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The economics of the Swedish individual transferable quota system: Experiences and policy implications

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ABSTRACT

Sweden and other European Union countries are currently carrying out extensive work aimed at improving the marine and freshwater environment. The adaptive management approaches typically used for this require the development of new policy instruments and measures when needed, but also evaluations of instruments and measures already in use or under way. This paper reports on a study of the Swedish individual transferable quota system introduced in 2009 for the pelagic fishery. The new system was motivated mainly by economic arguments and, thus, the need to get incentives right. Despite this, the design of the Swedish system weakened the intended incentive effects in several ways, compared with the foreign systems that served as models. Moreover, the information needed for future evaluations was not collected, even though the need for future evaluations had been expressed explicitly and the data needs for this could be identified at the time that the system was introduced.

1. Introduction

Individual transferable quotas (ITQs) are frequently discussed as an effective policy instrument to increase the profitability of the fishing industry, reduce industry overcapacity, and promote sustainable fisheries management. The positive effects of ITQs on performance, profitability, and fish stocks are expected to materialise when ships with different marginal costs of operation can start trading quotas.

In Sweden, an ITQ[1] system for pelagic fishing (fishing for herring, sprat, mackerel, horse mackerel, blue whiting and sand eels) was proposed in 2005 by the Swedish Board of Fisheries[2]. The background was the huge overcapacity and poor profitability of the Swedish pelagic fishing industry. Two years later, the government tasked the Board of Fisheries with developing and completing the proposal. During 2008, the Ministry of Agriculture presented a memorandum [25] which led to a bill on transferable fishing rights [21]. On August 1, 2009, the new Act on transferable fishing rights (Act 2009:866) went into force. Five years later, in October 2014, additional legislation empowered the government to expand the regulations to cover other species. Later that year, the impact of the Swedish system on capacity reduction, profitability, small-scale coastal fisheries and the development of various regions was evaluated by the lead government agency [34]. The conclusions were that the system had been effective, i.e. that fishing capacity had been reduced and profitability increased. The government is currently examining the question of a possible expansion of the system, but requires that it be preceded by a thorough investigation of the consequences for both the fishing industry and the environment.

That there is a political desire to evaluate policy instruments' consequences before they are introduced is clear from numerous policy guidelines. Furthermore, in marine environmental policy work, there are European Union (EU) requirements for various economic assessments, including cost-effectiveness analyses. The EU's Marine Strategy Framework Directive (MSFD)[3] and Water Framework Directive[4] set up a number of requirements for

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[1] Different terminologies abound for this and related concepts in the literature. Swedish literature on the topic uses concepts that can be translated as “transferable fishing use rights”, “transferable fishing rights” and “transferable quotas”, for example, while English uses the terms *transferable fishing concessions* and *individual transferable quotas*. The preferred term in this report is that of *individual transferable quotas*, but the other terms are treated as synonyms. However, the Swedish legal term for the policy instrument used in the pelagic fishery, namely *överlåtbara fiskerättigheter*, translates as “transferable fishing rights”, and should not be confused with the legal term *fiskerättigheter* [“fishing rights”] in isolation, which refers to fishing rights linked to ownership of land adjacent to fresh water.

[2] The Board acted as the lead agency for fisheries management at the time, but was subsequently abolished. The current lead agency is the Swedish Agency for Marine and Water Management.

[3] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy; EUT L 164, 25.6.2008, 19–40.

[4] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for community action in the field of water policy; EGT L 327, 22.12.2000, 1–73.

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different forms of socio-economic analysis. The MSFD demands that measures be assessed on the basis not only of technical feasibility, but also of economic cost-effectiveness. The MSFD also requires that the impact assessments of new actions that a country develops to achieve environmental quality standards should include economic cost–benefit assessments[5]. Thus, there is a clear political wish that policies aimed at protecting the marine environment should be as economically efficient as possible, and that the measures and instruments used should be evaluated both ex ante and ex post.

The aim of the Swedish ITQ system in the pelagic fishery was to change private actors' behaviour by altering the incentive structure they encountered; but there were also explicit statements that the instrument would subsequently be evaluated. In this paper, therefore, the Swedish ITQ system is offered as a useful case study to discuss the implementation of socio-economic analyses of policy instruments used in marine environmental policy.

2. What was known about ITQs in 2009?

The destructive economic incentives associated with open access fisheries, total-allowable-catch (TAC) systems and non-transferable fishing quotas are well-known to fisheries researchers (e.g. [6,10,11,20,24,26,32,36]) and, increasingly, to policymakers and fisheries managers. Overfishing, fishing during unsuitable parts of the fishing season, lobbying for expanded fishing quotas, discarding bycatches, and overall excess fishing capacity are some key problems that have been identified and are directly linked to the incentive structure facing fishermen[6] in such industries.

Therefore, a growing number of countries have experimented with economic instruments aimed at giving individual fishermen incentives to act in ways that are economically efficient as well as biologically sustainable. Numerous countries have introduced ITQ systems where the individual fisherman receives a fixed share of future catches from one or several fish stocks, and this fixed share can be sold, rented, or given to other fishermen.

In the short term then, the fisherman has an incentive to fish his/her share of the total catch in a manner that provides the highest possible profitability. In the longer term, such a system provides an incentive to sell the share to more efficient fishermen who are prepared to pay more for the share, and gives the individual fisherman greater reason to care about the fish stock's future state, as a larger future stock means greater future yields for such individuals.

As long as the fisheries management authority continues to set the total annual quota, the managing authority will determine how quickly the fish population can recover. Nonetheless, ITQs lead to greater industry support for more restrained fishing, which can be expected to enhance future profitability (see e.g. [22,31,33]).

Iceland and New Zealand were early adopters, introducing ITQs in the 1970s and 1980s for selected species and then gradually extending them to additional species (for Iceland, see e.g. [3,17,29]; for New Zealand, see e.g. [5,12]). The profitability of the affected fisheries rose dramatically and excess capacity declined. Since then, similar systems have been introduced or considered for numerous fisheries around the world (see e.g. [2,30,35]). Surveys (see e.g. [9,15,23]) indicate socio-economically beneficial effects in most fisheries in which ITQ systems are in place.

The relatively long experience of ITQ systems means that there has been considerable theoretical and empirical research on their impacts. There are obvious benefits to taking advantage of this research for countries wishing to implement such systems, and Sweden had this opportunity as well. Here, some important lessons that were available from research when the Swedish system was introduced in 2009 will be discussed.

The prices of ITQs (and, when quotas can be rented out temporarily, the rental prices) serve as an extremely important signal for the individual fisherman as well as for the fisheries manager (see e.g. [13]). High prices give fishermen with poor profitability the incentive to sell their quotas to fishermen who are prepared to pay those high prices. Since one of the goals of this type of system is often to speed up structural change and reduce overcapacity, fisheries managers have an interest in high prices. Valuable quotas can, in turn, be used as security by fishermen wishing to take out bank loans, which can contribute to further rationalisation in the industry.

However, if the fishery is small, trade in quotas will be limited, simply because there are not many actors who can trade. When major players trade, the prices of the quotas may fluctuate dramatically, creating uncertainty among other potential market participants about the price they could expect if they wanted to trade. A market with clear and transparent price formation and many potential players is, therefore, of interest to the individual fisherman and the fisheries manager alike (see e.g. [27], who studied price formation in the New Zealand ITQ system).

The price of quotas also shows what the fishermen themselves think about the future profitability of the fishing industry – and, thus, the future of fisheries management. In most publicly administered ITQ systems, the total fishing per season is still determined by a public fisheries authority, which thus remains responsible for the fish stock's future recovery. Low quota prices indicate that fishermen expect poor profitability in the future; this, in turn, is a sign that they do not expect fish stocks to increase, i.e. they believe that current overall quotas are too large, and/or that fisheries monitoring is of such a poor standard that not all catches are recorded. If the prices of quotas are high, on the other hand, this indicates that fishermen expect high profitability in the future and, hence, that fisheries management will lead to viable future fish stocks. Therefore, fisheries managers have a strong interest in monitoring the formation of prices, as the price indicates the level of confidence fishermen have in fisheries management [4].

However, the distributional impacts of quota allocation can potentially be problematic. For example, in Iceland, the value of ITQs rose sharply as stocks recovered and profitability improved [18]. Fishermen who had been listed on paper as nominal fishing rights holders received large windfall profits, while their colleagues, who worked on the same boats but had no fishing rights on paper, did not share in the quotas' rising values. Even when such situations do not arise, the allocation of fishing quotas means giving large (potential) profits to those actors who receive them, which may be politically complicated in societies where fishing plays a major role in the economy.

One way to avoid this problem is to establish ITQs that are limited to a certain time period, and then changed once their effects have been evaluated. However, the obvious disadvantage of such a system is that it limits the individual fisherman's interest in improved future profitability: fishermen who know that quotas will be redistributed in a few years will want increased withdrawals before then, while they still know what percentage of the catch they will get; they will also have far less interest in potential stock improvements after the end of the current rights' lifespan. Since such an arrangement also reduces the overall value of the quotas, it weakens the incentive for less-profitable fishermen to sell their quotas and leave the industry, while giving them a stronger incentive to stay in the hope of also receiving a share of quotas after the next redistribution.

An additional issue discussed in connection with ITQ systems is

[5] Article 13, MSFD.

[6] *Fisherman/-men* includes women fishers.