The Economic Performance of U.S. Non-Catch Share Programs

Ayeisha A. Brinson, Eric M. Thunberg, and Katherine Farrow

NOAA Technical Memorandum NMFS-F/SPO-150
February 2015

U.S. Department of Commerce
Penny Pritzker, Secretary

National Oceanic and Atmospheric Administration
Kathryn D. Sullivan, Administrator

National Marine Fisheries Service
Eileen Sobeck, Assistant Administrator for Fisheries

Recommended citation:

Brinson, A.A., E. M. Thunberg, and K. Farrow. 2015. The Economic Performance of U.S. Non-Catch Share Programs. U.S. Dept. of Commer., NOAA Technical Memorandum NMFS-F/SPO-150, 191 p.

Copies of this report may be obtained from:

Rita Curtis, Ph.D.
Office of Science and Technology
National Marine Fisheries Service, NOAA
1315 East West Highway
Silver Spring, MD 20910

Or online at:
http://spo.nmfs.noaa.gov/tm/ or
https://www.st.nmfs.noaa.gov/economics/fisheries/commercial/catch-share-program/index

The Economic Performance of Non-Catch Share Programs

Executive Summary

Nationwide, some fisheries are managed using catch share management; while others are managed using a broad range of management controls exclusive of catch shares. Catch share programs are a fishery management tool that dedicates a secure share of quota to allowing individual fishermen, fishing cooperatives, fishing communities, or other entities to harvest a specific amount of fish. This report provides data on the economic performance of selected fisheries not managed using catch share management As such, this report is an extension and companion to NOAA Fisheries' report on the economic performance of catch share programs (Brinson and Thunberg, 2013).

This report provides data on the selected non-catch share fisheries listed in Box 1. Although these fisheries are only a partial list of all such fisheries managed by Fishery Management Councils, they are fisheries that are of social and/or economic significance in each region and are distinct fisheries managed under a single Fishery Management Plan. In this report, a snapshot of the economic performance of these fisheries is provided including trends over time. Indicators for most programs span the years from 2002 to 2012. Indicators for Alaskan fisheries managed by the North Pacific Fishery Management Council are reported from 2003 to 2012.

Box 1. Selected U.S. Non-Catch Share Managed Fisheries By NOAA Fisheries Region

Greater Atlantic Region
Limited Access Atlantic Sea Scallops
Monkfish

South Atlantic Region
Gulf of Mexico Vermillion Snapper

West Coast Region
West Coast Salmon Troll
West Coast Sardines
West Coast Squid
West Coast Albacore
West Coast Swordfish

Alaska Region
Weathervane Scallops
Gulf of Alaska Other Rockfish

Pacific Islands Region
Hawai'i Longline
Hawai'i Bottomfish
American Samoa Longline

The fisheries reported here have adopted a wide array of management measures including, among other things, effort controls on days at sea, trip limits, gear restrictions, temporal and spatial controls. All but three fisheries (West Coast Albacore, West Coast Squid, and Hawai'i Bottomfish) are limited access fisheries. As of 2012, all but four fisheries had specified Annual Catch Limits or were quota-managed. Of the four fisheries that currently do not have Annual Catch Limits, three are fisheries for highly migratory species subject to international agreements, namely the West Coast Swordfish, West Coast Albacore, and American Samoa Longline Fisheries.

Methods

The selected indicators used to evaluate economic performance include metrics for quota and landings, effort (number of active vessels, trips, and fishing days), economic measures such as

revenues from species in the fishery, total revenue, average prices for landed catch, revenue per vessel, revenue per trip, revenue per day, and the Gini coefficient, which is a measure of the distribution of fishery revenues among active vessels.

Results

Each fishery described in this report has different management objectives, different regulatory frameworks, and markedly different operational characteristics. These differences complicate any direct comparisons of performance trends across fisheries except in terms of assessing trends in economic performance over time. For this reason, the Spearman rank-order correlation coefficients (for individual performance indicators and time) were estimated to determine whether any dominant upward (positive correlation coefficient) or downward (negative correlation coefficient) time trends were evident, and whether these trends were shared across fisheries. In doing so, it is important to keep in mind that correlation coefficients may not detect shorter term or cyclical trends. That is, correlations with time will be statistically significant only if the time trend is consistently up or down. This does not necessarily mean that inter-annual changes are strictly unidirectional, only that annual changes fluctuate around a distinct longer-term trend. Correlation coefficients do not indicate causality or any underlying structural reasons for change, nor do they reveal more complex relationships that may exist among multiple performance indicators.

Landings and Quota

There was no discernible long-term trend in aggregate landings of fishery species for seven of the 13 fisheries included in this report. Of the six fisheries where a long-term trend was evident, landings increased in two fisheries (West Coast Squid and Hawaiʻi Longline) and decreased in four (West Coast Swordfish, West Coast Salmon Troll, Monkfish, and Gulf of Alaska Other Rockfish).

Evaluating trends in aggregate quota of all species in the fishery, whether specified as a target, harvest guideline, or Annual Catch Limit, was complicated by the fact that these management instruments have been implemented at different times across fisheries. In eight fisheries, some type of quota was specified during at least the most recent six years. Of these, positive trends were detected in the Atlantic Limited Access Sea Scallop, Hawaiʻi Longline, and Hawaiʻi Bottomfish Fisheries. Downward trends were detected in the Gulf of Alaska Other Rockfish, Monkfish, West Coast Salmon Troll, West Coast Sardine, and Weathervane Scallop Fisheries.

Assessing whether catch targets have been exceeded was complicated by the fact that quotas for several fisheries have limits that apply to multiple management units in the fishery. A catch limit or quota for one species or sub-component of a fishery may be exceeded while the aggregate quota is not. Fisheries with multiple management units include the Gulf of Alaska Other Rockfish, Hawaiʻi Longline, West Coast Salmon Troll, Monkfish, and Weathervane Scallops Fisheries. In 2009-2012, overages occurred in 20-80% of the fisheries that were managed with some form of catch limit.

Active Vessels, Trips, and Days Absent

One component of fishery performance is the number of active participants. To examine participation over time, the number of active vessels was evaluated throughout the study period. A statistically significant trend in the number of active vessels in the fishery was detected in seven of the 13 fisheries included in the report, six of which exhibited a downward trend. An upward trend in active vessels was detected in only the Hawai'i Longline fishery.

Of the 11 fisheries where data were available, a statistically significant correlation between the number of trips and time was not detected for four fisheries (Squid, West Coast Albacore, Hawai'i Longline, and Hawai'i Bottomfish). For the remaining seven fisheries, the number of trips exhibited a statistically significant downward trend in the fishery.

For the eight fisheries where days absent data were available, a statistically significant positive trend was detected in two fisheries (West Coast Albacore and Hawai'i Longline); whereas, a statistically significant negative time trend was evident for American Samoa Longline, Limited Access Atlantic Sea Scallops, and Monkfish fisheries.

Revenues, Prices, Revenue per Vessel, Revenue per Trip, and Revenue per Day

A statistically significant correlation between fishery species revenue and time was detected in nine of the 13 fisheries included in this report. The majority, five of these nine fisheries, exhibited an increasing trend in fishery revenue, while in four (American Samoa Longline, Monkfish, West Coast Salmon Troll, and West Coast Swordfish) fisheries a downward trend was evident. A statistically significant positive correlation between average fishery species price per unit (pound or metric ton) and time was detected in nine fisheries.

A statistically significant correlation between fishery species revenue per vessel and time was detected for 10 of the 13 fisheries included in this report. In all but three of these 10 fisheries (West Coast Swordfish, West Coast Salmon Troll, and Monkfish), an upward trend in fishery revenue per vessel was evident. In general, the time trend for both fishery species revenue per trip and fishery revenue per day at sea were also positive for most fisheries.

Distribution of Fishery Revenue

The relative distribution of fishery revenues among active vessels was measured by the Gini coefficient. The Gini coefficient is based on the difference between the actual cumulative distribution of share of species revenue among active vessels and the cumulative distribution of revenue shares that would result if revenue among all active vessels was the same. As such, the Gini coefficient is a measure of the degree of concentration in the distribution of fishery species revenue among participating vessels. A low Gini coefficient indicates that revenues are relatively evenly distributed among active vessels, whereas a high Gini coefficient indicates that revenues are more concentrated among fewer vessels. There was no statistically significant correlation between the Gini coefficient and time in six of the 13 fisheries included in this report. Of the seven fisheries where a statistically significant trend was evident, the trend was negative (indicating a reduction in concentration in fishery revenues) in five fisheries, whereas the Gini coefficient was increasing in both the Gulf of Alaska Other Rockfish and the West Coast Swordfish fisheries.

Overall, the results of the correlations with the performance indicators and time revealed significant trends in some fisheries. Fishery revenue, average price, revenue per trip, and revenue per vessel tended to have significant correlations in at least 70% of the fisheries. Evidence of shared correlations with time for both relative distribution of fishery revenue shares as measured by the Gini coefficient and aggregate fishery landings were less definitive (less than 54% of fisheries). There were significant negative correlations for time and the number of trips for the seven fisheries where data were available.