

WHOM SHOULD THE RENT ACCRUE

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ABSTRACT

Resource rentals can be viewed as taxes on scarcity rents or as fees for access to use or utilize the resource. The Icelandic Fishery Management Act requires that vessel owners pay a Catch fee (Veidigjald). This paper discusses how the Catch fee is defined by the Fishery Management Act. Secondly it is discussed if and how the fee affects incentives. Thirdly a alternative method of taxing the resource rental is commented briefly upon. Lastly it is asked if the fee is high enough. <P>

Keywords:

Resource Rentals, fishing fee, ITQs, Icelandic fishery management

Introduction

Resource rentals can be viewed as taxes on scarcity rents or as fees for access to use or utilize the resource. The Icelandic fisheries are a potential and actual source of such rents. If utilized, resource rentals would be instrumental in how those rents are distributed among the citizens of Iceland. The higher is the resource rental the bigger is the share of the general public in the rent. Lower rental reduce the share that the general public gains and inflates the value of fishing rights. Hence, a heated debate has developed for and against use of resource rentals. Holders of fishing rights have been against use of resource rentals for natural reasons. Many others have been in favour and based their stand on equity reasons. Some that have been in favour have pointed out that higher resource rentals will lower the price of fishing rights and thus lowering the capital requirement for new entrants in the industry making it more attractive for young entrepreneurs to choose this line of activity. Fishery sector specific resource rentals have been given many names in the Icelandic discourse: Veidigjald (catch-fee), Auðlindagjald (resource fee), Auðlindaskattur (resource tax) are examples of terms used in the debate. Those in favour of use of resource rentals tend to associate rentals with a fee while those against tend to associate rentals with taxes. Hence, it is hard to find definitions for each term that all agree on so that terms are used interchangeably. Some has used fishing-fee as a catchall term. Thus, when I mention fishing-fee below it will have the same meaning as resource rental. Fishing-fee can be thought of as resource rental specific for the fishery sector.

Economists specializing in public finance usually point out that resource rentals are less harmful to economic incentives than most other forms of taxation. The reason is that resource rentals affect rent income but do not inflict a wedge between buyer and seller prices if correctly adapted. Hence, resource rentals will redistribute income in the economy but should not distort price-signals and incentives to the same extent as do more commonly used types of taxes¹.

The Icelandic Fishery Management Act requires that vessel owners pay a Catch fee (Veidigjald). The fee is based on an amendment to the Fishery Management Act passed by Alþingi in 2002. That amendment had travelled a long and winding road before passed as law.

¹ A wage tax would insert a wedge between the price employers pay for use of one unit of labour and the pay that employees take home as consequence of supplying one unit of labour.

Fishery management and resource rentals were about to take centre stage in the electoral debate leading up to the parliamentary election of 1999. It was obvious that the parties arguing for policy change had a good potential for gaining ground. To defuse that potential the government decided to erect the so-called Resource Committee in which all the political parties represented in Althingi had representation. The mandate was to deliver recommendations regarding definition of natural resources in public stewardship. Furthermore, to advise how to secure that potential rent from such resources found its way to stakeholders, including the general public. The mandate proved a tall order. An interim report containing review papers by several scientists was delivered before the parliament election in 1999, see Forsætisráðuneytið/Auðlindanefnd (1999). A final report was not delivered until September 2000, see Forsætisráðuneytið/Auðlindanefnd (2000). For the fisheries the majority of the committee advised rentals either in the form of a fee per allotted cod-equivalences kilos or by auctioning to the highest bidder a given percentage of quotas each year. The Ministry of Fisheries had established a second committee in 1999, see Sjávarútvegsráðuneytið/Endurskoðunarnefnd um stjórn fiskveiða (2001). The mandate of that committee was to evaluate and possibly revise the Fishery Management Act. The committee was named the Revision Committee for obvious reasons. The majority of a split committee adopted the Resource Committees suggestion to use a catch fee (fee per allotted kilo of cod-equivalences) as a method to alleviate some of the tension created when the system was inaugurated. Then existing vessel owners were “grandfathered” into the system. I.e. quotas were allotted to existing vessel owners for free. One of the leading opposition parties in Alþingi, The Socialdemocratic Party, consequently put on its program the adaptation of the alternate rule proposed by the Resource Committee, the so-called amortization rule.² The Minister of Fisheries finally proposed the Amendment to the Fishery Management Act containing the payment formula based on the recommendations of the majority of the Revision Committee. The payment formula, given below, was thus supposedly a compromise but in effect more or less dictated by a vessel-owner friendly government.

The organisation of the reminder of this paper is as follows: First I will discuss how the Fishery Management Act defines the Catch fee. Secondly I will discuss if and how the fee affects incentives. Thirdly the amortization proposal will be commented briefly. Then we will ask if the catch-fee is high enough.

Catch-fee, Icelandic version of a resource rental

The law text gives the exact formula (in words) for the fee. The formula is:

$$T_t^{catch} = 0.095 \left[(1 - 0.398) P_{t-1}^{catch} Q_{t-1}^{catch} - 6,218 \frac{P_t^{oil}}{P_{2000}^{oil}} - 17,568 \frac{CPI_t}{CPI_{2000}} \right] \quad (1)$$

Here the catch-fee at time t is given as T_t^{catch} , P_t^{catch} is ex-vessel price of catch, Q_t^{catch} is a quantity-index, P_t^{oil} is price of oil at time t and CPI_t is the consumer price index at time t . Note that 0.398 was the assumed crew share of catch value in the year 2000, ISK 6,218 millions was

²That method was originally proposed by a group of academics and people from non-fishing business organizations.

the assumed oil bill and ISK 17,568 millions was the assumed cost of inputs other than labour and oil in the year 2000. The catch-fee according to the above formula amounted to 3.14 kr/cod equivalence kilo during the fishing year 2004-2005. It is not fully effective yet, but would have brought in 1.5 billions of kronur 2004-2005. It is useful to compare the catch-fee and the lease price of a kilo of cod. The lease price of a kilo of uncaught fish should be high enough to leave a fisher holding the right to fish indifferent between fishing and renting. In other words, it should be at least as high as the difference between ex-vessel price of a kilo and the cost of bringing that kilo on shore. Thus, the lease price gives a rough indication of the size of the resource rent in a fishery. It is interesting in this respect to note that the lease price of kilo of ce was in excess of 100 kronur during the 2004-2005 fishing year, hence the resource rental collected for the public purse is apparently less than 3% of the rent! It should be kept in mind that the figures in equation (1) are explicitly fixed in the law text itself. Hence, if they are to be changed it is necessary to pass a bill through the parliament. That is important and we will return to that below.

Comparing the catch-fee and “ideal” resource rental

Resource rent can be defined as the difference between the total incomes of a resource based production activity and the value of inputs used. “The resource rent is hence an extra profit, over and above the normal remuneration to capital owners and workers. All who are participating in the production may earn as much as they could have obtained elsewhere and still there is a surplus left”, Moene (2002), her taken from Hersoug (2005). Most taxes affect both income and incentives of the payee. The incentive effect comes around as the payee tries to minimize the impact of the tax on his well-being. Taxes on pure rents, resource rents included, can be designed so as to minimize the incentive effect. Hence, experts in public economics tend to put resource rentals high on their list of things to catch, as pointed out in Commision_on_green_taxes_(Grønn_skattekommission); (1996), page 336. This is because a tax on a resource rent would have many of the characteristics of a lump-sum tax, as described by say, Hindriks and Myles (2006).

The catch-fee would be characterized as “Net royalties or taxes based on hypothetical costs” by Heaps, Helliwell et al. (1985), which by their account is designed to combine both high degree of rent collection without distorting incentives for effective resource use. They point out that once the rate is fixed the individual payee keeps all cost savings s/he comes up with. They also point out that the biggest administrative problem with this type of tax lies in the definition of cost and quality.

Heaps and Helliwell correctly predicted that definition of costs, and hence of the resource rent, is problematic. This is reflected in equation (1) which is an attempt to measure the resource rent created each year in Icelandic fisheries. Using the definition above the economic profit of the fishing firms can be defined as:

$$\Pi_t = P_t^{catch} Q_t^{catch} - P_t^{oil} Q_t^{oil} - P_t^{other} Q_t^{other} - P_t^{resource} Q_t^{resource} - W_t L_t \quad (2)^3$$

³ Note that accounting profit would be defined as $\pi_t = [1 - \alpha] P_t^{catch} Q_t^{catch} - P_t^{oil} Q_t^{oil} - P_t^{other} Q_t^{other}$ and would thus include the resource rent and would also take into account the remuneration system used in the fisheries.

Here, the resource rent is represented as $P_t^{resource} Q_t^{resource}$, and the opportunity cost of labour employed represented as $W_t L_t$. Now, assume that the category “other” includes all relevant inputs except oil and access to the fishery resource, including “normal” payment for capital employed.⁴ Assume furthermore that the industry is competitive, acting as a profit maximizing price taker on markets for products as well as for factors of production so that the expected value for Π_t is zero. Thus, the resource rent is given as:

$$P_t^{resource} Q_t^{resource} = P_t^{catch} Q_t^{catch} - P_t^{oil} Q_t^{oil} - P_t^{other} Q_t^{other} - W_t L_t \quad (3)$$

The formula of the law text is a crude attempt to define the resource rent as it is assumed that use of inputs other than labour and the natural resource was optimal in 2000, which is questionable. It is also crude due to the fact that labour is not valued at its opportunity cost but at accounting costs. Furthermore, it is crude as it is assumed that none of the inputs beside the resource are earning a scarcity rent.⁵

Note that the price of oil was low in 2000 as compared with the present situation (2005-2006) and as compared with the situation in foreseeable future. Note also that the fishers are remunerated by a share system. As constructed, the share system secures fishers income that exceeds their opportunity costs. Thus, the formula of the law text systematically overestimates both the cost of oil and the cost of labour. The formula underestimates the proper remuneration for special skills that are in short supply. It would be a happy situation if these two effects, the overestimation of cost of oil and labour and the underestimation of remuneration of special skills cancelled each other out. But that is rather unlikely. Special skills soon lose their value in a competitive industry as competitors imitate the doing of the skilful or as the skilful uses his advantage to acquire the business of the less skilful and apply the superior skills to the expanded business. Hence, it is safe to conclude that the formula is not unfavourable towards the payee of the catch fee as the formula is much more likely to underestimate the resource rent than to overestimate it!

Does the catch fee affect relative prices? The case of oil.

The rate of the catch fee is fixed by lagged values of the various variables and unaffected by use of inputs other than the quota. Hence, a contemporary change in any of the parameters of equation (1) will not affect the catch fee. Contemporary actions will therefore not affect the fee rate. Thus, relative prices of inputs other than quota are not distorted in the short run by the catch fee.

⁴ Normal payment for capital invested, whether supplied by owners or financial intermediaries would be included in the “other” category.

⁵ An owner or an employee of a fishing firm might be endowed with specific organizational skills not bestowed upon other owners or employees in the sector, say. Profit per unit of inputs could be higher in this firm than in other firms. By the assumptions of the Fishery Management Act this extra profit would be indistinguishable from the resource rent.

The “long-run” has been a particular topic of interest among fishery-economist.⁶ It is therefore of some interest to consider if the catch-fee formula is likely to affect long-term incentives. When designing new vessels vessel owners will have to form expectations about the future development of prices, including the oil price. Assume that a vessel-owner investor expects increase in the oil price during the lifetime of a new vessel. Then, at first glance one would believe that s/he would be well advised to put money on oil-saving techniques. When doing the calculation s/he would however note that the catch fee rate would be lowered when the oil price increases. Hence, the resource rent tax formula will in effect force the Ministry of Finance to share some of the burden of a higher long-term oil bill. Thus, the anticipated increase in cost of oil will only partly hit the vessel owner and will therefore less likely justify costly investment in oil-saving equipment. It should also be kept in mind that the crews already share part of the cost of oil as the share ratio is affected by the price of oil. Higher price of oil implies lower share ratio. Hence, the resource tax, as formulated will represent an additional wedge between the social cost of oil and the cost perceived by the vessel owners. Note that the source of an oil price hike would not matter. Price increase due to a governmental tax on carbon content of oil in order to curb the release of CO₂ would partly be paid by the public purse through lower resource tax. This could seriously counter governmental effort aimed at reduction of CO₂ release as at present (2006) the Icelandic fishing fleet contributes 1/3 of all CO₂ that is released in Iceland. The fishing fleet produces more CO₂ than does road transport.

Does the catch fee affect relative prices? The case of wages.

According to Statistics Iceland average income in fishing was 50-95% higher during the period 2000-2004 than average income in the economy in general. High wages and high income in Norwegian fisheries compared to other coastal industries has been taken as indicator that some of the resource rent is captured by the fishers, Hersoug (2005). Hence, it seems likely that the fishers in Iceland have also been able to capture some of the resource rent through the remuneration package. It is therefore of interest to map the possible connection between the catch fee and possible future development of the remuneration system in the fisheries.

The law on the catch-fee is not formulated so as to accommodate changes in the share ratio automatically. Hence, should the vessel owners and the fishermen’s organizations find out that they could solve some problems by changing the share ratio that change would not affect the resource rent tax automatically. But, it is probable that should the share accruing to fishers be increased that such a move would be preconditioned by consultation with government. It is therefore to be anticipated that government will pick up part of increases in wage costs of vessel owners in the future. A comparable pressure to renegotiate the tax formula should the vessel owners succeed in bringing remuneration of fishers in line with opportunity cost of labour does not exist. Incentives to use other resources efficiently are not distorted by the tax-formula per se.

⁶ Statements are somewhat contradictory, however. Anthony Scott (in Scott (1989)) states that “Durability” is one of the fundamental characteristics of property about which he says: “This characteristic, in a fisheries right, helps to enable the holder to “save” fish stock for harvest in a later year, by conservation or habitat enhancement”. Later on he states: “Quota holders, collectively, will naturally take a more long-run interest in the betterment of “their” fish stock or stocks when their individual rights have duration, exclusivity and transferability”. Note should be paid to the qualifier “collectively”. In other parts of the paper Scott convincingly argues that collective action is inadequate as management principle. The qualifier “collectively” and its implications have been left out of the equation when quoted by Ragnar Arnason (in Arnason (1995), p. 137)

Bottom line: Resource rent is defined in a crude way. That could have unanticipated and unintended incentive consequences. The fishery management act is amended each year in response to various challenges offered by the development of the fishery. With that in mind it seems save to predict that the formula in the catch-fee act will be revised should unintended incentive effects become too much of a troubling factor.

An alternative measure: The amortization proposal

One of the many government-appointed committees that looked into the various methods of resource rent taxation offered two proposals. One of the proposals was named the Amortization Method. That method implied that holders of quotas in one year would be allotted a given percentage of that quota next year. Assume that the amortization rate is fixed at 10%. Then a firm holding 10% of the quotas in year 0 would be allotted 9% of the total in year 1, or to be more precise:

$$A_t^i = a_{t-1}^i(1 - d)TAC_t \quad \sum_i a_{t-1}^i = 1 \quad (4)$$

Here A_t^i is the quota allotted to firm i in period t , a_{t-1}^i is the share of total allowable catch allotted to the firm the year before and TAC_t is the Total Allowable Catch in period t (fixed by the Ministry of Fisheries).

The Ministry of Fishery would auction the quotas not allotted out. Hence, if actual catch would be in excess of allotted quotas, $Q_t^{catch} > A_t^i$, then firm i would have to buy quota at the quota market. A quota thus acquired would then be object of amortization itself a year later. Hence, the firm that would keep a given level of activity would have to buy some quota at the auction market each year.

It is possible to adjust the amortization rate so that it is equivalent in revenue terms to other forms of the resource rent tax. Hence, the choice of form of tax should be on efficiency grounds. Now, the amortization method does not involve arbitrary definitions of the size of the resource rent. That part of the problem is in effect left to the traders at the quota market who presumably will adjust their bids to their willingness to pay for quotas, which should reflect their estimation of the probable resource rent. Thus, the amortization method does not involve incentive consequences, as does the catch-fee.

The amortization method is similar to “quota rental charge” proposed by Grafton, see Grafton (1992; Grafton (1995) and Grafton (1996). His proposal is to base the charge on the market value of quotas. It could be stated that the amortization method is a quota rental charge in-kind. Grafton finds quota rental charge non-discretionary whether risk is accounted for or not. If the market for quotas is working smoothly that conclusion should extend to the amortization method.

Effect of increased ex-vessel price variability on profits

Risk averse investors and risk averse firm owners demand compensation for increased risks. It is therefore of interest to ask if one method of taxation does increase or decrease the variability of profit as compared to an alternative method. The taxing authority should, cet. par. choose the

method that is least costly in terms of variability. Here I will concentrate on increase in ex-vessel price variability.

Definition of profit of a single firm in case of catch fee is given as:

$$\begin{aligned} \Pi_t^{catch-fee} &= (1-\alpha)P_t^{catch}Q_t^{catch} - P_t^{oil}Q_t^{oil} - P_t^{other}Q_t^{other} - T_t \frac{Q_t^{catch}}{\sum Q_t^{catch}} \\ T_t &= \theta \left[(1-\alpha)P_{t-1}^{catch} \sum Q_{t-1}^{catch} - A \frac{P_{t-1}^{oil}}{P_{2000}^{oil}} - B \frac{CPI_{t-1}}{CPI_{2000}} \right] \end{aligned} \quad (5)$$

The T_t is the catch fee, Π_t is the profit of an individual firm. A is 6,218; B is 17,568; $\alpha = 0.398$ and $\theta = 0.095$ according to equation (1). Q_t^{catch} is catch of an individual firm while $\sum Q_t^{catch}$ is the catch of all firms.

Definition of profit in case of quota rental charge:

$$\Pi_t^{quotar_rental_charge} = (1-\tau) \left[(1-\alpha)P_t^{catch}Q_t^{catch} - P_t^{oil}Q_t^{oil} - P_t^{other}Q_t^{other} \right] \quad (6)$$

Denote variance of P^{catch} as $\sigma_{p^{catch}}$ and that it is independent of time. Denote the correlation of the ex-vessel price this year with the ex-vessel price of last year as $\rho \sigma_{p_t^{catch}} \sigma_{p_{t-1}^{catch}} = \rho (\sigma_{p^{catch}})^2$.

Assume further that P^{catch} is uncorrelated with other prices affecting the profit of the fishing firm and also uncorrelated with volume of catch, Q^{catch} , and other quantitative variables.

An increase in the variance of the ex-vessel price, P_t^{catch} , would affect the variance of profit in the following manner in the case of a catch fee:

$$\begin{aligned} \frac{\delta \Pi_t^{catch\ fee}}{\delta (\sigma_{p^{catch}})^2} &= (1-\alpha)^2 \left[1 + \theta^2 \frac{\left[\sum Q_{t-1}^{catch} \right]^2}{\left[\sum Q_t^{catch} \right]^2} - 2\rho\theta \frac{\left[\sum Q_{t-1}^{catch} \right]}{\left[\sum Q_t^{catch} \right]} \right] \left[Q^{catch} \right]^2 \\ &\simeq (1-\alpha)^2 [1 + \theta^2 - 2\rho\theta] \left[Q^{catch} \right]^2 \end{aligned} \quad (7)$$

The variance of profit is the higher cet. par., the lower is the crew share of revenue, the higher is the catch-fee as share of last years estimate of the resource rent. The variance is also higher the more negatively correlated this years ex-vessel price is with last years price.

An increase in the variance of P_t^{catch} would affect the variance of profit in the following manner in the case of catch fee [equation (6)]:

$$\frac{\delta \Pi_t^{quotar_rental_charge}}{\delta (\sigma_{p^{catch}})^2} = (1-\alpha)^2 (1-\tau)^2 \left[Q^{catch} \right]^2 \quad (8)$$

In this case the variance of profit is the higher the lower is the crew share and the lower is the quota rental charge.

Assuming that $1 > \rho > -1$ and that $\tau = \theta$ it can be shown that change in the variance of the ex-vessel price will have bigger influence on the variance of the profit of the fishing firm when firms pay a catch fee as compared to when they are required to pay quota rental charge as $(1 - \tau)^2 = 1 + \tau^2 - 2\tau < [1 + \theta^2 - 2\rho\theta]$ when $\rho < 1$ and $\tau = \theta$. Hence, higher quota rental charge would both reduce profits and reduce variation of profits of fishing firms. Higher catch fee would reduce profits but would at the same time increase variation of profits. Consequently, a risk averse investor would behave differently in an environment with a catch fee as compared to an environment with a quota rental charge a la Grafton. The reason for this result is rather straightforward: An increase in the variability of the ex-vessel price will affect the profit of the fishing firm directly through more variable revenue. It will also affect the profit of the firm by increasing the variability of the catch fee. This second effect is not present should a quota rental charge be utilized.

Is the tax high enough? Is cost of management recovered

Conducting fishery management is quite costly. Stock assessment is based on extensive scientific effort that is conducted over extended period of time and considerable stretches of sea. Enforcement is also very costly in terms of registration systems, policing, etc. Fishing vessels utilize costly infrastructure for navigation and for other costal services. These costs have traditionally been paid out of the public purse. A masters student at Department of Economics at the University of Iceland has conducted an analysis of the size of subsidies in Iceland for the year 2002, FAO (2002); Ottosson (2004). His assessment was based on definitions of subsidies offered in a recent report of the FAO, see FAO (2002). The FAO defines four categories of fishery specific subsidies. Direct financial transfers constitute Category 1. Category 2 consists of below-cost provision of services and indirect financial transfers i.e. specific tax exemptions for the fisheries sector. Category 3 arises due to regulatory interventions that are specific to the industry, while Category 4 has its origin in lack of governmental intervention. Category 2 for Iceland consisted mainly of tax exemption for active fishers and the cost of maintaining a Coast Guard. Category 3 in Iceland accrued due to cost of having regulatory institutions like the Marine Research Institute. Category 4 which is generally defined as cost due to lack of intervention which in the Icelandic case was defined as lack of making paragraph 1 of the fishery management act active (says that the fishery stock in Icelandic waters are the property of the Icelandic people). Table 1 is reproduced from Ottesens report.

A 9.5% catch-tax would have contributed 2.1 billions of Icelandic crooner in 2002. Subsidies of fisheries, excluding the resource rent, amount to 3.9 to 5.7 billions depending on what we count as subsidies. Hence, it is obvious that the catch-fee is too low even if the only objective is to use the fee as a means of enforcing cost-recovery.

Adding up gives the following results:

Table 1: Value of total subsidy to the fishing sector (excluding aquaculture) in Iceland in the year 2002		
Category	Cost to government, ISK millions (USD millions)	Value to industry ISK millions (USD millions)
Direct financial transfers (Category 1)	ISK 166 (USD 2.3)	168 (USD 2.4)
Services and indirect financial transactions (Category 2)	3,888 (USD 55.3)	4,382 (USD 62.4)
Regulations (Category 3)	1,122 (USD 16.0)	1,129 (USD 16.1)
Lack of intervention (Category 4)	24,089–52,367 (USD 342.9–745.4)	2,400–4,000 (USD 34.2–56.9)
Total, excluding lack of intervention	5,176 (USD 73.6)	5,679 (USD 80.9)
Total, including lack of intervention	29,265–57,543 (USD 416.5–819)	8,079–9,679 (USD 115.1–137.8)

Concluding remarks

Iceland has introduced a catch fee as source of revenue for the Icelandic government. The catch fee is introduced in the Fishery Management Act and not in the general tax code. The basic idea is to base the taxation on the fishery rent. The aim was partly to gear the taxation of the fishing sector towards more efficient forms of taxation. The aim was also partly to reduce political dis-satisfaction associated with the grandfathering of fishing rights to vessel owners. We have seen that the definition of resource rent given by the catch-fee formula is crude and can be improved upon. Taxation based on a quota rental charge as proposed by Grafton and introduced in the Icelandic debate would be less distortionary than the present catch-fee rule and would also be more attractive in terms of risk-effects than that formula. It has also been argued that the catch fee is too low if costs are to be recovered and if the Icelandic economy is to enjoy the possible pleasure of having access to taxation that may yield the so-called double dividend.

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