FISKERIVERKET
RAPPORT 2005-06-30

Fuelling fishing fleet inefficiency

The development of a Swedish pelagic segment in the context of EU structural support schemes 1995-2002

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Summary

Diminishing fish stocks and increased fleet over-capacity have put fisheries subsidies and their possible negative impact on fish resources in focus. This study deals with a Swedish pelagic fleet segment, which received financial aid under EU support schemes in 1995-2002. The general development of the segment and the possible impact of aid on volume of catches, profitability, fishing capacity and fishing effort have been analysed.

The segment comprised 58 active vessels in 2002 and is the most significant Swedish fleet segment in terms of capacity, volume and value of landings. In 2002, the volume of landings, amounting to 247.8 thousand tonnes, constituted 87% of total national landings. Total value reached SEK 491.7m (€ 54m), which was 45% of the national value.

Profitability in the segment varied considerably between 1995 and 2002. The main factor for this variation was the high volatility of prices of pelagic species. The reduced quotas in the period were in many cases compensated by higher prices. The segment received SEK 87m (€9.7 m) in aid to investments and decommissioning under EU structural support schemes between 1995 and 2002, but the direct effect on profits was small. Under the assumption that the investment would have been made regardless of aid, the net profit as share of value of landings for the group of vessels concerned would have fallen only from 11% to 10% in 2002.

Even though some of the investments would have been made regardless of aid, it is likely that the structural aid programmes induced more investments than would otherwise have been the case. Important for the individual decisions to invest were the optimistic prospect of future income (to be generated by improved quality of fish and larger vessels) in combination with banks lending more and the National Board of Fisheries (NBF) granting aid**.**

It is clear that the fleet segment was modernised according to some of the objectives in the programming documents; working conditions have improved, safety at sea has increased, and new refrigeration systems and fish tanks have resulted in higher quality. On the other hand, objectives of obtaining a balance between fleet capacity and fish resources were not met. Despite investments in new and more modern vessels output decreased. This is, however, in line with the management ambitions to keep catches within the agreed framework by reducing quotas. There are several indications of increasing fishing capacity in relation to available fish resources between 1995 and 2002. Compared to 1995, landings per registered GT decreased by one third indicating a latent capacity of this magnitude, that is if the fleet was in total balance in 1995, which is doubtful. If capacity is defined as replacement value, it has increased by more than 50% since 1995 at the same time as landings have gone down by 20% in volume. A similar pattern can be seen for the fishing effort expressed in kW-days, which has increased by 45%, i.e. more effort has been used to catch less fish.

Although the aid was not the only cause of the over-capacity situation, it is quite clear that it fuelled a development towards growing inefficiency and that neither the aid for decommissioning nor the management system were sufficiently potent to balance the investments.

Sammanfattning

Minskande fiskbestånd i kombination med allt större överkapacitet i fiskeflottorna har medfört att frågan om fiskesubventioners eventuellt negativa effekter för fiskbestånden har hamnat i fokus. Denna studie behandlar ett svenskt pelagiskt segment, som mottog statligt finansiellt stöd i enlighet med EU:s strukturprogram under åren 1995-2002. Segmentets allmänna utveckling och stödets möjliga effekter på fångster, lönsamhet, fiskekapacitet och fiskeansträngning har analyserats.

Segmentet bestod av 58 aktiva fartyg under år 2002 och var det största svenska flottsegmentet mätt i fartygskapacitet, landningar och fångstvärde. Under år 2002 uppgick landningarna till 248 800 ton, vilket är 87% av de totala svenska landningarna. Fångstvärdet var 491,7 milj kr, vilket var 45% av det totala svenska värdet.

Lönsamheten i det undersökta segmentet varierade avsevärt mellan 1995 och 2002, vilket främst hade sin orsak i kraftiga prisfluktuationer för pelagiska arter som utgör huvuddelen av de landade volymerna. I många fall har minskande kvoter kompenserats med högre avräkningspriser. Fartygen i segmentet mottog 87 milj kr i stöd till investeringar och skrotning under perioden, men den direkta effekten på lönsamheten var begränsad. Under antagandet att investeringarna skulle ha gjorts även om stöd inte hade funnits, så skulle vinstmarginalen för de berörda företagen ha varit 10% istället för 11% under 2002.

Det är sannolikt att strukturstödet medförde större och fler investeringar än om inget stöd hade givits, även om vissa investeringar hade genomförts oavsett stödmöjligheter. Optimistiska prognoser om framtida inkomster genom bättre produktkvalitet och större fångstkapacitet i kombination med tillgång till krediter från banker och finansiellt stöd från Fiskeriverket har varit viktiga drivkrafter för viljan att investera.

Några av strukturprogrammens mål har utan tvekan uppfyllts. Arbetsmiljö och sjösäkerhet har förbättrats och nya kylsystem har höjt produktkvaliteten. Å andra sidan har mål om att nå en balans mellan fiskeflottans kapacitet och tillgängliga fiskresurser inte nåtts. Trots investeringar i nya och moderna fartyg har fångsterna minskat. De minskade fångsterna är emellertid helt i enlighet med beslut om kraftigt reducerade kvoter under perioden. Det finns flera indikatorer på att fångstkapaciteten i förhållande till tillgängliga fiskresurser har ökat mellan åren 1995 och 2002. I jämförelse med 1995 har landningarna per bruttoton (fartygets storlek) minskat med en tredjedel, vilket indikerar en latent outnyttjad kapacitet av denna storleksordning, under förutsättning att flottan var i balans 1995, vilket är tveksamt. Om kapacitet definieras som återanskaffningsvärde har detta ökat med 50% samtidigt som landningarna minskat med 20%, räknat i volym. Ett liknande mönster kan ses när det gäller fiskeansträngning uttryckt i kilowatt-dagar, vilka har ökat med 45%, dvs allt större fiskeansträngning har använts för att fånga allt mindre kvantiteter fisk.

Även om strukturstödet inte var den enda orsaken till överkapaciteten, är det uppenbart att stödet gav bränsle till en utveckling mot ökad ineffektivitet och att vare sig skrotningsstöd eller förvaltningssystemet har var tillräckligt kraftfullt för att balansera investeringarna.

1. Introduction

Diminishing fish stocks and increased fleet over-capacity have put fisheries subsidies and their possible negative impact on fish resources in focus. The debate in the EU in 1999 preceding the reform of the Common Fisheries Policy (CFP) also concerned to a great extent the financial aid to the fishing fleet and its effect on fish resources. In the Green Paper (European Commission 2001) on the future of the CFP, the European Commission concluded that many fish stocks were outside safe biological limits and that the fleet capacity exceeded that required to harvest fish in a sustainable manner. The Commission also put forward that the EU aid policy, implying aid to investments in new vessels or modernisation of old ones, might have aggravated the situation with over-capacity. In the programming period 1994-99, more than € 0.4 billion of EU–funding was given as aid to investments in fishing vessels within the EU (European Commission 2003).

Purpose

The purpose of this case study of fisheries structural aid in Sweden is to create a clearer picture of the link between subsidies on the one hand and fleet capacity and effort on the other. The intention was that the study should be able to conclude whether there are any linkages and if so, what is the effect on the volume of catches and fishing effort. In addition, effects on profitability are also briefly analysed.

It should be noticed that other potential factors having an impact on capacity, effort, profitability (long and short term) such as e.g. the design of management system, are outside the scope of the study and are only mentioned briefly when appropriate.

Methods

The study focuses on EU structural aid directed to the fishing fleet made available after the Swedish accession to the EU in 1995. The study concentrates on a specific segment of the Swedish fishing fleet: vessels with a length greater than 24 meters targeting pelagic species (herring, sprat, mackerel, capelin and sand eel). This segment was selected as it is the most significant segment in terms of capacity and volume and value of landings in the Swedish fishery. It also received almost 50% of the structural aid disbursed to the fishing companies in the period 1995-2002.

The analysis is mainly based on data from logbooks, sales notes, the fishing vessel register, a database on structural support and annual economic reports on the performance of the fishing fleets (AER)[1]. All the raw data in these registers and databases, in addition to the underlying data to the economic reports, are available at the National Board of Fisheries

[1]Concerted Action, AER:Economic Performance of Selected European Fishing Fleet, Annual Reports 2001-2003

(NBF). No fishermen were interviewed, but material published in an evaluation report of one of the structural programme has been used.

Interviews were held with banks co-financing the investments in the fisheries sector. The purpose of the interviews was to assess any possible impact of government grants on the banks' decisions on co-financing..

In order to see the effects at vessel level, specific analysis was done. The group of vessels which had received aid was divided into two groups, one having received aid for building new vessels and one which had received assistance for modernisation. As most of the vessels had received some kind of aid it was not possible to have a control group without any aid. Landings and capacity in term of GT and kW were compared to the situation before the assistance and, in the case of new vessels, with the replaced vessels.

In order to see the direct effect of EU structural aid on the net profit, a simulated profit and loss account was also set up for 2002 for the group of vessels having received aid any time in the 1995-2002 period. In the simulation, the actual case with aid was compared to a simulated situation where no aid had been given.

Outline

Chapter 2 sets out a general background on fisheries and the EU structural aid to the fishing fleet in Sweden as well very briefly discuss previous work carried out in fisheries subsidies. This chapter also includes a short description the management system and the CFP. In chapter 3, the focus is on the pelagic segment. Apart from a brief description of the segment, the general trends in the segment for total allowable catches (TAC:s), landings, capacity, fishing effort, profitability and EU-structural aid from 1995 to 2002 are described and analysed. In chapter 4 the vessels having received aid are specifically analysed in terms of landings and profitability. In addition, the interaction in the investment process between fishers, banks and the National Board of Fisheries is briefly analysed. Finally, the conclusions of the study are presented in chapter 5. In the Appendix there is a table summarizing economic, capacity and effort data for the segment 1995-2002.

2. Background

Previous work

There are numerous studies carried out internationally on fisheries subsidies. Many of them concern the impact on capacity and resources, the role of management in reducing the potential negative impact on fish resources and whether there are any beneficial subsidies (from a resource perspective). (Porter G, 2001)

In a conceptual paper for the OECD, R. Hannesson (2003) has developed an analytical framework for understanding the impact of financial transfers, incl. subsidies, on total catch, but also on trade. The paper concludes that the impact of subsidies largely depends on the status of stocks and type of management regime: open access, catch control or effective management. In the case of catch control, the total catch will be unaffected by subsidies, but the cost for taking the given catch will increase as investments increase. Under effective management, the individual catch is given and the subsidy will only raise the profit, as the vessel owners do not have incentives to raise the effort. If quotas are transferable, the increased profit will be reflected in a higher market price for the quota. In open access, the total catch will initially increase, but diminish in the long run as the stock will be over-exploited.

In the case of Sweden, K.Rikner at the School of Economics in Gothenburg in 1994 presented a report on the impact of government aid to the Swedish fishery. The entire fleet was analysed using data at a regional level. The objectives of the national fishery policy in the 1980s were the starting point for the analysis, which covered the period 1988-1993. These objectives concerned production, efficiency, income, regional aspects and consumers. Effects of government aid in the form of capital grants and low-interest loans were examined. The price supplement system, also in place at the time, was more or less excluded due to lack of data at a micro level.

Rikner concluded that the aid had contributed to an increase in technical efficiency, primarily due to increased average size of the vessels. At a fleet level, two opposite effects were identified: i) a rationalisation contributing to a reduction of total fleet size, ii) a reduction of costs (second hand spare parts) contributing to the preservation of old vessels giving rise to an increase in the average age of the vessels. In all, capital aggregation occurred, reducing the share of small vessels at the expense of large vessels at the same time as the total fleet was slightly reduced. No impact on the fisher's income was found.

Swedish fishery[2]

General characteristics

The Swedish fishing industry, which comprises marine and inland fishery, aquaculture and processing, is a very small sector in economic terms at a national level as it represents less than 0.1% of total GDP. Nevertheless, it plays an important role locally, particularly in some municipalities on the west coast of Sweden where the main processing plants are located.

In 2002, the total Swedish marine catches were 285,000 tonnes valued at SEK 1,074m (€119 m) of which 158,000 tonnes corresponding to SEK 344m (€38 m) were landed abroad, mainly in Denmark. The marine fishing fleet included 1,820 vessels with a total capacity of 45,000 GT and 225,000 kW.

In numbers, small fishing vessels are predominant, but in terms of value and volume of landings larger vessels account for the major part of the fishery. The Baltic Sea is the most important fishing area with close to 50% of the total national catch in volume. Other areas are the Skagerrak, the Kattegat, the North Sea and the North Atlantic. In 2002, cod was the most important species in economic terms, accounting for one quarter of the total value of landings, followed by herring and sprat for human consumption, fish for reduction purposes, *nephrops* and shrimp. 2,350 people were employed, full- or part-time, in marine fisheries.

Production from inland-fishery and aquaculture is comparatively limited with a total output of 9,000 tonnes, worth of SEK 240m (€26.7 m) in 2002. Important species in the inland fishery are pike-perch, crayfish and vendace. In the fish-farming sector rainbow trout is predominant, accounting for 80% of the total production. Inland fishery employs about 200 fishers and the employment in the aquaculture sector amounts to about 600 people.

There were about 170 processing plants with a total production value of SEK 4,100m (€443 m) in 2002. Total employment was 1,800, of which half worked in the five largest plants located on the west coast of Sweden. Production is mainly directed towards herring and cod, but also, to some degree, prawn, salmon and mackerel.

Management system

The Common Fisheries Policy (CFP)

As Sweden is a member of the European Union, the Common Fishery Policy (CFP) and its legislation is directly applicable.The objectives of the CFP are stated in several documents. In Council Regulation (EC) No 2371/2002, commonly called the basic regulation, article 2 contains the objectives as set out below:

[2] This section is based on Statistics Sweden (2003a, 2003b and 2004) and unpublished material from the National Board of Fisheries.

" The Common Fishery Policy shall ensure exploitation of living aquatic resources that provides sustainable economic, environmental and social conditions.

For this purpose, the Community shall apply the precautionary approach in taking measures designed to protect and conserve living aquatic resources, to provide for their sustainable exploitation and to minimise the impact of fishing activities on marine eco-systems. It shall aim at a progressive implementation of an eco-system –based approach to fisheries management. It shall aim to contribute to efficient fishing activities within an economically viable and competitive fisheries and aquaculture industry, providing a fair standard of living for those who depend on fishing activities and taking into account the interests of consumers"

There were similar objectives in the previous regulation from 1992 (Council Regulation, (EC) 3760/1992). The objective was to protect and conserve the available marine aquatic resources, at the same time as the needs of producers and consumers were taken into account.

At a national level, the CFP is supplemented by implementation regulations and legal acts covering areas outside the scope of the CFP, such as the inland fishery.

Within the CFP there are four main policy areas which are to each other. The conservation policy includes regulations aimed at protecting the fish resources mainly by setting quotas and effort limitations, and deciding on technical regulations. It is supported by a control and enforcement system. The structural policy regulates the financial aid to restructure the sector and the size of the fishing fleet. The market policy deals with the fish market and the work of the producer organisations. In addition, there is a policy for relations with countries outside the EU. (European Commission 2004)

Licensing and quotas[3]

Under the CFP, vessels participating in a professional fishery have to be licensed in a system linked to the EU fishing vessel register. The implementation and way of licensing is, however, up to the Member State (MS). In Sweden, access to fishery in public waters is limited by vessel permits and personal professional fishing licenses issued by the National Board of Fisheries (NBF). The vessel permit is normally a general permit for all kinds of fisheries, although restricted permits have been issued lately. Technical measures and quotas for the different fisheries are normally regulated separately.

The maximum total capacity of the Swedish fleet was fixed in so-called multi-annual guidance programmes (MGP III 1995-1996 and MAGP IV 1997-2002) for the fishing fleet, decided by the EU. These programmes also stipulated by segment, a reduction of fishing effort or fleet capacity in terms of fleet tonnage and engine power, with the exception of small-scale passive fishery for which capacity was not allowed to increase. Entry-exit schemes and aid to decommissioning have been the main tools for implementing the programmes. In 2002, a new system based on so called reference levels for the entire fleet were introduced.

[3] This section is based on Fiskeriverket (2004).

Most Swedish fisheries are under quota regulation. Total allowable catches (TAC) are fixed annually for different areas and species, and are set either within the EU, bilaterally between the EU and non-EU countries or within the framework of international organisations. The EU is the contracting partner, representing Sweden in all international negotiations. The EU quota is divided between the Member States (MS), following the principle of relative stability. Relative stability implies a fixed share of the Community quota, a percentage for each Member State, each species and fishing area. For some fisheries, mainly in the coastal areas, there are no quota regulations.

It is up to the MS to decide how to distribute the quota nationally. In Sweden, the distribution of the quota between vessels is regulated by the NBF or handled by the fishermen's associations. For some species, the principle of free entry for all licensed vessels is applicable. In the case of cod in the Baltic Sea, the NBF issues a regulation specifying the maximum vessel landings per week. For herring and sprat, two-weeks maximum quotas are applicable. The quantities landed are differentiated according to size of vessel. The fishery goes on until the national TAC has been exhausted. Normally, the maximum quotas are set with the objective to keep the fishery open all year. The fishermen's associations have imposed similar quota regulations on their members covering other species not included in the national regulations. In very few fisheries with small TAC:s, there are also vessel quotas. These individual quotas are given annually and are not transferable.

EU structural aid

When Sweden joined the European Union in 1995, three community structural aid programmes with financial assistance to the fishery sector were implemented.

The Financial Instrument for Fisheries Guidance (FIFG) was the main source of finance for measures directed at the fishery sector. For the PESCA programme, a regional programme, funding was also available from the European Regional Development Fund and the European Social Fund (European Commission 1998).

The objectives of the FIFG were[4];

1) to contribute to achieving a sustainable balance between fishery resources and their exploitation;
2) to strengthen the competitiveness of structures and the development of economically viable enterprises in the sector;
3) to improve market supply and the value added to fishery and aquaculture products

In 1999, a regional objective was added were[5]

4) to contribute to revitalising areas dependent on fisheries and aquaculture.

[4] Council Regulation (EEC) No 2080/1993
[5] Council Regulation (EC) No 1263/1999

The implementation of the EU structural policy led to a significant increase in financial assistance to the fishery sector in Sweden. In the years preceding the Swedish accession, less and less government aid had been given to the sector. A system with low-interest loans, loan guarantees and price supplements were abolished in the early 1990s. The system had been in place for 60 years.

For the programming period 1995-1999, total payments under the structural programmes amounted to SEK 550m (€ 61m) (Fiskeriverket, 2002). For the period 2000-2006, the budget totals SEK 970m (€ 114m) of which two-thirds is funding from the European Union under the FIFG and one third national, public co-financing (Fiskeriverket 2001, Lst Jämtland 2003 and Lst i Norrbotten 2003).

The structural programmes include financial assistance to most parts of the fishery sector: professional fishery, aquaculture, processing and marketing as well as fishing ports. Aid is given for investments and for development projects.

Aid to the fishing fleet

Objectives

In addition to the objectives for aid at EU-level, more precise objectives for each part of the sector are formulated in the national programmes. In the main programme for the period 1995-1999 (European Commission, 1995), the objectives for the fishing fleet were

1) to promote a competitive fleet consisting of modern vessels adapted to rational and economically viable fishing in coastal marine areas and in lakes and
2) to achieve an overall fishing effort within the Swedish fishing fleet which is adapted to the size of stocks and to create conditions for the continuing renewal of the fleet.

In the programme for the period 2000-2006 (Fiskeriverket, 2001), the objectives were similar, but focus had changed slightly from competitiveness to environmental aspects. The objectives were

1) to renew the Swedish fishing fleet with modern and flexible vessels and to stimulate new thinking and innovations in order to build, for the purpose, well suited vessels reducing environmental pressure, facilitating a improved handling of the catch and creating good working condition,
2) to modernise the Swedish fishing fleet in order to be able to optimally use, in a sustainable manner, the catch and to be a safe working place for the fishers
3) to dimension the fleet so that a balance is created between the fish resources and the fishing effort (Fiskeriverket, 2001).

Administration

In order to co-ordinate the structural aid programme and the management of fleet capacity, most issues related to the fleet are decided on by the National Board of Fisheries (NBF).

The aid is normally given as an interest free loan against security. The loan is depreciated over a period of 10 years and the recipient only has to repay the loan in case the vessel is

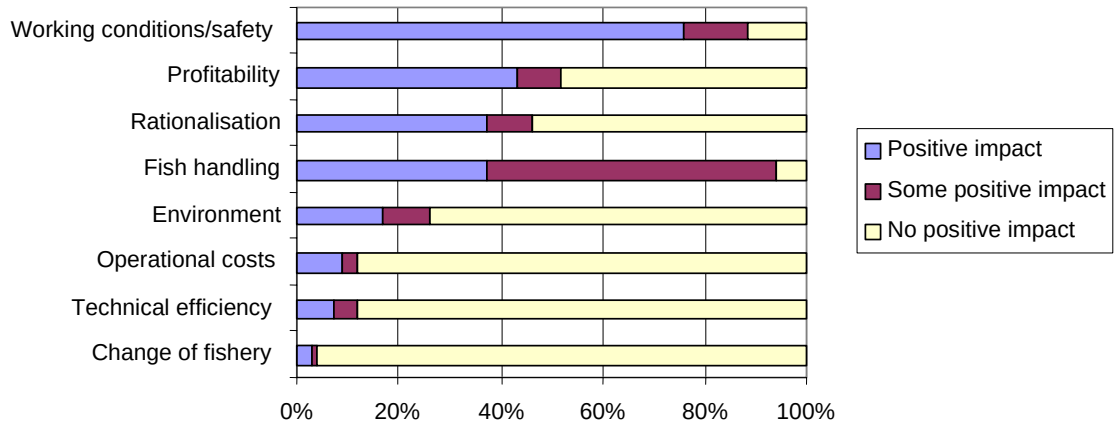
sold outside Sweden or used for other purposes. In case of small amounts of aid or aid for decommissioning, the aid is given as a grant with immediate depreciation. Payments of aid is only done after the investments have been made (or the vessels have been decommissioned) and paid for by the vessel owner (Fiskeriverket 2003).

Evaluation

The EU structural aid given outside the Objective 6 area in 1995-99 was evaluated as part of the monitoring and follow-up of the implementation of the programme (Nordregio 2002). According to this evaluation few fishing companies (7%) experienced increased technical efficiency, but 40% reported a positive impact on profitability.

The figure below summarises whether the fishers experienced positive impact of the aid on different aspects such as e.g. profitability and efficiency.

Figure 2.2. Fishers' view on the impact of the aid, 1995-99



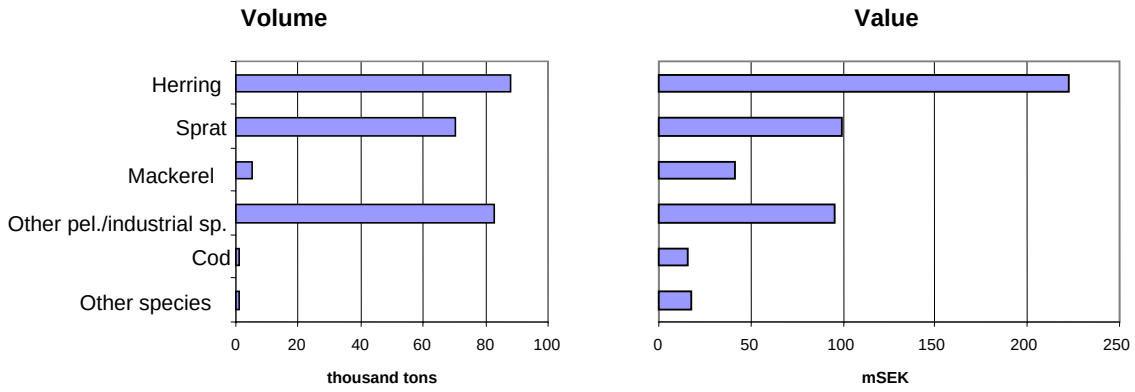
Among the fishers receiving aid for scrapping, 57% bought another vessel and continued fishing. The net effect was always a reduction of capacity if the replacement vessel was not a vessel under 12 meters with passive gear.

3. Pelagic segment, vessels ≥24 m

General characteristics

The pelagic segment is the most significant Swedish fleet segment in terms of capacity and volume and value of landings. In 2002, the volume of landings amounted to 247.8 thousand tonnes, which constituted 87% of total national landings. Total value reached SEK 491.7m (€ 54m), which was 45% of the national value. Pelagic and other industrial species like herring, sprat, sand eel, blue whiting and mackerel accounted for the lion's share (94%) of the total catch in volume (see figure 3.1). Approximately 65% of the catch was used for reduction purposes or animal fodder.

Figure 3.1 Volume and value by species, pelagic vessels ≥ 24m, 2002



Source: National Board of fisheries, unpublished

It is the most flexible segment of the Swedish fishing fleet as regards fishing area. The fishery takes place in the Baltic Sea, the North Sea, the Atlantic, and to a lesser extent in the Skagerrak and the Kattegatt.

In 2002, the segment totalled 58 vessels with a capacity of 21.9 thousand GT and 65.6 thousand kW. Employment amounted to about 350 people on board. The average vessel was 36 meters long, with an engine of 1,100 kW and a crew of six men. Most vessels have their home port on the west coast of Sweden

Trends 1995 to 2002

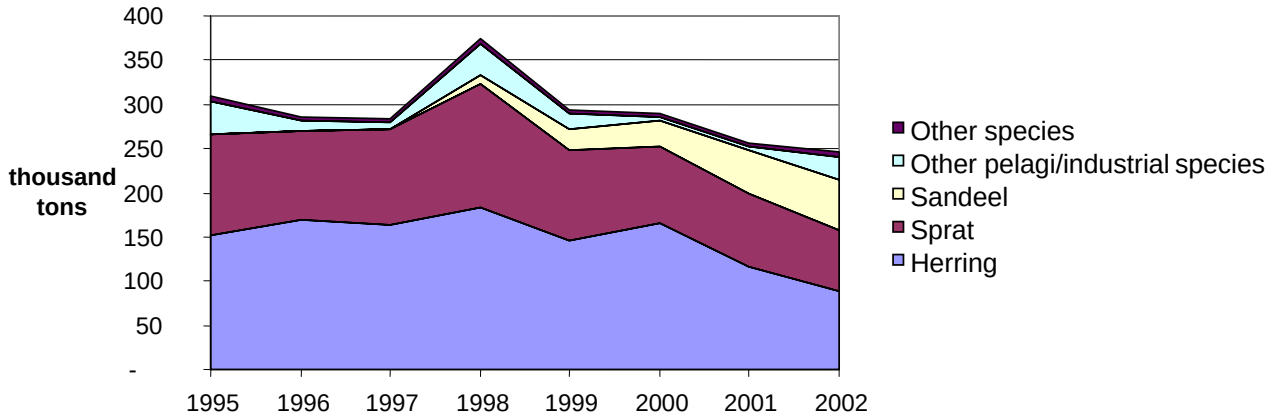
TAC:s and landings

The TAC:s available for the Swedish pelagic fleet have changed drastically during the period 1995-2002 reflecting a change in the stock situation. In this period, the total available quotas of pelagic species decreased by 25 %, which means a net loss of 90,000 tonnes from approx. 360,000 tonnes in 1995 to 270,000 tonnes in 2002.

The traditional pelagic fishery (herring and sprat) in the Skagerrak/Kattegat and the Baltic decreased by about 170,000 tonnes, but has to some extent been replaced by a new fishery in the North Sea for sand eel and two new ones in the North Atlantic for herring and for capelin. The herring in the Atlantic is well suited for human consumption and normally has a higher value than herring from the Baltic and the Skagerrak/Kattegat areas. The sandeel and capelin fisheries on the other hand are used exclusively for non-human consumption. However, the capelin quota in the Greenland waters (66,497 tonnes) is, under normal conditions, not profitable for the Swedish fishery due to the long distance from the homeports of the vessels.

In 2002, the Swedish quotas and TAC:s had a very high utilisation rate, i.e. landings more or less equalled the quotas, with the exception of capelin in the Greenland zone where about 60,000 tonnes were not fished and in the Skagerrak/Kattegat where 8,000 tonnes of sprat were not fished. The trend in volume of landings by species or group of species is shown in figure 3.2 below.

Figure 3.2 Landings by pelagic vessels ≥ 24m, 1995-2002



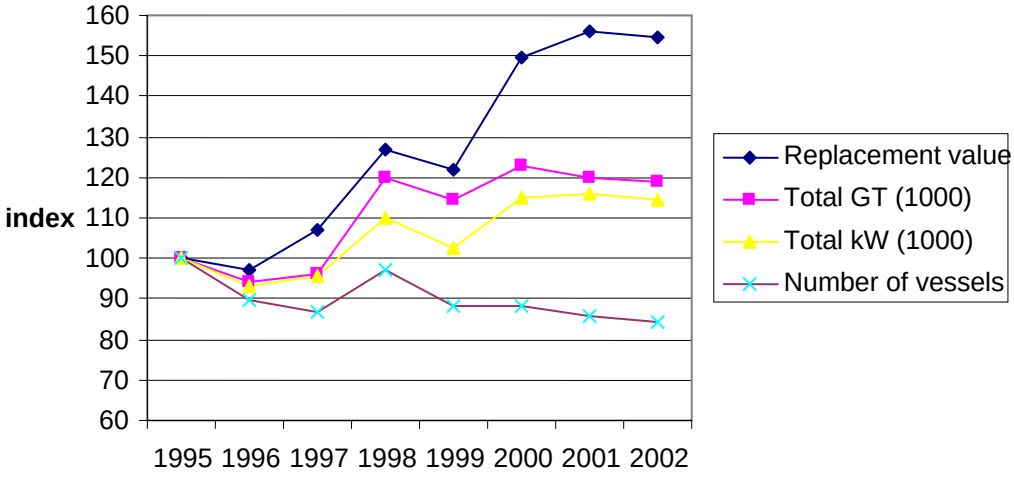
Source: National Board of Fisheries, unpublished.

Capacity and investments

Between 1995 and 2002 capacity, both in terms of gross tonnage and engine power, increased significantly in the segment concerned. Total gross tonnage increased by 19% and engine power by 14%. Some vessels switched from other segments to pelagic fishery, but the will to modernise old vessels and build new vessels was also strong giving an increase of the replacement value of the vessels (a proxy for invested capital) by 54%. The number of vessels, on the other hand, decreased resulting in an increase of the average tonnage per vessel by more than 40%.

In 2002 the average tonnage was 377 GT, compared to 267 GT in 1995. The development of capacity and replacement value are demonstrated in figure 3.3.

Figure 3.3 Capacity and replacement value, pelagic vessels ≥ 24m, 1995-2002



Source: National Board of Fisheries, unpublished.

Initially, from 1995 to 1997, the level of capacity was quite stable. From 1997 to the end of 1998, however, the gross tonnage grew by 25%. The reason for this increase was mainly the high prices both of fish for reduction and fish for direct human consumption attracting capacity to the pelagic segment from other segments. The induced increase of the cash flow and increased profitability coupled with the new EU financial support and easy access to commercial bank loans also triggered an investment boom. The Swedish tax system with high personal taxes but with generous depreciation rules also induces investments when profits are high.

The Swedish multi-annual guidance programme (MGP IV) was altered in 1999. The revision of the programme implied that the need for reduction was increased by the equivalent of 4,000 GT in the segment for demersal trawlers and decreased to the same extent in the pelagic segment. The overall objective for the entire fleet was unchanged, but the revision of the MGP IV programme implied that an increase of capacity in the pelagic segment was in line with the programme. The argument for the change, which was approved by the European Commission, was that investments had been done in quality enhancing measures not directly affecting the ability to catch fish (Commission Decision

1999/446/EC). Stricter entry-exit rules for fishing capacity were also introduced, not only for pelagic vessels but also for the rest of the fleet with the exception of the small-scale fishery. The NBF made it compulsory to withdraw at least the same amount of capacity that entered the fleet. It has to be noted that the entry-exit system only concerned new vessels or vessels for which the capacity was increased. It was still possible for vessel owners in other segments, with some exceptions, to switch to pelagic fishery if they already had a general vessel permit.

Initially there were few restrictions on what type of capacity that had to be withdrawn from the fleet in case a vessel owner wanted to enter capacity. In 1997 it was decided that the entry/exit of capacity in the pelagic segment had to be made within the segment. In 2001, rules were tightened further as the exit/entry ratio for the pelagic segment was increased to 130%.

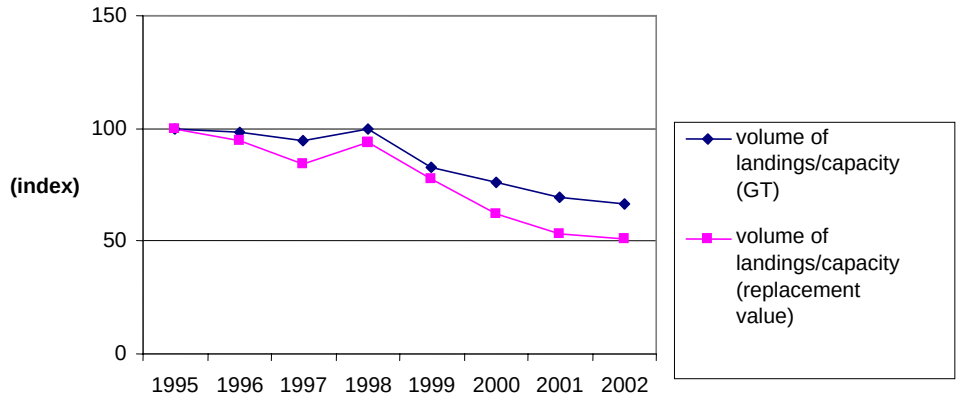
The entry-exit system created a second-hand market for fleet tonnage. Old vessels were withdrawn from the fleet and the right to the fleet tonnage was sold to companies investing in larger vessels. The high level of investment led to a sharp increase in the price for fleet tonnage. Decommissioning financed by the government went down, as the scrapping premium paid was not competitive. The entry-exit scheme has meant that the right to fish professionally has been capitalised, at least in the short run. The government accepts the transfer of capacity as being part of the entry-exit system, but there is no specific regulation for the market of tonnage. The vessel permits are only issued for a maximum of five year periods and do not, in general, imply specific or exclusive shares of quotas.

The level of gross tonnage in 1998 remained more or less at the same level in 2002, which, at least partly, may be explained by the entry-exit scheme. The low fish prices, with the exception of 2001, and reduced quotas have also made the segment less attractive. See also section 3.2.4 on profitability.

There is a common opinion that there is technical over-capacity in the segment. However, it is difficult to more precisely define in gross tonnage and engine power how much capacity is needed to catch a given quota, and from there calculate the over capacity. Alternatively, one can look at the development of capacity in technical and economic terms in relation to catches. If the volume of landings, which in most cases more or less equals the quota, is put in relation to the vessel gross tonnage (GT), it can be observed that the volume of landings per vessel GT has decreased by one third between 1995 and 2002.

By using the replacement value of the vessels, other aspects affecting the technical ability to fish than only gross tonnage and engine power may also be included. The replacement value used is in this way, a proxy for technical capacity. As mentioned before, the replacement value in the segment increased by more than 50% in the period 1995-2002, at the same time as the landings went down by 20%. Even if replacement value is not entirely proportionate to the technical ability to catch fish or is weighed against a given stock situation, it is likely that the figures indicate over-capacity. The development is illustrated in figure 3.4 below.

Figure 3.4 Volume of landings in relation to capacity, pelagic vessels ≥ 24m, 1995-2002



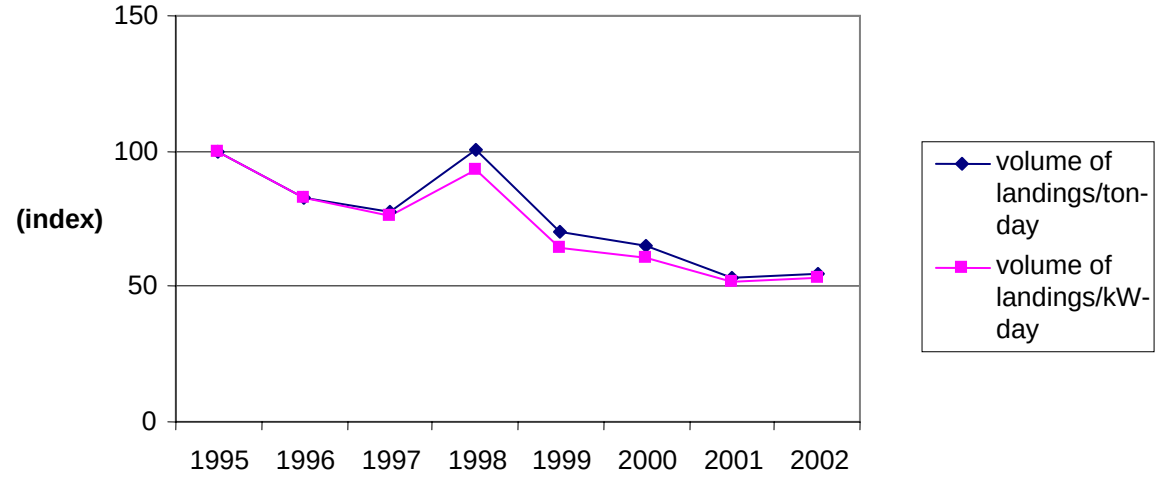
Source: National Board of Fisheries, unpublished.

Fishing effort

Fishing effort may be expressed in many ways. One method is to calculate the number of kW- (or tonne-) days. A kW-day is defined as the engine power measured in kW of each vessel multiplied by the number of days at sea.

For the pelagic segment, the number of kW-days has increased by 45% since 1995. The increase in effort is mainly due to new capacity, but the vessels also spend more days at sea, which may reflect some changes in fishing areas. The development of effort in relation to landings indicates a growing over-capacity. The increase in effort, defined as kW- and tonne-days, has not been met by an increase in the volume of landings, i,e. more effort has been used to find and catch less fish. The development of lower volume of landings per kW- and tonne-day is shown in figure 3.5.

Figure 3.5 Volume of landings in relation to fishing effort, pelagic vessels ≥ 24m, 1995-2002



Source: National Board of Fisheries, unpublished.

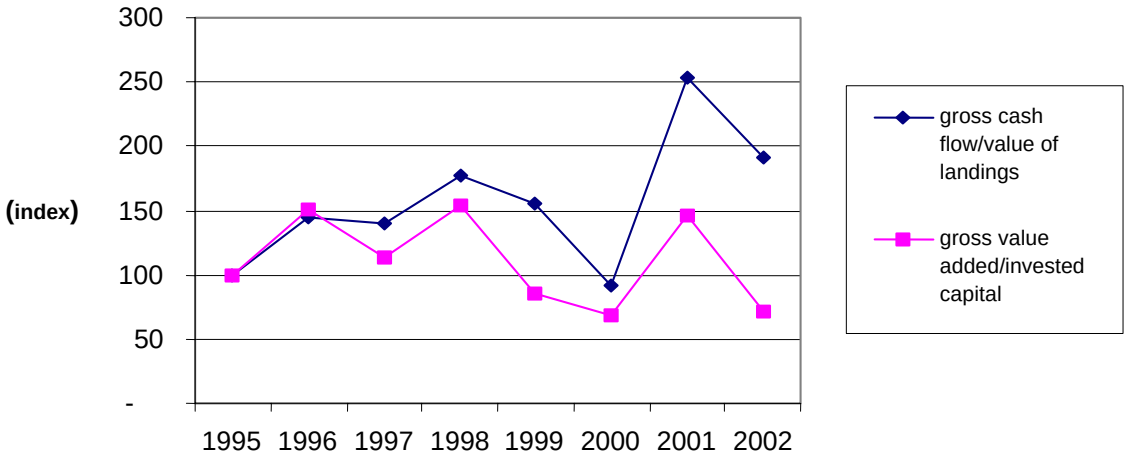
Profitability

Profitability varied considerably in 1995-2002. The main factor affecting profitability was changes in the fish market. Prices of fish for reduction and fodder, as well as for human consumption, are very volatile. The demand for pelagic fish for human consumption, which pays two or three times more than fish for reduction, was also relatively high during certain years contributing to a high value of landings. Reduced quotas resulting in lower landings in the period were, with some exceptions, compensated by increased prices. This compensatory effect has been quite strong. The value of landings in relation to vessel gross tonnage was 16% higher in 2002 than in 1995.

On the cost side, lower rates of interest, due to the macro-economic development in Sweden, partly compensated increased indebtedness and higher levels of invested capital calculated as a replacement value (+54% in the period). In relation to the volume of landings, capital costs have increased, but this is largely due to the reduced quotas. Gross cash flow (GCF) in relation to value of landings, which is a measure of profitability and the ability to survive in the short term, varied from 14% to 36%. It has to be taken into account that the crew share is normally adjusted according to the value of landings, i.e. the gross cash flow is overestimated in bad years and underestimated in good years.

With imputed costs for depreciation, the segment was unprofitable, expressed in net losses, in 1995 and 2000. In reality, the net profit in the actual accounts is more likely to have been positive due to transfers from untaxed reserves and other adjustments occurring in years with low profitability. In 2001, the segment was very profitable generating a net profit of 21% of value of landings. Financially bad years have thus been interspersed by occasional good years. Figure 3.6 shows how profitability in terms of GCF in relation to value of landings has varied.

Figure 3.6 Gross cash flow and gross value added, pelagic segment, 1995-2002



Source: National Board of Fisheries, unpublished.

Looking at the development of gross value added (GVA), the trend is the same as for net profit and gross cash flow. Put in relation to invested capital, however, it is obvious that the development has been weak. The development of value of landings does not match the high increase in invested capital. If the same level of gross value added (as share of invested capital) as in 1995 had been maintained in 2002 the value of landings would have increased by approximately 40%. Further it has to be remembered that the year 2002 was a good fishing year and generated a relatively high value of landings. In the Swedish fishery, the GVA is normally what is traditionally apportioned between the crew members and the vessel owner after each fishing trip. The GVA is defined as the value of landings minus costs paid to other supplying industries, i.e. it is the reward for capital an labour. It is the sum of cost of labour, depreciation, interest and net profit. A low value of GVA means that fewer investments can be financed and that the remuneration to the crew has to be reduced (all other things equal).

EU structural aid

In the pelagic segment there was a high demand for aid in the period 1995-99. Despite the new funding available under the FIFG, not all applications could be accepted and only investments that were considered high priority were granted assistance. In 1999, the demand for aid was three times the amount of funding available and measures with the objective to increase safety, improve quality and fish handling, and to give better working conditions were given priority. After 2000, the will to invest has been much lower and no aid has been granted to the construction of new pelagic vessels >=24m. Aid to the construction of vessels with a length exceeding 18m was also banned in the Swedish programme in 2002.

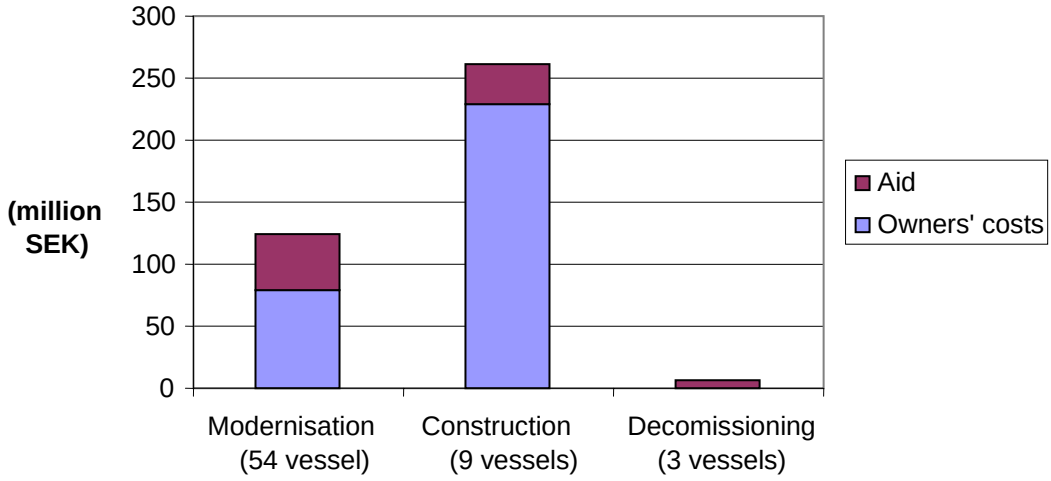
Under the programme 1995-99, aid for modernisation and construction totalled SEK 83m (€ 9m) based on investment costs amounting to SEK 385m (€ 43m). Under the new programming period 2000-2006, only SEK 4m (€ 0,5m) had been paid out to the modernisation of vessels by the end of December 2002.

Apart from the construction of nine new vessels, the financially most important measure since 1995 has been aid to investments in refrigerated (or chilled) sea-water tanks (RSW or CSW) in 40 vessels. This is a relatively large number considering that only 20 vessels in the Swedish fishing fleet had those kinds of fish tanks with refrigeration systems in 1995. Other important investments were fish pumps (related to the refrigeration systems) and sheltered decks.

For each investment and vessel there was a maximum level of aid, which gave an average financial support constituting 12% of the total eligible costs for construction and 36% for modernisation in 1995-1999. The total amount of aid and its share of the total cost its illustrated in figure 3.7. After 2000, the maximum levels according to EU-regulations have been lowered. For modernisation the maximum level is 20%. In a small area in northern Sweden (objective 1 area) the level is 40% of eligible costs.

Only five pelagic vessels were scrapped from 1995-2002. Total aid amounted to SEK 14.5m (€ 1.6m). Most vessels received structural aid. Out of 58 active vessels in 2002, 50 had received structural aid in 1995-2002.

Figure 3.7 Disbursed aid to pelagic vessels >=24 m, programme period 1995-1999



Source: National Board of Fisheries, unpublished.

4. Special analysis

Profitability

In order to see the direct effect of EU structural aid on the net profit, a simulated profit and loss account was set up for 2002 for the vessels having received aid any time in the 1995-2002 period. In the simulation, the actual case with aid was compared to a situation where no aid had been given. The subsidised vessels accounted for 86% of the value of landings of the pelagic segment in 2002. Under the assumption that the investment would have been made regardless of aid, the net profit as a share of value of landings would fall from 11% to 10% without aid. It should be noted that no tax effects were taken into account in this simulation. A financial aid is normally taxed as income, implying that the positive effect on the net profit in reality is even lower. The small financial impact from the aid can be explained by a low level of the rate of interest and the relatively small proportion of aid in relation to the investment costs for some investments. A large share of the new investments concerned the construction of new vessels with a contribution of aid of only 12% on average. Apart from the improved net profit, there is also a positive effect on the cash flow. For 2002 this effect can be estimated to 1.5% of the value of landings.

It should be noted that the simulation was not done for individual vessels, but for a group of vessels. According to the evaluation presented in section 2.4.3.4, 40% of the individual fishers say they experienced improved profitability.

If some of the investments would not have been made without aid, the impact is of course much greater. For the pelagic segment, as for most other fishery in Sweden, quotas and technical regulations limit the fisheries. As described in previous chapters the costs for the investments have not been met by increased output, but by reduced catches. The conclusion is that the aggregated net profit (due to less debt), at least in the short run, would probably have been higher if not all investments had been undertaken. It has to be remembered though, that the value of landings would probably have been lower if some quality-enhancing investments had not been made.

Aid to modernisation

Intuitively, the technical ability to fish should increase as more fish pumps etc are installed. In order to see if this effect could be confirmed in the group of vessels receiving aid for modernisation, catch per trawl hour was analysed. It turned out that the number of vessels was in most cases too limited to make reliable comparisons between the reference years. For 32-mm trawl (midwater) in the Baltic Sea and the Skagerrak, however, the catch per hour had diminished from 1995 to 2002. It should be noted that the stock situation worsened in the same period, but normally the catch per hour should not be considerably affected for pelagic species like herring. What happens when the stock is deteriorating is that the vessels have to increase search time and once the shoal of fish has been found the catch per hour

should not change much. In order to take into account the size of fish stocks effects, more sophisticated methods are needed.

The development of catches was also analysed. For vessels which received structural assistance for modernisation, the total catch decreased by 40,000 tonnes, which is 31% between 1995 and 2002, which was more than for the segment as a whole. The fishing pattern followed more or less the pattern of the segment as a whole implying a new fishery in the North Atlantic and reduced catches in the Baltic Sea.

Aid to construction

Vessels built with aid to construction were compared to the vessels they replaced. During the first programming period from 1995-1999, seven new vessels representing 4,505 GT and 15,495 kW, entered the fleet and were still active in the fleet during 2002. More vessels had entered but had been replaced before 2002. These seven vessels replaced 33 vessels representing 4,341 GT and 14,996 kW. Thus the analysis clearly shows that investments in new vessels lead to capacity aggregation, i.e. fewer but larger vessels in the segment. The new vessels also implied a concentration to the Göteborg area (GG) as all seven were registered in the GG area and 12% of the replaced GT originated from ports located by the Baltic Sea and 9% from other west-coast ports. In numbers, 17 out of the 33 vessels had homeports outside the GG area. The arithmetical medium age of the replaced vessels was 37 years.

The catches of the seven new vessels were compared to the catches of the replaced 33 vessels. Naturally, it was not possible to compare the catches during the same year and therefore in this study, the catches of the 33 vessels in 1995 have been compared to the catches of the new vessels in 2002.

In 2002, total catches of the new vessels were 57,600 tonnes compared to the catches of the replaced vessels, which in 1995 were 64,000 tonnes, a decrease of 10%. The reduction is less than for the whole segment, but it has to be taken into account that all replaced vessels did not belong to the pelagic segment in 1995. The catch pattern has changed implying that in 2002 about 11,000 tonnes of herring and capelin were taken in the North Atlantic compared to nothing in 1995 and that catches of herring and sprat in the Baltic has been reduced by about 20,000 tonnes. The fishing pattern of the new vessels is also more pelagic and practically no demersal species have been caught. In 1995, on the other hand 1,900 tonnes of cod was taken in the Baltic as well as other minor quantities of other demersal species and five tonnes of salmon. The catch share of the total Swedish available quotas and TAC:s was in 2002 for the new vessels, 15% and of the pelagic species 21%.

The role of the National Board of Fishers and the banks

In order to assess any possible impact of the government grants on the decisions of co-financing by the banks, interviews were held with three banks. According to the banks they accounted for more than 80% of the volume of lending to the fishing companies.

Generally the banks have engagements in all fishing segments. Lending to the fishery sector is also handled by a limited number of employees at the banks and the knowledge of the individual companies is very high. Regular overviews of the companies' finances also take place. The banks do not have enough capacity to analyse general developments within either the CFP or the biological advice. Instead, the banks rely on information from the individual fishing companies, the fishermen's associations and the Board of Fisheries.

Relatively large credits were given to investments in pelagic vessels from 1997 and onwards. Before credits were given to the fishing companies, the banks did company and security analyses mainly covering the cash flow and the market value of the securities. In case a fishing company planned to undertake investments eligible for structural aid, the banks generally also required a decision on structural aid from the National Board of Fisheries (NBF) before a loan was approved.

The NBF decisions on aid, in addition to the vessel permits, seem to have functioned as official approvals of the fisher's business idea and investment plans. The banks normally took for granted that the National Board of Fisheries (NBF) had analysed the application from both a resource and an economic perspective and the banks used the decision as an input into their loan process. However, the fleet management plan setting the limits for fleet capacity in relation to fish stocks was not closely enough monitored the NBF. Legally, it was also difficult for the NBF to refuse applications for vessel permits in case the equivalent capacity in kW and GT was withdrawn, unless major changes had been made to the regulations.

The insufficient analysis by the NBF as well the banks implied a band-wagon effect, which was also aggravated by not enough dialogue between the banks and the NBF. According to the banks the system with programming periods and limited funding also created a pressure to invest earlier than would otherwise have been made.

Compared with other industries, the banks witnessed that bank profitability in recent years in the fishing sector had been normal and that no bankruptcies had occurred. The fishery sector was still regarded as a high risk lending area, though, due to the changes in fish quotas and high price volatility.

5. Conclusions

The impact of investment aid to the fishing fleet on capacity, effort and fish stocks largely depends on to what degree the aid stimulates new investment and how the management system regulates access to fisheries and the level of output. The conclusions below, therefore, endeavour to describe the chain from the availability of aid to the possible effects on capacity, effort and fish resources. There is also some conclusion on the link between aid and profitability.

Stimulation to invest

The structural support schemes stimulated investments

Several factors gave rise to the investment boom from 1997 and onwards: i) increased profits because of high fish prices and a growing demand for pelagic fish for human consumption, ii) expectations on future profits if investing in chilled storing facilities on-board, giving increased value of landings or larger vessels, iii) availability of financial means in the form of bank credits and aid, in combination with time pressure to take advantage of the aid and iv) the approval of applications for vessel permits and aid by NBF giving a sort of green light to go ahead and invest. It is very difficult to rank these different factors, which are also linked to each other. It is clear that the structural aid contributed to the increase in investments, which is also in line with the objectives of the structural programmes to encourage investments. The fleet segment was modernised according to some of the objectives in the programme documents; the working conditions have been improved, safety at sea has increased and the new refrigeration systems and fish tanks have resulted in higher quality of the fish landed.

Capacity and fishing effort

The investments have contributed to an increase of capacity and fishing effort

Gross tonnage and engine power in the segment concerned increased substantially in 1997 to 1998. Some of this increase can be explained by investments co-financed by aid. From the end of 1998 and onwards, the capacity in terms if gross tonnage and engine power remained stable, partly due to a more efficient implementation of an entry-exit scheme. As a result of the modernisation of old vessels and the constructions of new vessels, however, the segment comprised more technically well equipped vessels in 2002 than in 1998.

There are several indications that capacity in relation to available fish resources has increased substantially. One explanation is of course that the quotas have been reduced, which leads to a growing imbalance per se. It is very difficult to measure this latent over-capacity.
Compared to 1995, landings per registered GT have decreased by one third indicating a latent capacity of this magnitude, if the fleet was in total balance in 1995, which is doubtful. If capacity is defined as replacement value, it has increased by more than 50% since 1995 while landings have dropped by 20%. Similar patterns can be seen for fishing effort expressed as kW-days, which has increased by 45%, i.e. more effort has been used to catch less fish. Most of the increased fishing effort comes from increased capacity. Although we

are not able to say exactly how much capacity and fishing effort that is needed to catch the available quotas, we can safely assume that there is technical overcapacity in the segment.

From an economic perspective, the gross value added as share of invested capital (defined as replacement value) has gone down by 28%, in the same period i.e. the reward for capital and labour has dropped.

Fish resources

The management system has reduced potential effects on fish resources

Looking at the impact on the fish resource, it has to be taken into account that the pelagic fishery is largely managed by TAC:s and technical regulations. As the fishing vessels concerned have not been able to increase catches despite the increased fishing capacity, the conclusion (see section 2.1) by R.Hannesson (2003) that management measures such as fishing quotas and technical measures will reduce the effects of investments, subsidised or not, on the fish resources can be confirmed.

Analyses of vessels receiving aid shows that the TAC:s and technical regulations have hindered a general expansion of the fishery. Total catches have in reality diminished, which is in line with the management goals of reducing catches when stocks are deteriorating. Whether the reductions of quotas have been sufficient for a sustainable fishery in the long run has, however, not been analysed in this study.

There has been an expansion of some fisheries, like the blue whiting, sand eel and capelin fisheries. There has also been a tendency to investigate new fishing possibilities benefiting private contracts outside the EU fishing zone even though this kind of distant fishery is still extremely rare for Swedish vessels.

There are some potential, not measurable, indirect effects such as the risk of more political pressure to keep the TAC:s when stocks are in decline. The temptation and incentive to fish illegally are also likely to increase.

Profitability

Price of fish was more important for profitability than aid or the level of capital costs

Developments on the market for fish for reduction and herring and sprat for human consumption were the main factors affecting profitability. Neither the level of quotas nor the financial input from aid seem to have had a similar impact. In a scenario where no investments would have been undertaken, if aid had not been available, the cost of fishing would be lower and the profit higher.

Concluding remarks

The objectives of the aid programmes to balance fleet capacity with fish resources have not been met. The decommissioning scheme and the entry-exit scheme may have slowed down the imbalance, but has not compensated for the level of investments and the reduced TAC:s. It may be questioned if the objectives of the structural programmes to modernise the fleet and adjust the capacity at the same time are at all realistic. It is very difficult to implement a structural aid investment scheme and to reach a balance between capacity and fish stocks in a situation where stocks are in decline. This is even more difficult if the effects of reduced quotas are offset by high prices.

Despite over-capacity, the study shows that profitability has been quite good in certain years, which can be explained by relatively high prices of fish. On the other hand, the segment is sensitive to changes in fish prices, quotas and the level of interest. It is also very difficult for the fishing companies to adjust to the situation by improving efficiency as it is not possible to accumulate quotas at a vessel level. The management system is constructed on the assumption that the resources will be restored shortly. The non-transferability of fishing quotas and a relatively free access to the segment has meant that the over-capacity (and hence lower profitability) is distributed to more or less all fishing vessels.

The over-capitalisation means that the fishery is also economically inefficient from a macro-economic perspective and does not generate an optimal resource rent.

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Appendix

Economic and capacity indicators, pelagic vessels >=24m, 1995-2002

	1995	1996	1997	1998	1999	2000	2001	2002
(mSEK)								
Value of landings (VoL)	357,0	460,3	395,5	560,2	316,3	383,5	563,2	491,7
Fuel costs	56,3	70,5	58,5	71,7	45,2	65,6	73,2	68,8
Other running costs	58,1	72,7	60,5	101,9	70,6	105,4	123,2	88,5
Vessel costs	95,8	101,9	98,1	99,3	46,5	62,0	30,5	88,4
Crew share	95,6	119,7	99,4	145,1	83,5	100,1	131,3	110,6
Gross cash flow (GCF)	**51,2**	**95,6**	**79,0**	**142,2**	**70,6**	**50,4**	**205,0**	**135,4**
Depreciation	25,9	25,1	28,2	34,9	33,6	41,2	41,7	40,5
Financial costs (net)	48,7	33,9	28,6	34,4	26,7	38,6	42,3	42,4
Net profit	**-23,4**	**36,6**	**22,2**	**72,9**	**10,3**	**-29,5**	**120,9**	**52,4**
Gross value added	146,8	215,3	178,5	287,3	154,0	150,5	336,3	163,1
Debts	474	462	508	602	577	709	790	734
Replacement value (RV)	790,6	769,8	846,5	1003,0	961,9	1182,0	1235,5	1222,0
Structural aid disbursed amount	0,0	3,0	16,4	11,0	20,2	0,8	11,9	0
GCF/VoL	14%	21%	20%	25%	22%	13%	36%	28%
Net Prof/VoL	-7%	8%	6%	13%	3%	-8%	21%	11%
Volume of landings (1000 t)	314,4	291,0	285,9	376,2	297,2	294,6	263,4	247,8
Employment on board	345	310	300	402	366	427	354	348
Fleet - number of vessels	69	62	60	67	61	61	59	58
Fleet - total GT (1000)	18,4	17,3	17,7	22,0	21,0	22,6	22,1	21,9
Fleet - total kW (1000)	57,3	53,3	54,8	63,0	58,9	65,7	66,5	65,6
Effort (1000 days at sea)	11,1	11,7	11,8	12,3	11,7	12,5	12,3	11,6
Effort (million kwdays)	9,5	10,7	11,1	11,3	12,8	13,7	15,0	13,8
Effort (million tondays)	3,1	3,5	3,7	4,0	4,6	4,8	5,0	4,6
Volume of landing in tons /GT	17,1	16,8	16,1	17,1	14,1	13,0	11,9	11,3
GT/vessel	267	279	295	329	345	370	375	378
kW/vessel	830	860	913	940	965	1078	1127	1131
Year of constuction	1969	1970	1971	1973	1973	1975	1976	1976
Age of vessel	26	26	26	25	26	25	25	26

Source: National Board of Fisheries, unpublished

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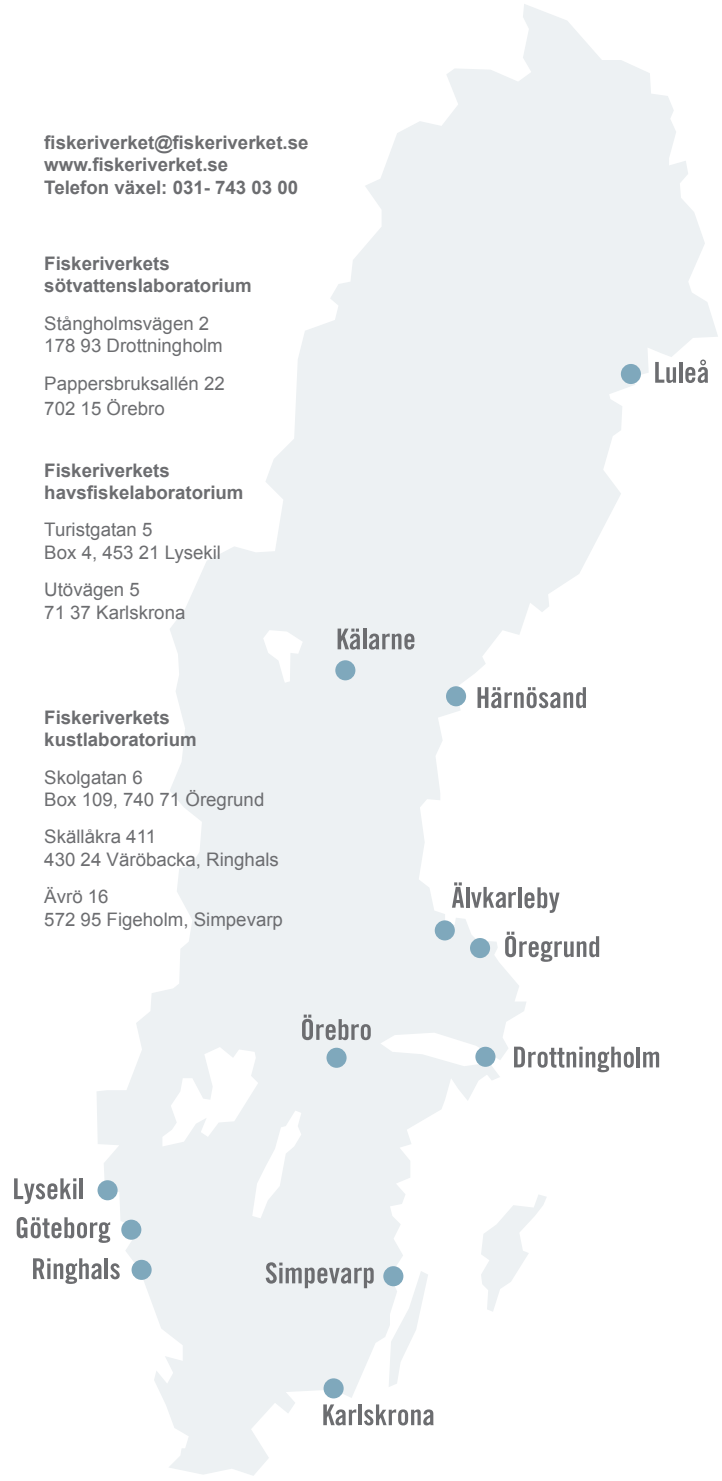

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