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Theory and practice of ITQs in Iceland

Privatization of common fishing rights

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In Iceland, fish quotas have been partly transferable since 1984 and freely transferable since 1991. Here, the assumption that an ITQ-regime will lead to an immediate reduction of catch capacity and discourage investment in the fisheries seems questionable, as the ITQ-regime seems to represent an input of "new" capital into the fisheries. As a result of quota leasing arrangements, tenancy relations have developed between parts of the coastal fleet and companies with large quota holdings. Crew wages have in these cases dropped, a situation that has provoked two strikes among fishermen. The demand for quotas is influenced by unemployment and lack of alternative sources of income for fishermen. Municipalities are in a number of cases significant participants in the quota market, as there are strong ties between companies and municipalities. A redistribution of wealth and income is taking place as a result of the system. Copyright © 1996 Elsevier Science Ltd

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This article attempts to pinpoint some of the economic and social effects of fisheries management by individual transferable catch quotas (ITQs). It is based on a study of Icelandic fisheries management, conducted in 1993–94. I will not describe the details in the development of the fisheries throughout the period of 1984–93, but concentrate on certain tendencies that can be identified: 1) A gradual formalization of private property rights over quotas. 2) A growing number of market transactions in the quota market, both as transfer of permanent quota shares, and quota leasing for one year only. 3) An increasing market value of all quotas until the end of 1992, and a continued increase of value of cod and shrimp quotas. 4) A growing concentration of quota ownership with the bigger companies.[1] 5) A tendency towards a reduction of fishing crew-member's share of catch value.

The first section of the article presents some of the basic assumptions of the ITQs model. The second section is a discussion of property rights and the process of privatization of fishing rights. The third section is about the development of quota market transactions and quota prices. The fourth section describes the effects of ITQs on the income of fishing crews. The fifth section is about the role of municipalities in the fisheries and their influence on quota marked transactions. The last section is about quota capital and capital return on ITQs.

Transferability of fishing quotas is being strongly advocated by many fisheries economists, including Scott,[2,3] Pearse,[4] Hannesson[5] and Árnason.[6,7] The system of individual transferable quotas (ITQs) is offered to fisheries managers world-wide, as an ideal solution to "tragedy of the commons" situations in the fisheries. In practice, ITQ-management means turning catch quotas into a market commodity and a development of private property rights to the resources. Recently,

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the Fisheries Research Institute of the University of Iceland.

[1]G. Pálsson, and A. Helgason, 'Figuring fish and measuring men; The ITQ-system in the Icelandic cod fishery', *Ocean and Coastal Management* (forthcoming).
[2]A.D. Scott, 'The fishery; The objectives of sole ownership', *Journal of Political Economy*, Vol 63, 1955.
[3]A.D. Scott, 'Conceptual origins of rights based fishing', in P.A. Neher et al., Rights Based Fishing, Nato ASI series, 1989.
[4]P.H. Pearse, 'From open access to private property: Recent innovations in the fishing rights as instruments of fisheries policy', *Ocean Development and International Law*, Vol 22, 1992, p 71–83.
[5]R. Hannesson, 'En samfunnsøkonomisk lønnsom fiskerinæring, struktur, gevinst, forvaltning', Rapport for Administrasjons- og arbeidsdepartementet, Oslo, 1990.
[6]R. Árnason, 'Efficient management of ocean fisheries', *European Economic Review*, Vol 35, 1991, pp 408–417.
[7]R. Árnason, 'Fiskveiðiarðurinn og skipting hans', in G. Pálsson, R. Árnason and Ö.D. Jónsson, eds, *Stjórn Fiskveiða og Skipting Fiskveiðiarðsins*. Sjávarútvegsstofnun og Háskólaúgáfan, 1992.
[8]A. Helgason, *The lords of the sea and the morality of exchange: The social context of ITQ management in the Icelandic fisheries.* MA-thesis in Anthropology, Faculty of Social Science, University of Iceland.
[9]Pálsson and Helgason, *op cit*, Ref 1.
[10]R.O. Boyd and C.M. Dewees, *Putting Theory Into Practice. Individual Transferable Quotas in New Zealand Fisheries*, Society and Natural Resources 1992, pp 179–198.
[11]B.M. McCay and C.F. Creed, 'Social structure and debates on fisheries management in the Atlantic surf clam fishery', *Ocean and Shoreline Management*, Vol 13, 1990.
[12]R. Árnason, *The Icelandic Fisheries. Evolution and Management of a Fishing Industry*, Fishing News Books, 1995.
[13]R.K. Lindner, H.F. Campbell and G.F. Bevin, 'Rent generation during the transition to a managed fishery: The case of the New Zealand ITQ system', *Marine Resource Economics* Vol 7, 1992.
[14]J.R. Gauvin, J.M. Ward and E.E. Burgess, 'Description and evaluation of the Wreckfish (*Polyprion Americanus*) fishery under individual transferable quotas', *Marine Resources Economics* Vol. 9, 1994.
[15]D. Squires and J. Kirkley, 'Resource rents from single and multispecies individual transferable quota programs', *ICES Journal of Marine Science*, Vol 52, 1995, pp 153–164.
[16]E. Eythórsson, 'Coastal communities and ITQ-management: The case of Icelandic fisheries', *Sociologica Ruralis* (forthcoming).

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The Economist (March 19th 1994) and *Newsweek* (April 25th 1994) brought cover reports on the global fisheries crisis, advocating privatization as a possible solution. Newsweek reporter Tony Emerson comments:

"Already, though, nations hit by stock collapse are turning to radical solutions—most notably controversial schemes to 'privatize the ocean'. The idea is to give or sell to individual fishermen a permanent share of fishing quotas, which the fisherman is then free to use or sell. New Zealand and Iceland have already privatized many of their fish stocks this way, and there is even talk of an international fish-quota stock exchange. Several American fisheries have been turned over to such 'individual quota' systems, and the Alaska halibut derby will go private in 1995. The hope is that the market will shake out the enormous excess in boats and fishermen, give fishermen a personal stake in conservation and restore order to the race for fish" (*Newsweek*, April 1994, p.33).

ITQs have been a highly controversial issue in debates on resource management during the last decade. They are now applied in certain fisheries in the USA, Canada, Australia, South Africa and the Netherlands but so far only New Zealand and Iceland have put ITQs into practice as an overall management system at the national level, New Zealand since 1986 and Iceland since 1991 (after having practised some degree of transferability since 1984).

Although there is an abundant literature, especially in economics on what will probably happen with the implementation of ITQs, the literature on the economic and social effects of ITQs in real settings is so far rather sparse.[8–16] The aim of this paper is to examine some traits of the recent development of the Icelandic fisheries and try to isolate some of the effects of ITQ-management in this specific setting.

The ITQ model—some basic assumptions

As a theoretical model, ITQs are a fascinating solution to the situation referred to as "The Tragedy of the Commons".[17] The model, as put forward by Scott[18–20] and Árnason,[21–23] assumes that:

1) By establishing private property rights to fish resources it is possible to create an incentive to harvest the resources in a way which secures long term sustainability. The fisherman will no longer be a *hunter*, but a "*fish farmer*". Or as the editors of *The Economist* (March 19th 1994) put it:

"Only when fishermen believe that they are assured a long-term and exclusive right to a fishery are they likely to manage it in the same farsighted way as good farmers manage their land."

2) Transferability will eventually lead to a state of equilibrium, when the most efficient fishermen/vessels have acquired sufficient quota to utilise their fishing capacity optimally by buying the less efficient ones out of business. This process can theoretically generate "full economic efficiency in the fishery"[24] as there will be no excess capacity left.

3) The increased efficiency makes it possible to collect a potentially enormous *resource rent* from the fisheries, once the stocks have been built up to an optimal size and the fishing effort reduced to an optimum level.

The concept of resource rent is similar to the concept of *land rent* used by Ricardo. Land rent refers to the market rent landowners are able to collect from tenants on different quality of land. While marginal

agricultural areas hardly generate any land rent, high rent can be collected from tenants on productive land. This is also assumed to apply to fisheries; marginal or poorly managed fisheries yield no resource rent, while productive fish stocks and efficient harvesting should have a great potential for generating resource rent.

4) Once the resource rent is generated, there are different options for its distribution. One is a build-up of private capital in the fishing industry, which in turn will be invested in other profitable industries, thus creating growth in other sectors of the economy. Another is taxing the rent by charging fishermen for resource rentals. The resource rentals can be redistributed to compensate potential losers and improve economic conditions for everyone.[25]

5) Market prices paid for quotas will reflect the resource rent generated in the fisheries and expectations of future resource rent. While quota prices in permanent transfers should reflect expectations of future rent, quota leasing prices should reflect the current rent generation in the fisheries. Growing stocks and optimal fishing effort are thus expected to generate high quota prices, while declining stocks and excess fishing capacity are expected to generate low quota prices.[26]

6) Since the fisheries are more profitable with ITQs, the bargaining position of fishing crews will improve, resulting in higher wages.[27]

Privatization or just another management measure?

Property, in the economic sense, can be defined as a set of rights to use, sell, lease and inherit an asset, assigned to particular individuals or groups. As pointed out by Ciriacy-Wantrup and Bishop[28] and Hanna,[29] the concept of property rights, as used by most economists, is rather one-dimensional, with only three options, private property which involves particular individuals having unrestricted rights to use, earn income from and to sell an asset, public or state property, and common property which is everybody's (and therefore nobody's) property. With only these narrow categories to define property rights within, standard economic theory is immune against a variety of other types of use rights, both formal and informal, which are rather well documented in anthropological literature.[30] Institutional economics however, have developed a more advanced analysis of property rights to natural resources.[31–33]

For fisheries economists such as Scott[34,35] and Árnason[36–38] the privatization of common fisheries resources is not a side-effect of ITQs, but rather the most important objective of the system. They actually see privatization as a great vision:

"ITQs are a part of one of the great institutional changes of our times; the enclosure and privatization of the common resources of the ocean. These are now mostly the exclusive property of the coastal states of the world. Will we see continued development of property to the individual or firm level, with harvesting rights becoming indisputably and irrevocably private property?"[39]

Scott[40] also sees individual quotas as a basis for a grand historical privatization scheme:

". . . individual permanent catch quotas of a regulator determined TAC (total allowable catch) are only a stage in the development of management from licensing to private rights. This evolution can be expected to continue until the owner has a share in management decisions regarding the catch; and further still until he has an owner's share in management of the biomass and its environment."

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[17]G. Hardin, The tragedy of the commons, *Science* Vol 162, 1968, pp 124–142.
[18]Scott, *op cit*, Ref 2.
[19]A.D. Scott, 'Development of economic theory on fisheries regulation', *Journal of the Fisheries Research Board of Canada*, Vol 36, 1979, pp 725–741.
[20]Scott, *op cit*, Ref 3.
[21]R. Árnason, 'Minimum information management with the help of catch quotas', in P.A. Neher et al., *Rights Based Fishing*, Nato ASI series, 1989.
[22]Árnason, *op cit*, Ref 7.
[23]Árnason, *op cit*, Ref 12.
[24]Árnason, *op cit*, Ref 21.
[25]P.A. Neher, R. Árnason and N. Mollett, *Rights Based Fishing*. NATO ASI series 1989, p 3.
[26]R. Árnason, 'Aflakvótar og hagkvæmni í fiskveiðum', in P. Helgason and Ó.D. Jónsson, eds, *Hagsæld í Húfi*. Greinar um stjórn fiskveiða. Háskóli Íslands, 1990.
[27]Árnason, *op cit*, Ref 7.
[28]S.V. Ciriacy-Wantrup and R.C. Bishop, 'Common property' as a concept in natural resources policy', *Natural Resources Journal* Vol 15, 1975, pp 713–724.
[29]S.S. Hanna, 'The eighteenth century English commons; A model for ocean management', *Ocean and Shoreline Management* Vol 14, 1990, pp 155–172.
[30]E.P. Durrenberger and G. Pálsson, 'Ownership at sea, fishing territories and access to resources' *American Ethnologist* Vol 14(3) 1987.
[31]D.W. Bromley, *Environment and Economy. Property Rights and Public Policy*, Blackwell, Cambridge MA.
[32]T. Eggertsson, *Economic Behavior and Institutions*, Cambridge University Press, 1990.
[33]E. Ostrom, *Governing the Commons, The Evolution of Institutions for Collective Action*. Cambridge University Press, 1990.
[34]Scott, *op cit*, Ref 12.
[35]Scott, *op cit*, Ref 3.
[36]Árnason, *op cit*, Ref 26.
[37]Árnason, *op cit*, Ref 6.
[38]Árnason, *op cit*, Ref 7.
[39]Neher et al., *op cit*, Ref 25.
[40]Scott, *op cit*, Ref 3, p.3.

Despite these very clear statements, the privatization aspect of ITQs has not been focused on when the policy has been promoted to government and fishermen's organisations in Iceland. In political debates in Iceland, pro-ITQ-politicians are still trying to convince people that ITQs mean *no privatization whatsoever*. Such rhetorics are not specific for the Icelandic debate, Macinko[41] describes a similar kind of confusion about the privatization aspect of ITQs in the Alaska debate. The Icelandic *Fisheries Management Act* of 1990, implementing full scale ITQs, states in its first article that the fish resources are *national property* and that the allocation of quota shares does not give the holders irrevocal property rights over quota shares. Even if it may be argued that the property rights are not to the resource, but to the harvesting, or that they are not "real", but imitated property rights, this statement raises a series of questions related to the definition of property rights. It has for instance caused serious practical problems in relation to the Icelandic tax legislation. Since quotas, according to the law, could not be defined as private property, investment in quotas could be treated as *expenditure*. Moreover, quotas could not be taxed as property, even though, according to the law, they can be sold, leased and inherited and thus have the same basic characteristics as private property. In November 1993 a Supreme Court decision eventually made it clear that buying of permanent quota shares should be treated as capital investment and that (bought) quotas should be taxed as property. Still, the Icelandic fisheries minister tried to calm critics by stating that the court decision was only a technical matter for the tax authorities, the fish resources still being national property.

The ITQ-system was promoted to political parties, the fishing industry and the fishermen's unions, not as a privatization scheme, but as the "best resource management system in the world". By making the fisheries more efficient, the system would boost the national economy and provide higher and more secure income for fishermen.[42] Besides, Iceland would become one of the world's leading nations in fisheries management, or as fisheries economist Ragnar Árnason[43] puts it in one of his promoting publications:

> "In fisheries management, the Icelanders are among the leaders. It is however an exaggeration that we are the world leaders here. Without doubt, the New Zealanders occupy that position of honour" (Author's translation).

In 1984, fishing quotas for cod and other demersal species were allocated to fishing vessels according to catch records for the three previous years. Quotas were not devisible, nor could they be removed from the vessels, except in cases when the vessel was wrecked or sold abroad. Concentration of quota holdings was only possible by buying vessels, and some companies bought old boats for wrecking, in order to add the quota to their own vessels. However, *quota leasing* was allowed from 1984 on.

By January 1991, the system was liberalized, and quota shares were allocated permanently, without any time limits. Quotas are now divisible, they can be separated from vessels and transferred as an independent commodity to other vessel owners, either by transfer of permanent quota shares or by leasing for one year only.

Market transfers of quota shares were relatively rare during the 1984–90 period. However, there was a substantial redistribution of quota during these years, especially due to the limited effort option, which was offered as an alternative to fishing under the ITQ system in

[41]S. Macinko, 'Public or private?; United States Commercial Fisheries Management and the Public Trust Doctrine, Reciprocal Challenges', *Natural Resources Journal*, 1994.
[42]Árnason, *op cit*, Ref 7.
[43]Árnason, *op cit*, Ref 26.

1985–90. In 1986–89, more than half of the catch of demersal species was taken under the system of limited effort, and in 1987 only 28% of the catch was subject to ITQs. When the limited effort option was abolished, ITQ-shares based on the new catch records under this system were given to the vessels which had operated outside the ITQ system. Quotas were also redistributed by different administrative means. There are several difficulties measuring the exact extent of market transactions, but by adding up all registered transactions, it appears that market transfers of quota shares were only 1% of TAC for demersal species in 1990, while after the management reform in 1991, 7% were transferred, and 14% in the 1992/93 fishing year (September to August). It seems that quota shares became a "real" marketable commodity only after January 1991.

The leasing market

Market transfers by *quota leasing*, however, appear to have been quite common ever since 1984.[44] Quota leasing is a common term for a number of different arrangements for temporary quota transfers, some of whom may be only pro forma. In 1993–94, the most common leasing arrangements could be described by four main categories:

a) *Quota exchange:* Exchange of quota in different species between vessels within the season may not be leasing in a strict sense. Before 1991, the exchange rates between species were fixed in *cod equivalents*, and a change in the leasing price of cod quotas automatically changed the leasing prices of other species. Since 1991, the exchange rates are more floating. Nevertheless, it seems that cod is the leading *currency* in the quota market, and for species as redfish, plaice and Greenland halibut there is probably hardly any "real" leasing market apart from quota exchange, the leasing prices being primarily an expression of the exchange rate.

b) *Contract fishing:* Long-term contracts between vertically integrated fishing companies with quota holdings and owners of inshore vessels little or no quota of their own. The boats are obliged to deliver the fish to the company fish factory, and receive a fixed price for fishing from the company quota (in 1993 approx. Ikr. 48/kg for cod, 50–60% of prices obtainable for raw cod in auction markets). These arrangements have become more common and more formalized since 1993, and are referred to as "fishing for others".[45] A similar "quasi-vertical integration" has been observed in the abalone fishery in New Zealand, where some operators have sold quota to processors but continue to fish on leasing contracts with these.[46]

c) *Quota pooling* ("tonn á móti tonni") is a variety of contract fishing. Vertically integrated companies with quota holdings enter contracts with boat owners with some quota of their own, approximately doubling the boats quota. The boats are obliged to deliver to the company, and receive a fixed price for the fish (in 1993 approx. Ikr. 60/kg for cod, 65–75% of auction market prices). These contracts sometimes involve agreements that the fishermen are allowed to sell some of the catch at auction markets; species and sizes which are unsuitable for the industry, and by-products such as liver and roe.

d) *Direct leasing:* Boat owners lease quota at a market price, directly from the owner or through a mediator. The boats are free to deliver the fish where they please. It seems that direct leasing is a solution for

[44]Árnason, *op cit*, Ref 12.
[45]Pálsson and Helgason, *op cit*, Ref 1.
[46]D. Squires, J. Kirkley and C.A. Tisdell, 'Individual transferable quotas as a fisheries management tool', *Reviews in Fisheries Science*, Vol 3(2), 1995, pp 141–169.

Table 1. Quota leasing prices[a] as % of average landing prices for raw fish 1988–93 (figures in brackets show % of average prices on Icelandic auction markets).

Year	Cod	Haddock	Saith	Redfish	Greenland halibut	Plaice	Shrimp
1988	17(17)	15(16)	17(19)	9(15)	8(13)	—[b]	—
1989	33(32)	25(26)	30(32)	16(24)	20(25)	—	—
1990	35(31)	30(33)	33(35)	20(31)	23(29)	—	—
1991	62(55)	28(30)	40(39)	25(42)	29(39)	33(51)	—
1992	61(56)	34(34)	54(61)	30(53)	38(50)	36(49)	6(9)
1993	58(45)	18(13)	27(27)	26(40)	26(38)	18(22)	10(—)

[a] There is no official registration of these prices in Iceland. The figures are drawn from four companies who act as mediators in quota transactions; [b] — = figures not available.

acquiring quota to match bycatch or to prolong the season for boats short of quota, primarily cod quota, but high "spot market" leasing prices have made this somewhat difficult. A large portion of the annual shrimp quota has however been transferred through such arrangements.

The available statistics do not differentiate the total of leasing transactions into these four categories. The statistics are also biased due to strategic transactions at the end of the fishing year, in order to "save" unused quotas for the coming year. The same units of quota may also be re-counted in cases of re-leasing. However, the general impression is that in 1993–94 a large and growing portion of these transactions were either *contract fishing* or *quota pooling*. In 1993, auction markets were loosing deliveries from small and medium sized boats because of such contracts, and in response they started leasing cod quotas themselves, in order to re-lease them to boats. The boats would then be obliged to deliver their catch at the auction market. There were also some examples of such re-leasing arrangements with European auction markets, through Icelandic mediators, though this is considered illegal.

Direct leasing is more like a "spot market", involving buyers in desperate need of additional quotas to avoid confiscation of catch and loss of their fishing license, as described above. Quota prices paid in this spot market may therefore become higher than in contract fishing and quota pooling arrangements.

The majority of contract fishing and quota pooling arrangements involve cod as the main species. In 1993, most of these arrangements were between small and medium sized coastal vessels and vertically integrated trawling companies. As only companies owning fishing vessels are allowed to own quotas, fish factories with no boats of their own are not in a position to benefit from such contracts.

The development of quota market transactions in 1990–93, shows approximately a doubling of the quota volume transferred by leasing from 1991 to 1993. The exact volume is difficult to ascertain. Helgason[47] has demonstrated that the figures turn out quite differently with different modes of calculation, but the pattern of increase is quite clear. A conservative estimate is that about one third of the quotas in demersal species were transferred by leasing in the 1993/94 and 1994/95 fishing years.[48]

According to the ITQ-theory, quota prices reflect the *resource rent*, which is supposed to grow along with increased efficiency in the fisheries. Low product prices, decreasing stocks and excess fishing capacity should indicate a low resource rent, while high prices, growing stocks and optimal fishing capacity should indicate a high resource rent. A comparison of quota leasing prices and product prices, that is raw fish landing prices, should then indicate the size of the resource rent for each species. The comparison shows an interesting price development in the six-year period of 1988–93 (Table 1).

[47]Helgason, *op cit*, Ref 8.
[48]Fiskifréttir: A fisheries weekly, Oct. 13, 1995.

These figures show that leasing prices have been rising for all species, to a peak in 1992, when leasing prices for cod and saith quotas equalled more than half of the average landing prices of these species. Since 1993, prices have decreased for some species, most significantly for haddock and saith. Meanwhile, for the two most important species on the leasing market, cod and shrimp, the increase has continued. Throughout 1994–95, the leasing price of cod quota has been 70–80% of average value of cod catches. It seems obvious, that a quota price increase of this magnitude can hardly be explained by increased efficiency, especially not in a situation of stock decline, a substantial excess capacity and stable or declining product prices, as in the Icelandic cod fisheries. Árnason[49] notes that in the initial phase of ITQ-management there may be an increase in the market value of catch quotas due to the reduced opportunity cost of using excessive fishing capital, that has become practically worthless. This short-term effect will, according to Àrnason, be corrected as soon as the level of fishing capital reaches a new *equilibrium*. Lindner et al.[50] also notes that the positive price of annual lease in this initial phase represents a quasi-rent, which will disappear in the long run as capital exits from the industry; "the quasi-rent is merely a transfer from the owners of physical assets to the owners of quota".[51]

If we look at the fisheries as just another industry, for whom the fish resources in the ocean are the *raw material*, we can see that new recruits (or those who were not among the lucky ones during the privatization process), now have to pay a market price for the raw material to the owner. In a market, the price of this raw material will reflect *supply and demand*. High leasing prices of cod quotas must then result from high demand and short supply. As contract fishing and quota pooling have become more common, a pattern of tenancy in leasing transactions has taken form since 1993. The demand for leased quotas stems from boats whose vessel quotas have shrunk to merely half of the initial volume, due to the severe reduction of TAC for cod. Some of these boats have been stripped of most of their quotas and thereafter sold cheaply to new owners who try to make a living from fishing as an alternative to unemployment.

The high demand for cod quotas can also be explained by several other factors. Because cod is the most abundant (and most valuable) species in the coastal waters, it is the most important species for the coastal fleet which consists of small and medium sized boats. These boats try hard to catch other species, but there is always a problem of a substantial *bycatch* of cod. If they lack cod quota to match this bycatch, they have two options: either to buy additional quota on leasing basis, or to dump the cod. The extreme rise in cod quota prices during 1994–95 when leasing prices rose to 70–80% of landing prices, may be partly explained by this situation (reports of cod dumping have also increased during these two years). Another factor, which helps boost cod quota prices is the "quota doubling" of longliners from November to February. Quota doubling means that only 50% of longline catches are counted against quota during these months.

As there were no signs of a development towards an equilibrium between catch capacity and resources, the Icelandic government initiated a buy-back program in 1994, to remove vessels from the fleet,[52] but it is too early to judge the effects of the program on cod leasing prices.

The development of shrimp leasing prices is also an interesting case.

[49]Árnason, *op cit*, Ref 12.
[50]Lindner et al., *op cit*, Ref 13.
[51]Lindner et al., *op cit*, Ref 13, p.234.
[52]Eythórsson, *op cit*, Ref 16.

In the early nineties, the situation in the shrimp industry was somewhat opposite of the cod industry. There was apparently a shortage of catch capacity, while TAC was increasing. The shrimp market price was considered low, but by the autumn of 1994 it went up by about 45%. As shown in Table 1, shrimp leasing prices were low in 1992–93, only 6–10% of product prices. However, a substantial portion of the total catch quota was being transferred annually by leasing. From 1994 onwards, an increasing number of vessels were attracted by the shrimp fisheries, and several specialized shrimp trawlers were bought from abroad. The increased demand for shrimp quota caused a tremendous increase of leasing price, from Ikr.10 in 1993 (10% of product price) to Ikr.75 in late 1995 (52% of product price). Similar to the case of cod leasing price, it appears unlikely that the *resource rent* from shrimp fisheries could increase by more than 600% in only two years, even with a positive development of catch volume and product price. It seems that even if initially there was no excess capacity in the shrimp industry, the ITQ-system did not prevent a quick reversal of the situation, leading to generation of quasi-rent.

The development of quota prices for cod and shrimp raises questions about the concepts of resource rent and equilibrium. First, how can we, in a real life situation, tell the difference between quasi-rent and the "real" resource rent? Fisheries economists will argue that the answer is simple; as soon as there is an equilibrium, there will be a "real" resource rent. But under what conditions will there be an equilibrium? The idea that fish populations tend towards equilibrium is being called into question[53] and it is evident that the dynamics of the fisheries industry are a lot more complex than the economic models. The insitutional framework of society, social and cultural factors may influence development in the fisheries in unexpected ways. In the following, I will briefly discuss three factors: the labour market, the municipalities and the "quota capital".

A reduction of fishermen's share

As a growing portion of TAC is being transferred through the leasing market and a pattern of tenancy or "quasi-vertical integration" has developed, a growing number of fishermen involved in quota leasing are getting lower income. In essence, the reason for this is that fishing crews get a fixed share of the catch value, but in case of quota leasing, the catch value is what is left when the quota leasing price has been subtracted from the landing price. Applied directly, such practices are a breach of tariff agreements for crew members, but as described by Helgason[54] low landing prices paid to fishermen on contract fishing, conceal a subtraction of the leasing price prior to payment to fishing crews.

It is evident that growing unemployment rates in Iceland, along with a weak support for the unemployed, are important reasons for the high demand for leased cod quota. The fishing crews accept (or are forced to accept) lower income, facing the grim alternative of unemployment. Boat owners with little or no quota of their own, often chose to continue fishing with leased quotas, as the alternative may be losing their boats, and perhaps their homes. According to the fishermen's unions, some leasing transactions were arranged with the sole purpose of reducing the income of fishing crews. Such practices, often referred to as quota-

[53]J.A. Wilson, J.M. Acheson, M. Metcalfe and P. Kleban, 'Chaos, complexity and community management of fisheries', *Marine Policy*, Vol 18(4) 1994, pp 291–305.
[54]Helgason, *op cit*, Ref 8.

profiteering ("kvótabrask"),[55] were the most provocating cause of the fishermen's strikes in January 1994 and May 1995. As discussed above, it seems that an increase in excess catch capacity, due to reduced TAC which has not been followed by a reduction of the fishing fleet, has generated a growing demand for quotas and high prices ("quasi-rent"). The kind of "efficiency" which has generated this high rent appears not to be a result of optimal fleet/stock ratio, but rather of fishermen's labour becoming cheaper. This is of course contrary to the predictions of Árnason,[56] that higher profitability of fishing with ITQs would improve the bargaining position of fishing crews, resulting in higher wages. Cunningham[57] argues that;

> . . . "the conclusion that net fishing incomes can be increased by optimal (economically efficient) management of the fishery . . . seems to be based on a confusion of wealth and income effects".[58]

It seems evident that in the Icelandic case, the bargaining position of fishing crews has not been strengthened under ITQ-management. Squires et al.[59] offer theoretical support for such conclusion:

> "Returns to crew may fall if crewshare agreements change to reflect the cost of obtaining ITQs and the opportunity cost of using them. In a broad sense, an ITQ program increases the relative bargaining strength of whomever controls the ITQs due to the wealth ITQs represent and the necessity of ITQs as a prerequisite to fish."[60]

In a sense, the ITQ system in Iceland is generating a market price for labour in the fisheries. The tendency seems to be that such market price is not only created in cases where quota leasing is involved, since the leasing price of quota sets the standard for what rate of capital return can be calculated by quota owners in general. And since most of the bigger quota owners are vertically integrated companies, the landing price for fish (the price used as a basis for calculating crewshare) is in principle an internal company matter. The prices paid to the companies own vessels are now being calculated with a clear reference to alternative allocation of the quotas, that is the prices available in the leasing market. This is demonstrated by the price difference between "direct sales" from vessel to company and auction market prices. In the case of cod, the auction prices in 1995 were 50–70% higher than prices paid in direct sales.[61]

The new situation in the Icelandic fisheries is often referred to among fishermen as a "feudal" system. The new group of low-income fishermen which is in the making, is referred to as the "tenants" (*leigulidar*), while quota owners are referred to as "lords of the sea" (*sægreifar*).

There is a geographical dimension to this, as the southern and western regions which are closest to the cod spawning sites, have been the most cod-dependent and having a large coastal fleet. Following the severe cuts in cod TAC, the fishermen in these regions are now dependent on leasing cod quotas from trawler companies in Northern Iceland and in the Reykjavik area.

The fishermen's strike in January 1994 was the first joint response to the diminishing shares of Icelandic fishermen in the new "feudal system". The strike was supported by fishermen in the whole industry, not only those who were currently getting reductions in income because of the new practices. It was clear that the fishermen were very frustrated, and their unions (there are three labour unions involved, two of whom were initially in favour of ITQs) were reconsidering their

[55]Pálsson and Helgason, *op cit*, Ref 1.
[56]Árnason, *op cit*, Ref 7.
[57]S. Cunningham, 'Fishermen's income and fisheries management', *Marine Resources Economics*, Vol 9, 1994, pp 241–252.
[58]Cunningham, *op cit*, Ref 57, p.243.
[59]Squires et al., *op cit*, Ref 46, p.153.
[60]J.M. Terry, *Individual Transferable Quotas for the Fixed Gear Sablefish and Halibut Fisheries Off Alaska*. Paris: Workshop on Individual Quota Management, Organization for Economic Co-Operation and Development 1993.
[61]Fiskifélag Íslands, 'Price information on fish landings in 1995', 1996.

former support to the ITQ-system. The strike was stopped by government action after two weeks, and in May 1994, the government decided on temporary restrictions on quota leasing transactions and a special committee to settle disagreements about illegal quota speculation. However, in May 1995, fishermen went on strike again. According to the unions of crew members, the development of "quota-profiteering" practices had accelerated despite the government measures, leaving an ever growing number of fishermen with reduced incomes. After three weeks of strike, an agreement involving a new system of price negotiations and minimum prices was reached. It is too early to judge the influence of this agreement on quota market transactions, but in October 1995 the secretary of the deck-hands' union felt somewhat more comfortable about the situation, while the secretary of the skippers union was of the opinion that not much had really changed.

The strikes are only one of several signs of conflicts related to the ITQ-system in Iceland. Since 1991, the politics of consensus and corporatism in the fisheries have come to a halt, and all political parties have internal disagreements about the system.

Coastal communities and quota shares

The social organisation of the Icelandic fishing industry and the institutional framework provided by government and local municipalities have an important impact on the development of the fisheries under ITQs.

During the period of modernization of the fishing industry after the second World War, a pattern of "one company-villages" became very common along the coast. In the 50 communities with 200–2000 inhabitants there is usually one, vertically integrated fishing company, owning and operating a freezing plant and one or more fishing vessels. During the seventies, this pattern became even more common, as stern trawlers became the economic backbone of most coastal communities of this size. In most cases the companies are locally owned. There is a strong tradition that local municipalities and co-operatives have been owners or major shareholders in many of these companies.[62] Even in the three biggest towns, Reykjavík, Hafnarfjördur and Akureyri, the leading fisheries companies were owned by the municipality during the post war period. The companies in Reykjavík and Hafnarfjördur were privatized during the eighties, but in Akureyri, the municipality still holds the majority of shares. According to Árnason[63] about 5% of the Icelandic fisheries industry is now owned by municipalities. In the early eighties however, 10–20% of the industry was under municipal ownership. As most Icelandic municipalities are extremely small, the general pattern is that every fishing community is a separate municipality. (Since 1994, there have been some changes in this pattern due to merging of municipalities.) The municipal legislation allows municipalities to invest public money in the companies, to grant them tax reductions (or convert tax debt to company shares) and municipal security for loans. In fact, the legislation imposes a certain responsibility upon municipalities to take necessary measures to prevent unemployment. Municipalities are also given a first option to buy quota/vessels, if the owners are planning to sell outside the community.

[62]G. Guðmundsson, ' "Den islandske model" for fiskebygder. Dens storhetstid 1940–80 og de aktuelle omstillingskrav', in *Fiskerisamfund- hvilke veje? Nord*, Vol 27, 1993.
[63]Árnason, *op cit*, Ref 12.

Within this framework, the "lives" of the community/municipality and the company are closely intertwined. Persons or families in charge for the company are most likely also represented in the community council, and company interests are usually seen as equivalent of community interests. Being a task of national priority, the modernization of the fishing industry has to a great extent been carried out without private capital, by grants and loans from public funds. The establishment of modern, vertically integrated companies in the coastal communities was in most cases aided, and sometimes carried out, by the municipal authorities, in close collaboration with private entrepreneurs, local co-operatives and sometimes labour unions and even women's associations as well. Thus, many companies were originally established by public agencies, but they have usually been turned over to private ownership later on. However, in times of crisis, the municipalities still feel obliged to intervene with all possible means to prevent a closedown of the local freezing plant.

Prior to implementation of ITQ-management, a company bankruptcy did not necessarily mean a social catastrophe for the community. Very soon, the municipal authorities would engage in re-opening the plant and negotiating with government agencies and banks in order to take over buildings, machines and boats on favourable terms (non-local buyers would rarely be interested in buying the plant). Even if the boats/trawlers were lost, new vessels would soon be bought, with the help of favourable loans from public funds. When the company was again running smoothly, the municipality would (in most cases, but not necessarily) turn it over to private ownership.

With ITQs, such community strategies are not as easy. The quota shares held by the companies are now the key to a continued existence, not only for the companies but for the communities/municipalities as well. Without quota shares there will be almost no employment, no municipal taxes paid, in short hardly any future for the community. This means that municipal authorities are willing to go quite far to keep the quota shares within the community. In times of crisis or bankruptcy of the local company, the external creditors now have a valuable collateral in the quota capital held by the company, a capital that does not wear out, but can be sold full price to any other fishing company at any time. There are recent examples of communities which have followed the traditional strategies within this new framework, using public funds to buy back not only freezing plants and trawlers, but quota shares as well. This has put enormous pressure on municipal funds, but it seems that the local authorities perceived that they had no other option. Recent figures[64] (1987–91) on municipal support to fishing companies also indicate that there has been a general increase in municipal support by credits, tax reductions and buying company shares. It is evident, that the struggle for keeping quota shares within local communities, thus generates a pressure of demand in the quota market. Thus, the increasing capital value of quota shares in the late eighties and early nineties may be partly due to this type of demand, backed by public funds at the municipal level. As actors in the market, the communities/municipalities are, similar to fishermen, left with very few options other than trying to stay within the fisheries, but within the ITQ-framework their position is weakened, and in times of crisis they have to pay a much higher cost than before for being allowed to continue as fishing communities.

[64]Unfortunately, it has not been possible to obtain figures for an extended period. The figures for 1987–91 were produced for a specific debate in the Icelandic Association of Municipalities, triggered by massive outlets from communal funds in Ólafsvik, in order to secure quota shares for the local company.

Table 2. Capital return from leasing of quota shares (leasing price per gross ton as % of quota price per gross ton).

	1991	1992	1993	93/94	94/95
Cod	27%	22%	20%	27%	27%
Haddock	14%	18%	14%	10%	10%
Saith	18%	25%	13%	13%	8%
Redfish	18%	25%	21%	20%	22%
Greenland halibut	22%	25%	23%	23%	15%
Plaice	20%	24%	15%	14%	16%
Shrimp	—	8%	13%	16%	26%

Source: Quota trading companies; — = figure not available.

The quota capital

With ITQs, quotas are practically transformed to capital, they gain similar characteristics as company shares in a stock market. The "*new capital*" generated by the ITQ-system is an interesting feature of this form of resource management. Though there is no official registration of quota prices, it is possible to calculate the approximate value of the quota capital from prices actually paid for quota shares, provided by quota traders. It is however difficult to extract reliable figures for the years 1984–87, since quota transfers were in most cases not separated from vessel transactions. Árnason[65] estimates that according to the development of quota market prices, the quota value for the whole fishery in 1990 was 4–5 fold the value in 1984. The increase of capital value of quota shares was substantial for all species from 1990 to 1992 (25–50%). In 1992–95 cod shares have doubled their value per metric ton and the price of shrimp shares has tripled. Herring shares have also doubled in price from 1994 to 1995. Other species have been more stable since 1992.

As mentioned above, since the Icelandic fisheries legislation did not define quotas as private property, this capital was, until the end of 1993, tax-free and officially non-existant. The status as non-capital was not only a problem for the tax authorities, but for the banks as well, since legally, quota capital cannot be treated as collateral for bank credits. In practice, this is solved by agreements where the banks have to be consulted in case of any transfer of quota shares from indebted boat owners. (According to a recent law proposal, the use of ITQs as bank security is about to be legalized.)

Since quota capital, in practice, is an important security for bank loans, quota owners are now in a better position to make new investments. In some cases, it seems that the generation of quota capital has provided an incentive to make new investments in fishing vessels, especially modern freezer trawlers, thus adding to the excess capacity in the fisheries. As the TAC for cod in Icelandic waters has been decreasing, there is a growing tendency that Iceland's new fleet of freezer tawlers operates outside the 200-mile limit, in the "Loophole" in the Barents Sea, the "Flemish Cap" east of Newfoundland and the Irminger Sea, south of Iceland. Meanwhile, the owners of these vessels can lease their quotas to the coastal fleet.

Boat owners who received big quota shares in the initial allocation of quotas or were farsighted enough to buy quota shares while the price was still low, have experienced a nice increase of their capital assets. The benefits of quota ownership can be harvested by offering quota for lease, thus receiving 8–27% annual return (Table 2). The quota share market is comparable to a stock market where quotas for different

[65]Árnason, *op cit*, Ref 12, p.130.

species can be compared with shares in different companies. The prices available in the quota leasing market reflect the annual return from investment in each species. As in other stock markets, the prices of quota shares for one species will vary according to the current capital return from the shares, that is market prices available in the quota leasing market. For the major demersal species, the capital return has been close to 20% in 1991–93, the price of quota shares thus being approximately 5 times the leasing price. While the return on shrimp quota was only 8% in 1992, it jumped to 26% in 1994/95, thus matching returns on cod quota. Meanwhile, the returns on haddock and saith fell drastically. While offering high annual return, ITQ-shares are attractive to investors. For the shareholders, it is probably of minor importance whether the returns can be traced to a "real" resource rent or a quasi-rent as defined by fisheries economists. It might however be argued, if the quota capital, at least to a certain degree, is a product of quasi-rent generation, that quota shares must be a kind of "quasi-capital". This aspect may be reflected in the decision taken by the Supreme Court in 1993, to allow quota owners to depreciate their ITQs by 20% annually. The court argued that this was to compensate for the insecure character of these assets.

An irreversible experiment

The privatization of the fishing rights in Iceland is a social experiment involving high stakes. So far, it seems that the most significant result from the reform is a rather massive re-distribution of wealth and income. The winners are the big quota owners, who can calculate high annual return from their new capital, a capital which also can be depreciated by 20% annually. The losers are the fishermen, or *the fishing crews*, who have been thrown into a market where eventually, only the lowest bidder gets a chance to catch the fish (companies may even advertise for vessels for contract fishing, in order to take the lowest offer). Losers are also those fishing communities who are losing quota shares, and consequently losing their opportunity to earn income from fishing.

The "new" quota capital cannot have come out of nowhere, the high value of quota shares is only possible as long as they are in high demand. The high demand is to a large degree created by fishermen with poor employment alternatives and coastal municipalities trying to prevent collapses of fishing communities by helping indebted local companies to keep their quota shares.

Most likely, the implementation of ITQs is an irreversible social experiment. The Icelandic state is in no position to buy back the quota shares in order to reverse the privatization of fishing rights. The quota capital is already being invested, primarily in new freezer trawlers and fisheries enterprises abroad. The political influence of the quota owners in the Icelandic society should also not be underestimated, as the fisheries account for about 70–80% of Iceland's exports. While controlling the key to the national economy, the ITQ-owners are in a rather strong position to influence the national policies. It will be interesting to follow the further development of the Icelandic ITQ-experiment, but so far the Icelandic experience with the system seems to indicate that there are some good reasons for a sceptical approach towards the visions and predictions of the ITQ-promoters.

Government of Iceland *Lög um stjórn fiskveiða (Fisheries Management Act)* May 15, 1990.