



## US catch share markets: a review of data availability and impediments to transparent markets



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### ABSTRACT

A growing number of US fisheries are managed with catch share programs, which allocate exclusive shares of the total allowable catch from a fish stock to individuals, cooperatives, communities, or other entities. All of these catch share programs allow transferability of catch privileges in some form. Information on these transfers, particularly prices, could be valuable to fishery managers and to fishery participants to support management and business decisions and to increase efficiency of the catch share market itself. This article documents the availability and quality of data on transfers of catch privileges in fourteen US catch share programs. These catch share programs include several individual fishing quota (IFQ) programs and a number of programs that allocate catch privileges to self-organized cooperatives. Price information on catch share transfers is found to be limited or unavailable in most US catch share programs. Recommendations are made on how to improve the design of catch share programs and associated data collection systems to facilitate effective catch share markets, collection of catch share market data, and better use of information from catch share markets.

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### 1. Introduction

A growing number of fisheries worldwide are managed with catch share programs, which allocate exclusive shares of the allowable catch from a fish stock to individuals, cooperatives, communities, or other entities. Most catch share programs, including those based on cooperatives, allow transfers of shares between individuals. Typically, both short term-transfers of quota pounds and permanent transfers of catch shares are allowed in individual fishing quota (IFQ) programs. Cooperatives often allow short term transfers within and sometimes between cooperatives, but permanent transfers generally require selling all of the catch shares associated with a permit or vessel. In some catch share programs, short term transfers of catch privileges are done by leasing of the long term catch privilege (e.g., leasing quota shares), but most US catch share programs create an annual form of the catch privilege

denominated in pounds that can only be used during a particular fishing year. These annual catch privileges are referred to in different programs as “quota pounds”, “quota allocation”, “IFQ”, or “annual catch entitlements.” The term quota pounds (QP) is used hereafter as a generic term to refer to the *annual* form of quota in a catch share program, and quota shares (QS) is used as a generic term to refer to the *long-term* catch privileges generally denominated as shares of the total allowable catch (TAC) for a species, area, and/or fishery sector.

The catch share markets that develop when QS and QP transfers are allowed can play an important role in promoting economically efficient and sustainable utilization of fishery resources. QS and QP markets facilitate redistribution of catch privileges to fishing operations that can generate more profit from catch (e.g., by increasing value and/or reducing costs). Transfers often enable some consolidation of fishing operations, which can reduce overall costs if excess capacity existed prior to implementation of the catch share program. In multispecies catch share programs, the ability to purchase QP to cover unexpected catches enables fishermen to land and sell those catches and helps

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discourage discarding [1]. If quota markets are functioning efficiently, QP prices for species with constraining TACs should rise providing fishers with an incentive to avoid them, allowing fuller utilization of other species with less constraining TACs [2].

If information on QP and QS prices is available, and prices accurately reflect value, they can provide useful information to fishery participants and managers. Theoretically, QS prices should provide an indication of profitability of the fishery and expectations of future profitability – the quota share price should equal the discounted sum of expected future profits that can be generated with the quota share [3]. Prices of QP should provide a measure of the marginal change in profit that can be generated from an additional pound of quota in the current year. If the QP market is efficient, the QP price should reflect the difference between the expected price of the fish and the expected cost of catching this fish on a per unit basis. Consequently, the combination of fish price information, which is collected in nearly all US fisheries, and QP price information could indirectly provide information about the costs of fishing. While cost information is collected in some US fisheries, in many it is collected only through occasional voluntary surveys. Understanding how costs are changing over time can help managers to understand the ramifications of management decisions on profitability. QP and QS prices, and what they indicate about expected profitability, are important criteria for decisions by fishermen to enter or exit a fishery, or to expand or contract individual fishing activity [3–6]. Having good information about prevailing prices can help facilitate negotiation and enable the market to converge on efficient prices. This not only ensures more efficient use and distribution of QS and QP, but should lower transactions cost. Thus, accurate price information both contributes to and is an outcome of transparent and efficient quota markets. Furthermore, without accurate price information, it is not possible to assess the efficiency of the catch share market and difficult to identify how that efficiency might be improved.

Prices of QP and QS may also provide signals to managers about the economic and biological health of a fishery [7,8]. QS and QP prices can quantify how the design of the catch share program impacts the economic value of the fishery and how it is affected by management decisions (e.g. change in TACs, closed areas, etc.). Decisions that enhance the expected long-term value of the fishery should increase the value/price of QS and vice versa. Most catch share programs include some restrictions on use and transferability of catch privileges that are designed to address social and distributional objectives. When restrictions on quota ownership or use differ across sectors or over time, evaluation of quota prices can enable quantification of these costs [9]. QS and QP prices can also provide information about the value generated by different sectors of the fishery which may help quantify the economic effects of reallocation of quota between sectors – e.g., by providing an estimate of the added benefits (costs) of gaining (losing) quota share [10].

QP prices in multispecies fisheries may provide fishery managers with an indication of relative changes in stock abundance of the species involved. For example, if the abundance of an incidentally caught species has actually increased, but its assessment has not been updated, and the TAC has not been increased, the price of QP for the incidentally caught species may rise because it has become harder and more costly to avoid and the total QP available has become more constraining. QP prices would then be expected to rise as demand increases for a fixed supply. QP prices near or above ex-vessel prices may create incentives for illegal discarding and provide a signal to managers that they may need to increase or target compliance efforts on trips likely to encounter these species. Of course, the utility of information from quota markets in incentivizing efficient behavior or informing management

depends on whether prices reflect the true marginal value of QP. This may not always be the case in a complex multispecies fishery so it is important to evaluate whether the QP market is operating efficiently [11].

For catch share programs categorized as “limited access privilege programs” that were established after January 12, 2008, the Magnuson-Stevens Fishery Conservation and Management Act MSA requires periodic “formal and detailed” reviews of those programs that include evaluating progress relative to the goals of the program. QS and QP prices provide indicators of how profitability has changed over time and how they have affected the distribution of benefits, both of which are typically relevant to the goals of most catch share programs [12]. Analysis of QP transfers can also reveal geographic and sectoral shifts of quota ownership (and associated wealth) and fishery participation that are important to fishery managers and stakeholders. These can be particularly important in evaluating and minimizing adverse economic impacts on fishing communities as mandated by National Standard 8 of the MSA.

Of course, the utility of information from quota markets in incentivizing efficient behavior or informing management depends on whether reliable and representative price information is available, and whether quota markets are efficient and prices reflect the true value of QS and QP. Although IFQs have been used to manage fisheries in New Zealand, Iceland, Canada, and Europe for decades, there has been relatively little study of catch share markets and the few studies that have been conducted have found mixed results regarding the efficiency of quota markets and consequently the utility of the information that may be contained in quota prices. Newell et al. [13] found evidence of economically rational pricing in the New Zealand quota management system, which is arguably the most comprehensive and mature catch share system in the world. Notably, regularly updated individual quota holdings and monthly average price information is publicly available in New Zealand and transactions costs are low [14]. In contrast, an analysis of barter trading (quota swaps) in the British Columbia (BC) groundfish IFQ suggests that the implicit values of QP revealed by trades generally do not reflect the full value for species that are constraining the catch of other jointly caught species [11]. Price information on quota sales and leases is not collected in the BC groundfish IFQ, and there is no publicly available information on QP or QS prices. Even single-species quota markets can be complex and present challenges for deriving and using information about quota values. Sanchirico et al. [9] note that restrictions on quota ownership in the North Pacific halibut and sablefish fishery result in 55 different unique types of halibut QS and 36 unique types of sablefish QS, each of which is likely to have its own market. They note that values vary by area, vessel class, and according to the restrictions on aggregation which vary for particular shares of quota. Their preliminary analysis suggests that quota prices could reveal information about the costs of restrictions on use and aggregation of quota, but note that quantifying these costs is challenging due to the practice of selling QS and QP together, the existence of many small sub-markets, and multiple rule changes through time.

Efficient markets are generally characterized by large numbers of buyers and sellers and low transactions cost – i.e., a low cost means of matching up buyers and sellers and negotiating fair terms of trade; and they generally require readily available price information to enable prices to converge to efficient levels [15–23]. Regulators may play an important role here in making information about quota holdings and prices of past transactions easily available, and simplifying the process of making transfers (e.g., through electronic trading systems that capture price information). Individuals and brokers may be reluctant to reveal price information for strategic reasons, though having this information available to all

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