

**BRINGING MARKET REFORMS  
TO FISHERIES GOVERNANCE  
FAROE ISLANDS LEADS THE WAY**

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# I. Introduction

Very few countries can claim that ocean fisheries—including fishing, aquaculture, and fish processing—account for 95-97 percent of total goods exports, approximately 15 percent of the total labour force, and 20 percent of GDP. This degree of economic dependence on a single industrial sector requires that national leaders get fisheries governance exactly right. Unfortunately, it is impossible to achieve coherent governance when essential economic incentives in the fishery are deeply flawed or missing. In this report, I document the establishment of necessary economic rationality into fishery governance in the Faroe Islands. The adoption of basic economic principles is a necessary departure from four decades of contentious political control over the governance of fragile fish stocks that constitute the social and economic foundations of Faroese society.

I open with a brief summary of four distinct historical eras of fisheries policy in the Faroe Islands. The first three stages were characterized by extensive political control by the Faroese Parliament. Given the economic importance of fisheries, this level of political involvement might be expected. However, political micro-management of fisheries governance resulted in persistent three-way disagreements among: (1) the fishing industry; (2) fisheries scientists employed by the government; and (3) members of the Faroese Parliament. These constant debates over fisheries governance then gave rise to a climate of distrust among all three participants—distrust that created unwelcome social divisiveness within this small close-knit nation.

Throughout this troubled history, and reflecting a pattern that is rather universal, representatives of the industry were generally critical of scientists and their empirical findings concerning stock size, stock robustness and resilience, the effects of fishing on specific fish stocks, and safe harvest levels. At the same time, fisheries scientists were equally concerned over industry pressure concerning annual catch levels—and species composition of those catch levels—that seemed to violate the precautionary principle. Members of Parliament were then required to mediate these sharp disagreements. Doing so put elected politicians in the awkward position of having to take sides against scientific evidence or against the economic interests of the dominant Faroese industry. Friends and neighbours were often implicated in these debates. Politicians are accustomed to making difficult choices—that is their job. But fisheries policy, cast in such stark terms—science versus business—was especially troubling.

The policy reforms starting in January 2018, and the subject of interest here, were necessary to substitute economic rationality for this long-standing political conflict. As a result, historic disagreement over the precarious **management** of fragile fish stocks has been transformed into a broader and more promising public discussion over the social and economic role of ocean fisheries in the Faroe Islands. This encouraging switch to a discussion of fisheries **governance** promises to create greater trust concerning the dominant Faroese economic activity.

## **II. A Troubled History of Reforms and Mistakes**

In this section I explain the forty-year period of efforts to create a coherent regime of fisheries governance in the Faroe Islands. There are four phases of this problematic effort: (1) forced adjustments in 1978; (2) imposed reforms in 1994; (3) industry-driven reforms in 1996; and (4) market-based reforms beginning in 2018.

### **A. Forced Adjustment: 1978**

The 1977 adoption of Exclusive Economic Zones in the North Atlantic confronted the Faroese fishing industry—and the entire economy of the Faroe Islands—with a stark urgency. Suddenly, a predominantly distant-water fleet consisting of approximately twenty large trawlers and several purse seiners was deprived of its historic access to fish stocks that had long comprised the foundation of the Faroese economy. As a result, the Faroese fishing industry was forced to re-direct its fishing effort to its own EEZ and this required the immediate re-deployment of a distant-water fleet ill-suited to this new legal reality. Most vessels had to be quickly re-configured for pursuing fish in much smaller domestic waters. A variety of government subsidies were introduced to facilitate this expensive structural transformation. In addition, subsidies to enhance ex-vessel product prices helped to ease the financial implications of the required transition.

One positive effect of these initial reforms was that it now became economically attractive to land fresh fish in Faroese ports. Gradually, a local filet industry emerged. Between 1979 and 1989 the number of fish factories increased from 15 to 23 [Gezelius, 2008, p. 101]. Local employment flourished. Unfortunately, as various subsidies and facilitative policies expanded, the fishing industry and associated businesses became increasingly dependent on a variety of perverse inducements. Soon, 5-10 percent of the Faroese treasury was dedicated to subsidies and budget transfers to the fishing industry. In addition, two Faroese banks were caught up in the growing economic crisis. Predictably, fish stocks also began to show the harmful effects of the accumulating economic incoherence—and of the expansion of a much more powerful industrial fishing fleet operating in a constricted Faroese EEZ.

In these early days, the policy focus had been on species composition of the catch, regulations on mesh size, small-fish rules, area closures, and periodic bans when fish stocks suddenly seemed threatened. However, hindered by historic perceptions of enormous and inexhaustible fisheries resources in the world's ocean, little attention was paid to the growth in total fishing capacity of the Faroese fleet. Finally, after a decade of this serious neglect, a licensing scheme was introduced in 1987 in an effort to bring total fishing power under regulatory oversight. A Raw Fish Fund—established in 1975 before the creation of the EEZ—continued to modulate swings in fishing income across years. As the industry continued to adapt

to the constrictions of the new EEZ, the Fund became a primary instrument for market regulation.

Throughout this early period of stark adjustment, it was assumed that the industry would allocate fishing effort in response to relative prices of the three major stocks—cod, haddock, saithe—and that as certain stocks diminished, effort would switch to relatively more abundant stocks. This expected behaviour did not occur. As a result, the Raw Fish Fund had to be devoted to manipulate ex-vessel fish prices to offset sharp differences in the market value of different species. It was assumed that this artificial pricing scheme would thereby produce the necessary economic incentives to alter allocation of fishing effort between high-valued species (cod and haddock) and low-valued species (saithe and redfish). Unfortunately, the pricing arrangements of the Fund were insufficient to affect fishing pressure on high-valued stocks—cod and haddock.

By this time, stock declines in cod and haddock forced the government to confront failures in the Raw Fish Fund as an instrument to mediate excess fishing capacity and the resulting overfishing on certain stocks. Gradually, policy makers made the obvious connection between perverse subsidies and resulting industry behaviour. Subsidies were eventually scaled back and price enhancements administered by the Raw Fish Fund were abolished in 1990. These changes coincided with a dramatic drop in the world price of cod, and with a serious crash in both cod and haddock stocks. In 1993, the ICES Advisory Committee for Fisheries Management recommended complete closure of Faroese fisheries.

These biological and economic changes had coincided with an emerging trend toward vertical integration of large vessels and processing capacity. Soon, approximately two-thirds of the trawlers and liners were in joint ownership arrangements with the processing industry. As a result, the 23 processing plants existing in 1989 were reduced to 14 by 1993. The number of deep-sea trawlers dropped from 74 to 55 over the same four-year period. The two Faroese banks mentioned above were on the verge of collapse. The first era in EEZ-based fishery management turned out to be severely problematic.

## **B. Imposed Reforms: 1994**

The gathering financial crisis growing out of flawed fishery policy required the Danish government to come to the rescue of the Faroese economy beginning in 1992. The Danish government provided DKK1.7 billion in loans to save the banks, and a special fund was established to solve the causes and consequences of the financial crash. Importantly, one of the conditions of the Danish rescue program was that the Faroese government finally bring economic coherence to its defective fishery policy. Two central requirements were: (1) fishery policy must create a self-supporting economically viable industry based on “biologically optimal” management protocols; and (2) fishery policy must be based on the principles of a

“market economy.” The Faroese tradition of political meddling in fishery policy was of particular concern to the Danish government.

Paramount in restructuring the industry was the need to reduce subsidy-driven fishing capacity, and to conserve fish stocks. A special “Structure Committee” was created with the mandate to craft a new fishery policy based on one of two possibilities: (1) government-mandated reductions of the fleet; or (2) introduction of a limited number of gifted Individual Transferable Quotas (ITQs). With little time for comprehensive review and deliberation, the Structure Committee—under pressure from Danish authorities—decided to copy the Icelandic model and recommended introduction of ITQs [Gezelius, 2008]. In retrospect, this was an unfortunate decision.

The Icelandic Fisheries Management Act of 1990 had created an ITQ regime with secondary markets for the fishing quotas handed out for free by the Icelandic government. A decade later, Icelandic banks became fully privatized and their new-found latitude for risky lending provided the opportunity for the new market in transferable quota shares. Soon, Icelandic quota shares had become financial collateral for the commercial fishing industry which borrowed heavily against the gifted shares to increase fishing capacity. When the worldwide financial crisis began in 2007, the Icelandic economy was badly affected, and in October 2008 the Icelandic economy collapsed [Einarsson, 2011].

In addition to the financial crisis in Iceland—tied to the inflated market for ITQs—accumulating evidence of other problems with ITQ regimes began to emerge. The Northern cod stock off the Canadian coast had crashed, and the Northeast Arctic cod fisheries managed jointly by Norway and Russia had been hit by an earlier crisis in 1989. Iceland’s cod stocks also crashed. Excessive discards, an unwelcome feature of ITQ fisheries, had revealed the fatal defect in such regimes. Faroese fishing firms had been watching, with alarm, the poorly managed North Atlantic cod fishery. Moreover, a number of EU fisheries managed under ITQ systems had been experiencing severe levels of illegal discards. The problem was serious enough that the Faroese government introduced a ban on discards and enabled confiscation for illegal discards.

At this time, the Faroese Parliament—not fishery scientists or managers in the Ministry of Fisheries—were responsible for setting annual total allowable catch (TAC) for each fish stock, with quotas then distributed among five vessel groups based on a system of fixed relative shares. The offshore fleet possessed individual quotas based on fixed shares of the group quota. We would call it a TAC-share fishery. The in-shore fishery was based on their group quotas [Gezelius, 2008, p. 106]. The government was authorized to consult logbooks, sales notes, and to carry out extensive surveillance at sea or on shore.

But management problems and political conflicts persisted. Scientifically credible determination of TAC turned out to be more difficult than imagined. Annual fluctuations in cod stocks became the subject of intense debate between fisheries scientists and participants in the fishing industry. Such disagreements are common in fisheries policy. But in a small close-knit society, such disagreements are politically destabilizing. When cod stocks recovered in 1994-96, there was increased pressure from the industry to increase the cod TAC.

However, the multi-species nature of the Faroese fishery—cod, haddock, saithe—meant that pursuit of haddock and saithe produced excessive by-catch of cod. Discards became problematic, and there were accusations of falsified notebooks to hide the extent of by-catch. Indeed, industry records suggested that misreporting comprised approximately 18 percent of cod landings [ICES, 2006, p. 32]. Closures seemed to be the only option. The new quota system also threatened the viability of many shore-based processing facilities and so yet additional resistance to this new management regime emerged in small villages where processing was the only source of employment.

At this point it was becoming apparent that coherent fisheries governance—a process that could offer both economic rationality and political legitimacy—required reliable scientific data, up-to-date and reliable reporting, regulatory adaptation, and—most importantly—trust. The 1994 regime offered nothing in this regard.

### **C. Industry-Driven Reforms: 1996**

In 1995, and in recognition of the inherent flaws in the existing governance regime, the industry requested important modifications in the prevailing system. A Planning Committee was required to produce a new set of policies by February 1996. The principal condition was that the ITQ/TAC-based regime be replaced. This would be accomplished by a new system of fishing-days allocated to license holders, augmented by area closures when necessary. License holders were permitted to trade their allotted fishing days among themselves [Gezelius, 2008, p. 107].

Serious problems began to emerge within just a few years [Hegland and Hopkins, 2014]. Haddock landings plummeted as its biomass shrank substantially. The biomass of cod on the Faroes Bank reached a level that all fishing there was suspended in 2009. On the Faroes Plateau a similar crash was underway. These problems figured prominently in the persistent contestation between the fishing industry and the government's scientific experts.

There were several obvious reasons for these sharp disagreements. In a multi-species fishery as in the Faroes, credible governance is only possible if certain conditions are met. These are: (1) a credible system for monitoring fishing effort; (2) a comprehensive fishery management plan (FMP); (3) clear harvest control rules; (4) no excess fishing capacity—including reliable

procedures to prevent inevitable “capacity creep” as vessels became more powerful and fishing skills improved; and (5) satisfactory and sustainable economic performance.

In addition to these system attributes, an effort-management regime requires the cooperation of an industry that is willing to abide by the best possible scientific information on offer. But there is a second condition if effort-management systems are to work—there must be some means to transform the historic two-sided contestation between fisheries science and industry into a genuine **dialogue of governance**. In the absence of this systems approach, fishery policy is fatally undermined by constant pre-occupation with the “vessels-versus-fish” framing that plagues much fisheries policy throughout the world [Johnsen, 2014; Ludwig, 2001].

The obvious problem was that only two “voices” were being heard in the discussion of fisheries policy. The absence of a credible environmental community—or general public participation—focused on fisheries meant that what is generally a three-way discussion and negotiation in most countries became seriously polarized.

With such durable disagreements, it was unavoidable that the entire debate over crucial governance decisions was simply passed “upstairs” to the political arena (essentially the Faroese Parliament) where crucial harvesting decisions about specific stocks—and specific areas—became the subject of political contestation. Indeed, since both groups of participants—fisheries scientists and the fishing industry—knew that the ultimate decision would be made at the political level, there was a perverse and counter-productive incentive to stake out rather extreme positions as a starting point for bargaining that *would then be carried out by others*. In such circumstances there was no reason to seek common ground. Adding to the governance problem, in a mixed-species fishery, with two highly valued stocks, and one of somewhat lesser value, the polarized contestation was made even worse.

At the same time, the rights to fish pelagic fish and demersal fish in the Barents Sea were still regulated as quotas. These quotas were all given to the shipowners as ITQs that could and have been be traded in the period from 1996 to 2018. In this period, the quotas for pelagic stocks have increased significantly.

## **D. Market Reforms: 2018**

When the effort-control system replaced the TAC/ITQ system in 1996, there had been a brief window for crafting a new governance regime, thereby leaving very little time for necessary discussion and analysis. Moreover, existing data were inadequate to a careful calibration—and determination—of optimal effort. It seemed reasonable to establish a rather

generous level of effort on the assumption that as the participants gained experience with the new regime, and as better data became available, necessary adjustments could be introduced.

However, with the passage of time, fisheries biologists—aware of deep scientific uncertainty—embraced the “precautionary principle.” Industry representatives, concerned with income growth—and always mindful of debt service obligations—quite expectedly advocated more generous harvest totals. These two contending positions, forcefully represented, easily became just another aspect of the enduring “political” nature of fisheries policy. Finally, in 2008, the Faroese Parliament terminated all existing fishing licenses effective January 1, 2018. Once again, it was time to start over.

Moreover, it seems there was a powerful additional reason for a new approach to fisheries governance. In 2010—just two years after the Parliament had shown its impatience with business as usual—an unexpected surge in mackerel stocks in the Faroese EEZ prompted a generous give-away. The mackerel quota was increased by a factor of ten and this new windfall was quickly awarded to the existing pelagic fleet, with a small share available for the demersal sector. There soon emerged cynical talk of the new “Mackerel Kings.”

With the Parliament already committed to a new governance regime, this surprising political gift reinforced the desire for less political interference in fisheries policy—and for a new regime based on economic principles. This new regime came into effect January 1, 2018.

### **III. Design Principles For Coherent Fisheries Governance**

I here summarize the “lessons learned” from this 40-year legacy of sequential policy reform in the Faroe Islands. These lessons are important in crafting a set of design principles for a new regime of coherent fisheries governance. It is appropriate to consider these design principles as a **policy template** against which to assess the most recent fisheries reforms introduced in January 2018.

Appropriate design principles must recognize five distinct attributes of a coherent fisheries governance regime: (1) there must be mutual trust among all participants engaged in fisheries activities—including members of the industry, government scientists, and political figures; (2) the governance regime must be regarded as scientifically credible by all participants; (3) the process of governance must be open and transparent so that all decisions are considered politically legitimate in Faroese society; (4) the behavioural parameters of the governance regime must be incentive compatible for all participants; and (5) all participants in the system must embrace the concept of adaptive behaviour when conditions—whether biological, economic, or social—indicate the urgency and necessity of such flexibility.

## **A. Mutual Trust**

The most important lesson learned over the past forty years is that any fishery governance regime requires trust and collaboration among all participants throughout the entire system. The idea of trust means that participants must see themselves, and must be seen by all others, as integral parts of a complex coordination activity where necessary information is treated with respect—and that information becomes the basis for decisions about harvest levels, stock parameters, discards, by-catch, reporting, monitoring, mortality, fishing power (CPUE), etc.

The importance of this lesson is illustrated by the persistence, over the past four decades, of contentious debates between the fishing industry and government fisheries scientists. Neither side trusted the other, and each side was induced to stake out extreme positions to enhance their chances of “winning” when the debate was transferred to the political level (the Ministry and the Faroese Parliament). Fishery governance in the Faroes was not a collaborative process—it was a realm of distrust that then fuelled contested policy discussions. No one—but especially fragile fish stocks—benefitted from that contestation. Successful reform required a new approach to governance.

## **B. Scientific Credibility**

The second important lesson is that coherent governance of ocean fisheries requires the development and maintenance of data-based decision models that are capable of addressing the necessary problems of mortality, stock levels, CPUE, spawning stocks, stock robustness and resilience, etc. This necessity derives from the fact that it is impossible create a credible fishery governance regime that does **not** follow from the data and analytical models that are available to give that governance regime scientific and political credibility. Rather than selecting specific governance regimes and then hoping to create analytical algorithms to support that regime, the process must be reversed. The availability of data—and the implicated analytical models—must dictate the specific governance regime selected. Notice that the policy mistakes of the past were selected *de novo* without adequate scientific justification.

## **C. Political Legitimacy**

A fishery governance regime will fail—lose acceptance and credibility—when doubts about its coherence emerge from an unexpected development that arouses suspicion. When a fish stock unexpectedly crashes there is understandable alarm—and questions arise as to why that happened. If the market for an important component of industry—a particular species of fish—suddenly disappears, there will be doubt about the coherence of the industry. If certain aspects of the regime are suddenly considered to be biased or unfair, doubts may arise. This happened in

2010 with the massive gifting of new mackerel quotas. Many people in the Faroe Islands regarded this political move by the Parliament as unfair and without justification. Talk of “Mackerel Kings” or “Quota Kings” does not arise without a reason.

Credible governance regime must be open and transparent. Such regimes must also be “learning communities” in which the general public is included in discussions and debates about fisheries policy. This does not mean that all essential decisions are subjected to public referenda. But it does require that government officials and industry representatives understand that they are engaged in the “people’s business.” Given the relative enormity of fisheries in the Faroe Islands, this public obligation is even more profound. No one can plausibly suppose that the well-being of Faroese fisheries is of interest only to a few large commercial fishing firms.

#### **D. Incentive Compatibility**

Incentive compatibility implies that all participants in Faroese fisheries are engaged in a system in which honesty and integrity are rewarded rather than punished. A multi-species fisheries regime that fails to create proper incentives to reduce or eliminate discards is a regime corrupted by flawed behavioural incentives. Notice that the incentives in such a regime encourage—they invite—mis-reporting and deceit. TAC-based fisheries, particularly in the presence of multiple species, virtually assure high levels of by-catch and discards. The holding of ITQs—whether gifted or purchased—creates perverse incentives among participants in the industry. If quotas have been purchased, the debt-service obligations to creditors pushes industry participants even further toward excessive landings to service that debt. The financial pressure encourages by-catch and discards. TAC/ITQ regimes are loaded with perverse incentives out on the water—but especially when fishing firms are in debt to money lenders.

Incentive compatibility in fisheries governance requires a suite of financial instruments—tools—that can re-direct fishing behaviour in the direction of compliance and concern for the safety of underlying fish stocks. I will illustrate below several examples of such instruments that will introduce incentive compatibility into Faroese fisheries governance.

#### **E. Flexible Adaptation**

The most difficult challenge in the governance of complex human-natural interactions is to recognize that unexpected change is the very essence of such systems. Fish stocks move, expand, contract, industry costs increase or decrease, consumer tastes shift, prices increase or decrease, spawning increases or decreases, foreign markets expand or contract, etc. None of these exigencies can be predicted with perfect certainty. It is this aspect of fisheries that led the respected expert Donald Ludwig to insist—in a famous paper—that “the era of management is over” [Ludwig, 2001]. By this Ludwig meant that it had always been a scientific and political

conceit to presume that humans could “manage”—which really means “to control”—fisheries. Fisheries “management” is a scientific fiction.

It will be noticed that I here resisted discussion of “fisheries management” in favour of the much more honest idea of **fisheries governance**. By governance I mean the establishment of an ongoing process of learning and adapting to biological and economic events as they reveal themselves to us. All governance systems must be based on flexibility and the ability to make corrections when things seem not to be working. As expected, a fisheries governance regime is a data-generating process and all governance systems will fail if they are not designed to process that data-generating nature of human-biological systems—and quickly make the necessary adjustments.

Careful monitoring of a few key indicators must be the starting point of such systems, but while necessary, the mere presence of performance indicators is not sufficient. The human processes that are the central moving parts of a governance regime must understand that public policy concerning the natural world—ocean fisheries—requires quick application of feasible responses when the data imply that change is called for.

In other words, the urgent need in the design of all public policy—not just fisheries—is the creation of “off ramps” when unexpected and unintended effects begin to emerge. They always will, and those of us engaged in policy formulation must find ways to help policymakers understand this fact, and be prepared to craft remedial action. The old adage of “don’t let the best be the enemy of the better” is apt here. Public policy is a quest for the better, and the better can always be improved upon as the world out there delivers its inevitable feedback. Public policy entails dealing with that inexorable feedback. But coherent policy cannot possibly be formulated on what is imagined to be the “best” [Bromley. 2006].

## **IV. The New Fisheries Governance Regime<sup>2</sup>**

On January 1, 2018, a new fisheries governance regime came into effect in the Faroe Islands. This new governance regime was based on nine specific objectives as expressed by the coalition document from the Faroese government in 2015:

1. All fisheries must be biologically, economically and socially sustainable;

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<sup>2</sup> <http://www.government.fo/the-government/coalition-agreement/>

2. All living marine resources in Faroese waters, as well as those managed under international agreements, shall remain the property of the people of the Faroe nation and cannot become the property of private companies or individuals, or be sold abroad;
3. Fishing rights shall be in Faroese hands;
4. We must move away from private sales of licenses and fishing rights;
5. We must move away from political allocation of fishing rights and towards a market-based system;
6. On-shore processing plants shall have access to bids for all fish catches;
7. Catches and all related products should be landed in the Faroes and, to the greatest extent possible, processed here for added value;
8. Only Faroese-owned companies registered in the Faroes, paying taxes in the Faroes and paying their crews in accordance with Faroese collective agreements, may seek to participate in Faroese fisheries;
9. A special regime may be established for coastal fisheries.

Table 1 shows the match between the declared objectives of the new fisheries policy and the five design principles derived from the lessons learned from Faroese fisheries policy over the past four decades. Notice that it is not possible to assess the design principle of “mutual trust” until the new governance regime has been allowed to perform. I predict that experience with the new regime, coupled with a few added operational aspects, will contribute to all five of the design principles, but will also create the necessary conditions for the gradual emergence of mutual trust among all participants.

**Table 1. Matching of Design Principles and Objectives of Fisheries Reforms**

Design Principle	Stated Objective
A. Mutual Trust	
B. Scientific Credibility	1, 4, 5, 9
C. Political Legitimacy	1, 2, 3, 4, 5, 6, 7, 8, 9
D. Incentive Compatibility	1, 2, 5, 6,
E. Flexibility and Adaptation	4, 5, 6, 8

The decision of the Faroese Parliament in January 2008 to withdraw (extinguish) all existing licenses to fish in Faroese waters was followed, in January 2016, by the establishment of a special Ministerial Commission to study the issues and develop recommendations for comprehensive reform of fisheries governance. In October 2016, the Commission presented its findings to the Minister of Fisheries. The recommendations, generally consistent with the nine general objectives listed immediately above, are reflective of six broad categories: (1) ownership of fish stocks in the Faroese fishing zone; (2) management measures to assure sustainability of fish stocks; (3) restrictions on foreign ownership and investment; (4) creation of value added within the Faroe Islands; (5) reliance on market principles to allocate access to fish stocks in the

Faroese fishery zone; and (6) limits on the degree of economic concentration of fishing permits granting access to fish.

On the December 13, 2017 the new Act on Management of Marine Resources was approved by the Faroese Parliament, and on December 18, 2017 the Act entered into force—becoming effective January 1, 2018.

The specifics of the new Act will not be elaborated here, except to note that the Faroese Parliament was very clear that fisheries resources in the Faroese EEZ belong to—are the **property of**—the Faroese people.<sup>3</sup> In principal, the points from the commission were followed, but with some exceptions. There will be a six-year period over which all foreign ownership interests must be phased out. For an individual, or the owner of a commercial firm, to receive a permit for access to Faroese fisheries now requires that the individual has been domiciled in the Faroes for at least two years at the time of application for such permits. All access permits will be awarded to—and held by—firms rather than by individual vessels. Unused permits will revert to the government.

The governance regime will retain a limited number of fishing-day permits for the near-shore demersal fishery. Long-term governance plans will be developed for these fisheries. There will be TAC-share permits for offshore demersal trawlers and longliners in excess of 110 gross tonnes, but these will only take effect from 1<sup>st</sup> of January 2019.

Access to fishing opportunities—by license, permit, fishing days, quota, etc.—may not be transferred in private transactions on a permanent basis. All changes of fishing access must be subject to public auctions. In this regard, a maximum of 20 percent of existing individually held quota may be transferred (change hands) in a single fishing year. All fish caught (and all fish parts) must be landed—and those landings must occur in the Faroe Islands. There is a complete ban on discards. As a goal, 25 percent of the expected catch/landings are to be allocated by public auctions over the immediate future.

Effective January 1, 2019 no person or commercial firm may obtain more than 35 percent of available quota in the following sectors: (1) pelagic fisheries; (2) demersal fisheries outside of the Faroese fishery zone; and (3) demersal fisheries inside of the Faroese fishery zone. In addition, no person (or firm) may hold more than 20 percent of total Faroese quotas.

Finally, some of the allocation were market based, but the parliament could not agree to have the total quota allocations market based. How this was planned can we see in the next section.

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<sup>3</sup> An English-language version of the new Act will soon be available.

## V. The Early Auctions

The new fisheries regime makes clear that Faroese fisheries resources are the property of the Faroese people, and that receipt of a permit, license, quota, or any other instrument does not imply a “property interest” in Faroese fisheries resources. While a major portion of existing access opportunities (I refer to them as “permits”) will remain intact, the advent of a market-based governance regime implies that future access will be based on economic principles. With this in mind, the Ministry conducted several auctions in 2016 and 2017 to determine the feasibility of allocating permits to specific fish stocks.

Objectives 2, 3, 4, and 5 of the new governance regime address ownership of the fisheries resources in the Faroese EEZ. This matter is important because much of the literature implies that no-one “owns” fish from the EEZ until those fish have been captured on board a vessel. This confusion persists despite the clear purpose of the U.N. Conference on the Law of the Sea to create Exclusive Economic Zones, thereby indicating that the natural resources within those nation-based territorial water belong to—are the “property of”—the adjacent coastal nation.

This universally acknowledged declaration of “belonging to” implies the associated opportunity and obligation for national governments to control, govern, and serve as a steward of those natural resources for the benefit of the citizens of each coastal nation. In light of this understanding, it is difficult to see how many contributors to the fisheries literature can still believe that fish within a nation’s EEZ are “unowned” until they have been captured.<sup>4</sup> Perhaps this confusion persists because of the history of international whaling in which whales were “fast and loose”—while “loose” they belonged to no-one, but once made “fast” to a whaling vessel, their ownership was no longer in doubt. But that distinction relied on the open-access nature of high-seas whaling and is no longer relevant in national EEZs [Bromley, 2016].

With ownership now clarified by the Faroese Parliament in objectives 2, 3, and 4, attention turns to objective 5 in which the Parliament abandoned the political gifting of fish to the industry and insisted on the adoption of a “market-based system.” This embrace of economic principles points to a second obvious defect in past fisheries governance in the Faroe Islands—the industry received the vast majority of fish belong to the Faroese people for free. By paying nothing for the fish caught and then sold for profit, the most basic aspect of a “market-based system” was violated. The new fisheries regime has thus started to correct these historic violations of sound economic principles—access to fish into perpetuity was granted by politicians rather than on the basis of a firm’s willingness to pay for those fish, and once caught, fishing firms paid nothing for the majority of their valuable landings.

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<sup>4</sup> I document the conceptual flaws underlying this durable confusion in Bromley [2016].

The related flaw of this double gifting—first of the access to fish (the permit), and second the near-zero price for valuable landings—was that the proper owners of the fish in the EEZ, the Faroese people, received nothing for the capture and sale of what belonged to them.<sup>5</sup> On both economic and ethical grounds, owners of valuable productive assets—commercial fish—expect to receive a financial return from the private appropriation of what belongs to the owner. Participants in the industry were benefitting from the private market for quota, but the owners of the fish on which those quota shares were based received nothing.

As indicated above, beginning in the summer of 2016<sup>6</sup>—before the adoption of the new governance regime, the Ministry of Fisheries conducted several permit auctions for small portions of the allowable catch of particular species in designated locations (Table 2).

Table 2. Proportions of Existing Quotas Sold at Auctions

	2016	2017	2018
Blue Whiting	7%	15%	25%
Mackerel	10%	11%	15%
Herring	8%	40%	15%
Barents Sea Norway	10%	10%	17%
Barents Sea Russia	10%	10%	17%

The results from these early auctions are summarized in Figure 1. Here we see the evolving mix between existing (and very low) fishing fees and the new resource revenue generated from the auctions. Since the auctions began in 2016, resource revenue to the government from auctions and fees has increased significantly. In 2017 and 2018, the prices on auctions were much higher than the fees, despite the fact that only approximately 20 percent of the available quota was subject to auction. That minor share of auctioned quota in 2017 and 2018 produces approximately 50 percent of additional fisheries revenue for the Faroese government.

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<sup>5</sup> It is important to point out that firms which acquired quota shares paid other fishing firms for that quota, not the government of the Faroe Islands.

<sup>6</sup> There was also an auction in 2011 of 20.000 mt of mackerel. This was the second year when the mackerel quota was still increasing. The income from this auction was 72 mDKK, so the prices were 3,6 DKK/kg, approximately 70% of the average landing price in 2011.

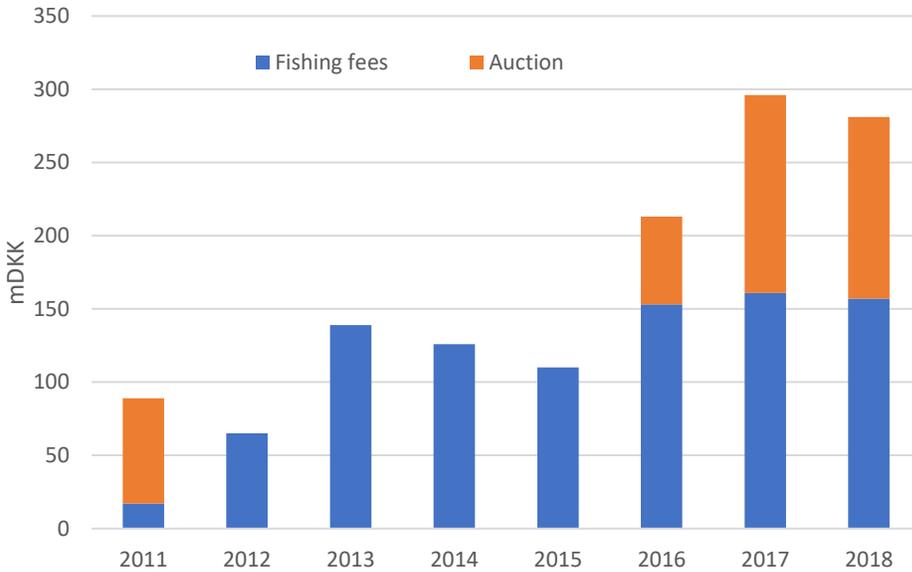


Figure 1. Realized Government Income Since 2011 (current resource tax is 1 DKK/kg for mackerel, 0.75 DKK/kg for herring, and 0.20 DKK/kg for blue whiting).

## A. 2016 Auctions

During the summer and fall of 2016, these auctions involved: (1) demersal stocks in the Russian part of the Barents Sea; (2) demersal stocks in the Norwegian part of the Barents sea; (3) mackerel; (4) herring; and (5) blue whiting (Table 2).

All auctions were limited to existing holders of licenses (closed auctions), and winners of the auctions could not transfer the acquired quotas to other vessels. Some auctions were in the English auction format (ascending prices), while others were sealed bid auctions where the unit price was determined as the lowest winning bid. In that case, vessel owners were invited to enter a single bid per ship, with the bid indicating both price and quantity. The results of all auctions will be discussed below.

These initial auctions demonstrate a willingness of the industry to engage in competitive (market-based) pursuit of fish stocks in the north Atlantic. Since bidding was restricted to Faroese vessels, there was very limited competition. Nonetheless, high prices emerged from the auctions. The one-time nature of these initial spot auctions offered little inducement for newcomers. This was to be expected since access to Faroese fisheries has traditionally been the quasi-monopoly domain of very few companies and vessels. The evidence suggests that existing firms (vessels) used these auctions to “top-up” their on-going fishing activity.

## B. 2017 Auctions

The 2017 auctions were slightly different from those in 2016—though both auctions entailed only single-year permits. In the 2017 auction, firms could make three bids as opposed to 2016 where only one bid per vessel was allowed. The 2017 auctions also contained both English style and sealed bid unit price auctions. As can be seen in Table 2, the portion of TAC on auction of blue whiting and herring was much higher in 2017 than in 2016. The revenue for the government in 2017 was also higher—almost twice the revenue in 2016 (Figure 3).

## C. 2018 Auctions

In accord with the new fisheries management law, in 2018 there have been auctions for 1, 3 and 8 year permits (Table 3).

The auctions in 2018 were for the same species as in 2016 and 2017. The quantities on auction for 2018 (and into the future) can be calculated as follows (for blue whiting in the North Atlantic). The Faroes controls a total quota of 482.000 metric tons of blue whiting. Of this amount, 8,5% (42.000 mt) was set aside as a “development quota” to be discussed below. After the international quota exchange (mostly to Russia in trading with Barents Sea cod), there was 351.000 mt remaining. Of this quantity, one metric ton was auctioned as a one-year permit. Then, 25 percent (87.500 mt) of the remaining 350.000 mt was auctioned as one-year, three-year, and eight-year permits. The eight-year permits account for 16 percent of the 25 percent (16 percent of 87.500 mt = 14.000 mt). The three-year permits account for 8 percent of 87.500 mt (7.000 mt).<sup>7</sup> When multi-year permits are auctioned, the subsequent yearly price is determined in relation to how the average seasonal landing price evolved. That is, the fee holds its proportion to the fee-price ratio of the original auction results.

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<sup>7</sup> The auctions are structured with a specific level for mackerel, blue whiting, herring, cod in the Barents Sea, and starting in 2019 on the Flemish cap, and in Eastern Greenland. When the TAC is below these levels the Minister must offer 15 percent of the total at auction (25 percent for blue whiting). When the TAC is above these levels, the Minister will offer all that is above. For example, the 2018 quota for blue whiting is 351.000 mt, and the limit is 350.000 mt. So the offering must be 25 percent—87.000 mt, and 1.000 mt extra. In 2019, it would be the same unless the quota is below the limit of 350.000 mt. In that case, the offering at auction must remain at 25 percent of that number (the limit of 350.000 mt), but there will not be any extra offering. This system applies to all stocks mentioned above. For the degraded demersal stocks around the Faroes, there will be no auctions until the stocks are in better shape.

Table 3. Offering of Multi-Year Permits

	1 year	3 years	8 years
Blue whiting	0,45	0,60	0,66
Mackerel	4,77	5,11	6,10
Herring	2,50	2,75	2,95
Barents Sea NO	3,10		3,20
Barents Sea RU	1,82	3,20	3,20

The special “development quota” in 2018 was allocated using a ‘beauty contest’ model that consisted of 8,5 percent of the three pelagic species. This means that 42.000 mt of blue whiting, 9.000 mt of mackerel, and 7,500 mt of herring was made available for “development” purposes. The Minister of Fisheries created a special Commission of three individuals to award these permits on the basis of innovative proposals received from areas of the Faroe Islands experiencing relatively high unemployment, high emigration, or low access to fishing permits. Forty applications for these development quotas were submitted to the Commission, and nine of the applications received quota around the islands.

To compare the prices resulting from the 2016, 2017, and 2018 (single year) auctions, the prices of the auction—and the fraction of average landing prices in each year—are shown in Table 4.

Table 4. Auction Results From 2016, 2017, and 2018.

DKK/kg and % of average price	2016	2017	2018*
Blue Whiting	0,11 (5%)	0,24 (17%)	0,45 (27%)
Mackerel	3,66 (50%)	3,18 (46%)	4,77 (70%)
Herring	3,58 (52%)	1,51 (41%)	2,50 (36%)
Barents Sea (Norway)	4,50 (25%)	3,01 (16%)	3,10 (16%)
Barents Sea (Russia)	3,15 (18%)	2,47 (13%)	1,82 (9%)

\* For mackerel and herring in 2018, only a small part of the total quotas has been fished yet.

## D. Future Auctions

Beyond 2018, the new law stipulates that there will be a continuation of the majority of outstanding access permits (“grandfathering”) with portions being made available for bidding through auctions. There will also be ‘beauty contests’ for permits covering 8½ percent of certain quotas for “development quotas” on a regional basis. Figure 2 depicts an example of the allocation schedule for Blue Whiting. There are two kinds of quotas on auction, one is called “sell quotas” and one is just quotas “offered” for one year. Sell quotas are there indefinitely, such that the 25% of the quotas up to 350.000 mt are to be offered. One-year quotas are just offered for 1 year if the TAC for Faroese vessels is above 350.000 mt in the case of the blue whiting.

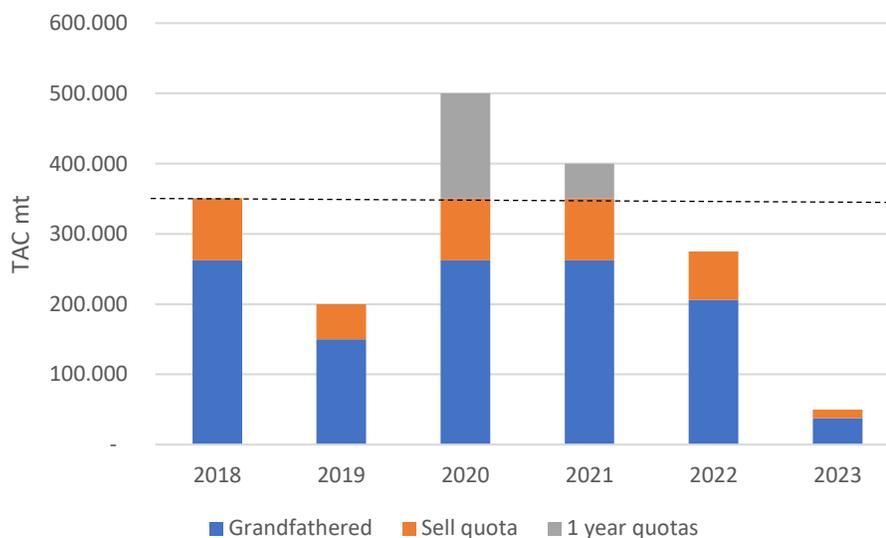


Figure 2. Example of a schedule of Auctions for Blue Whiting

Figure 2 implies that if the remaining quota—after development quotas and transfers to other countries—is below 350.000 mt, 25 percent of the total quota will again be offered at auction. Those permits for the existing three-year and eight-year shares will not be exposed to auction. For example, if total quotas in 2019 were 200.000 mt, then 50.000 mt will be offered as sell quotas—excluding the multi-year permits from the 2018 auctions. Those commitments are, in this case, 12.000 mt, thus leaving 38.000 mt for auction in 2019. At that time, there will again be offerings of one-year, three-year, and eight-year permits of these 38.000 mt.

Figure 3 depicts the auction schedule for demersal fish around the Faroe Islands (Faroe cod). In this case, the auction will not start until the quotas are above 20.000 mt, and initially only quotas above 20.000 mt will be auctioned. There can be a second limit if the TAC is above 26.666 mt, where all fish above that limit will be on auction. Then, if quotas below 20.000 mt, there will be an offering of 25% of the quota as sell quotas.

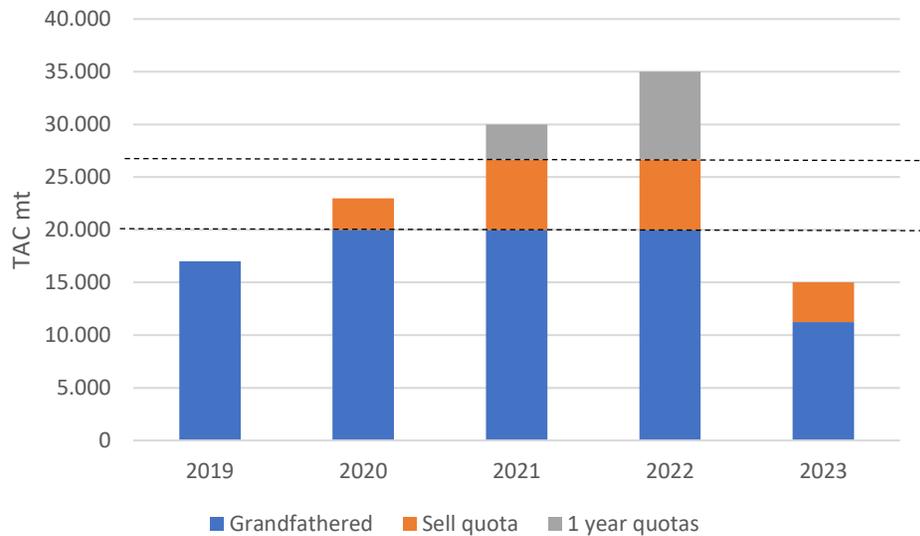


Figure 3. Example of a schedule of Auctions for the local Demersal stocks: Cod

## VI. Implications of the New Reforms

Reform of fisheries governance in the Faroe Islands was driven by the convergence of several serious concerns: (1) public rejection of the political machinations associated with traditional fisheries governance; (2) recognition of the perverse ethical and economic implications of giving away the nation’s wealth of ocean fisheries to a commercial sector that then trades in valuable commoditized “quota shares” for access to that wealth; (3) continued degradation of certain pelagic stocks; (4) persistent devastation of the near-shore demersal fisheries of great importance to coastal communities; and (5) virtual elimination of value-added employment—much of it in small coastal communities—by vertical integration in the commercial pelagic fleet.

Moreover, persistent contestation between government fisheries scientists and the industry continued to undermine the essential shared trust and legitimacy of this important industry. When a dominant economic sector loses its public legitimacy, the resulting crisis of credibility demands correction.

The governance reforms that took effect on January 1, 2018 addressed many of these concerns, and the reforms reflect general conformity to a set of design principles for coherent governance of an essential human-ecological system always in stochastic flux. The fact that the fishing industry is beginning to pay Faroese citizens a reasonable fee for access to the nation’s abundant natural resource wealth in the EEZ will do a great deal in creating a sense of political legitimacy for the industry.

This modest introduction of proper market-based principles is a profound move in the direction of enhanced incentive compatibility. After all, the availability of free—or under-priced—fish is a perverse encouragement to excessive effort and thus overfishing. The explanation is straightforward. Free fish destroys the basic decision rule for when to curtail fishing effort. The fishing firm equates the marginal cost of another hour of fishing effort with the marginal revenue (ex-vessel price) of the fish that are caught in that hour of effort. If the marginal revenue (price) of fish is artificially high because there is no price paid by firms for the fish they catch and then sell, the equation of cost and revenue at the margin is distorted—leading to artificially high fishing effort.

The auctions described above are the necessary first step in rectifying that historic flawed economic calculation. Those firms that are recipients of the auctioned quota now face correct economic incentives to cease fishing when the marginal revenue of another kg of fish—net of the necessary fee—is brought into equality with the marginal costs of finding and catching that kg of fish. Fishing effort under these proper incentives will be unambiguously less than if fish continued to be free (or almost free) to the fishing firm. The auctions are a move in the interest of incentive compatibility. The auctions are also obvious instruments for introducing incentives for enhanced sustainability of fish stocks.

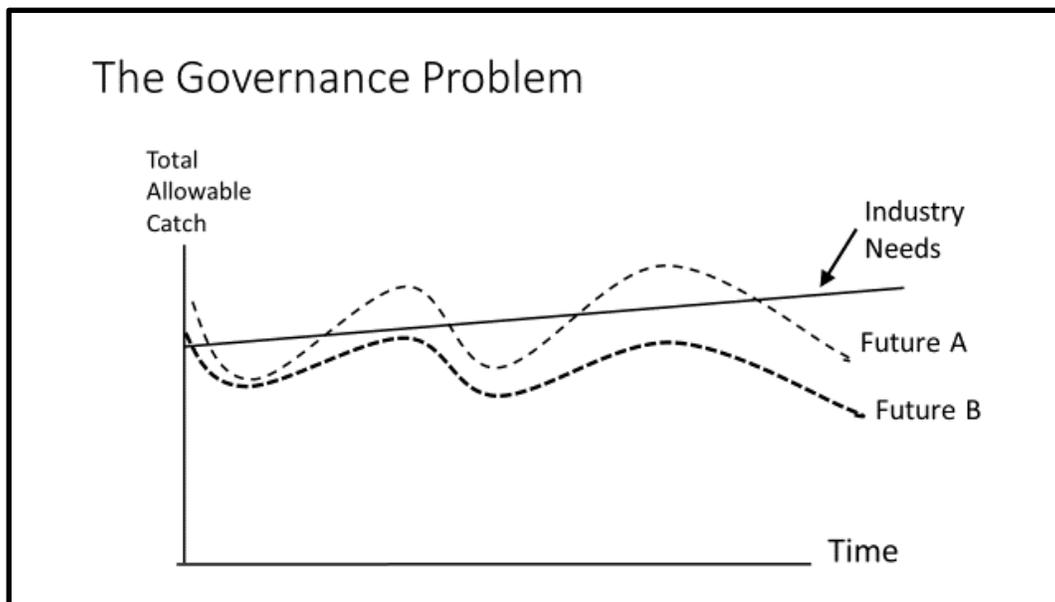
It is too soon to be certain of the other three essential design principles: (1) flexibility and adaptability of governance protocols; (2) enhanced respect for scientific models and findings; and (3) the emergence of mutual trust among all participants.

The acceptance of auctions among participants in the fishery provides assurance that the emergence of flexible and adaptive management might be within reach. This optimism is based on the realization that new natural resource revenues from the auction fees might provide the base funding for a **resource trust** that could meliorate the perceived costs of enhanced flexibility in governance protocols.

This problem can be clarified by a stylized depiction of the needs of the commercial industry to maintain a reasonably secure and slightly upward-sloping allowable catch (TAC) trajectory to meet income and debt-service obligations. Let us assume that this trajectory increases at the general rate of inflation of costs and revenue so that the industry in its entirety is in a steady-state economic setting. But of course the underlying fish stocks that enable that net economic trajectory is not at all stable—nor is it always increasing.

We have, instead, a stochastic process at work in which some years will probably give rise to TAC levels that exceed the general trend line of interest to the industry, and in some years it will fall below that long-run trend line. This dilemma is illustrated in Figure 4. The curve “Future A” traces out a somewhat sustainable though fluctuating stock trajectory, while the curve “Future B” traces out a fishery that appears to be in general decline. The Figure emphasizes the

centrality of mediating the conflicting interests of a commercial fishing industry and a fluctuating fish stock. Here is the “fisheries governance” problem in stark relief.



**Figure 4. Intertemporal Fluctuations of Fishery Stocks**

The quest for a governance regime enabling flexibility and adaptability is much enhanced by the fact that the industry is now beginning to pay a price for the fish they must have (a fee determined by the auction bidding protocols). There are a number of possible uses for the revenues to be generated by these auctions.

As above, one possibility would be to use some of that new resource revenue to create and sustain a fisheries **resource trust** that could be used to modulate inter-annual swings in industry landings and revenue as shown in Figure 4. Notice that under the circumstances depicted in Figure 4, it is the fluctuating fish stock—and the inevitable fluctuating TAC—that brings economic hardship to the commercial sector that seeks a stable trajectory along the gradually increasing line (“Industry Needs”).

Recall that this trajectory does not imply an unjustified enrichment of the industry—the curve can be understood as a steady-state pathway into the future where the net economic position of the industry remains static. But it is not the slope of the line that matters. Rather, it is the economic yield implied by the two highly variable trajectories that accompany the economic needs of the industry.

The industry, very much locked into an economic trajectory shown here, has little appetite—indeed little latitude—to embrace the nice idea of adaptive and flexible governance if it means fluctuating net economic returns from one year to the next. It is not the responsibility of the Faroese government, or the Faroese public, to insure against all stochastic variation in net

income of the commercial fishing industry. That variability is part of operating in a market economy.

However, common sense suggests that the industry will be more amenable to the call for flexible and adaptive management if there are ways to remove some of the unexpected economic fluctuation from the regime under study here. That is where new revenue from various auctions can play a role. The “resource trust” fund could—with careful design and operation—play the essential role of a modest “income smoothing” aspect of the new governance regime. In the presence of this inducement, it is easy to imagine that the industry would be more amenable to the explicit endorsement of greater flexibility in the parameters of the governance system.

This new prospect would offer important safeguards against continued pressure to maintain TAC levels in the face of scientific concerns. And a benefit of this innovation would be a reduction in the historic debates and contestation between fisheries scientists and the commercial industry. With that would emerge enhanced credibility of the work of fisheries scientists. But the most important advance would be a gradual increase in the essential attitude of mutual trust throughout the entire fisheries governance process.

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