ITQS IN A ROUGH WATER[i]

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ABSTRACT

The Icelandic ITQ system has been under development since the early 1980s. Rights were initially grandfathered. Rights have been priced and traded and put up as collateral against loans. Quota values have thus affected the balance sheet of Icelandic fishing firms in a fundamental way. The aim of this paper is to look at the development of the balance sheet and the development of booked equity as well as try to estimate the real value of equity in Icelandic fishing firms from 2000 till 2009. This period is of considerable interest as a condsiderable bubble developed and burst in the Icelandic financial market during the period.

PRICE FORMATION: EX-VESSEL, LEASE AND PREMANENT QUOTAS

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.

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.

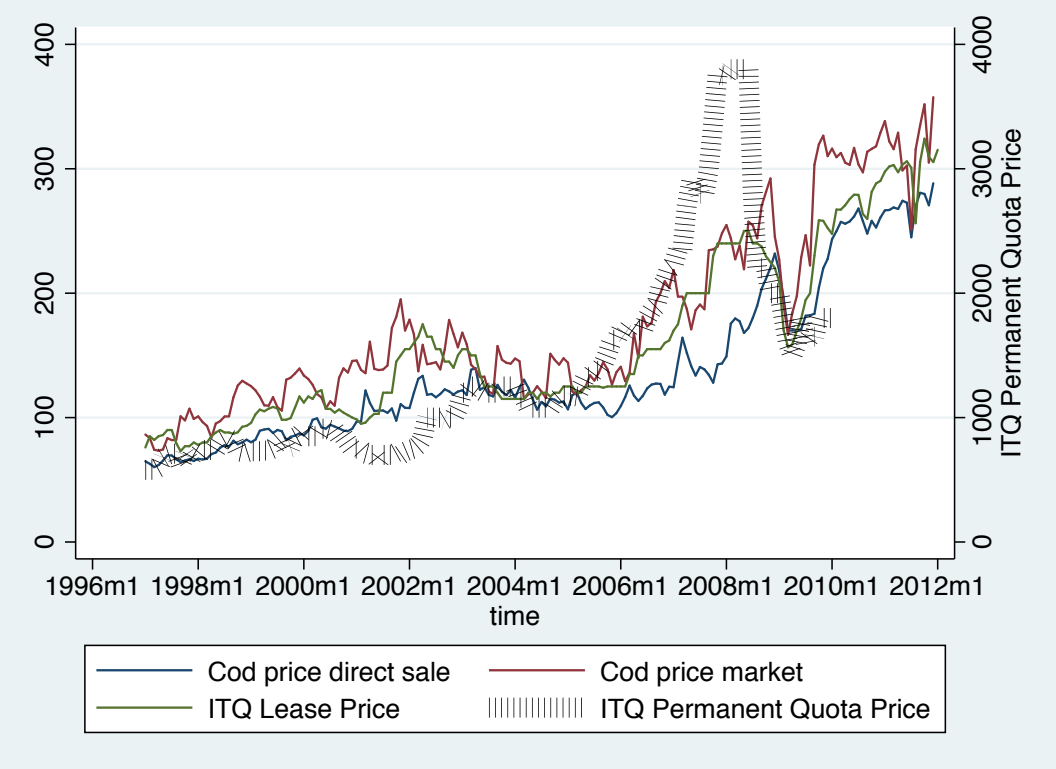


Figure 1 Prices of cod at the market, inside vertically integrated firms, lease quota and permanent quota, all prices in kronur per kilo. Sources: Central Bank of Iceland, Directorate for Fisheries

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.

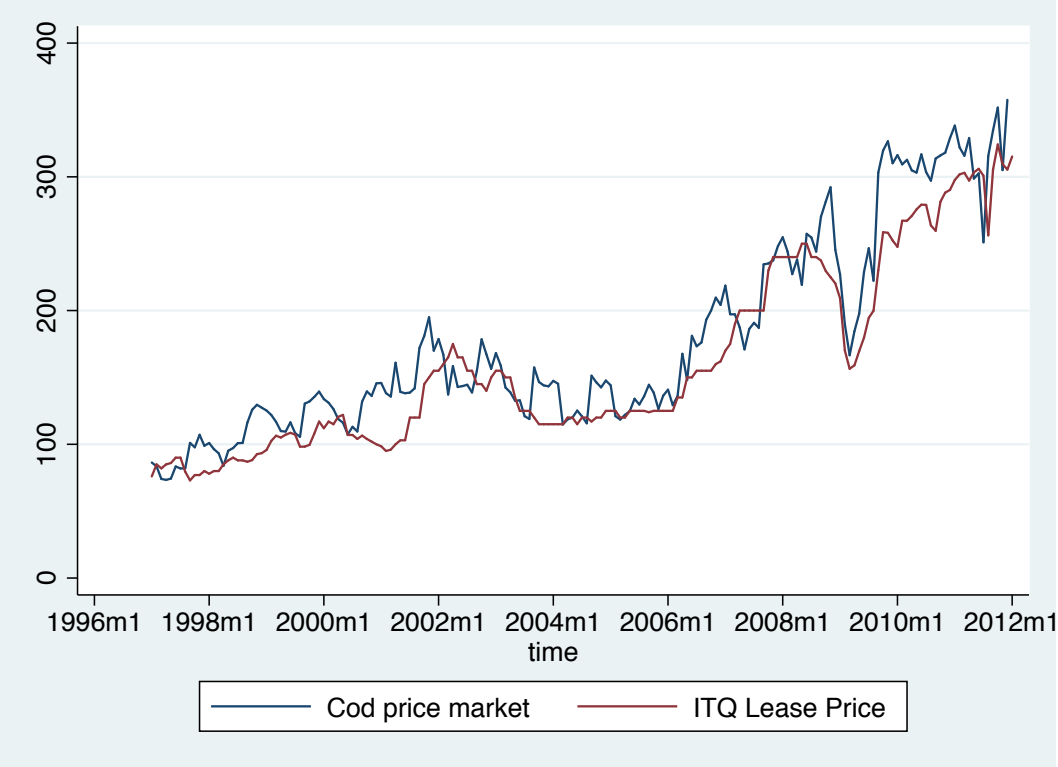


Figure 2: Comparison between lease price of cod and market price of cod, all prices in kronur per kilo. Source : Directorate for Fisheries

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 know among fishers and researches 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.

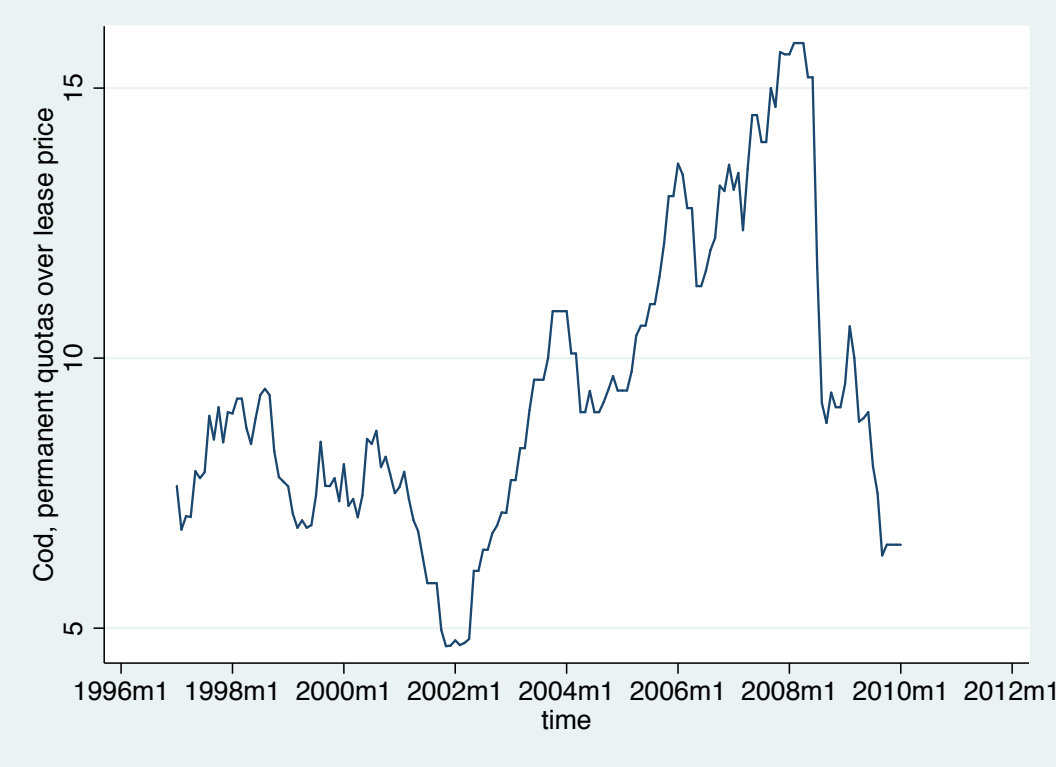


Figure 3 Price of permanent cod quota as multiplikum of lease price for cod quota.

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 a all time high of sixteen just before the collapse of the financial institutions.

All prices reported above are running prices in Icelandic kronur. Figure 4 gives the development of the lease price and the market price of cod calculated at the price-level of January 2012.

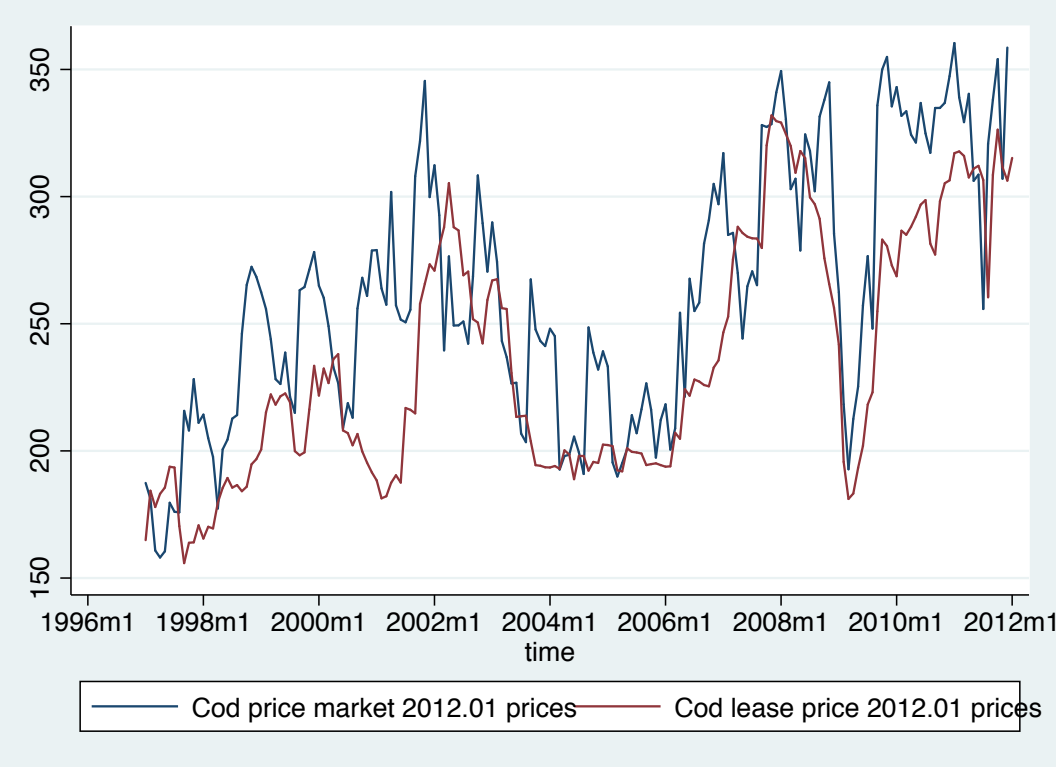


Figure 4 Cod prices at fixed price level ISK, all prices in kronur per kilo, base is January 2012. Source : Directorate for Fisheries

Figure 4 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.

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.

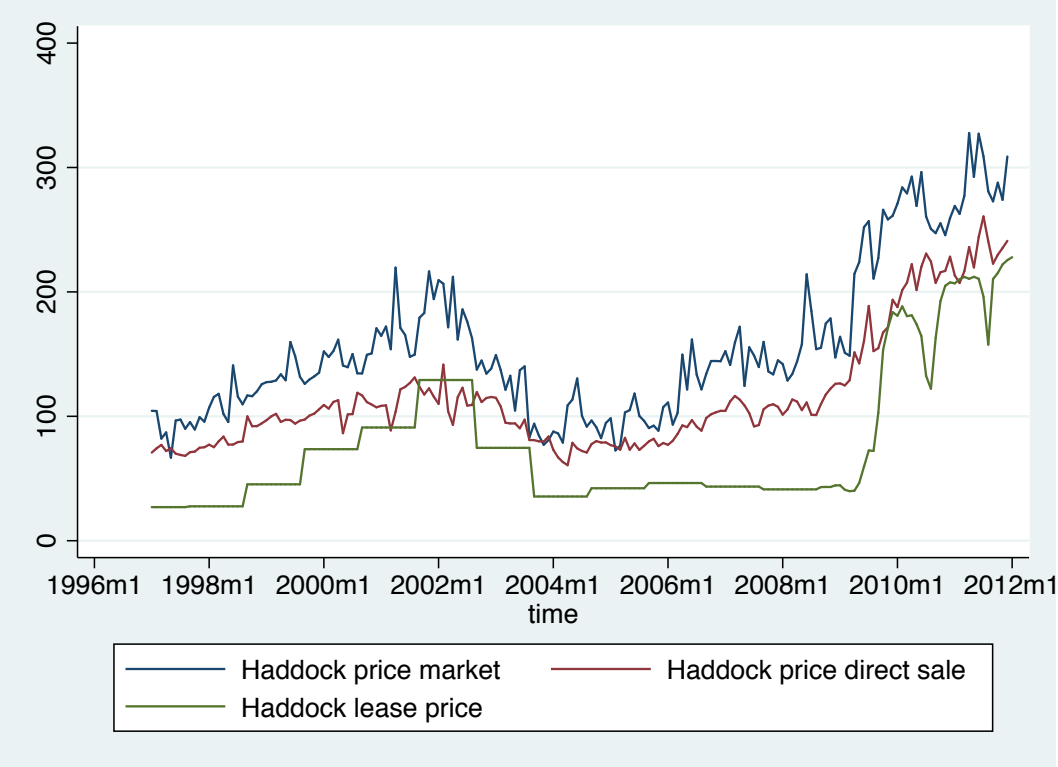


Figure 5 Haddock prices, all prices in kronur per kilo. Source: Directorate for Fisheries

Figure 5 reveals a much more "healthy" relationship between lease and market price of haddock than what was observed in the case of cod.

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 cause 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..

BALANCE SHEETS IN ROUGH WATERS

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

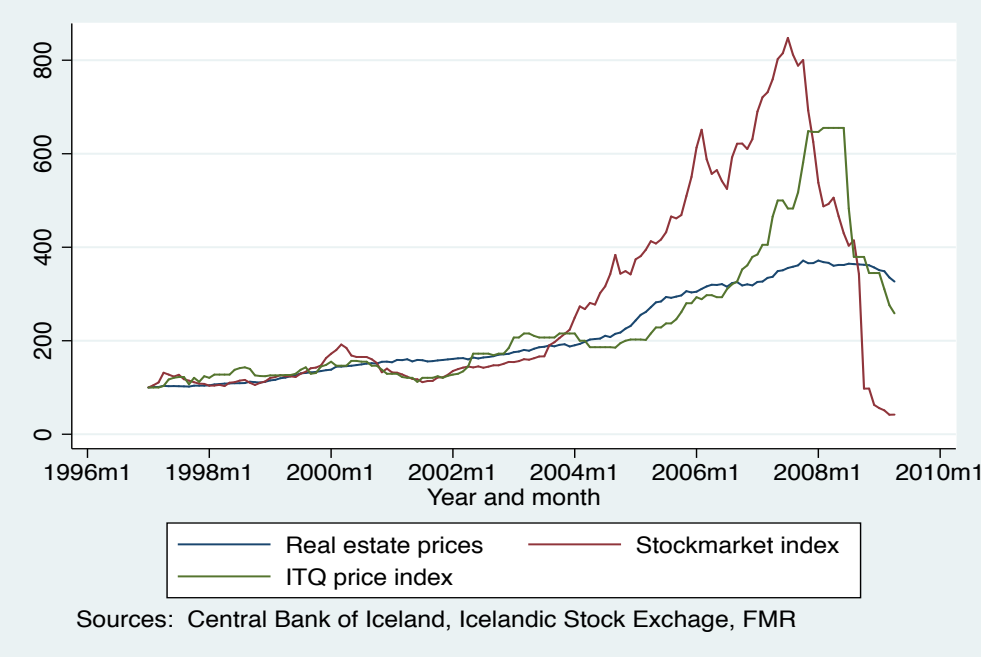
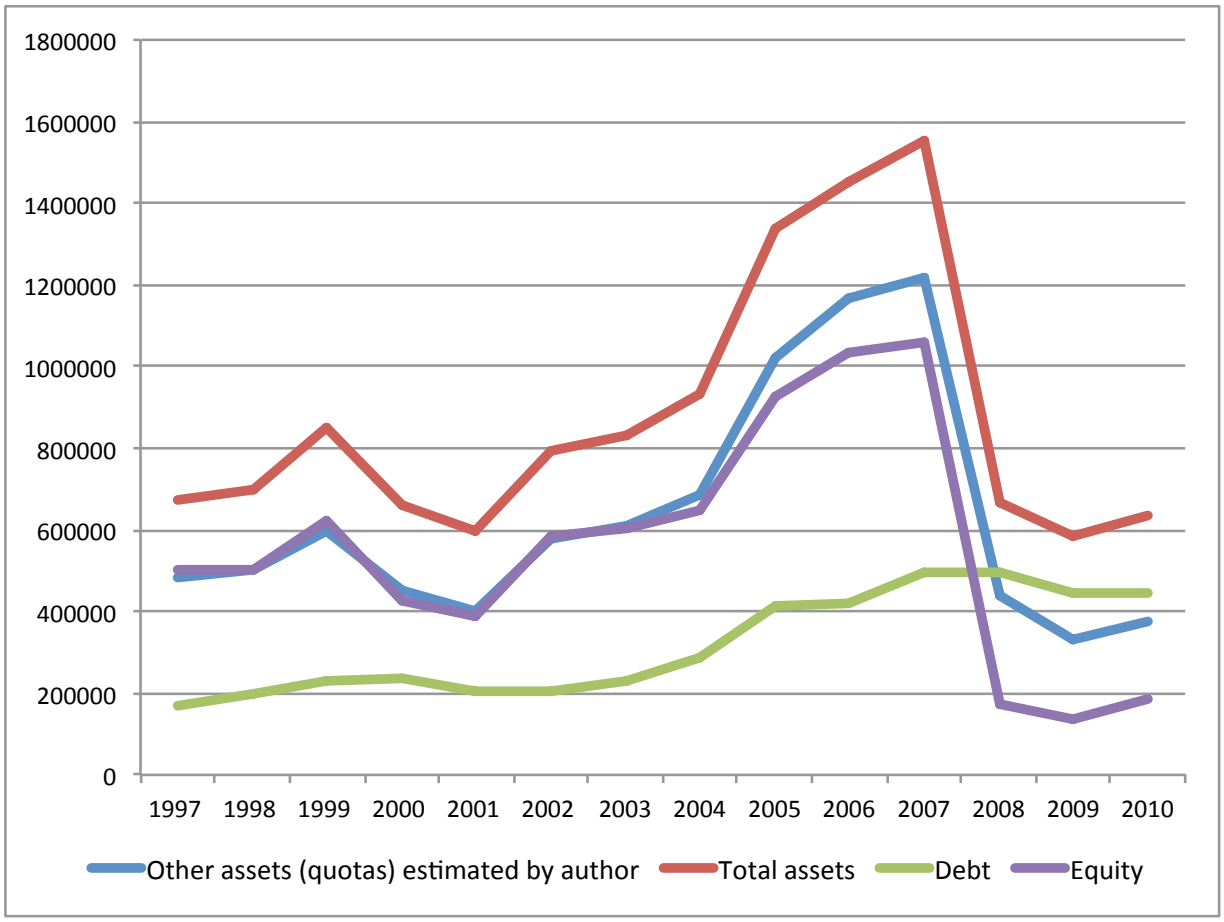


Figure 6 shows that the price of quota (the ITQ price index line) and the stock market index in Iceland behave in similar manner. When the stock market bubble takes off in 2003/4, quota market prices stay calm for a year or so and the show much the same pattern as price of publicly traded companies with a delay of 6 to 18 months. Bear in mind that quota trades are much less frequent that 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 registrated 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 7: Development of selected items on the balance sheet of fishing firms from 1997 til 2010. Value of quotas, total assets (including quotas), debt and equity.



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.

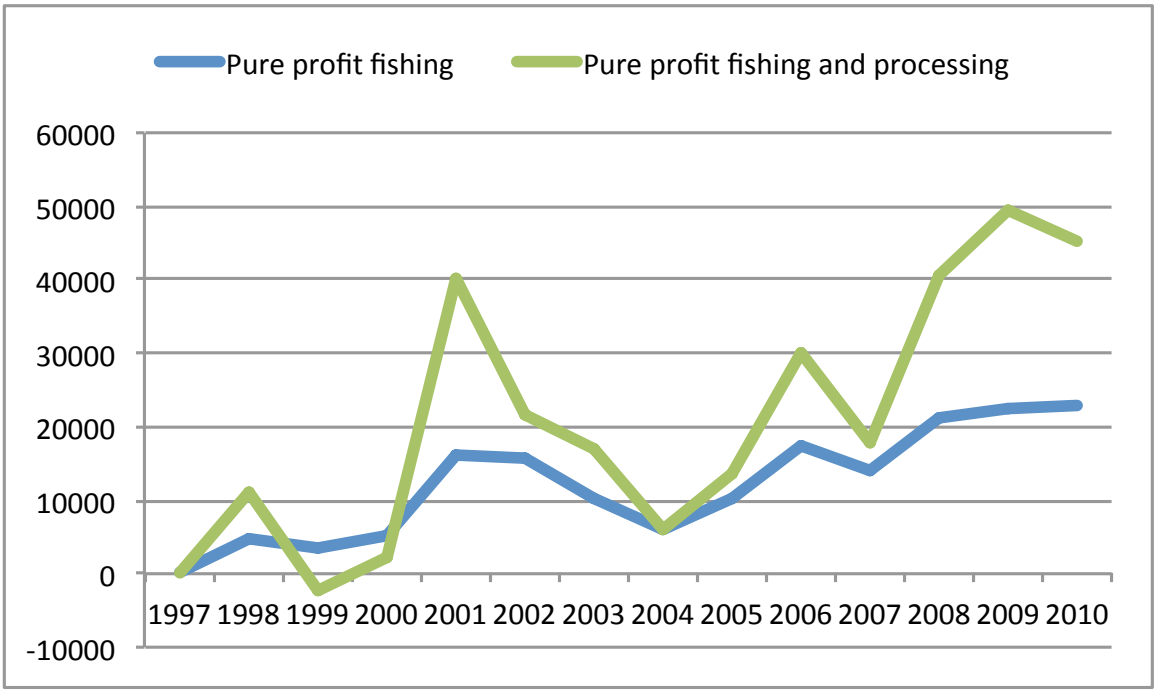
The picture highlights key-balance sheet figures for the fishing firms. Total value of quotas, total assets and equity increases in tandem with increase in quota prices from 2004/5 till 2007/8. Total assets are worth about 600 to 800 billions of 2011-kronur from 1997 until 2004. They double in value 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.

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 8 : Development of pure profit in fishing and fishing and processing, 1997 till 2010, measured in '000 of ISK in fixed (2011) prices.



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

Conclusions

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 parliamentarian 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.

REFERENCES

Thorolfur Matthiasson, 2012: RIGHT BASED FISHERIES MANAGEMENT IN ICELAND AND ECONOMIC AND FINANCIAL CRISIS, a note prepared for the European Parliament's Committee on [Regional Development], in March 2012, available at http://www.europarl.europa.eu/committees/en/studiesdownload.html?languageDocument=EN&file=73191

ENDNOTE

[i] This paper is based on chapters 2 and 3 of Matthiasson (2012).