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DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT B: STRUCTURAL AND COHESION POLICIES

FISHERIES

RIGHT BASED FISHERIES MANAGEMENT IN ICELAND AND ECONOMIC AND FINANCIAL CRISIS

NOTE

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AUTHOR

Mr Thórólfur Matthíasson

RESPONSIBLE ADMINISTRATOR

Mr Jesus IBORRA
Policy Department B: Structural and Cohesion Policies
European Parliament
B-1047 Brussels
E-mail: poldep-cohesion@europarl.europa.eu

EDITORIAL ASSISTANCE

Ms Virginija KELMELYTE

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poldep-cohesion@europarl.europa.eu

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AND FINANCIAL CRISIS**

NOTE

Abstract

An overview is given over the introduction and the development of the ITQ system in Iceland. It is shown how the economic and financial crisis affects the balance sheet of fishing firms. The gain in terms of increased pure profit (resource rent) in the fisheries post-crisis is also documented. Local communities are affected by redistribution of quotas, some of the initial effect is mitigated through inflation or deflation of real estate prices in these communities.

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LIST OF ABBREVIATIONS

ACE	Annual Catch Entitlement
CE	Cod equivalences
EEZ	Exclusive Economic Zone
FMR	State office for evaluation of real estate (<i>Fasteingamat ríkisins</i>)
GRT	Gross Register Tons
ITQ	Individual Transferable Quota
MRI	Marine Research Institute
TAC	Total Allowable Catch

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EXECUTIVE SUMMARY

Background

The Icelandic Fishery Management system is based on allotment of a share in the Total Allowable Catch of each regulated species to each participant in the fisheries. Each participant is (almost) free to lease or sell her share to another participant or would-be participant given that the participant or would-be participant is an Icelandic citizen and fulfils some other technical requirements. Hence, Icelandic fishing firms can or may be forced to expand their balance sheet to include the asset value of the fishing rights allocated to them. Quota prices did show sign of bubble just as share prices during the boom of the Icelandic financial sector during the middle of the first decade of the 21st Century.

Aim

Boom and bust of asset prices can have dramatic consequences for affected firms. This paper gives some account of how Icelandic fishing firms did fare. But first an overview of the Individual Transferable Quota system in place in Iceland is given.

There are many lessons to be learned from the Icelandic experiment with the ITQ system. First, when the system was started few of the parties involved believed that resource rent would be created. Hence, there were no precautions taken in order to secure that the distribution of the resource rent would be agreed upon by the majority of the people of Iceland. Secondly, many seem to be shy to admit that the ITQ system creates rents and try to hide facts that manifest that. That fact probably explains why quota prices are not printed on the business pages of the newspapers as is the price of shares in publicly traded companies. Third, prices of permanent quotas are prone to bubbles just as any other asset promising long-lasting income stream. This fact can influence the working of the quota system and create un-necessary volatility for labour and capital in the industry. There are numerous ways of reducing the risk of volatility due to bubbles. One way is to auction out the quotas having the income accrue to the public purse. Other ways include some form of fee-taking or taxation of the resource rent.

1. THE ICELANDIC FISHERY MANAGEMENT SYSTEM, AN OVERVIEW¹

KEY FINDINGS

- The collapse of the stock of Atlanto-Scandic herring and the near collapse of the Icelandic cod stock spurred experiments in fishery management
- Limiting entry into the fisheries and limiting catch capacity of fishing vessels did prove inadequate as management tools
- Introduction of Individual Transferable Quotas was a gradual and experimental process. The system was not comprehensive except for the bigger vessels.
- Fishing rights were initially given for free use to participants in the fisheries during a given period of time in the early 1980s (grandfathering).
- ITQs have become trading objects of considerable value. Hence, those that were granted quotas in the beginning have been able to leave the industry with a handsome amount of money. This has been a source of frustration and bitterness that has not been resolved yet.

In the late 1960's, following a decade of ever increasing catches, the herring stocks around Iceland had been almost depleted. A few years later scientist warned that the cod stock faced a similar fate, unless catches were severely reduced. Because of the importance of the fisheries sectors – and in particular cod and herring – for the Icelandic economy, declining catches of the two species had drastic consequences both at local and national level (Jónsson, 1984) and (Agnarsson & Arnason, 2007). More importantly, however, the serious condition of the stocks served as a reminder that unchecked utilisation of a natural resource could not continue indefinitely and that open access would sooner than later have to give way to some sort of management. In the ensuing years, a quota system was first introduced into the herring fishery, and a combination of effort and volume restrictions used to manage the cod fishery. Finally, in 1990 a comprehensive quota system was initiated in almost all the Icelandic fisheries. This chapter discusses the development of the herring and cod fisheries in last years of open access and describes the main attributes of the management tools introduced in each fishery, as well as the current management system. Special attention is paid to the treatment of social justice questions that have popped up time and again during the implementation of the ITQ regime in Iceland.

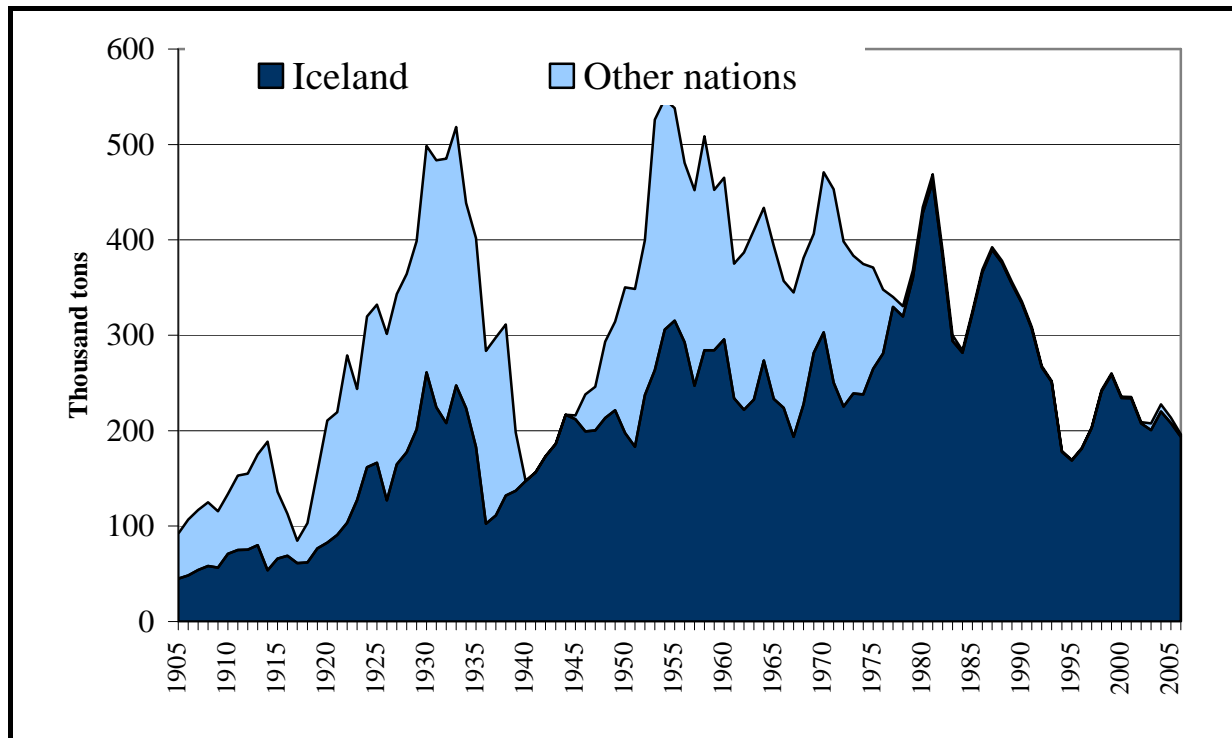
1.1. Cod and herring fisheries

Reliable catch figures exist for the period since 1905 and these show that both Icelandic and foreign catches skyrocketed from less than 100 thousand tons in 1905 to more than 300 thousand tons in 1938. Catches declined dramatically during both world wars as foreigners that frequented the Icelandic fishing banks were forced to use manpower and equipment in the war effort. In the post-war era, catches picked up again from the growth trend of the thirties and reached an all time high of some 500 thousand tons in 1958. During the 1950s, Iceland twice extended her fishing zone, to four miles in 1952 and 12 in 1958. Both extensions met stiff resistance from above all England, but also other European governments. The battle for complete control of the fishing grounds on the Icelandic continental shelf was continued in the 1970s, with the extension to 200 miles in 1975

¹ This chapter is based on a joint work with Sveinn Agnarsson, see (Matthiasson & Agnarsson, 2010).

signalling the end of foreign fishing. Since the last English vessels left the Icelandic fishing zone in 1976, domestic harvesters have had the fisheries almost completely to themselves. Icelanders invested heavily in the fishing industry in the 1970s, both vessels such as stern-trawlers and land-based processing plants. At first, increased effort yielded increasing catches, with landings rising from 266 thousand tons in 1975 to 460 thousand tons six years later. Since then, cod catches have declined, despite several attempts to turn the trend around. In the summer of 2007, the quota for the fishing year 2007-2008 was set at 130 thousand tons, the lowest catches since 1922.

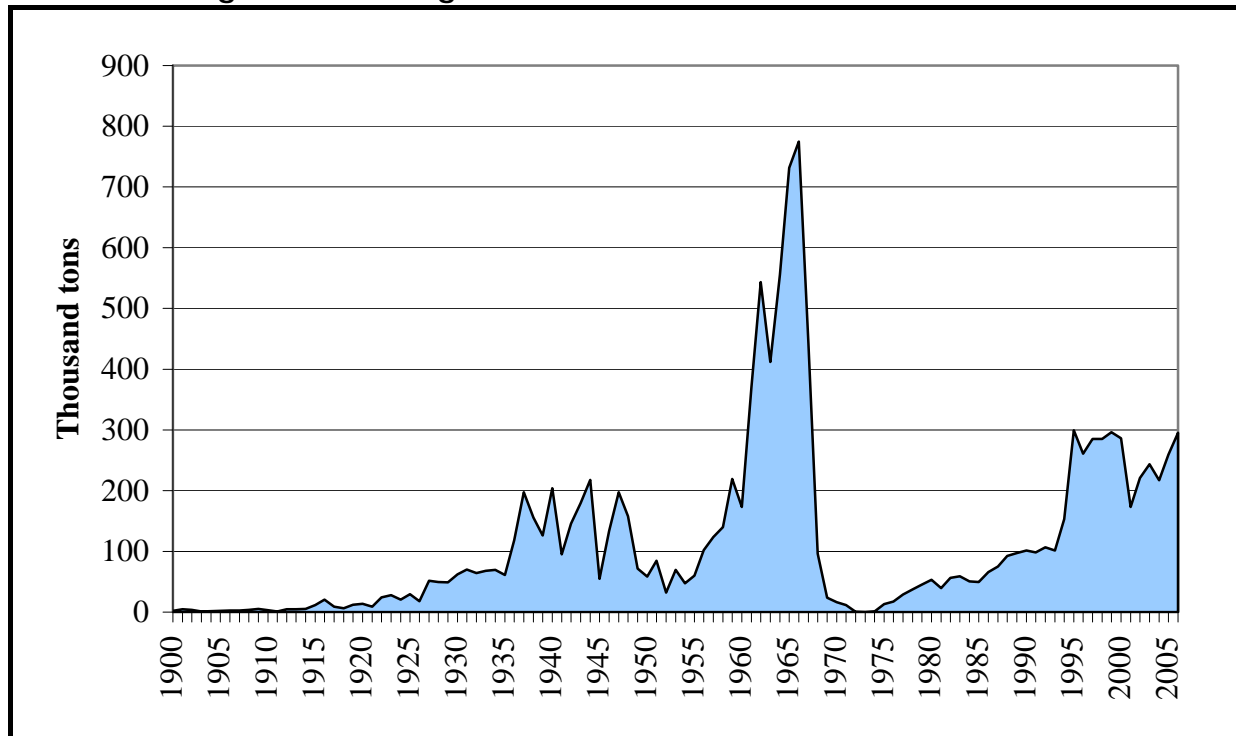
Figure 1: Cod catches in Icelandic waters 1905-2006.



Source: Marine Research Institute 2008, Table 3.1.1.

The Icelandic herring fishery developed into a large-scale industry during the first half of the 20th century. Icelandic catches ranged from 60 thousand to 220 thousand tons until 1961 when they escalated to a record figure of 370 thousand tons.² In 1966, catches reached an all time high of 770 thousand tons. And then catches plummeted. First to 440 thousand tons in 1967, and then even further to 96 thousand tons in 1968 and a mere 24 thousand tons in 1969, 3% of the record figures of just a few years earlier. In short, the herring fisheries were in a state of collapse.

² These figures include all catches of Icelandic spring and summer spawning herring and Icelandic catches of Norwegian-Icelandic spring spawning herring.

Figure 2 : Herring catches in Icelandic waters 1900-2006.

Source: (Jonsson & Magnusson, 1997), Table 5.8 and (Marine Research Institute, 2008), Tables 3.19.1 and 3.19.8.

1.2. Search for manageable management system³

The harsh reality of the fate of the herring stock showed Icelanders that although national control of the fishing grounds might be a necessary condition for sustainable management of the aquatic resource it was far from sufficient. In October 1975, the Icelandic Marine Research Institute (MRI) issued a "black report" on the state of the cod stock. The initial response was to reduce the total allowable catch (TAC) which was resolutely overfished, as no sanctions were induced to avert overfishing. Effort restrictions were next in line, with the Ministry of Fisheries stipulating measures in 1977 aimed at limiting cod catches. Each trawler was banned from fishing cod for 30 days a year, all other vessels had to accept a one week ban, and attempts were made to ban further increases of the fishing capacity of the fleet. The introduction of these measures coincided with the entrance of big year-classes into the fishable stock. Hence, the cod stock grew leaving politicians and the MRI free to worry about other things. Vessel owners soon learned how to expand fishing capacity of existing vessels without violating the capacity restrictions in effect. Thus, the capacity of the fishing fleet grew without much effort to restraint on behalf of the fishery managers.

It soon became clear that despite the effort restrictions the cod fishery was being mismanaged. Catches usually far exceeded the TAC, while the restrictions also led to greater fishing of other demersal species, increasing the pressure on species such as haddock, saithe and redfish. The system was also economically wasteful. Environmental conditions in the ocean deteriorated in the early 1980s leaving the effort restrictions inadequate as measure of keeping the cod stock at a sustainable level. In addition, prices on foreign markets had fallen, and most of the harvesting companies were experiencing severe operating losses. The processing industry was doing only slightly better.

³ For a more detailed account the interested reader can consult (Matthiasson T. , 2003).

As mentioned above, the herring fisheries had collapsed around 1970, and in 1972 all gear except driftnets were banned in the fisheries. Since purse seine had been the most widely used gear, while the use of driftnets had been very limited, the new restrictions really amounted to a moratorium on herring. In 1975 the ban on use of other gear, including purse seine, was lifted and each purse seiner allocated a quota. Vessels using driftnets were, however, not subject to a quota. In 1977 all vessels taking part in the herring fisheries were allocated quotas, and in 1979 the quotas became transferable. Transferability was introduced to reduce the cost of fishing, but in many cases the allotted quota was less than expected catch in one trip to the fishing ground. The management system remained relatively unchanged in the next decade, and was finally merged into the new comprehensive system in 1990 (see below).

In the autumn of 1983, a government advisory committee was formed to analyse the state of the fisheries, and to propose new methods to deal with the problems at hand. The general view was that the time had come to abandon effort restrictions and, instead, turn to a quota system. These ideas had gained considerable ground, both among fishermen and vessel operators, not least because of the success of the quota systems in the herring and capelin fisheries that had been put into place in the 1970s. These enhanced management methods were discussed at the meetings of the Fisheries Association of Iceland during 1983, with the meeting embracing these views.

Their proposals were later adapted by The Icelandic Parliament (*Alþingi*) and on December 22nd 1983, Parliament passed an amendment to the Fisheries Act of 1976, which gave the Minister of Finance discretionary powers to introduce an individual vessel quota system, as well as to restrict entry through licensing.⁴ Central to this Act and the associated Decree 44/1984 was that all vessel of 10 GRT or more were allocated quotas in the cod fishery and six other important demersal fisheries based on their overall catch record in the period from 1st November 1980 to 31st October 1983. Quotas were, though, only allocated to ships that had been active in the period from 1st November 1982 to 31st October 1983 and were still in operation. These vessels were issued with a fishing permit. Allowance was though made for vessels that had been out of operation due to repairs or other accepted reasons. Owners of new vessels or vessels that had been in operation for less than 12 months of the reference period could chose between obtaining an average quota for similarly sized ships or abiding by effort restrictions. Transfers of quotas were allowed to some extent. The system was intended as preliminary measure for one year at a time.

The opening up of the effort quota window paved the way for increased role for such quotas each time the system was up for approval for an additional year. Parliamentarians, vessel owners and other stakeholders understood that a hybrid output and effort quota system was not the right recipe for stability. Hence, in 1990 the parliament discussed and accepted Act 38/1990 which marked the introduction of a comprehensive quota system and made quotas permanent. At that time, it had also become self-evident that excluding a substantial part of the fleet from management was not a very wise move. Thus, the system was extended to cover all vessels bigger than 6 GRT. However, a loophole was opened for the smallest vessels, the rather large fleet of open boats.

⁴ Act nr. 82/1983.

1.3. Overview of the current Icelandic ITQ system

The current ITQ system in the Icelandic fisheries is based on the Fisheries Management Act of 1990 and subsequent amendments.⁵ At present the ITQ system applies to 25 different fisheries, which represent about 98% of landed value.

The Ministry of Fisheries and Agriculture determines the TAC for the next fishing year⁶ for each of the fisheries, after consultation with the Marine Research Institute, which puts forward its recommendation each year in a report describing and discussing the current status of the fish stocks. A valid fishing licence is needed to take part in the fisheries. There now exist two different types of licences; quota licences and hook-quota licences, with the latter only open to boats smaller than 15 GRT. The hook-quota licences derive their name from the fact that bottom longline and hand line are the only fishing gear allowed.

In the ITQ system a clear distinction is made between two types of quotas; TAC-shares and annual catch entitlements (ACE). The former is also sometimes called permanent quotas. Each vessel is allocated a percentage share in each of the fisheries the vessel is entitled to take part in. Once the TAC for each fishery has been set, the ACE of each vessel is simply calculated as the product of the TAC-share of the vessel and TAC. Thus, a vessel with a 1% share in a certain fishery will be allocated an ACE of 1.000 tons if the TAC is 100.000 tons, but only 500 tons if the TAC is 50.000 tons. All quotas are denominated in cod-equivalent terms, as the cod fishery is by far the most important fishery. Cod-equivalents for each quota-year are determined on the basis of the average unit value of the landings of each species the year before, and provide a measure of the relative value of individual species compared to cod.⁷

The initial allocation of the permanent quotas is discussed below, but the Act states that when a TAC is introduced into a fishery that has not been restricted before, TAC-shares will be allocated on the bases of each vessel's catch history in the previous three years. Quotas may only be allocated to vessels.

The TAC-shares are almost completely transferable, the only restrictions applying to cases when shares are transferred to a firm in a different community. Then the community where the seller is located has the right to buy at the negotiated price. . This provision has though been seldom utilised as municipalities have not had funds or political willingness to intervene. The TAC-shares are completely divisible. By contrast, only half of the ACE of each vessel may be transferred in a single quota-year between vessels of different ownership. Offsetting transfers of different species with equal value are, however, not subject to any such restrictions. Thus vessel owners are forced to harvest at least half of their quota allocations measured in cod-equivalents each quota-year. If the utilisation is below 50% for two years running the vessels forfeit their TAC-shares. Allowance is though made for damages incurred or substantial repairs. Quotas – both TAC-shares and ACE – may be transferred from vessels in the quota system to vessels in the hook-quota system, but not the other way around, i.e. from smaller to larger vessels.

⁵ Act nr. 38/1990.

⁶ The quota-year runs from September 1st to August 31st.

⁷ The cod-equivalences are thus based on the ex-vessel price of a kilo of fish of a given specie relative to the ex-vessel price of a kilo of cod. Thus, holding a given amount of cod-equivalences of cod, say, can give more value added than holding the same amount of cod equivalences of haddock or saith, say.

There is an upper limit or ceiling on the TAC-share holdings of each harvester and related firms or individuals. The combined TAC-shares of each firm in all fisheries must not exceed 12% of the total value of the TAC, measured in cod-equivalents. The corresponding ceiling in the hook-quota system is 5%.

There is considerable flexibility in the two quota systems. Except for cod, catches may exceed ACE in some of the demersal fisheries, provided quotas are larger than catches in others. Up to 20% of quota holdings in most fisheries can be transferred between fishing years. Finally, should catches exceed quotas moderately, say between 3% and 5% in any given fishing year, the quota allocation of the subsequent year is simply reduced correspondingly.

1.4. Problems with “grandfathering” and transferability

Quotas for demersal fisheries were allotted in 1983 as a part of a temporary solution to the overfishing problem. The allotment was based on catches during the previous three years with exceptions in case of irregularities regarding ship or skipper as already alluded to. Allotment of quotas in pelagic fisheries and in shrimp fisheries did not necessarily follow the same rules. Quotas for herring were initially distributed equally between eligible vessels. Half or more of the capelin quota was distributed equally between vessels, while the rest was distributed according to the cargo capacity of each vessel.

The methods used to allot quotas were assumed to be temporary. A rudimentary market for temporary as well as permanent quotas soon developed. With increase in trade in quotas, some people became worried that the development was getting out of hand and started voicing their discontent. Other critics pointed out the lack of social justice, as vessel owners in small communities were handed valuable quotas for free and could rent or sell the quota out of the community. In the process, the quota owners collected substantial fees, while those previously engaged in the harvesting and processing industry – fishermen and workers – collected unemployment insurance. Many also feared that the free transfer of quotas would put concentration in the industry on a fast track, transforming recruitment and family traditions.

In order to meet this criticism, a new sentence was added to opening paragraph of the Fishery Management Act in 1988. This sentence states that “[T]he fish stocks around Iceland are the property of the Icelandic people”. This declaration has been kept in all subsequent revisions of the Fishery Management Act. Further, the first article of the current Act states that the fish stocks in Icelandic waters are the common property of the Icelandic people, and that allocation of ITQs to individual harvesters does not represent irrevocable property right in these TAC shares.

1.5. The catch fee

According to an amendment to the Fishery Management Act passed by Icelandic Parliament (Althing) in 2002, the vessel owner holding a quota right is required to pay a catch fee (*veiðigjald*). The institution of the catch fee can be explained as an effort aimed at reducing the tension caused by free allotment of quotas. A detailed account of the political process leading up to the introduction of the catch fee is given in (Matthiasson T. , *Mar Resour Econ*, 2008). The catch fee is levied yearly as a given amount per cod-equivalence kilo. The amount is to reach 9.5% of estimated resource rent. The resource rent is estimated according to a formula given by the act of law. The formula can be motivated with references to economic theory. As the catch fee was instituted a number of other

levies accruing to the public purse were discontinued. Hence, the income from the catch fee did not constitute totally fresh money for the public coffers. Three important observations can be made: First, the catch fee has so far been in the range of 0.6–1.6% of rental price of quotas. The rental price is by many seen as a proxy for the resource rent. Second, the catch fee has not reduced tension caused by free allotment of quotas. But, third, the catch fee is a pioneering exercise both in the Icelandic and the international context. The institution of the catch fee forebodes a road possibly taken when other publicly owned resources are handed to private users in Iceland in the future.

1.6. The small vessel loophole

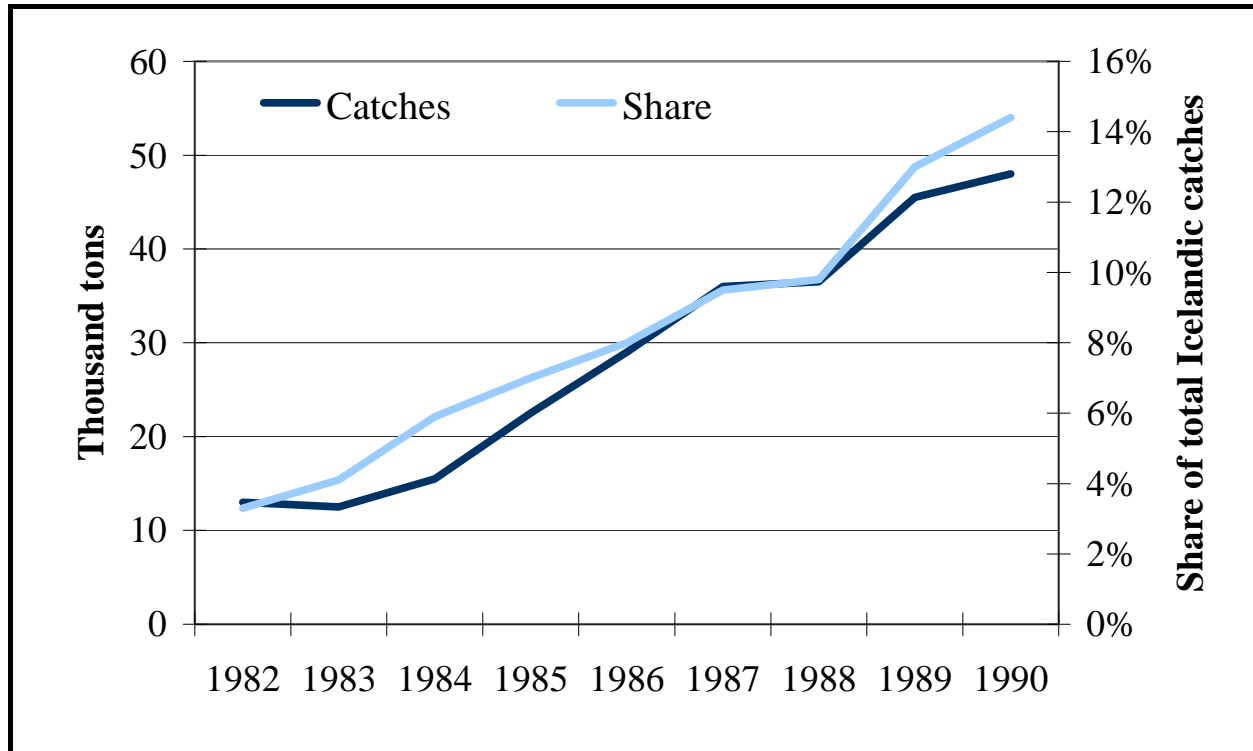
As mentioned earlier the quota system introduced in 1984 only applied to vessels 10 GRT or larger. Instead, during the period 1984-1990 various measures were used to both limit cod catches of the smaller vessels, as well as the number of vessels taking part in the fishery. At first, TACs were set for cod and six other important demersal species, but in 1985 TACs only applied to the cod and haddock fishery, and from 1986 only to the cod fishery. Catches of other demersal species, such as haddock, saithe and catfish, were thus completely unrestricted. Effort restrictions usually took the form of a cod fishing ban for a certain number of days in a year or shorter time interval. This applied both to vessels using hooks, i.e. line or longline, or nets. Because of fears that the latter might seriously overfish their "limits" a special fishing license system was introduced for the netters in 1986. In addition to effort restrictions, each netter was also allocated a certain catch maximum.

Up to 1988 entry into the small boat fisheries was completely open. However, in January of that year a new Act was introduced which attempted to curb the small boat fleet expansion.⁸ Boats larger than 6 GRT that were already in the fleet or being built were issued fishing licenses and a new boat could not enter the fleet without another one being sold abroad or taken permanently out of operation. Smaller boats than 6 GRT were banned from employing nets, but the ban did not apply to vessels that had used nets in 1986 or 1987.

At the end of 1983, there were 828 small vessels smaller than 10 GRT in the Icelandic fishing fleet. The small boats were allocated a quota of 8,300 tons for the following year, but their catches were almost double that amount, or 15,500 tons. This represented a 5.9% share of Icelandic cod catches. During the next six years, catches – both in tons and as a percentage share – rose tremendously, as more and more fishermen realised how easy it was to enter the small boat fisheries (see Figure 3).⁹ In 1990, catches had risen to 48,000 thousand tons, or 14.4% of the total. By then the fleet counted 1,600 boats smaller than 10 GRT, almost twice as many as had been active in 1983. Even the attempts to limit the number of boats larger than 6 GRT had proved futile, as their number grew by one hundred in 1988-1990.

⁸ Act nr 3/1988.

⁹ There exist many anecdotes of fishing vessel owners that were allocated quotas in 1984, but sold their share as soon as possible and instead began operating small vessels that were exempt from the quota system.

Figure 3 Cod catches of the small vessel fleet in 1984-1990.

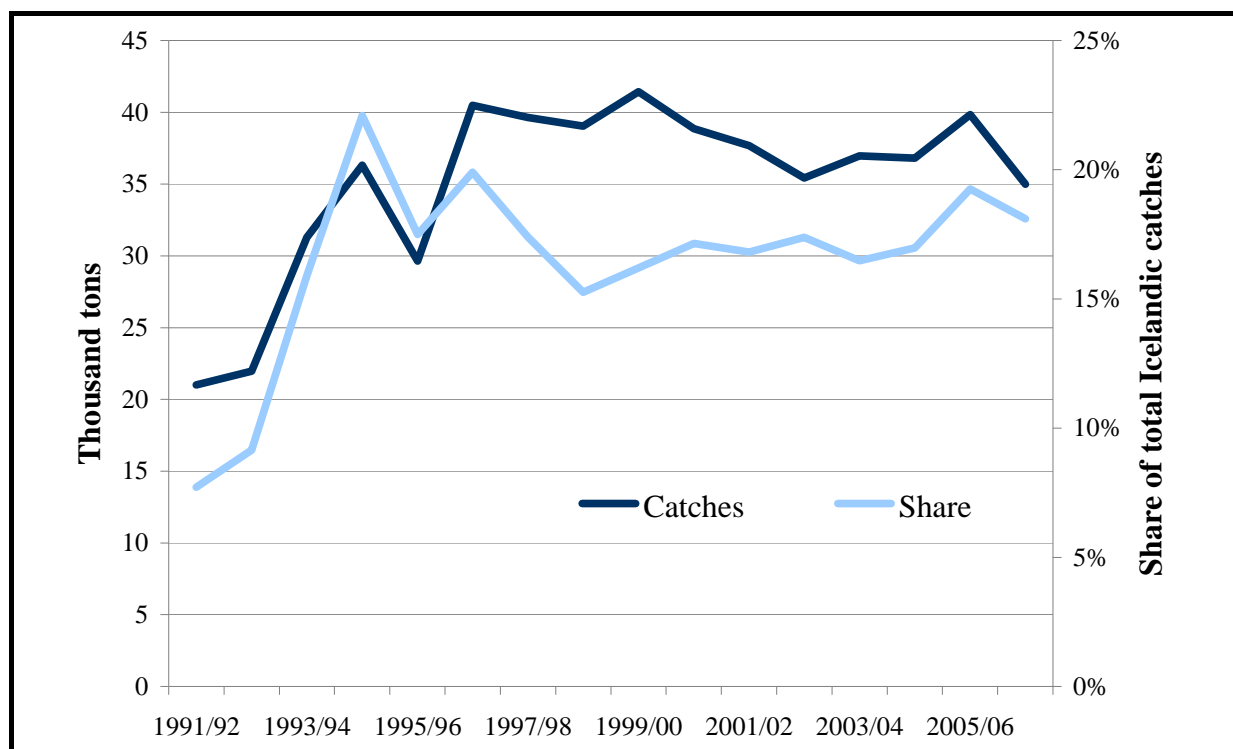
Source: (Runolfsson, 1999), Figure 9.17.

When a comprehensive quota system was introduced in 1990, a new attempt was made to deal with the small vessel problem. Boats larger than 6 GRT were thus included in the quota system, but effort restrictions used to manage the cod fishery of smaller vessels. It may seem strange that the authorities decided to stick with the effort restrictions that had proved fairly useless in limiting catches – not only of the small boat fleet but also of the trawlers – rather than allowing past experience to dictate management methods. However, despite the overfishing, many believed that including all vessels in a quota system would constitute too drastic a step, and that such a move could not gain enough political support. Many people still clung to the rather romantic view of a one or two fishermen going out on an open wooden vessel with a small engine and rather limited range, and regarded the operation of these vessels as an integral part of life in the small fishing villages that dot the Icelandic coastline. Although such old fashioned boats still existed, in reality most of the small fishing fleet was in the process of being completely modernised. During the next decade major improvements were made in design, speed and equipment, and by the turn of the century the most efficient boats were harvesting more than 300 tons a year. As an example, in 2001 six boats – all 6 GRT in size – registered catches in excess of 300 tons of cod and other demersal species, with one boat recording catches of 512 tons.

According to the Fisheries Act of 1990, boats smaller than 6 GRT could choose between entering the quota system that applied to all larger vessels, or staying outside and obtaining a hook license. Almost all boat owners opted for the latter. During the period 1990-1995, effort restrictions were used to limit the catches of those vessels. When the results proved – as expected – rather disappointing, harvest caps were introduced for individual vessels. In the next few years the management system became ever more complex, with up to five systems simultaneously in operation during the fishing years 1998/1999-2000/2001. In 1999 this intricate management web was greatly simplified with the introduction of a choice between effort restrictions with transferable fishing days and a quota system. The effort restriction system was slowly phased out in the ensuing years. By the beginning of the fishing year 2004-2005, 715 out of the 729 vessels smaller than 6 GRT

had obtained permanent quotas. Only 14 boats then still remained in the effort restriction system. Two years later, the small open loophole was finally closed. The small vessels were allocated quotas in cod, as well as in haddock, saithe and catfish based on past fishing history, much to the chagrin of owners of larger vessels who were firmly opposed to the allocation in other demersal species than cod, as it diminished their own quota shares.

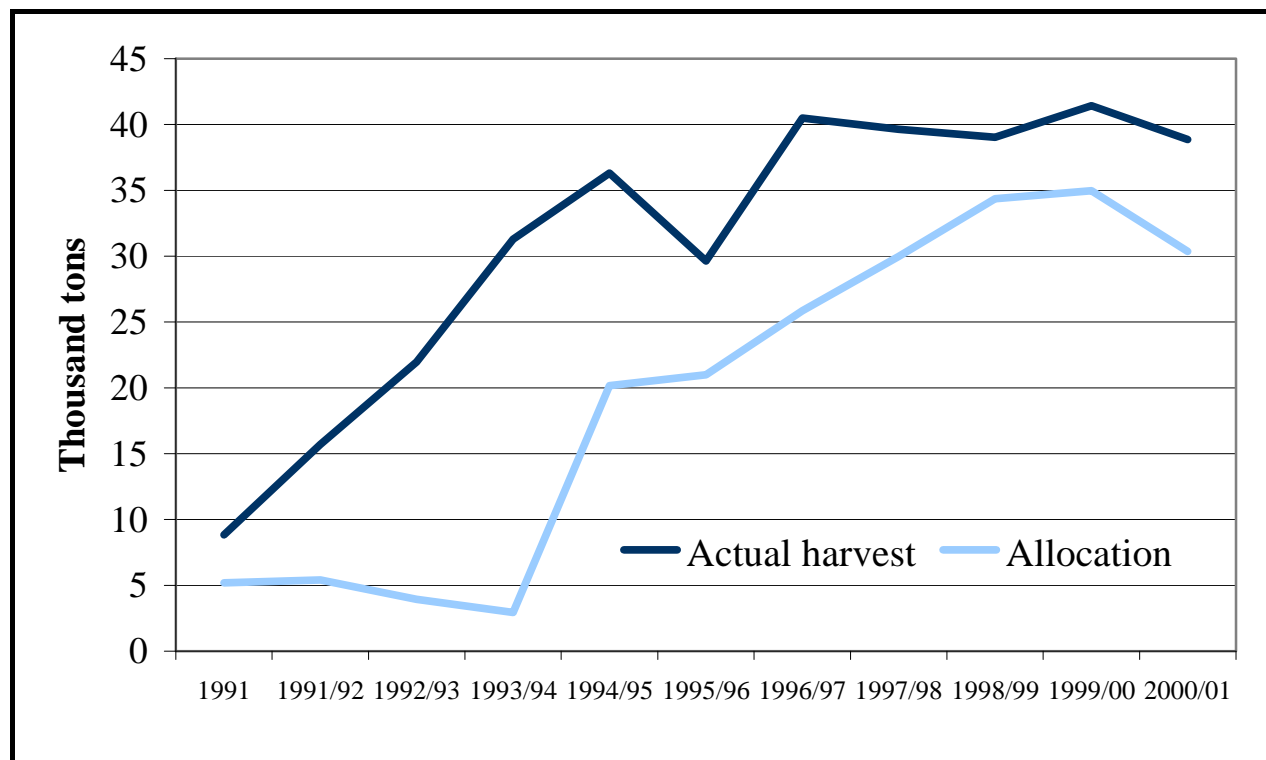
Figure 4 Cod catches of the small vessel fleet in the fishing years 1991/92-2006/07.



Source: (Runolfsson, 1999), Figure 9.17 and Directorate of Fisheries.

In the fishing year 1991/92, cod catches of the small vessel fleet amounted to 22 thousand tons or 7.7% of catches in Icelandic waters (see Figure 4). Five years later, the harvest had almost doubled to 40 thousand tons, or 20%, and since then cod catches have been in the 35-40 thousand tons range. No limit or TAC was set on cod catches of this fleet during the period 1991/92-1993/94, but in subsequent years the small fleets regularly overfished their allocation. Thus, in the fishing-years 1994/95-1997/98 landings were 20-40% above the ceiling and overfishing in these years totalled 44 thousand tons. Subsequently, better harmony was achieved between landings and allocations.

It is interesting to compare actual harvests of these small boats during the period 1991-2001 with what they would have been allocated if similar rules had been in effect for vessels smaller than 6 GRT as for the larger vessels. As shown in Figure 5, actual harvests always far exceeded what they would probably have been allocated.

Figure 5 : Actual harvest and possible allocation of cod quotas of the small vessel fleet 1991-2000/01.

Source: Estimates of the Federation of Icelandic fishing vessel owners, (**Federation of Icelandic Fishing Vessel Owners, 2003**).

During the 1990s, efforts were made to restrict entry into the hook license fisheries and these restrictions proved somewhat successful. The number of boats smaller than 6 GRT dropped from 1,148 at the end of the 1991/92 fishing year to 800 in 1999/00, but as expected the fleet dwindled much faster once a quota system was in place. At the beginning of the fishing year 2007/08, only 422 boats were registered in the small vessel quota system, half the number of seven years earlier, and a little over one third of the number of boats in 1991/92.

1.7. Quota regulated species and type of permits (rights)

All the commercially important fishing species are subject to quota regulation, twenty five in total. The most important demersal species are cod, haddock, saith and redfish. The most important pelagic species are capelin and herring. The most important shellfish species are lobster and shrimp. In 2007 the Directorate of Fisheries had issued 1.332 fishing permits to vessels big and small. Certain fisheries require special permits, examples are Danish seining, inshore shrimping and fisheries of Icelandic vessels in distant waters (if based on agreements between the Icelandic and foreign governments). As suggested above there are two types of permits (rights) issued by the Directorate for Fisheries. First, there is a general right to fish a particular regulated specie. The right-holder is granted the right to fish a given quantity of TAC for that particular specie based on her quota share and the size of the TAC. A quota holder holding general quota permit is not restricted in which equipment to use to catch her quota (except for Danish seining). A permit holder can forfeit her right to fish if the vessel is inoperative for 12 months, if the vessel is declared unseaworthy by the Icelandic Maritime Administration or if the vessel is acquired by a foreign citizen not entitled to fish inside the Icelandic EEZ. A fishing right can also be in the form of a hook and line permit. Hook and line permits are only issued to vessels smaller

than 15 GRT. Quota holders can lease or sell their quotas with some restrictions. Hook and line permits can not be used by vessels other than hook and line vessels, while a hook and line vessel can apply a general permit. The Marine Research Institute can close areas for a limited time for specific gear even also for vessels holding permits. There is also an upper limit on total share of quotas one firm can have (12% of total quotas, 10% of cod quotas). A quota holder can transfer up to 15% of her quota to a subsequent year and can use up to 5% of next year's quota to cover catches this year. Small-sized catches of cod, haddock and redfish are not fully deducted from the quota of a vessel if declared specifically. A vessel can overfish by 5% as long as that catch is declared and 80% of the value accrues to the Fisheries Development Fund. Quota in one species can be used to catch a different species. The transformation of quotas is performed using relative landing prices. This last rule does not apply to cod.

1.8. The ruling of the UN Human Rights Committee

The institution of the ITQ system has been challenged in Icelandic courts on several occasions. In 1998 the Supreme Court of Iceland ruled it unconstitutional to restrict the right to fish to those holding a title to a vessel during a specific period of time (the so-called Valdimar case, named after the person who raised the case). A second ruling of the Supreme Court stated that the Ministry of Fisheries could, however, allocate ITQs to a restricted group of people (the Vatneyri case, after the name of the vessel used to challenge the Fishery Management Act). There may be a thin red line of legal reasoning connecting the two rulings, but most people did see them as contradictory. In the aftermath of the Vatneyri-case, two fishers, who by coincidence, were not eligible for quota-allotment at the outset of the quota exercise deliberately disobeyed the law after having being rejected quota based on equal treatment arguments. Icelandic courts did not accept their equality arguments and rejected the reasoning of the two fishers. Hence, the two fishers brought their case for the UN Human Rights Committee. The Committee ruled in October 2007 that the initial allotment of quotas had been a violation of the equality principle embedded in the International Covenant on Civil and Political Rights. The Committee furthermore ruled that the two fishermen should be compensated for their losses and that the rules of the Fishery Management Act should be brought into line with the spirit of the Covenant on Civil and Political Rights. Government of Iceland, which was given 180 days to prepare its actions announced that compensation would not be paid but that the government would be willing to consider a long term plan for directing the Icelandic Fishery Management System into the course given by the Ruling of the UN Human Rights Committee. The Government also proposes a communication process with the Committee regarding the adequacy of the actions taken, see (Ministry of Fisheries and Agriculture, 2007). At the time of writing (early 2012) no action has been taken. The government of Jóhanna Sigurðardóttir has on its agenda to change the Fishery Management Act so as to take the remarks of the UN Human Rights Committee into account. Revising the Fishery Management Act has proven to be harder and more tedious than assumed at the outset.

Many critics of the grandfathering rule used to meter out the initial rights to fish in Iceland have pointed to various measures that could be taken to meet the requirements of the Human Rights Committee. The most extreme would be to auction permanent or temporary rights. This would be similar to Ronald Reagan's auctioning of oil-drilling rights in US coastal waters in 1982 see (Wenar, 2008), p. 10-11. Less extreme would be some form of yearly recall of quotas. Recalled quota would then be auctioned or rented. Lastly, the catch fee could be increased. This last method is alluded to in the reply of the Government of Iceland to the Human Rights Committee.

1.9. Conclusions

As an exercise in implementing ITQs, the introduction and development of the Icelandic fisheries management system has been a success in some respects, but left proponents disappointed regarding other aspects.

One of the major successes of the system is how comprehensive and all-inclusive it has become. It did not take long time to develop an exhaustive quota system for the pelagic species, herring and capelin, but establishing a comprehensive quota system without loopholes in the more valuable demersal fisheries did prove a harder nut to crack. While Icelandic fisheries authorities did manage to keep catches within the allocated quotas in the quota part of the system, management by effort restrictions has clearly been proven inadequate. Hence, it may be concluded that the Icelandic experiment proves that ITQs are superior if the aim is to control catches in a predictable manner. The Icelandic experiment also shows how difficult it can prove to ease all stakeholders in a fishery into acceptance of the system when the fleet in question is very segmented. The Icelandic fleet included ships as varied as small open boats registering a few tons to vast freezer trawlers that could stay at sea for weeks. The ITQ system has also delivered on the promise of reducing average harvesting costs.

When the quota system was introduced it was believed that the most valuable stocks, primarily cod, could be rebuilt and that stronger stocks would lead to higher catches. This has not materialised. Indeed, cod catches are now only half of what they were in the early 1980s. Although the quota system as such, can not be blamed for this disappointing development, opponents of the ITQs system have frequently cited this as one of the prime reasons for abandoning the quota system and reverting to different management methods. Lastly, the strong sentiment towards grandfathering quotas came as a surprise to the advocates of the ITQ system. The quota system has been the theme of discussion in several general election cycles and a whole political party was erected with the agenda to change the system in fundamental ways. The longevity of the loopholes for small vessels can be seen as an attempt to defuse those threats.

So far Icelanders have not had experience with stakeholders conflicts based on environmental interests (leaving food for birds or whales) or recreational interests (the tourist industry). Those interests will inevitably gain momentum in years to come. It will be interesting to see if the Icelandic system is flexible enough to accommodate those without fundamentally compromising its essence.

2. PRICE FORMATION: LEASE AND PERMENT QUOTAS

KEY FINDINGS

- Cod is used as unit of account and medium of exchange in the Icelandic quota system.
- The relationship between lease price of cod and price of permanent cod quota is complex and volatile.
- The relationship between port-side price of cod and lease price of cod is hard to understand and rationalize, but is probably influenced by how hard it is to avoid fishing cod in Icelandic waters.
- The relationship between port-side prices of other species and their lease price is much in line with theoretical predictions.

The purpose of the quota system is to use market instruments rather than direct measures to allocate the resources that able and willing men are bringing to the fishing industry. The idea is to force anyone participating to measure her own ability to economize resource use against the ability of other participants not by spying on her fellow participant but by observing publicly available information. This information is supposed to be contained in prices of quota, both lease prices and the price of permanent quotas. The idea is that an efficient fishing firm will outbid less efficient firms in both the lease market and the market for permanent quotas. A fishing firm operating with leased quota will have to make sufficient profit in order to pay off investment costs etc. from the difference between the port price of catch and the lease price. The more efficient the fishing firm is the higher price will it be willing to pay for leasing extra quota.

Given the relationship between efficiency and price-formation in the markets for quotas one would have expected two things: a) that quota price information was publicly and readily available, just as is information on share prices for publicly traded firms, and b) that the Ministry of Agriculture and Fisheries and/or the Directorate for Fisheries would use great deal of effort to collect information and investigate the rules of price formation in the quota market. Both conjectures are false. Bid and ask prices both for lease and for permanent quotas are treated like advertisement for escort services, hidden in obscure places and hard to find for the novice researcher. And if a price is given you will not know for sure if the advertisement was put out in 2005 or yesterday. Average monthly lease prices by specie can be had from the Directorate for Fisheries at least from September 2008. Yearly averages exist for earlier periods. The Central Bank did collect monthly averages for price of permanent quotas until 2008. Information since then only exists in sporadic form.

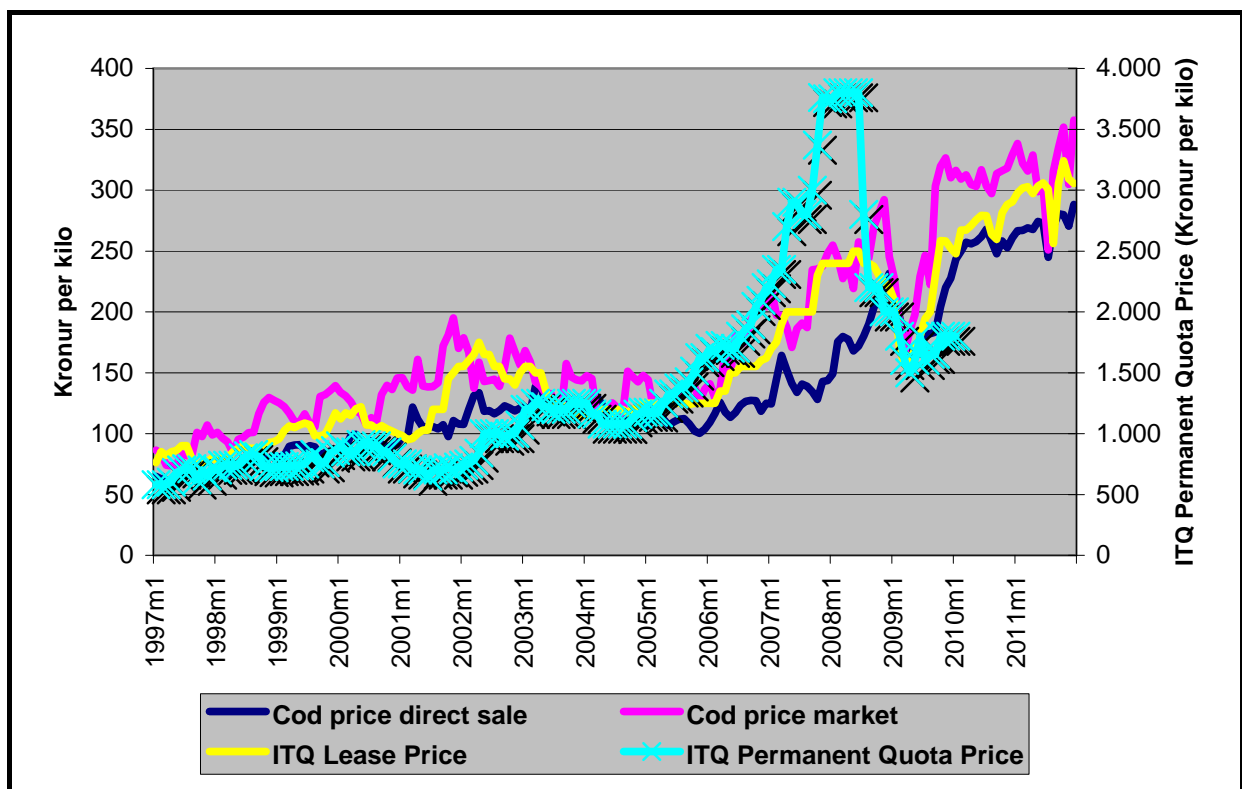
2.1. Monthly prices of cod

In the Icelandic quota system cod plays a role similar to that of money in an exchange economy. The tangible reason is that cod is abundant and readily caught in almost any gear. Hence, anyone fishing has to acquire some cod-quota in order to operate. Cod-equivalences (CE) are defined in a Ministerial Decree each year. CE's are thus a unit of account as a given quantity of quota in any other specie can be translated into an quantity of cod. CE's are also medium of exchange as traders use CE's as a reference. CE's can also serve as an incomplete store of value as a holder of permanent quota can, with restrictions lease out his quota and then sell the quota if and when a different asset is warranted. All those facts imply that all types of markets for cod, lease market, market for

permanent quotas, market for catch are more active ("thicker") than markets for other species.

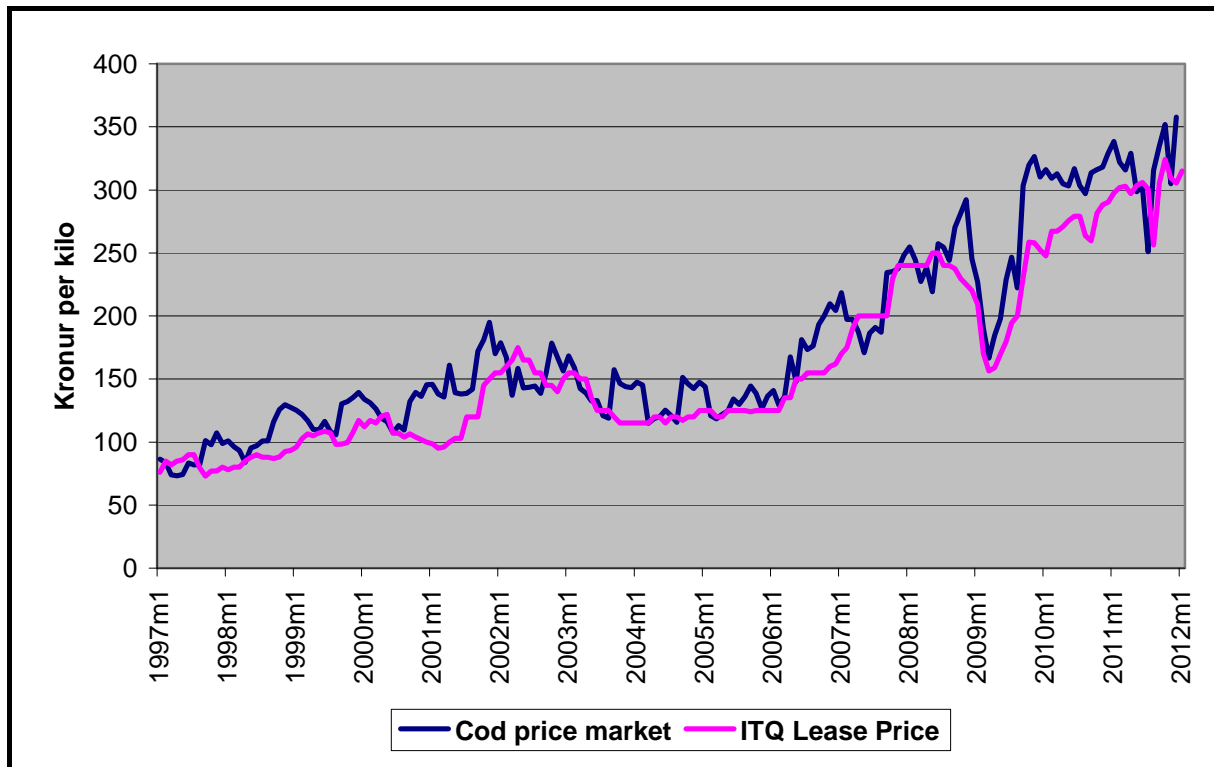
Figure 6 exhibits the movement of month-to-month average of the most important prices related to the cod-fishery. Two types of port-side prices are reported. Auction-price (named *Cod-price-market* in the figure) and the reported internal price used by integrated fishing and fish processing firms (*Cod-price-direct sale* in the figure). Furthermore, two prices related to the market for quotas (fishing rights) are also reported, the lease price and the price for permanent quotas. Note that the scale for permanent quotas is 10 times the scale for the instantaneous prices.

Figure 6 Prices of cod at the market, inside vertically integrated firms, lease quota and permanent quota.



Sources : Central Bank of Iceland, Directorate for Fisheries

The prices reported are monthly averages. Note that the lease price is almost always just as high or higher than the average price of cod. This is well reflected in figure 7 where it is obvious that the lease price is just slightly lower than the market price.

Figure 7: Comparison between lease price of cod and market price of cod.

Source : Directorate for Fisheries

The fact that the lease price is almost as high as the average port price means that someone leasing quota will not cover costs of operation if selling at average port price. This has spurred a question that has been rather hard to answer: Why does the equation leaseprice plus operation cost equal to port price not apply? The tricky answer is that the average price hides considerable fluctuation in prices in individual sales and that the lease price partially reflects a constant deficit of cod-quotas to avoid paying fines. But it must be admitted that despite the fact that this phenomenon is well known among fishers and researchers it has not been given adequate consideration in the literature. The Institute for Economic Studies of the University of Iceland did a study for Ministry of Agriculture and Fisheries on the efficiency of the lease market for quotas. The Institute had access to information about prices of individual lease-deals and could conclude that trades are closed inside a relatively narrow band of prices. The Institute did not consider the relationship between price at port side and the lease price.

Figure 6 reveals that the price of permanent quotas fluctuates a bit and even reflects the asset-price bubble that did arise in the years before the collapse of the financial system. Economic theory predicts that the price of permanent quota closely follows the ratio of the lease price and the interest rate. Figure 8 reflects the relationship between permanent quota price and lease price of cod quota.

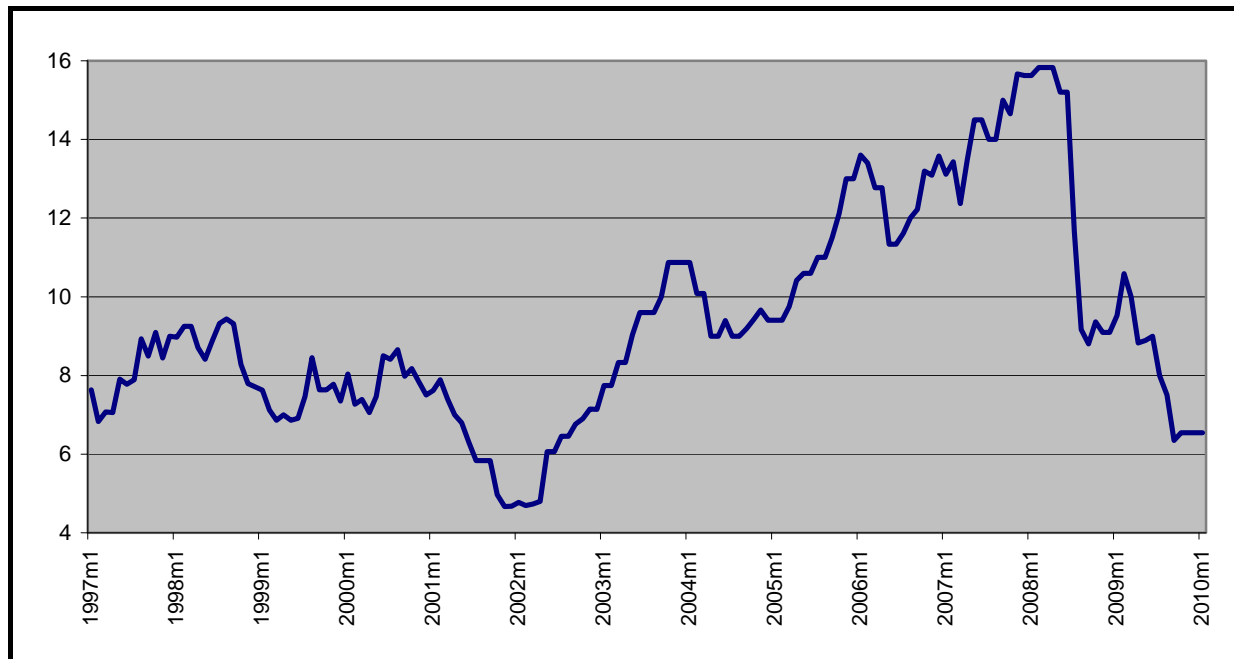
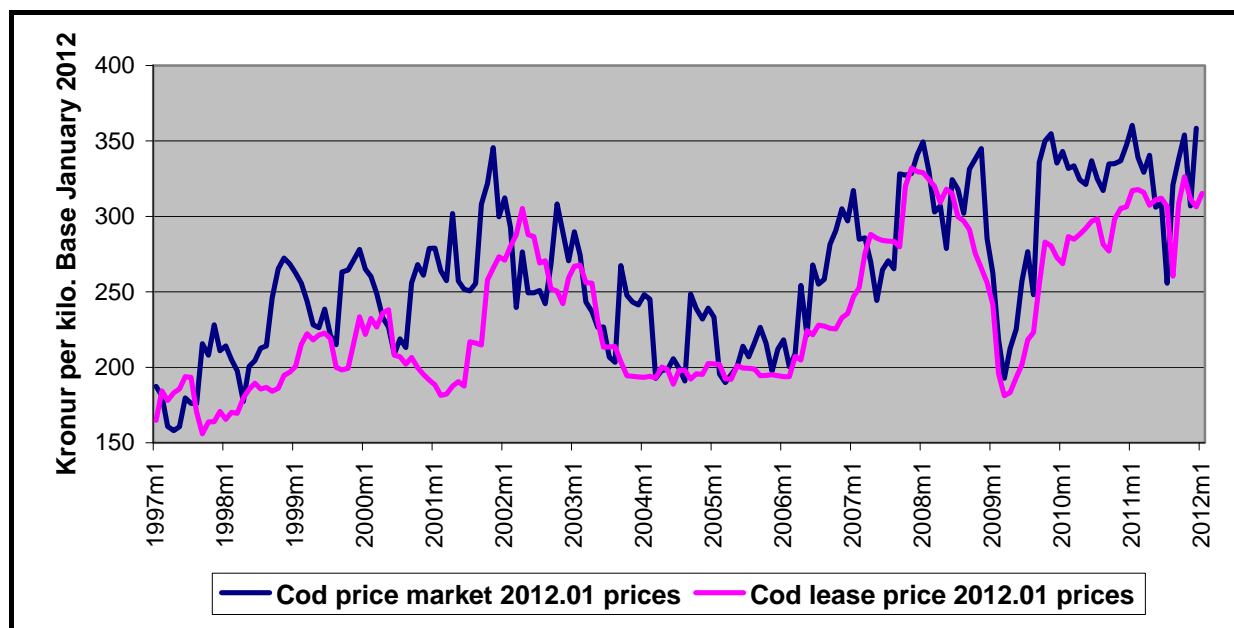
Figure 8 Price of permanent cod quota over lease price for cod quota.

Figure 8 shows that the price of permanent cod quota and the lease price for the same is rather unstable, the price of permanent quota seven to ten times higher than the lease price in the period between 1997 and 2001, this ratio takes a sharp dip at the end of 2001 and early 2002 to rise sharply, reaching an all time high of sixteen just before the collapse of the financial institutions.

All prices reported above are running prices in Icelandic kronur. Figure 9 gives the development of the lease price and the market price of cod calculated at the price-level of January 2012.

Figure 9 Cod prices at fixed price level ISK.

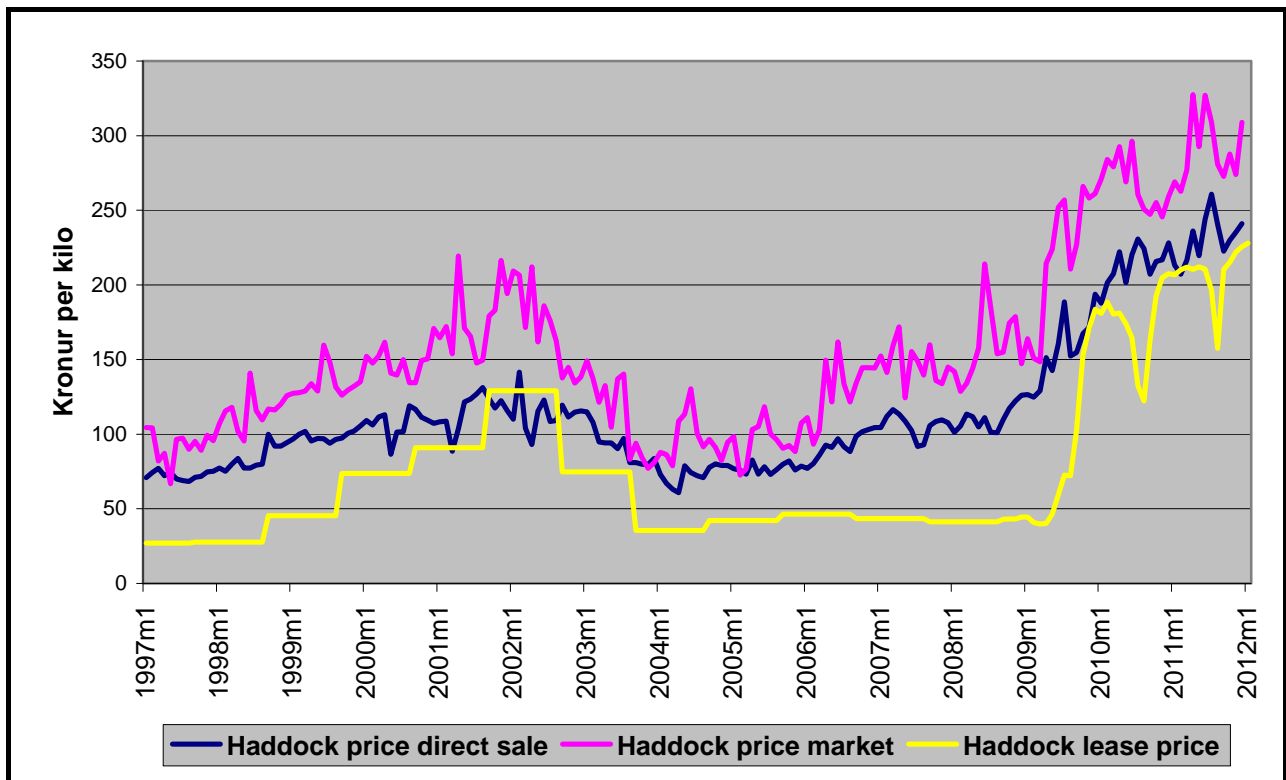
Source : Directorate for Fisheries

Figure 9 reveals cyclical movement in prices as well as an upward trend in the real price of cod and the lease price of cod. There is a peak in prices in early 2002 and a sharp drop to a level of 200-250 Jan2012 kronur in 2004-2006 coinciding with a strong krona. The real price of cod and cod-lease quota rises sharply as the krona looses value after 2006 and are now about 50% higher than in the period 2004-2006 in real terms.

2.2. Haddock prices

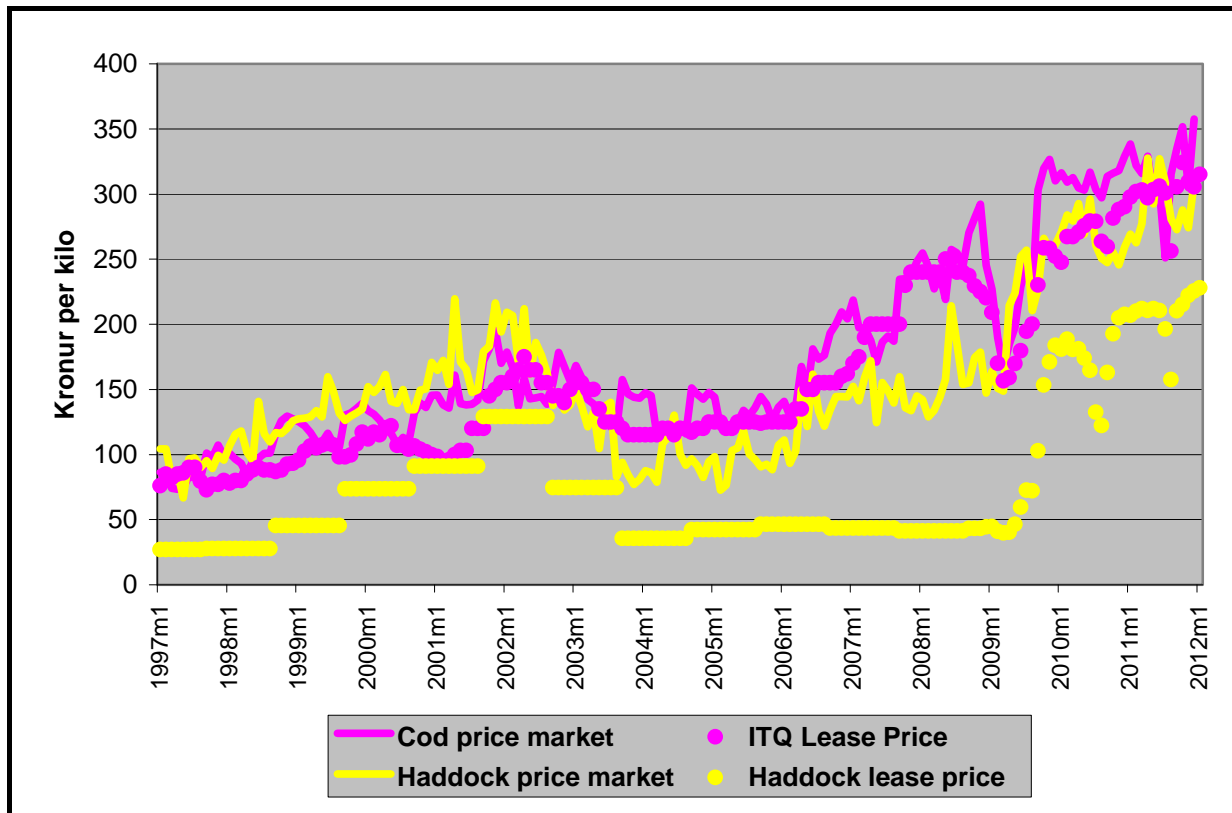
Price formation of quotas and at port-side for haddock should not be affected by unit-of-account effects as is the price formation for cod. Figure 10 shows the development of nominal prices in ISK for the two port-side prices (in direct sale and on market) and the lease price. Lease prices were only accessible as September-August averages prior to September 2008.

Figure 10 Haddock prices.



Source : Directorate for Fisheries

Figure 10 reveals a much more “healthy” relationship between lease and market price of haddock than what was observed in the case of cod. This is easy to see on figure 11.

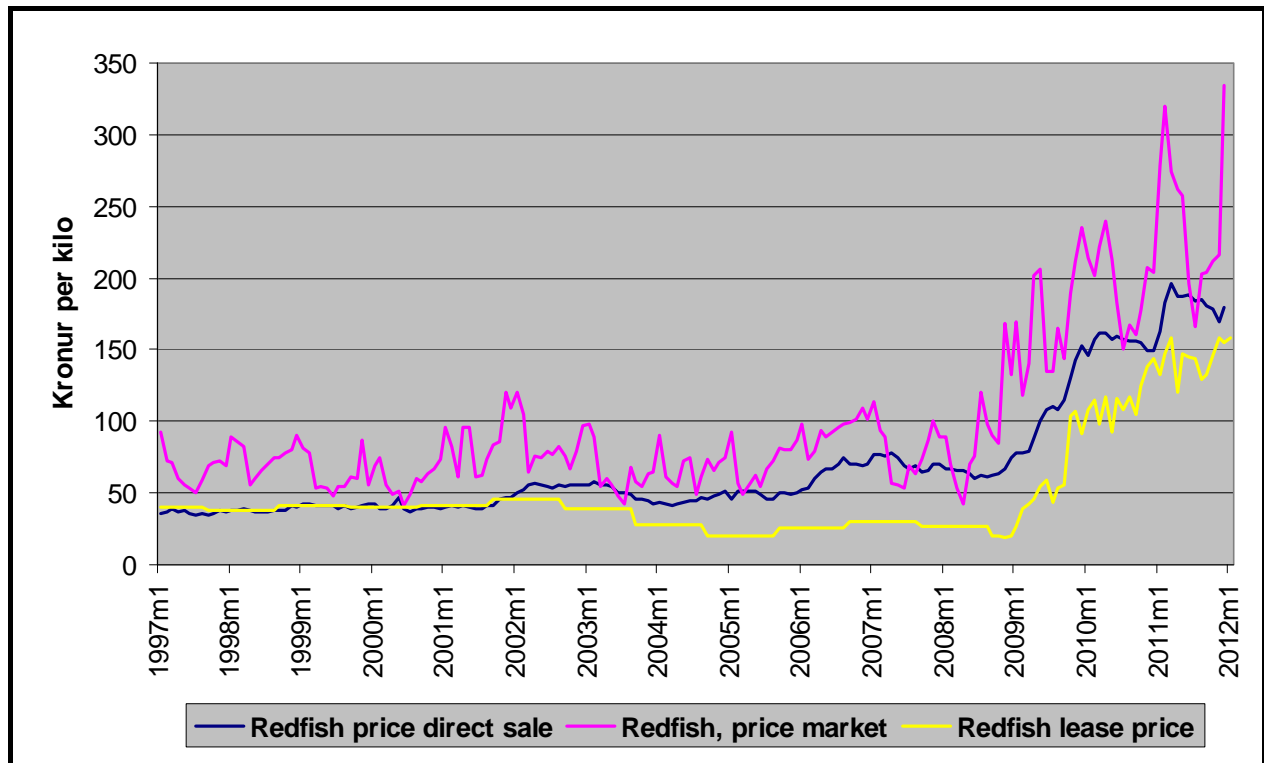
Figure 11 Haddock and cod prices.

Source : Directorate for Fisheries

The figure reveals some covariation between the lease prices of cod and haddock. It is also clear that the market price for haddock is higher than the market price for cod in the beginning of the period at the same time as the lease price for haddock is considerably lower than the lease price for cod. Market price for cod is higher than market price for haddock at the end of the period. Obviously, someone leasing a haddock quota and selling the catch at the fish-market will have had better change of covering operation costs than someone leasing, fishing and selling cod.

2.3. Redfish prices

Price formation in the case of redfish resembles that of haddock as can be seen in figure 12.

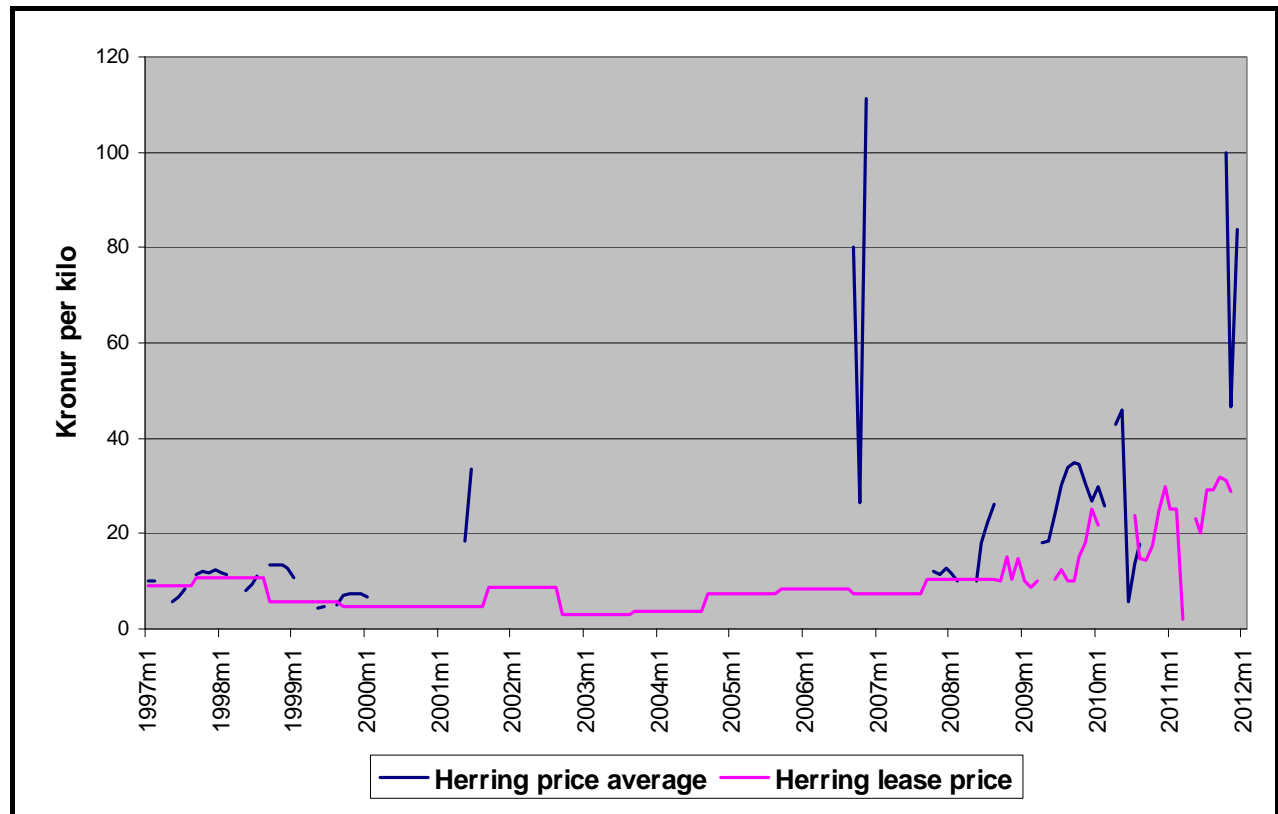
Figure 12 Redfish prices.

Source : Directorate for Fisheries

There is a considerable difference between price of redfish in direct sale and on the market. But the relationship between the lease price and the market price is akin to that of haddock. Note that nominal prices have increased 3-4 fold since the collapse of the financial sector in 2008.

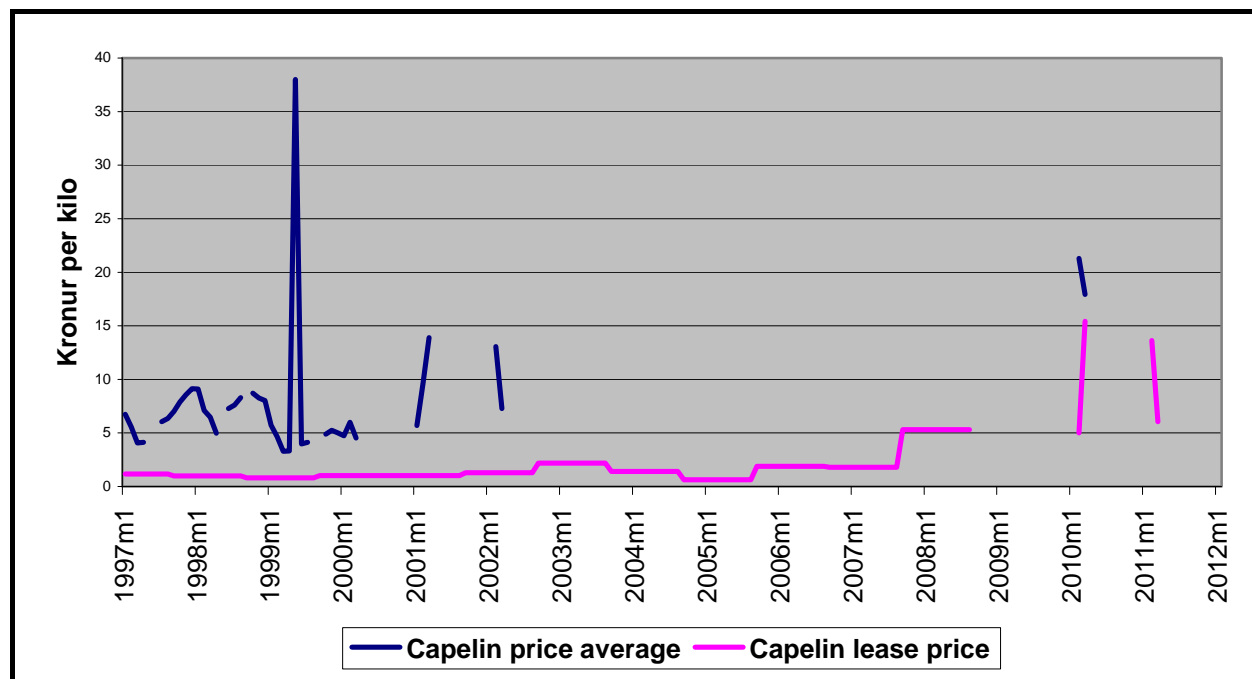
2.4. Herring and capelin

Figures 13 and 14 show the relationship between lease prices and port-prices of herring og capelin.

Figure 13 Lease and port-side prices for herring.

Source : Directorate for Fisheries

Fishing for herring is seasonal and price of catch may vary according to utilization of the catch by the buyer. Lease prices are on a yearly basis before September 2008. Figure 13 shows that the port-side price may be considerably higher than the lease price. This is natural as the herring fleet is highly specialized and the fishery rather capital intensive.

Figure 14 Lease and prices for capelin

Source : Directorate for Fisheries

Fishing for capelin is seasonal just as fishing for herring, and much of the same remarks apply as for herring.

2.5. Concluding remarks regarding price-formation in the lease market and market for quotas

We have noted that the price of permanent quotas (ITQs) behave in manners similar to other assets. In part 2 of this paper it is shown that the bubble in the Icelandic stock market spilled over to the market for permanent quotas. That bubble may then have spilled over to the lease price: A holder of a permanent cod quota had the choice of fishing, of selling the quota or leasing it out. Hence, the ask price for a lease of cod quota had to cover for the opportunity cost related to that option. Above it was argued that high lease price of cod quota related to port-side price might be explained by a) the fact that price of cod varies a lot by size and season and that some fishers may be able to select the most valuable catch and b) the fact that some fishers may have to lease cod quota in order to avoid fines. Here a third explanation is offered, that a bubble in the stock market may spill over to the lease market for cod. It is highly probable that all three explanations are valid at the same time.

We can also see that the relationship between port-side prices and lease prices are much more in line with predictions given by economic theory in case of species other than cod. The reason for the difference between cod and other species lies in how abundant cod is in Icelandic waters compounded by the fact that cod is kind of medium of exchange and unit of account in the Icelandic quota system.

It was mentioned in the introduction to chapter 2 that one would conjecture that prices of quotas were well announced and public knowledge. Most active fishing firm operators will of course not have difficulties learning the latest price of relevance for their operation. But, given how central the price and price formation of quotas are for the health and good working of the quota-system it may seem a bit of a paradox how little effort is put into making price information publicly available. The reason for this is probably that many of the politicians who's support is needed to keep the system going disdain markets and prices and don't want to be reminded of how integral prices are for the working of the ITQ system.

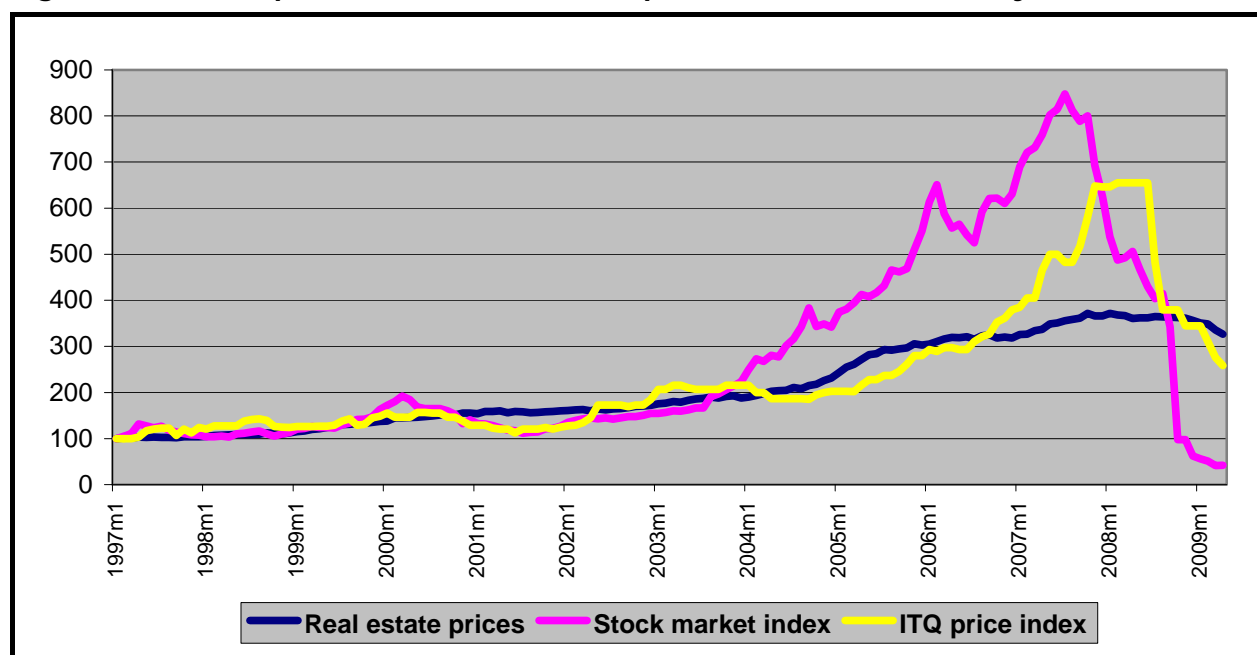
3. BALANCE SHEETS IN ROUGH WATERS

KEY FINDINGS

- Prices of assets in Iceland increased dramatically during the middle of the first decade of the 21st Century.
- The rise and fall of the stock market index is dramatic, sudden and sharp.
- The price of ITQs shows the same tendency as does the stock market index, but its rise is more modest and its fall less dramatic.
- When evaluating the effect of the financial crisis on balance sheet items of fishing firms one has to take into account that value of quotas is only partially reported on publicly available sources.
- Value of fishing firms shows the same pattern as does the price of ITQs.
- Pure profits (resource rent) has increased dramatically post crisis.

When traded, permanent quotas should command a price that is equal to the net present value of assumed income originating from holding the quota. The future income generated by holding a quota is not known with certainty. The lawmaker may change fees or levy new fees or abolish old fees associated with fishing. The lawmaker may also change his mind regarding use of quotas as management tool. Fish products may demand a higher or a lower price in the future than today. Catch technology can develop new equipment, cheaper to use and catch inputs can demand higher or lower price. Changing prospects with respect to any one of the above given variables will cause a change in the price of quotas at the quota market. Thus the price of permanent quotas will hinge on beliefs about future evolution of fishing fees, fish prices, input prices, technology and cost of funds. The formation of price of quota will have much in common with the formation of stock prices. It is not surprising that beliefs about future profitability of holding a right to fish and beliefs about profitability of publicly traded firms goes in tandem.

Figure 15: Development of series of asset prices in Iceland. January 1997=100.

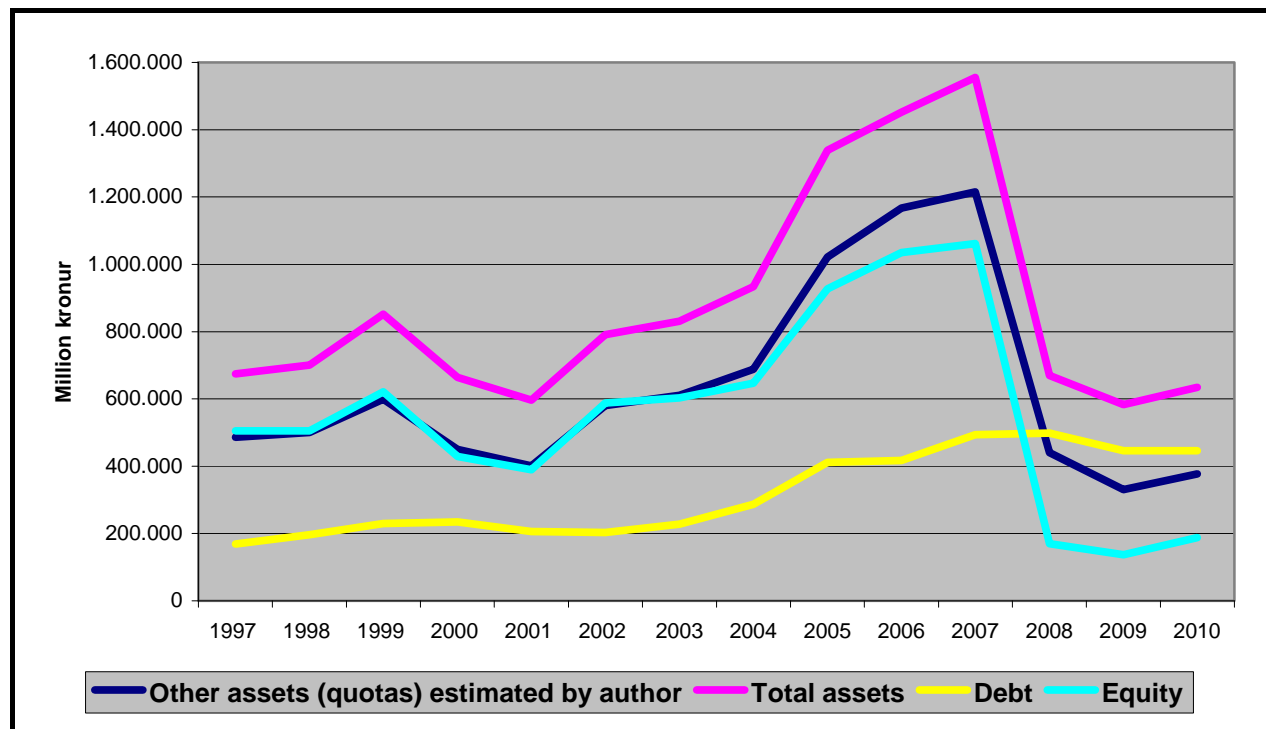


Sources: Central Bank of Iceland, Icelandic Stock Exchange, FMR

Figure 6 shows that the price of quota (the ITQ price index line) and the stock market index in Iceland behave in similar manner. When the stock market bubble takes off in 2003/4, quota market prices stay calm for a year or so and then show much the same pattern as price of publicly traded companies with a delay of 6 to 18 months. Bear in mind that quota trades are much less frequent than stock market exchanges. Prices of main assets in the economy, stocks, housing and ITQs move in similar fashion until early 2004 when the stock-market takes off. Stock values increase fourfold from early 2004 until April 2007. ITQs do not take off until beginning of the quota year that goes from September 2005 until end of August 2006. ITQs increase in value more than three fold until early 2008. Stock prices and ITQ prices drop in dramatic fashion from mid 2007 (stocks) or mid 2008 (ITQs). Real-estate prices show a much more moderate rise and fall in value.

The rise and fall of prices of ITQs are reflected on the balance sheet of fishing firms. ITQs are indirectly used as collateral against loans (loans are issued with a vessel as collateral, ITQs registered on a particular vessel can not be sold without the consent of the owner of the loan). Hence, as quota values increase the higher is the debt issued in connection with trade in quotas.

Figure 16: Development of selected items on the balance sheet of fishing firms.



Source : Statistics Iceland and authors own calculation.

The raw figures available are somewhat limited. Statistics Iceland reports aggregate balance-sheet figures for fishing and fish-processing. Rough measures are used to eliminate fish processing from the fishing firm figures. Furthermore, most fishing firms only report value of quotas bought at historical value. Grandfathered quotas are usually not reported at market value. That is corrected for. All values are reported in fixed prices.

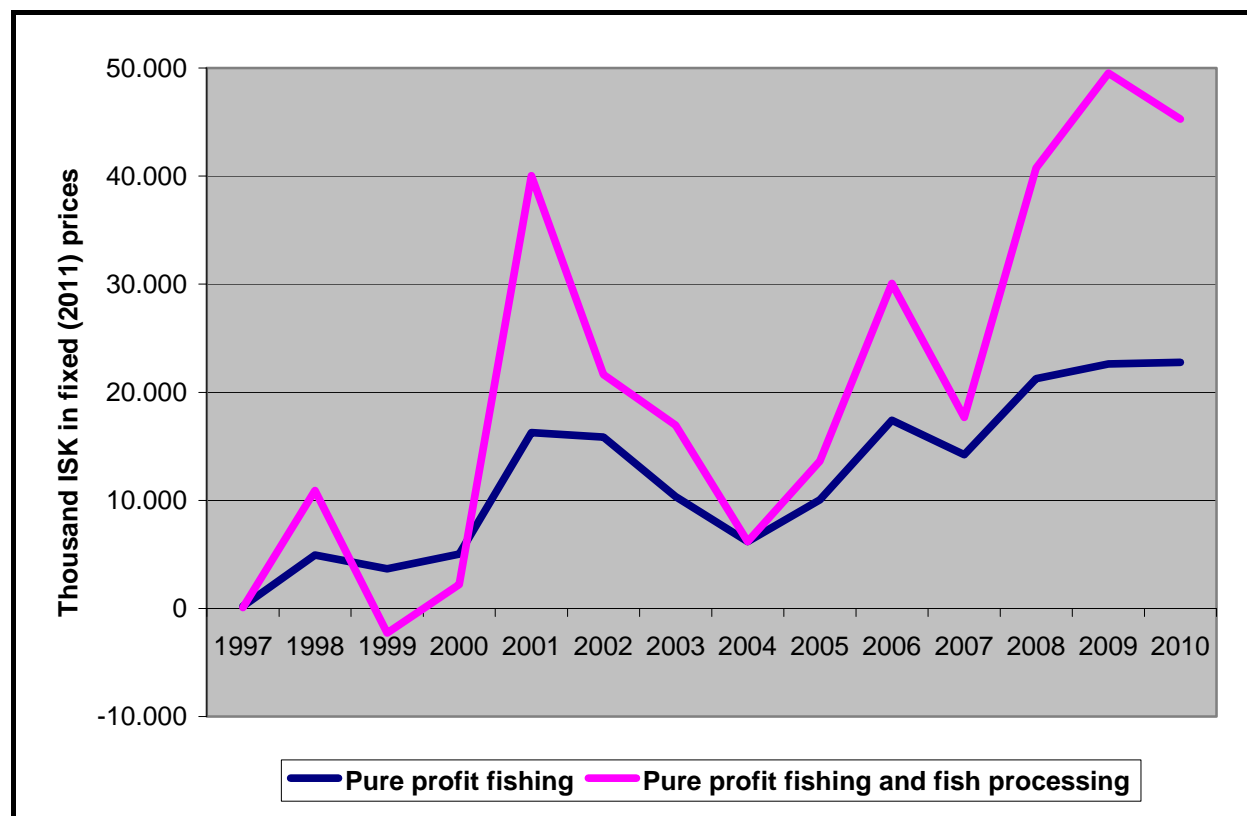
The picture highlights key-balance sheet figures for the fishing firms. Total value of quotas, total assets and equity increases in tandem with increase in quota prices from 2004/5 till 2007/8. Total assets are worth about 600 to 800 billions of 2011-kronur from 1997 until 2004. They double in value in fixed prices from 2004 until 2007, when they drop down to the pre 2004 level again. Debt hovered around 200 billions of 2011 kronur until 2003/4, double in real value in the period up to 2005/5 when it adds another 100 billions of 2011-

kronur. It is obvious from the picture that the jumps in value of total assets and the jump in level of debt is driven by the sharp rise of price of quota. The bubble in the stock-market spills over to the price of ITQs that again spills over in the debt level of fishing firms. We also note that even if the value of assets declines sharply the same is not the case for the value of debt.

3.1. Development of the resource rent, higher and lower limits

Statistics Iceland estimates the pure profit created in fishing and fish processing in Iceland. The definition used corresponds nicely with definition of the resource rent. The only caveat is the following: Icelandic fishermen are remunerated by share of the catch. Many operators operate a vertically integrated activity. Fishers point out that the port-price of fish, which determines the pay of the crew, is fixed by someone that benefits from keeping the port-price as low as possible. If correct that has two consequences, firstly the fishers get lower pay than stipulated by their contract. Secondly, booked income is transferred from the fishing operation to the processing operation. Hence, when estimating the resource rent one has to look at pure profits in both fishing and processing. Remember that processing is in essence what economists term as constant-return-to-scale industry. Such industries are characterized by the fact that they do not generate long-term pure profits.

Figure 17 : Development of pure profit in fishing and fishing and processing.



Source : Statistics Iceland and authors own calculation.

The picture shows the development of the size of the resource rent in Icelandic fisheries since 1997. The rent was slowly approaching 10 billion 2011-ISK at the turn of the century, fluctuates quite a bit until 2004. Since then a dramatic upsurge can be spotted, in particular after the collapse of the Icelandic banking system in 2008. The resource rent created in Icelandic fisheries is somewhere between 20 and 40 billion ISK at 2011 prices. That is between 5 and 10% of governmental tax-revenue in 2011. Note that the resource rent estimate here is based on tax-return information. Using lease price information to

estimate the size of the resource rent generates much higher estimates (estimates would be in the range of 60 til 80 billions 2011-ISK). The lease price does reflect the penalty for overfishing cod because it is almost impossible for vessel owners to avoid catching some cod even if they do not have quota for cod and are not targeting cod. Hence, they are forced to lease cod-quota in order to bring their house in order.

4. LOCAL COMMUNITIES AND THE ITQS

KEY FINDINGS

- Distribution of quotas by geographical areas has changed during last 20 years
- The distribution of quotas is none-the-less remarkably stable
- Real-estate prices Isafjordur have a tendency to increase when quota in Isafjordur increases
- Employment in fishing and fish-processing has been reduced from 15% of total employment in the mid 1960s to 5% of total employment in 2010
- Researchers that have looked at the influence of the quota system on internal migration in Iceland come to very divergent conclusions.

The ITQ system influences live in local communities in many ways. But as the introduction and implementation of the ITQ system coincides with a rapid development of catch equipment, efficiency in catch technology and equally or more rapid development of processor technology it is notoriously difficult to disentangle natural development from development caused by the introduction of the ITQ system.

4.1. Changes of distribution of quotas since 1992

The period since the introduction of the ITQ system in the mid 1980s has been characterized by rapid technical change in the fisheries, both on and off the shore. Figure 19 below shows that this technical change is of the labour-saving type. Labour saving has lasting influence on one-industry reliant small towns. Some factories must be closed while others may be expanded. Such changes are part of daily life in big cites, the implication being that a worker may have to travel from home to east of town, say, in the morning, instead of to west of town. In a small town there may not be any establishment expanding in the west of town when a fishing processor closes in the east of town. Readers of Icelandic newspapers know the name of towns in the Westfjords, the North West, the North East, the East and the South that have experienced dwindling quotas, closing of processors and general downward spiral of employment and number of inhabitants.

Table 1: Distribution of quotas (cod-equivalences) by geographic location

	1992/93	2000/01	2011/12
South Iceland	13,4%	12,7%	13,0%
Reykjanes	11,7%	12,8%	14,8%
Reykjavik	13,5%	10,8%	14,0%
West Iceland	9,7%	14,8%	13,9%
Westfjords	13,7%	8,0%	9,6%
North West	6,5%	6,2%	3,0%
North East –excl Akureyri	10,6%	10,8%	12,2%
Akureyri	8,4%	11,4%	5,6%
East Iceland	12,5%	12,5%	10,8%

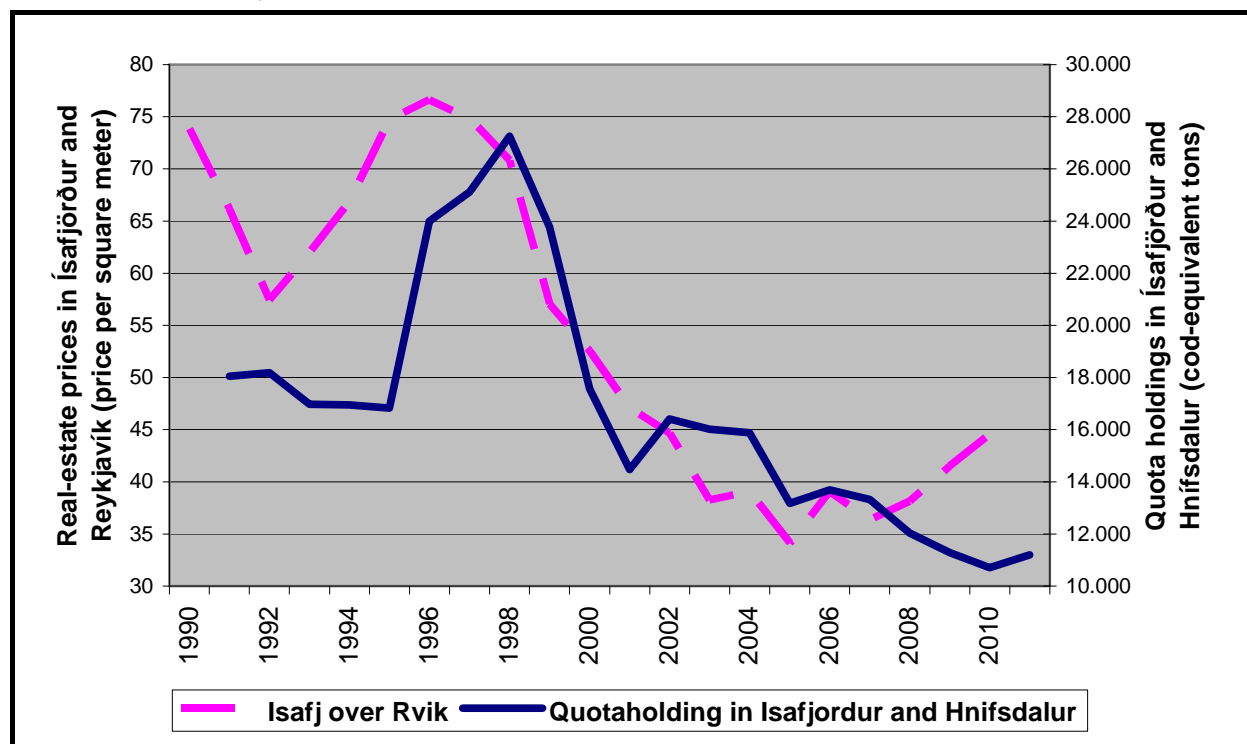
Source: Haraldsson (2001), Directorate of Fisheries, own calculations.

Table 1 gives the relative distribution of quotas measured in cod-equivalences during the last 20 years. The changes are strikingly small taken into account both the impression left by the general discussion in media and the big changes that both fishing and fish-processing has undergone during these 20 years. Reykjanes is the only area that is steadily increasing its share of total quotas, while other areas see increase first and then decrease or visa-versa. Note for instance how Akureyri first increases its share between 1992 and 2001 for then to loose out a big chunk of it during the next decade. Much of that quota is probably in Dalvik, only 20-30 km away.

4.2. The quota and real-estate values

There is no doubt that the relative and the absolute share of quotas have profound influence on day to day life in fishery dependent communities. A case in point is the co-variation of the real-estate prices in Ísafjörður relative to real-estate prices in Reykjavík on one hand and quotas allotted to vessels registrated in Ísafjörður and Hnífsdalur on the other hand.

Figure 18 : Real-estate prices in Ísafjörður and Reykjavík and quota holdings in Ísafjörður and Hnífsdalur.



Source : Fiskistofa, Fasteignamat.

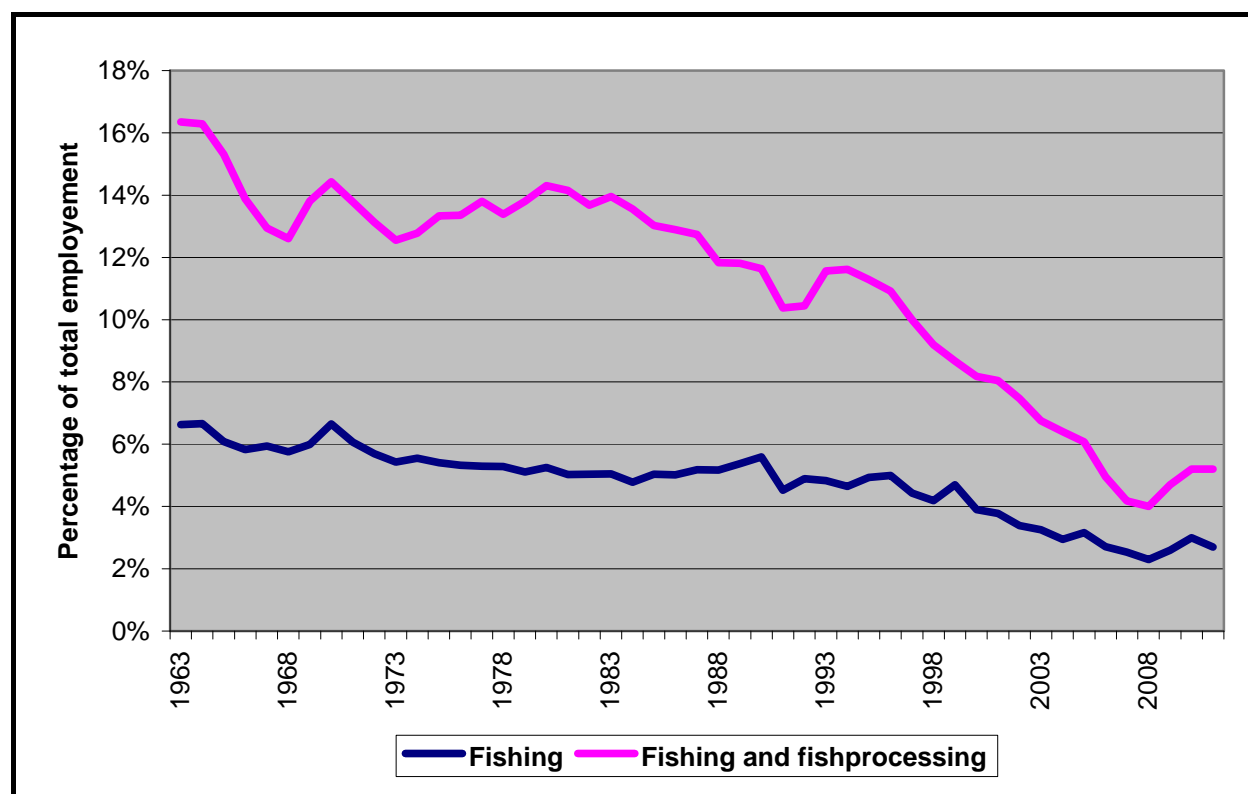
Income increases with quotas, and higher income generates higher real-estate prices. Now, quotas imply employment, and high demand for labour and high wages affects possible migrants. But the relationship between housing prices and quotas illustrates an important countervailing mechanism. Workers might want to move house from a place where quotas have been diminished to a place where quotas are getting relatively abundant. But higher real-estate prices, higher price for lease or rent of dwellings may discourage. Thus, the reaction to reduced quotas in terms of migration may be delayed by years.

Note that the financial crises of 2008 did depress real-estate prices in Reykjavik and surrounding areas due to oversupply of new houses, supply of houses overtaken by financial institutions from financially distressed families and due to dramatically reduced demand. Real-estate prices in other parts of the country were not hit as hard. That explains partly why the positive covariation of the relative price per square meter of real estate in Ísafjörður and Reykjavik on one hand the quota holdings in Ísafjörður on the other hand seems to be broken after the financial crisis.

The figure shows that quota holdings are an important determinant of real-estate prices in a fishing town like Ísafjörður. But the figure also shows that it is not the only determinant. Financial distress affects all asset markets in complicated manner.

Several authors have tried to map out the effect of the quota system on internal migration in Iceland. Fact is that employment in fishing and fishprocessing has been dwindling throughout last decades as shown in figure 19 complicates the argument.

Figure 19 : Development of relative employment in fishing related activities in Iceland since 1965 till 2010.



Source : Statistics Iceland.

The share of fishing and fish processing has declined from 15% of total employment in mid 1960s to mid 1970s down to 5% of total employment in the 2000s. Employment in fish related firms has been picked up by service jobs which are not in great supply in fishing hamlets. The technical progress has probably had faster impact on decline in fishing related employment due to the quota system, but the inevitable conclusion must be that superior and cheaper technology will eventually substitute costly means of doing things.

There exists a cacophony of views regarding how introduction of ITQs has affected internal migration in Iceland. Haraldur LÍndal (Haraldsson, 2001) is an early example of the view that ITQs have caused migration from rural to urban areas. Haraldsson points out that TAC in cod had been reduced by 33% from 1992/93 to 2000/01. This reduction is translated to

considerable reduction in quotas in the Westfjords, the Reykjavik area, Southern Iceland and North-West Iceland. Akureyri is an example of geographic area that increased its share of quotas during the last decade of the 20th Century. Runolfsson is an example of the opposite view (Runolfsson, Afli, aflahlutdeildir og ráðstöfun afla, 1968-1998, 2000). He points out that the ITQ system has brought with it specialization. Fishing firms in East Iceland have specialized in pelagic fisheries while others have specialized in demersal fisheries. Hence, cod quotas decline in the Eastern region while pelagic quotas are on the increase. (Zoega & Skuladottir, 2002) give a third view. They find that size of quota in an area does not significantly affect migration. The (insignificant) effect seems rather to be that higher quotaholding reduces immigration. This effect is passed through real-estate prices: Higher quota holding implies higher real-estate prices that again discourages migration into the community in question.

CONCLUSION

In the mid to late 1980s Icelanders had to admit that all previous attempts to control the fishing capacity of the Icelandic fishing fleet had been in vain. The aim was to bring the size of the fishing fleet in lieu with sustainable catches. Control measures were not effective enough to bring overfishing under control. The cod stock was close to collapse. Hard choices had to be made and were made.

The ITQ system that emerged has proven to be a success in terms of reducing costs. It has proven less successful in other respects. Catches have not improved as expected and hoped for. Distribution of the resource rent is still debated and source of dispute before every parliamentary election.

We have also seen how a bubble in the financial market can spill over to the market for transferable quotas, creating a new set of challenges and dangers for managers and vessel owners alike. But there is an important difference between the fishing sector and the financial sector. Many pure financial firms did go bankrupt as the bubble in Iceland burst. The reason was that those firms main assets were shares in other financial firms. Those “derivative” firms were thus under water so to speak in the early days of October of 2008 when the three big banks in Iceland collapsed. This was not the fate of the fishing firms. Some of them had invested in financial assets, and all of them experienced a collapse in the price of their quota-holdings. But the sharp decline in the value of the krona also increased income in terms of kronur while costs did not rise as sharply: The figures presented in section 2 of this paper clearly shows that pure profits (resource rent) has risen sharply in real terms after 2008. Hence, the collapse of the financial sector has both had a positive and a negative effect for the fishing firms. It has reduced equity, but at the same time increased profits. It has proven “bad” for the balance sheet, but proven good for the day-to-day results.

We have also seen that redistribution of quotas between communities can inflate or depress real estate prices in these communities.

There are many lessons to be learned from the Icelandic experiment with the ITQ system. First, when the system was started few of the parties involved believed that resource rent would be created. Hence, there were no precautions taken in order to secure that the distribution of the resource rent would be agreed upon by the majority of the people of Iceland. Secondly, many seem to be shy to admit that the ITQ system creates rents and try to hide facts that manifest that. That fact probably explains why quota prices are not printed on the business pages of the newspapers as is the price of shares in publicly traded companies. Third, prices of permanent quotas are prone to bubbles just as any other asset promising long-lasting income stream. This fact can influence the working of the quota system and create un-necessary volatility for labour and capital in the industry. There are numerous ways of reducing the risk of volatility due to bubbles. One way is to auction out the quotas having the income accrue to the public purse. Other ways include some form of fee-taking or taxation of the resource rent.

The government of Jóhanna Sigurdardóttir stated in its inaugural declaration that the fishery management system would be revamped. Fishery management should protect the fishing stocks, enhance efficient utilization of the fishing resources, secure jobs, secure livelihood in rural areas, enhance unity among the people of Iceland regarding ownership and utilization of the maritime resources. Finally, the government promised to recall and

redistribute all quotas during a period of 20 years. The government did establish a committee of politicians and fishing industry stakeholders. The committee was often referred to as the committee of Mr. Guðbjartur Hannesson, who was its chairman. Mr. Hannesson is now Minister of Health and Social Security. The Guðbjartur-committee published a report early in 2010. The majority in the committee recommended that present users were offered 15 year contracts and that the fishing fee was increased. Many government supporters did see those recommendations as betrayal of given promises. The Minister of Agriculture and Fisheries, Mr. Jón Bjarnason, did put forward a draft-proposal for a new Fishery Management Act in 2011. That draft did not reflect the findings of the committee of Mr. Hannesson. Neither did the draft satisfy those of the government supporters that earlier had criticized the proposals of Mr. Hannesson's committee. The draft of Mr. Jón Bjarnason was withdrawn, he did put forward a new proposal that did not have any backing in the government. As a result Mr. Bjarnason lost his ministerial post at the last day of 2011. Work is now said to be underway in the Ministry of Agriculture and Fisheries on a new draft proposal. What it will contain and if there are going to be big changes in the Fishery Management Act remains to be seen. But, the driver of change is not so much the financial collapse as the fact that there was not a solid decision taken at the beginning of how windfall gains in form of the resource rent were to be distributed

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NOTES

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