

2009

Economic Foundations of the Law of the Sea

Alan O. Sykes

Eric A. Posner

Follow this and additional works at: http://chicagounbound.uchicago.edu/law_and_economics



Part of the [Law Commons](#)

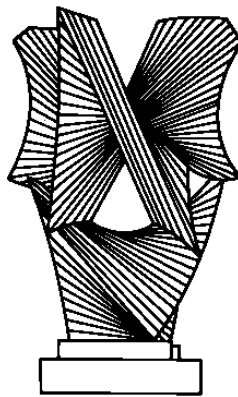
Recommended Citation

Alan O. Sykes & Eric Posner, "Economic Foundations of the Law of the Sea" (John M. Olin Program in Law and Economics Working Paper No. 504, 2009).

This Working Paper is brought to you for free and open access by the Coase-Sandor Institute for Law and Economics at Chicago Unbound. It has been accepted for inclusion in Coase-Sandor Working Paper Series in Law and Economics by an authorized administrator of Chicago Unbound. For more information, please contact unbound@law.uchicago.edu.

CHICAGO

JOHN M. OLIN LAW & ECONOMICS WORKING PAPER NO. 504
(2D SERIES)



Economic Foundations of the Law of the Sea

Eric A. Posner and Alan O. Sykes

**THE LAW SCHOOL
THE UNIVERSITY OF CHICAGO**

December 2009

This paper can be downloaded without charge at:
The Chicago Working Paper Series Index: <http://www.law.uchicago.edu/Lawecon/index.html>
and at the Social Science Research Network Electronic Paper Collection.

Economic Foundations of the Law of the Sea

Eric A. Posner¹
Alan O. Sykes²

Abstract. The United Nations Convention on the Law of the Sea has a plausible economic logic. Jurisdiction over portions of the ocean is assigned to states which can regulate them most cheaply and value them the most. These jurisdictional rights are subject to limits that reflect the interests of other states in navigation and other uses of the seas. For the vast areas of the ocean that no state can regulate, the Convention provides for an open access regime subject to simple rules, mostly self-enforcing, to limit conflict over resources.

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.³ UNCLOS has been ratified by most major nations but the United States remains a holdout.

UNCLOS has received little attention outside the specialist literature except for occasional flurries of press when the U.S. Senate considers the question of ratification. Yet, the treaty is among the most significant developments in international law of the last half century. International law traditionally sought to maintain order by dividing the world and assigning exclusive or quasi-exclusive regulatory authority over areas to the states with the power to control them. States were given authority over their territory and internal waters, and a small band of coastal sea. The large tracts of ocean over which no state could assert control were left unregulated. This state of affairs was tolerable as long as the oceans could be seen as 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 maritime technology have made control over larger portions of the ocean possible. States have responded by extending authority over larger portions of water, albeit subject to certain limited rights of other states; and trying to create international authorities that can regulate the areas of the ocean beyond the reach of particular states. This effort to bring such a vast area of the globe under international supervision is unprecedented.

Drawing on simple principles of microeconomics, this paper examines the most important features of UNCLOS. To our knowledge, we are the first commentators to analyze the law of the sea from an economic perspective.⁴ In brief, we argue that UNCLOS represents a

¹ Kirkland & Ellis Professor of Law, University of Chicago.

² James and Patricia Kowal Professor of Law, Stanford University. Thanks to Kathryn Burger for research assistance.

³ United Nations Convention on the Law of the Sea, Dec. 10, 1982 1833 U.N.T.S. 397. For a short, lucid history, see David Anderson, *Modern Law of the Sea* 1-22 (2008).

⁴ 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., 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 & Willy Østreng eds., 1999).

broadly sensible response to a wide range of externality problems that arise when nations act non-cooperatively to regulate (or fail to regulate) the sea. Regulatory jurisdiction is for the most part allocated to the nations that value it the most and 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.

Section I of this paper provides an overview of the externality issues that arise from the regulation or non-regulation of the sea, and introduces some economic concepts that bear on how best to address them. Section II then considers particular issue areas within UNCLOS, and evaluates the approach of UNCLOS to each issue from an economic perspective. These issue areas include property rights in fisheries and seabed minerals, maritime pollution, crimes, piracy, 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. The Conclusion briefly considers some objections to U.S. ratification of UNCLOS and suggests that they are unpersuasive.

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.⁵ International externalities arise from the activities of both individuals and states, and it is easy to understand why nations acting unilaterally may fail to address them. For example, consider a firm 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 in which 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 a national government engaged in some form of domestic regulation that raises costs for regulated firms. If the regulated firms are in large part foreign and will lower their prices to absorb some of the costs of regulation to avoid losing customers, the regulating government may regulate excessively in the sense that the global costs of regulation may exceed its benefits.⁶ 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 are a commonplace with activities at sea. In particular, the sea contains a wealth of valuable resources, including food, minerals, energy, and materials for bioresearch. Such resources that are un-owned or found in a “common pool” may be exploited

⁵ See, e.g., Alan O. Sykes, *The Economics of Public International Law*, in *Handbook of Law and Economics* (A. M. Polinsky and S. Shavell, eds., 2007).

⁶ Robert W. Staiger & Alan O. Sykes, *International Trade and Domestic Regulation* (2009), available at SSRN: <http://ssrn.com/abstract=1504913>.

inefficiently due to some familiar externality problems associated with the creation of property rights. 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 government efforts to regulate on land or to protect territory, occur at sea. These activities include shipboard crimes, piracy, smuggling, and espionage. The sea is also the locus of important military activity. With some of these activities, externalities arise because the activities of one government interfere with the legitimate activities of another. In other cases, the problem lies with a kind of “free rider” problem and an attendant lack of incentive on the part of governments 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.

A. 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 un-owned and available to all comers. In this sense, they represent a common property or “common pool” resource. A common pool resource has two defining characteristics: (a) no single actor has established control over it; and (b) 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.

1. Background Economics

The exploitation of common pool resources can create some important and familiar negative externalities.⁷ 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 for resources.

a. Overexploitation

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.

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

⁷ See generally Thrainn Eggertsson, [Economic Behavior and Institutions](#) (1990); Dean Lueck & Thomas Miceli, Property Law, in *Handbook of Law and Economics* (A. M. Polinsky and S. Shavell, eds., 2007).

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 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 over-consumption 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 fishing 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 generates 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 exist in which multiple fishing 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 over-exploitation of the resource still results albeit to a

⁸ More formally, let y and h denote the catch and hours devoted to fishing of a small company, and 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 $\pi = py - wh$, 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 *The Journal of Political Economy* 2 (1954).

⁹ Gordon, *supra* note ____, 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 ____. A more elaborate treatment of the dynamic case may be found in the appendix to Richard Cooper, *An Economist's View of the Oceans*, 9 *Journal of World Trade Law* 4 (1975).

lesser degree. In general, as the number of enterprises increases (and their behavior thus approaches that in the competitive case above), the magnitude of the externality increases and the over-exploitation of the resource increases.

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 an oil or gas deposit by one enterprise will reduce underground pressure and increase the costs of extraction for other enterprises drawing from the same deposit.

Maritime 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. Pollution raises the costs (or equivalently for economic purposes, lowers the value) of activities at sea by others—for example, by destroying marine life that otherwise would be caught and consumed. Because this negative externality is not taken into account by polluters, the tendency will be to pollute excessively.

b. Excessive Search

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 first to discover it, the result will be overinvestment in search for 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 (in expectation) are equal to the value of the resources expended on search.¹⁰

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 their own efforts at search make search more costly for other enterprises—as discoveries are made, new discoveries become harder to make.

As before, this problem disappears when only a single enterprise has the right to search. If search rights belong to a single entity, it will take proper account of the effects of its own efforts at search on its own costs, and the external effects on other entities will vanish. Also as

¹⁰ See Eggertsson, *supra* note ____; Lueck & Miceli *supra* note ____.

before, the tendency toward over-investment in search rises as the number of entities allowed to search rises.

2. 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 2009 Nobel laureate Elinor Ostrom, private actors may overcome the resulting externality issues through voluntary cooperation.¹¹ Perhaps the fishing enterprises that exploit a particular fishery will voluntarily agree to limit fishing, for example. But in many cases, voluntary private cooperation will be too difficult to orchestrate or enforce, and a role for government arises.

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 maritime pollution, governments may restrict or prohibit polluting 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 exist for the problem where multiple enterprises compete for ownership of undiscovered resources and as a result over-invest in search. 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 government 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, government intervention may be more costly than it is worth.

More important for our purposes, however, the difficult tradeoffs that must be confronted in the management of common pool resources will often be a purely domestic affair. Perhaps over-fishing in Lake Okeechobee is a problem, for example, but it is unlikely to materially affect the welfare of nations other than the United States and we would not expect international law to emerge that addresses the subject. When the geographic scope of a common pool resource is confined to the territory of a single nation, international externalities typically 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.

¹¹ See, e.g., Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (1990).

First, nations (and their citizens) may assert competing claims to the common pool resources of the sea. The United States may claim the right to all oil and gas discovered within x miles of the U.S. coastline, for example, and other nations may dispute that claim. International cooperation is thus valuable to resolve competing claims over resources. Absent a resolution of these claims, costly international conflicts can arise. And 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. Over-exploitation 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 arise because the resource lies in an area over which no nation wishes to claim jurisdiction, or because the resource is mobile across geographic areas under the 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 over-exploit the resource as they compete for the flow of returns, or may invest excessive amounts in search for 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 who 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 salmon, 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 over-fishing, and cooperation between the two nations can usefully address the problem. As another example, if maritime pollution in waters under the jurisdiction of the United States travels North to Canada, the United States may tend to under-regulate pollution in the waters that it controls. Again, international cooperation to establish higher pollution standards may be warranted.

3. 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 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 UNCLOS succeeds at these tasks.

With respect to the first of them—the 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 UNCLOS to the coastal seas, in particular, is to award property rights (or, more precisely, the power to create them) to the coastal state. The logic is straightforward. Coastal seas are close and easy to patrol, and their resources are comparatively cheap to exploit for nearby actors. As a rule of thumb, the state in closest proximity to the resources will have a cost advantage in exploiting the resources and in regulating to prevent overexploitation or excessive search. Coastal states thus have strong incentives to make rules for them and to enforce those rules.

Not only is an allocation of authority to the coastal states likely to be the most efficient option, it is also likely 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 likely conclude that participation in the international arrangement was unattractive.

Of course, proximity cannot be the sole consideration in the choices that must be made by 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.

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 at long distances, for example, than to detect and prevent unauthorized fishing at such distances. As shall be seen, these considerations come into play in various aspects of UNCLOS.

4. 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 anyone to enter a lake and catch fish, but subject them to regulations

governing how many fish they catch, the equipment they use, and so forth. As we shall see, UNCLOS takes this general approach to the resources of the high seas.

Thus, the resources of the high seas are generally subject to open access (seabed minerals presenting an exception that we will discuss in some detail later), yet states must obey certain rules in the navigation of the high seas and the exploitation of its resources. We think that the explanation is again straightforward. States may often gain little from the resources in the high seas due to the high costs of exploiting them, and the cost of enforcing rules to limit overexploitation or excessive search on the high seas may also be prohibitive because the high seas are remote and difficult to patrol. Dividing up the high seas among the states thus would serve little purpose because states would not control their portions of the high seas even if given jurisdictional rights to them. Indeed, one might ask why states would bother to create any rules at all for the high seas. As we will see, the answer for the most part is that those rules essentially solve very simple coordination problems, akin to the rules of the road, and thus are largely self-enforcing. UNCLOS actually does little to solve some of the thorniest common pool problems like overfishing, which would require real enforcement efforts and careful monitoring.

B. Other Externality Issues

The law of the sea must confront a variety of additional issues that go beyond conventional common pool problems, but that nevertheless involve situations in which the actions of one nation can have adverse impact (create negative externalities) for others. One can again divide cases into situations in which the activities of nations at sea conflict in some way, and cases in which problems arise at sea that no nation has adequate incentive to address acting 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 property rights or territorial integrity. Such activities include smuggling, illegal immigration, espionage, and poaching of resources. As we suggested above, it is natural to allocate jurisdiction over such matters closely proximate to a coastline to the coastal state. 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, property rights in coastal seas are not absolute. States have general discretion to regulate them but cannot, for example, deny certain navigation rights to other states. This pattern has a simple explanation. We have already suggested why every state likely values the resources of its coastal sea more than any other state. But it is also likely that every state values certain use rights in the coastal seas of other states—prominently, the right to navigation—more than those other states value the right to be free of such rights. For example, the United States values the right to send ships near the coast of Spain more than it values the right to block Spanish ships from traveling along the coast of the United States. Spain has a similar set of valuations. If these assumptions are correct, states are better off with limited

property rights (that exclude the power to block navigation) than with absolute property rights (that include the power to block navigation).

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 in other instances no nation may have an adequate incentive to act against the criminal. A shipboard homicide, for example, is a possible example of the first situation, in which multiple nations may claim an interest based on the nationalities of the ship, criminal, and victim, and the geographic location of the crime. Other crimes such as piracy in the open ocean may attract no government action—the nation from which the offending ship emanates may have little interest in sanctioning a crime that benefits its nationals, and those harmed by such crimes may face a severe free rider problem in patrolling the oceans to prevent 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 that can most cheaply take cost-effective steps to deter crime¹² and, if necessary, to provide an incentive for that nation to exercise its jurisdiction. It remains to be seen how effective UNCLOS may be in addressing such potential problems of underenforcement.

* * *

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 inland seas, over which a state has exclusive control, just as it does over its landmass. At the other extreme are high seas, over which no state has control. In between are certain coastal bodies of water, such as bays, which are treated as inland seas; the coastal sea, which forms a belt that projects twelve nautical miles from the coast; the contiguous sea, which extends another twelve miles; and the exclusive economic zone (EEZ), which projects out 200 miles from the shore. As we will see, a state's right to control activities on or under water decreases as distance from the coast increases. In addition, UNCLOS identifies certain features of the oceans—including mineral resources in the continental shelf and the deep sea bed—to which it gives states different bundles of rights. Certain other rules govern other geographical configurations that have special importance for states, including straits, which connect different parts of the high seas, and archipelagos.

¹² 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.

A. *The High Seas*

The starting point for our discussion is the high seas, defined by UNCLOS negatively as those portions of sea that are not included in the exclusive economic zone, the territorial and inland waters, and archipelagic waters.¹³ The high seas are governed by the classic principle of freedom of the seas, which goes back to the seventeenth century. UNCLOS defines the freedom of the seas (or “freedom of the high seas”) as:

- (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;¹⁴
- (f) freedom of scientific research, subject to Parts VI and XIII.¹⁵

The freedom of the seas establishes an unregulated open access regime. It therefore raises a puzzle. If open access regimes are overexploited, why would international law create 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 powerful states or perhaps all states—a regime that would surely be subject to constant conflicts over which area of the sea belongs, or ought to belong, to a particular state. 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 the high seas.

Freedom of the seas might best be understood as reflecting the assumption that no country has the power to control oceans except along the coasts. The cost of patrolling, monitoring, and punishing law violations in remote ocean spaces is just too high. These costs would also be high for a joint international authority. There may be some limited caveats to this proposition as we will see, but in general it seems correct.

In addition, freedom of the seas may reflect 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. Of course, overlapping jurisdiction would create an alternative set of potential problems because users of the high seas might be inconsistently regulated.

¹³ Art. 86.

¹⁴ With due regard to the interests of other states. Art. 87(2).

¹⁵ Art. 87(1).

Rather than assign jurisdiction over portions of the high seas to states, UNCLOS lays down a set of minimal rules that reduce the risk of conflict that might occur on the high seas. It imposes a general duty to take into account the interests of other states, and some more particular rules that, among other things, require ships to send signals that identify their locations and take other steps to minimize the risk of collision.¹⁶ 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 is 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. Thus, enforcement of the minimal rules on the high seas is not a serious challenge.¹⁷

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 they would require states to expend resources with the expectation that other states 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. Accordingly, despite the potential significance of such problems as a matter of theory, UNCLOS does relatively little to address them. We will say more about the matter of fisheries (and whaleries) in Section F below.

UNCLOS does grant states the authority to regulate ships that fly their flags. For example, if a murder takes place on a ship, the state whose flag the ship flies has exclusive jurisdiction. This rule can be given two justifications. First, to the extent that the ship has connections with the state whose flag it flies (for example, crew and passengers are most likely to be nationals of that state, 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 foreigners and foreign ships, the rule still makes clear which state is responsible for order on the ship. If passengers or crew who are nationals from other states are harmed, those states know which state to ask for help. When ships collide, the flag states have overlapping jurisdiction, which enables them to work out a solution without interference from other states.¹⁸

Other activities that take place on the high sea are of broader concern to a number of different states. These include slave-trading, piracy, drug smuggling, the transportation of nuclear weapons, and unlicensed broadcasting. UNCLOS regulates or prohibits these activities and gives warships from any country the right to stop and inspect ships suspected of engaging in these illegal activities.¹⁹ Here, UNCLOS gives states overlapping enforcement authority but not

¹⁶ Art. 94(3).

¹⁷ On international law as a self-enforcing solution to coordination games, see Jack L. Goldsmith & Eric A. Posner, *The Limits of International Law* (2005).

¹⁸ On this topic, see *The Lotus Case* (France v. Turkey), PCIJ (1927).

¹⁹ Art. 110.

legislative authority—the substantive rules are limited to those that states have agreed to in UNCLOS. This overlapping enforcement authority contrasts with the regime for run-of-the-mill criminal activity that occurs on ships, where states have exclusive legislative and enforcement authority.

The differences in approaches to these subjects reflect a basic tradeoff. 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 in the course of ordinary shipping; after all, foreign passengers and crew can avoid ships that fly the flags of states that they do not trust. In the case of an activity such as piracy, by contrast, the activity affects the interests of many states simultaneously, and here the limits of unilateral enforcement come into play—any state with exclusive jurisdiction over a particular act of piracy, say, may have inadequate incentive to expend the costs necessary to address it. Overlapping jurisdiction enhances the chances that some state will be moved to act. Here, the risk of inconsistent policies or parochial bias is limited inasmuch as the basic substantive rules have been hammered out in the treaty. 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.

B. Inland Waters, the Coastal Sea, the Contiguous Zone; Herein Baselines, Straits, and Archipelagic Waters

The territorial (or coastal) sea is the band of water, twelve nautical miles wide, that lies off the coast of the state.²⁰ The territorial sea, unlike the high seas, is a zone of exclusive control of the state—in this way, identical to the treatment of the state’s landmass—with one important exception. All other states have the right to 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 it is for the purpose of using military force or engaging in criminal behavior, or for fishing or research, and the like.²¹

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 the cost of transportation to the coastal sea is low, the value of fishing, research, mining, and similar activities is correspondingly high. Similarly, coastal states can also easily patrol their territorial waters and enforce the law. Airplanes and helicopters can reach them from bases on the 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

²⁰ Arts. 2, 3.

²¹ Arts. 17-19.

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 accident. 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 thereby increasing the cost of navigation. A 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.

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 if it were applied to the land. Ships that pass through territorial waters cannot easily stop and unload goods or engage in criminal activity, and the cost of obtaining and docking a ship is a natural barrier. By contrast, innocent passage for individuals onto land would enable them to enter countries without visas and engage in various undesirable activities that would be much more costly to police.

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 have indentations and projections; small and large islands are nearby; so are reefs; the tide ebbs and flows; rivers open out on them. UNCLOS contains a number of 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 inland 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 in order to go from one place to another (except to ports in the bay or on the rivers), 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 jurisdiction only when activities on the ship disturb the peace or in some other way cause harm to the state’s interest (for example, smuggling and serious crimes).²²

Because the UNCLOS rules treat bays as part of the inland waters, UNCLOS provides additional rules so that states don’t opportunistically claim enormous portions of the oceans as

²² Robin Rolf Churchill & Alan Vaughan Lowe, *The Law of the Sea* 56-67 (3d ed., 1999).

bays.²³ 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.²⁴

States' near-exclusive control over their coastal seas has created special problems where their coastal seas are unusually important areas of transit for other nations. This arises in two situations: straits and archipelagos. Straits are narrow passages that connect large bodies of water that contain areas of high seas. Because the passages are narrow—they lie between bodies of land only a few miles apart—they are part of the territorial seas of the state or states that control those bodies of land. Naval powers have historically insisted that straits be subject to “the right to transit passage,” rather than the right to innocent passage. Innocent passage, which requires that submarines surface and imposes some ambiguous limits on military activities, was not generous enough to satisfy the naval powers. The United States and other naval powers agreed to a widening of the territorial seas from six to twelve nautical miles—a development that benefited coastal states—in return for transit passage through straits.²⁵

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. Canada argues that no strait exists; the waters constitute its internal waters.²⁶ The United States and other countries argue that a strait does exist. If a strait does exist, foreign vessels may travel through the Northwest Passage without Canadian permission though they may be subject to certain regulations, such as pollution control rules. If a strait does not exist, the foreign vessels may travel through the Northwest Passage only with Canadian permission. UNCLOS does not resolve the dispute because it does not define “strait.”

Until recently, the dispute was largely academic. The Northwest Passage was almost always frozen, so ships rarely used it. However, in recent years the ice has retreated, and the waterway will soon be navigable during substantial portions of the year. Canada has 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.

The ultimate resolution of the dispute may well turn on whether Canada actually deploys the resources to exert control over the strait. If it does, then it is likely in the interest of other countries that Canada regulate this waterway so that it does not become congested and polluted. But if Canada claims dominion over the Passage without really exerting control, other countries will likely ignore its claims. The reason is that if any country X complies with Canadian

²³ “For the purposes of this Convention, a bay is 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. An indentation shall not, however, be regarded as a bay unless its area is as large as, or larger than, that of the semi-circle whose diameter is a line drawn across the mouth of that indentation.” Art 10(2).

²⁴ 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 at the Turn of the Century 445* (1990).

²⁵ Churchill & Lowe, *supra* note ____.

²⁶ For a recent overview of the dispute, see Michael Byers, *Who Owns the Arctic?: Understanding Sovereignty Disputes in the North* (2009).

regulations, it might fear that other countries Y and Z will not, putting X's shipping at a competitive disadvantage.

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 twelve 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.²⁷

The coastal state's power over the contiguous zone is thus more limited than its power over its territorial seas but that power is still substantial. This arrangement is sensible. Although states have a weaker interest in regulating behavior in the contiguous zone than in the territorial seas because there is less congestion and ships in that location pose less danger to the mainland, the interest is not trivial. 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.

C. Continental Shelf and Exclusive Economic Zone (EEZ)

Two further sets of rules extend coastal state's jurisdictions. 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 its 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.²⁸

The shelf is so called because the sea floor is not deep. The shelf typically ends in a slope that reaches the deep sea bed, which is thousands of feet deep. Beyond that point underwater mountains, ridges, and other protuberances are not counted as part of the continental shelf. Numerous ambiguities arise because portions of a shelf might continue as a ridge that extends to the shelves of other coastlines, as in the case of the Lomonosov ridge that 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 the purpose of research and exploitation of

²⁷ Art. 33(1).

²⁸ Art. 76.

minerals. 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 minerals in the continental shelf can be extracted economically. Exclusive jurisdiction prevents states from engaging in an inefficient races to control those resources.

Second, Article 56(1) confers on coastal states similar 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 superadjacent to the seabed and of the seabed and 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.”²⁹ The EEZ extends 200 miles from the baseline used to measure the territorial sea. Other states have full navigation rights in the EEZ, plus the right to lay down submarine cables.

The EEZ rights apply to the minerals in the continental shelf. The separate rights for the continental shelf are nevertheless important because a state’s continental shelf may extend beyond the 200 mile range of the EEZ. In addition, the EEZ covers fisheries and other resources in the water. Coastal states have a stronger interest in these fisheries than foreign states do, and a better capacity to regulate them—in both cases because coastal states have the advantage of proximity.

States initially asserted claims over the mineral resources of their continental shelves and the fisheries in EEZs (then usually called EFZs, or exclusive fishing zones) in the years following World War II. The claims over continental shelves were generally accepted, while the claims over EEZs were often resisted. The famous “cod war” between Britain and Iceland erupted when Iceland claimed exclusive jurisdiction over fisheries twelve miles from shore. Eventually Britain accepted Iceland’s claim, and gradually other states accepted EFZ and EEZ claims that were not too aggressive.³⁰ These developments, later codified in UNCLOS, reflect the strong economic logic of giving states exclusive jurisdiction over areas that they can control rather than treating those areas as open access resources.

The melting of the Arctic Ocean has given rise to a similar set of developments. On August 2, 2007, a Russian mini-sub deposited a Russian flag on the seabed of the North Pole. The evident purpose of this gesture was to help establish a 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 filed this claim with the Commission on the Limits of the Continental Shelf, an agency created by UNCLOS, basing it on the theory that the Lomonosov Ridge, an underwater mountain range that extended from the Russian coast northward, was part of Russia’s continental shelf. The Commission can offer an advisory opinion but Russia need not accept it, and ultimately UNCLOS does not provide a method for resolving Russia’s claims legally. Indeed, if the Lomonosov Ridge is properly understood to be continental shelf, then Canada and Denmark (through Greenland) have equally good claims to it, and UNCLOS says only that the affected countries have an obligation to negotiate a resolution.

²⁹ Art. 56(1)(a).

³⁰ Churchill & Lowe, *supra* note ____.

Critics argue that Russia's flag dropping gesture was an anachronistic appeal to nineteenth century norms of territorial conquest, but we think that those norms make sense even in the modern world. As we have argued, parceling out ocean resources to countries that can actually control them makes a great deal of sense, and Russia was essentially demonstrating that it, unlike other countries, has the capacity to regulate mining in Arctic waters. Other countries cannot match Russia's northern ports and fleet of ice-breakers, and until they can, their claims are not likely to be taken seriously. They may well decide to defer to Russian claims because of the high cost of exercising control over arctic waters from distant shores, especially given the fact that oil and other minerals are bought and sold in the world market, so there is a limit on the rents that Russia can extract in the form of high prices. Meanwhile, Russia will have an incentive to prevent overexploitation and other types of harms. This may well be preferable to nonregulation or overlapping regulation.

D. Division and the Equidistant 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 contiguous zones and the EEZ, and even inland waters—as when states share a bay. Many coastal states share a single continental shelf. 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 codified in UNCLOS, but it is popular as a matter of practice.³¹

However, the equidistance rule does have a limitation: it sometimes seems unfair. In the North Sea case, the International Court of Justice faced a conflict between Germany, the Netherlands, and Denmark over the continental shelf projecting from all three coasts into the North Sea. The Netherlands and Denmark argued that the equidistance rule should be used. Germany argued that application of the rule would be unfair because Germany's coastline in the relevant area was convex—curved inward, with the result that Germany would be entitled to a smaller share than it would if its coastline was straight or concave—while the convex coasts of the Netherlands and Denmark gave them a greater share. The ICJ agreed, ruling that the equidistance rule is not a norm of customary international law, and leaving it to the parties to hash out an agreement.³²

The ICJ based its decision on equity or fairness. It is surely true that there is nothing particularly fair about the equidistance rule, which does indeed favor states with convex coasts and disfavor states with concave coasts. 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

³¹ *Id.*

³² North Sea Continental Shelf Cases (F.R.G. v. Den., F.R.G. v. Neth.), Advisory Opinions and Orders, 1969 I.C.J. 3 (Feb. 20, 1969).

coastline such as its length; why is curvature more arbitrary than length?³³ Indeed, dozens of landlocked states have virtually no rights to the sea.³⁴ Accordingly, fairness does not provide much guidance here.³⁵ By contrast, the equidistance rule does have a good efficiency justification. States that are closer to a portion of the sea are generally 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.

E. Deep Seabed

The deep seabed contains extensive mineral deposits. Although at present they cannot be exploited economically, 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 a principle that the deep seabed is the “common heritage of mankind” and therefore that the economic value of resources in the seabed should be shared among nations. Developed nations generally resisted this view.³⁶

During the negotiations that led up to UNCLOS, an initial compromise provided for the creation of an international agency (the ominously named “Authority”) and an international corporation (the “Enterprise”) that would license and regulate deep sea exploration and mining. Developing nations would receive royalties and technology transfers. After the United States balked, a subsequent draft of the treaty weakened the Authority (and strengthened influence of developed nations over it), eliminated some advantages given to the Enterprise, 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.³⁷ Private mining enterprises must obtain permission of the Authority before exploring and exploiting the deep seabed, the portion of the seabed that lies outside of the jurisdiction of states under the other provisions of UNCLOS. In order 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 companies to transfer technology to the Enterprise and developing states; the 1994 revision eliminated this requirement but continues to obligate them to transfer technology to the Enterprise and developing states “on fair and reasonable commercial terms and conditions, consistent with the effective protection of intellectual property rights.”³⁸ This provision could conceivably be read to require some kind of

³³ See Wolfgang Friedmann, *The North Sea Continental Shelf Case—A Critique*, 64 *Amer. J. Int'l L.* 229, 236-40 (1970).

³⁴ See Churchill & Lowe, *supra* note __, for the limited exceptions.

³⁵ 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).

³⁶ 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 at the Turn of the Century*, *supra* note __, at 15.

³⁷ We follow the discussion in Churchill & Lowe, *supra* note __, at 248-53.

³⁸ Art. 144.

forced albeit compensated transfer—with the amount of compensation to be determined by the Authority itself, or by other relevant institutions and states.³⁹

When private mining enterprises seek the approval of the Authority 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.) 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 “anti-monopoly 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) two percent of the deep seabed area subject to the mining regime. Conceivably, the Authority could also set production limits where seabed mining threatens exports of competing commodities from developing countries.⁴⁰

Mining companies that are approved 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 mining 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.

Overall, the deep seabed regime has three features that trouble its critics.⁴¹ First, it provides for redistribution of wealth (including intellectual property) to developing nations—as compared to a baseline where states (or their mining companies) kept whatever they exploited. Second, it imposes a number of 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. Production controls, technology transfer, anti-monopoly 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 the UNCLOS by interpreting vague terms to promote those goals.

Let us briefly address these three concerns.⁴² Economic analysis usually puts questions of distribution to one side; there is no distinctive economic perspective on optimal distribution.

³⁹ Doug Bandow, Don’t Resurrect the Law of the Sea Treaty, Policy Analysis 8, 9 (Oct. 13, 2005).

⁴⁰ Salya 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* 73, 78-80; Bandow, *supra* note ___ at 7, citing art. 150(h).

⁴¹ Bandow, *supra* note ___; Jeremy Rabkin, *The Law of the Sea Treaty: A Bad Deal for America*, Competitive Enterprise Institute (June 1, 2006).

⁴² Here, we address them from the perspective of global welfare maximization; in the Conclusion, we will address them from the U.S. perspective.

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. 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, which, for reasons we give below, may well be objectionable. The reason is that 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. We should also note that some scholars are skeptical about whether even cash transfers from rich countries to poor countries actually help poor countries.⁴³ If these transfers are mainly enjoyed by corrupt elites, then the case for redistribution is obviously weakened.

The market restrictions are also open to fair criticism. We cannot think of an efficiency justification for the creation of the Enterprise, which, like most state-owned enterprises, is likely to be less efficient than private firms. Now, if the Enterprise competed with private mining firms on an equal basis, creating it would do no harm. In the unlikely event that it operated more efficiently than private firms, consumers would gain. In the more likely event that it operated 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. However, the Enterprise would not compete with private mining firms on an equal basis. The latter would subsidize the Enterprise by engaging in exploration on its behalf and possibly making technological transfers to it; it is also possible that royalties and other fees would be used to subsidize it. As a result, the Enterprise could survive in the market even if it is operated less efficiently than the private firms are. This deadweight loss is an avoidable consequence of the seabed mining regime.

The other market restrictions are equally dubious. Consider the anti-monopoly rules. Given that commodities mined from the seabed will enter a market that consists of commodities that are also mined on land, the risk of monopoly in output markets is remote—a nation's share of deep sea mining in the immediate area of a site or in the seabed as a whole bears no systematic relation to market power. Legitimate antitrust concerns can be addressed by making firms subject to the antitrust laws of their sponsoring (and customer) states.

To the degree that the “anti-monopoly” rules are really aimed at distributing wealth equitably among states, they are an inefficient mechanism. In general, production controls are a notoriously bad way of subsidizing inefficient firms. If seabed mining harms the export industries of developing nations and some palliative is necessary from the standpoint of distributive justice, the efficient response would be to offer cash compensation to those industries or nations. Placing a cap on seabed mining in order to keep the cost of commodities artificially high hurts poor as well as rich people who buy products for which those commodities are inputs;

⁴³ See, e.g., William Easterly, *The White Man's Burden: Why the West's Effort to Aid the Rest Have Done So Much Ill and So Little Good* (2006).

and it may help relatively wealthy workers and shareholders in poor countries rather than poor people in poor countries. The anti-monopoly rules may also foreclose the most efficient private mining companies from the opportunity to exploit particular deposits and divert the mining to less efficient firms sponsored by “non-monopoly” states.

The rule that applicants must discover and turn over a second mining site is another inefficient form of taxation. This rule raises the applicants’ 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. 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. Similarly, the technology transfer rules are at best unnecessary and at worst 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. If, as some fear, technology transfer would be forced, this just means 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.

This brings us to the third set of concerns involving the institutional dimension of the seabed regime. Because no state has the power to control the deep seabed effectively given current technology, UNCLOS does not assign jurisdiction to states. In this sense, the seabed is like the open water subject to the freedom of the seas. But because exploitation is potentially economical down the road, there remains a potential problem of overuse—here, technically, the problem of excessive investment in search.⁴⁴ Because 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 problem with this approach is that there is no guarantee that the international agency will in the long run act in the interest of states in general. Treaty designers thus face some familiar tradeoffs. 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. 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 its 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. However, if other nations have veto rights, they can prevent mineral exploitation by Americans unless the United States makes concessions to them. The current compromise features a complex

⁴⁴ See *supra*.

power-sharing arrangement; only time will tell whether it will promote the economically justified or economically dubious aspects of the regime.⁴⁵

The three concerns articulated by the critics have force. 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 seabed regime can clearly perform an important function by enabling mining firms to stake claims and thus obtain property rights in minerals in the deep sea bed. Firms would do less in the way of duplicative search and exploitation efforts; this 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 important.

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.⁴⁶ 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, however, we suspect that political realities preclude such a renegotiation. The various market restrictions and technology-transfer requirements have bought the assent of developing nations, and the mining authority has the ability 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, it is important to recognize that the UNCLOS regime may be significantly better than none at all.

Likewise, we are skeptical of proposals for countries like the United States to enter 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 with its own economic weaknesses. Among other things, international capital is mobile, and mining companies could simply relocate to non-member 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* “opt out” might accomplish little.

⁴⁵ See, e.g., Steven Groves, Why Reagan Would Still Reject the Law of the Sea Treaty, October 24, 2007, available at <http://www.heritage.org/Research/internationalorganizations/wm1676.cfm>.

⁴⁶ Cf. Edmund W. Kitch, The Nature and Function of the Patent System, 20 *Journal of Law and Economics*, No. 2, (265) (Oct. 1977) (describing the mineral prospecting system in the American west and the analogy to patent law).

F. Fisheries

Fisheries (and whaleries) vary in their characteristics. Some fish occupy a relatively stable and confined area in 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) or 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 have 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.

In contrast, fisheries in the high seas are not subject to regulation under UNCLOS rules. To the extent that such fisheries have avoided overexploitation to date, that fortunate result is simply because it is too costly for commercial operations to harvest at a level that would represent overfishing.

The biggest challenges are posed by fisheries that cross the EEZs of different states or that straddle an EEZ and the high seas. This has been a particular problem for whales. The states that share in the fishery (or whalery) have an incentive to overexploit the resource for the reasons we described in Part I. States have tried to overcome this problem in a series of treaties but the results so far 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.

States have also approached the overfishing problem with restrictions on particular technologies, such as drift nets, which also damage other forms of marine life.⁴⁷ By raising the cost of exploiting the fishery, these rules may temporarily mitigate overexploitation.

In sum, UNCLOS itself has few provisions that specifically address fisheries but its rules clearly have an impact on the management of fisheries. Aside from the rights granted by UNCLOS regarding fisheries contained in the exclusive regulatory zones of member states, much of the remaining international law governing fisheries is contained in other international agreements. On the whole, the resulting body of law is less than fully satisfactory, although it is hardly clear that solutions to the remaining problems exist that would cost less than the benefits.

⁴⁷ Some of the most prominent disputes through the years in the WTO, for example, have involved efforts by some nations to impose restrictions on fishing technology. The “tuna-dolphin” case involved the U.S. Marine Mammal Protection Act and its prohibition on tuna imports caught by fleets that did not use dolphin-safe technology. See *United States – Restrictions on Imports of Tuna (Mexico)*, DS21/R (September 3, 1991) (unadopted GATT panel report). The “shrimp-turtle” case involved a U.S. prohibition on shrimp imports from nations that did not require shrimpers to protect sea turtles adequately. See *WTO, United States – Import Prohibition of Shrimp and Shrimp Products*, WT/DS58/AB/R (Appellate Body Report adopted November 6, 1998).

G. Summary of General Themes

We can summarize as follows. 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 regulating the sea is to assign regulatory authority to the most efficient regulator. 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. This explains why 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 three miles wide. This was the distance of a cannon shot, and the so-called cannonball rule thus made it clear that the territorial sea was premised on the territorial state's ability to control it. 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.⁴⁸ UNCLOS would recognize many of these claims, as we have seen, settling on a twelve-mile coastal sea, 200-mile EEZ, and so forth. The evident explanation is the development of technology, which makes possible control of 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.⁴⁹ 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 claim larger and larger portions of the oceans as subject to their exclusive or near-exclusive control.

A second fundamental point is that UNCLOS shows a strong preference for carving up the sea into different regulatory domains controlled by different states, and against international regulation by international agencies. The reason for this preference is that states are better regulators than international agencies are. International agencies can only operate with the consent of all or most states, which makes them slow and inefficient.

Third, the particular bundles of jurisdictional rights in the different zones reflect a tradeoff between the benefits of conferring regulatory authority on a single state—which thus obtains the costs and 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 resources. Typically, the law resolves the tension by giving foreign states discrete rights (for example, innocent passage) while giving the coastal state otherwise plenary jurisdictional authority.

Fourth, UNCLOS responds to the legitimate equitable interests of poor nations in a confusing and occasionally unwise fashion. In some respects, it completely ignores issues of fairness. States with the longest coasts benefit the most from its rules; landlocked states benefit

⁴⁸ Churchill & Lowe, *supra* note ____.

⁴⁹ See Anderson, *supra* note ____ at 19.

very little. 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 (as opposed to nations that happen to have pivotal votes in the regulatory institutions).

Conclusion: Should the United States Ratify UNCLOS?

We have now argued that UNCLOS is on the whole an efficient agreement from a global standpoint. With a few exceptions, its major contours have a simple and readily identifiable efficiency rationale. The United States has yet to ratify the treaty, however, and we now turn to a narrower question of self-interest—is the United States better off by participating in the treaty regime than it is by opting out?

This question raises a familiar set of issues relating to what “objective function” the United States ought employ in deciding whether to ratify. Some observers may believe that the United States ought behave as an other-regarding nation, and thus accede to any treaty regime that is globally efficient. If so, the arguments we have set forth above push strongly for ratification.

Other commentators may allow that the United States should act in more self-interested fashion, yet believe that international cooperation on the law of the sea is part of a greater strategic game involving cooperation on many fronts. Here, too, an argument might be made for accession to a globally efficient arrangement on the grounds that such behavior will support broader coordination on globally efficient policies that will in the aggregate benefit the United States regardless of whether UNCLOS viewed in isolation confers a benefit.

Still other commentators may insist that the United States not ratify UNCLOS unless it can be demonstrated that UNCLOS alone is a source of net benefits for the United States. From this perspective, the most cogent criticism of UNCLOS focuses on the seabed provisions contained in Part XI.⁵⁰ We argued above that even if the seabed provisions are not optimal, they are likely better than nothing, given the risks of overexploitation.

Critics also worry about a provision that gives the International Tribunal for the Law of the Sea jurisdiction when naval forces seize a vessel on the high seas.⁵¹ Although another provision creates an exception for “military activities ... by government vessels and aircraft engaged in non-commercial service,”⁵² a narrow interpretation of this section would interfere with efforts to inspect and detain vessels being operated by criminals and terrorists.⁵³ However, we suspect that these concerns are more theoretical than real. Customary international law already forbids naval forces to stop and detain foreign vessels on the high seas merely on the

⁵⁰ See *supra*.

⁵¹ Art. 290(5).

⁵² Art. 298(1)(b).

⁵³ See Jeremy Rabkin, *supra* note ___, at 3-4. For a discussion of the relationship between UNCLOS and the Proliferation Security Initiative, a 2003 agreement among states to intercept ships suspected of carrying weapons of mass destruction, see Stuart Kaye, *Freedom of Navigation in a Post 9/11 World: Security and Creeping Jurisdiction*, in *The Law of the Sea: Progress and Prospects*, *supra* note ___, at 346, 356-61.

suspicion of criminality (there are exceptions for piracy and the slave trade, which UNCLOS preserves). UNCLOS thus maintains the status quo in this respect. This means that under current law, if U.S. forces do detain vessels controlled by suspected terrorists, the United States takes the risk that other nations will issue diplomatic protests and seek legal remedies. The novelty introduced by UNCLOS is just Tribunal jurisdiction. If the Tribunal adopts the broad interpretation, the United States will benefit, because its preferred rule will be incorporated into international law. If the Tribunal adopts the narrow interpretation, the United States will not be harmed, because the status quo legal rule will be maintained. The only risk is that the Tribunal will adopt an interpretation that is even narrower than current law. But this risk seems remote.⁵⁴

UNCLOS is sensible from both a global and an American standpoint. A better treaty could be imagined, but if, as seems likely, no alternative treaty could be negotiated as a replacement, the United States would be well-advised to ratify.

Readers with comments should address them to:

Eric A. Posner
University of Chicago Law School
1111 East 60th Street
Chicago, IL 60637
eric_posner@law.uchicago.edu

⁵⁴ Another concern about whether transit rights are expanded or narrowed by UNCLOS also strikes us as academic, and in any event extends beyond our expertise. See Bandow, *supra* note ____, at 11-12.

Chicago Working Papers in Law and Economics (Second Series)

For a listing of papers 1–450 please go to Working Papers at <http://www.law.uchicago.edu/Lawecon/index.html>

451. Tom Ginsburg, Public Choice and Constitutional Design (January 2009)
452. Richard Epstein, The Case against the Employee Free Choice Act (January 2009)
453. Adam B. Cox, Immigration Law's Organizing Principles (February 2009)
454. Philip J. Cook, Jens Ludwig, and Adam M. Samaha, Gun Control after *Heller*: Threats and Sideshows from a Social Welfare Perspective (February 2009)
455. Lior Jacob Strahilevitz, The Right to Abandon (February 2009)
456. M. Todd Henderson, The Nanny Corporation and the Market for Paternalism (February 2009)
457. Lee Anne Fennell, Commons, Anticommons, Semicommons (February 2009)
458. Richard A. Epstein and M. Todd Henderson, Marking to Market: Can Accounting Rules Shake the Foundations of Capitalism? (April 2009)
459. Eric A. Posner and Luigi Zingales, The Housing Crisis and Bankruptcy Reform: The Prepackaged Chapter 13 Approach (April 2009)
460. Stephen J. Choi, G. Mitu Gulati, and Eric A. Posner, Are Judges Overpaid? A Skeptical Response to the Judicial Salary Debate (April 2009)
461. Adam B. Cox and Eric A. Posner, The Rights of Migrants (April 2009)
462. Randal C. Picker, The Google Book Search Settlement: A New Orphan-Works Monopoly? (April 2009, revised July 2009)
463. Randal C. Picker, The Mediated Book (May 2009)
464. Anupam Chander, Corporate Law's Distributive Design (June 2009)
465. Anupam Chander, Trade 2.0 (June 2009)
466. Lee Epstein, William M. Landes, and Richard A. Posner, Inferring the Winning Party in the Supreme Court from the Pattern of Questioning at Oral Argument (June 2009)
467. Eric A. Posner, Kathryn Spier, and Adrian Vermeule, Divide and Conquer (June 2009)
468. John Bronsteen, Christopher J. Buccafusco, and Jonathan S. Masur, Welfare as Happiness (June 2009)
469. Richard A. Epstein and Amanda M. Rose, The Regulation of Sovereign Wealth Funds: The Virtues of Going Slow (June 2009)
470. Douglas G. Baird and Robert K. Rasmussen, Anti-Bankruptcy (June 2009)
471. Bernard E. Harcourt, Alon Harel, Ken Levy, Michael M. O'Hear, and Alice Ristroph, Randomization in Criminal Justice: A Criminal Law Conversation (June 2009)
472. Bernard E. Harcourt, Neoliberal Penalty: A Brief Genealogy (June 2009)
473. Lee Anne Fennell, Willpower and Legal Policy (June 2009)
474. Richard A. Epstein, How to Undermine Tax Increment Financing: The Lessons of *ProLogis v. City of Chicago* (June 2009)
475. Randal C. Picker, Online Advertising, Identity and Privacy (June 2009)
476. M. Todd Henderson, Credit Derivatives Are Not "Insurance" (July 2009)
477. Lee Anne Fennell and Julie Roin, Controlling Residential Stakes (July 2009)
478. Douglas G. Baird, The Holmesian Bad Man's First Critic (August 2009)
479. Douglas G. Baird, The Bankruptcy Exchange (August 2009)
480. Jonathan Masur and Eric A. Posner, Against Feasibility Analysis (August 2009)
481. Lee Anne Fennell, The Unbounded Home, Property Values beyond Property Lines (August 2009)
482. Bernard E. Harcourt, Henry Louis Gates and Racial Profiling: What's the Problem? (September 2009)
483. Stephen J. Choi, Mitu Gulati, Mirya Holman, and Eric A. Posner, Judging Women (September 2009)
484. Omri Ben-Shahar, One-Way Contracts: Consumer Protection without Law (October 2009)
485. Ariel Porat, Expanding Liability for Negligence *Per Se* (October 2009)
486. Ariel Porat and Alex Stein, Liability for Future Harm (October 2009)
487. Anup Malani and Ramanan Laxminrayan, Incentives for Surveillance of Infectious Disease Outbreaks (October 2009)
488. Anup Malani, Oliver Bembom and Mark van der Laan, Accounting for Differences among Patients in the FDA Approval Process (October 2009)
489. David Gilo and Ariel Porat, Viewing Unconscionability through a Market Lens (October 2009)

490. David Weisbach, Instrument Choice Is Instrument Design (October 2009)
491. M. Todd Henderson, Justifying *Jones* (November 2009)
492. Eric A. Posner, *ProCD v. Zeidenberg* and Cognitive Overload in Contractual Bargaining (November 2009)
493. Randal C. Picker, Antitrust and Innovation: Framing Baselines in the Google Book Search Settlement (November 2009)
494. Richard A. Epstein, Against Permittitis: Why Volunteer Organizations Should Regulate the Use of Cancer Drugs (November 2009)
495. Richard A. Epstein, Heller's Gridlock Economy in Perspective: Why There Is Too Little, Not Too Much, Private Property (November 2009)
496. Richard A. Epstein, *NRA v. City of Chicago*: Does the Second Amendment Bind Frank Easterbrook? (November 2009)
497. Randal C. Picker, Easterbrook on Copyright (November 2009)
498. Omri Ben-Shahar, Pre-Closing Liability (November 2009)
499. Randal C. Picker, Assessing Competition Issues in the Amended Google Book Search Settlement (November 2009)
500. Saul Levmore, Ambiguous Statutes (November 2009)
501. Saul Levmore, Interest Groups and the Problem with Incrementalism (November 2009)
502. Tom Ginsburg, The Arbitrator as Agent: Why Deferential Review Is Not Always Pro-Arbitration (December 2009)
503. Nuno Garoupa and Tom Ginsburg, Reputation, Information and the Organization of the Judiciary (December 2009)
504. Eric A. Posner and Alan O. Sykes, Economic Foundations of the Law of the Sea (December 2009)