisdiction, which enables them to work out a solution without interference from other states.²⁷

Other activities that take place on the high seas are of broader concern to a number of different states. These include slave trading, piracy, drug smuggling, and unlicensed broadcasting. UNCLOS regulates or prohibits these activities and authorizes warships from any country

²⁵ *Id.*, Art. 94(3).

²⁶ On international law as a self-enforcing solution to coordination games, see GOLDSMITH & POSNER, *supra* note 19, at 26–35.

²⁷ UNCLOS, *supra* note 1, Art. 97.

to stop and inspect ships suspected of engaging in piracy and the slave trade.²⁸ Here, UNCLOS gives states overlapping enforcement authority but not unilateral legislative authority; the substantive rules that may be enforced by nations other than the flag state are limited to those agreed to in UNCLOS. This overlapping enforcement authority contrasts with the regime for run-of-the-mill criminal activity that occurs on ships, where flag states have legislative jurisdiction and exclusive authority over boarding and detention while the ship is on the high seas.

The differences in approaches to these subjects reflect a basic trade-off. When states have exclusive legislative and enforcement authority, the risk of inconsistent policies is minimized, but states may also have an incentive to legislate and enforce in a way that is biased against other states. This risk is tolerable with respect to crimes that may occur on board; after all, foreign passengers and crew can avoid ships that fly the flags of states that they do not trust. An activity such as piracy, by contrast, affects the interests of many states simultaneously, and here the limits of unilateral enforcement come into play—if any given state were accorded exclusive enforcement jurisdiction over a particular act of piracy, it might have inadequate ability or incentives to expend the costs necessary to address it.²⁹ Overlapping jurisdiction can enhance the chances that some state will be moved to act, though, to be sure, overlapping jurisdiction will not solve the collective action problem, because states may still have inadequate incentives to take account of the interests of other states. For piracy, the risk of inconsistent policies or parochial bias is limited, inasmuch as the basic substantive rules were codified in UNCLOS.³⁰ Some risk may remain at the enforcement level, but it is tolerated because of the importance of increasing the chances that some state will find it in its interest to act against piracy.³¹

Inland Waters, the Territorial Sea, and the Contiguous Zone

As seen above, the territorial sea is the band of water, now up to 12 nautical miles wide, that lies off the coast of the state.³² Unlike the high seas, the territorial sea is a zone exclusively controlled by the state—in this way, identical to the treatment of the state's landmass—with one important exception. All other states have the right of innocent passage. This right includes the right to enter and navigate through the territorial seas, whether to traverse them or to reach a port of call; it extends to all ships, including commercial and military ships. States can regulate passage, for example, by designating sea lanes; but they cannot prohibit it unless the passage is not innocent, meaning that the ship is engaged in specified activities such as espionage, weapons exercises, smuggling, fishing, willful pollution, and the like.³³

This treatment of territorial waters is consistent with our framework. Areas of the sea near the coast have high value to the coastal state—much higher than that of the high seas. Because

²⁸ *Id.*, Arts. 99, 105, 107, 108, 109, 110. Other illegal activities are addressed in other international agreements.

²⁹ For example, the UN Security Council has found it necessary to authorize all states to take enforcement action against pirates in Somalia's territorial sea. SC Res. 1816 (June 2, 2008); see J. Ashley Roach, *Countering Piracy off Somalia: International Law and International Institutions*, 104 AJIL 397, 400–02 (2010) (on Resolution 1816 and subsequent Security Council resolutions regarding piracy off Somalia).

³⁰ The piracy provisions of UNCLOS are essentially the same as those in the Geneva Convention on the High Seas, Arts. 14–22, Apr. 29, 1958, 13 UST 2312, 450 UNTS 82.

³¹ See *supra* note 21 and corresponding text.

³² UNCLOS, *supra* note 1, Arts. 2, 3.

³³ *Id.*, Arts. 17–19.

the cost of transportation between land and the coastal sea is low, the value of fishing, research, mining, and similar activities is correspondingly high.³⁴ Similarly, coastal states can also easily patrol their territorial waters and enforce the law, as well as guard against foreign threats. Airplanes and helicopters can reach these areas from bases on land; shore batteries can stand guard; the coast guard can operate from nearby ports.

Yet the right of innocent passage is clearly of great value to foreign states. Without an opportunity for innocent passage, ships would spend extra time and fuel circumnavigating large swaths of the sea as they travel from one place to another. At the same time, innocent passage imposes relatively limited costs on the coastal state: congestion (but limited because the ships may not dawdle) and the attendant risks of accidents. Of course, if the right of innocent passage did not exist under international law, the attendant inefficiencies might be eliminated through bargaining—coastal states might charge tolls for entering their waters. But this solution is inferior; it would involve transaction costs and presumably would also be affected by inefficiencies associated with states' "market power" over the relevant area of the ocean. Such inefficiencies would arise whenever the fee charged for passage by a state exceeded the marginal cost to that state of permitting passage, which we have suggested is very low, and when ships responded to such fees by circumnavigating the area covered by the fee, which would increase the cost of navigation. The right of innocent passage reflects, in effect, a deal under which states give up their right to charge such fees in return for being spared having to pay the fees of other states, either directly or in terms of higher costs for the movement of trade.

One might ask, why does international law recognize a right of innocent passage for territorial seas but not for land? After all, the two areas are otherwise subject to the same rules. The answer is surely that innocent passage could be much more easily abused, and pose greater burdens on the territorial state, if it were applied to the land. This difference is evident in the complex provisions of the Law of the Sea Convention regarding landlocked states' right of access to the sea.

Some of the most difficult questions that arise in connection with territorial seas concern the baselines for defining them. Coasts are not straight lines. They are marked by indentations and projections; small and large islands lie nearby, as do reefs; the tide ebbs and flows; rivers open out on them. UNCLOS contains various rules that stipulate the baseline in areas of ambiguity. Consider, for example, a convexity in the coastline. If it is relatively deep, it might be considered a bay. If the convexity is shallow, however, so that it offers nothing of value for shipping (protection from the weather on open seas) and is unlikely to be used for a port, it is unlikely to be considered a bay.

Bays and similar formations, like river mouths, are considered internal waters, and thus not even the right of innocent passage applies to them. The reason is plain. Foreign states do not need to traverse these areas to go from one place to another (except to ports in the bay or on the rivers, where entry can be denied anyway), so the value of such a right is low for foreign states. At the same time, these are sensitive and congested areas and thus suitable for maximum control by the coastal state. Interestingly, states generally permit foreign sovereigns to regulate the "internal economy" of ships at port (for example, employer-worker relations) and claim

³⁴ These resource justifications are, to be sure, no longer specific to the territorial sea, as coastal states now have control over resources extending well beyond the territorial sea through the EEZ and the continental shelf. *See id.*, pts. V, VI.

jurisdiction only when activities on the ship disturb the peace or in some other way cause harm to the state's interest (for example, through smuggling and serious crimes).³⁵ In addition, where foreign states do have a strong interest in entering waters close to a state's territory, the law provides for rights of innocent or transit passage. This approach is taken, for example, in using a generalized system of straight baselines drawn to and between islands along coasts to enclose internal waters, and similarly in the case of archipelagic waters. In the latter cases, in addition to innocent passage, the right of transit passage or archipelagic sea lanes passage ensures that coastal states cannot block important types of navigation by claiming that islands enclose internal waters.³⁶

Because the UNCLOS rules treat bays as part of internal waters, the Convention provides additional rules so that states will not opportunistically claim enormous portions of the oceans as bays.³⁷ A straight line is drawn across the bay; the territorial sea begins only at that point. Similar rules are used to handle reefs and the other geographic formations noted above.³⁸

The near-exclusive control of states over their internal waters and territorial seas has created special problems where these areas are crucial to transit by other nations. These problems pertain to the waters of two areas: straits and archipelagos. Straits are narrow passages connecting large bodies of water that contain areas where there is freedom of navigation and overflight, be they classic high seas or exclusive economic zones. Because the passages are narrow—they lie between bodies of land only a few miles apart—they form part of the territorial sea or internal waters of the state or states that control those bodies of land. During the UNCLOS negotiations, naval and other maritime powers insisted that straits be subject to “the right to transit passage,” rather than the right to innocent passage, in response to the extension of the territorial sea from 3 miles to 12 miles, which would enclose several existing straits. Innocent passage does not apply to aircraft and requires that submarines surface. It has an ambiguous history with respect to warships, and is subject to unilateral regulation by the coastal state. This regime was not liberal enough to satisfy the naval powers and other maritime states. Accordingly, states agreed to transit passage, which means “navigation and overflight solely for the purpose of continuous and expeditious transit of the strait between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone.”³⁹

A great deal can turn on whether a waterway is classified as a strait or not. The United States and Canada have long disputed whether the “Northwest Passage,” a route through Canada's northern archipelago that connects the Atlantic and Pacific Oceans, constitutes a “strait used for international navigation.” Canada argues that no legal strait exists; it claims that the waters constitute its historic internal waters through which there is no right of passage and, in any event, that the Northwest Passage was not traditionally used for international navigation.⁴⁰ In its view, foreign vessels may traverse the Northwest Passage only with Canadian permission.

³⁵ R. R. CHURCHILL & A. V. LOWE, *THE LAW OF THE SEA* 56–67 (3d ed. 1999).

³⁶ See UNCLOS, *supra* note 1, Arts. 8(1), 35(c), 49, 52–54.

³⁷ See *id.*, Art. 10(2) (defining a “bay” as “a well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain land-locked waters and constitute more than a mere curvature of the coast”).

³⁸ For a discussion of the problem of opportunistic baseline drawing and possible solutions, see Tullio Scovazzi, *The Establishment of Straight Baselines Systems: The Rules and the Practice*, in *ORDER FOR THE OCEANS*, *supra* note 2, at 445.

³⁹ UNCLOS, *supra* note 1, Art. 38(2).

⁴⁰ For a recent overview of the dispute, see MICHAEL BYERS, *WHO OWNS THE ARCTIC?: UNDERSTANDING SOVEREIGNTY DISPUTES IN THE NORTH* 59–87 (2009).

The United States and other countries contest Canada's internal waters claim and argue that, in any case, the use of the strait for purposes of international navigation renders it a strait through which there is a right of transit passage. If a legal strait does exist, foreign vessels may travel through the Northwest Passage without Canadian permission, though they would be subject to unilateral Canadian pollution control regulations under a special provision regarding ice-covered areas that was negotiated with the Arctic specifically in mind.⁴¹

Until recently, the dispute was largely academic. As the Northwest Passage was almost always frozen, surface ships rarely used it. However, it has since become clear that the ice will eventually retreat, and at that time the waterway will be navigable during substantial portions of the year. Canada recently announced plans to patrol the Northwest Passage and to build a deepwater port, while the United States has said that it will continue to regard it as a strait.⁴²

We now consider the rules relating to the contiguous zone. The contiguous zone, aptly named, is a zone of water contiguous to the territorial sea. Like the territorial sea, its width is 12 nautical miles. In the contiguous zone, "the coastal State may exercise the control necessary to: (a) prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea; (b) punish infringement of the above laws and regulations committed within its territory or territorial sea."⁴³

The power of the coastal state over the contiguous zone is thus more limited than its power over the territorial sea. It has no power to legislate in that zone. But it does have the power to enforce. This arrangement is sensible. All states have a greater interest in freedom of navigation and overflight in the area. At the same time, coastal states have a weaker interest in regulating behavior in the contiguous zone than in the territorial sea because the zone is less congested and ships there pose less danger to the mainland. But in the absence of a contiguous zone, a state's coast guard would be powerless, for example, to intercept a suspected smuggler just outside the territorial sea absent agreement with the flag state.

Continental Shelf and Exclusive Economic Zone

Two further sets of rules extend coastal states' jurisdiction. First, Article 77 gives coastal states exclusive rights to exploit the minerals and other natural resources in the continental shelf. The continental shelf comprises the

seabed and subsoil of the submarine areas that extend beyond [the coastal state's] territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance.⁴⁴

The continental margin typically ends in a slope that reaches (and at times a rise formed by sedimentary rock that overlays) the deep seabed, which is thousands of feet deep. Beyond that point underwater mountains, ridges, and other protuberances are not considered part of the continental margin. Numerous ambiguities arise because portions of a shelf might continue as

⁴¹ UNCLOS, *supra* note 1, Art. 234.

⁴² BYERS, *supra* note 40, at 42–44.

⁴³ *Id.*, Art. 33(1).

⁴⁴ *Id.*, Art. 76(1).

a ridge that extends to the shelves of other coastlines, as in the case of the Lomonosov Ridge, which extends from Russia to Canada and Greenland.

Jurisdiction over the continental shelf is defined functionally, unlike jurisdiction over the territorial sea: the state has exclusive control only for limited purposes, notably exploration and exploitation of natural resources of the seabed and subsoil. It has no control over the waters above the continental shelf unless they fall in some other designated zone. What distinguishes the continental shelf from the deep sea is that most exploitable deposits of hydrocarbons are likely to be found within the limits of the continental shelf as defined in UNCLOS, which creates the problem of potentially inefficient races to control those resources. Exclusive jurisdiction helps mitigate this problem.

Second, Article 56(1) confers on coastal states similar exclusive rights for the EEZ, including rights for the purpose of exploring and exploiting, conserving and managing natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, current and winds.⁴⁵

The EEZ extends 200 miles from the baseline used to measure the territorial sea. All states continue to enjoy the high seas freedoms of navigation, overflight, and the laying and maintenance of submarine cables and pipelines, and related uses, in the EEZ.

In addition to seabed resources that are in any event covered by the continental shelf regime, the EEZ regime establishes the coastal state's exclusive jurisdiction over natural resources in the water column, notably fisheries. Coastal states have a stronger interest in these fisheries than foreign states, and a better capacity to regulate them—in both cases because coastal states have the advantage of proximity.

In the years following World War II, states made claims over the continental shelf, which were generally accepted,⁴⁶ and over the water column for fisheries or other purposes, which were often resisted. The famous “cod war” between Britain and Iceland erupted when Iceland claimed exclusive jurisdiction over fisheries 12 miles from shore. Eventually, Britain accepted Iceland's claim, and gradually other states accepted fisheries and EEZ claims that were not too aggressive.⁴⁷ These developments, later refined in UNCLOS, reflect the strong economic logic of giving states exclusive jurisdiction over resources in areas where they can control their use, rather than treating these resources as open to all.⁴⁸

The melting of the Arctic Ocean has given rise to a similar set of developments. Growing access makes the resources both more valuable and easier to regulate. On August 2, 2007, a Russian mini-submarine deposited a Russian flag on the seabed of the North Pole. The apparent purpose of this gesture was to dramatize the Russian claim to control of mineral resources over a large portion of the Arctic Ocean, extending from the north coast of Russia to the North Pole. Russia had submitted this claim to the Commission on the Limits of the Continental

⁴⁵ UNCLOS, *supra* note 1, Art. 56(1)(a).

⁴⁶ The scramble for claims was initiated by President Truman in 1945. Proclamation No. 2667, Policy of the United States with Respect to the Natural Resources of the Subsoil and Seabed of the Continental Shelf (Sept. 28, 1945), 10 Fed. Reg. 12,303 (1945).

⁴⁷ CHURCHILL & LOWE, *supra* note 35, at 426 (describing the history of the conflict).

⁴⁸ See Benvenisti, *supra* note 2.

Shelf created under UNCLOS, basing it on the theory that the Lomonosov Ridge, an underwater mountain range that extends from the Russian coast northward, was part of Russia's continental shelf. The commission has made recommendations, but Russia need not accept them and can make a new submission. If Russia, or any other coastal state party to the Convention, ultimately does establish the limits of its continental margin on the basis of the commission's recommendations, UNCLOS provides that the limits will be final and binding to the extent that they determine that the area is continental shelf extending from the coast.⁴⁹ But that does not resolve the question of which parts are Russia's continental shelf rather than those of some other Arctic coastal state. If the Lomonosov Ridge is properly understood to be continental shelf, then Canada and Denmark (through Greenland) may have claims to part of it, and the coastal states concerned would have to agree on its delimitation pursuant to Article 83 of UNCLOS.⁵⁰

Critics argue that the flag-dropping gesture was an anachronistic appeal to nineteenth-century norms of territorial conquest, and the flag planting clearly gives Russia no rights under international law. Others note that Russia has conformed to UNCLOS procedures for asserting claims to its portion of the seabed.⁵¹ Whatever the true motivations of the Russians, it makes a great deal of sense to prefer allocations of jurisdiction over ocean resources to coastal nations that are able and willing to control them, and Russia was essentially demonstrating that it has the interest and capacity to regulate mining in Arctic waters.

Division and the Equidistance Rule

A recurrent problem that extends across many of these different topics is that of dividing areas to which states have overlapping claims. If a body of water less than 24 miles wide divides two states, then their territorial seas overlap. Similar conflicts can arise over the EEZ and continental shelf, and even inland waters—as when states share a bay. In all these cases, the states must divide jurisdiction over the resource.

Many states have used a simple equidistance rule to resolve these disagreements. The equidistance rule simply draws a line across the area in question, so that any point that is closer to one coastal state is deemed to be subject to that state's jurisdiction and control. The rule is not expressly mentioned in UNCLOS except with respect to the territorial sea, but it is popular as a matter of state practice and is increasingly used in judicial and arbitral decisions with respect to delimitation of the EEZ and the continental shelf under the Convention.⁵²

There is nothing particularly fair about the equidistance rule, which does indeed favor states with convex coasts or small islands and disfavor states with concave coasts. The International Court of Justice stressed this point in its first case delimiting the continental shelf.⁵³ But the same point can be made about virtually all the rules of the law of the sea, which make states' rights dependent on arbitrary features of their coastline such as its length; why is curvature more

⁴⁹ UNCLOS, *supra* note 1, Art. 76(8).

⁵⁰ To be sure, development of the law, including through the International Court of Justice (ICJ) and arbitral tribunals, has helped resolve some of the ambiguity.

⁵¹ See Betsy Baker, *Law, Science and the Continental Shelf: The Russian Federation and the Promise of Arctic Cooperation*, 25 AM. U. INT'L L. REV. 251 (2010).

⁵² See *Maritime Delimitation in the Black Sea (Rom. v. Ukr.)* (Int'l Ct. Justice Feb. 3, 2009), at <http://www.icj-cij.org/>.

⁵³ *North Sea Continental Shelf (FRG/Den.; FRG/Neth.)*, 1969 ICJ REP. 3, 44 (Feb. 20).

arbitrary than length?⁵⁴ Indeed, dozens of landlocked states have virtually no rights to the sea's vast coastal resources.⁵⁵ Accordingly, fairness does not provide much guidance here.⁵⁶ By contrast, the equidistance rule does have a good efficiency justification. Its location is easily determined. States that are closer to a portion of the sea are often in a better position to control it. By granting the closer state jurisdiction, the equidistance rule on average favors the state that can more cheaply regulate.

Deep Seabed

The deep seabed contains extensive hard mineral deposits. Although at present they are not exploited economically, and many of the same resources can be found on land and within EEZs, states have long believed that technology would eventually develop to the point that deep seabed exploitation would be economically advantageous. Since the 1970s, the developing states have tried to establish the principle that the deep seabed is the "common heritage of mankind" and that the economic value of resources in the seabed should therefore be shared among nations. Although industrial nations were prepared to accept the term "common heritage," and to share revenues, they objected to discretionary control by multilateral voting majorities.⁵⁷

During the negotiations that led up to UNCLOS, an initial compromise provided for the creation of an international agency (the "Authority") and an international corporation (the "Enterprise") that would license and regulate the exploration and exploitation of deep seabed minerals lying beyond the broad limits of the continental shelf. Developing nations would receive royalties and technology transfers. After the United States balked, a new "implementing agreement" (1994 Agreement),⁵⁸ in effect an amending agreement, weakened the Authority (and strengthened influence of developed nations over it), eliminated advantages given to the Enterprise and perhaps in practice the Enterprise itself as originally conceived, and enlarged the freedom of private corporations to engage in mineral extraction without international interference.

The current regime, which was agreed to in 1994, can be described, briefly, as follows.⁵⁹ While both scientific research and prospecting are largely free of restrictions, private mining enterprises must obtain a license from the Authority before exploring and exploiting a particular area of the deep seabed, the portion of the seabed that lies outside the jurisdiction of states under the other provisions of UNCLOS, namely, beyond the continental shelf. To obtain a license, the mining enterprises must be sponsored by a member state, and show that they meet certain standards of technological and financial capacity. The original treaty required mining

⁵⁴ See Wolfgang Friedmann, *The North Sea Continental Shelf Cases—A Critique*, 64 AJIL 229, 236–40 (1970).

⁵⁵ See CHURCHILL & LOWE, *supra* note 35, at 433–45, for the limited exceptions.

⁵⁶ For additional criticisms of the "proportionality" criterion, as it is sometimes called, see Malcolm D. Evans, *Maritime Boundary Delimitation: Where Do We Go from Here?* in *THE LAW OF THE SEA: PROGRESS AND PROSPECTS* 137, 154–56 (David Freestone, Richard Barnes, & David Ong eds., 2006).

⁵⁷ For a discussion, see Bernard H. Oxman, *The 1994 Agreement Relating to the Implementation of Part XI of the UN Convention on the Law of the Sea*, in *ORDER FOR THE OCEANS*, *supra* note 2, at 15.

⁵⁸ Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, July 28, 1994, 1836 UNTS 42 [hereinafter 1994 Agreement], available at <http://www.un.org/Depts/los/>.

⁵⁹ We follow the discussion in CHURCHILL & LOWE, *supra* note 35, at 248–53.

companies to transfer technology to the Enterprise and developing states. The 1994 Agreement eliminated this requirement but permits the Authority to “request” that mining companies and their sponsoring states “cooperate with it in facilitating the acquisition of deep seabed mining technology by . . . developing . . . States seeking to acquire such technology on fair and reasonable commercial terms and conditions, consistent with the effective protection of intellectual property rights.”⁶⁰ Some commentators have argued that this provision could conceivably be read to require some kind of forced, albeit compensated, transfer—with the amount of compensation to be determined by the Authority itself, or by other relevant institutions and states.⁶¹ However, there is no clear textual support for this position.⁶²

When private mining enterprises seek the Authority’s approval for a plan of work, their application must identify two mining sites. The applicant would have the right to exploit the first; the second would be reserved for the Enterprise or developing states. (Initially, the Enterprise would be required to act through joint ventures; later, it would operate as a stand-alone mining company, albeit subject to a prior right to a joint venture enjoyed by the applicant.⁶³) The Authority may turn down applications for the following reasons: (1) the area has already been claimed by or assigned to another applicant; (2) the mining activities would cause significant harm to the marine environment; and (3) the applicant is sponsored by a state that has sponsored an excessive amount of mining activity. This last, so-called antimonopoly clause relies on two alternative tests: the applicant’s state sponsors activities covering 30 percent of a 400,000 square kilometer circle surrounding either of the two sites in the application, or those activities cover (roughly) 2 percent of the deep seabed area subject to the mining regime.⁶⁴

Approved mining companies would be required to provide significant operational information to the Authority, so that it could ensure that they comply with the terms of their contract and do not violate regulations. The companies would have to pay an initial application fee and then annual royalties, which would be set by the Authority. Surplus revenues of the Authority and the Enterprise would be distributed to states on an “equitable” basis, with preference for developing states whose commodity exports compete with the products of seabed mining.

The critics of the deep seabed regime make three basic arguments.⁶⁵ First, it provides for redistribution of wealth (arguably including intellectual property) to developing nations and others—as compared to a baseline where states (or their mining companies) would keep whatever they exploited. Second, it imposes restrictions on the free exercise of the market. Here, the baseline would be a system in which the Authority merely recorded and enforced claims on a first-in-time basis, so as to prevent conflicting and overlapping claims. Technology transfer,

⁶⁰ 1994 Agreement, *supra* note 58, annex, §5, para. 1(b).

⁶¹ *E.g.*, Doug Bandow, *Don’t Resurrect the Law of the Sea Treaty*, POL’Y ANALYSIS, Oct. 13, 2005, at 8, 9, at <http://www.cato.org/pubs/pas/pa552.pdf>.

⁶² See Bernard H. Oxman, *The 1994 Agreement and the Convention*, 88 AJIL 687, 691 (1994); see also Oxman, *supra* note 57, at 22–27 (discussing the issue in more detail).

⁶³ 1994 Agreement, *supra* note 58, annex, §2, paras. 2, 5. However, there is a further question whether the Enterprise will ever come into existence, given the procedural requirements set forth in the 1994 Agreement.

⁶⁴ Satya N. Nandan, *Legislative and Executive Powers of the International Seabed Authority for the Implementation of the Law of the Sea Convention*, in ORDER FOR THE OCEANS, *supra* note 2, at 73, 78–80; Bandow, *supra* note 61, at 7 (citing UNCLOS Article 150(h) on protecting developing countries from adverse economic effects of deep-seabed-mining activities).

⁶⁵ Bandow, *supra* note 61; Jeremy Rabkin, *The Law of the Sea Treaty: A Bad Deal for America*, ISSUE ANALYSIS, June 1, 2006, at <http://cei.org/pdf/5352.pdf>.

antimonopoly rules, and the Enterprise would be unnecessary. Third, it creates an international bureaucracy dominated by developing countries, which would further strengthen the redistributive and regulatory themes of UNCLOS by interpreting vague terms to promote those goals.

The interpretations of the text proffered by these critics are not accepted by most industrial states and experts in the field, notably on the grounds that the substantive and decision-making provisions of the 1994 Agreement largely eliminated the textual basis for such concerns. Thus, while economic analysis would support at least the second and third concerns in theory, the extent of reason to fear that the Convention, as modified by the 1994 Agreement, could or would be interpreted and applied in a manner giving rise to such concerns is a different matter. Economic analysis can tell us that major producers and consumers of deep seabed minerals, as well as those benefiting from transfer payments with respect to deep seabed mining, have an interest in maximizing the efficiency of the system; but it can also tell us that land-based competitors do not share that interest, that the interest of beneficiaries of transfer payments may be too contingent and diffuse to have a significant impact on their policy preferences, and that states whose coasts and EEZs are exposed to potential environmental risks from deep seabed mining have an interest in imposing rules to minimize those risks.

As to the first concern, economic analysis usually puts questions of distribution to one side; there is no distinctive economic perspective on optimal distribution. From the perspective of general utilitarian ethics, as well as certain approaches to fairness, poor people should receive transfers of wealth from richer people, and it would seem to follow that poorer countries should receive transfers from richer countries. Royalties and taxes are typically paid by mining companies to the states in whose territory and on whose continental shelf they operate. For these reasons, some form of redistribution may be defended.

Economic analysis can, however, distinguish better and worse forms of redistribution. Poorer states should prefer cash transfers to in-kind transfers such as technology transfers and subsidization of the Enterprise. After all, poor countries can always use cash transfers to purchase intellectual property if that is in their interest; if it is not, they can put cash transfers to their best use, for example, to build medical clinics or schools. Moreover, the expenditure and distribution of cash payments to the Authority by miners are subject to an effective veto by each of the principal industrial states on the Council of the Seabed Authority, which could make the funds more likely to be used for widely supported aid purposes.⁶⁶

Most experts take the view that the 1994 Agreement effectively eliminates mandatory technology transfer and subsidization of the Enterprise. The critics remain concerned about the potential for mischief in the persistence of references to technology transfer and the Enterprise.

No one disputes that applicants must discover and transfer a second mining site. This is another inefficient form of taxation. The rule raises the applicants' prospecting costs without necessarily providing a benefit to anyone; it may turn out that the second site cannot be economically exploited once output from the first site enters the market.⁶⁷ If the second site can

⁶⁶ We should note, however, that some scholars are skeptical about whether even cash transfers from rich countries to poor countries actually help poor countries. If these transfers are mainly enjoyed by corrupt elites, then the case for redistribution is obviously weakened. *See, e.g.*, WILLIAM EASTERLY, *THE WHITE MAN'S BURDEN: WHY THE WEST'S EFFORTS TO AID THE REST HAVE DONE SO MUCH ILL AND SO LITTLE GOOD* (2006).

⁶⁷ The rule is mitigated somewhat by a provision that gives the mining company a right to participate with the Enterprise in a joint venture.

be economically exploited, it may turn out that the transferee is simply not an efficient mining company. To be sure, the text gives priority to the mining company that originally identified the site, and the transferee could otherwise sell the site to an efficient mining company, but the extra transaction would itself be costly. If the purpose of the rule is to subsidize the Enterprise or redistribute wealth to developing nations, and this purpose is appropriate, then a cash tax would be a more efficient device.

As for the Enterprise, we cannot think of an efficiency justification for its creation. If the Enterprise competes with private mining firms on an equal basis, creating it would do no harm. In the unlikely event that it operates more efficiently than private firms, consumers would gain. In the more likely event that it operates less efficiently than private firms, it would be driven from the market and the only loss would be the costs of setting up the institution in the first place. It is possible, however, that the Enterprise would not compete with private mining firms on an equal basis. If so, the Enterprise could survive in the market even if it is operated less efficiently than the private firms. This possibility may be the source of the critics' concern that some kind of implicit (and inefficient) redistribution might take place; as noted before, there is no explicit textual support for this concern under the regime as modified in 1994.

The antimonopoly rule tries to prevent any single state (or small group of states) from dominating the deep-seabed-mining industry. From an economic perspective, a possible objection to this rule is that neither states nor miners will be given monopoly power in the economic sense because the types of commodities likely to be mined are available in international markets with multiple sources of supply. Commodities must be sold on the world market at market prices regardless of source. It also follows that the antimonopoly rule will not redistribute wealth to smaller states. In addition, to the extent that a few states develop special bureaucratic or legal expertise with respect to deep seabed mining so that they can effectively carry out their obligations under UNCLOS, it would be better to ensure that those states sponsor miners even at risk of "monopoly." Nevertheless, none of these considerations are to deny that important symbolic and political purposes may be served by ensuring that a few powerful states do not end up with excessive influence over the seabed; our limited point is that the economic benefits of the antimonopoly rule are hard to discern.⁶⁸

What remains of the technology transfer provisions is at best hortatory and unnecessary, and at worst an invitation to impose another inefficient tax. If technology transfer takes place only at market prices, then a rule is not necessary—the transaction would occur without the rule. Unlike the original text, the 1994 Agreement does not impose a technology transfer obligation directly on private mining firms. But if, as some fear, technology transfer could still be forced, this would mean that the market price would not be paid. Private mining firms would underinvest in research and development if they must share the proceeds with others.

The third set of concerns involves the institutional dimension of the seabed regime. Because, given current technology, no state has the power to control the deep seabed far from shore effectively, control over seabed resources is not partitioned among individual states beyond the continental shelf as defined in UNCLOS. In this sense, the deep seabed beyond the continental

⁶⁸ This point is particularly true since the antimonopoly provisions limit only the number and distribution of sites sponsored by a given state, and do not apply to private companies and their subsidiaries and affiliates. Even if that were otherwise, we are of the view that there would be no discernible economic benefits from the antimonopoly provisions because the commodities extracted from the deep seabed are expected to be products for which there are other, territorial sources of supply and for which competitive markets exist.

shelf, like the open water, is subject to the freedom of the high seas, with the mining company's "sponsoring State" performing functions analogous to those of the flag state of a ship. But because exploitation is potentially economical down the road, a potential problem of overuse remains—technically, the problem of excessive investment in search.⁶⁹ Since no nation is the cheapest regulator of the deep seabed, an international authority, supported by all states, suggests itself as a natural alternative. An additional reason for such an authority is that states cannot agree on all rules for the exploitation of seabed minerals because of conflicting interests. Many issues are thus left to the international agency to resolve at a later date. The Authority established by UNCLOS has the power to determine the rules.

The problem with this approach is that it does not guarantee that the international agency will ultimately act in the interest of states in general. Treaty designers thus face some familiar trade-offs. States will submit to an international agency's jurisdiction only if they expect the gains to be greater than their returns to opting out and enjoying the benefits of the pre-UNCLOS regime. For most states, the implicit "reservation price" is low or zero because they have no capacity to exploit underwater resources in the high seas—or highly uncertain, to the extent that they envision rapid development or the possibility that they could attract mining companies as potential "flags of convenience." But for the United States, at least, the price is relatively high because it expects that its firms will eventually be able to exploit deep sea resources. Accordingly, the United States and countries in its position need a guarantee that the Authority will not act against their interests. Only a unanimity rule or a veto right for the United States and similarly situated countries can provide clear assurance in this regard, but a unanimity rule would make decision making too difficult, and a veto right would enable the United States to demand an excessive share of the rents created by the legal regime. Yet if other nations have veto rights, they could prevent mineral exploitation by Americans unless the United States makes concessions to them. The current compromise features a complex power-sharing arrangement. The Authority consists of an Assembly, where every state has one vote and a qualified majority rule prevails, although consensus is preferred; and a more powerful Council, which has thirty-six members, including representatives of the major interests in seabed mining. The Council, unlike the Assembly, must (generally) act by consensus.⁷⁰ This feature protects all major states but creates a risk of holdups and gridlock. Only time will tell whether it will promote economically justified or economically dubious applications of the regime.⁷¹

The three concerns articulated by the critics emphasize the risks of the latter outcome. However, it would be a mistake to conclude that the seabed regime of UNCLOS is necessarily a bad one on balance. On the benefit side, the regime can clearly perform an important function by enabling mining firms to stake claims and thus obtain property rights in minerals in the deep seabed. Firms would do less in the way of duplicative search and exploitation efforts, which would both encourage research and avoid overexploitation of discovered resources. Many of the other rules, such as those that restrict damage to the marine environment, are also desirable.

⁶⁹ See text at notes 6–12 *supra*. By contrast, overexploitation of fisheries in the high seas for now does not seem likely to be a problem.

⁷⁰ See CHURCHILL & LOWE, *supra* note 35, at 239–48.

⁷¹ See, e.g., Steven Groves, *Why Reagan Would Still Reject the Law of the Sea Treaty* (Heritage Foundation Web-Memo No. 1676, Oct. 24, 2007), at <http://www.heritage.org/Research/InternationalOrganizations/wm1676.cfm>.

In an ideal world, we might advocate a further revision of the rules to eliminate the inefficiencies noted above. A better approach would simply allow mining operations to establish clear property rights over exploitable seabed resources, much as governments have awarded rights to prospectors on land. Property rights over discrete areas of the seabed, awarded at a point in time before companies make excessive sunk investments in search, seem like the best way to provide proper incentives for exploitation.⁷² To the degree that such a system would award excessive rents to developed countries from a distributive standpoint, some system for redistributing cash compensation to developing countries might be devised.

At this stage, we suspect that political realities preclude such a renegotiation. The various market restrictions have bought the assent of developing nations, and the Authority has the capacity to create property rights and regulate against abuses in a manner that improves on the potential chaos of a pure open access system. Despite its imperfections, the UNCLOS regime may be significantly better than none at all.

Likewise, even if such an option were still a plausible alternative,⁷³ we are skeptical of proposals for countries like the United States to enter into a stripped-down seabed treaty with the handful of developed states that have firms capable of deep seabed mineral exploitation. To be sure, such an arrangement would cut out the developing countries and avoid any need to “pay them off.” Even if such an approach could be defended from a distributive standpoint, it would sacrifice the other benefits of UNCLOS, and would be beset by its own economic weaknesses. Among other things, international capital is mobile, and mining companies could simply relocate to nonmember states if they wished to avoid the regulatory regime (much as shipping companies have at times avoided regulation by registering their ships with developing countries and flying their flags). Any regime that permitted such de facto “opting out” might accomplish little.

Fisheries

Fisheries (and whaleries) vary in their characteristics. Some fish occupy a relatively stable and confined area of the sea. Other fish migrate great distances. Certain species spawn in rivers and then head out to sea; other species go in the reverse direction. Some types of sea life are sedentary (like oysters); others crawl along the seabed (like lobsters).

UNCLOS handles some of the attendant issues in a straightforward fashion. Fisheries that fall entirely within the EEZ, territorial seas, or inland waters of a single state are subject exclusively to the regulation of that state. At least in theory, it should be impelled by the correct incentives to regulate the fishery. The UNCLOS regime does not mandate efficient regulation, of course, but simply empowers the single regulator to do what is necessary, and trusts it to proceed appropriately.

The biggest problems concern fisheries in the high seas and those that cross the EEZs of different states or that straddle an EEZ and the high seas. Various species fit this description and

⁷² Cf. Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. L. & ECON. 265 (1977) (describing the mineral-prospecting system in the American West and the analogy to patent law).

⁷³ All major industrial and maritime states except the United States are party to the Convention and the 1994 Agreement. UNCLOS Article 137 prohibits recognition of claims or exercise of rights over deep-seabed-mining resources except in accordance with the Convention. In Article 311(6), the parties to the Convention have also agreed that they will not be party to any agreement in derogation of the common heritage principle.

have become subject to significant overexploitation, including certain whales and bluefin tuna. The states that share in the fishery (or whalery) have an incentive to overexploit the resource for the reasons we described in part I.

UNCLOS addresses such problems to a limited degree, relying largely on various regional and sectoral arrangements that are encouraged by (and to some degree enforceable under) the Convention itself. For example, Article 63 requires nations confronting a situation where fish stocks straddle their EEZs “to agree upon the measures necessary to coordinate and ensure the conservation and development of such stocks.” Article 64 imposes a similar requirement with respect to “highly migratory species.”⁷⁴ Articles 118–19 impose an obligation on states to cooperate to preserve the living resources of the high seas, and offer some general principles to that end. In addition, in 1995 a supplemental agreement on highly migratory species and straddling stocks (1995 Agreement) was negotiated.⁷⁵ UNCLOS permits states to take other states to arbitration if they violate the rules negotiated in regional or sectoral agreements. To date, however, the general results of this system have been disappointing. The failure of fishery and whalery regimes is a case study of the collective action problem. States can agree, but they cannot enforce.

The saga of the *Southern Bluefin Tuna* case is rather illustrative.⁷⁶ Australia, New Zealand, South Korea, and Japan are the original parties to the Convention for the Conservation of Southern Bluefin Tuna, a highly migratory species. In the late 1990s, Japan began to fish on an “experimental” basis to a degree beyond its previously allocated allowable catch under the Convention, ostensibly to determine whether the tuna population was recovering to a greater extent than anticipated. Australia and New Zealand invoked their rights under UNCLOS Article 290(5) to seek provisional measures from the International Tribunal for the Law of the Sea, and won an award in 1999 directing Japan to curtail fishing the tuna pending further arbitration. On August 4, 2000, the arbitral tribunal seized of the merits determined that it lacked jurisdiction, but in effect warned Japan that a return to the status quo ante might constitute an aggravation of the dispute. Despite this limited degree of success in litigation, there is little evidence that the southern bluefin tuna population is recovering; to the contrary, it is now widely regarded as endangered.⁷⁷

In sum, UNCLOS contains useful rules requiring conservation of fisheries in the high seas that are subject to compulsory dispute settlement procedures, and these rules are strengthened by the 1995 Agreement, but their implementation depends on regional and sectoral agreements and institutions composed of the principal fishing and coastal states concerned. Some of these arrangements, as in the case of bluefin tuna in both the Atlantic and Pacific Oceans, have proved less than satisfactory. One difficulty from an economic perspective is that it is not

⁷⁴ UNCLOS, *supra* note 1, Arts. 63(1), 64; *see also* Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, Aug. 4, 1995, 2167 UNTS 3, *available at* <http://www.un.org/Depts/los/> (including Article 8(4) of that Agreement conditioning the right to fish on participation in the regulatory system).

⁷⁵ *See* note 74 *supra*.

⁷⁶ *See* Barbara Kwiatkowska, Case Report: Southern Bluefin Tuna, Provisional Measures, *in* 94 AJIL 150 (2000); Bernard H. Oxman, *Complementary Agreements and Compulsory Jurisdiction*, 95 AJIL 277 (2001).

⁷⁷ *See* Takver, *Australia: Southern Bluefin Tuna Crashing Toward Extinction to Feed Sushi and Sashimi Market*, INDYMEDIA, Oct. 29, 2009, *at* <http://www.indybay.org/newsitems/2009/10/29/18627181.php>.

clear that practical solutions to the remaining problems can be devised whose long-term benefits are perceived to justify the immediate costs to those engaged in the fishery.

The Distribution of Sea Resources

UNCLOS reflects a large number of distributive choices that could have been otherwise. Consider, for example, the concept of the exclusive economic zone. Although distribution of area and distribution of valuable natural resources are not necessarily the same thing, at least with respect to area this concept favors countries with long coasts facing the open sea. One could imagine alternative concepts that would have different distributive effects. For example, all states (including landlocked states) could be given control over natural resources in identically sized portions of the seas, whether or not those areas are next to their coasts (if they have coasts). Or states could be given control over natural resources in proportion to the size of their population, or in proportion to need. Such distributive principles can be found elsewhere in international law. Indeed, the provisions for sharing revenues from seabed mining appear to reflect such principles, as does the norm of common but differentiated responsibilities, which holds that poorer nations ought to be given less burdensome obligations than rich nations in trade and environmental treaties.

As we noted above, economic principles do not shed light on distributive issues other than recommending that redistribution should occur through taxes and transfers rather than through distortion of rules. This idea suggests some puzzles about UNCLOS. For example, UNCLOS recognizes the right of all coastal nations to claim territorial seas up to 12 miles and EEZs up to 200 miles from their coastal baselines, without regard to their capacity to control these areas for purposes such as maintaining public order in the territorial sea⁷⁸ or conserving living resources in the EEZ. Indeed, our analysis suggests that some public order values would be served if more powerful states had broader jurisdictional limits than weak states—that is, to the extent that the powerful states have capacity that weak states lack to keep order in certain areas. How can we account for these anomalies?

We suggest a partial answer. It may well be that proximity gives all states a significant advantage in controlling the sea, just because of the high cost of sending patrol ships and aircraft over great distances. In addition, states have relatively similar interests in the regulation of coastal waters—to prevent congestion, to enable the exploitation of resources, and so on—so that it is rarely worthwhile for one nation to try to wrest control of these waters from another nation. Further, a relatively simple and uniform system of regulation is valuable. Finally, the *de facto* regime may well give larger fishing nations access to larger areas of the ocean—because weaker states do not have the naval resources to keep the fishing trawlers of foreign states out of their EEZs or do have greater incentives to permit foreign access. Accidents of geography may produce similar effects. Under the Convention, the United States has the largest EEZ in the world.

Other factors may also be in play. Bargaining over the law of the sea no doubt required some focal points for agreement, and norms of equal treatment may have pushed the negotiators toward uniformity in the rules (such as the rules that extend the EEZ to 200 miles for all nations

⁷⁸ On international authority and efforts to suppress piracy in Somalia's territorial sea, see, for example, SC Res. 1816, *supra* note 29; Roach, *supra* note 29.

with a seacoast). As we indicated earlier, we do not claim that every detail of UNCLOS has an efficiency justification.

III. CONCLUSION

Our examination of the economic logic of the law of the sea can be summarized as revealing four general themes. The first and most basic point is that many of the resources of the sea require regulation to protect against overexploitation, excessive investment in search, and related externality problems. The core challenge for an international agreement on regulatory authority over activities at sea is to allocate that authority to the most efficient regulator (which could be the regulator who values the resources the most). In this regard, the value of a sea resource to land-based actors tends to diminish with distance from the shore, and the cost of regulating that resource for land-based actors rises with distance from the shore. For this reason, states' regulatory authority declines with distance from the shore.

This theory also sheds light on the evolution of the law. For many centuries, going back at least to the eighteenth, the territorial sea was only 3 miles wide. This was supposedly the range attributed by some eighteenth-century writers to cannon, and the "cannon-shot rule" reflected the view that the territorial sea was premised on the territorial state's ability to control it from land, where coastal batteries could be set up.⁷⁹ After World War II, the United States claimed its continental shelf and other states followed suit. In the next decades, states also claimed broader territorial seas and economic zones.⁸⁰ UNCLOS would recognize many of these claims, as we have seen, settling on a 12-mile coastal sea, 200-mile EEZ, and so forth. The evident explanation is the development of technology, which makes it possible to control the sea at greater distances from the shore, and at the same time puts sea resources farther from the shore in greater danger of overexploitation.⁸¹ The law evolved to reflect these new realities. As technology continues to advance, the cost of regulating ocean waters far from shore will decline, and the benefits of ocean resources far from shore will increase. We thus predict that the open access regime will erode, and that states will seek increasing control over larger and larger portions of the oceans, at least absent effective international mechanisms that achieve similar ends. Management of that process will be the major challenge in the implementation of UNCLOS.

A second fundamental point is that UNCLOS reflects a strong preference for carving up the natural resources of the sea into different regulatory domains controlled by different states, and against international regulation of those resources by international agencies. The reason for this preference is that states are better regulators than international agencies. International agencies can operate only with the consent of all or most states, which makes them slow and inefficient. States agreed to the Authority only because it was clear that no single state could, or wished to, police the deep seabed. But whether states can collectively police deep seabed mineral development through the Authority, and can devise effective means for policing the development of deep sea biological resources, remains to be seen.

⁷⁹ See James Brown Scott, *Introduction* to CORNELIUS VAN BYNKERSHOEK, *DE DOMINIO MARIS DISSERTATIO* 17 (Ralph Van Deman Magoffin trans., Carnegie Classics 1923) (2d ed. 1744) (claiming notion of 3-mile maritime belt of coastal state sovereignty, amounting to extreme range of cannon, originated with Bynkershoek). *But see* Wyndham L. Walker, *Territorial Waters: The Cannon Shot Rule*, 1945 BRIT. Y.B. INT'L L. 210, 231 ("The historical identification of cannon range with the three mile limit does not carry complete conviction.")

⁸⁰ CHURCHILL & LOWE, *supra* note 35, at 143–45.

⁸¹ See ANDERSON, *supra* note 1, at 19.

Third, the particular bundles of jurisdictional rights in the different zones reflect a trade-off between the benefits of conferring regulatory authority on a single state—which thus incurs the costs and receives the residual benefits of regulation—and the risk that, by granting a monopoly to a coastal state, the state will exclude other states or otherwise interfere with their use of the sea.

Fourth, UNCLOS responds in a confusing and occasionally unwise fashion to poor nations' legitimate interests in equitable treatment. In some respects, it completely ignores issues of fairness. States with the longest coasts benefit the most from its rules; landlocked states benefit very little. This system does not seem particularly fair. Where UNCLOS tries to redistribute to poor nations, it relies too much on inefficient restrictions on market activity and not enough on cash transfers; where it does rely on cash transfers, it does little to ensure that the cash goes to the poorest nations.

We have sought to explain the economic logic underlying UNCLOS. Given the empirical issues attendant on the exploitation of ocean resources, we have not tried to prove that UNCLOS is efficient or inefficient. Instead, our aim was to provide an analytic framework that helps identify the nature of the empirical issues and the implications if they are resolved. That said, we believe the UNCLOS provisions we have discussed, subject to our caveats regarding the deep-seabed-mining provisions, have a rough economic logic in view of the empirical assumptions that are generally made in the literature.