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The elephant in the room: The hidden costs of leasing individual transferable fishing quotas

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ABSTRACT

Despite the increasingly positive reviews of individual transferable quotas (ITQs), few studies have considered how quota leasing activities can reduce the economic benefits to society and to fishermen operating under the ITQ fisheries system. This analysis reveals negative economic impacts of ITQs previously overlooked by examining the extent of quota leasing and the relationship between the catch value, the cost of fishing, and the quota lease price in the BC halibut fishery, long considered a poster child for ITQs. Findings challenge assumptions of economic theory used to promote the benefits of ITQs.
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1. Introduction

Individual transferable quotas (ITQs) are permits allowing the holder of the ITQ to catch or transfer a share of a total allowable catch (TAC). Typically, these permits do not expire, although if a fishery must be closed or diminished, the permit is similarly devalued. Most ITQ systems by definition allow these permits to be leased or sold to others. ITQs have received increasingly widespread positive evaluations from resource economists and fisheries managers, and have been widely adopted and accepted as a way of dealing with problems in fisheries management [1]. At the same time, problems with this approach have been raised by economists [2], political scientists [3], anthropologists [4], and geographers [5]. Yet, as some scholars have noted [6], there are few detailed empirical studies assessing changes in efficiency in the same fishery following the creation of individual quota programs. This discussion attempts to address this gap by examining how widely adopted quota leasing practices impact the delivery of economic benefits to society and to fishermen operating under an ITQ system.[1]

ITQ advocates posit that ITQs should be transferable via the market to allow quota to gravitate to the vessels and operators with the lowest fishing costs [9]. ITQ advocates also hold that these "efficient" vessels yield the greatest public benefit by virtue of the fact that they have the lowest fishing costs and thus their operations result in the least dissipation of wealth for society in general [10]. The role of quota leasing has been largely ignored in ITQ analyses, which can be explained by a common assumption that leasing automatically means a transfer of wealth rather than dissipation of wealth. This discussion questions the role of quota leasing as it relates to the achievement of an economically efficient fishery and the service of the public good. The impact of leasing on the financial viability of fishing operations, the costs of leasing, the extent of leasing, and the functioning of the quota leasing market are examined in the halibut fishery ITQ system in British Columbia, Canada. The BC halibut fishery was chosen because of its position as a "poster child" success story [11].

The leasing of quota is "the elephant in the room" of the BC halibut fishery. Despite the fact that the amount of the TAC which is leased out (i.e. not fished by the quota owner) has steadily increased to 79% in 2006, leasing is unmentioned, little mentioned, or considered insignificant by most analysts of the BC system. The discussion will reveal how hidden assumptions embedded in the analysis of ITQs, especially assumptions about the negligible impact of the initial allocation of permits, adequate information, and the effective functioning of capital markets have contributed to a failure to identify important impacts of quota leasing. An analysis of the impacts of leasing invites a new consideration of the benefits which have been claimed for ITQ systems that lack a mechanism to regulate leasing and control the concentration of holdings.

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[1] One study [7] did measure efficiency gains in the BC halibut fishery through 1994, but did not consider leasing, as the authors believed that "most of the active vessels are owner operated". By 1994, 34% of the quota was already being leased out, but the lease price at that time was only c. 50% of the catch value, enabling what lessee fishermen considered a reasonably fair distribution of benefits. The problems identified in this discussion did not become evident until 1998. An overview of ITQs [8] reviewed outcomes in less detail and noted leasing at 50–60 % of the catch value in Iceland.

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2. Methods

Methods included 15 years of discussions with an array of BC fishermen and fish processors about the operation of ITQs, monitoring of the discussion among fishermen on the listserve BC FishNet, review of the literature on ITQs in several disciplines, and detailed analysis of business practices, transactions and fishing costs of the BC halibut fleet. The detailed analysis used data obtained from Department of Fisheries and Oceans, interviews with fishermen, and monitoring of service provider reports [12].

The analysis will focus on (a) the relationship of the catch value obtained by fishermen to the lease price paid by lessee fishermen, including the impact of the lease price on the financial viability of lessee's fishing enterprises, (b) the extent and nature of leasing in the fleet, and (c) the impacts of leasing on the achievement of management objectives for fleet stability, viability, safety, efficiency, and greatest net benefits to society.

3. ITQs in the BC halibut fishery

There are several reasons why ITQs in the BC halibut fishery should be among the most successful ITQ systems and why it, therefore, provides a best case scenario, a good test case of how an ITQ system can work. Since 1923, the Pacific halibut fishery has been managed by some iteration of the International Pacific Halibut Commission, which exercises considerable oversight and collects stock status information. There has been a history of reasonably effective conservation, keeping the TAC at a level that avoided stock swings and collapses, unlike many other fisheries [13]. Because of beneficial characteristics of halibut physiology (no swim bladder) and markets (same price per pound regardless of size), problems common in ITQ fisheries have been largely avoided in halibut. Thus there are fewer incentives to highgrade (retaining only the largest fish) because halibut has traditionally been sold at the same or similar price per pound whether the fish is larger or smaller. Although this has been changing in recent years, the change has not been significant enough to precipitate high-grading. Unlike many other groundfish, halibut has low discard mortality so that when juvenile or under-sized halibut are hooked and discarded, greater than 80% are expected to survive [14]. Highgrading and discard mortality of the target species are, therefore, two problems widely appearing in ITQ systems [15] which are absent or minimal in the halibut fishery.[2]

Because of the contentious nature of the halibut ITQ system, twice voted down by a majority of fishermen, a rule was created capping the holding of more than 1% of the TAC as quota on a single halibut license. This rule inhibits the concentration of vessel catches, although it does not inhibit quota ownership concentration, since nothing prevents a party from holding multiple vessels and multiple licenses.

ITQs were implemented in the BC halibut fishery as non-transferable individual quotas for the first two years, 1991–1992, and became temporarily transferable as leases in 1993. In 1999, restrictions were lifted on permanent transfers (sales), although a number of sources indicated that permanent transfers were easily made through private arrangements previous to the formal lifting of restrictions. Temporary transfers are an indicator of how much quota has been leased out annually since 1993.

[2] The discard mortality of species caught incidentally in the halibut fishery has been identified as a significant problem [16], but does not bear directly on this analysis.

4. Analysis: the relationship between catch value and quota lease price

The lease price of quota an increase from $1.95/lb (in constant 2008$) in 1993 to $3.80/lb in 2008, an increase of nearly double, (Table 1). The purchase price of quota increased during the same period of time by 2.5 times, from 3.5 times the ex-vessel price (landed value of the fish paid to the fisherman) in 1993 to more than eight times the ex-vessel price in 2007. The ex-vessel price of halibut has remained relatively stable over this time period, increasing at first due to improved product quality and enhanced fresh product flow from a longer season, but then stabilizing, while quota sale and lease prices continued to rise.

The relationship between the value of the catch (the ex-vessel value) and the lease (and sale) price of quota demonstrates that a lessee faces a cost-price squeeze between what he must pay to lease the quota and what he is paid for his catch. Therefore, the assumption that "the market value of the ITQs reflects the market's perception of the net present value of the future stream of net economic returns from the fishery" [17] applies only to the value of the fishery to quota owners and not to vessel operators who lease quota.

The rise of the quota lease price as an increasing proportion of the ex-vessel value (i.e. catch value) of the fish (from 53% in 1993 to 78% in 2008) should be considered in evaluating the financial viability of fishing enterprises. In analyzing the financial costs of fishing, it is useful to distinguish fixed annual costs, variable fishing costs, or "trip costs", and lease fees. Leasing is by far the largest fixed annual cost, and operations that lease the majority of the quota that they fish, are marginally profitable or unprofitable (Fig. 1).[3]

There are three factors which account for the high quota lease and purchase prices out of proportion to the value of the catch. The first two of these factors have generally not been identified by the fisheries economists prominent in the discussion of ITQs [1]. Nonetheless, it is clear that their claims about the efficiency benefits of ITQs rest on key unstated assumptions about the conditions under which trading of property rights will lead to efficient outcomes: (1) there are no wealth or income effects from the initial allocations of rights, (2) there is perfect information among all parties on all aspects of the negotiation, and trading of these rights, (3) there are low transaction costs for the negotiation, trading, and enforcement of the trade, and (4) there is a well-functioning capital market (access to capital by all actors). Many economists[4] would claim that if these conditions are *not* met, trading of property rights will *not* lead to efficient outcomes (i.e. in the case at hand, the transferability of ITQs to the most efficient operators will not occur). It is argued below that these conditions are not met in the halibut fishery.

4.1. Factor 1. There are large wealth effects from the initial allocation of quota

Vessels that were not granted quota in the initial granting process must recover their fixed costs, trip costs and lease fees.

[3] Two anomalies in the pattern of the rise of lease costs as a percent of catch value can be explained in the following way. The sudden higher lease price relative to catch value in 1998 occurred because of (a) expectations that the catch price would be remain as high as 1997 being reflected in the 1998 quota lease price and (b) an oversupply of frozen halibut from 1997 which lowered the catch price in 1998. The sudden lowering of this ratio in 2005 and 2006 resulted from fears that the new groundfish integration program would lower ability to catch halibut, and this was factored into the lease price. When this fear proved unfounded, the lease price rebounded in 2007.

[4] This claim is often attributed to the "Coase theorem", for example [18].

Table 1
The relationship between ex-vessel value and halibut quota lease price and sale price.

Year	Lease price ($/lb)	Ex-vessel price ($/lb)	Quota purchase price ($/lb)	Ratio—lease/purchase (%)	Ratio—lease/ex-vessel (%)	Ratio—ex-vessel/purchase (%)
1993	1.96	3.73	11.73	17	53	32
1996	2.24	4.49	28.19	8	50	16
1997	2.08	4.16	29.01	7	50	14
1998	2.50	3.02	27.49	9	83	11
2002	2.68	4.49	29.65	9	60	15
2003	2.89	4.77	33.29	9	60	14
2004	3.05	4.55	39.21	8	67	12
2005	2.45	4.29	34.03	7	57	13
2006	2.25	4.54	28.13	8	49	16
2007	3.58	5.03	34.77	10	71	14
2008	3.80	4.90	38.00	10	78	13

All prices corrected for inflation to 2008 equivalent. Quota purchases technically are based on a percentage of the TAC, but in the market, the percentage is translated to poundage based on the current year's TAC, and prices based on $/lb. *Source:* Department of Fisheries and Ocean; license broker advertisements published in trade magazines; fisherman and processor interviews.

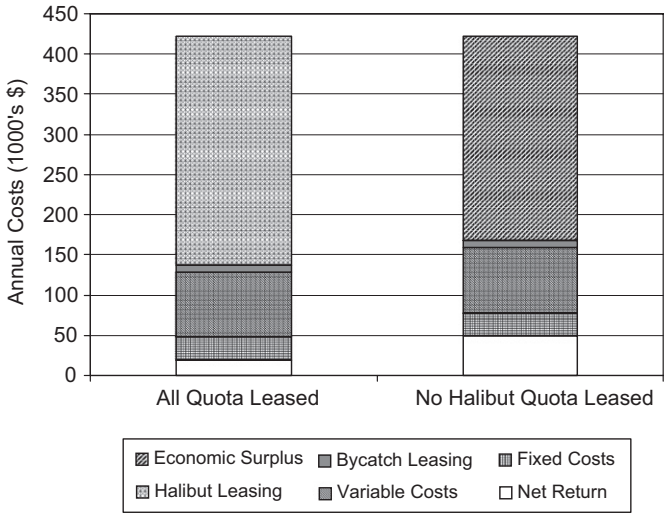

Fig. 1. The distribution of annual halibut revenue by cost category for an average halibut vessel catching a full block (1% of TAC) of halibut quota under two scenarios, one where all quota is leased at market price and the second where the halibut quota is owned and no lease fees paid.

Since quota owners retain c. 70% of the catch value, fishing costs must be recovered from the 30% of catch value that remains for the skipper, crew, and vessel share. Vessels granted quota can cover both their fixed and variable costs from the full 100% of landed value, and can then afford to pay higher lease prices for additional quota, needing only to cover trip costs. Those vessels operating with granted quota are therefore more financially viable than new entrants and can afford to pay higher quota lease fees by virtue of the wealth effects accrued through the initial granting process. This eventually had the effect of bidding up the lease price.

4.2. Factor 2. Asymmetric information held by buyers and sellers results in market power

Many quota owners prefer to lease their quota out through a processor as a broker because the processor is in a better position to get the highest price and because, as several fishermen stated, they do not want to be "guilted by other fishermen" about the high lease price they are asking. Similarly, many lessee fishermen do not wish to deal directly with the quota owner because of their hostility toward the high lease prices. High lease prices violate the previous norms of the share system in which license-owning skippers and crew were considered co-venturers and both rental skippers and crew took a far higher percentage of the catch value. Because a "moral economy" [19] persists in the fleet, and because reputation matters in securing the best arrangements, quota owners prefer to keep their leasing arrangements secret. Processors compete to secure quota at the beginning of the season because of their desire to guarantee delivery of fish to themselves [20, interviews].[5] Securing a large amount of quota pre-season also puts processors in the best bargaining position to re-lease the quota in turn under the most advantageous conditions and to maintain relationships with reliable fishermen. Even when fishermen make leasing arrangements directly with quota owners, these leases are normally financed by a processor and, therefore, the fish is delivered to this processor as part of the bargain. Processors are brokers of most of the leases because they can afford to pay more upfront, both because of their access to capital and because of their power in allocating fishing opportunity through control of a large amount of quota. It is advantageous for fishermen to have ready access to additional quota during the season if they happen upon more fish than they currently hold quota for. The price of quota when it is leased out to fishermen by the processors is confidential; it varies with arrangements and the bargaining power of the lessee. The lessee usually agrees to deliver catch from other fisheries to the processor as part of the arrangement. There is, therefore, asymmetric information between buyers and sellers of quota leases (considered a transaction cost by economists, along with search and information costs, bargaining and decision costs [21]), which confers market power to quota owners and to a lesser extent to the processors who buy up and reallocate quota leases. Processors may not charge a fee for this transaction, but the guaranteed delivery of the fish to them gives them leverage over the price of the catch. This may be an even more important form of market power. The resulting allocation of quota leases, and the stated and unstated terms under which they are allocated, are not the product of a freely operating market with open competition.[6]

Economists have generalized from a few cases in the trawl fishery in which lease transactions operate transparently and

[5] A few interviewees reported that some processors offer Employment Insurance stamps to quota owners who lease to them, as an inducement to acquire their quota, even though the quota owners do not actually fish. In these instances, quota owners are able to collect Employment Insurance benefits for the weeks the leased quota is fished. We do not know how widespread this practice is.

[6] Since groundfish integration in 2006, the necessity of leasing bycatch often gives processors even more leverage. If a fisherman catches non-target species, which are recorded by the cameras on his vessel, he must lease quota for this by-catch to continue fishing. Under these circumstances, a processor is the swiftest and most reliable supplier of by-catch leases.

small share. It is questionable whether this system meets the management objectives identified in the 1999 halibut management plan which included the "stability and viability of the existing fleet" [23]. The 2000 halibut management plan elaborated on the stated objectives and included an assessment of the fishery: "The IVQ program has proven very successful. Not only has IVQ management resulted in a more sustainable, rational and safer commercial halibut fishery, it has also improved the *financial viability* of the industry" [24, emphasis added]. It appears from this statement that the system has been analyzed only from the perspective of the quota owner, excluding the perspective of skippers and crew who lease the quota from the owner and actually do most of the fishing. Clearly, a large number of operations and possibly the crew benefits on *all* operations are driven by the costs of the lease arrangement to the lessees, not benefits to quota owners.

While processors characterize these skipper lessees as "desperate", the situation of crew or deckhands is equally or more precarious. It is not surprising that the proposal to move to ITQs was opposed by the Deep Sea Fishermen's Union (the union of crew), as it constituted the end of bargaining rights that crew had formerly enjoyed [20]. They are now an unorganized surplus labor force (because so many crew jobs have been eliminated) hired at whatever the market will bear. They formerly got 10–20% of the catch value before ITQs and now get 1–5%. Whereas the value of the halibut fishery has increased by 25% between 1990 and 2007, the proportion of that value retained by the crew share has dropped by 73%. There is now a widespread industry practice of taking a lease fee "off the top" as a trip cost (subtracting it from the amount to be divided among the crew), even if a fisherman-skipper owns the quota (and thus pays the lease fee to himself).[9] The skipper/quota owner justifies this on the grounds that he could get this lease price on the market, and his crew would receive the remaining benefits if he did have to lease quota. Thus even owner-operated vessels which do not have to lease quota usually pay reduced wages to crew. The existence of the ITQ system has altered accounting practices in ways which fundamentally alter wealth distribution.

One consideration in thinking about the net benefits to society is the distributional aspects of the ITQ program. A way that economists might measure net societal benefits is to examine the sum of the "marginal value" to rich and poor alike. In this calculus, a small benefit has far greater value to the poor, which get a higher value for each additional increment of benefit than the rich, and so a policy attempting to maximize total social benefit will at least not penalize the poor more than the rich, and will even attempt to allow the poor to benefit a bit more than the rich. In other words, the greatest overall social benefit is achieved when the poor realize more marginal value than the rich. The halibut ITQ system does not meet this measure of social benefit, since the cost of leasing is passed on the crew, who can least afford to bear the cost. Secondarily, the costs are passed on to lessee skippers, who seek entry into the fishery as quota holders, but who face very high barriers to entry, since their operations are not profitable enough to buy quota. The situation rewards those who were fortunate enough to be gifted the public resource because they were fishing in the qualifying years. The situation also rewards those who already have capital to invest, such as investors outside the fishing industry. The situation punishes all those non-quota-holders in the fishery who would like to advance in the future, either through buying or leasing quota. The stated policy goal of both government and economists that ITQs will reduce fishing costs for the entire industry and will increase societal benefits has not been met in these cases.

It is also not clear that the public benefit of increased safety has been met as much as is claimed. Quota-holding vessels can pick their weather and fish under the safest conditions, but skippers who are desperate will take greater risks and fish earlier in the season when prices are often higher and weather less predictable. Windle et al. [25] found that quota systems which do not limit ownership, such as those of Iceland and New Zealand, tend to maintain relatively high accident and fatality rates under ITQ systems.

The other major area in which public benefit may be diminished is in innovation. Although it is possible for new processors to enter the halibut fishery, and examples of this include the processors that entered the fishery in response to the increased and longer supply of fresh halibut [20], enabling them to access a higher-value, white tablecloth market, other innovations from new processors are likely suppressed by continued delivery to the established processors who often compete more successfully for quota. Another source of innovation is from political debate. In New Zealand [26], where quota owners have become closely partnered with government in the system, government is receiving so much funding from quota owners who increasingly pay for research and management that criticism of the system from within has become unthinkable.

7. Conclusion

Increasingly, those who have advocated ITQs as economically efficient are making broader claims about the general health of the industry and broader public benefits. So in the question of "efficient for whom?", the answer is assumed to be "efficient not just for holders of ITQs but also for all actors in the fishery and the owners of the resource, the Canadian public". This discussion has shown that this assumption, as well other assumptions underpinning the indiscriminate promotion of ITQs, do not apply in the British Columbia halibut fishery.

(1) The usual assumption is that lease price reflects "the market's perception of the net present value of the future stream of net economic returns from the fishery. As such, the market value of quota is affected by the market prices for halibut, fishing costs and the long-term health of the resource" [17]. "Because lease prices are measures of profitability per unit of catch, (prices minus marginal cost of fishing), it follows that in a well-functioning lease market, lease price should be a fraction of ex-vessel prices" [27]. An examination of the escalating quota lease price in relation to the ex-vessel value of the catch has shown that lease price can be seen instead as an indicator of the non-viability of a large portion of the fleet, constituting an unsustainable financial burden for this portion of the fleet under ITQs rather than an improvement. Thus a significant portion of the halibut fleet is not economically viable, contrary to claims in both DFO reports [23,24] and in economic evaluations of the halibut ITQ fishery [7,10,17].

(2) It is usually assumed that the fishermen who can operate at the least cost will end up in possession of ITQs, regardless of the initial allocation of ITQs, e.g. "under the ITQ schemes the market, by facilitating the allocation of harvests among fishers…. and by directing harvesting to the most efficient, magnifies the returns from the cooperative fisher games to the benefit of the fishers, and to the benefit of the public at large" [17]. But an increasing number of barely viable operations exist because of the market power of the initial recipients of quota. Therefore, initial allocations have resulted in significant

[9] This practice has also been documented in the US surf clam ITQ system [8].

wealth effects and market power imbalances that have hindered the transfer of quota in the market to those who can operate with the lowest fishing costs and highest rate of return.

(3) It is usually assumed that there are no wealth effects from initial allocations, no lack of information, and low transaction costs, although all of these are acknowledged to inhibit efficient trading if they do exist. It has been assumed in the BC groundfish fisheries that the dominant form of trading would be free public movement of quotas through brokers, auctions, or within fishermen's networks [17], that these activities would occur without significant transaction costs or wealth effects, and that, therefore, transferability through selling and leasing would lead to efficiency. But it has been shown that there is asymmetric information (a transaction cost) between buyers and sellers of quota leases, and that considerable market power is exercised by the holders of quota and by the processors who lease up and reallocate quota, thereby gaining significant influence over the catch price. The existence of transaction costs and market power means that efficiency should not be assumed to be achieved through trading in the BC halibut fishery. Economist Ronald Coase [30] warned that "One result of this divorce of the theory from its subject matters has been that the entities whose decisions the economists are engaged in analyzing have not been the subject of study and in consequence lack any substance", emphasizing that the market operates within institutional arrangement which must be understood in order to understand how the market functions. This discussion has attempted to provide more insight into how quota leasing arrangements actually operate.

It is clear that ITQs in the BC halibut fishery were an effective mechanism to promote efficiency gains through the concentration of fishing effort onto fewer vessels. However, there are low incentives for quota-owning vessels to maintain or increase efficiency after the first wave of consolidation. Furthermore, this discussion has shown that this efficiency is achieved at the expense of many lessees of quota, at the expense of crew even on owner-operated vessels, at the expense of the financial viability of many current operations, at the expense of future quota holders who have to buy quota from the original grantees vs. inheriting them as grandfathered public goods, and at the expense of those who will continue as lessees. Thus the efficiency achieved for quota owners comes with a cost in the lack of public benefits created by the ITQ system. Fishing operations are only sometimes conducted by parties who are able to obtain the most value from the resource.

The leasing of halibut quota is the "elephant in the room" because its importance has been missed by analysts, and not incorporated into the overall evaluation of quota programs. Instead, many argue for the complete relaxation of limits on transferability, as witnessed in Munro's [10] analysis of halibut ITQs and McRae and Pearse's [28] arguments for how a BC salmon ITQ system should be designed. These and other analysts have focused on the seemingly successful limits on vertical integration, without noting the reassertion of some traditional forms of market power [29] conferred on processors when they become the brokers of lease arrangements.

In a major study of ITQs, the US National Research Council [8] recommended: "The capacity of IFQs for transferability, consolidation, and leasing has led to a general concern that independent owner-operators of fishing vessels or crew members will be led into economic dependence on absentee owners as quota shares increase in value and small investors are excluded from the field. Consequently, some programs (e.g., Alaskan halibut and sablefish) have adopted owner-on-board and other provisions intended to prevent absentee ownership. Leasing of quota shares should generally be permitted but, if necessary, with restrictions to avoid creation of an absentee owner class. Making shares freely transferable is generally desirable to accomplish the economic goals of an IFQ program. However, if it is desired to promote an owner-operated fishery or to preserve geographic or other structural features of the industry, it may be necessary to restrict long-term transfers of quota shares to bona fide fishermen or to prohibit transfers away from certain regions or among different vessel categories". In future work we will elaborate on the economic and ecological alternatives which address the problems which ITQs systems intend to solve. It should be noted that mechanisms other than ITQs have been used in many fisheries to spread fishing effort over a longer season and promote a more even flow of fresh fish into the market. In the BC halibut fishery, the voluntary "layover" system operated successfully for a time to achieve this, but was not made mandatory.

The quota leasing market in the BC halibut fishery is limiting efficiency, stifling innovation, and causing financial hardship. It is clear that a well functioning ITQ fishery requires greater forethought, oversight, and regulation in the design and implementation of transferability rules.

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