PROPERTY RIGHTS AND EQUITY IN FISHERIES MANAGEMENT: THE SIGNIFICANCE OF VERTICAL INTEGRATION

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ABSTRACT

This paper explores the relationship between property rights and equity in fisheries management with a particular focus on vertical integration. The initial two sections of the paper discuss the impact of IFQs on efficiency and distribution/equity, respectively. The third section highlights the crucial role of vertical integration. Vertical integration is both an instructive indicator of industry preferences regarding IFQs as well as a focal point of contention when devising the details of an IFQ program. The fourth section discusses additional factors that affect the establishment and evolution of IFQ programs in a given country. The paper concludes with some guidance for fisheries managers. The claims that are advanced are based upon the author's assessments of the IFQ programs in Iceland, Norway, Canada and the United States. The author is developing a book manuscript based on this research that will also include assessments of New Zealand and Australia. Due to space limitations in this paper specific country examples have not been included.

EFFICIENCY GAINS

Much of the zeal for IFQs stems from their impacts on economic efficiency. Unlike the contested claims regarding IFQ impacts on ecological sustainability, the efficiency gains associated with IFQ programs in fisheries are theoretically powerful and empirically well supported. The theoretical basis for the efficiency gains associated with IFQs dates back to two seminal articles (Gordon 1954; Scott 1955) which demonstrated that societal rents would be completely dissipated under an open-access fishery and that sole ownership of the resource would instead allow society to capture those rents. Although IFQs do not constitute sole ownership the fixed shares that each individual quota holder holds lead to the same behavioral incentive to end what is referred to as a "race for the fish."

One need not be an economist in order to understand the behavioral logic associated with a race for the fish. Two the most common forms of fisheries regulations that exist in the absence of an IFQ program are TACs without individual allocations and season limits. When TACs exist without individual allocations those who catch their fish quickly will obtain the greatest share while those who are slow to catch their fish risk having their access cut off when the TAC is reached. A race for the fish ensues and actors with bigger, faster and more technologically advanced vessels usually fare better than those with slower, smaller vessels that use more traditional technology. The latter fishers may be able to operate at significantly less cost but by doing so they forfeit a significant share of the TAC to those who catch it first. With season limits the logic is similar even though the open season is usually fixed while the TAC is

allowed to vary. With a fixed window of time fishers try to catch as much as possible which gives rise to a comparable incentive to invest bigger, faster and more technologically advanced vessels. Given the fact that season lengths are usually set with a target TAC in mind they often become shorter in the wake of new capital investment and the increased fishing intensity associated with it. Shorter seasons reinforce the need for faster boats with greater fishing capacity and the vicious cycle feeds itself. In some fisheries this type of spiral has culminated in massive fishing derbies or open seasons that last no more than a few days a year.

The race for the fish is driven by the incentive of each individual fisher to maximize their share of the available fish by catching as many fish as possible as quickly as possible. Under an IFQ program, the share of each individual fisher is fixed in advance. Fishers are prohibited from landing more fish than they've been allocated. Catching fish before others do will do nothing to increase their share. The only way a fisher can increase their share is by purchasing another fisher's quota in an ITQ program. Since fishers can no longer affect the size of their slice of the pie they instead focus on getting the most value out of the slice that they have. The basic incentives under an IFQ program are to minimize the cost of catching a given share of fish and to maximize the price obtained for it. And when the behavioral imperatives associated with a race for the fish are relaxed the opportunities for minimizing costs and maximizing prices abound.

There are opportunities for efficiency gains with both fixed and operational costs. On the fixed cost side, fishers could choose to deploy smaller boats or less capital-intensive harvesting methods that may catch fish a little more slowly but that do it with significant cost savings. Operational cost savings can result from smaller crews and greater flexibility in planning trips that again sacrifice a little time and fishing power for significant cost reductions.

On the price side, the opportunities for enhancing the value of harvested fish are substantial. When fishers land their fish within relatively brief windows of time under season limits or impending TAC-triggered closures the resulting glut tends to depress wholesale prices. When the fishing season is spread out over a longer period of time prices are usually higher. Fishers can also focus greater attention on handling and fish quality when relieved from the pressure to catch as many fish as quickly as possible. This results in price premiums. Perhaps most importantly, when IFQs do not have any season limits fishers can better negotiate with brokers, processors and retailers in order to target their catches in response to market conditions as opposed to simply fishing within a brief window of time and taking what the market gives them. Given the historical fluctuations and perishable nature of seafood commodities the ability to contract in advance for specific quantities of specific species to be delivered at specific times garners significant price premiums in the seafood market. Few fishers that have never been exposed to an IFQ program fully appreciate the magnitude of the dockside price increases that usually occur under such programs. These prices have been known to double or triple under IFQ programs.

In addition to the efficiency gains realized by individual actors many economists emphasize the aggregate efficiency gains that can be realized when IFQs are fully transferable with minimal restrictions. Assuming that different fishers operate with varying levels of efficiency it follows that IFQs will be more valuable to the more

efficient fishers. If the most efficient fishers offer enough money to the less efficient ones than the less efficient ones will exit the industry and the overall efficiency of the industry will improve (Hannesson 2004). Temporary transfers are also important for program efficiency in that they provide the short-term flexibility to reallocate quota from those least willing to those most willing to fish in the short term and to cover quota overages. However, access to capital is an important prerequisite for permanent purchases of quota under an ITQ program. Efficient, small-scale fishers may often find it difficult to finance such quota purchases. Larger-scale actors with the means to finance quota purchases can more easily acquire it even if they're less efficient in terms of overall cost vs. revenue calculations in their existing operations. Why would a less efficient fisher or firm want to buy more IFQs? Because economies of scale and increasing returns to IFQ holdings can make quota acquisitions profitable regardless of a fisher's initial level of efficiency. Fishers and firms can become more efficient by increasing the scale of their operations. And barring any rules that preclude the practice they can also increase profits by obtaining revenues from quota leasing with no operational costs.

Small-scale fishers who do not have the mobility or equipment to access offshore and/or unregulated species may not have any other option but to use their harvesting assets in fisheries regulated under an IFQ or ITQ program. If such actors find that their quota allocations are insufficient for profitable operations, they can either "buy in" or "sell out". These decisions can usually be made on a temporary (purchasing or leasing quota for one season) or permanent basis. Access to capital is not a prerequisite for leasing quota since the lease price can be recovered as a portion of the sale of fish. But fishers that lease quota from others capture significantly less rent from a given catch while absorbing all of the associated operating costs. Permanent quota purchases can be extremely lucrative investments, but high quota prices make access to significant amounts of capital a necessary prerequisite for prospective buyers (McCay 1995; Palsson and Helgason 1995).

DISTRIBUTIVE IMPACTS AND THEIR EQUITY IMPLICATIONS

It was noted in the previous section that ending the race for the fish with an IFQ program allows quota owners to reap greater rents from a given amount of fish by lowering costs and increasing prices. Quota owners can operate more deliberately, use less capital and labor, and better calibrate their harvesting activity to respond to market demands. While much of this rent increase can be attributed to efficiency improvements some of it results from the increased bargaining power of quota owners. This means that some of the additional rents that quota owners gain results from their ability to renegotiate their share of the rent from a given amount of harvested fish vis-à-vis other actors in the commodity chain. In this sense, many of the sector and market impacts of IFQs involve redistribution in addition to increases in efficiency.

Less demand for fishing labor that results from more deliberate fishing and consolidation of harvesting activity leads to a surplus of unemployed crewmembers. Those that want a job on a fishing vessel but have difficulty finding it will work for less. This can lead to lower crewmember wages in an IFQ fishery. In cases where crewmember wages are determined by allocating a given a share of vessel profits IFQs could conceivably raise crewmember wages by increasing boat vessel

profitability. However, quota owners often decrease crewmembers' share of the rent from a fishery by abandoning traditional profit sharing arrangements in favor of a straight salaries. Crewmembers have reported working longer hours and making less money in many of these cases (Alcock 2003).

The historic distribution of fisheries rent is often similar to the following scenario: operating expenses are deducted from the total revenue from a given fishing trip, and net profits are split 50%-50% among the vessel owner and the crew. Where captains are also owners, their share is typically larger. Under some ITQ programs there is a robust market for quota leasing and a common practice is for owners to treat leasing costs as an operating expense. Empirical evidence suggests that leasing quota for more than 50% of a species' current market price is not uncommon (Alcock 2003; Palsson and Helgason 1995; Eythorsson 1996). Where leasing costs are treated as operating expenses, the net result is a substantial redistribution of fisheries rent from crewmembers to quota owners, with the primary beneficiaries being those quota owners who lease their quota rather than fishing it themselves.

Quota owners also benefit from increased bargaining power vis-à-vis downstream actors in the fishing and seafood sector. When large amounts of fish are landed in small amounts of time the resulting glut eliminates the bargaining leverage of the fisher. Fishers have historically been price takers. If fishers have exclusive rights to a given amount of fish and if they can catch it at their discretion it vastly enhances their bargaining power. Longer fishing seasons eliminate gluts and spread out the supply of fish. With the ability to advance contract the savvy quota owner is then well positioned to look around for a good deal. Processors are forced to make concessions under these conditions and award better prices to retain a steady supply of fish. This results in a redistribution of rent from processors to quota owners.

Contemporary arguments in favor of IFQ adoption steadfastly assert that the actors operating in a given fishery will be much better off as quota owners. For those actors that acquire a sufficient amount of quota, this is undoubtedly true. However, the fishing and seafood industry consists of a complex commodity chain with significant degrees of heterogeneity at every level. Quota owners make out very well but not everyone becomes a quota owner. In most cases, vessel owners are the primary recipients of IFQs. But who are the vessel owners? In some fisheries vessel owners may operate or captain their respective vessels. In others owners might own multiple vessels that employ separate captains and crew. Owners can also include small to medium size firms from the processing sector and in large-scale, offshore fisheries it is not uncommon for vessels to be owned by large corporations and their subsidiaries. Who initially receives and/or ultimately obtains control of fishing quota under a given IFQ program has significant distributive implications. Rents from the fishery are redistributed to quota owners from both upstream and downstream segments of the commodity chain on account of the bargaining leverage they gain over wages and prices. Leverage over wages stems from lower labor demands and quota owners' control over access while leverage over prices stems from quota owners' ability to spread their fishing seasons out over longer time periods, calibrate market supply with market demand and shop around for the best deal.

The equity implications inherent in the establishment of an IFQ program are largely a function of the programmatic details that regulate quota ownership. My usage of the

term equity denotes a sense of fairness in the distribution of rents from the fishery. The most salient equity concerns derive from programmatic details regarding ownership eligibility, initial allocation mechanisms, and quota transferability. IFQ programs that are typically looked upon favorably with respect to equity criteria are those that use allocation mechanisms that privilege small-scale fishers and/or vulnerable segments of the industry. Equally important are the inclusion of what might best be thought of as distributive safeguards that restrict quota eligibility and/or quota transferability in a manner that preserves the ownership stake of these groups. This will ensure them a given portion of fisheries rents. Such restrictions pose constraints on the potential efficiency gains associated with the program, however. IFQ programs that are looked upon less favorably with respect to equity criteria are those that do not consider it to be an important consideration for an allocation mechanism as well as those that include minimal restrictions on eligibility and/or transferability. The latter types of programs are thought to benefit most from efficiency gains.

THE SIGNIFICANCE OF VERTICAL INTEGRATION

The above discussion should illuminate how vertical integration is significant in two important respects. First, existing degrees of vertical integration are a useful predictor of whether or not a given fisheries sector will adopt some form of IFQs. Second, the political struggles over the details of IFQ programs are often best understood in terms of their ability to facilitate or impede higher degrees of vertical integration.

The presence of vertical integration is an instructive indicator for a given fishery's preferences regarding IFQs. IFQ programs will typically be embraced by vertically-integrated seafood firms that own fishing vessels. These firms are usually aware of the efficiency gains associated with IFQs that were discussed in the previous chapter. They are also sensitive to the downstream bargaining leverage that would result from control over reliable supplies of fish. So long as these firms can acquire adequate amounts of quota through the initial allocation mechanisms or through ITQ purchases there is little reason to resist IFQs.[1]

The preferences of independent harvesters, especially smaller-scale fishers, are more complex. Most fisheries sectors are characterized by longstanding conflicts between harvesters and processors and it is not uncommon to witness the former group maintaining and/or controlling access to fisheries with the latter group controlling dockside prices. It is not always clear that independent fishers fully appreciate the degree to which dockside prices tend to increase under an IFQ program or the opportunities to increase operational efficiency. They are, however, quite sensitive to the potential loss of access to fisheries that accompany IFQ programs. And they are especially apprehensive of the possibility that downstream interests will gain control over the fishery. In short, independent harvesters tend to fear vertical integration. If they view a given IFQ program as a precursor to and/or a facilitator of vertical integration then they will likely resist it. As noted, however, it is possible to establish an IFQ program that prohibits and/or limits vertical integration while empowering

[1] In the few cases that I am aware of where vertically integrated firms resist IFQ programs the enforcement of fisheries regulations is usually lax. These actors associate the introduction of IFQs with the enforcement of catch restrictions where such restrictions have yet to be enforced. Their resistance to IFQs is better understood as a preference for unregulated fishing.

quota owners vis-à-vis downstream fishing interests. If independent harvesters view a prospective IFQ program as a means of preventing or limiting vertical integration then they will likely support it (Alcock 2003).

If a given fishing sector is largely characterized by vertically-integrated firms a priori to the introduction of an IFQ program then the likelihood of the sector adopting property rights is high. Furthermore, the rights are more likely to be defined in a manner that emphasizes efficiency over distributive concerns. Vertically-integrated firms should be favorably disposed to IFQs and independent harvesters should be less concerned with preventing vertical integration in fisheries that are already vertically integrated. Even if independent harvesters are inclined to resist, their ability to block and/or shape property rights reforms will often be limited in cases where they account but for a small proportion of production in a given fishery.

If a given fishery is largely characterized by independent harvesters a priori to the introduction of an IFQ program then the adoption of property rights reforms is less likely. If property rights are adopted, they will likely be defined in a manner that privileges distributive concerns over efficiency considerations. The logic here is the same as in the above case. Independent harvesters will likely have stronger concerns about vertical integration where it not prevalent and their ability to influence the design of an IFQ program will be greater where they are the primary actors in a fishery.

Prospects for IFQ adoption in heterogeneous fisheries with a more even balance of vertically integrated firms and independent harvesters is harder to determine solely on the basis of economic structure. In such cases the adoption of IFQ programs and its specific characteristics will be determined by the relative political influence of different groups and the degree to which they compromise over programmatic details. Political organization, political influence and willingness to compromise will in turn be shaped by a broader set of regulatory and political institutions. These latter factors will be discussed more in the next section (Alcock 2002; Alcock 2003).

With respect to programmatic details, we should expect the upstream and/or large-scale segment of the fishing industry to fight to ensure that they are eligible to acquire fishing quota through an initial allocation or by purchasing it from those receiving initial allocations. Regardless of initial allocations, this segment will push hard for minimal restrictions on quota transferability in order to facilitate consolidation. Smaller-scale, independent harvesters willing to consider and/or experiment with an IFQ program will usually fight to restrict program eligibility to existing vessel owners. They will sometimes seek to restrict quota ownership to owner-operators as a means of limiting the scale of operations and precluding vertical integration. This segment often pushes for concentration limits and other restrictions on transferability at the outset of a program. Over time, independent vessel owners wishing to exit the industry begin to realize that the largest buyouts will likely come from with the greatest capital resources – larger-scale and/or vertically integrated firms. This often results in the relaxation of transferability restrictions. All segments of the fishing industry that are eligible to receive quota will likely endorse whatever allocation principle favors their particular circumstances. This will include principles that favor catch history, existing capital investments and/or equal shares. Few segments favor

auction mechanisms but those with the greatest access to capital tend to be the least resistant.

OTHER FACTORS THAT DETERMINE THE PRESENCE AND FORM OF PROPERTY RIGHTS IN FISHERIES

The economic structure of a given fisheries sector will determine how preferences regarding property rights arrangements are distributed across the sector. As argued above, vertical integration is perhaps the most important indicator. Vertically integrated segments are likely to support the introduction of IFQ programs and push for programmatic details that allow for greater concentration and integration. Segments that are characterized by smaller-scale, independently owned vessels are less likely to support IFQ programs unless they believe such programs can be designed in a manner that protects against vertical integration.

There are a number of additional factors impacting the establishment and evolution of property rights arrangements in fisheries that warrant mention. First is the manner in which different segments of the fishing industry organize themselves politically. Do multiple segments of the fishing industry coexist within one large organization or are there separate organizations representing different segments of the industry? Do the most relevant organizations operate nationally or are they regional or local in scope? Are some segments of the industry more effectively organized than others? The political organization of fishing interests within a given country is an important determinant of the relative political influence of different segments of the industry (Holm et al. 1998). Where larger-scale vessel owners and associations representing processors and/or processor-owned vessels are effectively organized ITQ programs with minimal restrictions on ownership and transferability are more likely. Where small-scale vessel owners and/or associations representing fishing labor and fishing communities are effectively organized IFQ programs are less likely and those that are present will likely embody significant restrictions on ownership and transferability. Importantly, political organization is shaped by both the underlying distribution of fishing interests as well as the institutional structure in which those interests compete.

The character of political institutions is thus another important factor shaping the development of property rights regimes in a given country. Federal political systems by definition grant greater autonomy to state and regional governments than unitary political systems. They are also more common in countries with large geographic areas which in turn are likely to embody greater heterogeneity in economic structure and commercial species across different regions. Comprehensive IFQ systems are therefore much more difficult to establish at the national level under federal systems than they are under unitary systems. IFQ programs under federal systems are likely to be established at the regional, provincial or state level and limited in scope. Conversely, greater variety in the form of IFQ programs is likely to be witnessed under federal systems.

A second characteristic of political institutions that shapes property rights reforms in fisheries sectors is the degree to which the institutions are corporatist vs. pluralist (Lijphart 1999). In corporatist systems institutional bargaining tends to be centralized with a dominant union or interest group serving as a mechanism for channeling industry influence. Those segments of the industry that become marginalized in the

organizational structure of the industry often have little recourse for articulating their concerns. Channels of influence are more numerous under the federal structures. This can lead to frequent deadlocks that stall policy development and piecemeal approaches to constructing a property rights regime (Burke and Brander 1999).

Learning and experience also play an important role in the evolution of IFQ programs. The early sections of this paper depict a number of anticipated impacts of IFQ programs on efficiency and distribution. For some segments of the fishing industry (very small scale vs. very large scale) this translates into an unequivocal set of policy preferences. For other segments there is a great deal of uncertainty regarding the net impacts of expected efficiency gains coupled with expected distributive losses. Anecdotally, my research has led me to believe that under moderate levels of uncertainty about rule changes fishers tend to overestimate distributive threats while underestimating efficiency gains. A number of fishers seem to place a greater emphasis on efficiency considerations than on distributive concerns as they gain experience with an IFQ program. This translates into a commonly observed relaxation of restrictions on transferability over time (Alcock 2002).

Finally, the policy preferences of state leaders and fisheries regulators are not to be overlooked. The perspective adopted in this paper takes an admittedly bottom-up or demand side orientation toward property rights. This is not meant to dismiss top-down or supply side factors (Wyman 2005). Different segments of the fisheries sector clearly push for their preferred policies but government officials no doubt pull policies along in a direction consistent with their bureaucratic interests and/or the political philosophy of the political party to which they belong. In general, it would seem that officials that profess an affinity for market rationality and/or that are especially sensitive to business interests tend to be supportive of concept of IFQs and their purported impacts on efficiency. Officials that profess concerns with socioeconomic stability and/or that are especially sensitive to labor interests tend to be more wary of IFQs and their purported impacts on distribution.

GUIDANCE FOR ACADEMICS AND PRACTIONNERS

The primary message to academics and practitioners is that greater attention should be given to the distributive stakes inherent in establishing IFQ programs. Much of the academic literature from the economics discipline either ignores issues of distribution or adopts a cavalier attitude toward them. The distributive impacts of IFQ/ITQ programs involve more than the loss of employment that inevitably occurs when bloated industries are rationalized and consolidated. It also involves important changes in bargaining power for different segments of the industry that result in the redistribution of fisheries rents across these segments. The segment or segments that control quota will benefit at the expense of those that don’t.

Vertical integration plays a crucial role in distribution. This paper adopts an agnostic stance with respect to the ideal balance between efficiency and equity considerations as well as the optimal level of vertical integration. It suggests, rather, that the most appropriate balance of criteria considerations and associated stance on vertical integration should vary with the prevailing economic and political conditions in a given case. When high levels of vertical integration are present a priori to the introduction of IFQ programs redistribution should be less of an issue than when

levels of vertical integration are moderate or low. Given the greater potential for redistribution under the latter conditions distributive safeguards should be considered when designing IFQ programs in these cases. Even if one does not feel that distributive concerns warrant compromises in programmatic efficiency one should consider what is politically feasible in a given set of conditions. It may be that the political influence of resistant segments of the fisheries sector and additional constraints associated with the prevailing institutional and regulatory structure preclude what one might think of as an ideal IFQ/ITQ program. Delayed reforms can become quite costly and crude IFQ programs that relax impediments to optimizing efficiency over time are vastly superior to the most efficient IFQ programs that never see the light of day.

Finally, I should highlight a significant impediment to conducting this type of research: the availability of data on economic structure and political organization. Ownership data is often proprietary and notoriously difficult to ascertain with any level of precision. Still, the manner in which national and international fisheries authorities collect and report data on fisheries sectors could be modified with a view toward estimating levels of vertical integration. At minimum, it would be helpful to get a better picture of the proportion of landings and associated revenues that can be attributed to different segments of fishing fleets within a given fishery. Data on the political organization of different segments of the fishing industry is also difficult to obtain. Systematically collecting and disseminating this type information would provide invaluable assistance to those analyzing the political dimensions of fisheries management. And most attendees to this conference will agree that the political dimensions of fisheries allocation are indeed important.

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