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Economic consequences of recovery plans for fish stocks

Pavel Salz

The Netherlands

Abstract

This paper discusses briefly the economic consequences of reduction of TAC for the sake of stock recovery. It shows that running a fishing vessel requires more than fish stocks alone. Reduction of TACs in the short run leads to adverse consequences for the fishing company in terms of profitability, loss of crew and buyers turning to other sources. Compensation of short-term losses by higher future revenues is rather uncertain. Unless serious threats to survival of the fishing firms are dealt with adequately, it would not be 'economically rational' for the industry to support stock recovery plans. Furthermore, introduction of property rights seems an essential part of a recovery plan in order to prevent future overexploitation.

Introduction

According to a recently completed study on 'Regional socio-economic study on employment and the level of dependency on fishing' the number of people employed on board of fishing vessels in the EU has decreased from about 300,000 in 1990 to 250,000 in 1998. A drop of almost 20%. This development has occurred in all EU Member States, incl. the North Sea coastal areas. This is a consequence of a number of factors, state of the stocks being only one. Other causes, which lead to people leaving the fishing industry are social position, irregular working conditions, falling difference between earnings at sea and on shore, alternative employment opportunities, increasing complexity of regulation, labour saving innovations on board, etc.

The above figure implies an annual decrease of employment of about 1.7%. This is in fact still quite slow compared to the development in European agriculture where about 4% of the working population take up a different job annually. Decrease of employment in primary industries is an established process caused by constant real prices of output (fish), increasing labour productivity and demand for higher real earnings by those who remain in the sector.

Recovery of fish stocks is evidently desirable, but the positive economic and social consequences (income and employment) of such recovery should not be overestimated. They will primarily lead to higher earnings of the active fishermen. Recovery plans may require a prolonged period of substantially reduced fishing. Consequently, they imply that social hardship in the short run is accepted in exchange for uncertain increase in fishing opportunities in some unknown distant future. The herring moratorium in the seventies has led to a situation where stock recovered, but by that time fisherman, consumers, markets and logistical infrastructure disappeared. This illustrates that the major issue, to be considered in relation to recovery plans, is the chosen speed of recovery. The recovery path is even less predictable than the long run chances of recovery itself. Reconciliation of short and long term interests lies here at the heart of the matter.

Simple example: North Sea cod

Average TACs of North Sea cod for 1998-2000 amounted to 118,000 tonnes annually. In the long term, cod catches could theoretically reach about 200,000 tonnes. Such an increase would lead to an increase in landed value from 190 to 320 mln Euro. Under certain

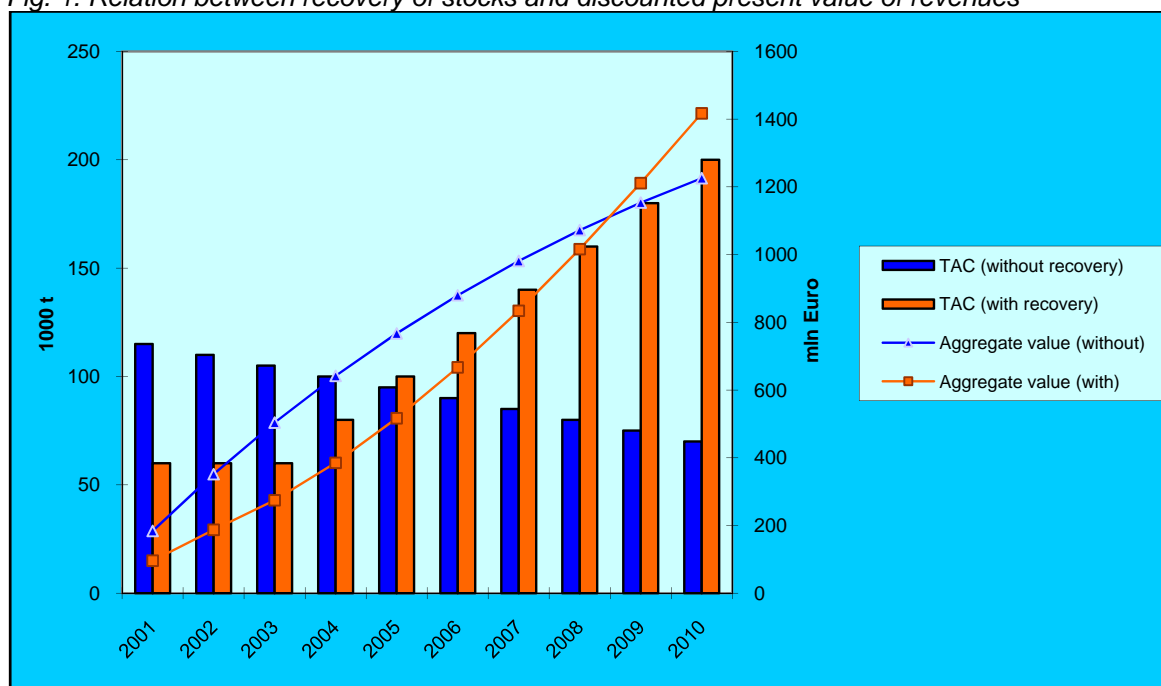
assumptions regarding production costs and costs of labour (crew share), these figures would imply that cod currently maintains about 1,400 full time jobs (fte)¹. Considering an average increase in real earnings of 2% per year, the constant real value of cod landings will be able to maintain 1,050 jobs in 10 years time. If the stock would sufficiently recover and allow TACs of 200,000 tonnes, the employment related to cod would be about 1,900 jobs. If the cod landings would decrease further to about 70,000 tonnes, the number of jobs related to it could be estimated at about 700.

The above presentation of a few key indicators is also the way in which things are traditionally presented, although may be not as quantified. However, such straightforward reasoning does not do justice to a little more complicated reality. A few other arguments may be mentioned, which qualify the notion that stock recovery leads 'automatically' also to economic prosperity:

- Additional income may lead to higher profits and earnings of those already in the business and to higher investments in labour saving technologies. Efficiency means replacing people by machines. Real gain in employment is highly uncertain.
- In a multi-species context it is not certain what happens to other stock when cod recovers. Falling TACs of cod and other 'traditional' species have made some fleets shift to other resources, e.g. monk, nephrops, hake, etc.
- Low cod stocks may not be only caused by high fishing pressure, but also by changing environmental conditions (higher temperatures, north Atlantic oscillation). In that case a recovery programme may not have the desired results.
- Recovery of the cod stock requires investment in the sense of temporary reduction of catches. Economic attractiveness of the recovery depends on the duration, extent of reduction and speed of recovery.

The last bullet point is illustrated by a specific example

Fig. 1. Relation between recovery of stocks and discounted present value of revenues



The above graphic presents two hypothetical situations for the years 2001-2010. Neither of these situations has any scientific basis!²

1. In the situation **without a recovery plan**, TACs slowly decrease from 115.000 tonnes in 2001 by 5.000 tonnes per year, ending at 70,000 tonnes in 2010.

¹ It is assumed that 60% of gross revenues are production costs, 40% is net value added (labour income and profit) and 55,000 Euro is equivalent to one fte. Based on 'Economic performance of selected European fishing fleets, 1999. (FAIR PL97-3541)

² Statistical variation of annual recruitment is relatively high, so that prediction on recovery paths cannot be done with any reasonable confidence.

2. In the situation **with a recovery plan**, TACs would be reduced to 60,000 tonnes for the first three years in order to allow the size of the stock to recover. Subsequently it is assumed that the stock will start recovering and TAC will rise by 20,000 tonnes annually to reach 200,000 tonnes in the year 2010.

The two lines show the aggregated net present value of the gross revenues over the given period, with a constant real price per tonne. This is the sum of all values of landings of the preceding years, with each value discounted by an assumed interest rate of 5%³. The discounting is required because the value of 1 mln Euro in 2010 is not equal to the same amount in 2001. At an interest rate of 5% 1 mln Euro in 2010 is equal to 0.65 mln Euro in 2001.

In the chosen example the two lines show that it takes about 8-9 years before the aggregate value of both options is approximately equal. The difference between the two value increases as long as the TACs of the option 'without recovery' exceeds the TAC of the option 'with recovery', which is the first 4-5 years. Evidently, the assumed recovery path determines this result, but the principle applies in any case. It takes relatively long time to compensate short-term economic loss. This is the fundamental problem why so-called recovery measures are often disputed by the industry. While the companies face a certain loss, in return they are offered uncertain revenues in unknown future. For individual entrepreneurs this is a way to go out of business for sure.

Consequences for whom: regions and companies

North Sea

There are some 48,000 fishermen working in the six EU countries fishing in the North Sea (UK, NI, Be, Ge, Dk, Fr). Approximately 50% of them may spend most of their time in the North Sea area. If the recovery of the cod stock as outlined above allows 700 new jobs, it would be 3% of the current total. These jobs could be realised fully only in 10 years time. By that time economy of the coastal regions will be further restructured, probably mainly towards services (trade, recreation, etc.). In view of the shortage of the crews and lack of interest for fisheries schools, which occur nowadays, it is also a question whether these crewmembers will be found at all. In any case 700 jobs in the heavily populated North Sea basin does not seem to make a great difference, even if these jobs would be concentrated in the most fisheries dependent regions.

On the basis of these rough indications it may be concluded that it is difficult to justify stock recovery measures on the basis of arguments regarding development of regional economies of the North Sea. Fishing is simply an activity with too little importance, even if all backward and forward linkages would be considered. In the North Sea countries there are on average 2 jobs on shore (fish processing and auxiliary activities) on every job at sea.

Companies

Availability of fish is evidently of major importance for fishing companies. However, it is not the only factor, which determines their economic survival. At least three other considerations are equally important: prices of fish, production costs and productivity (cpue in economic terms).

Most fishing companies are relatively small. Therefore they have difficulty to follow a long-term strategy. The level of indebtedness varies, but 40-50% foreign capital (bank loans) is quite usual. In case of recovery plans, the individual companies are asked to invest in uncertain future. But the investment is such that it threatens directly the survival of the companies itself.

³ In feasibility studies a discount rate of 10% would be applied, so that the assumed 5% is in fact rather low.

A fishing vessel will not usually depend on one species alone. Assuming that revenues of vessels in certain fleet segments depend for 15-20% on cod, reduction of cod TAC by 50% will lead in the first instance to a fall of revenues by 7-10%. Such a fall may make precisely the difference between making profit or loss. Furthermore, the number of companies and jobs threatened in reality is than 5-6 times higher than the 1400 jobs ascribed to cod stock above.

Reduction of revenues, due to reduction of TACs will further affect the company several other ways:

- Earnings of the crew falls and consequently it may become more attractive for the individual crew members to look for another job. Whether they ever return is most uncertain.
- The bank expects its loans to be repaid. Although the credit line will not be cut very quickly. 2-3 years is approximately the limit. After such a period the bank may suggest to sell off the assets (vessel, etc.).
- Buyers of the fish will look for and find alternative new sources. Whether they will return to the original source, once the stock recovers, is by no means certain.

The above considerations explain why empirical research has demonstrated that fishing vessel owners implicitly have a very high level of discount rate, in the order of 20-25% per annum (and not 5% used above). Income in short term (1-2 years) is fundamental to survival of the (fishing) firms.

Conclusions

1. It seems unlikely that recovery of stocks will offer a major contribution to the development of the economy of the coastal regions around the North Sea.
2. Short-term reduction of TACs for the sake of higher catches in the long-run implies excessive commercial risk in relation to the survival of the individual firms, not only in terms of loss of catch and revenues, but also concerning loss of crew, markets and credibility to banks.
3. If a stock recovery programme is to be accepted and successful, the threat of 'going out of business' has to be addressed in its full scope. Co-operation of the banks may be of major importance.
4. Preventing bankruptcies will maintain the presumed overcapacity. Higher earnings from recovered stocks will be an incentive to invest. Recovery plans are a necessary, but certainly not a sufficient condition for rational fisheries management. Introduction of property rights to stocks (ITQs) and restriction of fleet size (licences) are at least as important.