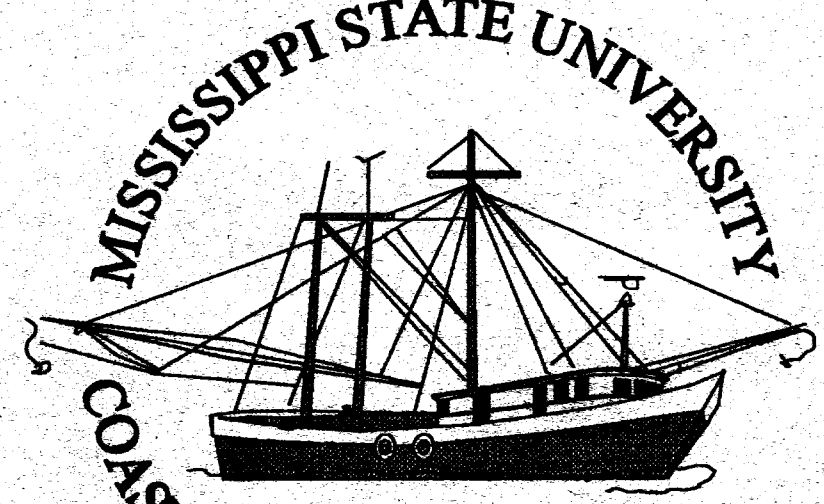
Economic Impact of Dockside Gaming on the Commercial Seafood Industry in Coastal Mississippi

Final Report



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Abstract

The economic impact of dockside gaming on the commercial seafood industry was evaluated by comparing selected economic indicators of the commercial fishing and processing sectors before and during the legalization of dockside gaming in Mississippi. It is evident that dockside gaming expanded economic activities in the region leading to higher employment, personal income and government revenues. The economic expansion associated to dockside gaming, however, was accompanied by some adjustments in the state's commercial seafood industry. First, the reduction of the size of the commercial fishing fleet due to the closure of some support services eventually led to the decline in both the volume and value of state's commercial landings. The number of commercial fishing licenses issued slightly decreased during the second period. Second, the significant reductions in the volume and value of seafood production in Mississippi during the later period were accompanied by substantial shrinkage in both seafood processing capacity and employment. The average volume and nominal values of fishery products processed by each plant also fell during the second period. Fewer seafood wholesaling plants and workers were reported during the later period. Third, the drop in the state's commercial landings during the later period resulted in some downward adjustments in the region's economy in terms of output, jobs and income related to commercial fishing. Finally, as the volume and values of fishery products processed diminished, lesser value added, income and employment effects were generated by the seafood processing sector in coastal Mississippi.

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Introduction

The development of the dockside gaming industry in coastal Mississippi brings about changes in the economies of the coastal counties. Economic decisions made by households, business and government institutions are affected by the size and growth of this industry. Household spending patterns are affected by the added choices on the various forms of entertainment or recreation provided by the industry. The total incomes of households are enhanced by the direct and indirect economic activities and employment created by the new industry. Tax revenues of both local and state governments expand as a result of the additional economic transactions created by casino gaming. The public demand for government infrastructure and services would likewise increase as the size and composition of resident and tourist populations increase, and as the size and structure of the local economy transform.

The size and structure of local business establishments are either positively or negatively affected by the size and growth of the casino industry. Those firms that provide complementary products or services will experience expansion in business transactions as the dockside gaming industry grows. Other firms that offer competing products or services will be displaced by the competition from the dockside gaming industry. The new and existing firms that employ the same scarce economic resources which the dockside gaming industry also employs will be forced to operate more efficiently, diversify or cease operations. Those establishments which produce goods and services consumed by the gaming industry will have an expanded local market for their products.

The main goal of this study is to measure the economic impact of the development of dockside gaming on the commercial seafood industry in coastal Mississippi. Specifically, it aims to compare both the direct and indirect output, income and employment created by the harvesting and processing sectors of coastal Mississippi commercial fisheries before and after the legalization of dockside gaming in the area. The results of this study will provide a framework for coastal planners and decision-makers to evaluate the potential economic impact of similar developments on coastal communities. The study is timely because other coastal states are in the process of developing dockside gaming as a means of economic expansion.

Dockside Gaming

Brief history. Dockside gaming was legalized in Mississippi when the State Legislature passed the Gaming Control Act in 1990 (King, 1994). Voters in two coastal counties voted in favor of dockside gaming. Hancock County voters approved dockside gaming in December 1990. During a second referendum conducted in March 1992, voters in Harrison County approved dockside gaming. King (1994) reported that seven more counties have legalized dockside gaming in Mississippi, namely: Adams, Clairborne, Coahoma, Issaquena, Tunica, Warren and Washington.

Despite the regulatory supervision which the Mississippi Gaming Commission exercises over dockside gaming in the state, the decision to enter or leave the industry is made by the individual casino operations themselves based on their ability to compete. As of November 1995, the number of operating casinos totaled 28 with 12 operations located in two coastal counties and 16 operations in six river counties (MBJ, 1995 and Table 1). Since legalization, two coastal casino operations closed, four river operations went bankrupt, one casino located in Tunica County moved to Iowa, one moved from Tunica County to Coahoma County and one coastal casino swapped location with another river operation. A few more casino operations are either in the construction or planning stage in both coastal and river counties, e.g., Imperial Casino and Golden Nugget Casino in Harrison County and Grand Casino in Tunica County.

These casino operations also provide diversified services including restaurants and lounges, hotel and convention accommodations, sports facilities, gift and souvenir shops, recreational facilities and live stage performances. These service facilities were initially constructed in compliance with state regulation on required investment in physical infrastructure. In October of 1994, the Mississippi Gaming Commission adopted a regulation requiring casinos to invest at least 25 percent of their total investment in shore-based infrastructure. Additional economic activities, employment opportunities and income are generated by the establishment of these service facilities by the gaming industry. However, it is expected that due to added competition by these new service facilities, there will be restructuring of the service and related industries in the region.

Gaming revenues. Gross revenues from gaming refer to net gains realized by a casino after payment of all cash paid out as losses to patrons, and those amounts paid to purchase annuities to fund losses paid to patrons over several years by independent financial institutions (MDECD, 1995). The annual gross revenues of the Mississippi gaming industry since it was legalized were $428 million in FY 1992-93, $1,176 million in FY 1993-94, $1,611 million in FY 1994-95 (Table 1). The gross monthly revenues of all casino operations rose steadily during the first two years (Fig. 1). During the last twelve months, however, gross monthly revenues remained fairly stable at about $143.7 ± 9.5 million.

The casino operations located in the coastal counties received about 45% of the total gaming revenues in FY 1994-95 totaling $721 million. During the first half of FY 1995-96, however, their share fell to about 41% of the state total gaming revenues. On the average, the coast casinos reported gross revenues of about $60.3 ± 4.7 million per month since January 1994 to December 1995 (Fig. 2). On the other hand, an upward trend in gaming revenues received by river casinos was observed during the last two years ending in December 1995 (Fig. 2).

Fig. 1. Monthly Gaming Revenues
Mississippi, Aug. 1992-Dec. 1995

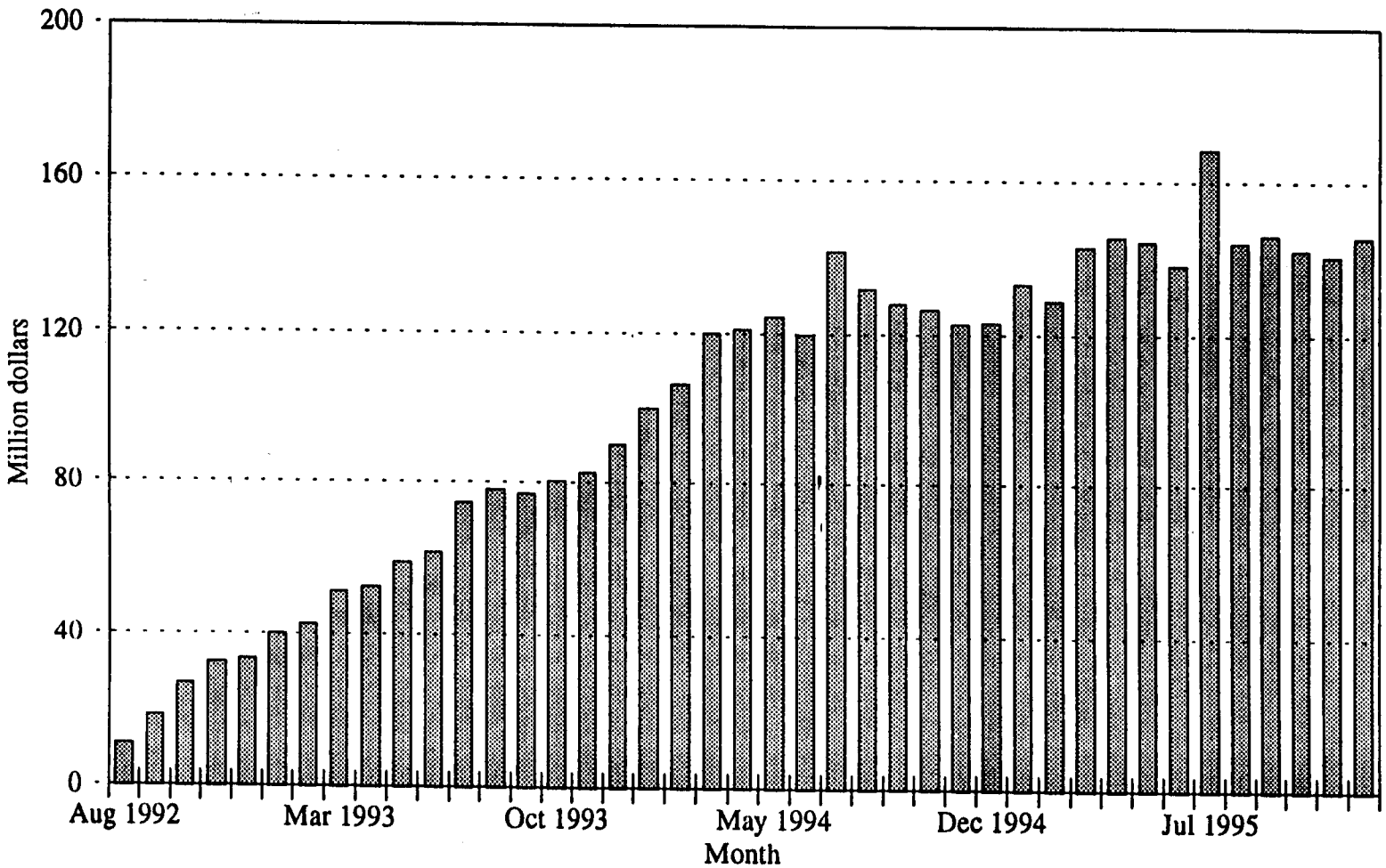


Fig. 2. Monthly Gaming Revenues
Mississippi Counties, Jan. 94-Dec. 95

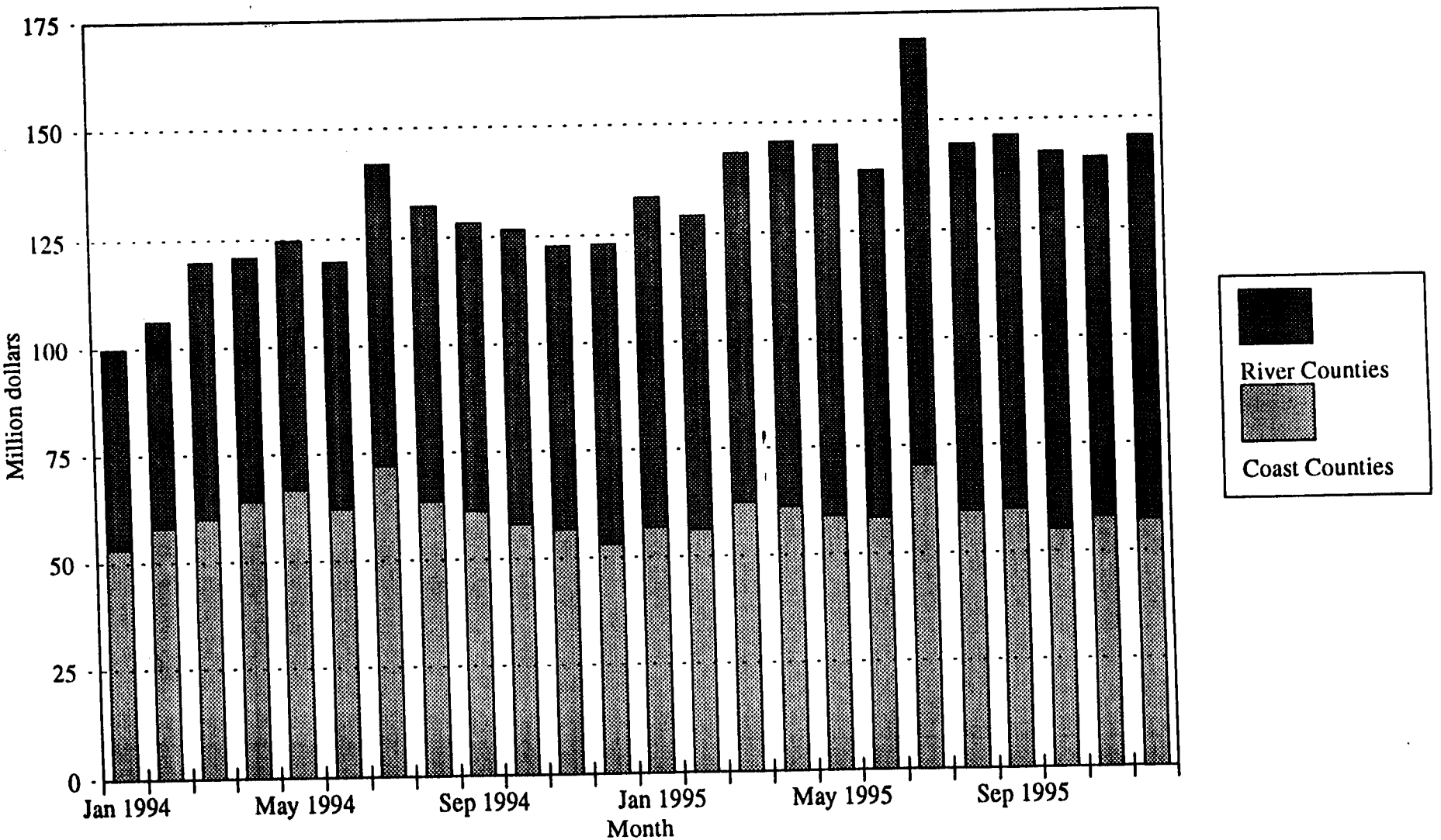


Table 1. Number of Boats, Gaming Revenues and Tax Revenues from Mississippi Gaming Industry, Fiscal Years 1992-93 to 1994-95

Item	FY 1992-93	FY 1993-94	FY 1994-95
Number of Boats:			
Coastal Counties	6	12	12-14
River Counties	2	16	17-20
Total	8	28	29-34
Gross Gaming Revenues ($M):			
Coastal Counties	NA	NA	721
River Counties	NA	NA	890
Total	428	1,176	1,611
Tax Revenues from Gaming ($M):			
General Fund Transfer	33	95	129
Transfer to Local Governments	11	34	60
Total	44	129	189

Sources: Gaming revenues and taxes - MSTC (1996); number of boats - CPRP (1994), MBJ (1995) and MBJ (1996).

Income and employment. The number of persons employed and income generated by the state gaming industry continued to increase during the last three fiscal years. The annual income received by employees averaged between $16,000 and $17,000 per person. By FY 1994-95, about 42,000 persons were employed by the casino operations in the state and another 38,000 persons were hired by related industries (Table 2). In FY 1994-95, the 12-14 dockside gaming operations located in two coastal counties hired about 15,000-16,000 persons while indirectly related industries employed between 14,000 and 15,000 additional persons. Total wages and salaries paid by coastal gaming operations to their own workers and employees amounted to about $265 million, while employers in indirectly related industries paid $250 million more to their own employees.

Table 2. Estimated Employment and Income Effects of Mississippi Gaming Industry, Fiscal Years 1992-93 to 1994-95

Item	FY 1992-93	FY 1993-94	FY 1994-95
Employment effects (persons):			
Direct	13,000	31,000	42,000
Indirect	11,000	28,000	38,000
Total	24,000	59,000	80,000
Income effects ($M):			
Direct	210	520	720
Indirect	190	470	630
Total	400	990	1,350

Sources and legends: Economic effects and multipliers - CPRP (1994); economic impacts - annual impact and start-up investment impact; income multiplier - 1.94; employment multiplier - 1.91.

Commercial Fishing

All species. The long-term trends of Mississippi commercial landings, which consist of several major species of foodfish, shellfish and industrial finfish are shown in Fig. 3. Significant reductions in the volume of commercial landings and size of the commercial fishing fleet were observed in 1992-95. Approximately 287.7 ± 34.7 million pounds were landed in 1988-91, as compared to 183.8 ± 30.9 million pounds in 1992-95 (Table 3). The size of the Mississippi fishing fleet varied during both periods. Fewer fishing vessels weighing more than 5 tons (707 vs. 650 vessels) and fishing boats weighing less than 5 tons (1,206 vs. 971 boats) were reported during the later period. The number of commercial fishing licenses issued slightly declined (2,869 vs. 2,533) during the second period.

The dockside values of commercial landings expressed in both current and constant prices were lower during the second period. Current dockside values were $41.1 ± 4.6 million in 1988-91 and $36.9 ± 7.7 million in 1992-95. Deflated landing values also decreased from $32.5 ± 5.2 million during the first period to $25.2 ± 4.6 million during the second period. The average ex-vessel prices of all species, in both nominal (14.3 vs. 20.5 cents per pound) and deflated (11.3 vs. 14.0 cents per pound) terms, rose slightly during the second period.

Fig. 3. Commercial Fisheries Landings
Mississippi, 1950-1995, in millions

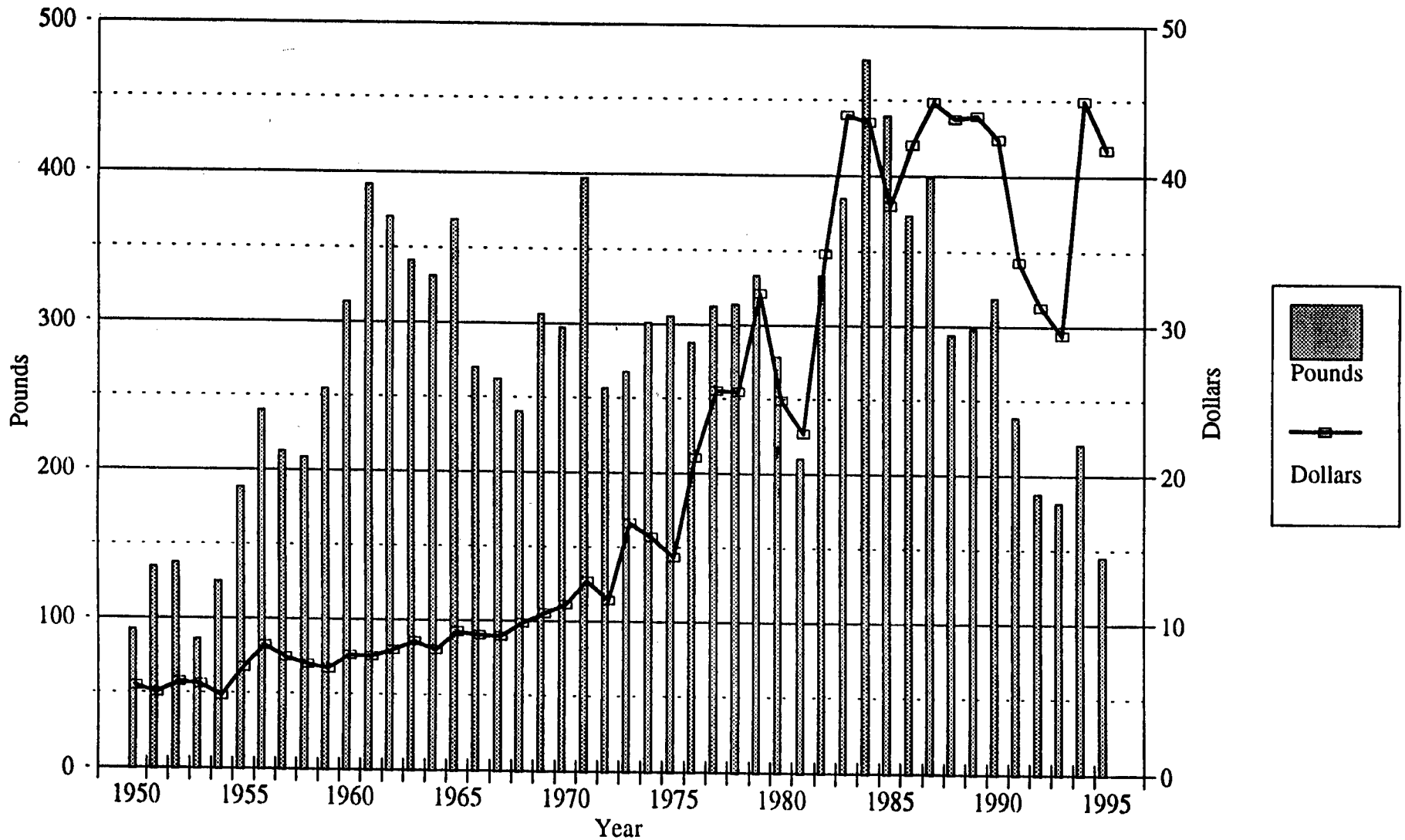


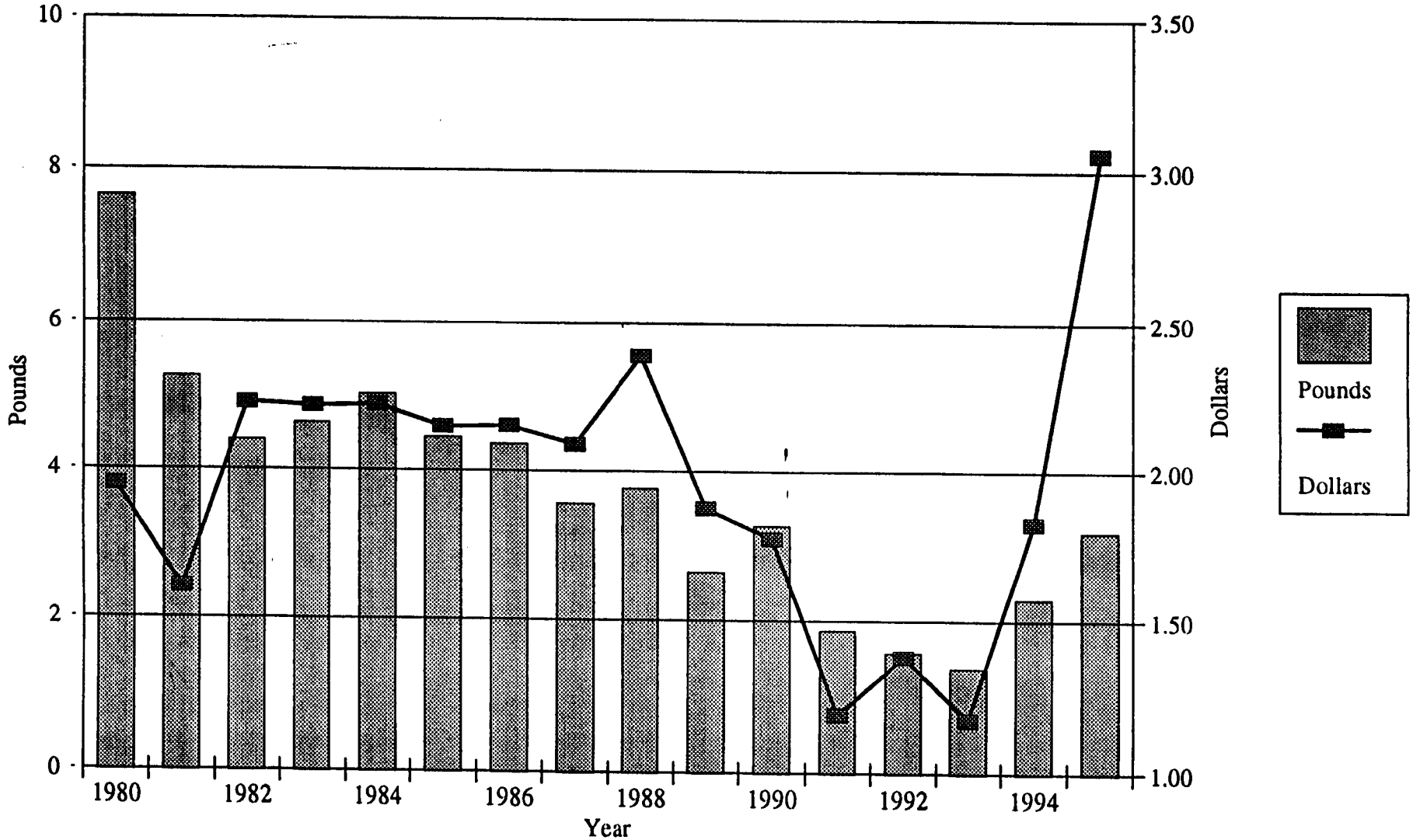
Table 3. Total Commercial Landings, Fishing Units and Fishermen in Mississippi Before and During Dockside Gaming, 1988-95

Item	Description	1988-91	1992-95
Volume of landings ***	million pounds per year	287.71 [a] (34.68)	183.81 [b] (30.88)
Nominal landings value ns	million dollars per year	41.09 [a] (4.58)	36.88 [a] (7.65)
Deflated landings value *	million dollars per year	32.51 [a] (5.24)	25.19 [a] (4.63)
Nominal ex-vessel price *	cents per pound	14.3 [b] (0.7)	20.51 [a] (5.7)
Deflated ex-vessel price ns	cents per pound	11.3 [a] (0.1)	14.0 [a] (3.5)
Number of fishing vessels ns	> 5 tons	707 [a] (55)	650 [a] (203)
Number of fishing boats ***	< 5 tons	1,206 [a] (54)	971 [b] (34)
Number of fishermen ns	persons	2,869 [a] (174)	2,533 [a] (649)

Sources and legends: Landings - NMFS (1989-96); operating units - NMFS (1990-94) and NMFS (1988-89); *** - significantly different at 1%; * - significantly different at 10%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations; number of fishermen refers to number of commercial fishing licenses sold in 1988-91 and 1992-94.

Foodfish species. Commercial foodfish landings refer to commercial landings of all finfish species excluding some species used for industrial purposes such as menhaden and bait. Fig. 4 shows the commercial landings of foodfish species during the last 15 years. The value of foodfish landings constituted 4.3 ± 0.6 percent of the total commercial landings during the two periods under consideration. There were no significant variations in the volumes and values of commercial foodfish landed in Mississippi during the two periods. Commercial foodfish landings averaged 2.9 ± 0.8 million pounds in 1988-91 and 2.1 ± 0.8 million pounds in 1992-95 (Table 4). The current landing values of commercial foodfish were $1.8 ± 0.5 million in 1988-91 and $1.9 ± 0.8 million in 1992-95.

Fig. 4. Commercial Foodfish Landings
Mississippi, 1980-95, in millions



There is a strong indication, however, that there were marked improvements in the markets for foodfish species landed in Mississippi. Ex-vessel prices of foodfish species at current market prices rose from 62.8 ± 6.4 cents per pound to 87.0 ± 6.7 cents per pound. At constant 1982-84 prices, the average ex-vessels prices of foodfish were 49.6 ± 6.9 and 59.6 ± 4.3 cents per pound in 1988-91 and 1992-95, respectively.

Table 4. Total Commercial Landings of Foodfish in Mississippi Before and During Dockside Gaming, 1988-95

Item	Description	1988-91	1992-95
Volume of landings [ns]	million pounds per year	2.90 [a] (0.82)	2.11 [a] (0.82)
Nominal landing value [ns]	million dollars per year	1.81 [a] (0.49)	1.86 [a] (0.84)
Deflated landing value [ns]	million dollars per year	1.44 [a] (0.47)	1.26 [a] (0.54)
Nominal ex-vessel price ***	cents per pound	62.8 [b] (6.7)	87.0 [a] (6.7)
Deflated ex-vessel price **	cents per pound	49.6 [b] (6.9)	59.6 [a] (4.3)

Sources and legends: Landings - NMFS (1993-95) and NMFS (1988-92); *** - significantly different at 1%; * - significantly different at 10%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations.

Shrimp. Commercial shrimp landings consist primarily of commercial landings of brown, white and other species. The long-term fluctuations of shrimp landings in the state are shown in Fig. 5. Shrimp landings comprised 60.4 ± 6.0 percent of the total commercial landing value during the two periods. Houston and Nieto (1988) stated that shrimp supplies in the short run and long run are based on the interaction of biological availabilities and the pricing system. While the conditions affecting the biological cycles of shrimp abundance may vary over time, shrimp landings increase proportionately with fishing effort. On the average, more shrimp (13.9 million pounds or $25.5 million) were landed in 1988-91 as compared to 1992-94 (11.2 million pounds or $22.4 million, Table 5). The size of the commercial shrimp fleet fluctuated during the two periods. The number of fishing vessels weighing more than five tons decreased from 655 ± 113 vessels to 626 ± 209 vessels, while those fishing units less than five tons fell from 873 ± 155 boats to 818 ± 21 boats. A slightly lesser number of commercial fishing licenses (2,180 ± 575) were issued in 1992-94 as compared to that in 1988-91 (2,251 ± 262).

Fig. 5. Commercial Shrimp Landings
Mississippi, 1950-95, in millions

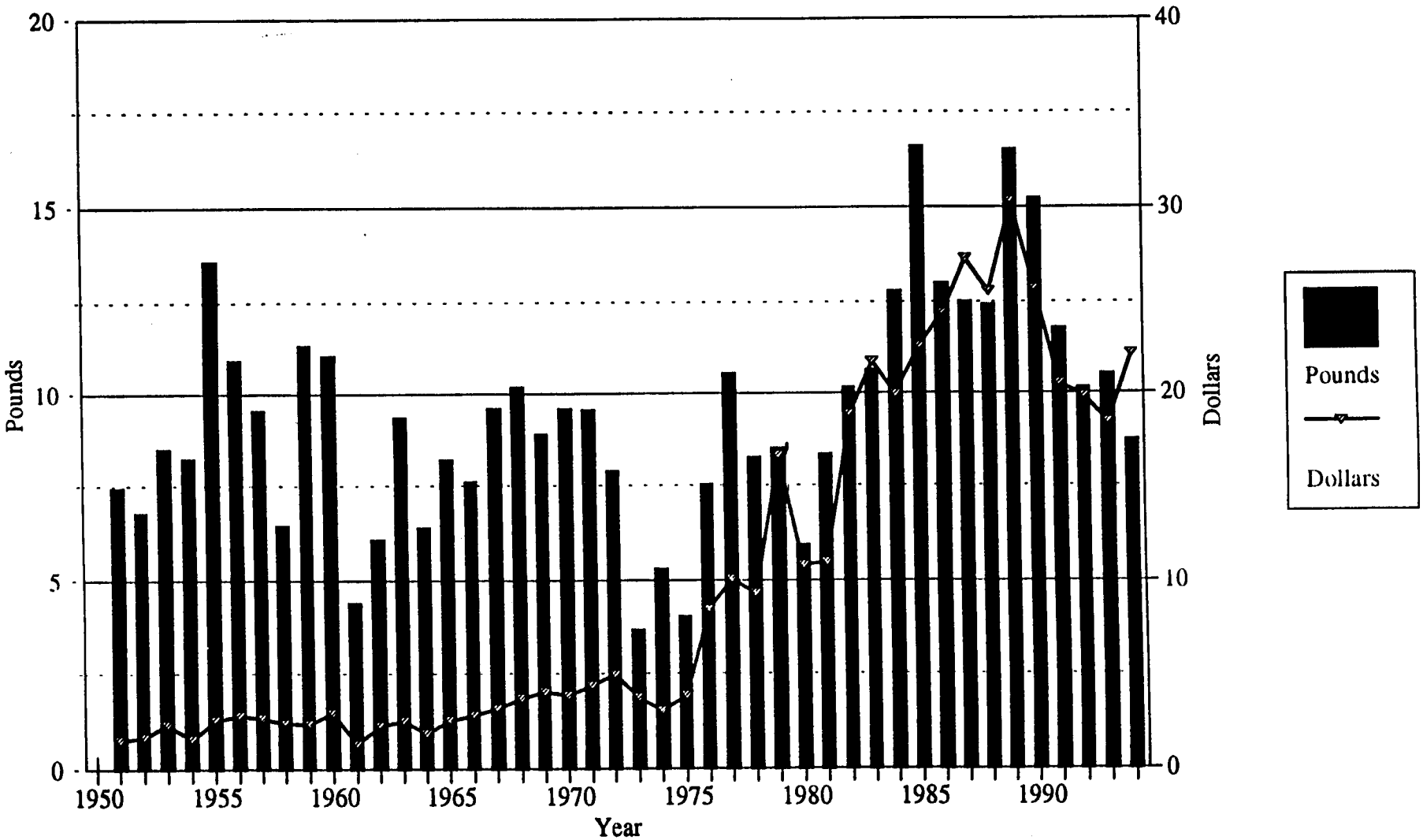


Table 5. Commercial Shrimp Landings, Fishing Units and Fishermen in Mississippi Before and During Dockside Gaming, 1988-95

Item	Description	1988-91	1992-95
Volume of landings [ns]	million pounds per year	13.99 [a] (2.26)	11.20 [a] (2.91)
Nominal landing value [ns]	million dollars per year	25.51 [a] (3.99)	22.35 [a] (4.69)
Deflated landing value [*]	million dollars per year	20.19 [a] (3.94)	15.27 [a] (2.81)
Nominal ex-vessel price [ns]	cents per pound	182.8 [a] (16.2)	203.1 [a] (34.4)
Deflated ex-vessel price [ns]	cents per pound	144.5 [a] (21.4)	139.1 [a] (22.5)
Number of fishing vessels [ns]	> 5 tons	655 [a] (113)	626 [a] (209)
Number of fishing boats [ns]	< 5 tons	873 [a] (155)	818 [a] (21)
Number of fishermen [ns]	persons	2,251 [a] (262)	2,180 [a] (575)

Sources and legends: Landings - NMFS (1993-95) and NMFS (1988-92); operating units - NMFS (1990-94) and NMFS (1988-89); ** - significantly different at 5%; * - significantly different at 10%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations; number of fishermen refers to number of commercial fishing licenses sold in 1988-91 and 1992-94.

Houston and Nieto (1988) found that deflated ex-vessel prices of shrimp in the Gulf Coast tend to decrease as the Gulf and other regions' landings increase, net shrimp imports increase, and regional disposable income decreases. Current shrimp ex-vessel prices in Mississippi increased from $1.83 ± 0.16 per pound in 1988-91 to $2.08 ± 0.40 per pound in 1992-95. On the other hand, deflated ex-vessel prices of shrimp landed in Mississippi decreased slightly from $1.45 ± 0.21 to $1.44 ± 0.25 per pound. Total Gulf of Mexico commercial shrimp landings (heads-on) declined from 233.1 ± 10.9 million pounds in 1988-91 to 211.6 ± 9.1 million pounds in 1992-94. Likewise, total U.S. shrimp imports increased from 593.5 ± 29.8 million pounds in 1988-91 to 717.6 ± 28.9 million pounds in 1992-94. Mississippi shrimp landings contributed an average of 5.42 ± 1.01 percent of the total Gulf shrimp landings in 1988-94.

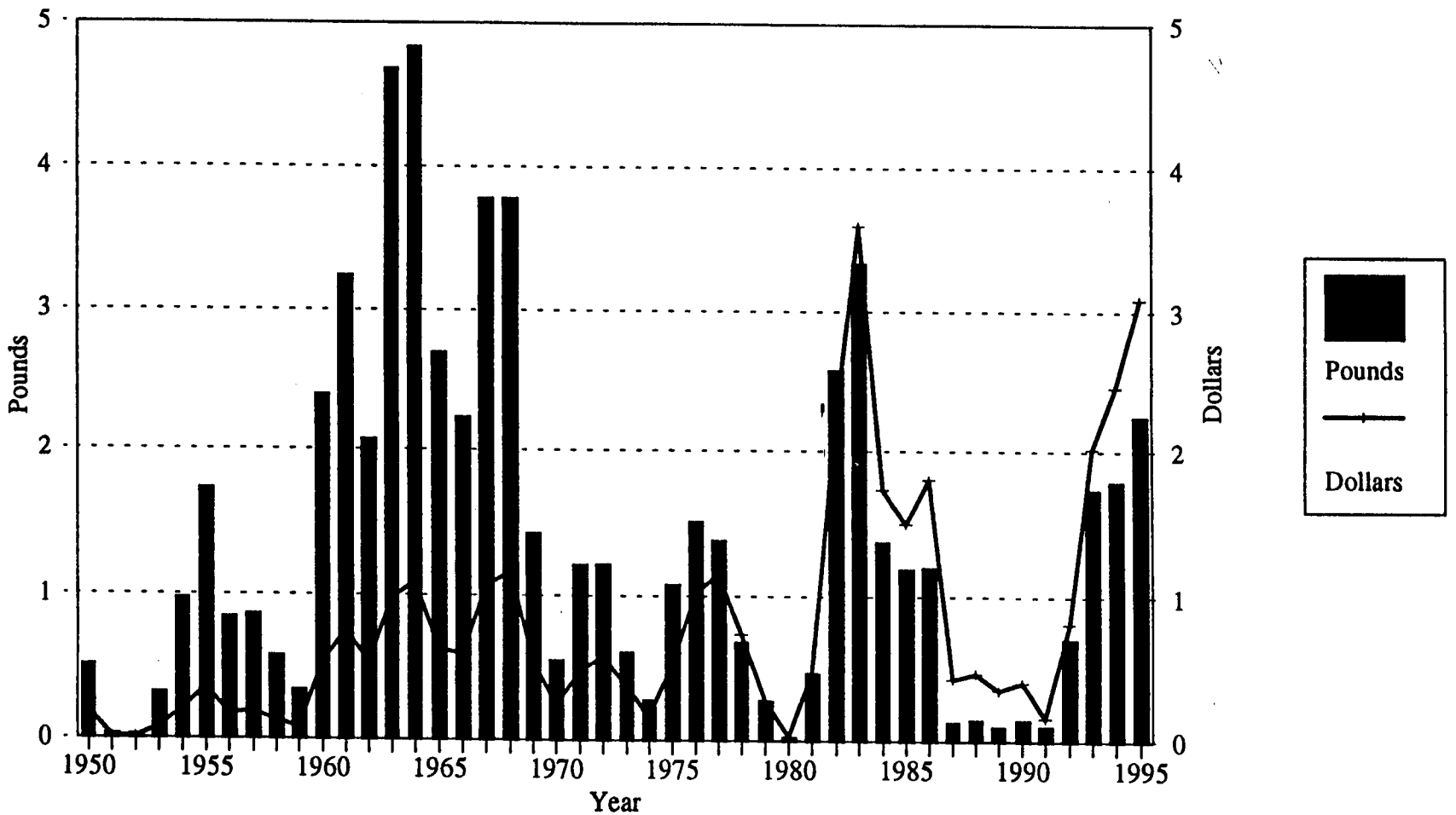
Oysters. GSMFC (1991) stated that long-term fluctuations in the catches and landings of the commercial oyster fishery by state (Fig. 6) and for the entire Gulf of Mexico indicated the degree of oyster dependence upon and sensitivity to environmental changes. First, habitat deterioration was considered the most severe cause of the fluctuations in oyster catches. Second, seasonal salinity fluctuation may have caused short-term reductions in oyster populations. Third, sewage pollution in oyster growing areas made oysters unsafe for human consumption. Finally, regulatory, enforcement and socioeconomic problems, and regulations concerning public health safety have increased over time and exerted restrictions on oyster landings.

Table 6. Commercial Oyster Landings, Fishing Units and Fishermen in Mississippi Before and During Dockside Gaming, 1988-95

Item	Description	1988-91	1992-95
Volume of landings ***	million pounds per year	0.12 [b] (0.03)	1.62 [a] (0.65)
Nominal landing value **	million dollars per year	0.34 [b] (0.13)	2.09 [a] (0.96)
Deflated landing value **	million dollars per year	0.27 [b] (0.12)	1.42 [a] (0.62)
Nominal ex-vessel price **	cents per pound	272.5 [a] (84.4)	126.3 [b] (12.8)
Deflated ex-vessel price **	cents per pound	217.3 [a] (75.9)	86.4 [b] (6.4)
Number of fishing vessels ns	> 5 tons	33 [a] (9)	29 [a] (12)
Number of fishing boats **	< 5 tons	184 [a] (28)	118 [b] (4)
Number of fishermen ns	persons	236 [a] (79)	244 [a] (28)

Sources and legends: Landings - NMFS (1993-95) and NMFS (1988-92); operating units - NMFS (1990-94) and NMFS (1988-89); *** - significantly different at 1%; ** - significantly different at 5%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations; number of fishermen refers to number of commercial fishing licenses sold in 1988-91 and 1992-94.

Fig. 6. Commercial Oyster Landings
Mississippi, 1950-95, in millions

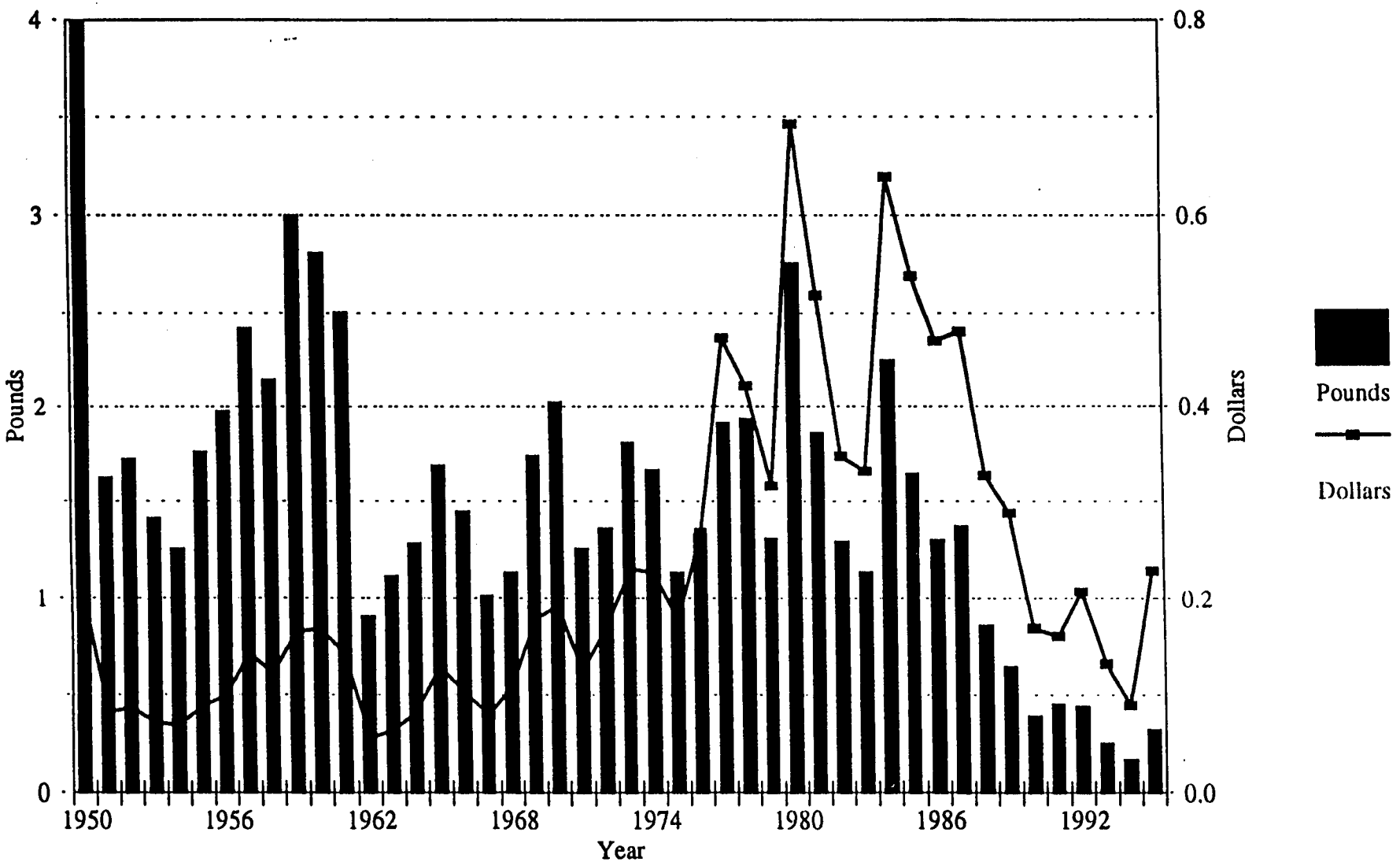


Mississippi oyster landings, which made up 2.59 ± 2.56 percent of the total commercial landing value of the state in 1988-94, varied significantly during the two periods (Table 6). More oysters were landed in the state by a smaller fleet of commercial oyster fishing units during the later period. About 0.12 ± 0.03 million pounds were landed annually in 1988-92, while 1.62 ± 0.65 million pounds were reported in 1992-94. The higher commercial landings were reported by fewer fishing vessels weighing more than five tons (33 vs. 29 vessels), fewer fishing boats weighing less than five tons (184 vs. 118 boats), and slightly higher number of commercial fishermen (236 vs. 244 persons).

Both the current and deflated dockside values of commercial oyster landings were significantly higher during the second period. The annual oyster landings were valued at $0.34 ± 0.13 million in 1988-92 and $2.09 ± 0.96 million in 1992-94. Oyster ex-vessel prices (in nominal terms) fell from $2.73 ± 0.84 per pound of meat during the first period to $1.26 ± 0.13 per pound of meat during the second period. The average deflated prices of oysters landed in Mississippi fell from $2.17 ± 0.76 to $0.86 ± 0.06 per pound of meat. Using 1970-94 data, it was shown by ordinary least squares (OLS) regression analysis that expansions in state oyster landings would lead to lower dockside oyster prices in the state. Since Mississippi reported about 3.24 ± 3.23 percent of all the oysters landed in the Gulf of Mexico region during the two periods, the deflated ex-vessel prices of its oyster landings are likewise influenced by market forces outside of the state. When oyster landings in other Gulf states increase, ex-vessel prices in Mississippi tend to decrease as its oyster market tends to follow market signals from major producing states in the region such as Louisiana. Higher oyster imports also tend to exert direct effects on the state's dockside oyster prices. The prices of other species (shrimp, blue crabs, beef, poultry and pork), disposable income and the dummy variable representing dockside gaming did not have any significant effect on dockside prices.

Blue crabs. Rhodes and Shabman (1994) referred to the blue crab fishery in Virginia as highly influenced by its marine environment. Although the commercial catch varies from season to season, Van Engel (1985) as cited in Rhodes and Shabman (1994) attributed these variations from short-term changes in the quality of the environment. Meeter et al. (1979) as cited in GSMFC (1990) suggested that certain unidentified socioeconomic variables may in part be responsible to long-term fluctuations in blue crab landings in the Apalachicola River estuarine system in Florida. Other investigators cited in GSMFC (1990) stated that fluctuations in blue crab landings were influenced by economic conditions rather than by scarcity of crabs (Lyles, 1976) or population levels (Moss, 1981). Large fluctuations were observed in the long-term landings of blue crabs in the state (Fig. 7). Crab landings constituted 0.5 ± 0.2 percent of the total commercial landing values of the state in 1988-94. The volumes of commercial crab landings were significantly lesser during the second period. On the average, landings were 0.59 ± 0.21 million pounds in 1988-91 and 0.30 ± 0.12 million pounds in 1992-94 (Table 7). The size of the fishing fleet, which consist mainly of boats weighing less than five tons, however, remained fairly stable (33 vs. 34 boats) during the two periods. More crab commercial fishermen were registered during the later period (31 vs. 48 persons).

Fig. 7. Commercial Blue Crab Landings
Mississippi, 1950-95, in millions



Annual commercial crab landing values were $0.25 ± 0.09 million in 1988-91 and $0.17 ± 0.07 million in 1992-94. Average current ex-vessel prices of blue crabs slightly increased from 42.2 ± 6.3 cents per pound in 1988-91 to 56.7 ± 11.4 cents per pound in 1992-94. Since Mississippi crab landings contributed less than 1 percent (0.76 ± 0.32 %) of the entire U.S. Gulf of Mexico region in 1988-94, ex-vessel prices in the state tend to follow market signals from other major crab producing states in the region. It has been shown by several investigators cited by (GSMFC, 1990) that dockside blue crab prices are relatively unresponsive to variations in landings. The primary factor believed to have caused dockside prices of blue crabs to increase was the rapid growth in disposable income.

Table 7. Commercial Blue Crab Landings, Fishing Units and Fishermen in Mississippi Before and During Dockside Gaming, 1988-95

Item	Description	1988-91	1992-95
Volume of landings **	million pounds per year	0.59 [a] (0.21)	0.29 [b] (0.12)
Nominal landing value ns	million dollars per year	0.25 [a] (0.09)	0.17 [a] (0.07)
Deflated landing value ns	million dollars per year	0.20 [a] (0.08)	0.12 [a] (0.05)
Nominal ex-vessel price *	cents per pound	42.2 [a] (6.3)	56.7 [a] (11.4)
Deflated ex-vessel price ns	cents per pound	33.3 [a] (5.7)	38.7 [a] (6.7)
Number of fishing boats ns	< 5 tons	33 [a] (9)	34 [a] (10)
Number of fishermen ns	persons	31 [a] (9)	48 [a] (14)

Sources and legends: Landings - NMFS (1993-95) and NMFS (1988-92); operating units - NMFS (1990-94) and NMFS (1988-89); * - significantly different at 10%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations; number of fishermen refers to number of commercial fishing licenses sold in 1988-91 and 1992-94.

Using 1970-94 data in an OLS regression analysis, several factors were identified as having major influences on the deflated ex-vessel price of blue crabs landed in Mississippi. First, it was shown that a 10 percent increase in blue crab landings in other Gulf states would result to a

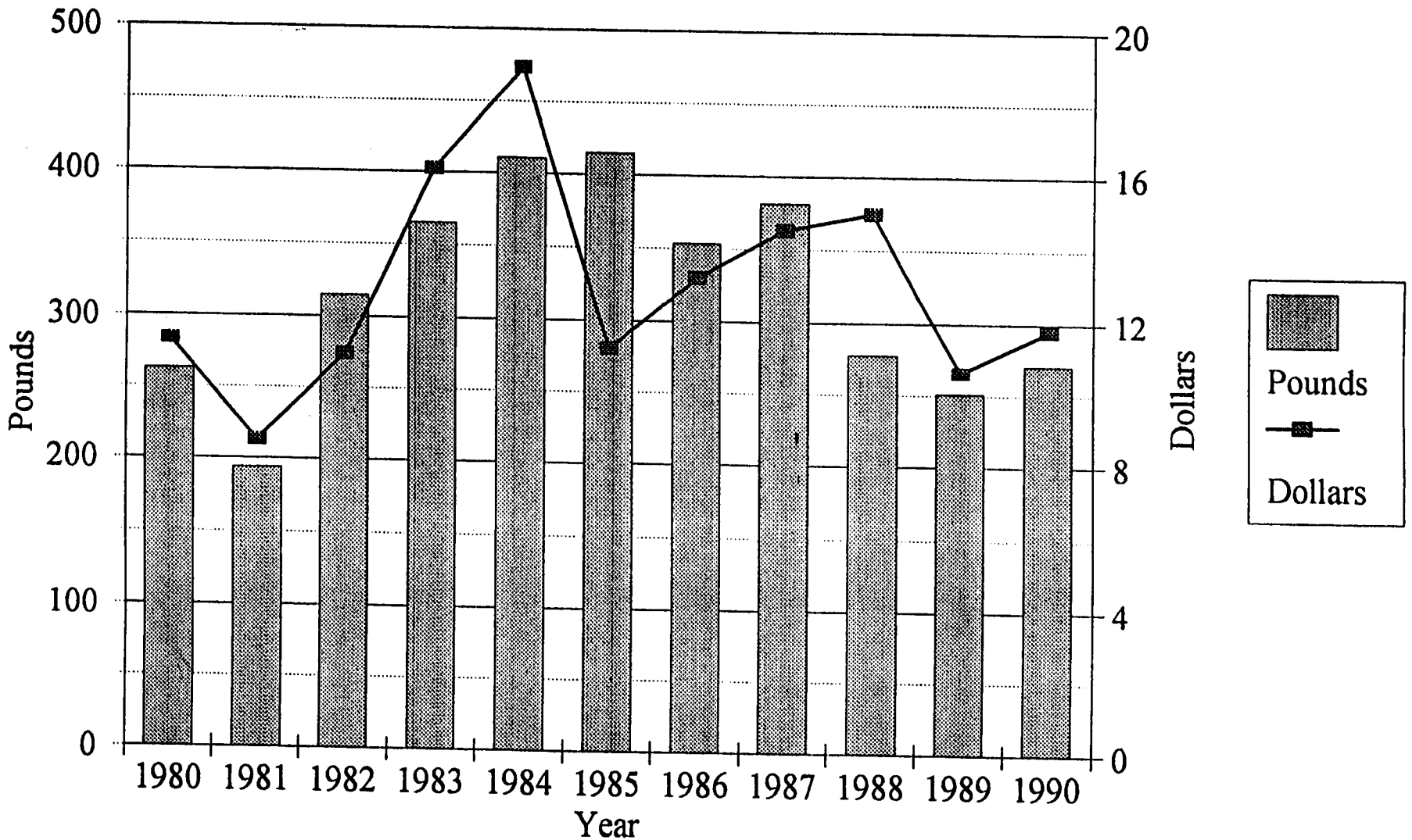
1.1 percent reduction in blue crab ex-vessel price, assuming other factors remaining constant. Second, as the dockside price of oysters landed in Mississippi decreases by 10 percent, blue crab ex-vessel price may decline by 1.6 percent, *ceteris paribus*. Finally, the dummy variable representing dockside gaming, disposable income and the prices of other species (shrimps, beef, poultry and pork) did not have any significant effect on the ex-vessel price of blue crabs landed in Mississippi.

Table 8. Commercial Menhaden Landings, Fishing Units and Fishermen in Mississippi Before and During Dockside Gaming, 1988-94

Item	Description	1988-91	1992-94
Volume of landings **	million pounds per year	265.97 (13.64)	NA
Nominal landing value ns	million dollars per year	12.46 (2.27)	NA
Deflated landing value ns	million dollars per year	10.08 (2.25)	NA
Nominal ex-vessel price *	cents per thousand pounds	46.7 (6.5)	NA
Deflated ex-vessel price ns	cents per thousand pounds	37.8 (6.9)	NA
Number of fishing vessels **	> 5 tons	16 a (3)	8 b (1)
Number of fishing boats **	< 5 tons	26 a (4)	16 b (1)
Number of fishermen **	persons	250 a (57)	135 b (8)

Sources and legends: Landings - NMFS (1993-95) and NMFS (1988-92); operating units - NMFS (1990-94) and NMFS (1988-89); ** - significantly different at 5%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations; number of fishermen refers to number of commercial fishing licenses sold in 1988-91 and 1992-94; landings in 1990-94 were not reported separately due to the confidential nature of the data; NA - data not available.

Fig. 8. Commercial Menhaden Landings
Mississippi, 1980-90, in millions



Menhaden. Mississippi landings contributed about one-fifth (20.91 ± 2.31%) of the commercial menhaden landings of the entire U.S. Gulf of Mexico in 1988-90. On the average, the state's commercial landings of menhaden in 1988-90 were 265.9 ± 13.6 pounds per year which were valued at $12.5 ± 2.3 million per year (Table 8). Due to the confidential nature of the data in 1990-94, the state's commercial menhaden landings were not reported as a separate species (Fig. 8).

The size of the Mississippi commercial menhaden fleet shrunk from 16 ± 3 vessels and 26 ± 4 boats in 1988-91 to 8 ± 1 vessels and 16 ± 1 boats in 1992-94. Likewise, the number of persons employed in the menhaden fishing fleet declined from 250 ± 57 persons in 1988-91 to 135 ± 8 persons in 1992-94. The decline in the size of the menhaden fleet and crew would eventually lead to lower commercial landings and processing. GSMFC (1988) estimated that it would take five or more fishing vessels to provide the optimal volume of industrial fish for the reduction needs of one processing plant.

Seafood Processing

Total Production. Seafood processing in coastal Mississippi deals primarily with shrimp, industrial fish, foodfish, oysters and crabs. Fig. 9 shows the annual processing output of fishery products in the state since 1980. The significant reductions in the volume of seafood production in Mississippi during the later period were accompanied by substantial shrinkage in its seafood processing capacity. The volume of fishery products processed by commercial plants decreased from 210.6 ± 15.0 million pounds in 1988-91 to 169.4 ± 15.0 million pounds in 1992-94 (Table 9). Total seafood processing capacity decreased from 38 ± 2 plants in 1988-91 to 32 ± 3 plants in 1992-94. The average volume (5.5 vs. 5.4 million pounds) and nominal value ($5.3 vs. $5.1 million) of fishery products processed by each plant also declined during the second period. Employment at the seafood processing plants declined from 1,687 ± 289 persons to 1,134 ± 225 persons. Fewer seafood wholesaling plants (30 vs. 24 plants) and workers (142 vs. 109 persons) were reported during the later period.

Plant-gate values, in both current and constant prices, of fishery products processed in Mississippi declined in the later period. The average nominal values of processed fishery products were $201.1 ± 20.2 millions in 1988-91 and $161.6 ± 8.8 million in 1992-94. At constant prices, the annual value of processed fishery products declined from $158.5 ± 18.9 in 1988-91 to $112.1 ± 9.2 million in 1992-94. Deflated plant-gate prices fell from $0.75 ± 0.04 to $0.66 ± 0.05 per pound, while nominal plant-gate prices increased from $0.95 ± 0.04 to $0.96 ± 0.07 per pound of processed fishery products.

Fig. 9. Seafood Processing Production
Mississippi, 1980-94, in millions

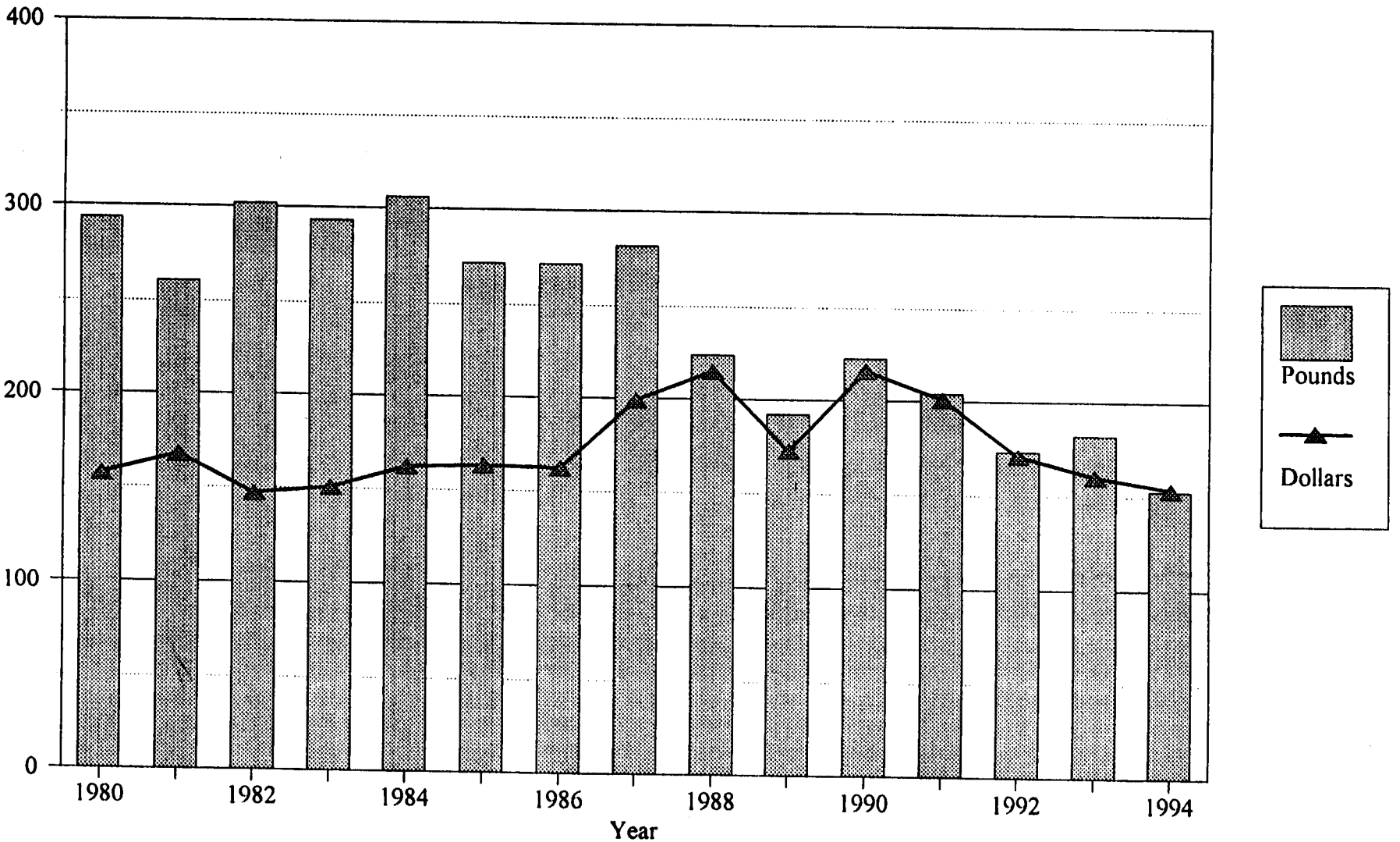


Table 9. Commercial Seafood Processing Production, Plants and Employment in Mississippi Before and During Dockside Gaming, 1988-94

Item	Description	1988-91	1992-94
Volume of processed products **	million pounds per year	210.58 [a] (15.01)	169.44 [b] (15.00)
Nominal value of processed products **	million dollars per year	201.15 [a] (20.20)	161.63 [b] (8.84)
Deflated value of processed products **	million dollars per year	158.45 [a] (18.91)	112.15 [b] (7.86)
Nominal plant-gate price ns	cents per pound	95.4 [a] (3.9)	95.7 [a] (6.8)
Deflated plant-gate price *	cents per pound	75.1 [a] (4.2)	66.3 [a] (4.9)
Processing plants ***	number	38 [a] (2)	32 [b] (3)
Wholesaling plants **	number	30 [a] (2)	24 [b] (3)
Processing workers **	persons	1,687 [a] (289)	1,134 [b] (225)
Wholesaling workers *	persons	142 [a] (22)	109 [a] (14)

Sources and legends: Production, value and operating units - NMFS (1989-96) and NMFS (1996); *** - significantly different at 1% ; ** - significantly different at 5%; * - significantly different at 10%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations.

Shrimp processing. Roberts et al. (1990) cited that while the increase in shrimp processing in Alabama and Mississippi in the middle 1970's were tied to the decline in shrimp processing in Louisiana and Texas, the more recent expansions in shrimp processing in these states are more likely based on higher imports of shell-on shrimp. The authors estimated a regression equation showing the effects of headless shrimp landings in the Southeast and shell-on shrimp imports on the volume of shrimp processed in the region. Fig. 10 shows the volume and values of processed shrimp products in Mississippi since 1980.

Table 10. Commercial Shrimp Processing Production, Plants and Employment in Mississippi Before and During Dockside Gaming, 1988-94

Item	Description	1988-91	1992-94
Volume of processed products [ns]	million pounds per year	45.03 [a] (4.77)	30.11 [a] (2.43)
Nominal value of processed products [*]	million dollars per year	161.13 [a] (16.07)	134.70 [a] (5.90)
Deflated value of processed products [***]	million dollars per year	126.68 [a] (11.64)	93.43 [b] (6.27)
Nominal plant-gate price [ns]	cents per pound	358.5 [a] (23.8)	344.9 [a] (18.0)
Deflated plant-gate price [*]	cents per pound	283.1 [a] (34.1)	238.9 [a] (9.9)
Processing plants [*]	number	23 [a] (1)	19 [a] (3)
Processing workers [ns]	persons	1,151 [a] (258)	811 [a] (66)

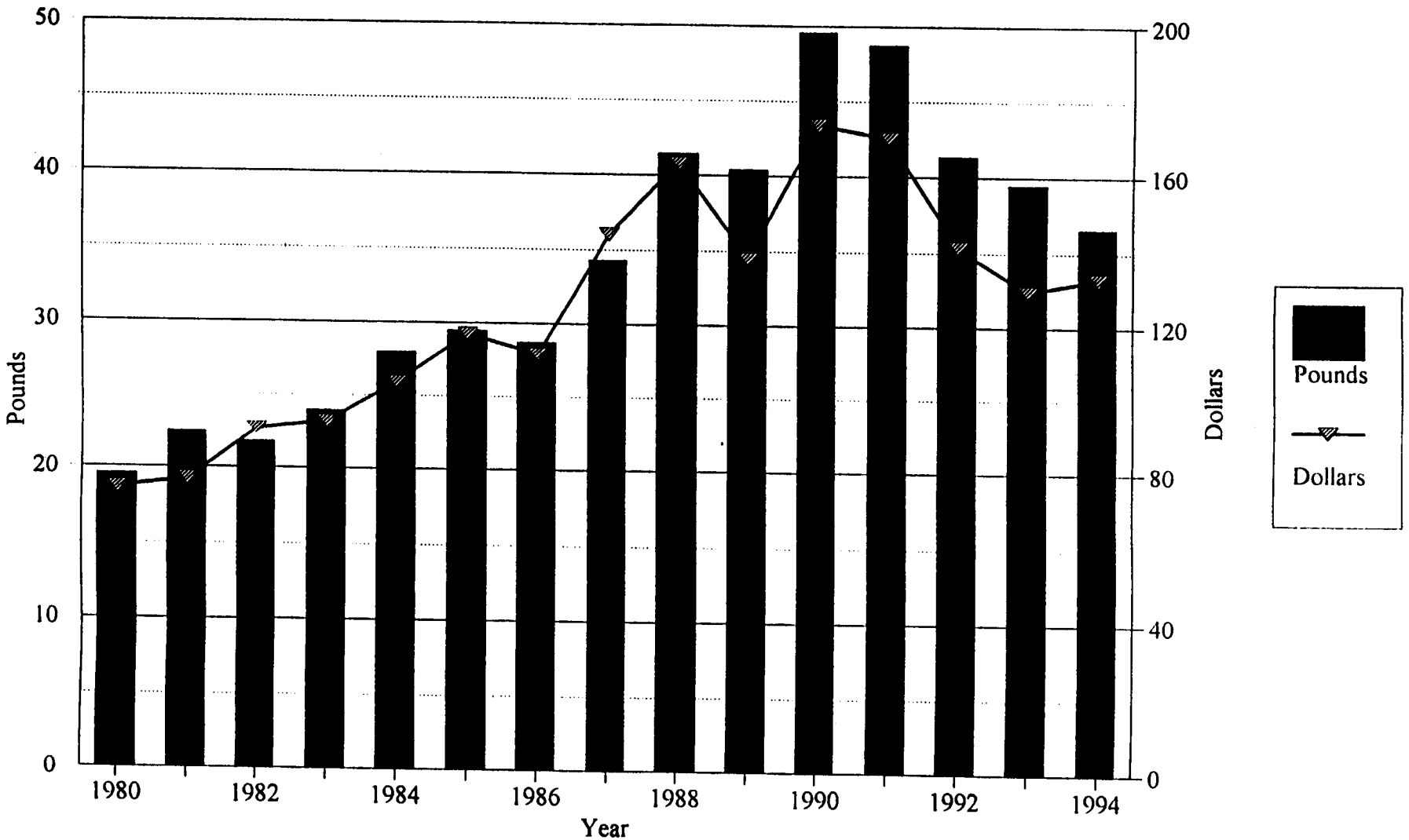
Sources and legends: Production and operating units - NMFS (1996); *** - significantly different at 1% ; ** - significantly different at 5%; * - significantly different at 10%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations.

Shrimp processing is the major component of seafood processing in coastal Mississippi contributing 81.5 ± 3.5 percent of the total processing value in 1988-94. The decline in the volume of shrimp processed in Mississippi tends to be associated with its reduced shrimp processing capacity during the second period and the reduction in both Gulf shrimp landings and shell-on imports. Using a similar approach used by Roberts et al. (1990) and converting all values into natural logarithms, Mississippi shrimp processing output appeared to be strongly affected by its own shrimp landings, landings by other Gulf states, total U.S. imports of shell-on shrimps, and the dummy variable representing gaming.

The estimated regression equation with the Mississippi shrimp processing production (1970-94) as dependent variable is as follows:

$$\ln msproc = 6.376^{**} + 0.426*\ln msland^{***} + 0.194*\ln osland^{ns} + 0.060*\ln ussoi^{ns} - 0.103*gaming^{ns}$$
$$(6.755) \quad (0.131) \quad (0.259) \quad (0.325) \quad (0.167)$$
$$R^2 = 0.941 \qquad DW = 2.110 \qquad F\text{-value} = 54.795^{***}$$

Fig. 10. Shrimp Processing Production
Mississippi, 1980-94, in millions



where:

lnmsproc - quantity of shrimp products processed in Mississippi (lbs); lnmsland - shrimp landings in Mississippi (lbs); lnosland - shrimp landings in other Gulf states (lbs); lnussoi - volume of U.S. imports of shell-on shrimp (lbs); gaming - dummy variable representing gaming.

The volume of shrimp products processed fell from 45.0 ± 4.8 million pounds in 1988-91 to 39.1 ± 2.4 million pounds in 1992-94 (Table 9). This decline in shrimp processing output maybe attributed to several factors. First, shrimp processing capacity decreased from 23 ± 1 plants during the first period to 19 ± 3 plants during the second period as a result of the closure of some of these processing plants. With the reduction in plant capacity, the number of processing workers also decreased from 1,251 ± 258 persons to 811 ± 66 persons. Second, shrimp landings in the state as well as the entire Gulf region declined from 233.1 million pounds to 211.6 million pounds. The regression results also indicate that a 10 percent reduction in state landings would lead to a 4.3 percent cutback in shrimp processing, *ceteris paribus.* If other Gulf states' landings fell by 10 percent, Mississippi's shrimp processing would decrease by 1.9 percent, *ceteris paribus*. Finally, when shell-on imports decrease by 10 percent, shrimp processing in Mississippi would most likely decline by 0.6 percent, ceteris paribus. U.S. imports of shell-on shrimps, however, remained fairly stable during both periods. About 342.9 ± 27.3 million pounds of shell-on shrimps were imported by the U.S. in 1988-91, as compared to 342.8 ± 8.3 million pounds in 1992-94.

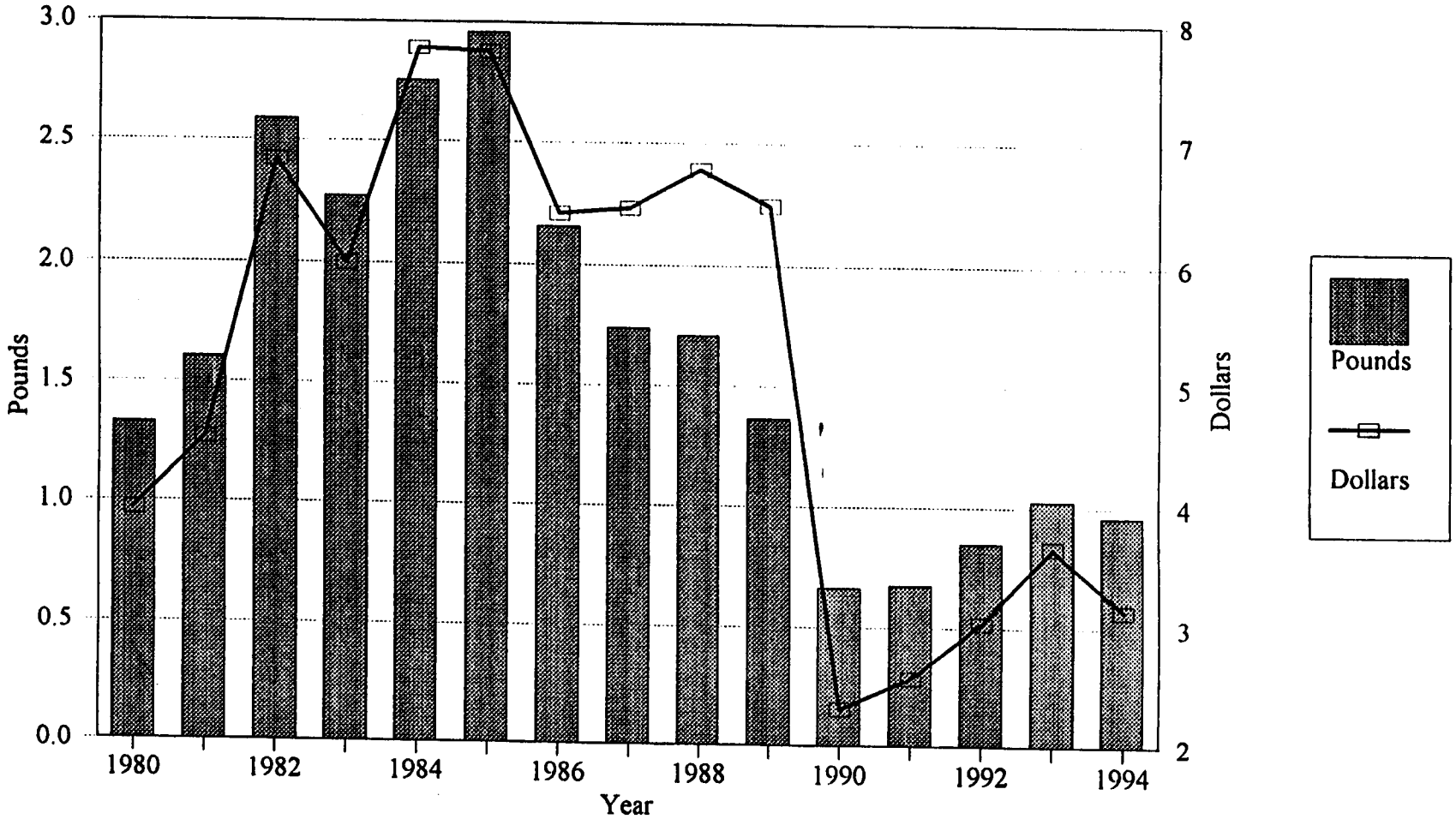
The reduction in the volume of processed shrimp products also led to decline in both the current and deflated plant-gate values and prices of shrimp products. In nominal terms, processing values fell from $161.1 ± 16.1 million in 1988-91 to $134.7 ± 5.9 million in 1992-94. Deflated-wise, the value of shrimp processed decreased from $126.7 ± 11.6 million to $93.4 ± 6.3 million. Plant-gate prices of shrimp products processed also fell, in both nominal ($3.59 vs. $3.45 per pound) and deflated terms ($2.83 vs. $2.39 per pound) during the later period.

Oyster processing. About 2.2 ± 1.1 percent of the total value of processed fishery products in 1988-94 consisted of processed oyster products. Oyster processing decreased both in volume (1.1 vs. 0.9 million pounds) and plant-gate value ($4.5 vs. $3.3 million) during the later period (Table 11). Using 1980-94 data, the effects of oyster landings and imports on Mississippi oyster processing output are shown by the following regression equation:

$$\begin{aligned} \text{lnmsproc} = &-10.242^{**} + 0.115*\text{lnmsland}^{ns} + 0.870*\text{lnosland}^{**} + 0.489*\text{lnusimp}^{**} \\ &(3.883) \quad (0.065) \qquad\qquad (0.307) \qquad\qquad (0.158) \\ &- 0.340*\text{gaming}^{*} \\ &(0.166) \end{aligned}$$

$R^2 = 0.945$ DW = 2.263 F-value = 27.766 ***

Fig. 11. Oyster Processing Production
Mississippi, 1980-94, in millions



where:

lnmsproc - quantity of oyster products processed in Mississippi (lbs); lnmsland - oyster landings in Mississippi (lbs); lnosland - oyster landings in other Gulf states (lbs); lnusimp - volume of U.S. imports of oysters (lbs); gaming - dummy variable representing gaming.

Table 11. Commercial Oyster Processing Production, Plants and Employment in Mississippi Before and During Dockside Gaming, 1988-94

Item	Description	1988-91	1992-94
Volume of processed products [ns]	million pounds per year	1.10 [a] (0.52)	0.94 [a] (0.09)
Nominal value of processed products [ns]	million dollars per year	4.53 [a] (2.43)	3.28 [a] (0.33)
Deflated value of processed products [ns]	million dollars per year	3.65 [a] (2.12)	2.27 [a] (0.23)
Nominal plant-gate price [ns]	cents per pound	400.8 [a] (54.5)	347.6 [a] (17.3)
Deflated plant-gate price *	cents per pound	316.7 [a] (54.3)	241.2 [a] (17.8)
Processing plants [ns]	number	13 [a] (3)	10 [a] (0)
Processing workers [ns]	persons	634 [a] (147)	490 [a] (4)

Sources and legends: Production and operating units - NMFS (1996); * - significantly different at 10%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations.

The decline in oyster processing output could be attributed to several factors. First, there was a reduction in the processing capacity for oysters from 13 ± 3 plants to 10 ± 0 plants. Subsequently, employment at the oyster processing plants also decreased from 634 ± 147 persons to 490 ± 4 persons. Second, variations in state oyster landings played an insignificant influence over oyster processing by plants located in the state. Despite the increase in oyster landings in Mississippi (0.124 vs. 1.619 million pounds) during the later period, oyster processing in the state declined. Third, fluctuations in oyster landings in other Gulf states had very strong direct effects on the volume of oysters processed in Mississippi. Commercial oyster landings in the entire Gulf, however, rose from 14.316 ± 3.182 in the first period to 21.941 ± 4.704 million pounds in the second period. Finally, the volume of imported oysters seemed to have exerted very significant

positive influence over the state's oyster processing activities. U.S. imports of oysters, which consist of fresh, chilled and frozen products, fell from 31.824 ± 13.242 million pounds in 1988-91 to 14.608 ± 0.853 million pounds in 1992-94.

The decrease in processing output, however, did not lead to higher plant-gate prices of processed oyster products. The deflated plant-gate prices of processed oysters decreased from $3.17 ± 0.54 per pound in 1988-91 to $2.41 ± 0.18 per pound in 1992-94.

Table 11. Commercial Blue Crab Processing Production, Plants and Employment in Mississippi Before and During Dockside Gaming, 1988-94

Item	Description	1988-91	1992-94
Volume of processed products *	million pounds per year	0.20 [a] (0.12)	0.41 [a] (0.07)
Nominal value of processed products [ns]	million dollars per year	0.94 [a] (0.29)	1.23 [a] (0.41)
Deflated value of processed products [ns]	million dollars per year	0.74 [a] (0.23)	0.85 [a] (0.30)
Nominal plant-gate price *	cents per pound	523.1 [a] (146.0)	293.1 [a] (57.5)
Deflated plant-gate price *	cents per pound	416.3 [a] (132.6)	203.7 [b] (43.9)
Processing plants [ns]	number	5 [a] (1)	6 [a] (1)
Processing workers [ns]	persons	170 [a] (123)	345 [a] (21)

Sources and legends: Production and operating units - NMFS (1996); * - significantly different at 10%; ns - not significant at 10%; means with the same letters are not significantly different at 5%; numbers in parentheses are standard deviations.

Crab processing. The processing of crab products contributed 0.6 ± 0.3 percent to the total value of processed fishery products in 1988-94. Mississippi crab processors produced more crab products which were sold at lower plant-gate prices during the later period. The volumes of processed products were 0.20 ± 0.12 and 0.41 ± 0.07 million pounds while the plant-gate values were $0.94 ± 0.29 and $1.23 ± 0.41 million during the first and second periods, respectively. The increase in the volume of processed crab products lead to a decline in plant-gate prices of these

products during the second period in both nominal ($5.23 vs. $2.93 per pound) and deflated ($4.16 vs. $2.04 per pound) terms.

The regression results with Mississippi blue crab processing output as the dependent variable are as follows:

$$\begin{aligned} \text{lnmsproc} &= 0.461^{ns} + 0.446*\text{lnmsland}^{**} + 0.325*\text{lnosland}^{ns} + 1.047*\text{gaming}^{***} \\ &\quad (7.872) \quad (0.166) \quad (0.406) \quad (0.330) \\ R^2 &= 0.505 \quad DW = 2.165 \quad \text{F-value} = 3.374^{*} \end{aligned}$$

where:

lnmsproc - quantity of blue crab products processed in Mississippi (lbs); lnmsland - blue crab landings in Mississippi (lbs); lnosland - blue crab landings in other Gulf states (lbs); gaming - dummy variable representing gaming.

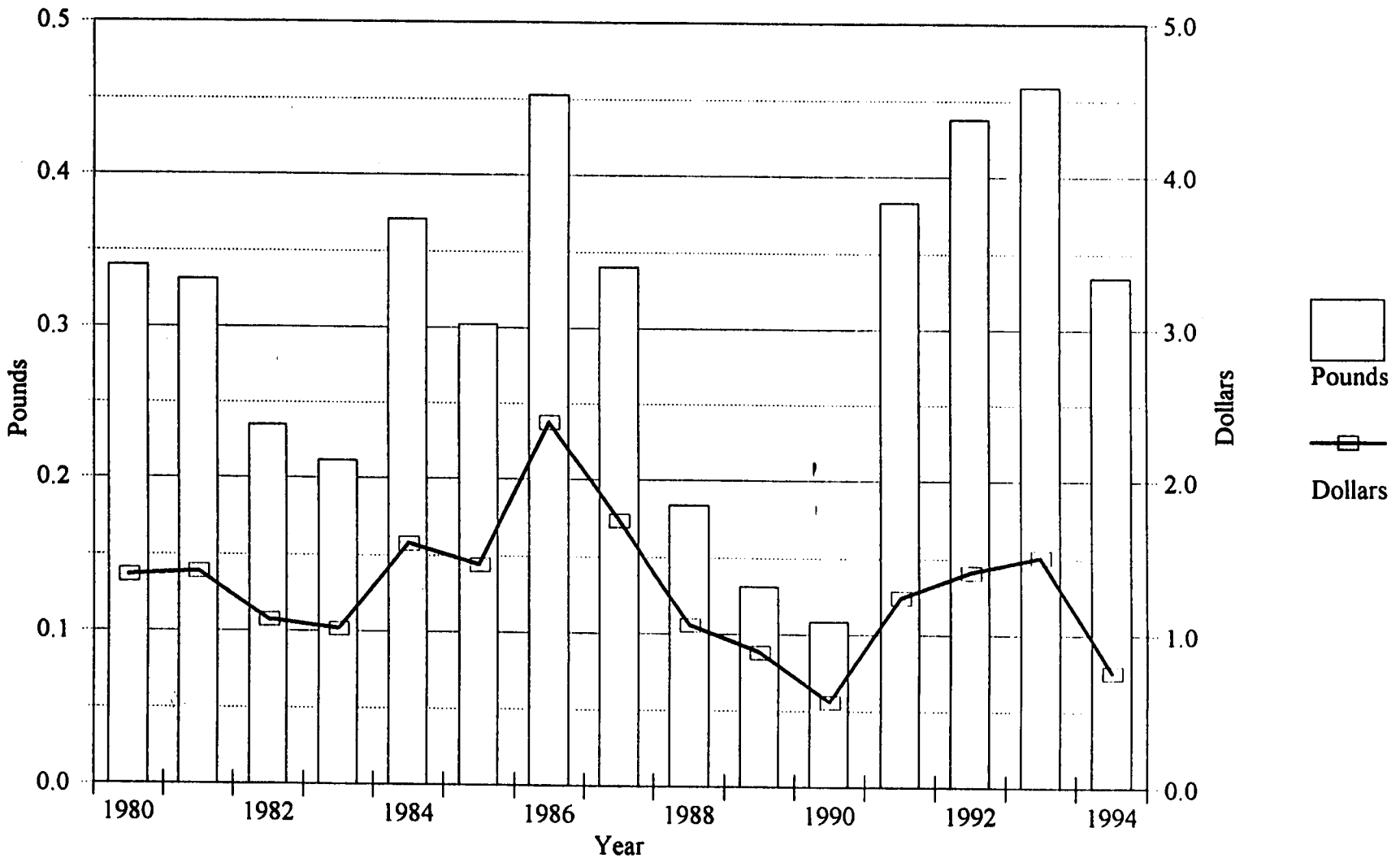
A direct relationship between the output of processed crab products and crab landings within the state and other states in the Gulf was observed in 1980-94. An increase in state landings of blue crabs by 100 percent would lead to an expansion in processing output by 44.6 percent, *ceteris paribus*. As described earlier, however, the commercial landings of blue crabs in Mississippi declined during the later period. As commercial landings of other Gulf states rise by 100 percent, blue crab processing output in the state would also rise by 32.5 per cent, *ceteris paribus*. Annual Gulfwide commercial landings of blue crabs remained fairly stable during the two periods (59.7 vs. 59.5 million pounds). The increase in crab processing production during the later period resulted from a slightly higher processing capacity during the later period (5 vs. 6 plants, 170 vs. 345 workers).

Economic Impact

Generally, the seafood industry consists of the harvesting, processing, wholesaling, retailing and restaurant sectors (CAI 1984 and Haby et al. 1993). The harvesting sector consists of commercial fishermen using various gear on board fishing vessels (>5 tons) and fishing boats (<5 tons). The processing sector involves plants engaged in primary wholesale and processing activities. The wholesaling sector includes secondary wholesale and processing activities. The retailing sector refers to retail trade of seafood products. The restaurant sector deals with retail trade of final seafood products by food service establishments. In this report, however, only the harvesting and processing sectors will be included.

The economic impact of the industry is estimated by using multiplier analysis. Three measures can be used in calculating the economic impact of the industry. First, the outputs of fish and fishery products landed, processed or distributed in Mississippi. Second, the incomes earned by households because of the new outputs of fish and fishery products. Lastly, the employment generated because of the new outputs of fish and fishery products.

Fig. 12. Blue Crab Processing Output
Mississippi, 1980-94, in millions



In estimating the economic impact of commercial fisheries, CAI (1984) identified three components, namely: direct, indirect and induced effects. Direct effects are effects in the initial sector under consideration. Indirect effects are those related to the purchase of inputs by the directly affected industry. These indirect impacts extend as each supplier purchases from other suppliers. Induced effects are those related to the purchase of goods and services resulting from wages paid by both directly and indirectly affected businesses. These induced effects have additional indirect and induced effects as well. Williams and Lee (1989) suggested a new multiplier, the total linkage multiplier, which includes both forward and backward linkages. The direct, indirect and induced effects incorporate only backward linkages, while the total linkage multiplier measures both the backward and forward linkage effects. In this report, however, the analysis will be limited to the backward linkage effects of the harvesting and processing sectors of the Mississippi seafood industry.

Harvesting sector. Annual sales in the harvesting sector refer to the ex-vessel values of commercial landings in the state. Total personal income from commercial fishing is the sum of crew shares, bonuses, return to captain after expenses have been paid, and occasional piece-work fees paid to helpers for cleaning or unloading catch, mending nets. or helping with vessel repair (CAI, 1984). The number of fishing licences issued serves as an indicator of the number of persons employed by the commercial fishing industry. The use of licenses issued, however, over-estimates the true number of employment generated due to the high seasonality in almost all commercial fisheries.

Table 13. Economic Impact of Commercial Fishing or Harvesting Sector in Mississippi Before and During Dockside Gaming, 1988-95

Item	Description	1988-91	1992-95
Output effects	million dollars per year	101.33	90.94
Income effects	million dollars per year	37.29	33.46
Employment effects	persons per year	4,512	3,983

Sources and legends: Output effects = average commercial landing value x type 2 forestry and fishery products output multiplier (k_o = 2.46589); income effects = average personal income from commercial fishing x type 2 forestry and fishery products income multiplier (k_y = 1.70531); employment effects = average number of fishing licenses issued by the state x type 2 forestry and fishery products employment multiplier (k_n = 1.57263); forestry and fishery products (sector 8) output, income and employment multipliers - Lee (1986).

The decline in the state's commercial landings during the later period resulted in some adjustments in the region's economy in terms of output, jobs and income related to commercial fishing. In 1988-91, the average commercial landing value in the state amounting to $41 million produced an annual output of $101 million, created employment opportunities to over 4,500

persons per year, and generated a yearly income of more than $37 million (Table 13). With lower average commercial landing value ($37 million) in 1992-95, the associated output, income and employment created directly and indirectly by the commercial fishing industry declined to $91 million, $33 million and 4,000 persons, respectively.

Processing sector. In estimating the economic impact of the Mississippi seafood industry, the processing sector needs to be considered separately since the state seafood processing plants handle landings of fishery products from other states and imports from foreign countries to sustain existing plant capacity. In order to eliminate double counting, value added is used in measuring the output effects in the processing sector. NMFS (1989-96) defined value added as the gross receipts of firms minus the cost of purchased goods and services needed to fabricate the product. For the processing sector, value added is the value of sales less the cost of purchased seafood products, containers and packaging materials, ingredients and other materials, various supplies, fuel and electric energy, transportation, insurance, repair and maintenance and miscellaneous services (CAI, 1984).

Table 14. Economic Impact of Commercial Seafood Processing Sector in Mississippi Before and During Dockside Gaming, 1988-94

Item	Description	1988-91	1992-94
Value added effects	million dollars per year	113.28	71.80
Income effects	million dollars per year	66.21	53.21
Employment effects	persons per year	7,331	4,981

Sources and legends: Value added effects = average commercial seafood processing value added x type 2 miscellaneous food and kindred products output multiplier (k_o = 1.83761); income effects = average personal income from commercial seafood processing x type 2 miscellaneous food and kindred products income multiplier (k_y = 3.57121); employment effects = average number of workers employed in seafood processing plants x type 2 miscellaneous food and kindred products employment multiplier (k_n = 4.00798); miscellaneous food and kindred products (sector 21) value added, income and employment multipliers - Lee (1986); value added ratios in seafood processing - NMFS (1989-96).

As the volume and values of fishery products processed in coastal Mississippi declined, additional adjustments were taking place in the region's economy. In 1988-91, as the commercial seafood processing sector produced an annual output of fishery products valued at more than $201 million, it created value added over $61 million. The economic activities associated with the value added from processing during that period produced an annual output valued at $113 million, provided jobs to more than 7,300 persons, and generated an annual

income reaching over $66 million. Consequently, as both the volume and values of fishery products processed in coastal Mississippi declined during the later period, the value added, income and employment effects also decreased to $72 million, $53 million, and 5,000 persons, respectively.

Conclusion

The economic impact of dockside gaming on the commercial seafood industry was evaluated by comparing selected economic indicators of the commercial fishing and processing sectors before and during the legalization of dockside gaming in Mississippi. It is evident that dockside gaming expanded economic activities in the region leading to higher employment, personal income and government revenues. The number of persons employed and income generated by the state gaming industry continued to increase during the last three fiscal years. The annual income received by employees averaged between $16,000 and $17,000 per person. By FY 1994-95, about 42,000 persons were employed by the casino operations in the state and another 38,000 persons were hired by related industries. In FY 1994-95, the 12-14 dockside gaming operations located in two coastal counties hired about 15,000-16,000 persons while indirectly related industries employed between 14,000 and 15,000 additional persons. Total wages and salaries paid by coastal gaming operations to their own workers and employees amounted to about $265 million, while employers in directly related industries paid additional $250 million to their own employees.

The economic expansion associated with dockside gaming, however, was accompanied by some adjustments in the state's commercial seafood industry. First, the reduction of the size of the commercial fishing fleet due to the closure of some support services eventually led to the decline in both the volume and value of state's commercial landings. Approximately 287.7 ± 34.7 million pounds were landed in 1988-91, as compared to 183.8 ± 30.9 million pounds in 1992-95. Current dockside values were $41.1 ± 4.6 million in 1988-91 and $36.8 ± 7.7 million in 1992-95. Fewer fishing vessels weighing more than 5 tons (707 vs. 650 vessels) and fishing boats weighing less than 5 tons (1,206 vs. 971 boats) were reported during the later period. The number of commercial fishing licenses issued slightly declined (2,869 vs. 2,533) during the second period.

Second, the significant reductions in the volume of seafood production in Mississippi during the later period were accompanied by substantial shrinkage in its seafood processing capacity. The volume of fishery products processed by commercial plants decreased from 210.6 ± 15.0 million pounds in 1988-91 to 169.4 ± 15.0 million pounds in 1992-94. The average nominal values of processed fishery products were $201.1 ± 20.2 millions in 1988-91 and $161.6 ± 8.8 million in 1992-94. Total seafood processing capacity decreased from 38 ± 2 plants in 1988-91 to 32 ± 3 plants in 1992-94. The average volume (5.5 vs. 5.4 million pounds) and nominal ($5.3 vs. $5.1 million) values of fishery products processed by each plant also declined during the second period. Employment at the seafood processing plants declined from 1,687 ± 289 persons to 1,134

± 225 persons. Fewer seafood wholesaling plants (30 vs. 24 plants) and workers (142 vs. 109 persons) were reported during the later period.

Third, the drop in the state's commercial landings during the later period resulted in some adjustments in the region's economy in terms of output, jobs and income related to commercial fishing. In 1988-91, the average commercial landings value in the state amounting to $41 million produced an annual output of $101 million, created employment opportunities to over 4,500 persons per year, and generated a yearly income of more than $37 million. With lower average commercial landing value ($37 million) in 1992-95, the associated output, income and employment created directly and indirectly by the commercial fishing industry declined to $91 million, $33 million and 4,000 persons, respectively.

Finally, as the volume and values of fishery products processed in coastal Mississippi declined, additional adjustments were taking place in the region's economy. In 1988-91, as the commercial seafood processing sector produced an annual output of fishery products valued at more than $201 million, it created value added over $61 million. The economic activities associated with the value added from processing during that period produced an annual output valued at $113 million, provided jobs to more than 7,300 persons, and generated an annual income reaching over $66 million. Consequently, as both the volume and values of fishery products processed in coastal Mississippi declined during the later period, the value added, income and employment effects also decreased to $72 million, $53 million, and 5,000 persons, respectively.

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