DOCUMENTATION FOR THE WEST COAST FISHING FLEET COST-EARNINGS DATA BASE

by

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I. INTRODUCTION

The west coast fishing fleet cost-earnings data base (CEDB) was created to consolidate fishing vessel cost and earnings data into an informational and analytical data base that would support economic research and provide economic information on selected U.S., west coast fisheries.

The major source of landings and ex-vessel earnings data for west coast fishing vessels is the PACFIN Research Data Base which contains annual fish ticket and vessel registration data: landings, ex-vessel prices, and fishing vessel characteristics data for Washington, Oregon and California vessels for the years 1981 through 1989 (Jacobson et al,). Because of its design, comprehensiveness, continuity, and the level of support provided users, the PACFIN data base has experienced widespread popularity among researchers investigating and monitoring changes in the fishing activities and gross earnings of various west coast fleets over time.

Fishing vessel cost data, on the other hand, are typically assembled on an ad hoc basis. There is nothing for vessel costs that incorporates the annual, secondary data reporting and compilation mechanisms that constitute the PACFIN Research Data Base. Instead, cost data are usually collected as part of a specific study and are therefore subject to the special needs and concerns of the investigator. Because a routine standard cost data reporting format is lacking, it is difficult to use these data to conduct consistent or routine analyses (e.g. fleet productivity analyses) which draw on both the PACFIN and various vessel cost data bases.

In view of the disparate nature of fishing vessel cost data, we set out to establish an economic information and research data base, comprising both fishing vessel cost and earnings data, which would feature the versatility and permanence that characterizes the PACFIN data base. In this report, we document that effort by first providing an overview of the data base in terms of the elements contained in the data base, their source, and concerns about confidentiality and access. We next describe in detail the structure and content of the cost-earnings data base system, and in the last section present statistical

summaries for the quantitative variables in the data base.

II. OVERVIEW

A. Data Description

There are costs associated with operating and owning a fishing vessel. Costs related to the vessel's operation are generally categorized as variable costs, since they vary with the level of fishing activity. Ownership costs tend to be incurred whether or not the vessel actually engages in fishing (or non-fishing activities), and therefore fall into a fixed cost category. Vessels generate earnings from the sale of fish caught, or by engaging in alternative revenue-producing activities. For over 140 vessels that belonged to either the west coast trawl fleet, the U.S. tropical tuna purse seine fleet, the west coast wetfish fleet, or the southern California gillnet fleet, in one or more of the years 1981-89, we acquired data on annual expenditures for major items of both variable and fixed cost, and annual earnings by fishing and non-fishing activities. Petroleum (fuel and lubricants), wages and benefits, maintenance, and expenditures on a number of other intermediate inputs were the major items of variable cost. Interest, mortgage, depreciation, insurance, administrative, professional, and other overhead, were the major fixed expenses. For these items, actual expenditures are further disaggregated and detailed in the next section. In addition to economic data, data on the vessels' physical characteristics were also obtained.

B. Data Sources

The scope of the data base is limited by the periodic availability of secondary cost data from individual fishing vessels. In this regard, individual vessel cost and earnings information that could be obtained, directly from federal tax forms, through NMFS's fishing vessel Capital Construction Fund (CCF) and Fishing Vessel Obligation Guarantee program (FVOG) provided a starting point for the construction of the data base. We recognized the interpretive problems inherent in data taken from tax forms, but nonetheless feel that these have been sufficiently resolved so that reasonable data on the costs and returns of owning and operating a fishing vessel have been entered into the data base.

For west coast vessels, cost and earnings data taken from tax forms were supplemented with corresponding PACFIN data on landings

and revenue by species, as well as physical characteristics data, to thoroughly document a particular vessel's economic performance over a given time period.

C. Confidentiality

Standard provisions for confidential data apply to the Cost-Earnings Data Base. Access is limited to National Marine Fisheries Service personnel in accordance with the data sharing agreement with the state of California. NMFS employees must sign a confidentiality agreement before accessing the data.

D. Who to Contact for More Information

Responsibility for the maintenance and continuance of the west coast fishing fleet cost-earnings data base rests with Dr. Samuel F. Herrick, Jr. and Dr. Dale Squires of the Southwest Fisheries Center, La Jolla. Their address and respective phone numbers follow:

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III. DESCRIPTION OF THE SYSTEM

A. Data Base Design

The west coast fishing fleet cost-earnings data base has been implemented on a IBM compatible personal computer, running the MS-DOS operating system. Fleet-specific data files were created using the relational data base structure and data management system provided by dBASE IV. The intent was to establish a highly flexible structure that could be easily modified to accept "nonstandard" data (i.e., data not from tax forms or the PACFIN). The dBASE IV system satisfies these requirements, and also allows for report generation, data manipulation using an internal programming capability, and automated data entry.

B. Data Base Structure

The database contains four categories for: the west coast groundfish/shrimp trawl fleet, (81-89) the southern California swordfish/shark drift gillnet fleet, (81-86) and the U.S. tropical tuna purse seine fleet, (81-89). The respective files are called TRACE.DBF, TUNA.DBF, and GILLNET.DBF. TRACE.DBF contains 72 fields, 342 vessel-years, 116 vessels, TUNA.DBF contains 75 fields, 40 vessel/corporation years, 15 vessels, GILLNET.DBF contains 71 fields, 39 vessel-years, 12 vessels.

Each fleet file contains a separate record for each vessel in that fleet, for each year in which cost-earnings data were available for that vessel. Each record contains the information shown in table 1.[1]

[1]TUNA.DBF and GILL.DBF have a slightly different structure. TUNA.DBF has 5 extra fields HELICOST (cost of helicopter aquisition), FISHREV (revenue received from fishing operations) DEPPLANE (annual depreciation on plane) OTHERREV (other unspecified revenue), and NOTE (a note to give added information). In addition, ice, bait, and salt expenses have been aggregated into SALTCOST.

GILL.DBF also combines ice, bait, and salt into SALTCOST. Other than that it is the same.

Table 1. dBASE IV FORMAT OF DATA BASE

Data Element	Name	Format	Description	Source
1	ID	Numeric	6 digit Coast Guard ID #	CCF tax
2	VES_NAME	Character	Name of Vessel	CCF tax
3	YEAR	Numeric	Calendar year for which cost-earnings data applies	CCF tax
4	PRINPORT	Character	Principle port of vessel which account for a plurality of revenues	PACFIN
5	LENGTH	Numeric	Coast Guard measurement in feet.	PACFIN
6	GROSSTON	Numeric	Coast Guard registered tonnage	PACFIN
7	HORSEPOWER	Numeric	Coast Guard registered horsepower	PACFIN
8	CREWSIZE	Numeric	Number in crew	PACFIN
9	YEARBUILT	Numeric	Construction year of vessel	CCF tax
10	YEARPURCH	Numeric	Purchase year of vessel	CCF tax
11	LANDINGS	Numeric	Number of fish tickets	PACFIN
12	WEEKS	Numeric	Weeks fished in year	PACFIN
13	GEARTYPE	Numeric	Code to indicate type of fishing gear used	CCF tax
14	JV	Numeric	Joint Venture operations dummy variable; 1=JV 0=not	OTHER
15	DEPTOTAL	Numeric	Vessel depreciation for year	CCF tax
16	SIZE	Charactor	Vessel size code	OTHER
17	PETROCOST	Numeric	Vessel fuel cost	CCF tax
18	PROVISCST	Numeric	Cost of vessel provisions	CCF tax

19	GEARCOST	Numeric	Cost of vessel gear	CCF tax
20	CREWCOST	Numeric	Crew expenses including crewshare and captain's share	CCF tax
21	TAX	Numeric	Local, state, and federal taxes. Does not include income taxes.	CCF tax
22	AUTOEXPEN	Numeric	Costs related to automobiles	CCF tax
23	REPAIRCOST	Numeric	Repair expenses	CCF tax
24	DUES	Numeric	Membership costs	CCF tax
25	BAITCOST	Numeric	Costs for bait	CCF tax
26	ICECOST	Numeric	Costs for ice	CCF tax
27	PERMITCOST	Numeric	Cost of fishing permit or license	CCF tax
28	OFFLOADEXP	Numeric	Offloading costs	CCF tax
29	RENTETC	Numeric	Expenses listed as rent, lease, moorage	CCF tax
30	INSURCOST	Numeric	Insurance expenses	CCFtax
31	INTERESTEX	Numeric	Costs of interest	CCF tax
32	PROEXP	Numeric	Professional fees including management accounting and legal	CCF tax
33	TRAVELEXP	Numeric	Costs of travel	CCF tax
34	SUPPLYEXP	Numeric	Items listed as supplies not as provisions	CCF tax
35	OFFICEEXP	Numeric	Office expenses	CCF tax
36	PHONEEXP	Numeric	Phone or utilities expenses	CCF tax
37	BANKCHARGE	Numeric	Bank charges including special loan guarantee program fees	CCF tax

38	CCFDEPOSIT	Numeric	Capital Construction Fund deposit	CCF tax
39	OTHEREXP	Numeric	Misc. vessel expenses	CCF tax
40	TOTALEXP	Numeric	Total deductions or total deductions plus costs of goods sold, those items listed as totals	CCF tax
41	OWNERPAY	Numeric	Payments to the owners of the vessel such as partners and corporate officers	CCF tax
42	DEPNEGATIV	Numeric	Negative depreciation expense due to CCF deposit	CCF tax
43	FUELPRICE	Numeric	Price of fuel (No.2 marine diesel)	OTHER
44	OPPLABOR	Numeric	Opportunity cost of labor	OTHER
45	CAPSERV	Numeric	Capital services price	OTHER
46	TOTALREV	Numeric	PACFIN reported total revenue	PACFIN
47	TOTREV	Numeric	Tax form reported total revenue	CCF tax
48	JVREV	Numeric	Computed joint venture revenue	OTHER
49	TR_SP1	Numeric	Total revenue species1	PACFIN
50	TR_SP2	Numeric	Total revenue species2	PACFIN
51	TR_SP3	Numeric	Total revenue species3	PACFIN
52	TR_SP4	Numeric	Total revenue species4	PACFIN
53	TR_SP5	Numeric	Total revenue species5	PACFIN
54	TR_SP6	Numeric	Total revenue species6	PACFIN
55	TR_SP7	Numeric	Total revenue species7	PACFIN
56	TR_SP8	Numeric	Total revenue species8	PACFIN
57	TR_SP9	Numeric	Total revenue species9	PACFIN

58	TR_SP10	Numeric	Total revenue species10	PACFIN
59	JVTONS	Numeric	Computed joint venture catch in tons	OTHER
60	TOTCATCH	Numeric	Total catch in tons	PACFIN
61	TC_SP1	Numeric	Total catch species1	PACFIN
62	TC_SP2	Numeric	Total catch species2	PACFIN
63	TC_SP3	Numeric	Total catch species3	PACFIN
64	TC_SP4	Numeric	Total catch species4	PACFIN
65	TC_SP5	Numeric	Total catch species5	PACFIN
66	TC_SP6	Numeric	Total catch species6	PACFIN
67	TC_SP7	Numeric	Total catch species7	PACFIN
68	TC_SP8	Numeric	Total catch species8	PACFIN
69	TC_SP9	Numeric	Total catch species9	PACFIN
70	TC_SP10	Numeric	Total catch species10	PACFIN
71	PRICE	Numeric	Vessel acquisition price	CCF tax
72	OPP_CAP	Numeric	Opportunity cost of capital	OTHER

(All costs and revenues are in nominal dollars).

1). Data Source Codes

CCF tax data: Tax data from vessels participating in the Capital Construction Fund

PACFIN: Data transferred directly from the PACFIN Research Data Base

OTHER: Computed Variables (listed below)

C. Other Variables

GEARTYPE. Type of fishing gear used. "1" = Trawl, "3" = Coastal pelagic, "4" = Troll, pots, longline.

JV. Personnel at National Marine Fisheries Service, Southwest Region monitor joint venture participation by west cost trawl

vessels. Vessels in the cost-earnings trawl fleet were identified accordingly.

FUELPRICE. Average of quarterly fuel prices obtained from vessel principle ports.

OPP_LABOR. Opportunity cost of labor by homeport - Labor earnings information from the Bureau of Labor statistics was used to calculate the next best alternate income source for crew members in their principle area. The geometric mean for three labor categories, captain, mechanic, and crew, was used as opportunity cost.

CAP_SERV. Capital services price - This variable was derived from the following formula: Vessel acquisition price * [depreciation rate + opportunity cost of capital]. where depreciation rate = 7% annually

JV_REV. Joint venture revenue - This variable was computed taking tons caught by the vessel as listed in the JV log books, and multiplying it by a coastwide average price per ton of Pacific Whiting, compiled by the National Marine Fisheries Service, Southwest Region.

OPP_CAP. Opportunity cost of capital - [vessel acquisition price * interest rate, where interest rate = Baa bond rate.

D. Missing Values

The cost data presented in the data base have various degrees of aggregation depending of the tax reporting method used. Therefore cost fields where nothing has been reported are assigned a value of (0). Fields that exhibit actual missing values have been assigned a (-1).

IV. Summary Statistics

A. Data Integrity.

The integrity of the cost data was checked by comparing the observed share of annual total variable/fixed costs for each of the vessel's itemized costs with the corresponding mean cost

shares for all vessels in the cost-earnings fleet, i.e.,

$$C_{i,j}/TC_j - \Sigma_{j=1}(C_{i,j}/TC_j)/N$$

Where $C_{i,j}$ = expenditure on cost item i for vessel j and

TC_j = total expenditure by vessel j.

Using a two standard deviation difference rule (actual minus fleet mean), none of the reported cost values were considered to be outliers. PACFIN revenue is checked for integrity as it is introduced into the PACFIN data base.

All statistical summaries and data integrity checking were done using Statistical Package for the Social Sciences (SPSS/PC+).

The statistical summaries are listed at the end of this document.

For purposes of completing summary statistics the following aggregations were performed.

TOTAL VARIABLE COST = PETROCOST + PROVISCOST + GEARCOST + OTHERCOST + TAX + AUTOEXPENS + REPAIRCOST + DUES + BAITCOST + ICECOST + PERMITCOST + OFFLOADEXP + RENTETC + SUPPLYEXP.

TOTAL FIXED COST = INSURCOST + PROEXP + TRAVELEXP OFFICEEXP + PHONEEXP + BANKCHARGE.

TOTAL COST = TOTAL VARIABLE COST + TOTAL FIXED COST.

B. Statistical Results (see appendix for statistical definitions)

Table 2.
(Note: these figures are in nominal dollars)
a) Trawlers with length less than 50 feet

Variable	Mean	Max	Min	Median	Std. Dev.
Total Variable Cost	40714	118212	5274	41104	21995
Total Fixed Cost	10870	45320	522	10405	7951
Length(ft.)	44	49	28	46	5.7

Gross ton	37.9	58	12	39	12.8
Horsepower	249	375	100	230	84.7
Crewsize	2.6	3	2	3	.489
Weeks fished	28.7	46	3	32	10.5

b) Trawlers with length between 50 and 75 feet

Variable	Mean	Max	Min	Median	Std. Dev.
Total Variable Cost	63451	263384	500	52211	51953
Total Fixed Cost	16687	112206	0.0	13784	14043
Length(ft.)	62.2	75	50	62	7.2
Gross ton	80.8	141	25	83	26.8
Horsepower	345	840	135	340	118.2
Crewsize	3.01	4	2	3	.46
Weeks fished	31.7	52	9	32	8.1

c) Trawlers with length greater than 75 feet

Variable	Mean	Max	Min	Median	Std. Dev.
Total Variable Cost	78746	237226	0.0	85571	64495
Total Fixed Cost	32600	116259	100	21899	32927
Length(ft.)	82.8	104	76	80	7.6
Gross ton	144.3	196	90	140	28.9
Horsepower	556	1040	335	470	186
Crewsize	3.4	5	2	3	.69
Weeks fished	25.3	43	4	29.5	12.2

V. Appendix.

Table 5. Definition of Homeport codes

A. Oregon

AST	Astoria	COS	Coos Bay	NEW	Newport
BRK	Brookings	TLL	Tillamook Bay	FLR	Florence
DES	Deschutes	CSC	Coos	CUR	Curry
CRK	Crook	KLM	Klamath	MLR	Malheur
MRN	Marion	MRW	Morrow	TLC	Tillamook
WLR	Tillamook				

B. Washington

BLN	Blaine	BLL	Bellingham	ANA	Anacortes
EVR	Everett	TAC	Tacoma	SEA	Seattle
OLY	Olympia	NEA	Neah Bay	WPT	Westport
CPL	Copalis	PAG	Port Angeles	WLB	Bay Center
LWC	Chinook	GRH	Gray's Harbor	OSP	Kitsap

C. California

ALB	Albion	AVL	Avila	BDG	Bodega Bay
BRG	Fort Bragg	CRS	Crescent City	CRZ	Santa Cruz
ERK	Eureka	MNT	Monterey	MOS	Moss Landing
MRO	Morro Bay	NWB	Newport Beach	OAK	Oakland
TML	Tomales Bay	TRM	Terminal Is.	TRN	Trinidad
WLN	Wilmington	SB	Santa Barbara	SD	San Diego
OBV	Ventura	SF	San Francisco	BDO	Sonoma

Table 7. Definition of species codes

TRAWL FLEET	TUNA FLEET	GILLNET FLEET
sp1) Salmon	sp1) Yellowfin	sp1) Albacore
sp2) Dover	sp2) Skipjack	sp2) Mackerel
sp3) Flatfish	sp3) Bluefin	sp3) Swordfish
sp4) Rockfish	sp4) Albacore	sp4) RockfiSh
sp5) Cod & Lingcod	sp5) Unspecified	sp5) Thresher
sp6) Sable	sp6) Other	sp6) Halibut
sp7) Whiting	sp7) Black skipjack	sp7) Mako
sp8) Shrimp	sp8) Pacific bonito	sp8) Seabass
sp9) Crab	sp9) Swordfish	sp9) Lobster
sp10) Misc.	sp10) Other	sp10) Other