

Review of the economics of fisheries licensing

Rodney Beard

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Restricted Access to Common-Property Fishery Resources: A Game-Theoretic Analysis

Colin W. Clark

Chapter

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Abstract

The "tragedy of the commons" (Ref. 1) has proved particularly difficult to counteract in the case of marine fishery resources (Refs. 2–4), where the establishment of individual property rights is virtually out of the question. Common ownership is the fundamental fact affecting almost every regime of fishery management.

Keywords

Fishery Management Differential Game Fishery Resource Yellowfin Tuna
Economic Rent

Clark, C. W. (1980). Restricted access to common-property fishery resources: a game-theoretic analysis. *Dynamic optimization and mathematical economics*, 117–132.

Cooperative Fisheries Arrangements between Pacific Coastal States and Distant-Water Nations

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The widespread implementation of extended fisheries jurisdiction (EFJ) throughout the world has meant that substantial fishery resources, which hitherto had been international common property, have become the property of coastal states. One question that this development raises is what is the future role of cooperative fisheries arrangements between coastal states and distant-water nations in the newly created zones. I address the question of whether such arrangements should be viewed as temporary, with the ultimate elimination of distant-water activity in coastal state zones, or as permanent components of the new framework of world fisheries management emerging as a consequence of EFJ. Although many coastal states at the dawn of EFJ viewed cooperative fishery arrangements largely as temporary expedients, the economics of such arrangements indicate that coastal states in the Pacific and elsewhere would benefit from maintaining many, and perhaps most, such arrangements on a permanent basis. This is true whether the coastal states are developing or developed. However, the opportunities for long-term cooperative arrangements in the Pacific and elsewhere are endangered by uncertainties and ambiguities in coastal states' rights to the fishery resources within their zones. Two major sources of uncertainty are the inadequate management capacity of some coastal states and the transboundary nature of many of the stocks in their waters.

Munro, G. Cooperative fisheries arrangements between Pacific coastal states and distant water nations, in: *Renewable resources in the Pacific: proceedings of the 12th Pacific Trade and Development Conference*, held in Vancouver, Canada, 7-11 Sept. 1981.



Allocation Problems Between National and Foreign Fisheries with a Fluctuating Fish Resource

John R. Beddington and Colin W. Clark

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Abstract



Abstract

The problem of allocating the rights to exploit fish resources between domestic and foreign fleets is posed in the context of a fluctuating fish stock. Such fluctuations are ubiquitous and are driven by the recruitment variation. A number of biological models are proposed to describe the dynamics of the resource. It is supposed that harvesting by both foreign and domestic fleets is permitted, and the possibilities for allocation between these two fleets are examined. The optimal allocation policy is derived for a number of different economic and biological situations. In many situations it will be optimal for there to be a mix of foreign and domestic fishing on the resource. This result implies that licensing and joint-venture agreements between coastal states and distant-water fishing nations may be desirable from the point of view of the coastal state, even in the long term.

Beddington, J. R., and Clark, C. W. (1984). Allocation problems between national and foreign fisheries with a fluctuating fish resource. *Marine Resource Economics* 1(2), 137-154.

Coastal states, distant-water fleets and EFJ

Some long-run considerations

Gordon R. Munro

Coastal states' powers and obligations vis-à-vis distant-water nations are reviewed under the terms of the LOS Convention. Cases for and against coastal states entering into cooperative fisheries agreements (cfas) with distant-water nations are considered and the economics of distant-water fishing operations and cfas commented upon. It is suggested that if a long-term, distant-water nation presence is to be maintained, the nature of the arrangements must be such as to encourage reinvestment in distant-water fleet capacity.

Keywords: Fisheries economics; Coastal states; Law of the sea

It is now generally accepted that, regardless of the ultimate fate of the Law of the Sea Convention,¹ the widespread implementation of Extended Fisheries Jurisdiction (EFJ) is virtually irreversible.² It is also generally accepted that EFJ carries with it the promise of a stream of benefits for coastal states through time. Many articles have now appeared in this and other journals analysing the nature of these expected benefits.³

However, it is also clear that, for any given coastal state, these benefits could prove to be ephemeral unless the coastal state addresses successfully the several resource management issues raised by EFJ. One of these issues is the role, if any, to be played by distant-water fleets in the exploitation of fisheries within the coastal state's exclusive economic zone (EEZ).⁴

At the dawn of EFJ, for most coastal states this issue appeared to be

Munro, G. R. (1985). Coastal states, distant-water fleets and EFJ: some long-run considerations. *Marine Policy*, 9(1), 2-15.



Research Article

COASTAL STATES, DISTANT WATER FISHING NATIONS AND EXTENDED JURISDICTION: A PRINCIPAL-AGENT ANALYSIS

F.H. Clarke, G.R. Munro

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Abstract

This paper is concerned with the issue of optimal economic arrangements between coastal states and distant water fishing nations under Extended Jurisdiction. It is argued that the issue is appropriately examined within the framework of principal-agent analysis. The coastal state, having property rights to the relevant fishery resources, is seen as the principal; the distant water fishing nation (s) is (are) seen as the agent(s). Circumstances under which it will, and will not, be possible for the coastal state to establish incentive schemes that will allow it to achieve first best situations are analysed.

Clarke, F. H., and Munro, G. R. (1987). Coastal states, distant water fishing nations and extended jurisdiction: a principal-agent analysis. *Natural Resource Modeling*, 2(1), 81-107.

Coastal States and Distant-water Fishing Nation Relations: An Economist's Perspective

GORDON R. MUNRO

Introduction

The widespread implementation of Extended Fisheries Jurisdiction (EFJ) has confronted coastal states with several resource management problems. One of these consists of the economic relations, if any, that the coastal state should establish with distant-water fishing nations (DWFN's), seeking access to the coastal state's 200-mile zone.

Several of the other papers presented here deal with specific aspects of the issue. This paper, on the other hand, will concern itself with the question of the analytical framework to be used by economists in studying this issue. It will offer some suggestions with respect to possible components of the framework.

In doing so, the paper will restrict itself to the coastal state's perspective of EFJ and the management issues arising therefrom. It goes without saying, of course, that an enlightened coastal state will attempt to account

of coastal states to DWFN's under the U.N. Law of the Sea Convention and the significance of these obligations. The second is concerned with the designated beneficiaries of EFJ within the coastal state¹.

With regard to the first question, the Law of the Sea Convention, which arose from the U.N. Third Conference on the Law of the Sea, has yet to be signed, let alone ratified, by several important maritime nations. The Convention may never achieve the status of international treaty law. Nonetheless, it now seems to be generally accepted that Part V of the Convention on the Exclusive Economic Zone (United Nations, 1982) has achieved the status of customary international law (Fleischer, 1984) and has come to provide most, if not all, of the "rules of the game" under EFJ.

Even the United States, the most prominent of the nonsigners of the Convention, has accepted the concept of the Exclusive Economic Zone (EEZ).² Hence, when one considers coastal state obligations

exploring and exploiting, conserving and managing... living (as well as nonliving) resources within the state's EEZ (United Nations, 1982). As such, the Article, to all intents and purposes, grants the coastal state property rights over the fishery resources within its 200-mile zone. The one possible exception consists of the highly migratory species (*i.e.*, tunas), about which there has been great controversy. This will be commented on later.

An apparent major qualification to the coastal state's fishery property rights, a qualification of direct relevance to coastal state obligations to DWFN's, is to be found in Article 62. Article 62 contains the "surplus principle," which can be stated briefly as follows. For each fishery within its 200-mile zone, the coastal state is to determine its harvesting capacity in relation to the total allowable catch (TAC) set for the fishery. Where the harvesting capacity falls short of the TAC, a surplus is deemed to exist. Article 62 calls upon the coastal state

Munro, G. R. (1989). Coastal states and distant-water fishing nation relations: an economist's perspective, *Marine Fisheries Review*, 5(1), 3-10.

The Production of Fishing Effort and the Economic Performance of Licence Limitation Programs

H. F. Campbell and R. K. Lindner

I. INTRODUCTION

Anderson (1985) has demonstrated that fishery regulation by means of licence limitation may generate rents in a commercial fishery. He points out that, while restricting the amount of a major input used in the production of effort may increase the unit cost of effort, the reduction in the total amount of effort devoted to the fishery will yield a benefit through a shift of resources to higher value uses elsewhere. He argues that licence limitation programs should not be rejected out of hand because they increase the cost of fishing effort. Instead, the costs and benefits should be analyzed to determine whether the program can produce a net gain and, if so, at what level of the program the net gain is maximized. Such an optimum would of course be a second-best optimum as compared with that which could in theory be achieved by a sole

the welfare effects of a licence limitation program for the Tasmanian rock lobster fishery, and Dupont (1988) who analyzes input substitution and rent dissipation in the British Columbia salmon fishery. At a more general level it may be useful to analyze how the characteristics of the production function for fishing effort under a licence limitation program influence the capacity to generate rents equal to a significant proportion of the theoretical maximum. Fisheries in which suitable characteristics exist could then be the subject of detailed analysis to determine the extent of the optimal program. For fisheries which do not possess suitable characteristics, an investigation of alternative methods of regulation is likely to prove more fruitful. The purpose of the present paper is to examine the influence of the parameters of the production function for effort on the likely net social benefits of licence limitation.

Campbell, H. F., & Lindner, R. K. (1990). The Production of Fishing Effort and the Economic Performance of Licence Limitation Programs. *Land Economics*, 66(1), 56-66.



Restricted capacity and rent dissipation in a regulated open access fishery

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Abstract

A common strategy for limiting the total annual catch in a fishery is to restrict entry and season length. We examine the results of this strategy when entry limitation amounts to a limit on capital, but fishing firms can vary an unrestricted input, and thereby use the restricted input more intensively. Under these regulatory constraints, fishing firms will earn rents that depend on the elasticity of substitution between restricted and unrestricted inputs. Using simulations with data from the Alaskan pollock fishery, rents and season length are shown to depend on fish and variable input prices, sometimes in surprisingly non-monotonic ways.

Deacon, R. T., Finnoff, D., & Tschirhart, J. (2011). Restricted capacity and rent dissipation in a regulated open access fishery. *Resource and Energy Economics*, 33(2), 366-380.



Fishing access agreements and harvesting decisions of host and distant water fishing nations

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Abstract

The declaration of exclusive economic zones (EEZs) granted coastal states sovereign rights over the marine resources in their EEZs and enabled developing coastal states to legally charge access fees to distant water fishing (DWF) nations for access to the resources in these waters. Despite the potential for economic gains, however, the ability of coastal states to benefit from the granting of sovereign rights and to ensure the sustainable use of their fisheries resources depends on how domestic fishing effort responds to the harvesting decisions of the DWF nations. We develop a stylized bioeconomic model to explore the change in fishing behavior of host and DWF nations when the two nations enter into an access agreement with varying levels of access fee.

Nichols, R., Yamazaki, S., Jennings, S., and Watson, R. A. (2015). Fishing access agreements and harvesting decisions of host and distant water fishing nations. *Marine Policy*, 54, 77-85.

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International Fisheries Access Agreements and Trade

Tatyana Chesnokova & Stephanie McWhinnie 

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Abstract

International fishery access agreements allow fishermen from one country to harvest fish in another country's waters. We empirically examine why countries sign fisheries access agreements with each other and compare these to the characteristics of countries that choose to undertake international trade. Using a unique global panel dataset, we show that access agreements and fish exports are driven by two key motives: a pattern of comparative advantage in fishing, which depends on fish stocks and fishing capacities; and gravity factors of economic size and distance. Our results suggest that most gravity factors work similarly for the dual pathways of agreements and exports: larger countries that are closer to each other are more likely to sign access agreements or to trade. However, the pattern of advantage is determined differently: source countries with larger fishing capacity are more likely to export fish, while source countries with lower fishing capacity are more likely to sign agreements.

Chesnokova, T., & McWhinnie, S. (2019). International fisheries access agreements and trade. *Environmental and Resource Economics*, 74(3), 1207-1238.