THE NORWEGIAN STRUCTURAL POLICY - MAINTAINING PRODUCTIVITY GROWTH WITH A LIMITED NATURAL RESOURCE.

Rolv Dahl-Jørgensen, The Norwegian Ministry of Fisheries and Coastal Affairs, rdj@fkd.dep.no

ABSTRACT

Overcapacity is probably the most fundamental challenge to fisheries management as it can lead to both overfishing and to low profitability. Most of the Norwegian fisheries have limited entry, through the use of annual permits (coastal fleet) and licences (ocean going fleet) in combination with individual vessel quotas (IVQ). Limited entry is necessary in order to secure a stable resource basis for the participants. This can also ensure profitability and future investments in the fishing fleet, without using fisheries subsidies. The shares of the overall Norwegian TAC is allocated to different vessel groups, and then distributed between the vessels within the different groups. This allows for several ways of reducing overcapacity, where marked based instruments have aimed at reducing the overall number of operating vessels, while simultaneously protecting the small-scale fleet, maintaining coastal settlements and encompassing regional considerations. The two primary structural instruments that have been employed are decommissioning and various systems for consolidating vessel quotas. In 2007 the current structural system was introduced in the White Paper Norwegian structural policy, which among other alterations put a time limitation on 20 to 25 years on the use of consolidated quotas, and the system was extended to include the vessel group between 11 and 15 meters. This extension was recently evaluated and examined in relation to other instruments used for this vessel group. This paper discusses the Norwegian experience of employing structural instruments within a limited entry scheme with individual vessel quotas.

Keywords:

FLEET MANAGEMENT IN NORWEGIAN FISHERIES

Today's management of Norwegian fisheries is a result of a process that has spanned over several decades. The main elements of Norwegian fisheries management have in many cases been implemented as a response to an immediate challenge within a fishery, but they have also been constructed to meet the long-term challenges that the fisheries sector faces. Even though the presence of a problem in the fisheries can be evident, the solution to said problem is not always equally clear. This paper discusses the Norwegian experience of implementing structural instruments with the aim of reducing overcapacity while maintaining a regionally dispersed small-scale fleet.

Productivity growth, vessels and fishermen

The fishing industry has during the last century been through a period of continued technological growth, which has led vessels to become increasingly more efficient at harvesting fish. The technological development is affecting the fisheries industry through two channels.

Firstly, mechanization of equipment, development of fishing gear, and faster and larger boats all contribute to vessels being able to catch larger amounts of fish with fewer inputs. This means that any given group of vessels and fishermen over time will become more efficient and make a larger impact on any given stock. This puts pressure on biologically limited resources, and can cause collapse in stocks, or a strongly reduced output in fishing.

Secondly, while the technological growth is making fisheries more effective, society at large is experiencing a growth in productivity. While other sectors have the possibility of increasing output whilst

using the same amount of labor and capital, fisheries are naturally limited by the amount of fish they harvest.

Other sectors compete with the fisheries sector in attracting labor and capital. Therefore, the fisheries sector needs to uphold a similar productivity growth if the sector is to be able to pay attractive wages. Productivity is measured as the amount of output divided by the amount of input. In the fishing industry this equates to the amount fish sold divided by the number of workers and the amount of capital used for fishing vessels, gear, infrastructure etc.

Without the ability to increase the production over the biological limits of the stock, the sector must achieve productivity growth by other means. One way is by the increase of the price of fishing products. The development of fish prices will depend on the interactions of demand and supply. For some fisheries it may be possible to increase the price of the products in order to pay higher wages and higher rents to capital. This will depend on the price elasticity of the demand and supply curves. For other fisheries the price does not increase, but is perhaps set by an international market with a high degree of competition. For instance, it can be shown that the real price for Norwegian fisheries export during the last 60 years has not increased. With a set real price of fish, the fisheries sector must either reduce the amount of labor and capital used, or rely on subsidies, in order to achieve wage growth.

For the Norwegian fisheries this trend has been evident throughout much of the post-war era. In the years prior to the Second World War, unemployment was high and the fisheries served as an employment of last resort, leading to a peak in the number of fishermen in 1945 and a subsequent peak in the number of registered vessels around 1960, as shown in Figure 1.

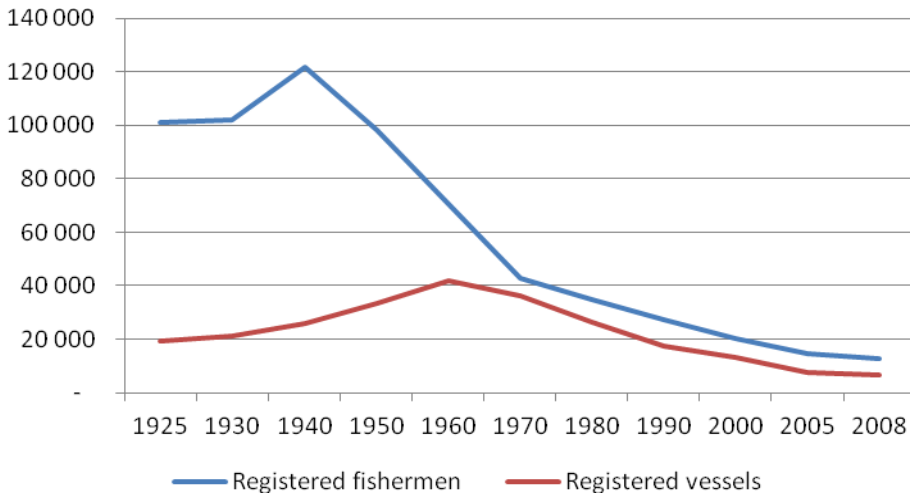

Figure 1. Number of registered fishermen and registered vessels

Since then the number of fishermen and vessels have declined while catches have increased until they peaked in the 1970s, and subsequently stabilized. It is noteworthy that the number of fishermen and registered vessels started to decline while Norwegian fisheries still were open-access with rising catches, an indication that this was the result of underlying economic factors. Figure 2 shows the relation between aggregate catches and number of registered fishermen. The catch per fisherman is included and shows a substantial growth from 1945 to today.

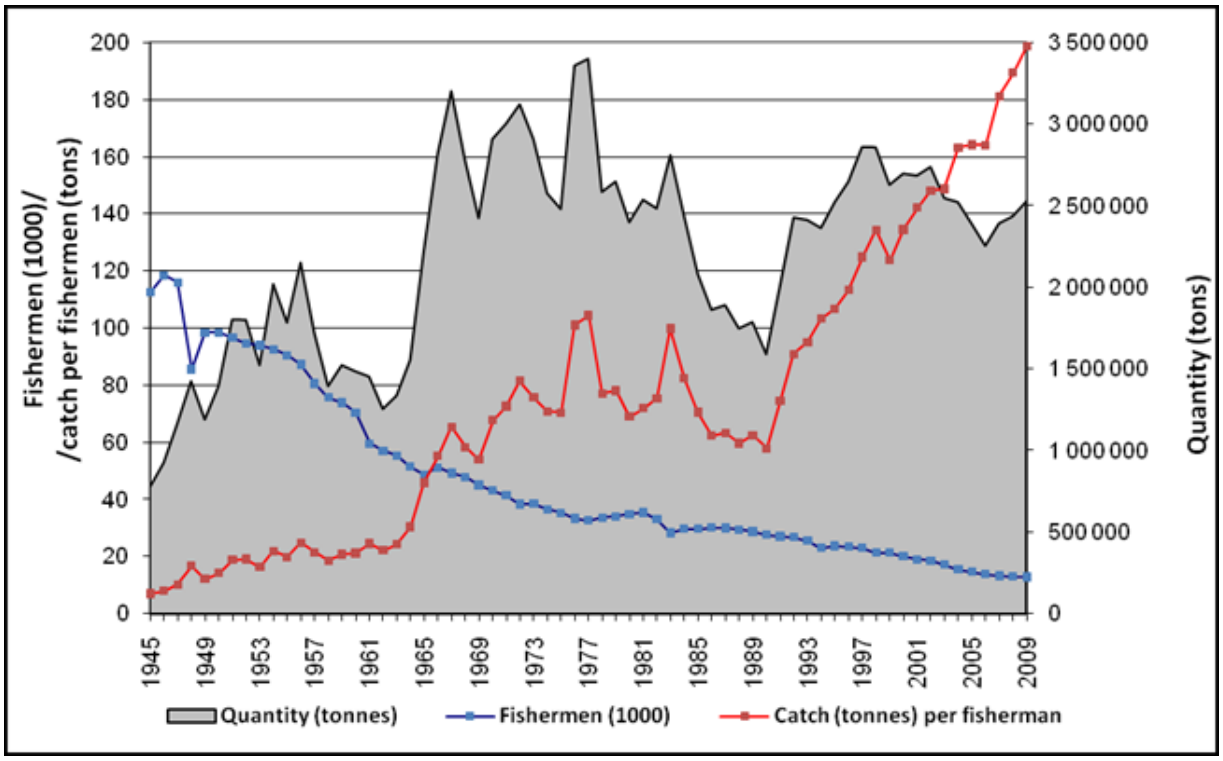

Figure 2. Aggregate catch, number of fishermen and catch per fisherman in Norway.

Limited entry

In 1945 large portions of Norwegian fisheries were open-access fisheries with no measures in place to restrict effort. Since then all major fisheries have one by one been closed and limited to prevent overfishing, and the last major stock to be closed was the Northeast-Arctic cod stock in 1990. The closing of a fishery has been the result of a perceived threat to the sustainability of a stock, and has been implemented when catches have shown to be precariously low, or when biological models show that a stock is nearing possible collapse. While the majority of the economically important fisheries in Norway are now closed, some small-scale fisheries remain open for vessels that a set of given requirements.

At the closing of several important fisheries in Norway, such as the herring fishery in the 1960s and the Northeast-Atlantic cod fishery in 1990, limited access was introduced. Annual permits were allocated to the group of vessels that had recorded activity in the fishery in the previous years. The annual permit is a vessel's official license to harvest from a limited marine resource, and the list of permits works as the government's register of undertakings in a fishery.

The permit is renewed every year if the vessel and vessel owner meets a set of national requirements. In the majority of the coastal fisheries the permit will let the vessel fish an annually set quota. The quota is assigned to the vessel and is not transferable; other vessels cannot be used to fish on this particular quota. Any newcomers into the fishery would have to buy out a vessel from inside the fishery, thus restricting entry.

Allocation of individual quotas to vessels

All species of fish in Norway that are subject to regulation are assigned a total national quota. Annual quota recommendations are given by the International council for the Exploitation of the Sea (ICES). Around 90 percent of the Norwegian fisheries are based on stocks shared with other countries. The Norwegian quotas are thus decided after a series of bilateral and multilateral negotiations based on the scientific recommendations for the Total Allowable Catch (TAC).

Controlling the amount of fish caught and strictly enforcing fisheries regulation ensures a sustainable harvest of Norway's renewable marine resources. With a discard ban all fish caught is brought ashore and counted of the national quota. Furthermore, the introduction of a TAC coupled with enforcement, effectively transforms the issue of overcapacity from a problem of overfishing to a problem of economic inefficiency.

A central question in the assignment of quotas is how to minimize the inefficiencies that often arise in a sector with resource rent. If the quotas were only assigned to a group of vessels with limited entry, the construction of larger vessels designed to catch fish in competition with other vessels could lead to overinvestment. Such an "arms race" can lead to the resource rent being completely dissipated by costs. To avoid such a scenario, quotas are further divided among the vessel, assigning a unique quota to each vessel.

Each year shares of the total Norwegian quota is allocated to different vessel groups, and further distributed between the vessels holding the necessary licenses to participate in the groups. This allocation is based on a fixed key system, giving the vessels a certain share of the group quota, and thus a share of the TAC. Individual vessels may have quotas for several different fisheries.

This gives the participants a certain degree of stability. Even though the sizes of the stocks fluctuate on a yearly basis, the participant knows he will be assigned his proportional share of the national quota, and he will be able to make long-term investment decisions.

The quota allocation differs from an ITQ-system in that the quotas are not the property of individuals, since they are non-transferable vessel quotas. The link between an individual and the permit to access the national resource goes through the ownership of the vessel.

The structural division in fleet groups

A central element in the Norwegian fisheries management is the division of the fishing fleet into different regulatory groups. Firstly, this system divides between the ocean fleet and the coastal fleet. Within the ocean fleet there are different subgroups, depending on different parameters such as which fisheries or which gear type the vessels are using. Within the coastal fleet the main system is a division of different lengths of vessels. To be considered a part of the coastal fleet a vessel cannot have a cargo hold capacity larger than 300 m^3. Further subdivisions apply depending on which fishery the vessel participates in. In the main coastal cod fishery the vessels are divided into groups of: vessels larger than 21 meters length, 15-21 meters, 11-15 meters and under 11 meters length.

A vessel is placed into a length group based on the length of the vessel on a historic date, not the vessels current length. The historic date that is chosen is often the vessel's length at the closing of the fishery, and is then referred to as the vessel's quota length. Quota allocations are based on this quota length, and a physical alteration to the vessel does not change the quota length. This is essential for the system not to give perverse incentives. If building a larger vessel could give a higher quota, vessel owners would have

an incentive to build successively larger and larger vessels. Banning alteration of vessels is not a practical option either, since this could hinder the construction of safer workspaces or more fuel-efficient propulsion.

The current division of the fleet is the result of several decades of policy changes where the goal has been to address management issues arising at any given time, while upholding a varied fleet. This allows smaller vessels to coexist with larger vessels, without the larger vessels acquiring quotas at the expense of smaller vessels. For most species of fish, the national quota is divided proportionately between the different groups. This is based on long term fixed allocation keys. The industry has played an important role in the establishment of these allocation keys.

For example, of the 2010 national quota of Northeast-Atlantic cod about 30 % was assigned to the ocean fleet and 70 % was assigned to the coastal fleet. Of the quotas assigned to the coastal fleet, 13 % was assigned to vessels over 21 meters, while 20 % was assigned to vessels between 15 and 21 meters. It is a stated national policy that the relative division of national quotas between the groups is upheld, and quotas cannot be transferred from one regulatory group to another. If a vessel with a quota length of 10 meters is withdrawn from fishing, the vessel's quota will be divided among all the remaining vessels with a quota length of less than 11 meters.

MEASURING AND REDUCING CAPACITY

Measuring capacity

Capacity in the fisheries may be defined and measured on the basis of various parameters. However, pinning the exact relation between the fishing fleet and the amount of fish it is able to catch is difficult. It is possible to attain the technical data of a vessel, and aggregate for all vessels. Whichever measure such as aggregate engine power or operating days is used is unlikely to give a full picture of the fleet's capacity. Even though two vessels have the same technical parameters, they can participate in different fisheries, differ in operational intensity and have crews with differing skills and experience. Also, there are differences between capacity in the short run and in the long run. The stocks vary in size from one period to another, and the size of fleet cannot adapt at the same pace as stock sizes change. The capacity needed to harvest a stock in one given year could differ from the size needed the next year. It must also be kept in mind that vessel renewal is a wanted progress. Better technology allows for more fuel-efficient vessels, larger and safer workspaces for crew, as well as more selective fishing techniques. These improvements could be registered as capacity increases.

With annual permits, quota allocations and enforcement of fishing regulations, the focus is shifted from the fleet's technical capacity to the fleet's economic efficiency. Now the question is if the vessel's anticipated quota basis is able to pay wages and give a return on capital at levels equal to alternative employment and alternative investments. As shown above the technological growth has over time led to a reduction in the number of fishermen and vessels harvesting from a relatively steady amount of stock. The Norwegian structural systems therefore allows for the controlled reduction in the number of participating fishermen and vessels in order to achieve an economic surplus comparable to other sectors.

Development of capacity reducing instruments

Throughout the years several different programs have been used to reduce capacity in Norwegian fisheries. The first decommissioning program was introduced in 1960 and was publicly financed. Vessel owners were given grants to withdraw the vessels from fishing and demolish the hull to prevent usage in other fisheries. After 1980 schemes for consolidating quotas became the predominant capacity reducing instrument within the ocean fleet. With quota consolidating schemes a vessel owner could purchase a vessel, decommission and demolish it, and have the associated vessels quota assigned to his existing vessel. The vessel would then have the newly assigned quota added to its existing quota.

The decommissioning schemes were publicly financed and from 1960 to 2002 a total of 2843 vessels were decommissioned to a total nominal cost of 514 million NOK. The benefiters of this scheme were primarily the vessels owners left in the fisheries who would receive higher quota allocations. Because the programs were state-financed they implied a subsidy element to the fishing industry. The quota consolidating schemes were however self-financed by the industry as this cost was borne by the vessel owners who chose to expand their quota allocation.

An important historical development alongside the creation of the structural instruments was the gradual phasing out of fisheries subsidies. Starting in the 1960s, the government subsidized the fishing industry through an agreement with the Fishermen's Organizations. The reason for this was the low income rates for active fishermen after the gradual build-up of capacity in unregulated fisheries had reduced profitability. The subsidies reached their peak in the 80s and were gradually scaled down in scope during the 90s. The agreement ended in 2004, after being reduced to a minor amount compared to previous years. The subsidies were meant to compensate the difference between the average wage of a fisherman and an industrial worker. The existence of these subsidies held back the necessary capacity reductions and lessened the effectiveness of the capacity reducing instruments.

Decommissioning program in the coastal fleet

The most recent decommissioning program in Norway acted from 2003 to 2009 and was available for the smaller vessels in the coastal fleet. Initially, only vessels with a quota length of under 15 meters and permits to participate in limited-entry fisheries were given access to the program. With an expansion of the structural quota system in 2008 the length limit was reduced to 11 meters. A vessel owner who wanted to exit from fishing could apply for a grant from a government-administered fund. A grant would then be given on the condition that the vessel was decommissioned and demolished. The vessel's quotas would then be divided and assigned among all the remaining vessels in the same length group. The program is illustrated in figure 3.

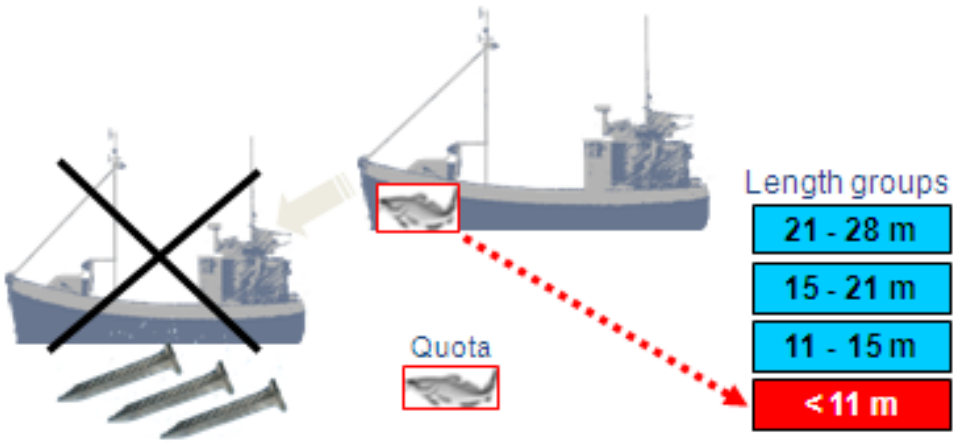

Figure 3. The decommissioning program

Half of the fund was state financed, while the other half was funded by the fishing industry through a decommissioning tax set on the first hand sale of fish in Norway. This marked a change compared to previous decommissioning systems, since the implicit subsidy element of state financing was reduced. The system came closer to following a "user pays, user gains"-principle. To a large extent this system fulfils the criteria in the OECD best practices for decommissioning schemes.

The goal of the decommissioning system was to reduce the number of participating vessels in the coastal fleet, make the fishery more profitable for the remaining vessels, and to make the fleet better adapted to the natural resources.

Structural quota system in the coastal fleet

Until 2003 systems of quota consolidation were only available to the ocean fleet. Introduced in 2003, the structural quota system (SQS) for the coastal fleet, applied to vessels with quota lengths over 15 meters with permits to participate in limited-entry fisheries. The system allows a vessel owner to renounce a vessel's quota and have it allocated to another vessel as a structural quota, upon the condition that the quota-renouncing vessel is decommissioned and demolished. The structural quota corresponds to the withdrawn vessel's quota, reduced by 20 percent. All the vessels in same length group divide the remaining 20 percent among them. Thus, all vessels in the group stand to benefit from the SQS. Figure 4 shows a graphical depiction of the SQS.

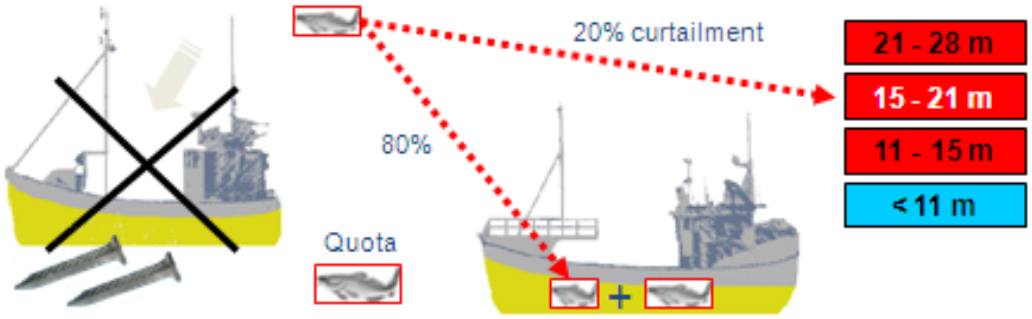

Figure 4. The Structural Quota System

A concern with systems of quota consolidation was that if introduced without restrictions, some vessels could accumulate large amounts of quotas at the expense of smaller vessels. If left without limits, the result could be that a group of many small vessels would eventually transform into a group of only a few vessels, vastly larger in size than the original vessels. Therefore the SQS was introduced with a quota limit, where a vessel could only be allocated three times the vessel's own quota of the individual fish species including the vessel's basis quota. In addition, for some fisheries, such as the fishing of the Northeast-Atlantic cod, a regional constraint applies. The regional constraint means that two vessels can only have their quotas consolidated if they were registered in the same region.

In 2007 the Norwegian Government presented the White Paper on Structural Policy for the Norwegian Fishing Fleet[1]. With this the SQS was expanded to encompass the group of vessels with a quota length between 11 and 15 meters. Consequently, the decommissioning scheme was limited to vessels with a quota length of under 11 meters. At the same time, the quota limit was lowered so a vessel could only be allocated a maximum of two times the basis quota if the vessel participated in several fisheries sectors, and three times the basis quota if the vessel specialized within a single fishery sector.

EXPEREIENCE OF CAPACITY REDUCTION WITHIN THE SMALL-SCALE COASTAL FLEET

The decommissioning program

A review was performed by The Norwegian Ministry of Fisheries and Coastal Affairs in 2009 of the decommissioning program [2]. In 2003 there were 2975 registered annual permits with a quota length under 15 meters. During the period from 2003 to 2008 a total of 404 vessels were decommissioned with an accompanying 442 annual permits removed, 15 % of the original 2003-permits. Since a vessel can have a permit to participate in more than one fishery, hence the number of vessels and the number of permits do not always correspond. The majority of these were permits where within the Northeast-Atlantic cod fishery.

The average value of the grants given was 512,000 Norwegian kroner (approximately 80,000 US Dollars), varying from 160,000 to 1.3 million Norwegian kroner. The total expenditure over the 6 years was over 200 million Norwegian kroner.

There was a slight variation between the intensity of decommissioning among the different regions of Norway. The western region of Sogn and Fjordane removed 24 percent of their registered permits, while the mid-northern region of Sør-Trøndelag removed only 4 percent of their registered permits. However, the degree of which the program was used in the different regions has a close connection with the type of fisheries in these regions and the makeup of the local coastal fleet. Of the 442 permits registered in 2003 in the far northern region of Finnmark, almost a quarter were removed, a total of 19 percent of this region's permits within the vessels with a quota length under 15 meters. This region has a key share of this vessel group, where a large amount of the small-scale fishing after the Northeastern-Atlantic cod is done. The western region is more dominated by pelagic fisheries, where much of the fishing is done by larger coastal vessels or by ocean vessels.

The most interesting question was if the profitability of the remaining vessels had increased, as this was the intent of the program. There are several measures of profitability that could be used, depending on which aspect is deemed most relevant and the availability of data. The factor chosen was the mean operating margin for the different vessel length groups. The operating margin has a long-standing history in Norwegian fisheries, as it was one of the key components in determining the level of subsidies in previous years. It has been consistently measured for the entire period, and data exists for the entire active fleet with a quota length above 8 meters and with permits within limited-access fisheries in Norway. The operating margin is defined as the undertaking's revenue divided by its total net sales.

In the period from 2003 to 2008 all the vessel groups showed an increase in mean operating margin. The decommissioning program was available to vessels with a quota length of less than 15 meters. Vessels with a quota length between 8 and 10 meters increased their mean operating margin from 2.7 percent to 3.6 percent. Vessels with a quota length between 10 and 15 meters increased their mean operating margin from 2.4 to 7.4 percent. Still, in the years following the implementation of the instruments the larger vessel groups had a higher increase in their mean operating margin than the smaller vessel groups. There could be several reasons for this result, but a predominant feature is that the larger vessel groups had access to the SQS.

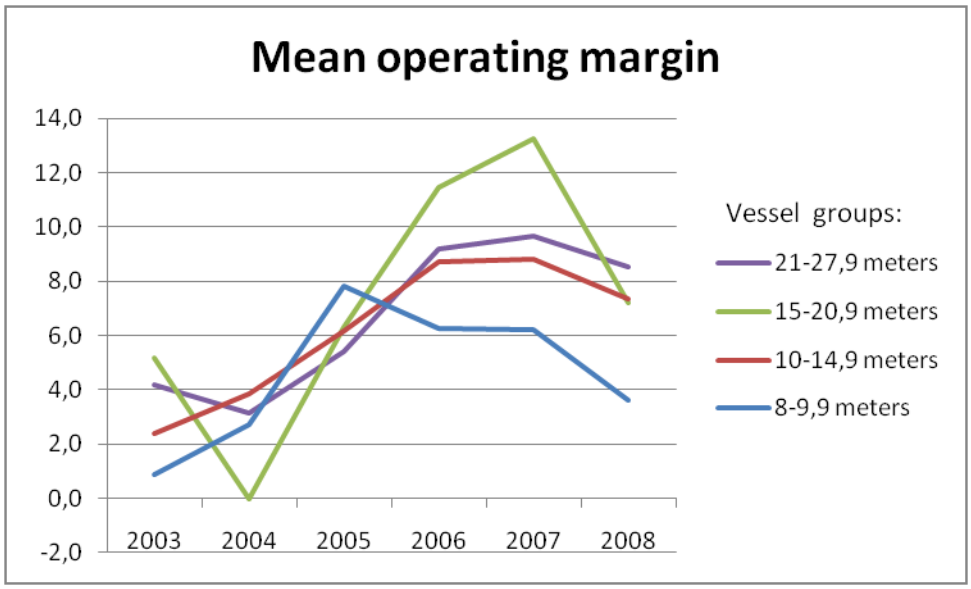

Figure 5. Mean operating margin in different vessel groups

The structural quota system

The Structural Quota System for the coastal fleet was expanded to include the vessels with a quota length of between 11 and 15 meters in January 2008. It is yet difficult to give clear answers about the effects on profitability for the group, since the introduction of the system is so recent. A review conducted by the Norwegian Ministry of Fisheries and Coastal Affairs in December 2009 therefore focused on the degree of consolidation and the possible effects on quota allocation in local communities [3].

From January 2008 to September 2009 a total of 200 vessels with a quota length below 15 meters were removed from the fleet through the SQS, with an associated total of 219 annual permits. The renounced quotas were assigned to a total of 177 vessels as structural quotas. In January 2008 there were 1009 annual permits given to vessels with a quota length between 11 and 15 meters. This means that about a fifth of the permits were removed from fishing by the SQS in a matter of just over 20 months. The far northern region of Finnmark had the strongest degree of consolidation, with 33 percent of their annual permits removed during the period. However, all of the northwestern and northern regions in Norway had over 20 percent of their annual permits removed through the SQS in the same period. The southern regions hardly used the SQS at all, but this is most likely due to the prevalence of small-scale fishing after Northeast-Atlantic cod further north.

Even though the SQS is used more intensively in one region than another the regional constraint present in some fisheries effectively hinders that quota allocations are transferred from one region to another. Consequently, a stronger consolidation in a region will lead to fewer vessels, but the structural quotas will remain within the region. Simply counting the number of vessels in different regions will not give an accurate picture of the quota distribution. Furthermore, there are no geographical constraints within the regions, so the SQS could change the distribution between local communities in a region.

The review looked closer at the change in distribution of the quotas at municipal level in the three northernmost regions in Norway. If a municipality only has a few vessels, the removal of one vessel through the SQS could register as a large reduction. Therefore the review studied the change in municipalities' share of the region's total quota allocations, measured in percentage points. This showed that there were very small changes in quota distribution, also at the local municipal level.

The capacity reduction effect of introducing the SQS for the vessels with a quota length between 11 and 15 meters was far stronger than with the decommissioning program. During the five years from 2003 to 2007 a total of 72 vessels with a quota length between 11 and 15 meters were removed from fishing by the decommissioning program. During the far shorter span of 20 months from January 2008 to September 2009 a total of 200 vessels in the same group were removed through the SQS. The demand for quota consolidation was far larger than the demand for grants through the decommissioning program.

The strong effectiveness of the SQS is in line with what was anticipated at the outset. Both the SQS and the decommissioning program give a reduction in the number of operating units in the fisheries. However, there is a difference between them. This is a strong indication that the SQS performs more efficiently as an economic instrument. A decommissioning program is primarily aimed at giving the least effective participants an incentive to exit the fishery. Participants who are able to fish more cost-effective cannot increase their quota base by buying other vessels. The renounced quotas are redistributed to all participants in the same group, and are equally divided among the most effective and the least effective vessels. With an SQS the participants who can most efficiently harvest fish will have a higher willingness to pay for a structural quota than the less effective. This system thus opens up for efficiency improving transactions of quotas within a regulated system.

The system is also believed to be more effective in adjusting the capacity of the fleet to the resource base, and as mentioned above a possible indication of this is that vessel groups with access to the SQS had a larger increase in their mean operating margin than groups with access to decommissioning programs.

CONCLUSION AND FINAL REMARKS

Due to the ongoing technological progresses, an inevitable development in the world's fisheries is fewer vessels and fewer fishermen. The first challenge for any policy maker is to acquire an overview of the stocks and the fleet. This is a daunting task, because it is neither clear-cut how to define and measure biological stocks, nor is it straightforward to define and measure capacity in the fleet. The Norwegian approach has been, in essence, to count the fish and to count the vessels.

Limiting access to the resource and introducing a Total Allowable Catch has been the primary tool to prevent the overcapacity from being a threat to the sustainability of the resource. Coupled together with enforcement of the regulations the issue of overcapacity is then an economic issue.

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