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Three Aspects of the Economic Problems of the Shrimp Industry

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Abstract

In the Gulf area in the past few years the operators of shrimp craft have been faced with acute economic problems that have prompted members of the industry to seek governmental action to stabilize the market situation. In 1959 the market price for shrimp declined sharply, and vessel owners, confronted with the continuing high costs of vessel operations, found it difficult to meet their financial obligations. In 1961 the scarcity of shrimp in certain areas of the Gulf reduced the volume of landings to a level at which vessel operators in many instances found it unprofitable to continue their shrimping activities.

A detailed study of the performance of the vessels in the shrimp fleet in 1959 reveals that the economic problems arising out of the sharp decline in prices adversely affected broad segments of the industry. Affected were not only large firms but small ones as well, shrimping operations of essentially all types, vessels operating out of all of the principal port areas, and vessels engaged in a variety of fishing patterns. The shortage in the supply of shrimp in 1961 has likewise broadly affected the industry because of the participation of a large number of shrimp vessels in the rotation of operations to various grounds as the availability of shrimp makes this feasible. The impact of these changing market and supply conditions on essentially every segment of the shrimp industry, and the nature of these changes, has shown that any measures of market control must take into account conditions over a number of years, and the continuing likelihood of unpredictable conditions of scarcity and abundance in the supply of shrimp. If the needs of a growing consumer market are to be met, control measures should be flexible enough to permit the continuing flow of an adequate quantity of shrimp into the channels of trade.

IN THE REPORT to you today on the findings from the economic study of the shrimp industry which has been carried out at the University of Florida under

a contract with the Bureau of Commercial Fisheries, your attention is directed to a few matters of interest that relate importantly to any program which might be developed to strengthen the economic position of the shrimp industry. First to be examined briefly is the problem of fluctuating annual levels of production experienced by individual shrimp vessels; second is the fishing effort of shrimp vessels in the Gulf area; and third are some aspects of the relationship of production to the cost of vessel operations. In order to provide strong arguments in support of the economic policies desired by the shrimp industry it is necessary to show the conditions that create the problems within the industry, the extent to which these problems extend to all types of vessel operations, and the extent to which the industry is unable to deal with these problems on its own initiative.

The Bureau of Economic and Business Research at the University of Florida has undertaken research to probe into the industry's operations to discover the economic characteristics of the industry and how these characteristics affect its performance. In the process a number of very specific questions have been explored. As indicated, this discussion is limited to a brief consideration of three matters.

The Problem of Fluctuating Annual Levels of Production

One important question that is appropriate to ask is: Is it possible for the individual vessel operators to reduce greatly the fluctuation in their annual landings of shrimp by pursuing a different fishing strategy or different fishing practices? Obviously there is no definite objective measure that can be utilized to secure an answer to this question, but this question, nevertheless, is of vital importance to those who would be asked to provide some type of protection to the industry. For this reason we sought to discover, by a study of the performance of large numbers of vessels in the Gulf area, the extent to which year-to-year fluctuations in the volume of landings characterized the vessel operations. This analysis reveals that the landings of individual vessels do fluctuate greatly from year to year, and that fluctuation in performance is not something that is common only to those who may be lacking in knowledge of fishing techniques and of skill in navigation, but it pervades all segments of the industry. It is not uncommon for vessels to rank at the top of the industry on the basis of total pounds landed in a given year, and then in other years to obtain much lower levels of production.

The study of all reporting vessels operating in the Gulf area and of systematic samples of these vessels, selected on a variety of bases, clearly indicates two things: (1) that the annual volume of landings by shrimp vessels fluctuates greatly from year to year, and (2) that the return from a given amount of fishing effort as measured by the time spent fishing also fluctuates not only between vessels, but for each individual vessel. This analysis of the inability of vessels to maintain stable levels of production reveals that the larger vessels capable of landing a larger volume of landings during the period of a year have been faced with even greater uncertainty concerning their total landings than have the smaller vessels.

Correlations between the pounds landed and the number of days fished indicate that for those vessels that fish a greater number of days during the course of the year there is a greater variety in the resulting total volume of pounds landed. This is illustrated by the scatter diagram for a sample of vessels (Figure 1). This shows the relationship of pounds landed to the number

of days fished for a systematic sample of the vessels in the Gulf area in 1959 which were operated by one-vessel firms. Figure 1 reveals the ranges of production in pounds landed that were achieved as a result of fishing a certain number of days. For example, it may be seen that one vessel which fished between 60 and 70 days landed about 25,000, while another vessel which fished approximately the same amount of time landed almost 70,000 pounds. It appears from this scatter that as the vessel fishes a greater number of days, the deviation from the line of regression or average performance tends to be greater. This evident uncertainty confronting the individual vessel operator and its intensification at higher levels of fishing effort indicates the problem that must be faced in setting up programs to finance the purchase of shrimp vessels. The fluctuation in the results obtained from a given amount of effort makes it very clear that the industry cannot escape recurring financial difficulties if certain types of price instability continue to prevail.

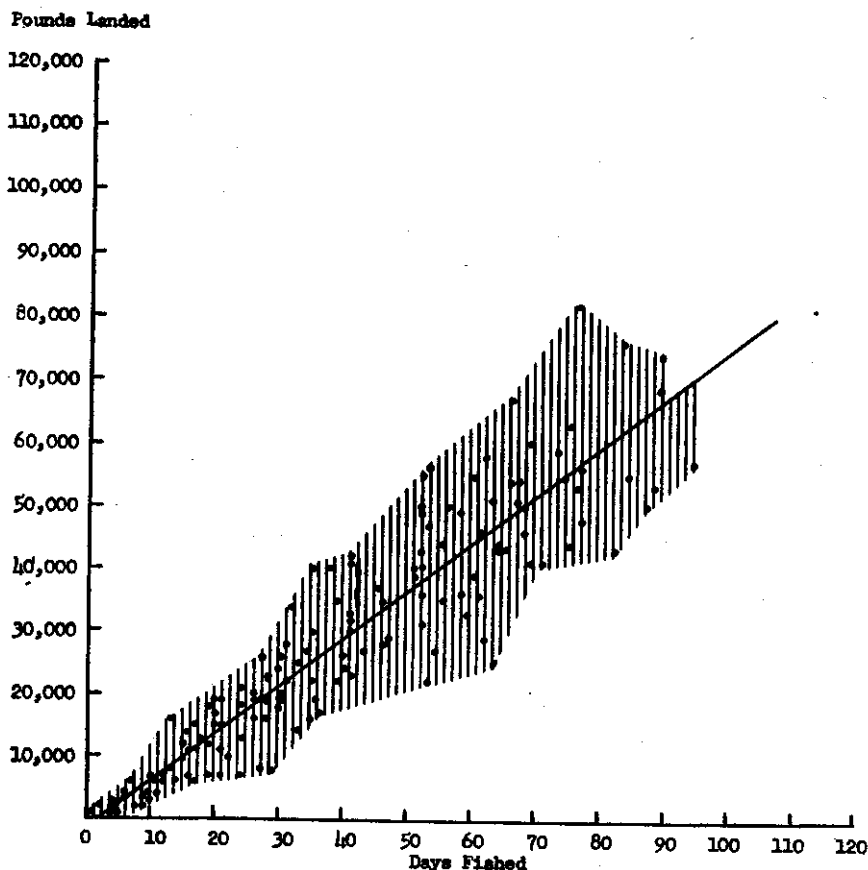


FIGURE 1. Random sample of shrimp vessels in the Gulf area in 1959, operated by one vessel firms: Relationship of pounds landed to days fished in 1959.

TABLE 1
OTTER-TRAWL SHRIMP VESSELS IN THE GULF AREA IN 1956, 1957
1958, AND 1959: DAYS FISHED PER VESSEL

Number of Days Fished	1956			1957			1958			1959		
	No. of Vessels	Percentage Dis. Cum.	Percentage	No. of Vessels	Percentage Dis. Cum.	Percentage	No. of Vessels	Percentage Dis. Cum.	Percentage	No. of Vessels	Percentage Dis. Cum.	
20.9 and under	640	23.6%	23.6%	778	28.0%	28.0%	758	24.5%	24.5%	747	24.4%	24.4%
21.0 — 40.9	599	22.1	45.7	708	25.6	53.6	722	23.3	47.8	734	23.9	48.3
41.0 — 60.9	621	22.9	68.6	544	19.6	73.2	728	23.5	71.3	724	23.6	71.9
61.0 — 80.9	406	15.0	83.6	461	16.6	89.8	565	18.1	89.4	607	19.7	91.6
81.0 — 100.9	303	11.3	94.9	249	9.0	98.8	254	8.2	97.6	236	7.7	99.3
101.0 — 120.9	123	4.5	99.4	34	1.2	100.0	61	2.0	99.6	22	0.7	
120.9 and over	15	0.6	100.0	—	—	—	11	0.4	100.0	1	(*)	100.0
Total	2,707	100.0%		2,774	100.0%		3,099	100.0%		3,071	100.0%	

Source: Compiled from data from the U. S. Bureau of Commercial Fisheries, Machine Run No. 8.

Note: A "day fished" is defined as a total of 24 hours spent by one vessel in trawling or in some phase of the fishing operation. This does not include the travel time to and from the fishing grounds or the time at the fishing grounds when the vessel is not fishing. It usually takes several calendar days at the fishing grounds to accumulate the 24 hours defined as a day fished.

*Less than 0.05 per cent.

—Zero.

TABLE 2

ALL SELECTED SHRIMP VESSELS IN THE GULF AREA IN 1959, GROUPED BY MAJOR AREAS: AVERAGE RECEIPTS, OPERATING COSTS, AND PROFIT AND LOSS PER VESSEL, 1959.

Items	Average per Vessel for All Vessels		East Gulf Area		For Vessels in the— Central Gulf Area		West Gulf Area	
	Amount	Per cent	Amount	Per cent	Amount	Per cent	Amount	Per cent
(Number of vessels)	(126)		(60)		(18)		(48)	
Gross receipts	\$32,041	100.0%	\$35,352	100.0%	\$23,263	100.0%	\$31,193	100.0%
Less unloading and processing	1,737	5.4	1,988	5.6	63	0.3	2,050	6.6
Adjusted gross receipts	30,304	94.6	33,364	94.4	23,200	99.7	29,143	93.4
Crew share	9,925	31.0	10,083	28.5	9,683	41.7	9,819	31.5
Groceries and other crew expenses	1,492	4.7	1,410	4.0	1,745	7.5	1,499	4.8
Fuel, lube oil, etc.	3,725	11.6	3,985	11.3	2,842	12.2	3,729	11.9
Ice	1,323	4.1	1,260	3.6	1,192	5.1	1,451	4.7
Other trip expenses	23	0.1	37	0.1	0	0	15	(*)
Total trip expenses	16,488	51.5	16,775	47.5	15,462	66.5	16,513	52.9
Depreciation	4,368	13.7	5,081	14.4	1,870	8.0	4,412	14.2
Insurance	1,865	5.8	2,254	6.4	890	3.8	1,744	5.6
Repairs	2,846	8.9	2,897	8.2	2,133	9.2	3,051	9.8
Fishing gear and supplies	1,808	5.6	1,955	5.5	1,358	5.8	1,792	5.7
Net and net repairs	1,291	4.0	1,456	4.1	1,021	4.4	1,187	3.8
Licenses and taxes	423	1.3	428	1.2	356	1.5	442	1.4
Interest	540	1.7	615	1.7	64	0.3	625	2.0
Other overhead expenses	892	2.8	1,262	3.6	527	2.3	567	1.8
Total overhead expenses	\$14,033	43.8%	\$15,948	45.1%	\$ 8,219	35.3%	\$13,820	44.3%
Net profit (loss)	(217)	(0.7)	641	1.8	(481)	(2.1)	(1,190)	(3.8)

Source: In addition to the information obtained in a field survey by the Bureau of Economic and Business Research, University of Florida, an important supplement to the data in the table is the cost information supplied by the National Shrimp Congress, Inc.

*Less than 0.05 per cent.

TABLE 3

ALL SELECTED SHRIMP VESSELS IN THE GULF AREA IN 1959, GROUPED BY MAJOR AREAS: AVERAGE RECEIPTS, OPERATING COSTS, AND PROFIT AND LOSS PER VESSEL, 1958

Items	Average per Vessel for All Vessels		East Gulf Area		Central Gulf Area		West Gulf Area	
	Amount	Per cent	Amount	Per cent	Amount	Per cent	Amount	Per cent
(Number of vessels)	(91)							
Gross receipts	\$36,797	100.0%	\$39,276	100.0%	\$25,362	100.0%	\$39,667	100.0%
Less unloading and processing	1,546	4.2	1,678	4.3	87	0.3	2,215	5.6
Adjusted gross receipts	35,251	95.8	37,598	95.7	25,275	99.7	37,452	94.4
Crew Share	11,402	31.0	11,493	29.3	10,279	40.6	11,939	30.0
Groceries and other crew expenses	1,603	4.4	1,303	3.3	1,661	6.5	2,060	5.2
Fuel, lube oil, etc.	3,615	9.8	3,828	9.7	2,713	10.7	3,811	9.6
Ice	1,374	3.7	1,231	3.1	1,165	4.6	1,734	4.4
Other trip expenses	42	0.1	60	0.2	24	0.1	22	0.1
Total trip expenses	18,036	49.0	17,915	45.6	15,842	62.5	19,566	49.3
Depreciation	4,761	13.0	5,214	13.2	1,994	7.9	5,694	14.5
Insurance	1,922	5.2	2,280	5.8	1,033	4.1	1,874	4.7
Repairs	3,279	8.9	3,662	9.3	1,569	6.2	3,689	9.3
Fishing gear and supplies	2,336	6.3	2,470	6.3	1,754	6.9	2,469	6.2
Net and net repairs	1,745	4.7	1,880	4.8	1,424	5.6	1,719	4.3
Licenses and Taxes	356	1.0	414	1.1	229	0.9	338	0.9
Interest	668	1.8	723	1.8	85	0.3	932	2.3
Other overhead expenses	951	2.6	1,086	2.8	575	2.3	957	2.4
Total overhead expenses	16,018	43.5	17,729	45.1	8,663	34.2	17,672	44.6
Net profit (loss)	\$ 1,197	3.3%	\$ 1,954	5.0%	\$ 770	3.0%	\$ 214	0.5%

Source: In addition to the information obtained in a field survey by the Bureau of Economic and Business Research, University of Florida, an important supplement to the data in the table is the cost information supplied by the National Shrimp Congress, Inc.

The Extent of Shrimp Vessel Utilization

The extent to which the vessel fleet is utilized is a matter of considerable importance to the shrimp industry, because the cost studies have shown that the fixed costs are a significant component of the cost of vessel operations and that this component of cost has tended to increase as larger vessels and more elaborate gear and equipment have been brought into widespread utilization. As a result of the broadening of the statistical program by the Bureau of Commercial Fisheries it is possible to examine utilization on the basis of reported activity in the Gulf states area by the vessels operating in that area. From the detailed machine tabulations frequency distributions have been prepared to show the number or proportion of vessels according to the number of days fished in each of the years from 1956 through 1959. Before these figures are discussed it should be pointed out that a day fished has a technical meaning and is defined as a total of 24 hours spent by one vessel in trawling or in some phase of the fishing operation. This does not include the travel to and from the fishing ground when the vessel is not fishing. It usually takes several calendar days at the fishing grounds to accumulate the 24 hours which constitute a day fished.

It may be seen from Table 1 that in each of the four years a very high proportion of the vessels saw very limited use in Gulf shrimping operations. These statistics do not include the fishing days during which these vessels were engaged in operations outside of the Gulf area, but our investigation has indicated that this additional activity will not change the basic showing of the data that there is a tendency for the shrimp vessels to be operated far below their maximum potential use. It is known that many of the shrimp vessels operate on a seasonal basis and that there are a number of conditions operating to restrict the maximum economic potential use of the vessels in the shrimp fisheries to a number of fishing days far below the level that might be considered to be the maximum potential utilization of the vessel. Nevertheless, these figures do show very clearly that two conditions which must be examined with great care are (1) the use that is being made of the vessels in the fleet and (2) the possible alternative uses that may be made of these vessels. The tendency for there to be a declining average productivity among the vessels in the shrimp fleet combined with the increasingly higher costs of vessels and gear make it desirable for the alternative uses to be examined on a broad and searching basis and for the types of programs that would make this possible to be studied with great care.

Operating Costs and Profit and Loss of Selected Vessels

As you know, it is difficult to develop cost information on the operation of shrimp vessels because of the variety of ways in which records are maintained by vessel operators. Past efforts to obtain operating data from a representative group of vessels have not met with success. Thus, in our efforts to secure information, attention has been centered on some selected types of operations. In this connection we were fortunate in being able to supplement our extensive field survey with a significant analysis prepared by the National Shrimp Congress and presented by them to the United States Tariff Commission.

Although no endeavor is made here to explore all of the elements that influence costs, two sets of cost tables have been prepared on selected shrimp vessels in the Gulf area, and these divide the vessels according to the three

broad geographic areas of the Gulf in which their principal ports are located: (1) the western area, which includes all ports along the Texas coast; (2) the central area, which includes all ports in Mississippi and Louisiana plus the extreme western Florida port of Pensacola; and (3) the eastern area, which includes all of the Florida ports on the Gulf except Pensacola. The average operating results from these vessels in the respective areas are shown for the years 1958 and 1959. Several conditions may be observed. The selected vessels in each of the geographic areas earned an average net profit in 1958; the selected vessels in the East Gulf area earned the highest profit, and those in the West Gulf area earned a very low profit. The average gross receipts in the East Gulf area and the West Gulf area were essentially the same, while in the Central Gulf area they were much lower. In the East and West Gulf areas the total overhead expenses both in dollar amounts and as a per cent of gross receipts were essentially the same. The item which accounted principally for the difference in the average profits between the respective areas was the total trip expenses. In the East Gulf area these were 45.6 per cent of gross receipts, while in the West Gulf area they were 49.3 per cent. It is noticeable also that in the Central Gulf area the selected vessels have a strikingly different cost structure from those in the other areas. The trip expenses are a much higher proportion of gross receipts, and the total overhead expenses, a much lower proportion. This is a reflection of the differences in the types of fishing operations and in the types of vessels utilized.

In 1959 all of the selected vessels showed a small net operating loss. The vessels in the East Gulf area earned a small profit of 1.8 per cent of gross receipts, while the vessels in the other two areas incurred an operating loss, the greatest loss occurring in the West Gulf area. Several findings may be noted. The average value of landings in the East and in the West Gulf areas continues to be considerably above the average value for the selected vessels in the Central Gulf area. The average gross receipts in 1959 were lower than the average gross receipts in 1958, even though the average number of pounds landed in 1959 was much greater than in 1958. This relationship occurred in all three geographic areas. It is significant to observe the change in the cost structure that occurred between 1958 and 1959 as a result of the drop in the average receipts per pound. In 1958 the average receipts per pound of shrimp landed were 67.9¢ in the East Gulf area, 73.1¢ in the Central Gulf area, and 71.5¢ in the West Gulf area. In 1959 these respective figures were 52.1¢, 54.3¢, and 50.1¢. Even with these substantial declines in the receipts per pound, the average total receipts were almost as high in 1959 as in 1958 because of the larger volume of landings. In 1959 the overhead as a per cent of gross receipts was essentially unchanged; however, the trip expenses as a per cent of gross receipts increased. This was true to a considerable extent in each of the three geographic areas. The only exception was that the overhead expenses as a per cent of gross receipts increased slightly in the Central Gulf area.

Thus it may be reasoned that as a result of the acceleration in volume it was possible for the vessels to off-set the decline in price in meeting their overhead expenses, but this greater volume of operations had the effect of increasing the proportion of trip expenses that had to be met out of the aggregate receipts. The operating statements for the two years indicate that overhead is a relatively high proportion of the total outlays, and thus, it is to be anticipated that during a period of rapid price decline a substantial augmentation in volume is necessary to keep these at the same level as when prices are

favorable. On the other hand, the direct tie of a very high proportion of the operating costs to the price levels, and to the volume of landings as well, makes it difficult to attain a level of landings that will produce a profit. It is to be noted also that even during the period of favorable prices the profits were modest as a result of the high overhead expenses.

An examination of the individual items of overhead expense indicates that these were quite variable depending upon the insurance coverage, method of writing off depreciation, the interest cost on mortgage indebtedness, and the expenditures for repairs during the accounting period. If an accurate evaluation is to be made of the operating costs of shrimp vessels, cost data should be obtained on individual vessels over a number of years in order to develop information on cost experience. The cost structures of the group of vessels showing a higher proportion of receipts going to operating expenses are to a considerable extent a result of the crew share arrangements existing in the Central Gulf area. These higher returns to the crew in this region are not necessarily a reflection of higher wage rates because it was found that there was a high incidence of vessels that were operated by owner-captains or of vessels that are operated as family operations.

The Mechanical Performance of Gulf of Mexico Shrimp Trawls

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Abstract

THIS THIRTY MINUTE FILM described the three basic Gulf of Mexico shrimp trawl designs: the flat, the four seam, semi-balloon, and the two seam balloon trawls. The configuration and dimensions of these trawls under various physical conditions was shown. The effect of variables such as flotation, towing speed, door size, and footrope weight was depicted. Also the performance of accessory equipment such as tickler chains and mud rollers was shown.

This 16mm color film may be obtained on loan from the Pascagoula Fishery Laboratory, P.O. Box 630, Pascagoula, Mississippi.