

Asymmetric information and heterogeneity in fisheries: An empirical study of the information rent in the cod fishery in Kattegat

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Asymmetric information between buyers and sellers always complicates contracting. One problem is adverse selection, which occurs if this asymmetry can be exploited by privately informed agent(s) before outcomes are known. Originally described in relation to insurance markets, adverse selection occurs when an insurer (a seller) is unable to distinguish between risk types and high-risk individuals (one type of buyers) therefore feign being low-risk types in order to pay a lower insurance fee and thereby profit from the value of holding private information – also known as the “information rent”. This issue of adverse selection can be solved with a self-selection mechanism in which a manager offers a non-linear menu of contracts that incentives privately informed workers to reveal their types by their choice of contracts. In such a menu of contracts, the agent who could benefit from feigning his type is given a compensation equivalent to the information rent. The manager is now left with the problem of minimising the necessary compensation - the information rent - while maximising the total value of the fishery. A second-best optimum can thereby be achieved.

My thesis empirically estimates the relative cost of solving an adverse selection issue and achieving a second-best optimum in a case study of the Danish Cod fishery in Kattegat. The basic fisheries problem of the stock externality is thus accounted for in the optimal way, but my focus is not on the cost of this externality, but rather on the cost of solving a further complication – that of asymmetric information. The ensuing adverse selection issue can be resolved by a self-selection mechanism, in this case a non-linear tax system. I measure the welfare cost of such a self-selection mechanism by estimating the information rent relative to the total welfare accruing from the fishery.

In order to provide this estimate, I first set up a structural Principal-Agent model combined with a framework from optimal control theory. Next, based on time series from the Danish fishery account statistics and ICES, I estimate a price, cost functions and a growth function. Based on the estimated parameter values and the model I program a simulation that finds the second-best optimum. In the case studied, I find the information rent relative to total welfare to be extremely low at around 0.49 % or (DKK 1,3m relative to 268m). A sensitivity analysis proves the results are very robust to parameter changes, with no results above to 1.5 %.

The case and therefore the quantitative result is specific not only to fisheries, but to a specific fishery. The theory and estimation fills a gap in the literature, as there is almost no study of asymmetric information in fisheries economics. Outside of fisheries economics, the empirical estimate could be of general economic interest because no other quantitative studies of the information rent exist – except in a few auction studies. While the case is highly specific, the issue of adverse selection is general across many economic applications and not only optimal resource management.